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U.S. Trade and Development Agency

INFRASTRUCTURE OPPORTUNITIES IN SOUTH AMERICA:

ENERGY SECTOR
TRANSPORTATION SECTOR
ENVIRONMENT SECTOR
TELECOMMUNICATIONS SECTOR
INDUSTRIAL SECTOR

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COUNTRY BUSINESS & FINANCE REPORTS

REPUBLIC OF ARGENTINA

REPUBLIC OF BOLIVIA

FEDERATIVE REPUBLIC OF BRAZIL

REPUBLIC OF CHILE

REPUBLIC OF COLOMBIA

REPUBLIC OF ECUADOR

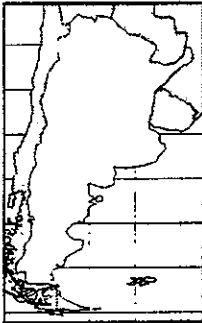
REPUBLIC OF PARAGUAY

REPUBLIC OF PERU

ORIENTAL REPUBLIC OF URUGUAY

REPUBLIC OF VENEZUELA

REPUBLIC OF ARGENTINA

	GDP ('94)	U.S.\$279 billion	GDP/Capita	U.S. \$ 8206
	Real GDP Growth	1995: 1.0%	Population	34.2 million
	(forecasts)	1996: 3.5%	CPI ('94)	4%
			S&P Rating	BB-
	Expected Markets	1995-2000		
	Energy	U.S.\$4.24 billion	Environment	U.S.\$4.3 billion
Telecommunications	U.S.\$10.7 billion	Transportation	U.S.\$6.3 billion	

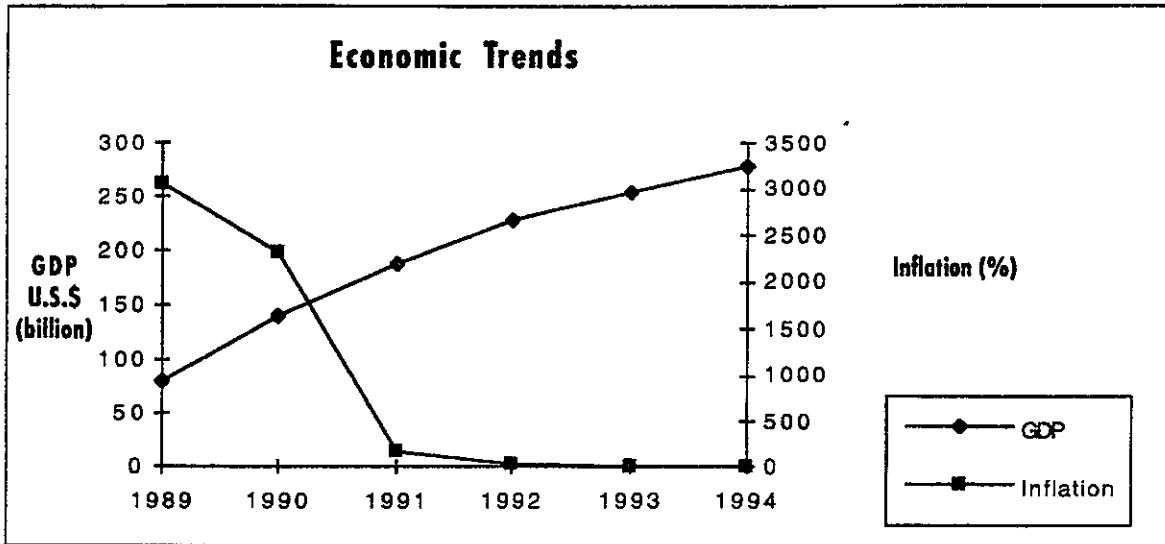
Executive Summary

Argentina will experience high demand for infrastructure across all sectors for the remainder of the decade. The reelection of President Menem provides underlying support for the current economic restructuring.

Growth—as in all South American countries—is driven by pent-up demand to improve the aging infrastructure. The financing picture is positive because of the country's relatively high per capita income level. The government is prioritizing infrastructure development as a means of removing bottlenecks, especially those relating to exports, which are critical to the success of the Argentine model.

In addition, the government has created the necessary environment for substantial long-term private investment in infrastructure by containing inflation, ensuring economic growth, and removing barriers to private participation in all aspects of the economy. U.S. business has played an active part in Argentina's economic rebound. U.S. exports to Argentina approached U.S.\$5 billion in 1994 through large increases in trade and investment.

Argentina is an open economy that welcomes foreign participation in all aspects of infrastructure development. As a result of legal and regulatory reform, foreign firms are free to enter and participate in the economy without discrimination. The regulatory frameworks supporting private participation in energy, environment, telecommunications, and transportation are recent but will likely strengthen over time. Current economic uncertainty resulting from events in Mexico is not likely to have long-term negative effects on Argentina's overall, positive economic direction.



Source: US DOC/IMF and EIU

Energy

Electrical transmission and distribution equipment will be an important market as Argentina continues to modernize and privatize its electrical system. Prior to privatization, the system was characterized by malfunctions, overloads, and frequent power interruptions. New private owners, including several U.S. firms such as AES and Entergy, are investing heavily to improve system reliability and efficiency. New regulations that allow end users to buy directly from power producers will further fuel privatization of provincial distribution companies. Demand for electricity for the rest of the decade is expected to mirror GDP growth, about 5 to 6 percent per year. New opportunities will emerge in 1995 in the nuclear power sector. Newly passed legislation authorizes the sale of up to U.S.\$600 million of nuclear generating assets.

The Argentine marketplace is increasingly well-organized, divided into four sectors: (1) generation (2) transmission (3) distribution and (4) large users. This is the wholesale electricity market, which also features an active spot market. The manager of the market is CAMMESA, which schedules and dispatches the generation through a marginal cost system.

The state oil company, YPF, has been privatized, and the government is actively courting foreign firms to exploit the country's vast gas and oil reserves. Over 95 concessions have been granted for the private exploitation of the country's hydrocarbon and mineral reserves.

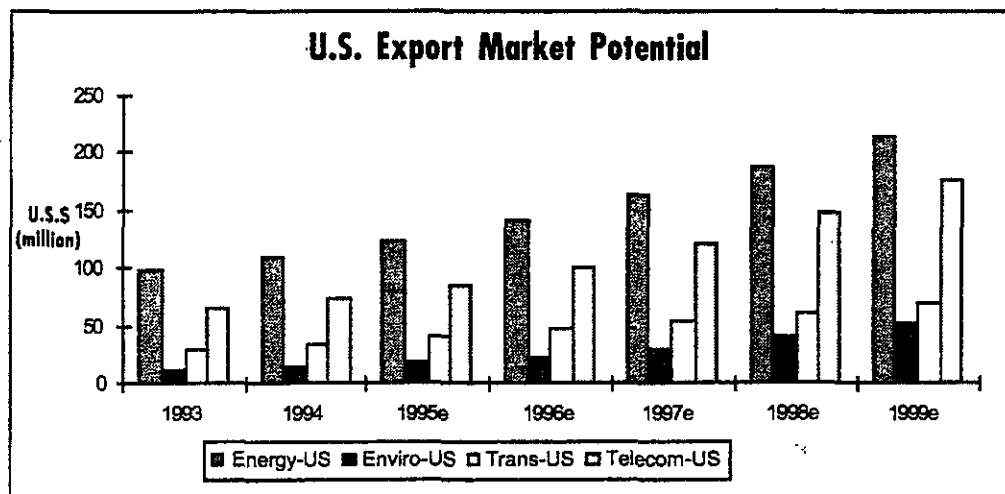
Environment

The best opportunities for U.S. firms center on the privatization, modernization, and construction of provincial water and sewer systems. A recent plan to upgrade sewage and potable water services reveals that nine million people lack access to drinking water and over 20 million lack access to ad-

equate sewage treatment. *The plan recommends total expenditures of close to U.S.\$5 billion over the next five years to remedy these deficiencies—the majority being targeted for urban areas.* Lesser amounts are being targeted for the cleanup and restoration of the most severely polluted rivers and lakes.

There are no treatment plants for hazardous wastes in Argentina. Although the hazardous waste law requires the proper treatment and disposal of waste, the government will need a more pro-active approach to break the current logjam over siting and enforcement. When this logjam is broken, it is expected that the government will invite private firms to own and operate these facilities.

Argentina's overall environmental regulatory infrastructure is weak, inhibiting the market place for environmental goods and services. At the same time, many major businesses seek to be ahead of the regulations and are involved in auditing their environmental practices and taking corrective action where appropriate. Industrial opportunities exist in the areas of environmental planning and auditing, industrial wastewater, and in-house storage and treatment of hazardous wastes.



Transportation

In surface transport, opportunities involve the recent privatization of the Buenos Aires subway system and five commuter rail lines. The terms of the privatization require major new investments to modernize service. In roads, Argentina expects to expand its network of highways and bridges through a highway concession program.

The government is promoting the modernization of its airport system, especially the upgrade of smaller airports. Demand will focus on areas favorable to U.S. exports such as sophisticated navigational systems. Demand is expected to total U.S.\$2.5 billion through the year 2000.

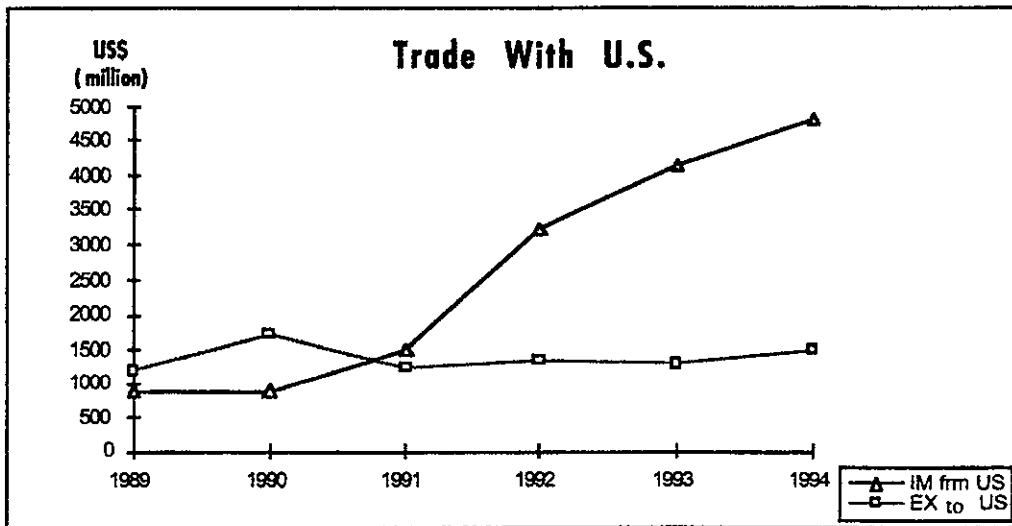
Telecommunications

The government transferred control of ENTEL, the public telephone company, into the hands of two private groups, Telecom (Stet/France telecom and JP Morgan Bank) and Telefónica Argentina (Telefónica of Spain and Citibank). Subsequent investments to rehabilitate and modernize the telephone network are fueling demand for high-technology equipment and services, especially switching systems. Within individual firms, economic growth and competitive pressures are leading to investments in state-of-the-art internal systems and value-added services.

Demand for cellular services is also strong in Argentina. Telefónica and Telecom are heavily investing in a program to provide cellular service throughout the country.

Economic & Political Climate

The Menem government has been very successful at reversing years of inflation and sluggish growth in Argentina. The government's program is focused on opening the country to trade and investment, guaranteeing full convertibility of the peso, a tight fiscal and monetary policy, and a major privatization campaign. The result has been four years of strong economic growth, single-digit inflation, renewed investor confidence, and strong public support.



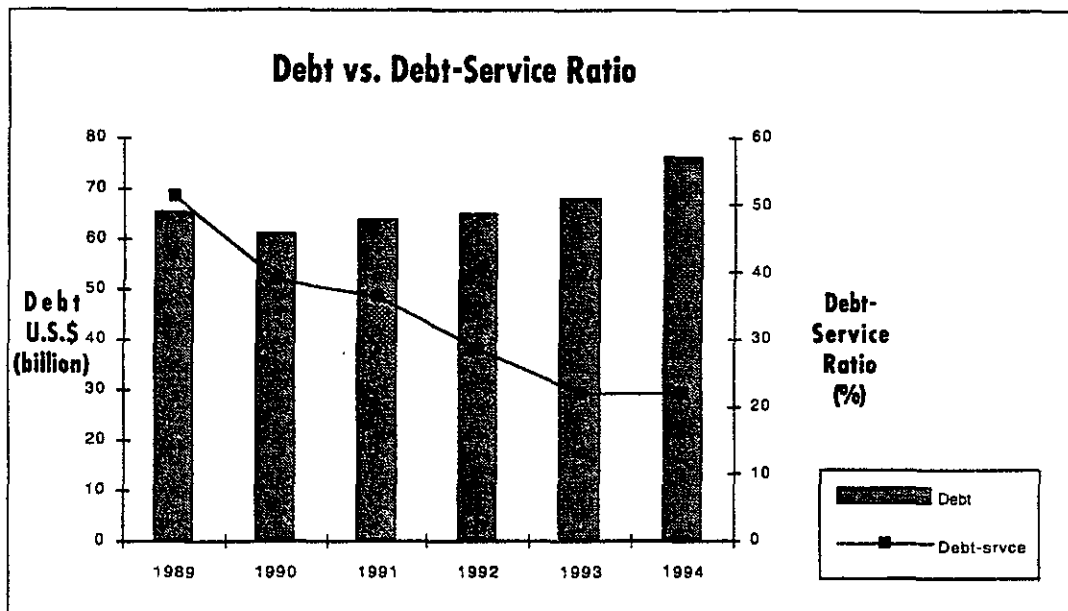
Source: IMF, NTDB and EIU

U.S. exports during the period have seen explosive growth as a result of the new openness and renewed economic vitality. U.S. exports rose to close to U.S.\$5 billion in 1994 from less than U.S.\$1 billion only four years prior. Growth was highest in telecommunications, electrical distribution, and transportation equipment. •

The Mexican peso crisis was felt particularly hard in Argentina because of the two countries' similar

trade and debt profile. The government has responded with a preemptive economic plan designed to curb consumption, improve its fiscal balance, and restore investor confidence. The plan includes multilateral funding of U.S.\$6 billion. It is unlikely that this short term uncertainty and lower economic growth will impact Argentina's long-term positive outlook for U.S. business.

President Menem was reelected on May 14, 1995 to a second term.



Source: EIU

Business Climate & Regulatory Overview

Foreign investors and national firms receive equal treatment in Argentina, and there are no barriers to entry or exit. Foreign firms operating in Argentina enjoy the following:

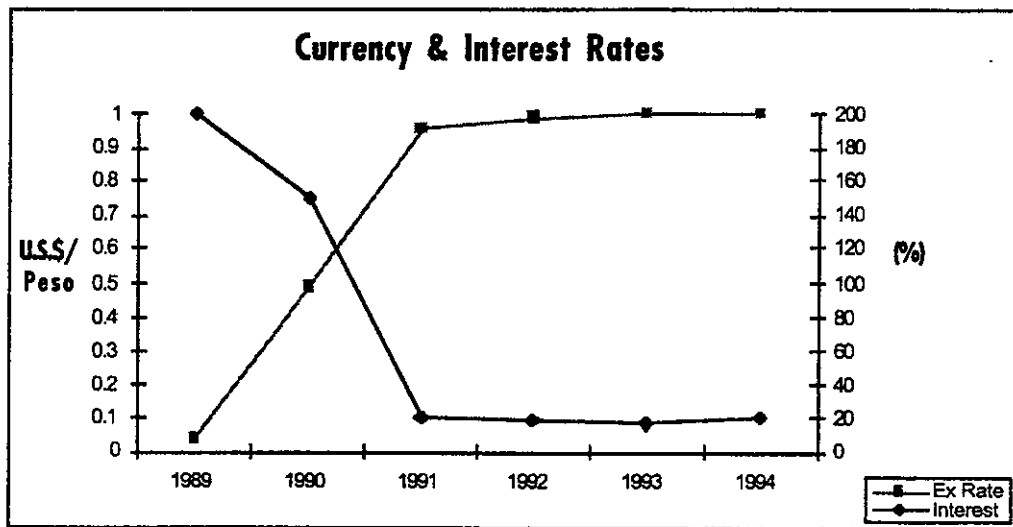
- Same tax liabilities as local firms
- Eligibility for the government's export promotion schemes
- Participation in research and development programs
- No restriction on the movement of capital
- No reporting requirements on the capital flows
- Recent cuts in federal and provincial taxes

The government has virtually eliminated non-tariff barriers and specific duties. The average tariff has been reduced to 12 percent, with a range of 0 to 35 percent. Trade regulations are characterized by:

- Simplified documentation
- No import licenses except in the auto market
- Ten -percent statistical fee on imports
- Eighteen percent value-added tax
- Harmonized system in alignment with GATT customs code

Argentina is still developing the necessary regulatory structures and supporting institutions to support the private development of infrastructure. In the past, problems have arisen as aggressive efforts to privatize were not backed by clear legal provisions or a regulatory framework. Continued improvement in this area will need to occur to guarantee vibrant private-sector investment in infrastructure projects. Argentina is a member of Mercosur.

Argentina adheres to international laws on intellectual property rights and copyrights. However, the patent laws are inadequate with respect to certain industrial products. Argentina signed a bilateral investment treaty with the U.S. in 1991 and also has agreements with OPIC and the World Bank's MIGA. In 1991, Argentina also abolished its system of government procurement that favored local firms.



Financial Overview

Capital markets and investment portfolios have become efficient as a result of the elimination of regulated credit policies. Capital markets are favorable with:

- No bias in credit allocation vis-à-vis foreign entities
- Growing number of credit alternatives
- Information requirements for issuance of stocks and bonds are less exacting

- Banking sector is characterized by only 8 -percent non-performing assets at the end of 1993
- No restrictions on mergers and acquisitions.

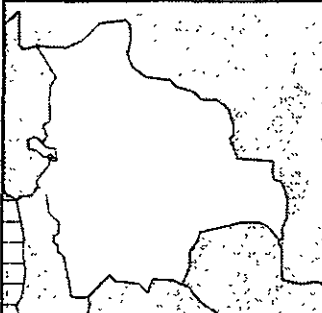
The Argentine peso is fully convertible at a 1 to 1 rate with the U.S. dollar and no repatriation or capital controls exist. U.S. Ex-Im Bank services are fully available in Argentina, and OPIC covers both convertibility and political risk. The major U.S. private banks operate in Argentina.

The emerging market for project finance in Argentina has been placed on hold because of the Mexican peso devaluation. These fears, along with the government's tight money policies, have increased interest rates in Argentina in the short term. If current economic policies continue to hold investor confidence, and external accounts strengthen, then a reduction in rates can be expected.

Assessment of Factors Affecting Business Climate in Argentina

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	medium	high	medium	medium/low voltage distribution equipment
Transmission	high	high	medium	
Distribution	high	high	medium	
Oil/Gas	medium	high	high	
Environment				
Sewage/water	medium	high	low-medium	sewage treatment equipment
Pollution control	medium	medium	low	
Effluent treatment	high	medium	medium-low	
Telecommunications				
Network expansion	medium-high	high	high	cellular, ATC, hi-tech switching equipment
Switching	high	high	high	
Cell & Value Added	high	high	high	
Transportation				
Road	high	high	medium	road concessions
Air	medium	low	low	
Water	low	medium	low	
Rail	high	high	medium-high	commuter rail/metro

REPUBLIC OF BOLIVIA

	GDP ('94)	U.S. \$6.8 billion	Per Capita	U.S. \$890
	Real GDP growth (forecasts)	1995: 4.5% 1996: 4.5%	Population	7.8 million
			CPI ('94)	7%
			S&P Rating	Not Rated
	Expected Market	1995-2000	Environment	U.S.\$30 million
	Energy	U.S. \$400 million	Transportation	U.S.\$300 million
	Telecommunications	U.S. \$500 million		

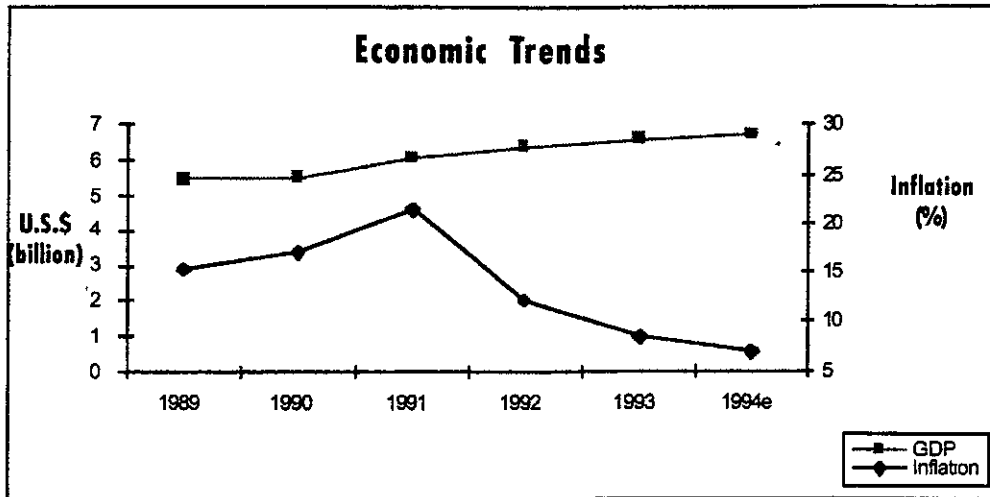
Executive Summary

Bolivia will undergo extensive privatization and modernization, notably in the energy, railways, and telecommunications sectors. Driven by the government's need for an infusion of foreign investment, management expertise, and new technology.

The government's strategy focuses on the transfer of assets in the key state firms in electricity, telecommunications, air and rail transport, smelting, and mining. Oil, gas, and mining are expected to remain the biggest sectors for foreign investment and U.S. exports. The Bolivian legislature passed a general privatization law in April 1992 and enabling legislation in July 1994. U.S. business should note that many of Bolivia's unions are not supportive of the government's privatization efforts and may attempt to hinder the process.

While Bolivia remains one of the poorest countries in Latin America, it has recently benefited from steady economic growth and low inflation. The country also has considerable mineral and natural gas reserves that should serve as catalysts for continued economic growth. Short-term political difficulties should not result in a major shift of economic policy. During the remaining part of the decade, economic growth is forecast to remain steady and inflation low.

Bolivia is entering an interesting period, as the country attempts to create a platform for accelerated growth and modernization through the "capitalization" of state-owned industries — in energy, telecommunications, mining, railways, the national airline, and ultimately oil. This process will "capitalize" the state-owned firms through the sale of 50 percent of their stock to investors; the remaining 50 percent will be distributed to Bolivians over the age of 21. If this works it will serve as a model for other politically sensitive privatizations in the region. Paraguay is already adopting this model.



Source: EIU

Energy

The Bolivian electricity market is small, but growing, with significant areas unserved. The Bolivian government is also examining the possibility of developing generation for export to neighboring countries. The assets of Empresa Nacional de Electricidad (ENDE) should be *capitalized* during 1995. The objective is to create a competitive marginal cost system, based on the Chilean model. Three generating companies will be created, along with a transmission company and several distributors.

Four investment banks and 17 companies from the United States have prequalified for the bid. However, final approval will be conferred by the World Bank. The total installed capacity in Bolivia is 780 MW. Demand is growing at roughly 7 percent per year.

The oil and gas sector will be an important market for U.S. firms. Strong external market demand is anticipated with the possible construction of the Bolivia-to-Brazil gas pipeline and the potential construction of a pipeline to Chile. BHP will participate in the Brazilian pipeline project to be developed under the joint partnership of Enron (40 percent) and Yacimientos Petrolí-feros Fiscales Bolivianos (YPFB). YPFB is the country's largest asset and is expected to be *capitalized* by the end of 1995. Key questions still surround the value of its assets because YPFB's most valuable contract involves the Brazilian pipeline, which is not guaranteed construction. YPFB has the monopoly on 85 percent of the oil and gas market.

Environment

Bolivia has a serious lack of sewage treatment and potable water capacity that is resulting in water rationing in several of the country's major cities. Opportunities may develop in the construction and upgrade of water and sewage treatment plants, particularly if municipal financing can be arranged.

In addition, there is growing pressure on industrial concerns to curtail discharges that are harming water supplies for drinking and irrigation. *However, Bolivia has yet to create the necessary environmental regulatory infrastructure. Low per capita income will hinder projects based on concessions or user fees.*

A number of developmental programs are aimed at increasing environmental awareness, reducing deforestation, preserving natural habitat, and preventing soil erosion. Bolivia's debt-for-nature initiative established an environmental fund of U.S.\$21.8 million under 24 grants. USAID is a lead donor for programs that improve public and private sector institutional capacity for improved forestry. By 1997, 50,000 hectares are expected to be under improved management to maintain the environment.

Transportation

Bolivia's geographic position will catalyze several transportation projects to link Brazil with the Pacific Coast. These will be private concession projects, some of which will receive significant support from the Andean Development Bank and the Inter-American Development Bank. Two of the most promising are highways linking Brazil (Mato Grosso) with the port of Arica in Chile and the port of Ilo in Peru. All told, Bolivia now has 1,536 kilometers of paved roads.

The national railway, ENFE, is expected to be sold in either 1995 or 1996. The buyers are expected to invest heavily in modernization and expansion. The current rail system has 3,652 kilometers of track.

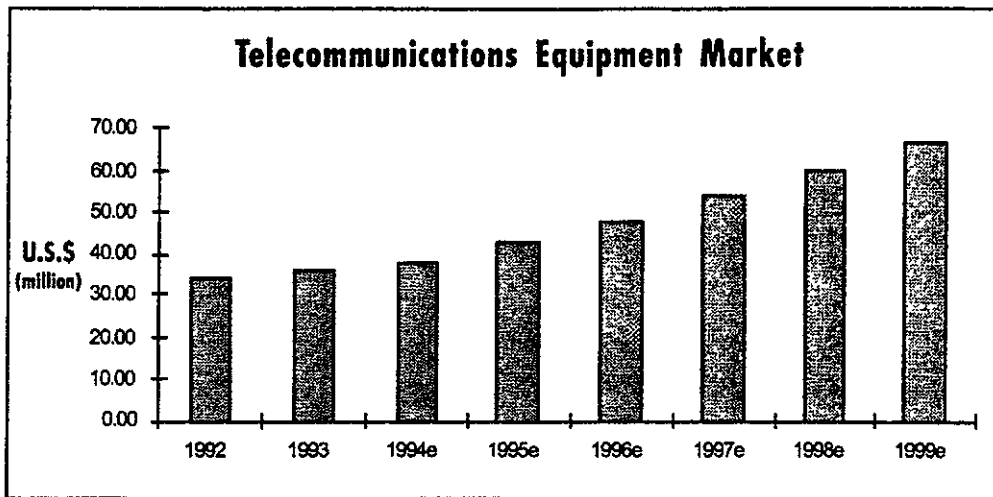
Telecommunications

There is a strong demand for expansion of Bolivia's telecommunications network. Bolivia is tied with Paraguay for the lowest line density in South America, at three lines per 100 inhabitants. Bolivia has a shortage of phone service with only 250,000 lines covering 4 percent of the total population. The government expects to have about 750,000 lines by the end of the decade.

There is also significant demand for rural telephony, driven by a political imperative to install lines in municipalities of more than 500 people. U.S. export potential is significant; however, the country's two main switches were sold to the telephone system by Siemens, which is well-entrenched in the local market.

The state telephone company is expected to be *capitalized* by the end of 1995. It provides 80 percent of the country's telecommunications services and has a gross profit margin of 20 percent. U.S. investors should be aware that the company's labor unions appear to be opposed to the current privatization scheme.

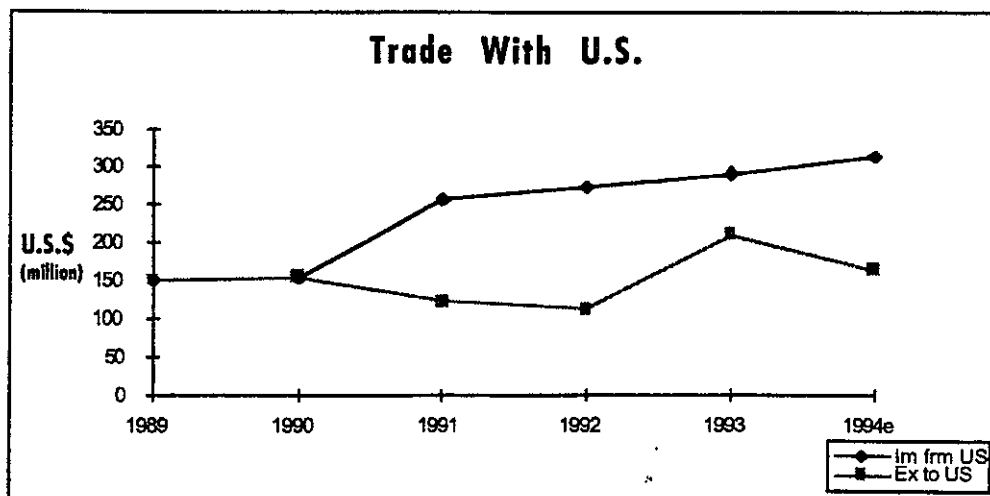
The cellular market is expected to grow steadily. Telecel and Millicom International of the United States have invested U.S.\$8 million in a joint venture, and their system now supports 2,600 lines. They expect to make an additional U.S.\$2 million investment by the end of 1996.



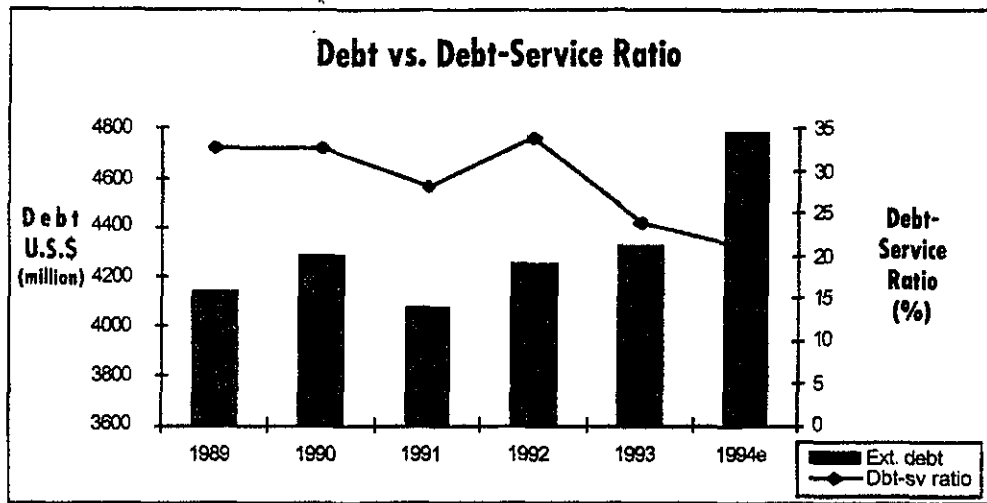
Source: NTDB

Economic & Political Climate

The Sanchez de Lozada administration continues to pursue the market-oriented reforms started in 1985.



Source: EIU



The reforms have had the following economic results:

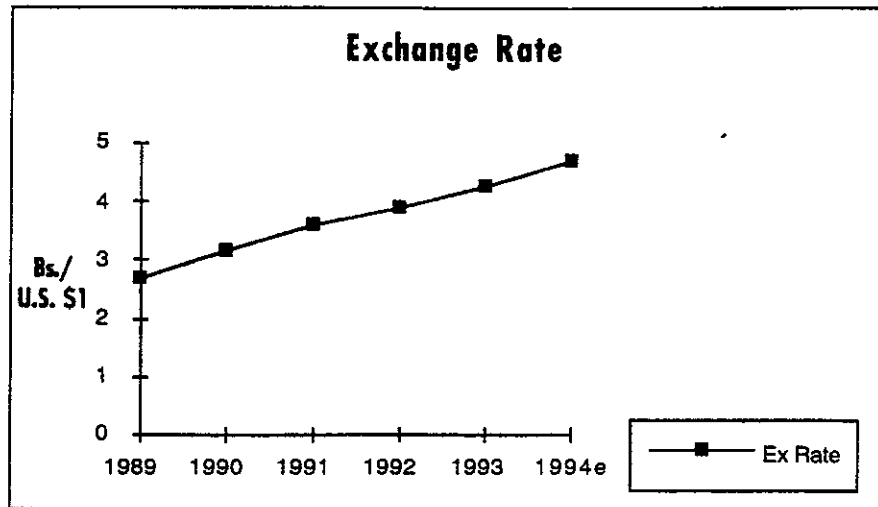
- Control of inflation
- Increased private investment
- Steady economic growth
- Tripling of bank deposits to U.S.\$2 billion over a six-year period
- Reduction in budget deficit backed by IMF programs
- Increased tax revenues due to better administration

Bolivia receives U.S.\$140 million through the Enhanced Structural Adjustment Facility (ESAF) of the IMF to support economic stability and reform policies. A total of U.S.\$1.05 billion in new concessions has been pledged by the Paris Club (World Bank Consultative Committee).

Business Climate & Regulatory Overview

Foreign investors receive the same treatment as domestic companies. Bolivia's foreign investment law is characterized by permitting:

- One-hundred percent foreign investor ownership
- No requirement to register
- No screening of investment
- No preferential or discriminatory treatment
- Free currency
- Unrestricted remittances
- Right to international arbitration



Source: EIU

Trade policies have been liberalized. New laws regarding exports were passed in 1993. Tax rebates are granted to exporters to make them competitive.

The following trade characteristics describe the rules of the game for exporters to Bolivia:

- Capital goods tariff at 5 percent; other tariffs at 16 to 10 percent
- 13 percent value-added tax and 2-percent transaction tax on all goods on sale
- No restriction on U.S. imports. No licenses required
- GATT membership on customs valuation treaty
- Andean Pact places some U.S. products at a slight price disadvantage
- Lower shipping cost on exported commodities compared to imported goods

The Bolivian legislature ratified treaties to join the World Intellectual Property Organization. The executive branch is drafting a law for patent protection. Bolivia is a member of the Andean Pact.

Financial Overview

Bolivia has signed agreements with both OPIC and the World Bank's MIGA for political risk, convertibility, and expropriation. The U.S. Ex-Im Bank has also opened credit facilities with three Bolivian banks. Bolivia does not have a bilateral investment treaty with the United States because of differences over arbitration procedures in the hydrocarbon sector.

There are significant inflows of credit into Bolivia. The Central Bank auctions this credit to commercial banks to finance private investments. The Andean Development Corporation (CAF) provides project trade finance of about U.S. \$240 million to Bolivia.

A few recent announcements include:

- IFC's U.S.\$25 million to provide long-term funds to private investors
- Paris Club's U.S.\$1.05 billion concessions on trade
- Japan's annual technical and economic assistance of U.S.\$70 million
- Germany's U.S.\$44 million credit authorization in 1994

Assessment of Factors Affecting Business Climate in Bolivia

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	low-medium	low	low-medium	technology transfer
Transmission	low-medium	low	low-medium	
Distribution	low-medium	low	low-medium	
Oil/Gas	high	high	low medium	oil/gas export market
Environment				
Sewage/water	low	low	low	
Pollution control	low	low	low	
Telecommunications				
Network expansion	medium	low	low	expansion
Switching	medium	high	low	ATC, hi-tech
Cell & Value Added	low	low	low-medium	
Transportation				
Road	medium	high	low-medium	links to Pacific Coast,
Air	medium	low	low-medium	rail privatization
Rail	medium	high	low-medium	
Waterways	low	low	low	

FEDERATIVE REPUBLIC OF BRAZIL



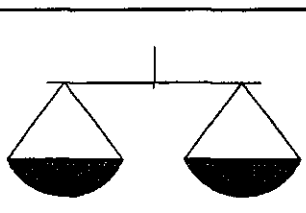
GDP ('94)	U.S.\$590 billion	Per Capita	U.S.\$3,688
Real GDP growth (forecasts)	1995: 3.4%	Population	160 million
	1996: 3.9%	CPI ('94)	1046%
Expected Markets	1995-2000	S&P Rating	B
Energy	U.S.\$29.7 billion	Environment	U.S.\$7 billion
Telecommunications	U.S.\$20 billion	Transportation	U.S.\$15.1 billion

Executive Summary

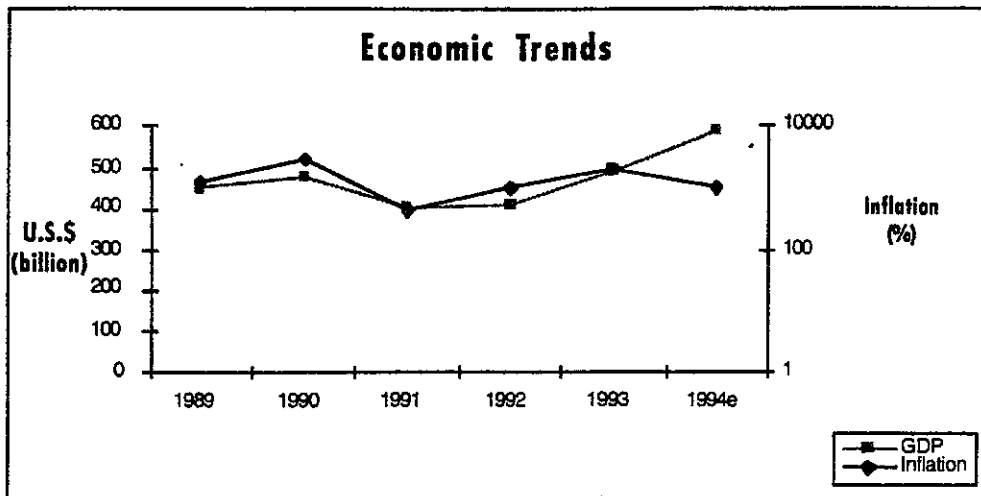
Brazil is the dominant economy in South America with over 50 percent of South America's GDP. A new economic plan has drastically reduced inflation and led to high economic growth. As a result, the World Bank estimates that Brazil will require investments of U.S.\$15 billion per year to build the infrastructure necessary to support its economic growth.

Brazil lags behind most other Latin American countries in its efforts at privatization and in creating the necessary regulatory framework for project financeability. This will initially slow many important projects. However, once the structures are in place, Brazil's infrastructure marketplace will develop an unstoppable momentum. President Cardoso himself has identified U.S.\$65 billion worth of projects that he would like to build in the next ten years.

Energy is a leading sector as the country attempts to diversify its energy matrix and develop private financing for virtually all new power generation. The opening of the telecommunications sector will fuel investment and imports. Pieces of Brazil's dominant state-owned companies will begin to be privatized as will be a growing number of state-owned firms. While Brazil's constitution remains distinctly nationalist, key constitutional amendments are being voted on in the areas of natural gas and petroleum, telecommunications, and concession regulation.



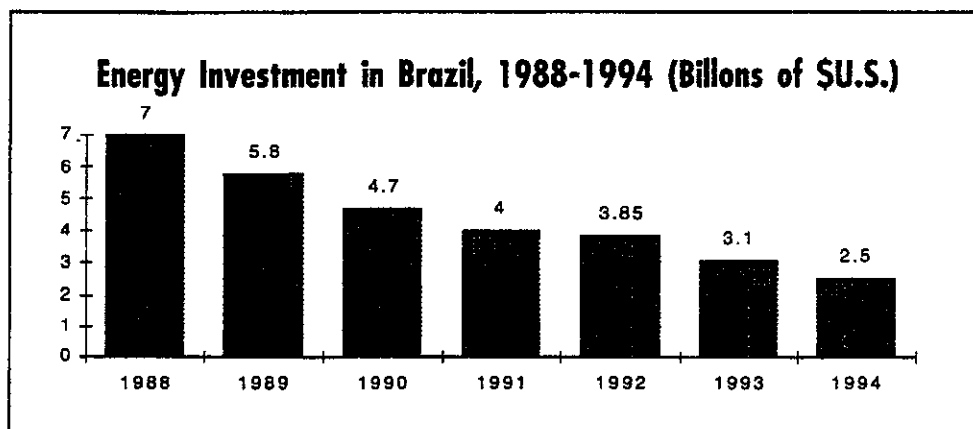
Brazil approved a Federal Concessions Law on February 13, 1995. The law requires that all services provided by the public sector be put out to concession. It allows foreign firms to bid, individually or in consortium. Given that the Brazilian state is no longer able to finance infrastructure projects, the practical effect of the law is to create wide areas of opportunity for private project creation.



Source: EIU

Energy

The Concessions Law allows for concessions in the generation, transmission, and distribution of electrical energy; a private power production law will soon be approved by the Brazilian legislature. Demand for electricity is increasing rapidly while the Brazilian state-owned company Electrobras does not have the financial resources to meet this demand. In some areas demand is increasing at an annual rate of 10 percent; in other areas, for example in Mato Grosso, brown outs are common.



Source: Electrobras; Banco Vector

Brazil's national energy plan calls for the privatization of Electrobras along with state and regional distribution companies and the promotion of co-generation and thermal power plants, especially those utilizing natural gas and biomass fuels.

A large part of this strategy is built around the construction of a 3,350-kilometer gas pipeline from Bolivia. The project will initially supply 8 million cubic feet of natural gas to São Paulo, at a total investment of U.S.\$1.2 billion.

 **Environment**

Brazil's environmental market is the most diverse in Latin America, principally because of the country's large industrial base. In addition, Brazil is attempting to push forward municipal waste water concession regulations that will generate significant opportunities to U.S. firms. Manufacturers are under increasing pressure to reduce discharges, creating a market for U.S. suppliers of pollution control equipment and services.

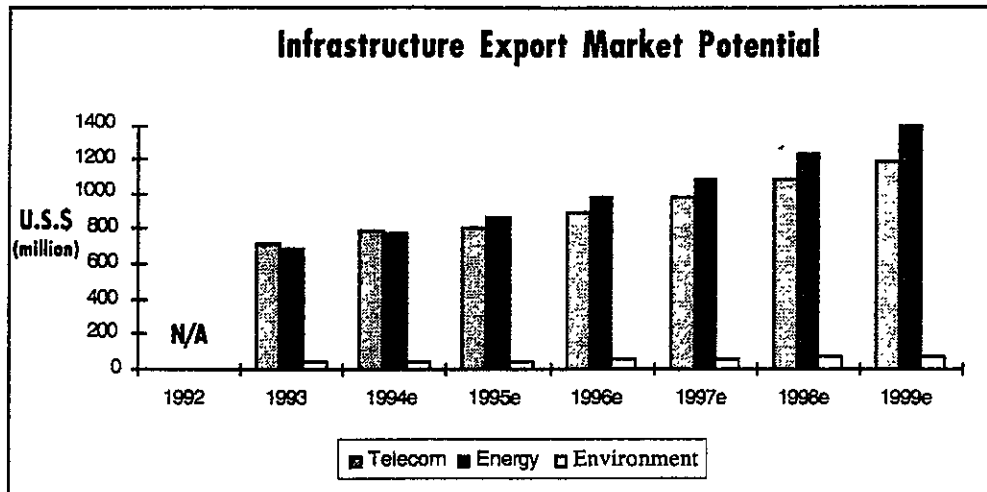
The World Bank is becoming increasingly involved. The Bank has provided U.S.\$4 billion to cleanup the waters of the Tietê River, and to reduce the level of untreated sewage flowing around the city of São Paulo. A three-stage plan will increase sewage collection and treatment along with controlling industrial pollution through the year 2005.

Construction of landfills, incinerators, and recycling plants also provides promising opportunities for U.S. business. São Paulo produces 13,000 tons of garbage daily, which might be used to supply power to the city. Major environmental issues involve deforestation in the Amazon Basin and air and water pollution in Rio de Janeiro, São Paulo, and several other large cities. Opportunities also exist for U.S. business in pollution control equipment.

 **Transportation**

The transportation sector will show promising growth over the remainder of this decade. New roads, bridges, and tunnels are being built and old ones are being refurbished in response to pent-up demand and traffic increases resulting from high rates of industrial growth (17 percent in São Paulo in April). One of the biggest highway projects is the 173-kilometer São Paulo Beltway. This will be constructed at a cost of U.S.\$2.2 billion. Eleven major highways join this expressway. Tenders are scheduled for three of these highways, with a total prospective budget of U.S.\$750 million.

Brazil's waterways require new signaling and monitoring equipment. There is also demand for barges, boats, and navigational equipment. The Tietê waterway project represents a huge opportunity for U.S. investors and suppliers. The area to be covered by the waterway encompasses the largest consumer market in South America. New railroads are also under construction to improve transportation to the country's ports. The federal and state railway companies are being privatized and modernized, a development that is creating enormous opportunities for U.S. suppliers.



Source: NTDB

Telecommunications

Brazil's market for telecommunications equipment and services is expected to grow at 200 percent over the next three years. The state-owned telecommunications company, Telebras, is forming joint ventures to finance new projects for telephone line expansion, satellite transmissions and a data/voice network. However, regulations impose local content requirements in the procurement of telecommunications equipment. In August 1994, Brazil announced new regulations for this industry. This provides opportunities in equipment sales and investment. However, private companies cannot provide services directly to the public. By allowing private companies to install switching equipment and networks, Brazil expects to add a million lines a year.

Cellular networks have experienced significant growth. Private companies are allowed to build networks and turn them over to the monopoly system for operation. Telebras estimates 1.8 million cellular subscribers by the year 2000. Opportunities exist in hand-set terminal equipment, a Mobile Telephone Switch Office (MTSO) and cell sites for U.S. equipment suppliers. American cellular mobile equipment is well-received in the Brazilian market due to high quality and state-of-the-art equipment.

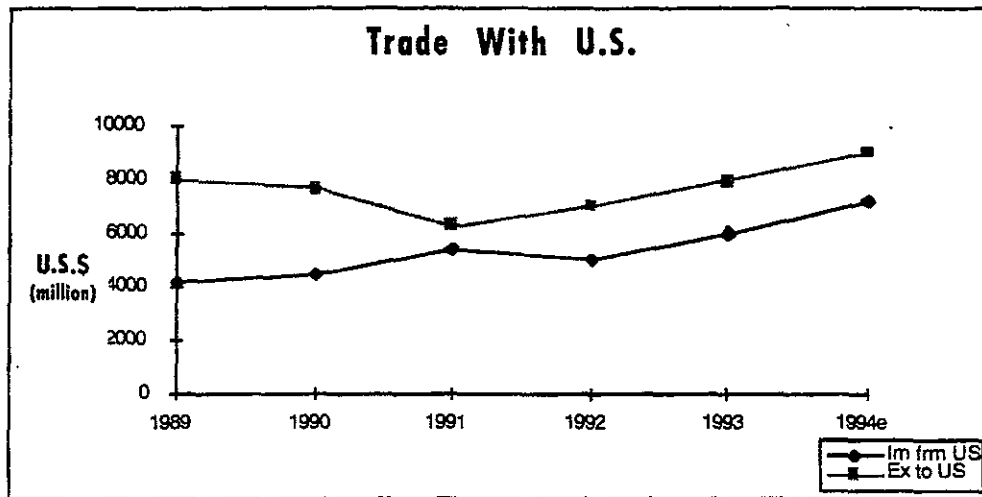
Economic & Political Climate

Brazil's large and diverse market is undergoing a transition from a closed, inward-looking economy dominated by government enterprise to a relatively open economy. These alterations are creating enormous opportunities, particularly for those firms with well-organized strategies.

However, Brazil's lack of consensus on economic reform policies prevented its progress towards greater market liberalization and economic stabilization. As a result, Brazil continues to experience rising inflation and unemployment, inconsistent economic growth, and persistent trade and investment barriers.

The *real* plan was introduced to stabilize the currency and, in turn, the economy. This plan initially controlled inflation without causing the economy to contract, resulting in the fall of the dollar against the *real*. The government has since introduced measures to curb demand and the inflow of foreign currency. Access to consumer credit was also restricted to three months. This resulted in a cut in the demand for consumer finance. The *real*, however, is still trading in a narrow band against the dollar.

President Cardoso faces a tough year in 1995. However, the Brazilian presidency is powerful, and has historically been able to pass virtually any piece of legislation that it considers important. This is a very positive development for U.S. business.



Source: EIU

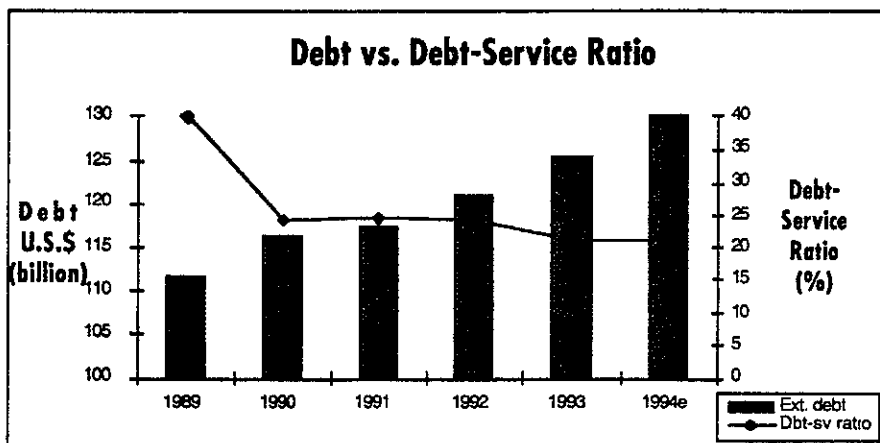
Business Climate & Regulatory Review

Brazil's 1988 constitution establishes restrictions on private sector and foreign capital participation in telecommunications services, petroleum extraction and refining, nuclear energy, and shipping for the state. This is coming to an end, as are restrictions on engineering and construction. The constitutional provision for preferential treatment of Brazilian national companies was amended in April 1995 for this purpose.

The following characterizes the regulatory mechanisms in the Brazilian economy.

- Foreign investment must be registered with the Central Bank
- The government's privatization program allows a 40-percent foreign participation
- Base tax rate on profits and royalty remittances is at 15 percent
- Import duties range from zero to 35 percent with an average of 14 percent
- Import permits and export licenses need to be obtained from SECEX
- Free trade zones facilitate trade by tax rebates and no import duties.

Brazil has made steady progress in the protection of intellectual property rights and in 1994 was removed from the U.S. list of "priority countries" under the 1988 Trade Act. Theft of trademarks has been a significant problem in Brazil but the government is moving to enforce new guidelines giving greater protection to internationally famous brands. Brazil's copyright laws conform to world standards. Brazil is eligible for insurance both through OPIC and the World Bank's MIGA. Brazil belongs to both the ALADI and Mercosur.



Source: EIU

Financial Overview

Brazil has a highly-developed and extensive banking system with a wide range of financial services regulated by the Central Bank. The National Monetary Council recently permitted foreign institutional investors in the stock market, resulting in a significant increase in foreign portfolio investment. Consumer credit remains expensive and interest rates are high. The Brazilian Bank for Economic and Social Development (BNDES) offers long-term financing with a repayment period of 60 months. IAD and the World Bank provide project finance and the Ex-Im Bank provides loans to facilitate exports.

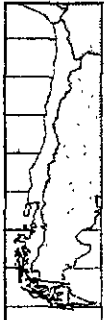
In the past, Brazil maintained restrictive policies on capital repatriation. While registration requirements exist especially for royalties and technology transfers, capital repatriation has become decidedly easier in recent years. At this time Brazilian currency, the *real*, is fully convertible.

A private non profit organization, the Tietê Paraná Development Agency (ADTP), devotes itself to promoting private investment in infrastructure development projects. Currently it is promoting the Tietê waterway and keeps investors informed of opportunities in all aspects of infrastructure development. ADTP helped create private-public partnerships worth U.S.\$7.2 billion. It estimates further investment of U.S.\$20 billion in waterways alone, among other infrastructure projects.

Assessment of Factors Affecting Business Climate in Brazil

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	high	high	none	high
Transmission	medium	low	none	medium
Distribution	high	low	none	high
Oil/Gas	medium	low	none	medium
Environment				
Sewage/water	high	high	inadequate	high
Pollution control	medium	medium	inadequate	medium
Telecommunications				
Network expansion	high	high	inadequate	high
Cell & Value-Added	very high	very high	inadequate	high
Transportation				
Road	very high	low	improved	very high
Air	medium	low	nascent	medium
Water	high	low	improved	medium
Ports	high	low	nascent	medium
Rail	very high	low	nascent	medium

REPUBLIC OF CHILE



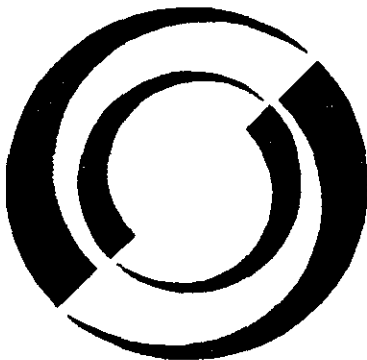
GDP ('94)	U.S. \$48.7 billion	Per Capita	U.S.\$ 1,607
Real GDP growth (forecasts)	1995: 6.0%	Population	14 million
	1996: 6.2%	CPI ('94)	11.2%
		S&P Rating	BBB+
Expected Market	1995-2000		
Energy	U.S. \$2.7 billion	Environment	U.S. \$3.2 billion
Telecommunications	U.S. \$3.8 billion	Transportation	U.S. \$6.1 billion

Executive Summary

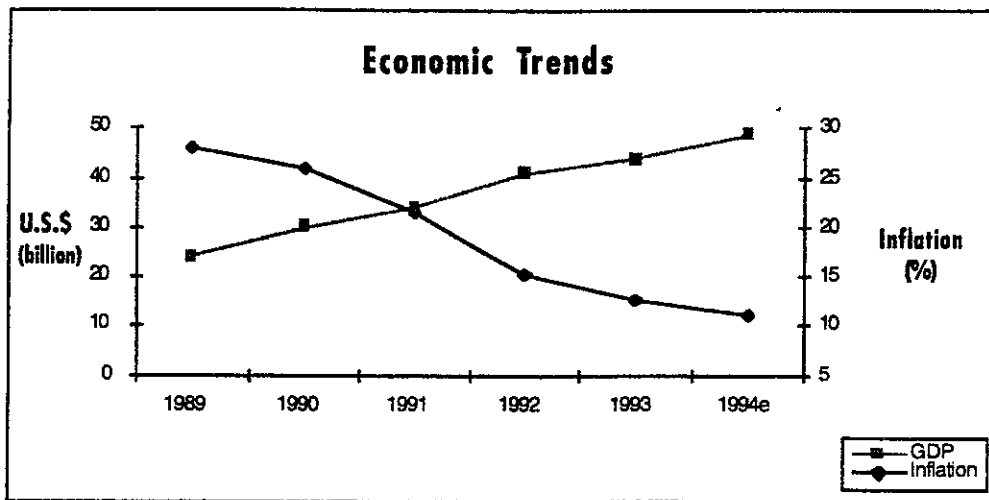
Chilean investment in infrastructure is expected to reach U.S.\$16 billion over the next five years with at least 50 percent from the private sector. Most of this infrastructure spending will be in the transportation and telecommunications sectors, but there will also be significant investment in the energy and environmental areas. Chile is positioning itself to be the communications center of South America—especially as the gateway to the Asia Pacific region. Transportation projects include roads, highways, airport upgrades, and port expansions. Environmental projects include water and sanitation systems. Other expected infrastructure projects are in the primary health and education sectors.

Chile will continue to attract foreign direct investment in 1995-96 despite the fall in investor confidence after the Mexico crisis. Investors are learning to segment the South American countries, distinguishing, and rewarding, those that have followed good financial discipline.

Inflation is expected to remain under control, and the target for 1995 is set at 8 percent. Economic growth slowed during 1994. However, it is expected to accelerate owing to strong investment and export performance. The government economic policy is expected to stabilize the peso.



Chilean firms are leaders in private infrastructure creation, and are strategically positioning themselves to be very significant players in infrastructure throughout South America. Chileans are already big players in the Argentine and Peruvian energy sectors, and are looking farther afield—toward Colombia, and toward the Brazilian privatizations. They are able to do this for a number of reasons, not least because this is part of a national financial strategy. Chile's large and well-endowed groups, and the capital provided by their system of private pension funds, create tremendous options. In addition, they are leaders in telecommunications, and are beginning an aggressive highway concession program. All of these factors create the "expertizaje" necessary to penetrate other South American markets, and locate Chilean firms among the most valuable of clients and partners.



Source: EIU

Energy

The government will approve a gas pipeline from Argentina to Chile. Two consortia are competing in the bid. One expects to connect Neuquen in Argentina and Santiago at a cost of U.S.\$1.8 billion. The other would connect Mendoza and Santiago at a cost of U.S.\$800 million. Gas will be supplied to the Chilean electricity generating stations at a price ranging between U.S.\$2.26 and U.S.\$2.85 per million BTU by mid-1997. U.S. companies Tenneco and Lone Star are participating in the bid.

The Tocopilla power station will be privatized through the issue of U.S.\$150 million worth of new stock. The plant will need an investment of U.S.\$150 million to build a new 150-MW thermoelectric plant to supply the El Abra copper mine, which is under construction. The Pehuenche electricity company will expand capacity by 38 MW at a cost of U.S.\$58 million and will come on stream in October 1997.

The national energy commission forecasts that the demand for electricity will grow at an annual rate of 6.7 percent in 1994-2003. Under this scenario Chile's capacity requirements will double. According to the commission's plan, three 340-MW natural gas-fired thermal power stations will start operations in April 1998, 1999, and 2001. Other projects to increase the country's overall capacity are also expected to come on line by 2004.

Environment

The government is considering the privatization of water companies. Private sector participation is expected to speed up the construction of water treatment plants. However, the coalition government that was divided on the issue of privatization has recently invited bids. Investment is expected to reach U.S.\$1.82 billion in water and sanitation, including water treatment plants.

Copper mining poses tremendous risks to the environment. Liquid emissions and solid materials poisoned the water supply and aerial emissions contaminated the air at several mining sites. The state mining company, Codelco's El Teniente Division plans to build sulfuric acid plants and a gas emission monitoring system to control air pollution at a cost of U.S.\$600 million. The construction is expected to start in 1995 and is expected to reduce toxic gas emissions. Other opportunities include environmental studies in the mining sector.

Transportation

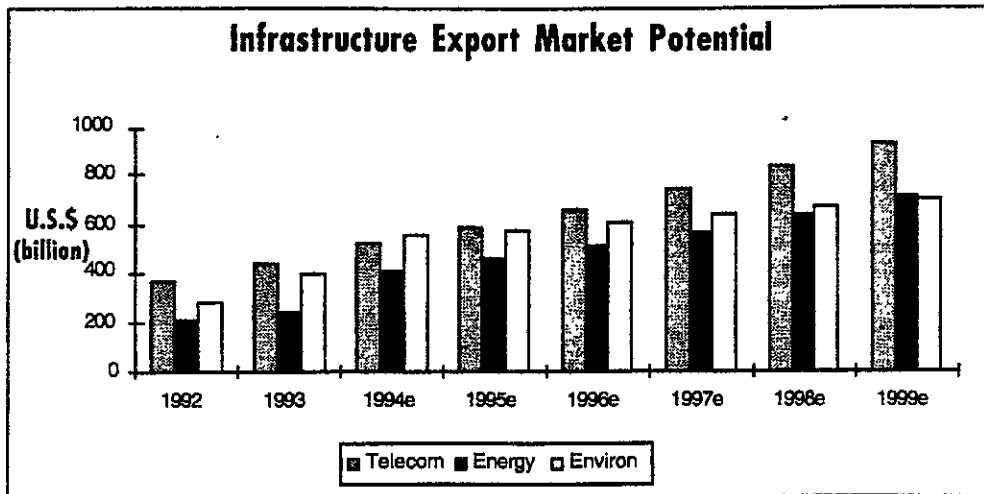
The government considers transportation to be a priority sector in infrastructure development. Some of the opportunities include road and highway projects, airport upgrades, and port expansions at an expected investment of U.S.\$6.2 billion. The Santiago Metro will be expanded at a cost of U.S.\$360 million. Build-operate-and-transfer concessions are amended to calculate value-added tax and income tax. *These also include guarantees from private pension funds to participate as financial brokers.* The concessions are expected to vary between U.S.\$1.8 and 3.8 billion, and are expected to include underground parking garages and tourist attractions.

The state holding company, Corfo, sold a 51-percent stake in Ferrocarriles del Pacífico (Fepasa) for U.S.\$30 million and a future investment commitment from the bidder of U.S.\$88.6 million over the period 1995-2000. Among new ventures is the construction of a connection with the Argentinian railway system.

Telecommunications

Chile offers excellent opportunities for U.S. telecommunications equipment manufacturers. Chile's telecommunications sector has grown at an 11.4 percent pace since 1991. Chilean companies are leaders in Latin America, and seek modern equipment to keep pace with the economy. U.S. companies enjoy a reputation for quality in the market. But French and Japanese companies are increasing their market share using aggressive marketing strategies. Aggressive trade promotion is particularly important, as it strengthens ties with local firms that participate in the bidding process for telecommunications projects.

The Ministry of Transportation and Telecommunications regulates and supervises the operations in this sector. It will adapt a new law favoring a multicarrier system in long-distance and overseas communications. This promotes competition and is expected to make the services affordable to the vast middle class population. Opportunities exist in providing the Chilean market with cellular telephony equipment and fiber optic equipment.

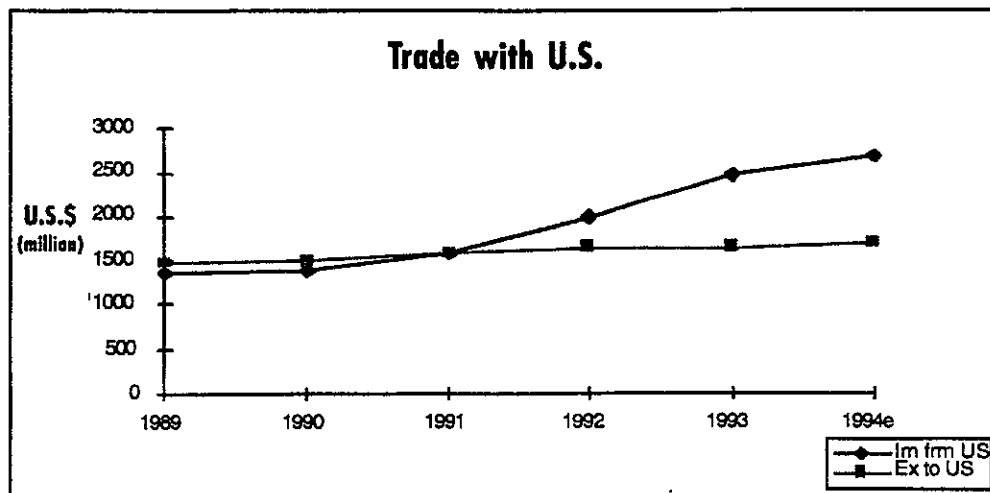


Source: NTDB

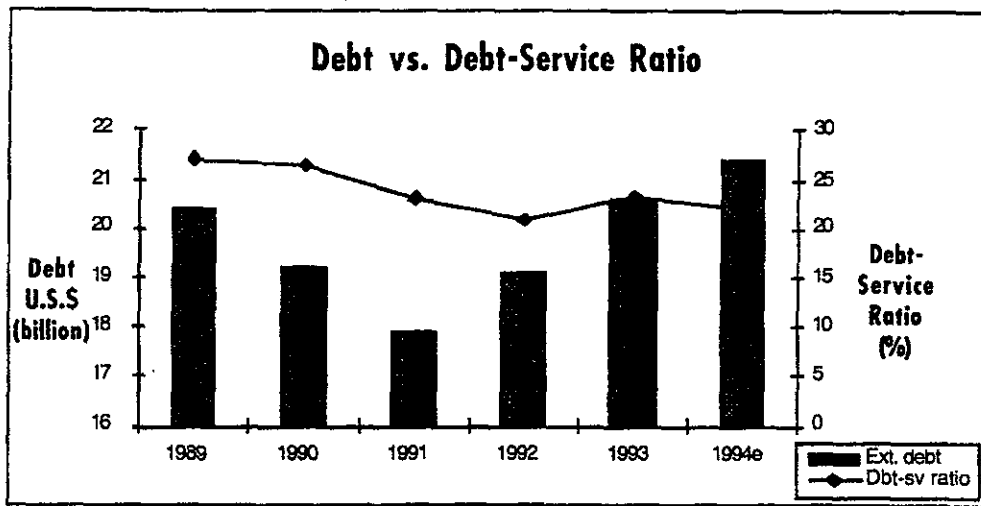
Economic & Political Climate

Chile has experienced ten consecutive years of economic growth, and remains committed to an open domestic market and continued trade expansion. Since 1985, annual gross domestic product growth has averaged 6.1 percent per year. Chilean liberal import policies provide an attractive market for U.S. goods and services. The success of Chile's export sector will be vital to its economic development.

The coalition government is divided over public-sector reform, as was demonstrated when the move to



Source: EIU



privatize the country's copper industry was defeated. However, the coalition is expected to remain united with the elections scheduled in December 1999. Trade liberalization and free market reform are expected to continue. Chile is also increasingly participating in economic cooperation agreements with other countries. Chile joined APEC in 1993, expects to be the next country to join NAFTA, and is in active negotiations to join Mercosur.

Business Climate & Regulatory Review

The Chilean economy is open to foreign investment. Investment must be approved by the government's Foreign Investment Committee and is expected to take a month's duration.

Chilean openness to foreign investment gives investors the right to:

- Receive nondiscriminatory treatment
- Hold assets indefinitely
- Remit or reinvest earnings immediately but remit capital after one year
- Opt for national tax treatment or a rate of 42 percent for the first ten years
- Acquire foreign currency at the official exchange rate. However, 30 percent of external credit must be placed in non-interest bearing account, with the central bank for one year. Alternately, investors pay an equal amount of interest.

Chile imposes few barriers on imports. There are no significant trade barriers on imports in infrastructure development. Currently, the tariff rates are a flat 11 percent on most imports and are expected to be reduced. Duties on capital goods purchased for use in export production may be deferred for a period of seven years and reduced by the percentage of production that is exported.

Imports are subject to 18 percent value-added tax as are domestic products. Intellectual property rights

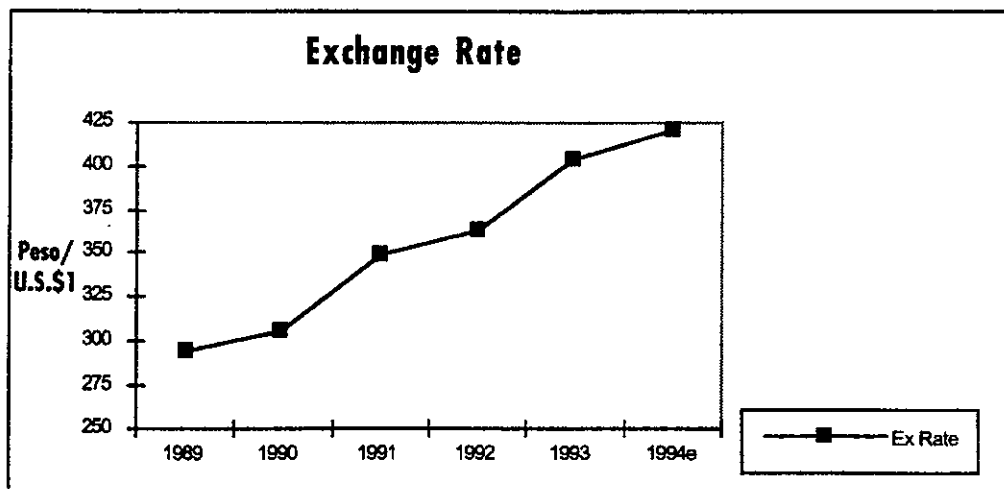
Financial Overview

are compatible with international norms. Copyright protection has been extended from 30 to 50 years. Chile has a sophisticated financial system by South American standards. A wide variety of financial instruments is available on market terms. Many U.S. banks are active in Chile, including Chase Manhattan, Citibank, Chemical, Bank of America, Bank of Boston, American Express, and Chicago Continental.

Investors, as well as importers, are guaranteed access to the interbank rate to repatriate earnings and capital. Other transactions may use the parallel exchange market that typically does not deviate from the interbank rate by more than 2 percent.

The country's banking system is sound due to eight years of continuous growth. Chilean banks have achieved an average profitability of 19.1 percent.

Chile has well-functioning capital markets—Chilean companies raised U.S.\$383 million in 1994.

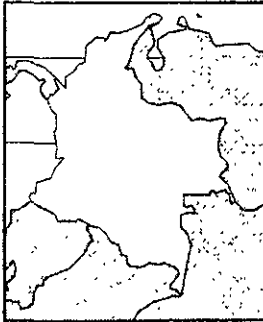


Source: EIU

Assessment of Factors Affecting Business Climate in Chile

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	medium	medium	medium-high	industrial generation
Transmission	medium	medium	medium-high	
Distribution	medium	medium	medium-high	
Oil/Gas	medium	medium	medium-high	gas pipelines
Environment				
Sewage/water	medium	medium	medium	water systems
Pollution control	low-medium	low-medium	low	mining/air pollution
Telecommunications				
Network expansion	medium	medium-high	medium-high	
Switching	medium	medium-high	medium-high	switching equipment
Cell & Value Added	high	medium-high	medium-high	cellular, value-added
Transportation				
Road	medium	medium	medium-high	
Air	medium	medium	medium	
Water	high	medium	medium	port expansion
Rail	medium	medium	medium	privatization

REPUBLIC OF COLOMBIA

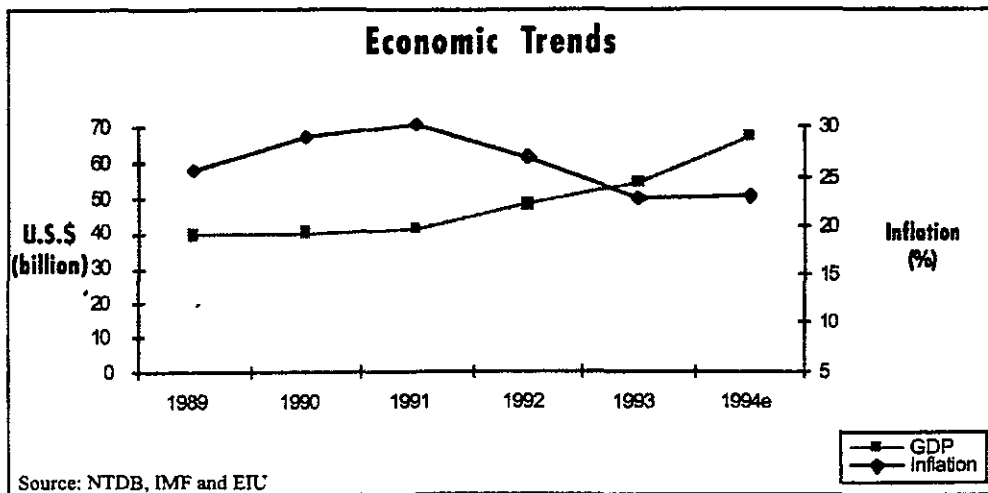


GDP ('94)	U.S.\$67.3 billion	Per Capita	U.S. \$1,886
Real GDP growth (forecasts)	1995: 6.5%	Population	35.7 million
	1996: 4.5%	CPI ('94)	25%
		S&P Rating	BBB-
Expected Market	1995-2000	Environment	U.S.\$1.5 billion
Energy	U.S. \$6.46 billion	Transportation	U.S.\$2.69 billion
Telecommunications	U.S. \$2.16 billion		

Executive Summary

The Colombian government's economic policies provide a major role for the private sector in new infrastructure projects. The government has initiated significant projects in telecommunications, power generation, gas, roads, ports, airports, and railroads. Under the liberalization or *apertura* program initiated by the last administration and continued by President Samper's administration, the government is continuing to implement legal reforms to make the bidding process more transparent. The *apertura* program has resulted in strong economic growth and lower inflation. Despite the country's well-publicized problems with the illicit narcotics trade and guerrilla violence, the economy will continue to expand.

Colombian imports have grown by over 50 percent between 1992 and 1995. U.S. imports make up about 36 percent of the total, and the growing economy provides promising opportunities for U.S. businesses. Colombia is enthusiastic about doing business with the United States. U.S.-produced goods are generally highly competitive and are preferred in most cases.



 **Energy**

Thermoelectric power generation provided by private companies has become a priority in the Colombian infrastructure. A prolonged drought and the poor condition of publicly-owned and operated hydro facilities compelled the government to take a new approach in power generation, stressing private investment in thermal projects. The policy was embodied in the Electricity Law and the Public Services Law, both passed in 1994. These laws established a comprehensive legal framework for the overall reform of the power sector.

In addition, the government established a plan to provide 1,950 MW of new capacity in late 1993 to start operations by the year 2000. The government recently signed power purchase agreements for 900 MW, backed by government guarantees. Some of the new projects are backed by government payment guarantees. The government will award future projects only to credit-worthy companies or consortia. The newly created Energy and Gas Regulatory Commission (CREG) has created the regulations allowing for direct contracts between generators and large consumers.

The national oil company, ECOPETROL, is expected to add 1,300 kilometers of new pipelines. Pipeline capacity is the biggest obstacle in increasing production of oil, which has become the country's number one export. Private and public investments in coal fields and related infrastructure projects are expected to significantly increase exports of coal in the remaining part of the decade. Construction of a new gas pipeline is underway and is expected to provide increasing amounts of natural gas for domestic use.

Finally, ISA-GEN, the national generating utility, is scheduled to be put up for sale in 1996.

 **Environment**

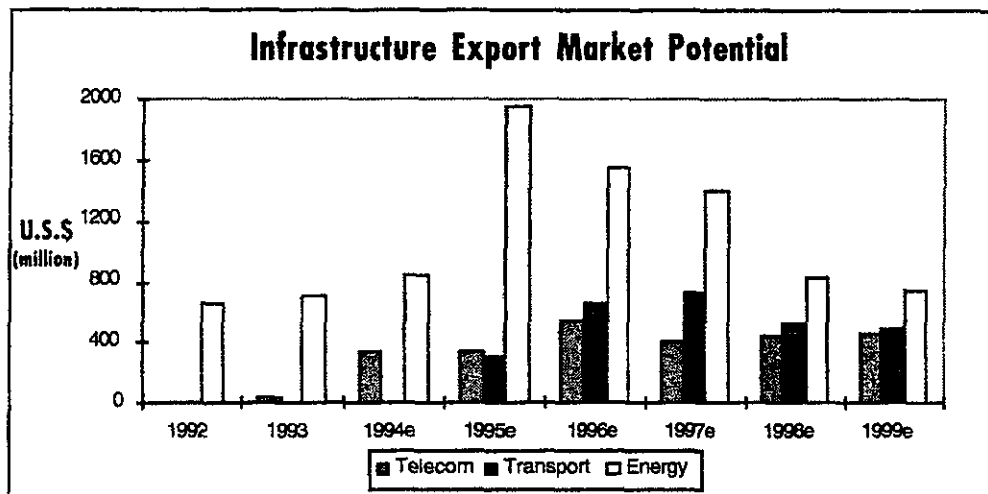
Projects to expand potable water supply, sewage connections, and wastewater treatment should provide good opportunities for foreign businesses through the remainder of the decade. A large wastewater treatment concession project in Bogotá was awarded to the French firm, Lyonnaise des Eaux, and is expected to receive permanent financing this year. A successful closing on this project should spur other major cities such as Cali and Medellín to move ahead with plans for their own facilities.

Expected stricter enforcement of environmental laws should increase demand for air pollution control equipment, particularly as the new Ministry of the Environment matures and takes a more active role in environmental protection. A new project initiated by ECOPETROL is expected to reduce pollution at its Barrancabermeja plant.

Transportation

The Samper administration believes that new transportation infrastructure is very important for the economic future of the country. New projects will make Colombian goods more competitive by reducing transportation costs. Planned projects include toll highways, awards of concessions for the national railroad system, construction of the Medellín subway system, and construction of a second runway at Bogotá's El Dorado airport.

Under a new government policy to decentralize road construction and maintenance down to the state level, new tenders are expected on the part of state governments. In airports, private-sector participation is expected to assist in overall modernization. The government expects to spend U.S.\$557 million under the nationwide program to improve airports. One of the success stories of the apertura program has been the privatization of Colombia's port system. Productivity has gone up even as overall employment has dropped. The next step in continued modernization may be the introduction of containerization on a large scale, a phenomenon which would open up strong business opportunities for U.S. equipment suppliers.



Source: Government of Colombia

Telecommunications

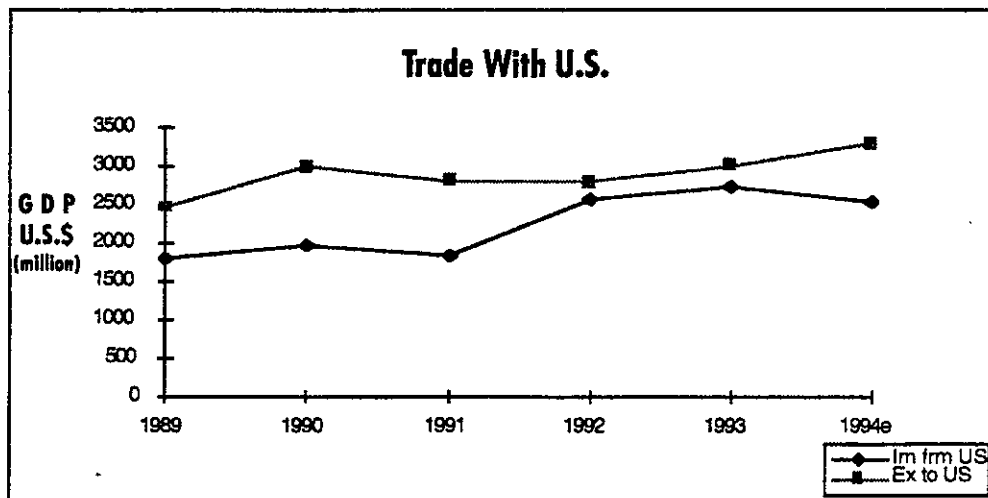
Cellular technologies represent a strong telecommunications sales opportunity in Colombia. Private sector investment in telecommunications is a priority for the government. Although Colombian telecommunications infrastructure is superior to that in most Latin American countries, the country has no infrastructure in cellular telephony. TELECOM entered into joint ventures to develop telephone services. Investment is regulated and there are specific provisions under which companies can provide cellular services in Colombia.

The initial market in cellular telephony will consist mainly of imports with an estimated market size of U.S.\$100 million. The U.S. market share is expected to be U.S.\$60 million. Future demand will depend on the level of acceptance and affordability to customers.

The government has opened the market for long-distance telephone services, thereby ending the monopoly of state-owned TELECOM. The bidding rules and technical specifications will be made available by the end of 1996.

Foreign investment is permitted in all telecommunications services except radio. The government is opening up the television sector to allow private ownership of individual television stations.

Economic & Political Climate



Source: NTDB, IMF and EIU

Colombia has been successful in improving its economy under the apertura program. The government's program centered on opening the country to trade and investment. Private-sector participation in infrastructure development is a high priority for this government.

The economy is expected to grow at a healthy rate over the next three years. High coffee prices will stimulate growth in GDP. Consumption will slow as the government has tightened the restrictions on foreign borrowing and investments. Inflation will remain at the same level, as the government has made commitments to social development. This will increase the public deficit and is expected to increase interest rates.

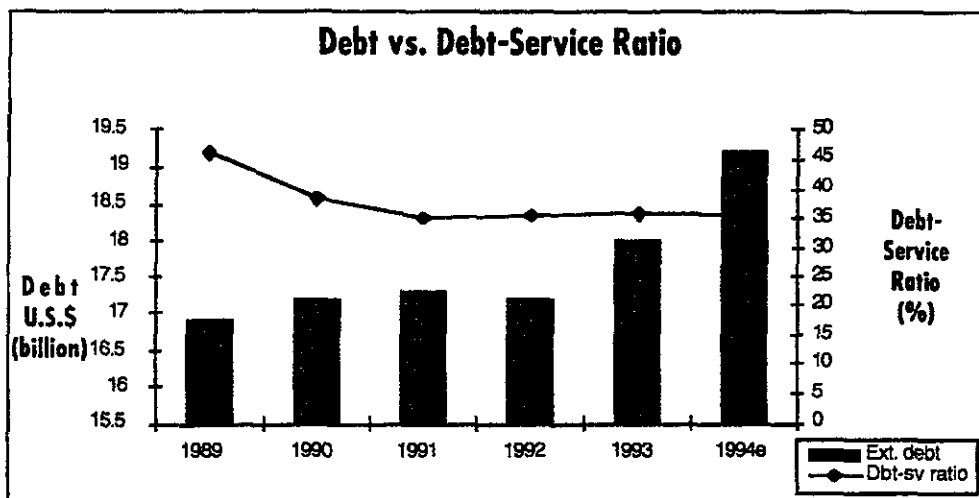
The problem of drug trafficking will remain high on the political agenda. The government of Colombia has increased its efforts to stop that illicit trade. In an effort to stop money laundering, the government has placed restrictions on foreign investment in real estate. The Samper government will combat

guerrilla violence. This will increase oil production as security at oil installations improves. The two major guerrilla groups have approached the government for a peaceful dialogue. The government is expected to increase spending on social development. The government will intervene in coffee and oil trade and the revenue generated will be used for public spending.

Business Climate & Regulatory Review

The government's economic reforms have significant effects on modernization and liberalization. Legislation enacted since 1990 has:

- Eliminated prior import license requirements
- Simplified import/export procedure
- Established preferential treatment for exports
- Established a free market foreign-exchange regime
- Clarified regulations to allow creation of new financial entities
- Reoriented tax collections from external to domestic sources



Source: EIU

U.S. businesses receive national treatment in Colombia. Foreign businesses are treated the same as local businesses. There are no significant barriers in infrastructure investments.

- All imports must be registered with Colombia's Foreign Trade Institute
- A few products sensitive to national defense and security are not on the list of free imports
- Import licenses are also required for used goods
- Import tariffs vary from zero to 20 percent with an average tariff duty of 10 percent
- Import surcharges have been eliminated
- Value-added tax on all goods was increased to 14 percent from 12 percent
- Income is taxable at a rate of 30 percent
- Stamp tax on some contracts of 5 percent

The government created COINVERTIR, a corporation to promote foreign investment, in November 1992. It encourages foreign investment, including foreign participation in portfolio investments. U.S. investment accounted for 63 percent (U.S.\$2.7 billion) of the U.S.\$4.3 billion total foreign direct investment registered between 1967 and mid-1993. Other important investment provisions include:

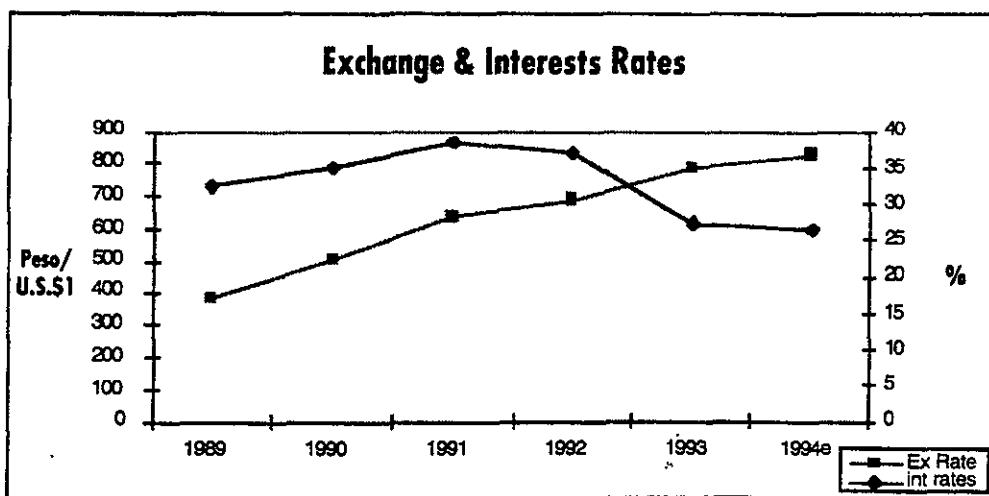
- Permission for foreign investors to own up to 100 percent in most sectors, including financial institutions.
- Prior approval necessary for investments in infrastructure.
- Registration with the Central Bank's foreign exchange office within three months is necessary to repatriate profits.
- An operating license from the Superintendent of Companies and registration with the local Chamber of Commerce is also required.

Colombia enforces intellectual property rights through Andean Pact Decisions—overall the level of protection afforded patents, copyrights, and intellectual property rights is moving to world standards. The U.S. ITA, however, reports that enforcement of these rights remains weak.

Colombia has agreements with both OPIC and the World Bank's MIGA. It is a member of the Andean Pact. Moreover, Colombia and the U.S. have held preliminary discussions on a bilateral investment treaty.

Financial Overview

The Colombian banking sector is sound and was recently opened to majority foreign investment. It consists primarily of 29 commercial banks with combined assets of U.S.\$9.7 billion. The Colombian private sector pays imports through "irrevocable letters of credit" or time drafts. Colombia has eliminated minimum payment-term requirements, but importers must register the agreed-upon payment schedule on the import documents. Exporters of equipment should be alerted to the financial market.



Source: NTDB, IMF

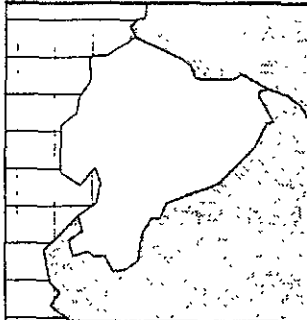
Capital markets are an important source of finance in the Colombian market. The government perceives the role of capital markets as fostering savings in order to achieve growth of investments. Financial reform has allowed the development of alternative sources of financing in the capital markets. Main biases in favor of debt were eliminated. Institutional investors provide finance with retirement pension funds and other private pension funds. Major sources of finance include:

- Capital market issues
- Portfolio investment markets
- Export credit agencies
- Financing by multilateral institutions
- Local and international commercial bank loans

Assessment of Factors Affecting Business Climate in Colombia

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	high	medium	medium	new thermal plants
Transmission	medium	medium	medium	
Distribution	medium	medium	medium	gas/oil pipelines
Oil/Gas	high	medium	medium	
Environment				
Sewage/water	medium	high	medium	urban water concession
Pollution control	low-medium	low	low	oil industry
Telecommunications				
Network expansion	medium	medium	medium	cellular, value added
Switching	medium	medium	medium	
Cell & Value Added	high	medium-high	medium	
Transportation				
Road	medium-high	medium	medium	toll roads
Air	medium-high	medium	medium	airport quality program
Water	medium-high	medium	medium	port containerization
Rail	medium	medium	medium	subway/rail concessions

REPUBLIC OF ECUADOR



GDP ('94)	U.S.\$15 billion	Per Capita	\$1,471
Real GDP Growth (forecasts)	1995: 3.0% 1996: 2.5%	Population	\$10.2 million
Expected market	1995-2000	CPI ('94)	25%
Energy	U.S.\$450 million	S&P Rating	N/A
Telecommunications	U.S.\$200 million	Environment	U.S.\$50 million
		Transportation	U.S.\$200 million

Executive Summary

The Government of Ecuador has initiated a number of efforts at privatization in many significant industries. The year 1995 will see the launching of substantial projects in the petroleum, mining, energy, and telecommunications industries. U.S. companies have historically fared well in successfully bidding for contracts in state projects. This success stems largely from Ecuador's favorable business attitude towards U.S. companies.

The Ecuadorian economy will continue to depend heavily on the agricultural and petroleum sectors, which together account for over 50 percent of the country's GDP. The further development of these industries will require more efficient infrastructure which will not be achieved through domestic investment alone. There is an urgent need for foreign participation in the development of these projects. Opportunities will surface, not only for foreign financial support, but also for managerial and other technical and consulting assistance.

This is a critical year for Ecuador, as the country attempts to focus on needed economic reforms. The border dispute with Peru diverted the government's attention. This should be closely watched, as privatizations in telecommunications and energy might provide opportunities — particularly as these systems are modernized. The country is at a critical stage, because it must attract foreign investment; yet it has not made much progress in the kind of reforms that would make this possible.

Energy

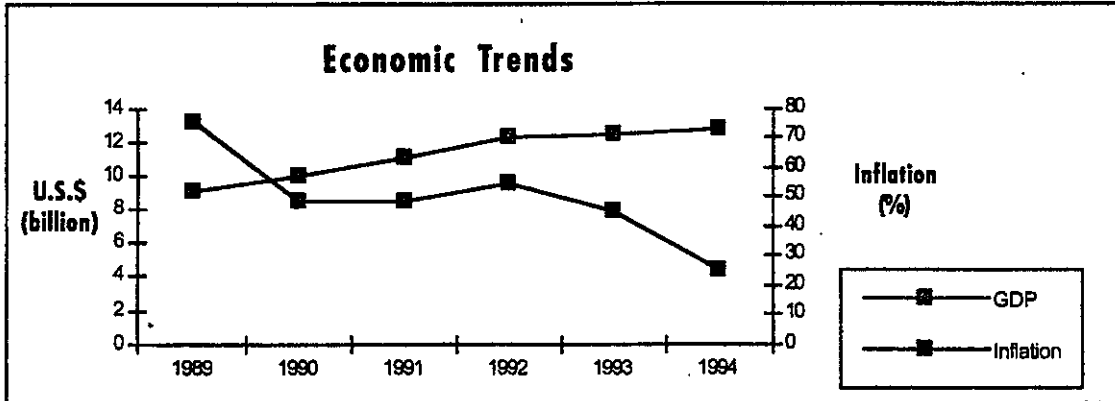
Major steps have been taken towards the restructuring of the electricity industry. The government has divided this industry into two major subsectors of generation and transmission. Having decided to maintain governmental control over the transmission sector, the government is actively seeking

private participation for the task of power generation. This restructuring effort is to meet an expected increase in the demand for generating capacity. Annual estimates of electricity demand are 5-6 percent.

Electrical power generation can be divided into hydroelectric generation and thermal generation which currently account for 1,473 MW and 932 MW respectively. Over 10 projects are expected to be completed in these categories with a total cost of approximately U.S.\$450 million. The Daule Peripa Hydro is expected to cost \$U.S.206 million, of which 60 percent will be allocated towards equipment for electrical production. The government is also seeking to hire a consortium of legal, accounting, and engineering firms to assist in the development of the regulatory framework required to promote private-sector participation in energy generation and distribution projects.

Due to a severe drought in the first half of 1995, the country is suffering through brownouts and blackouts. Overreliance on hydropower is the main cause of this problem.

Deregulation has also occurred in the petroleum industry, where government has encouraged increased participation from the private sector. Ten oil fields are expected to be developed with private sector assistance.



Source: EIU

Environment

While there is an increased level of concern over pollution from air, water, and solid and hazardous waste, these concerns have not yet been translated into specific, viable large-scale projects, except in the petroleum industry, where there has been strong demand for environmental consulting services.

The World Bank has proposed a U.S.\$24 million restructuring project in the mining industry. A major component of this sum will probably go toward environmental control. In addition, a strong pulp and paper industry has led to imports of recycling machinery, which in 1992 was U.S.\$12 million and reached U.S.\$20 million in 1993. The U.S. share of these imports is close to 60 percent.

Transportation

Efforts are being made to revive the now defunct national airline, Ecuatoriana de Aviación. The company went bankrupt in 1993 when the government removed its subsidy. At that time the company's debt stood at some U.S.\$100 million. The government is now willing to sell 50.1 percent of the company's assets to a foreign or domestic consortium. However the government is legally required to retain 24.9 percent ownership in this company. The remaining ownership will be sold to the public.

The agreement signed with a Mexican consortium for the concessions of the Quito-Los Chillos highway route represents the first in a series of new measures for the highway industry. Deregulation measures are intended to offer private companies opportunities to participate in the construction, maintenance, and operation of priority highways. Some of the projects being considered are the roads from Quito to Riobamba and Santo Domingo to Quevedo.

Ecuador has 6,323 kilometers of paved roads and 965 kilometers of railways.

Telecommunications

The government of Ecuador considers this industry one of the most important in the economy. Market size is expected to grow by 25 percent to well over U.S.\$116 million with U.S. imports accounting for 93 percent or U.S.\$107 million of these total expenditures. Line density is 5.31 per 100 persons.

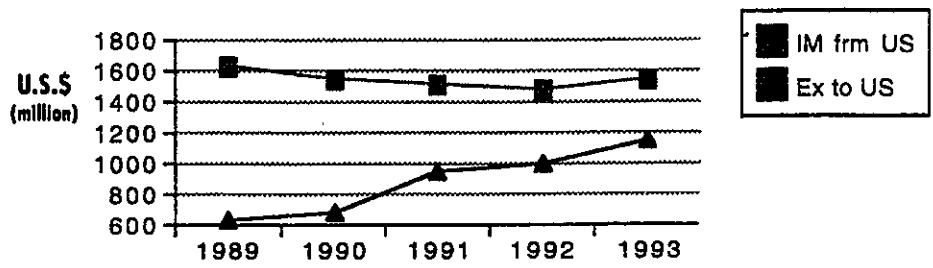
At present EMETEL, the national telecommunications company, enjoys a monopoly. However, this monopoly will be phased out and provide competition in different subsectors. Specific opportunities will be available in business telephone systems, cellular telephones, wires, and cable. With little domestic competition, U.S. companies are expected to maintain their hold on this market. In the meantime, the government has outlined measures to expand its current services from 609,000 telephones to 1.9 million at a cost of U.S.\$1.9 billion.

Economic & Political Climate

One of the top priorities of the newly-elected government of President Sixto Duran-Ballén has been to reduce the role and expense of government and to turn over many government activities to the private sector. This policy puts Ecuador in the mainstream of Latin American thinking with respect to the revised roles for the private and public sectors. Subsequently, the government embarked on a massive public-sector reduction program and has reduced the payroll by more than 5 percent.

The government ran on a platform of reducing inflation, modernizing the economy, and renegotiating Ecuador's external debt. Once in office, the Duran-Ballén administration took quick action and applied a number of drastic macroeconomic policies, including a devaluation of the sucre by 30 percent.

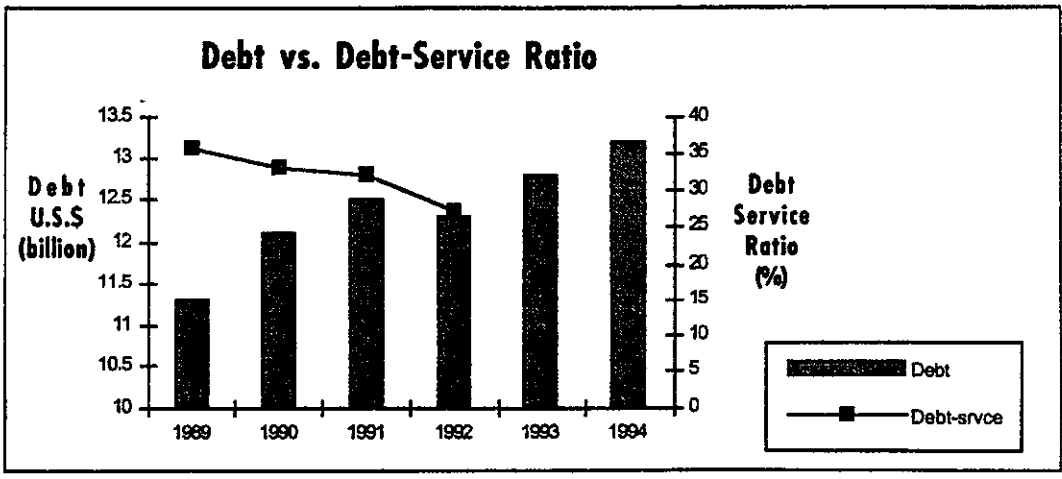
Trade With U.S.



Source: NTDB, IMF and EIU

The results of these measures exceeded expectations. The public sector deficit was reduced to 2.3 percent of GDP in 1992 and 0.4 percent in 1993.

Foreign exchange reserves recovered sharply, and inflation was reduced from 60 percent in 1992 to 31 percent in 1993. The completion of the debt reduction agreement recently reached with commercial bank creditors has significantly eased debt servicing requirements. Over the next few years, interest payments on all long-term debt would claim less than 4 percent of GDP, or 16 percent of exports. However, current legislative opposition has derailed the government's plan to introduce a broader value-added tax.

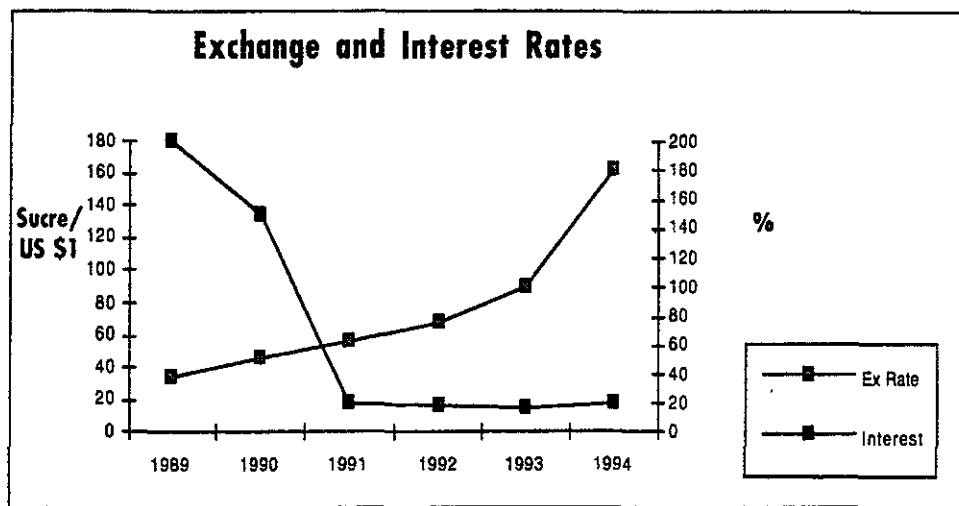


Business Climate & Regulatory Review

Tariffs, except for the 37 percent tariff on automobiles, are generally low, ranging from 5 to 20 percent. There are very few non-tariff barriers to imports.

To sell to the government, a U.S. company needs a local representative. There are over 120 majority-owned U.S. subsidiaries in Ecuador. Most Ecuadorian importers look first to the U.S. when they are in the market for new products, and U.S. consumer goods dominate. Many of the supermarkets are full of U.S.-processed foods.

Recently the U.S. and Ecuador finalized an Intellectual Property Rights Agreement, as well as a Bilateral Investment Treaty. However, Ecuador must now ratify both before these can be enforced.



Source: EIU

Import transactions are primarily financed through letters of credit which are usually issued by commercial banks. The financial services sector grew by 4 percent in 1994, and even higher growth is expected in 1995.

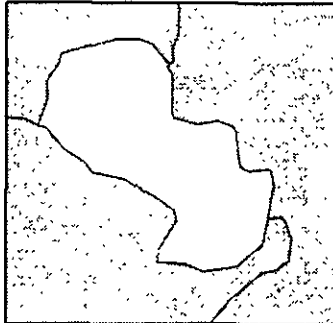
Ecuadorian banks have sought to expand their participation in foreign markets. For example, Banco del Pacífico bought a branch of Banco Latino in Colombia in 1994, and Banco de Pichincha is considering an acquisition of a financial company in Medellín. The consolidation of Ecuadorian banking has permitted the entry of U.S.\$17.5 million in foreign investment in the last years.

Interest rates have declined in tandem with inflation. Many U.S. companies now avail themselves of loan guarantees from the U.S. Export-Import Bank to reduce credit risk.

Assessment of Factors Affecting Business Climate in Ecuador

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	high	high	low-medium	brownouts from drought
Transmission	low	low	low	gov't-owned
Distribution	low	low	low	gov't-owned
Oil/Gas	medium	medium	low-medium	refinery/new fields
Environment				
Sewage/water	medium	high	low-medium	small projects
Pollution control	medium	medium	low	mining/petroleum
Telecommunications				
Network expansion	medium	medium	NA	major expansions
Switching	medium	medium	NA	gov't-owned
Cell & Value Added	low	low	low	weak demand
Transportation				
Road	low-medium	low	low	road concessions
Air	medium	medium	NA	terminals/expansion
Water	low	low	low	
Rail	low	low	low	

REPUBLIC OF PARAGUAY



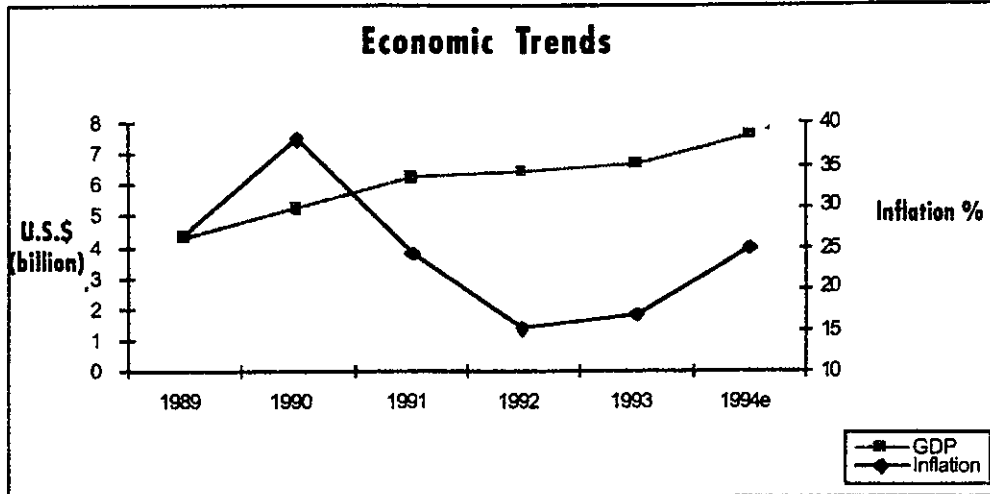
GDP ('94)	U.S. \$7.63bn	Per Capita	U.S. \$ 1,650
Real GDP growth (forecasts)	1995: 3.4% 1996: 3.5%	Population	4.78 Million
		CPI ('94)	25%
		S&P Rating	Not Rated
Expected Market	1995-2000		
Energy	U.S. \$500 million	Environment	U.S. \$200 million
Telecommunications	U.S. \$275 million	Transportation	U.S. \$320 million

Executive Summary

The government of Paraguay is keen on privatizing most of the state-owned monopolies in infrastructure. Although, President Wasmosy has vowed to privatize state enterprises, privatization has stalled due to political opposition. However, on October 21, 1994, the government sold an 80-percent stake in the state airline, LAPSA, to a consortium of Ecuadorian and Paraguayan investors. The shipping company (FLOMERS) and railway company (FCCAL) are expected to be sold by April 1996. Opposition from the legislature is likely in the second round of privatizations involving telecommunications (ANTELCO), water (CORPOSANA) and electricity (ANDE).

The stability of the first freely-elected civilian government in 50 years has been shaken with the assassination of the head of the anti-narcotics squad and the sacking of the finance minister in connection with corruption in his ministry. The public-sector deficit is expected to grow. The government is also offering bonds in the international markets to raise capital to finance investment projects.

Paraguay's President, Juan Carlos Wasmosy, led the Paraguayan team that constructed the Itaipú Dam, a world-class construction project. He is very interested in seeing the modernization of key infrastructure sectors, through privatization, or capitalization. His team of advisors, most of whom worked with him on Itaipú, are top-level engineers and decision-makers. There is a chance for Paraguay to emerge from its relative isolation, with a series of public works projects that would (a) connect the country's producing regions with Argentina, and (b) serve as an artery from Brazil's producing regions to the Paraguay Waterway System.



Source: EIU

Energy

Electricity in Paraguay is provided by the state-owned monopoly ANDE. ANDE is expected to be *capitalized* in a second phase of privatization by the government. ANDE has undertaken an ambitious project with the Argentine government, and is in the process of finishing the Yacyretá hydroelectric project. The Yacyretá plant will generate 3,000 MW of power by 1998 (ANDE's other giant asset, Itaipú, generates 12,000 MW). Two turbines at a capacity of 300 MW are now in operation, but are running well below capacity.

The Argentine government has announced privatization of its share of the company. In addition, ANDE has undertaken a rural electric power transmission and distribution project. At a cost of U.S.\$77 million, this would connect the Yacyretá hydroelectric plant with Asunción and other significant energy consumers.

Paraguay and Argentina are considering a second joint hydroelectric project at Corpus, just upstream from Yacyretá. The two governments plan to establish a concession to let private-sector companies construct and manage the project. The project will be built only if a long-term purchase contract can be negotiated with Brazil.

Paraguay consumes 641 Kwh per inhabitant.

Environment

There are a number of specific water projects in Paraguay, including the U.S.\$200 million Asunción Bay reclamation project. The IDB is prepared to provide U.S.\$100 million. This project would reclaim several thousand acres of waterfront property which floods annually. The project also includes the

installation of several water and waste water treatment plants to handle the increasing effluent produced by Asunción's growing population, which is currently dumped untreated into the bay. This project is expected to begin in early 1996.

There is also an ongoing project for the recuperation of the Ypacaraí Lake Basin, which also involves the Bay of Asunción project. The final report would include recommendations for the installation of wastewater treatment plants and the construction of river walls.

Transportation

Paraguay's most significant problem, according to the World Bank, is a lack of efficient transportation. The government of Paraguay has plans to address these needs through the development of an air cargo system, and also through the development of a container rail system. There are also plans to purchase a new radar system for the Asunción airport. On this project the government prefers to work with a supplier who is able to provide financing for the project.

Another important project is the *hidrovía*, a long-term waterway transportation project that aims to improve the navigation system of the River Plate region, including the Paraguay and Paraná Rivers—all the way to Bolivia. The project is financed through a loan from IDB. The *hidrovía* project will fund improvements in roads and ports, and may include some river dredging. Governmental programs supported by the World Bank, IDB, Fonplata, and the Japanese government are upgrading and extending the road network and improving the integration of outlying regions, as well as connections with neighboring countries. Paraguay has 2,094 kilometers of paved roads and 441 kilometers of railways, most of which are in poor condition.

Telecommunications

Policy and regulations for all Paraguayan telecommunications are established by the state-owned enterprise, ANTELCO. ANTELCO also provides telecommunications services and currently has a monopoly in the market. Service availability, however, is limited compared to the growing demand in the country; line density is only 3 per 100, which, along with Bolivia's, is the second lowest on the continent.

ANTELCO is in the process of concessioning 120,000 lines—80,000 new lines, and the upgrading of 40,000 existing lines. This will be the first step in the modernization of the system, and should stimulate the release of new opportunities, such as that in rural telephony.

The government has allowed private investment in telecommunications services since 1991, when Telecel S.A., a joint venture between U.S. Millicom and a Paraguayan partner, won the bid to operate a mobile phone service in Asunción. The company plans to invest U.S.\$13 million within the first five years. Recently, Telecel operations extended coverage to Ciudad del Este, and it is planning service to

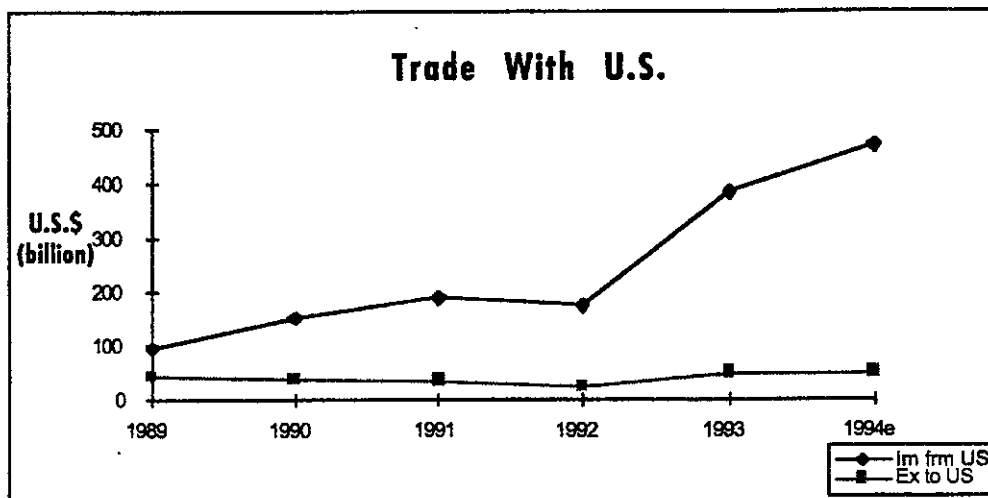
the Encarnación area in the near future.

Economic & Political Climate

Paraguay has recently undergone a transition process to democracy. General Andrés Rodríguez presided over the political and economic changes that culminated on August 15, 1993 with the inauguration of President Juan Carlos Wasmosy, the first freely elected civilian president.

The new government pledged to continue the market-based economic reforms begun under the Rodríguez administration, and specifically work to:

- Keep expenditures in line with revenue
- Combat inflation
- Keep duties low and uniform with no restrictions on capital flows
- Emphasize production and export

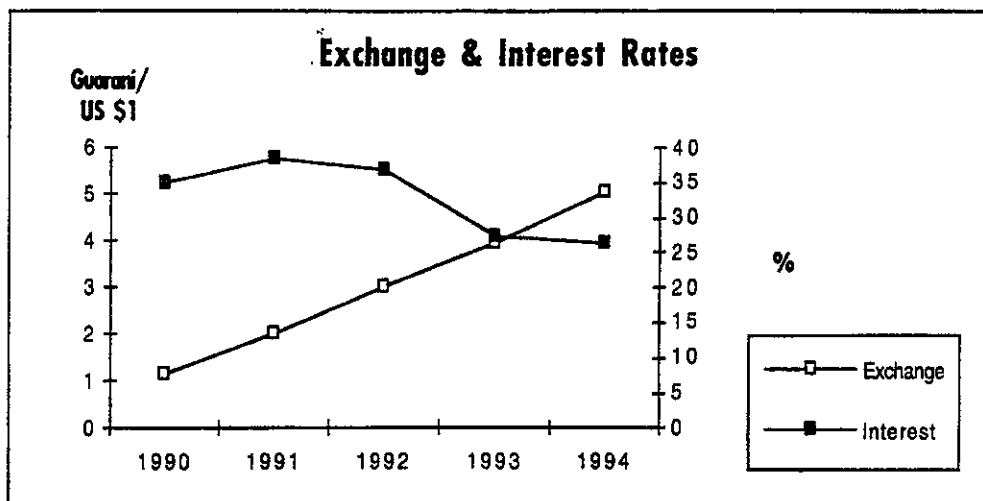


Source: IMF, EIU

The country has a predominantly agricultural economy and vast hydroelectric potential. The commercial sector is primarily engaged in the import of goods from Asia and the United States for reexport to neighboring countries.

President Wasmosy's market-oriented reforms are expected to restore business confidence and improve macroeconomics management. Exchange rate and interest rate liberalization stand out as the most effective reforms to date. The Wasmosy administration has promised to continue the reform of the economic system and to speed up privatization and financial sector reforms.

The next scheduled national elections are in 1996 for mayors and municipal councils. Paraguayans will go to the polls to choose a new president, legislature and departmental governors in May of 1998.



Source: ITU

Business Climate & Regulatory Review

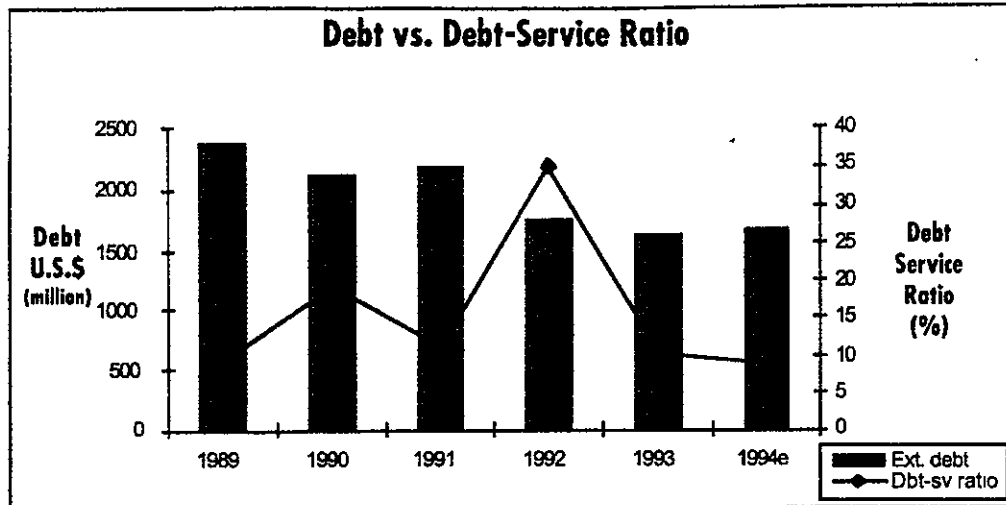
In February 1989, the Rodríguez administration devalued the guaraní (the local currency), and eliminated foreign exchange rate controls. The value of the guaraní is thus set by free market forces.

In 1992, the government implemented a new simplified tax code and import tariff reform. The tax and tariff reform had the following effects:

- Number of taxes reduced from 84 to seven
- Value-Added Tax (VAT) implemented to expand tax base
- Elimination of administrative barriers to promote trade
- Reduction of custom duties
- Continued ban on agricultural products

Paraguay welcomes foreign investment except — to date — in state monopolies like cement, electricity, water, and telecommunications. A legal framework was established to promote an open climate for foreign investors under law 60/90.

- Investors enjoy the same legal rights as do national investors
- Total exemption from certain taxes on establishment of operations
- Reduction in customs on import of capital goods
- Unrestricted repatriation of profits and capital
- Same tax rules are applied to domestic businesses
- 30-percent corporate tax
- 10-percent tax on reinvestment profits



Source: EIU

Financial Overview

The government's economic policies encourage the free flow of financial resources to attract capital. The following characterize the financial markets in Paraguay:

- Asunción stock market established in 1992 and operational in October 1993
- Credits are allocated on market terms
- No discriminatory credit policies
- Foreign investors allowed to raise capital in the local markets without restrictions
- Law 210 provides tax incentives to companies operating in the stock market
- National stock exchange commission created for regulation and control of stock markets

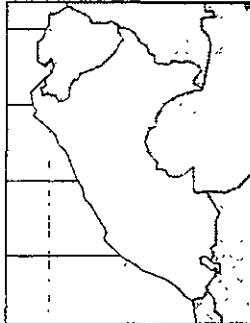
The banking system is composed of 31 banks and 52 finance companies. Four banks are state-owned, 13 banks are foreign banks, and 14 banks are owned by private nationals. Private banking accounts constitute close to 85 percent of assets for a total amount of U.S.\$1.58 billion.

Available finance includes a Spanish government finance package of U.S.\$155 million, 50 percent of which is supplier credit and the remainder soft loans. The government of Japan provides a U.S.\$80 million loan at 3-percent interest to expand the electricity distribution network in Asunción.

Assessment of Factors Affecting Business Climate in Paraguay

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	medium	low	medium	technology transfer
Transmission	medium	low	medium	export market
Oil/Gas	low	high	high	oil/gas
Environment				
Sewage/water	medium	low	low	sewage treatment
Pollution control	low	low	low	equipment
Telecommunications				
Network expansion	high	low	high	expansion
Cell & Value Added	low	low	high	ATC, other hi-tech
Transportation				
Road	medium	high	low-medium	railroad and road
Air	low	low	low-medium	concessions, air traffic
Rail	medium	high	low-medium	control systems

REPUBLIC OF PERU



GDP	U.S. \$32 billion	Per Capita	U.S.\$1,368
Real GDP Growth (forecasts)	1995: 7.9% 1996: 4.5%	Population:	23.4 million
		CPI 1994	18%
		S&P Rating:	Not Rated
Expected Markets	1995-2000		
Energy	U.S.\$1.4 billion	Environment	\$1.2 billion
Telecommunications	U.S.\$2.1 billion	Transportation	\$1.75 billion

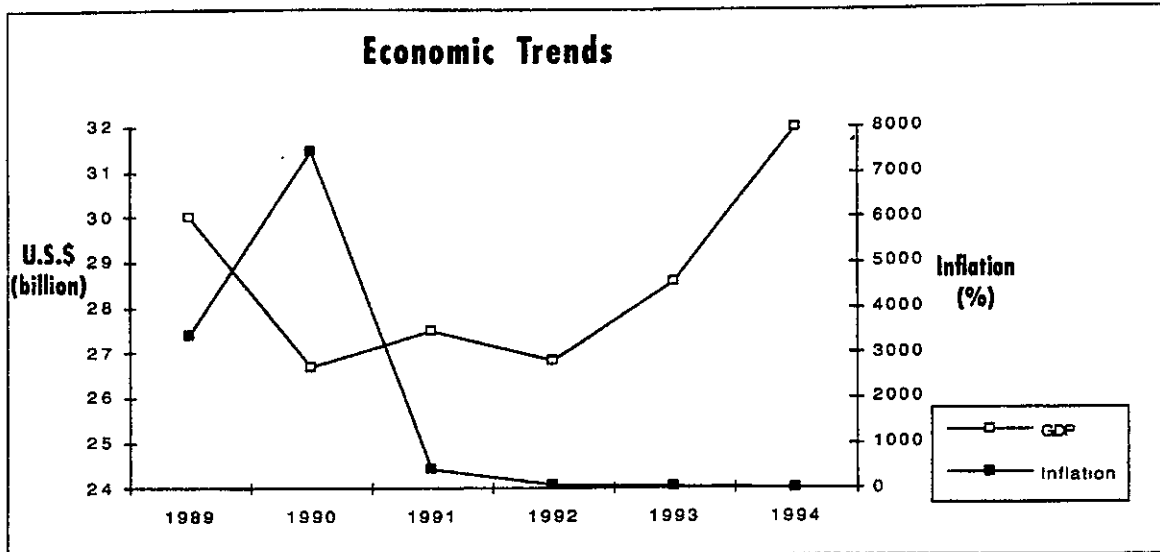
Executive Summary

Peru has gone through the most dramatic economic turnabout in Latin America. Over a span of less than four years, Peru has transformed itself into an economy driven by the private sector with one of the fastest growth rates in the world.

Central to this strategy has been a movement to privatize state-owned companies, particularly in the area of infrastructure. Companies that have been privatized or are waiting privatization include the state electricity utility, the state telephone company (sold), the state oil company, Lima's water authority, and numerous other companies in the fishing, mining, and industrial sectors. Privatization has been combined with policies to remove most controls on imports, foreign investment, foreign currency transactions, and the financial sector and to simplify the fiscal code.

An important feature of Peru's privatization effort has been a stress on "public infrastructure"—the ability of the government to establish and enforce the necessary regulatory framework in order to guarantee the continued provision of public services. This is a critical area, as U.S. companies pursue the explosion of project opportunities in Peru.

With the reelection of President Fujimori in April, Peru is set on a course of sustained growth—with very high infrastructure demand. This is commendable given that several years ago Peru lost one quarter of its GDP, saw inflation at 7,000 percent, faced high levels of political violence, and was isolated from financial markets due to huge arrears on international debt. During the end of 1994 and the early part of 1995, many key reforms were on hold. It now appears that the privatization process will be pushed ahead very aggressively in the coming months. Peru is a country to watch.



Source: EIU

Energy

Peru represents an excellent market for U.S. energy equipment suppliers and developers. Peru has adopted the "Chilean model" for electricity development, which leaves the development of new generating capacity to the private sector.

The 1993 Law of Power Concessions ended the state's monopoly and separated out generation, transmission, and distribution. *Independent power is fully authorized and generators are guaranteed access to the grid to wheel power directly to customers.* Rates for transmission and distribution will be regulated and prices set by formula. Fuel is a problem.

The law also called for the sale of the two state generating and distribution companies, Electrolima and Electroperú. For privatization purposes Electrolima was divided in three firms—two distribution companies, Edelsur and Edelnor; and Edelger, a generating company. Edelnor and Edelsur have both been sold to non-U.S. consortia. The privatization of Edelger has been postponed but is expected soon. The privatization process for Electrolima has trailed but one of its generating assets, the 40-MW Cahua plant, has been sold.

The demand for new capacity, transmission, and distribution of electricity in Peru is strong. The country produced 14,347 Gwh in 1993 but reached less than half of the population. Per capita electricity consumption is 543 kwh per inhabitant.

Given this level of underdevelopment, each percentage increase in GDP results in a 1.5 percent increase in electricity demand. Currently Peru's electricity demand is estimated to increase 18 percent from 1994 to 1998 and 22 percent in the following four years.

U.S. firms will find particular opportunities for cogeneration and independent power with private industry, especially in the mining sector. Mining is a major growth industry in Peru and many of the major players are planning generation facilities. The U.S. government estimates that U.S. exports in the power sector will expand by 500-800 percent in the next several years, from a small base of U.S.\$4 million annually.

The oil and gas sector is also being opened to private investment and the oil company sold. The privatization of Petroperú was slated to begin in 1994 with the sale of the Talara and La Pampilla refineries, but has been delayed and is still under review. Under the new privatization scheme, foreign companies will be granted licenses to own and freely operate oil and gas production, while paying a royalty to the government. Peru has important oil and gas reserves, and there is tremendous U.S. and foreign interest.

Transportation

Peru has a diverse transportation network, and privatization and modernization efforts are underway in each segment.

At Peru's airports the process is well underway, with an increasing number of services being carried-out by concessionaires. Lima's airport is also undergoing a U.S.\$24-million renovation to improve runway quality and instrumentation. This is a process that is being assisted through a feasibility study grant from TDA. Important improvements are also underway at provincial airports.

Of Peru's roughly 57,000 kilometers of roads, only 7,500 kilometers are paved. The road system is in a state of disrepair and a major (U.S.\$500 million) investment and upgrading is underway (financed to this point by the multilateral banks). The government will complement these efforts through a concession program, emphasizing the Pan-American Highway and the Lima area. This program has not yet been defined.

Peru's railway infrastructure consists of 1,608 kilometers of mostly unusable railways, administered by Enafer, the state railroad authority. In 1991 rules were announced for concessions on all rail services; this year, the first concession to be granted is the Cuzco-Quillabamba Line. Concessions for two additional routes are scheduled to be awarded soon thereafter. As in Argentina and Chile, concessionaires will have a substantial task in bringing these lines up to standard—42 percent of the rolling stock is operable, and close to 70 percent of the track is in bad condition.

Environment

With the enactment of the Natural Resource Code in 1990 (Decree 613), Peru began constructing an environmental regulatory and enforcement mechanism and, consequently, a market for pollution control equipment. Specific technical norms have not been issued, leaving government and industry with

wide leeway on the level of environmental investment required. The U.S. government currently estimates the market for pollution control equipment to be growing more than 12.5 percent, over half of which is sourced from the U.S. This market will grow by an estimated 15-20 percent per year, over the next five years.

Several large mining, fisheries, and industrial firms are already undertaking environmental improvements, and these represent the best opportunities for U.S. firms over the short term. For example, the Southern Copper Company announced a U.S.\$300 million investment in environmental measures and a recently privatized cement company will spend U.S.\$8 million to clean up several sites.

Peru desperately needs upgrades to its sewage and potable water systems. Only 72 percent of the urban population and 16.7 percent of rural Peruvians have potable water, and these percentages drop further to 67 percent and 12.5 percent when sewer hookups are considered.

One measure underway to remedy this situation is the privatization of SEDAPAL, Lima's water and sewage company, which serves 5.4 million inhabitants. Lima's system requires rehabilitation costing up to U.S.\$600 million. Three European consortia have pre-qualified for the bid which should be finalized in 1995. Peru currently lacks a formal wastewater or potable water concession program along the lines of Mexico. Such a structure will need to be developed to more rapidly expand service throughout Peru.

Telecommunications

Telecommunications was the first major sector privatized, and it is experiencing a rapid growth in investment. With three phone lines per 100 inhabitants, there is a large demand for telecommunications services in Peru. In February of 1994, Peru's two state-run telephone companies were sold to Telefónica de España for a price of U.S.\$2.1 billion to operate a concession for five years. The terms of the concession require an aggressive investment program to result in a system-wide upgrade and enhancement of service with a total installation of an additional 978,600 new lines. Telefónica estimates that it will spend U.S.\$1.9 billion to achieve these goals.

Tele 2000, a five-year-old firm, is aggressively competing in the telephone marketplace against Telefónica.

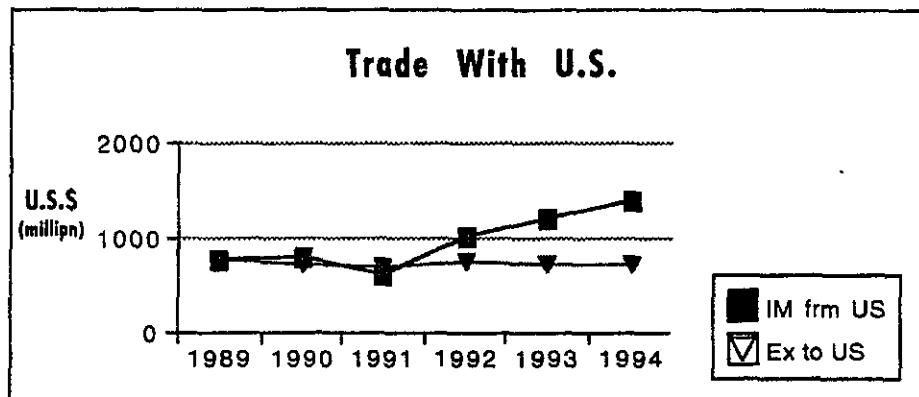
A series of legal and regulatory reforms established the basis for the privatization along with the privatization of cellular and all value-added services. Under these reforms satellite, paging, and cellular phone services will all be under the control of the private sector. Telecommunications in Peru is now under the authority of OSIPTEL, the Private Investment in Telecommunication Supervising Authority, which regulates all concessions and disputes.

Exports of telecommunications equipment to Peru are expanding very rapidly, having increased over 200 percent to total U.S.\$104.6 million, of which U.S.\$24.5 million was from the United States. The

U.S. government estimates that telecommunications exports to Peru will triple in each of the next three years. Japan is currently the leading supplier to Peru with 25.7 percent of the market. Mobile, of the United States, is investing U.S.\$35 million to launch a paging service in Lima .

Economic & Political Climate

The government has systematically tackled the severe obstacles that blocked its path to economic stabilization and growth. Current government expenditures now match revenues and this fiscal policy,



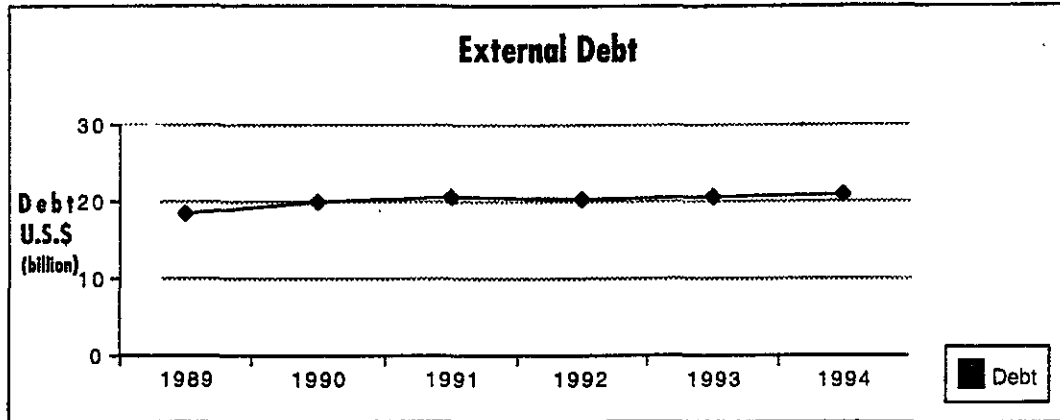
Source: EIU

in combination with tight monetary policy, has brought inflation to under 20 percent annually. The Peruvian economy grew at an incredible rate of close to 12 percent in 1994 and is forecast to grow at a 6-7 percent rate in 1995. The government has moved to restore international confidence by renegotiating the substantial arrears it has accumulated on its foreign debt. The government has already cleared arrears with the World Bank, IDA and the Paris Club, setting the stage for a Brady-style renegotiation of its commercial bank debt. The government has accumulated U.S.\$6 billion in international reserves and attracted U.S.\$4 billion in direct foreign investment in 1994.

The reelection of President Fujimori shows public support for his efforts despite economic dislocation. It is expected that under his second term he will attempt to continue the aggressive privatization scheme and attempt to consolidate gains already made. One such area is judicial and administrative reform, since the country's judiciary is inefficient and frequently not transparent. Reform of this system will be critical to fully restoring investor confidence and safeguarding private investment in ongoing projects.

The United States remains Peru's dominant trade partner, providing a destination for 21 percent of the country's exports and 27 percent of its imports. Total U.S.-Peru trade exceeded U.S.\$2.1 billion in 1994 with U.S. exports accounting for about U.S.\$1.4 billion. U.S. trade with Peru has been volatile, reflecting Peru's recent economic dislocation, but it is expected to rise sharply in response to positive economic growth.

The Peruvian economy remains heavily dependent on the international price of commodities such as



Source: IMF, EIU

minerals, fish, and farm products. Consequently, investors should expect some degree of institutional economic volatility.

Business Climate & Regulatory Review

Peru has established a clear set of business rules that minimize the role of the government in the economy. The Foreign Investment Promotion Act (Decree Law 662) establishes important principles for foreign investors, including:

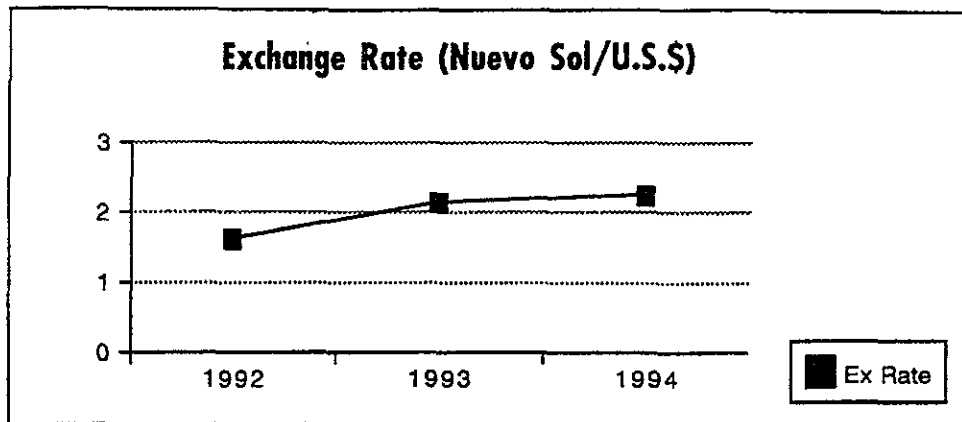
- Equal treatment of foreign firms in all business dealings
- Free repatriation of all capital and dividends
- Free remittance of royalties with registration (authorization is automatic and there are no limits on the size of royalties)
- No registration or authorization required for investment

In addition, the law authorizes the National Commission on Foreign Investment and Technology to sign judicial stability contracts with investors guaranteeing tax rates that will increase for 10 years and guaranteeing access to foreign exchange.

There are no import licensing or quota restrictions. The tariff structure has been greatly simplified with rates between 15 and 25 percent, with 97 percent of import items at the lower rate.

Peru is also a signatory to a number of agreements to increase investor security, including the Multilateral Investment Guarantee Agency (MIGA), OPIC, the International Center for Settlement of Investment Disputes, and the 1985 Convention on recognition and enforcement of arbitral awards. Additionally, Peru has expressed interest in signing a bilateral investment treaty with the United States.

Peru has put into place the legal and administrative systems for the protection of intellectual property rights. However, the ITA reports that enforcement efforts for protecting intellectual property are substandard and Peruvian courts often fail to punish offenders. For this reason, Peru remains on the U.S. government's 301 Special Watch List for intellectual property protection.



Source: EIU

Financial Sector

Peru adopted the Financial and Insurance Institutions Act to strengthen the financial system through increased competition. Among the key components of this act are:

- Interest rates set by market forces
- Exchange rates set by market forces
- Equal treatment for foreign and local banks, as long as they comply with banking laws
- Insurance fees unregulated
- Individuals may maintain foreign currency accounts in local banks and/or hold bank accounts abroad

There are no restrictions on currency transactions; rates are set by market forces. Exporters are not required to turn hard currency proceeds to the Central Bank.

Corporate taxes are fixed at 30 percent, with a 2 percent minimum tax on assets, with a 1 percent tax on finance and insurance. The sales tax is 18 percent.

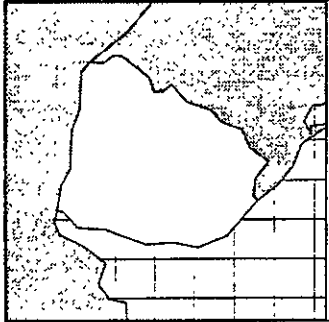
Peru's Securities Market Act privatized Peru's stock market and established the National Stock Exchange Securities Commission to oversee and regulate the market.

Project finance in Peru is difficult because of the country's current arrears to foreign banks. However, the country is making progress on this front, and equity and direct investors are again very active in Peru. If Peru continues on its current course and can negotiate a Brady-style arrangement with its creditors, project finance should return as an option for Peru.

Assessment of Factors Affecting Business Climate in Peru

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	high	medium	medium	industrial producers
Transmission	high	medium	medium	
Distribution	high	high	medium	
Environment				
Sewage/water	medium	high	low	mining/fishing
Pollution	low	low	low	
Telecommunications				
Phone lines	high	high	medium	2,000,000 new lines
Switching	high	medium	medium	
Value-added	medium	medium	high	
Transportation				
Highways	medium	medium	medium	Toll roads
Railways	medium	medium	medium	Rail renovation
Airports	high	low	medium	Radar + Air traffic
Waterways	medium	medium	medium	New ports

ORIENTAL REPUBLIC OF URUGUAY



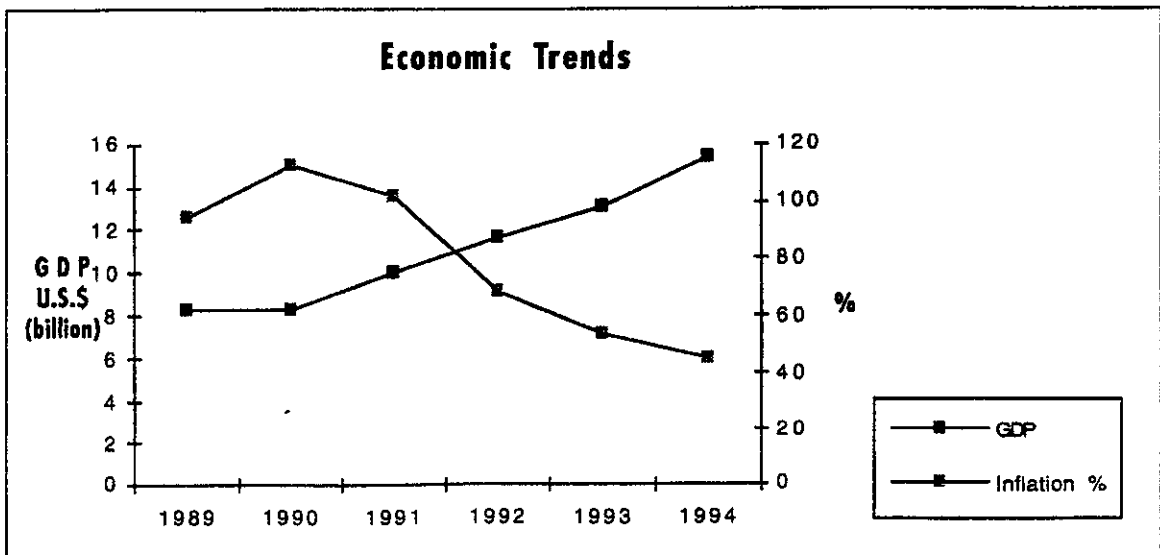
GDP 1994	U.S.\$ 15.4 billion	GDP/capita:	U.S.\$4,858
Real GDP Growth (forecasts)	1995: 3.0%	Population:	3.1 million
	1996: 2.0%	1994 CPI:	45%
		S&P:	Not Rated
Expected Markets	1995 to 2000	Environment	U.S.\$25 million
Energy	U.S.\$400 million	Transportation	U.S.\$600 million
Telecommunications	U.S.\$500 million		

Executive Summary

Uruguay has an open economy that has enjoyed relatively strong economic growth and stability. President Sanguinetti assumed office on March 1, 1995, promising to continue gradual economic reform to improve the country's competitive position. Economic forecasts predict modest growth of 2 to 3 percent and moderate inflation of 45 to 55 percent per year.

Uruguay is a signatory to the Mercosur Treaty, intended to drive infrastructure developments, particularly in the area of increasing land and water transportation links between Brazil and Argentina.

Uruguayans are conservative in their approach to structural reforms and privatization. For example, in 1992 Uruguay rejected the privatization of the state phone company, ANTEL, by a sizable margin.



Source: EIU

 **Energy**

Uruguay is self-sufficient in electrical production, receiving about 70 percent of its power from hydro-electric sources and 30 percent from thermal production. Total generating capacity for the country is approximately 2,200 MW, and the World Bank estimates annual increases in demand of between 6 and 7 percent. Despite this growth, existing peak is only 1,100 MW, leaving an adequate reserve over the short term, and spot market electricity exports to Argentina accounted for more than 2 percent of GDP in 1994.

The state power monopoly, UTE, has control over distribution of electricity, although a 1991 amendment to the national electricity law established the right of private parties to generate power for sale to UTE. As part of this plan, the Technical Commission for Energy was established to oversee the modernization of the electrical sector and establish the rules for private participation. The Commission has not been established and the rules for private generators remain unclear.

UTE has plans to improve and expand the existing system, including a U.S.\$15-million interconnection of the Uruguayan and Brazilian grids at Rivera/Livramento. Plans for the conversion of existing fuel oil boilers to natural gas and the construction of two additional combined cycle natural gas facilities are also being studied.

Oil and gas importation, refining, and distribution are under the control of the state oil monopoly, ANCAP. A U.S.\$100 million renovation, in part utilizing U.S. technology, was just completed at the country's single oil refinery. The distribution of natural gas in Montevideo is now being managed under a 30-year concession by Gaseba (of Argentina) in one of the country's first privatizations. Finally, discussions are underway between Argentina and Uruguay on the construction of a U.S.\$70-million pipeline to connect Buenos Aires and Montevideo. Energy consumption is 1,472 KWH per inhabitant.

 **Environment**

Uruguay needs to establish the necessary regulatory framework and enforcement system to develop an important market for environmental services and equipment. Environmental matters are under the responsibility of the Ministry of Housing, Land Planning, and Environment. While industry is moving toward more environmentally sound practices, and new projects receive close environmental scrutiny, there are no reliable estimates on Uruguay's environmental market.

Potable water and sewage systems are under the control of the state-owned firm, OSE, which has plans to upgrade and expand services but currently lacks the financial capability to do so. There has been limited movement toward the privatization of water services, but there are currently no substantial opportunities for U.S. firms.

Transportation

Economic integration will increase demand for transportation links with neighboring Mercosur countries. Uruguay's economy is focused on Montevideo and Montevideo is focused around its port. Port services were recently privatized, leading to a sharp increase in productivity and reduced costs. A U.S. firm, the Great Lakes Dredging Company, was awarded a U.S.\$100-million contract to improve the Martín García Canal in early 1995. Uruguay and Argentina have also agreed to spend an additional U.S. \$24 million for improvements to the Uruguay River from its mouth to the cities of Salto, Uruguay and Concordia, Argentina.

Uruguay has 3,000 kilometers of aging railroad track and deteriorating rolling stock managed by the state company, FE. Freight tonnage hauled has decreased each year for the past decade and there were over 60 derailments in 1994. The government recognizes the need to make a fundamental decision on the future of its rail network. An estimated U.S.\$100 million may be needed to recondition the existing rail network.

After two unsuccessful attempts, the state airline was privatized. The airline, Pluna, was in desperate financial straits at the time of the privatization. It is unclear what plans the new owners have for their acquisition.

Telecommunications

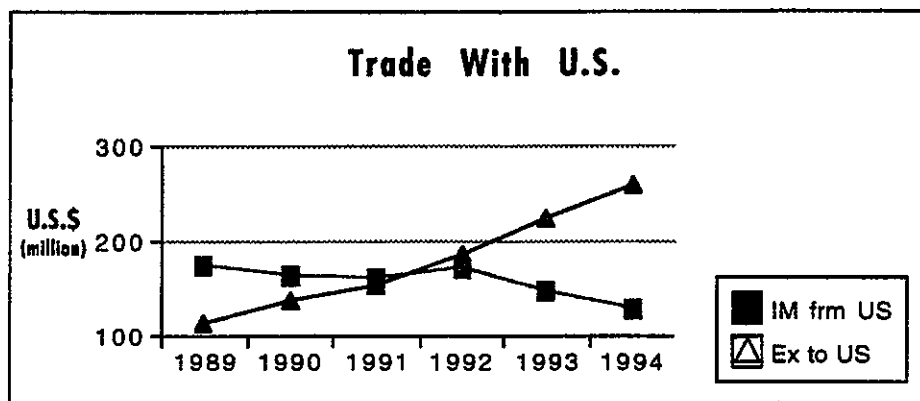
Telecommunications in Uruguay is under the control of National Telecommunications Administration (ANTEL), which maintains a monopoly over all telecommunications services, with the exception of cellular phones. The previous government attempted to privatize ANTEL but was rebuffed when 72 percent of the voters rejected the privatization plan in a national referendum.

ANTEL will preside over modest growth in telecommunications over the next several years. Uruguay already has the highest phone density of any major country in South America, at 16.8 phones per 100 residents. Investments are focused on efforts to further integrate digital systems and improve management and services.

The overall telecommunications market was estimated to be U.S.\$75 million in 1994, with over 90 percent of the market supplied by imports. European firms dominate the market—among them Alcatel, Ericsson, and Siemens. The best prospects for U.S. firms are in the areas of switching equipment, private branch exchange (PBX), radio transceivers and cellular equipment. The United States exported U.S.\$14.7 million worth of telecommunications equipment to Uruguay in 1994, which was a 128-percent increase over 1993 exports. Overall U.S. exports of telecommunications equipment have increased five-fold over the past five years.

Economic & Political Climate

Since 1990, Uruguay has been headed on a steady and moderate course toward economic reform. These reforms, begun under the La Calle administration are likely to continue under newly elected President Sanguinetti. The president has called for a reduction in public spending and debt, privatization of state companies, and increasing private participation in service provision. Uruguay's entry into the Mercosur Treaty represents a major step toward these economic objectives.



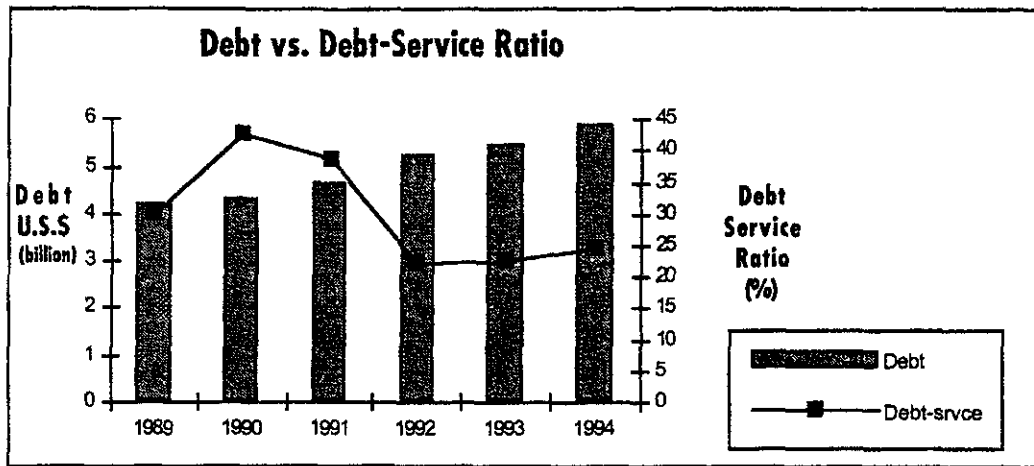
Source: NTDB, EIU

Despite persistent inflation problems over the past years, Uruguay has managed to achieve steady economic growth and has one of the highest per capita incomes in the region. Uruguay benefits from a vibrant agricultural sector that exports worldwide. It is a marketing and distribution point and "safe haven" for investors from its larger and often more turbulent neighbors—Argentina and Brazil.

As a result, infrastructure in many areas is advanced, which has slowed demands for private investment and ownership. While the progress toward privatization has been steady, it has not approached the rapid pace of Argentina or Peru. To date, reforms have included the privatization of port services, natural gas services, electrical power generation, cellular services, and the former state airline.

The major challenge facing the Sanguinetti administration is to lower its fiscal and trade deficits. Progress was made on reducing the fiscal debt first, by reforming the pension system to lessen its drain on state resources. Progress on the trade deficit may be more difficult, as Uruguay lowers its tariffs with its more industrialized neighbors in Mercosur while resisting efforts to devalue its currency.

The U.S. is an important trading partner for Uruguay, although U.S. exports play a lesser role than in most other Latin American countries. In 1994, U.S. exports to Uruguay increased by 16.7 percent to total U.S.\$259.6 million. The value of U.S. investment in Uruguay is difficult to estimate, as there are no investment registration requirements. However, according to a U.S. survey of current businesses in Uruguay, U.S. investment is in excess of U.S.\$200 million.



Source: EIU

Business Climate & Regulatory Overview

Uruguay maintains a regime that is friendly to both international trade and investment. On the investment side, there are no registration requirements for foreign investors. Foreign investors receive the same treatment as national companies in Uruguay with full access to investment promotion programs, credit, and foreign exchange. Authorization is still required in what are defined as strategic industries, including electricity, hydrocarbons, basic petrochemicals, railroads, telecommunications, radio and television, and banking.

Imports to Uruguay are mostly free from import licensing requirements and quotas. From non-Mercosur countries, import tariffs range from 6 percent for raw materials and capital goods, to 15 percent on intermediate goods, to 20 percent on finished goods. The government recently established simplified import procedures, which have greatly reduced red tape.

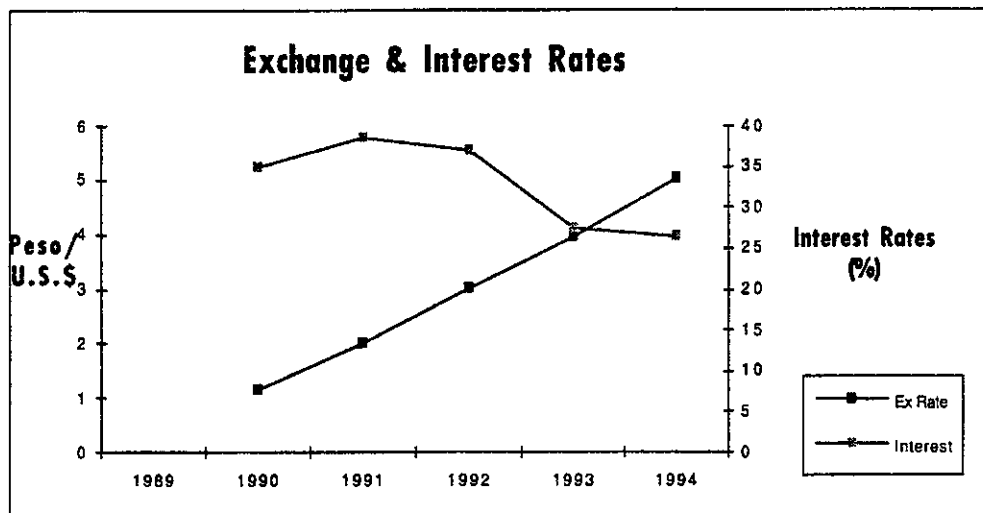
Uruguay offers comprehensive protection to foreign trademarks and patents (except pharmaceuticals). This protection was recently extended to copyright protection on software, although enforcement is reportedly weak. Technology transfer is unregulated and there are no limits on royalties between private parties.

Government procurement in Uruguay is transparent and open to foreign firms. Preference is given to local suppliers and to firms that will use local content. Uruguay is not a signatory to the GATT treaty on public procurement.

Uruguay is a member of or has agreements with the following:

- OPIC: OPIC provides insurance against expropriation, currency convertibility, war, or civil unrest.
- Mercosur Common Market: This consists of Brazil, Paraguay, Argentina and Uruguay and will result in a zero tariff level for most products by January 1, 1996.
- ALADI: This is an alliance of Latin American countries that provides reduced tariff levels among its members.
- GATT

Uruguay and the United States are currently considering the text of a draft bilateral investment treaty.



Source: IMF, EIU

Financial Overview

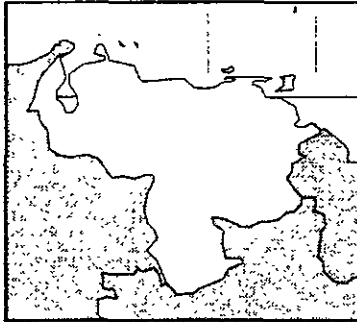
Uruguay is considered a regional banking center and offers sophisticated financial services. There are 24 commercial banks, eight offshore banks and 11 brokerage firms. Foreign banks operating in Uruguay include the Chase Manhattan Bank, Citibank, Bank of Boston, Republic National Bank of New York, Lloyds Bank, and the American Express Bank. Retail banking, however, is dominated by the state-owned bank, Banco de la República de Uruguay, which provides about 75 percent of total bank financing.

There are no restrictions on currency convertibility. The Uruguayan peso floats freely within a declining 7 percent band. The band currently declines 2 percent per month to compensate for inflation. Profits may be freely repatriated without restriction.

Assessment of Factors Affecting Business Climate in Uruguay

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	low	low	low	biomass cogeneration
Transmission	low	low	low	
Oil/Gas	medium	low	medium	
Environment				
Sewage/water	low	high	low	
Pollution control	low	low	low	
Telecommunications	medium	high	N/A	
Transportation				
Road	low	medium	low	
Air	low	medium	low	
Rail	medium	medium	low	

REPUBLIC OF VENEZUELA



GDP ('94)	U.S.\$ 57 billion	Per Capita	U.S.\$ 2,714
Real GDP growth (forecasts)	1995: 1% 1996: 3%	Population	21 million
		CPI ('94)	75%
		S&P Rating	B+
Expected Markets	1995-2000		
Energy	U.S. \$4 billion	Environment	U.S.\$1.75 billion
Telecommunications	U.S. \$7 billion	Transportation	U.S.\$3 billion

Executive Summary

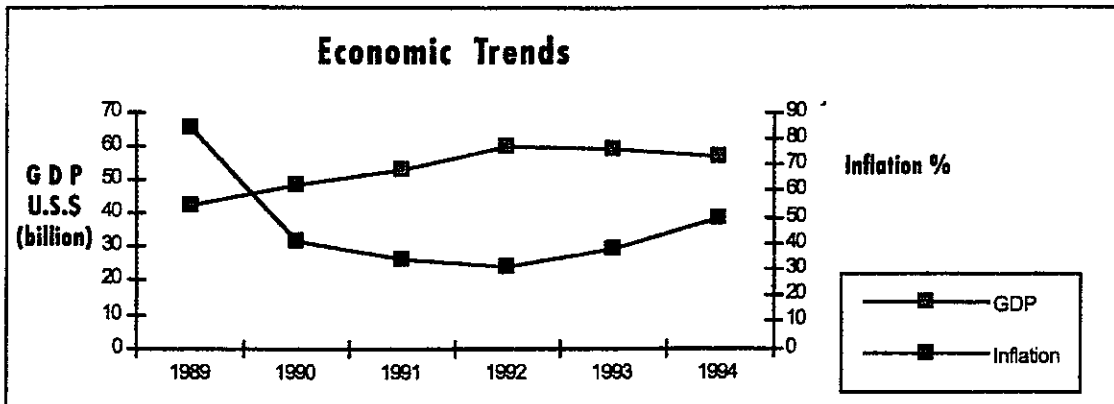
Venezuela's economy has traditionally been centered around the oil industry, which accounts for over 20 percent of its GDP and over 90 percent of its export value. However, while today most opportunities for U.S. business still originate in this sector, there is increased potential in other sectors of the economy. Though significant infrastructure development occurred during periods when world oil prices were high, lower public revenues have prevented the proper maintenance of this infrastructure, and the further public sector development of it. There is a need for private sector investment.

Venezuela will push for significant privatization, and especially for the creation of means for private funds to invest in new infrastructure, as well as in the maintenance of existing infrastructure. This will be part of a crash program to generate increased and diversified exports. PDVSA, Venezuela's national oil company, also presents enormous opportunities.

President Rafael Caldera's government has attempted to open the country's economy to foreign participation. However, pressured by a significant decline in the price of petroleum and waning public confidence in the political and economic stability of the country, President Caldera was forced to introduce policies that, at a glance, appear to counter the liberalization of the economy. The most noticeable of these policies was the reimposition of foreign exchange control measures in 1994.

Energy

Unlike many other oil-producing countries that have nationalized their petroleum sectors, the Venezuelan national company, PDVSA, continues to be one of the brighter stars in the public sector. This company has actively engaged in joint ventures with many foreign firms, and its research and development efforts have resulted in the creation of an increasingly profitable product called Orimulsion, which is marketed by its subsidiary, Bitor.



Source: EIU

PDVSA and the government of President Caldera have devised a profit-sharing scheme with foreign firms interested in investing in this sector. The implementation of this proposal, however, is currently pending because of a political dispute between the legislature and President Caldera. If it is implemented, U.S. businessmen will have a wide range of investments from which to choose, including reserves exploration, production, refining, transport, storage, and marketing of hydrocarbons.

Electrical supply has also come under the government's intended privatization umbrella. The rate of private participation, however, is substantially slower in this industry, with only one of the four state-owned power generation companies, ENELBAR, being considered for privatization. The government, however, is seeking foreign participation in the construction of hydroelectric dams and spillways and the installation of auxiliary electrical and mechanical equipment.

Environment

The environmental sector probably provides the strongest opportunities for foreign participation. The market for industrial toxic waste, air pollution, and water treatment control equipment is estimated at U.S.\$39 million for 1994 and is expected to increase by 3 percent annually over the next three years. Though the import of pollution control equipment from the United States fell from U.S.\$75 million in 1992 to U.S.\$4 million in 1993, U.S. goods still comprise at least 65 percent of the import share.

Venezuela's environmental policy began in 1986 with the Environmental Organic Law (EOL), and was followed by the Criminal Environmental Law. These two laws have resulted in an increased need for technical evaluations for environmental permits and environmental impact studies. Local governments would need to spend U.S.\$300 million in the next three years to meet the current legal regulations. In the municipalities' waste water treatment plants, there is need for modernization within the range of U.S.\$200 million.

In fact, the total private sector would need at least U.S.\$1.5 billion in order to meet minimum requirements of the Criminal Environmental Law over the next three years. U.S. companies should be ready to supply products such as pumping systems, bulldozers, specialized trucks, chromatographs, control

boards, and laboratory equipment to measure physical and chemical concentration patterns.

 **Transportation**

Government efforts to privatize its ailing airline industry have proved unsuccessful to date. Lacking the funds required for its safe and profitable operations, the airline Aeropostal finally collapsed.

The National Canalization Institute is responsible for the general maintenance of Venezuela's waterways. Two major projects include the continued dredging of both the channel into Lake Maracaibo and the 100-kilometer stretch at the lower Orinoco River Delta. In the case of the Lake Maracaibo project, its operation is vital, as this waterway accounts for more than 60 percent of the oil exported out of Venezuela.

Other transportation projects include the construction of a second bridge over the Orinoco closer to Guyana. The estimated cost of this project is U.S.\$275 million, and concessions are to be offered for the construction, management, and maintenance of this bridge. The government, through its Transportation Ministry, has outlined a number of new projects which it hopes to commence in the air, rail, and transportation industries. The most vital of these will be the expansion of the Caracas to Central Litoral Highway System.

 **Telecommunications**

The Venezuelan telephone company, CANTV, plans to spend U.S.\$2 billion to expand and modernize the current telephone network. An additional U.S.\$10 billion needs to be invested over the next five years to meet the country's unsatisfied needs. Of this sum, approximately U.S.\$ 600 million will be invested in cellular systems.

A joint venture between Bell South and local investors has 130,000 subscribers to its cellular system. Meanwhile, another company, Movilnet, has an additional 100,000 subscribers. On a daily basis, there is an average of 4,000 calls. This increased demand has greatly strained the system capacity while bills continue to accumulate for phones.

The need for closer relationships between Venezuela and its neighbors has underscored yet another system requirement, that of data transmission. There is an estimated growth in this area of an annual rate of 7 percent by the year 2000. Throughout this growth period, cumulative investments could amount to U.S.\$15 billion. Currently, installed equipment amounts to U.S.\$1 billion. Companies in the United States wishing to supply equipment to this industry should find it quite favorable, as they will find no domestic competition in a market in which U.S. goods already dominate.

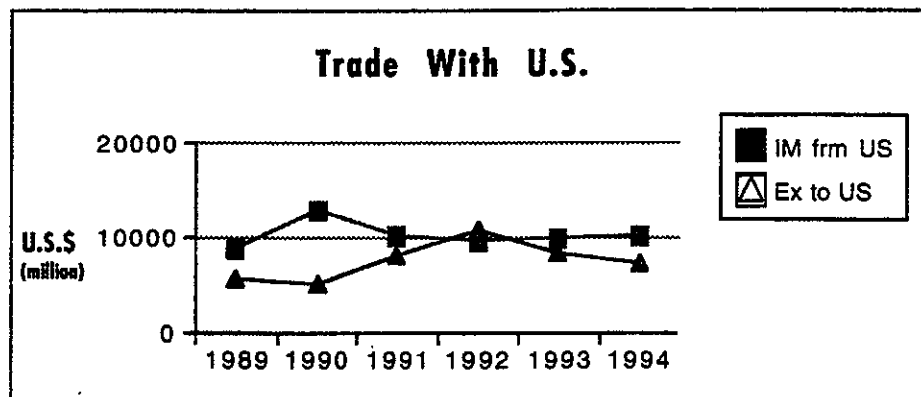
Economic & Political Climate

The early conflict between President Caldera and the Venezuelan Legislature has been partially resolved. Faced with the need for quick, decisive moves to address the country's economic problems, lawmakers opted not to battle with the popular Caldera.

The government's economic policies were aimed at achieving the following tasks:

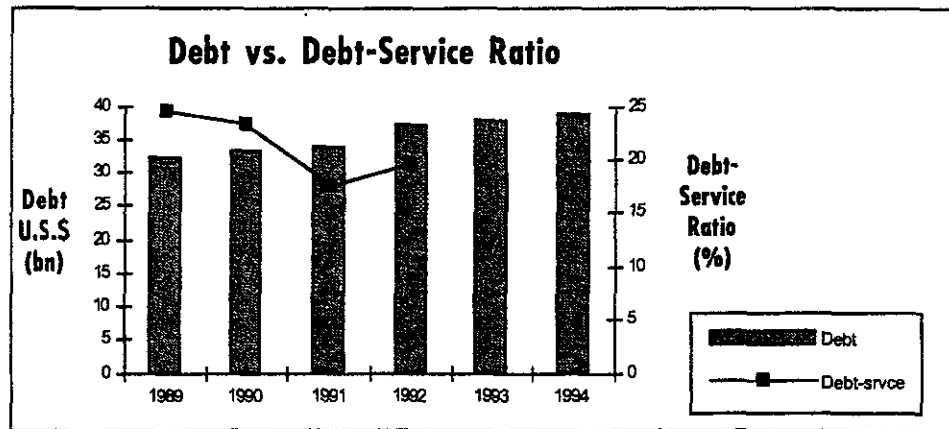
- Hold the fiscal deficit to 15 percent of GDP
- Issue dollar bonds backed by oil revenues to cover the cost of the banking system
- Lift price and exchange controls
- Open the oil sector to private and foreign investment

The privatization program is, once again, a designated priority.



Source: IMF, EIU

The government is continuing to maintain an oil export price of U.S.\$13 per barrel. The price of gasoline will also add to the oil income, allowing for an expected revenue increase, from 7.3 percent of GDP in 1994 to 9.7 percent of GDP in 1995.

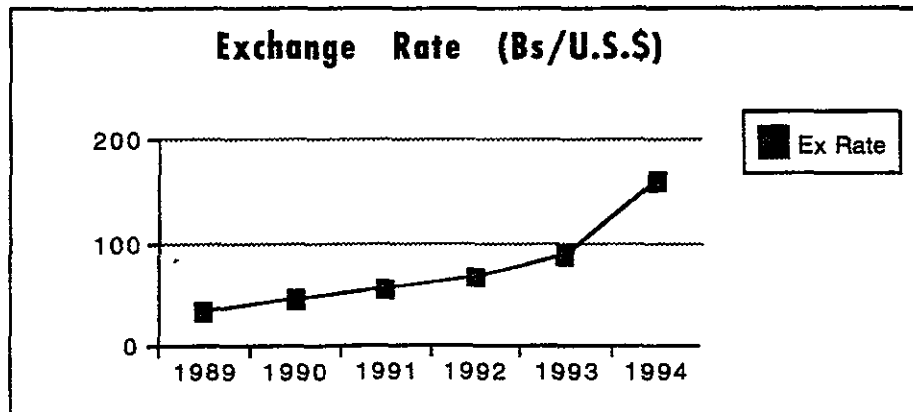


Source: IMF, EIU

Business Climate & Regulatory Overview

Despite the recent economic difficulties, Venezuela is a country increasingly open to foreign trade and investment. As of 1992, foreign investment was allowed in all sectors unless specifically barred. Foreign investors face non-discriminatory practices. Investors only need register with the Superintendent of Foreign Investment within 60 days. Foreign firms are allowed full repatriation rights (although this has been complicated by recent exchange controls). Restrictions still apply in media and the oil sector, although foreign firms are allowed to participate through joint ventures and agreements with the state oil company.

Licensing and quota restrictions for imports have been practically eliminated. Venezuela joined GATT in 1990 and agreed to a 40-percent ceiling on tariffs. Currently, tariffs in Venezuela have a maximum level of 20 percent and a trade-weighted average of just 10 percent. Venezuelan law does permit emergency increases in tariffs in response to "specific threats."



Source: IMF, EIU

Government procurement allows for preference to national firms or national content. Firms wishing to sell to PDVSA must register with the firm's unified suppliers register.

According to the U.S. International Trade Administration, Venezuela does not yet have adequate and effective protection for intellectual property rights. Venezuela's recent adoption of more stringent Andean Pact requirements in the areas of patents, trademarks, and copyrights have improved the situation. In 1994, Venezuela was placed on the U.S. government's Special 301 "Watch List" as a result of a judgment that deficiencies existed in the protection of U.S. intellectual property rights.

Venezuela is eligible for insurance programs under both OPIC and the World Bank's MIGA. Venezuela is a member of the Andean Pact and has ratified the G-3 Free Trade Agreement with Colombia and Mexico. In addition, Venezuela became a founding member of the World Trade Organization on January 1, 1995.

Financial Overview

The major financial event has been the collapse of the national banking system. The government was forced to intervene in many banks, but has promised to return these institutions to the private sector. As of January 1, 1994, banks from countries that provide reciprocal access are allowed to establish 100 percent foreign-owned subsidiaries.

In 1994, Venezuela imposed major exchange controls designed to stop the outflow of capital. All requests for foreign exchange must now be submitted to the Technical Exchange Management Office. The official exchange rate has been set at Bs170 per U.S. dollar.

Assessment of Factors Affecting Business in Venezuela

	Demand	Competition	Regulation	Opportunities
Energy				
Generation	low	low	low	Petroleum will continue to dominate this sector.
Transmission	low	low	low	
Distribution	low	low	low	
Oil/Gas	high	medium	medium	
Environment				
Sewage/water	high	high	medium	Strict environmental code.
Pollution	medium	low/medium	medium/high	Increased enforcement will drive market.
Hazardous waste	medium	low	medium	
Telecommunications				
Network expansion	high	low	medium	CANTV's aggressive plans to expand and modernize network. Large investments in value added and cellular services.
Switching	high	low	medium	
Value-added	high	low	medium	
Transportation				
Road	high	medium	medium	Port modernization.
Rail	low	low	low	New road and bridge links.
Air	medium	low	medium	Caracas subway expansion.
Water	high	medium	low/medium	Airport construction and modernization.



TDA Case Studies in South America

Brazil Tietê-Paraná Symposium

Colombian Telecommunications

Grenada Power Privatization

Venezuela Hueque-Barrancas Water

Venezuela Hydrometeorology

The US TDA in South America, 1990-1995

Brazil Tietê-Paraná Symposium

<i>Project Identification Source:</i>	U.S. Companies, U.S. Embassy, Government of Brazil
<i>Sector:</i>	TRANSPORTATION
<i>Project Type:</i>	Public and Private Sector
<i>TDA Activity Type:</i>	Technical Symposium

TDA presents specific project opportunities, addresses host country needs

The Government of Brazil is undertaking a major effort to tap the potential of its inland waterway system. Currently, only 2-5% of Brazil's freight moves along waterways. In an effort to increase the use of the Brazilian waterways, and in coordination with the multi-country Paraná river-dredging program being developed under IDB sponsorship, a group of Brazilian industrialists formed the Tietê-Paraná Development Agency (ADTP) to specifically implement a number of projects in the São Paulo area. It is estimated that approximately \$5 billion will be invested in related projects over the next 10 years.

In response to inquiries from U.S. firms involved with the ADTP, and after discussions with the U.S. Embassy in Brazil, TDA allocated funding for a technical symposium and orientation visit to introduce the Brazilian industrialists and government officials to U.S. companies experienced in developing the U.S. inland waterways systems. Brazilian officials had specifically expressed interest in developing the Tietê-Paraná and other national waterway systems based on the U.S. model.

The two-day conference in New Orleans took place in 1993, and was attended by 30 Brazilian participants, including the Governor of São Paulo State, the Secretary of Science and Technology in the State, the president of Petrobras, and the president of the São Paulo Energy Company. Presentations were made both by Brazilians (State Bank of São Paulo, São Paulo Highway Agency, Petrobras and São Paulo State Railway Company) and by U.S. attendees. Conference sessions concentrated on specific project presentations and included private meetings between the delegation and U.S. firms. Following the conference, Brazilian delegation members were taken on site visits to the Port of New Orleans, the New Orleans and Baton Rouge waterway corridor, and a Tennessee Valley Authority installation.

Colombian Telecommunications

<i>Project Identification Source:</i>	U.S. Industry, Industry Association
<i>Sector:</i>	TELECOMMUNICATIONS
<i>Project Type:</i>	Public Sector
<i>TDA Activity:</i>	Orientation Visit

TDA response to a U.S. industry proposal

In the early 1990s, the Government of Colombia began to undertake the privatization process in a variety of state-controlled sectors. In August, 1991, the Minister of Communications issued a decree which established how value-added services in telecommunications could be provided by private companies or consortia through a licensing process by the Ministry.

As a result of this change in policy, U.S. industry representatives and the U.S. Embassy in Bogotá approached TDA to seek funding to bring a delegation of Colombian telecommunications officials to the United States. The goal of the orientation visit was to provide the key Colombian decision makers with the chance to meet U.S. telecommunications industry representatives and get an overview of the U.S. telecommunications regulatory structure.

The visit occurred during May, 1992. The delegates traveled to several government facilities and met with FCC and other government officials. In addition, the delegates met with U.S. companies such as AT&T, GTE, IBM, and Bell Labs. The issues discussed during the orientation visit included competition among suppliers, regulatory oversight of the delivery system, and the original method employed for the deregulation and demonopolization of the telephone industry in the U.S.

Since the visit, the Colombian government has moved forward with its privatization and concession program. The U.S. Embassy in Colombia believes that the visit helped shape the policies and methods being used by the Government in developing the privatization program. In addition, the visit enabled the Embassy to facilitate ongoing contacts with the Colombian delegates and to work directly with these officials to identify potential U.S. technology and policy solutions to the growing telecommunications system in Colombia.

Grenada Power Privatization

<i>Project Identification Source:</i>	U.S. Company
<i>Sector:</i>	ELECTRIC POWER
<i>Project Type:</i>	Public Sector Concession
<i>TDA Activity:</i>	Training Grant

TDA supports a host government procurement with training resources

The Government of Grenada determined in the early 1990s to privatize Grenlec, the Electric Company of Grenada. Grenlec was responsible for the generation, transmission, and distribution of electric power throughout Grenada. Budget pressures had prevented the Grenadian government from making the necessary investments in maintenance and upgrades to the system. As a result, the system was suffering increasing failures, and service was worsening.

The Government of Grenada determined to privatize 50% of Grenlec and concede managing control to an operating company. Among the final candidates for the concession was a U.S. firm who was identified by the Government of Grenada as the preferred investor. However, during preliminary negotiations for the concession contract, several problem issues arose which threatened to derail the final decision-making process. Specifically, it became evident that training of local Grenadian officials on system changes and equipment upgrades was not to be provided by the Grenada Government. Therefore, the U.S. company approached TDA to request assistance for funding of the requisite training.

TDA reviewed the request both internally and with U.S. Embassy officials and determined to offer a grant to the Grenada Ministry of Works for \$209,000 to support an extensive training program for the Grenadian utility employees. The training is taking place both at U.S. equipment manufacturer locations in the U.S. and at various utility sites in Grenada.

The TDA funding provided the Government of Grenada with an extensive retraining program for the former Grenlec employees. In addition, the TDA funding assisted the U.S. firm pursuing this opportunity to successfully obtain the utility concession. The U.S. firm has already procured several U.S.-manufactured generators and expects to procure at least \$12 million in additional U.S. equipment and services over the next 2-3 years.

Venezuela Hueque-Barrancas Water

Project Identification Source:

Sector:

Project Type:

TDA Activity:

Host Country Solicitation

ENVIRONMENT

Public Sector

Feasibility Study

TDA response to a host government request

As a result of a critical water shortage in the state of Falcon in the mid-1980s, Venezuela's Ministry of Environment and Natural Resources (MARNR) determined to better utilize the water resources of the Hueque river by constructing a new reservoir. After beginning development on the reservoir dam, the project was halted due to lack of government finances. Several years later, the Ministry received parliamentary and cabinet approval to reinstate the project. However, solicitations of Inter-American Development Bank and U.S. Ex-Im Bank financing were fruitless due to the lack of an updated project feasibility study.

Shortly thereafter, the Minister of Environment was introduced to the feasibility programs of the U.S. Trade and Development Agency. The Minister contacted the U.S. and Foreign Commercial service staff in Caracas, who in turn informed TDA of MARNR's need. TDA staff met with Ministry officials in Miami. Based on these meetings and discussions with Embassy staff, TDA determined to contract for a definitional mission to assess the project. The subsequent DM evaluation, conducted in August, 1989, recommended TDA grant funding for the study. TDA and MARNR then negotiated and signed a grant agreement for \$200,000. Following TDA's normal competitive selection procedures, MARNR selected Harza Engineering to conduct the full feasibility study.

The study was completed in early 1991. MARNR worked with Harza to secure U.S. Ex-Im Bank guarantees and to raise the final private bank financing. The Hueque Dam and its accompanying water supply systems were built and fully operational within three years of Venezuela's application to TDA for the feasibility study grant. Numerous U.S. equipment and service providers assisted MARNR to implement this important project and, in turn, generated over \$150 million in new U.S. exports.

Venezuela Hydro-Meteorology

<i>Project Identification Source:</i>	U.S. Company, TDA Meetings in Venezuela
<i>Sector:</i>	INDUSTRIAL
<i>Project Type:</i>	Public Sector
<i>TDA Activity:</i>	Feasibility Study

TDA response to a host government request developed with a U.S. firm

The Venezuelan Ministry of Environment and Natural Resources (MARNR) prioritized improvement of their weather forecasting system in the early 1990s. The existing system had been developed piecemeal, with disparate systems procured from separate suppliers.

In order to improve the government's ability to provide weather forecasting services for severe storm, flood, and aviation applications, MARNR began to analyze the current system and to seek potential assistance in reconfiguring and expanding it. A U.S. firm, the Republic Group, which specializes in design and supply of integrated weather forecasting and analysis systems, began to work with MARNR to redesign the system and identify alternative solutions. MARNR and the Republic Group worked together to undertake portions of the initial engineering analysis that would be required to fully assess the viability and requirements of an expanded weather forecasting system.

MARNR then turned to TDA to seek the requisite funding for a full feasibility study. MARNR submitted a full proposal, which requested that the Republic Group conduct the study, for funding in mid-1992. In order to evaluate the proposal, TDA funded a Definitional Mission (DM) to visit Venezuela in October of that year. The DM analysis, conducted jointly with FAA specialists, recommended TDA funding for the study. The total cost of the study was valued at \$260,000. TDA and MARNR signed a Grant Agreement for the study in May, 1993. To pay for the study costs, TDA provided funding of \$155,000, and the remainder (\$105,000) was cost-shared by the Republic Group.

The feasibility study was completed in August, 1994. The study recommended design and installation of a \$100 million project. The Venezuelan Ministry of Planning has given MARNR its support for the project which will be submitted to the Venezuelan Congress for budgetary authorization under the FY1996 umbrella law for public financing.



June 1995

**THE U.S. TRADE AND DEVELOPMENT AGENCY
IN SOUTH AMERICA, 1990-1995**

Introduction

The U.S. Trade and Development Agency (TDA) is an independent agency of the United States Government. TDA provides effective assistance to the U.S. private sector facing international competition for major capital infrastructure projects in developing and middle-income countries. TDA accomplishes its mission as a primary agency for implementing U.S. trade and economic cooperation to developing and middle-income countries. TDA is the primary U.S. Government agency for developing and funding feasibility studies under the Foreign Assistance Act. This activity is further supported by TDA funding of orientation visits, conferences that present U.S. technology and equipment capabilities for the subject sector, and Bidders Briefings upon the conclusion of a feasibility study.

TDA has been active in Latin America and The Caribbean (LA&C) since the early 1980s. TDA sponsored projects have resulted in significant exports and development support in Latin American and Caribbean countries. The TDA program in LA&C has grown substantially in recent years, and the demand for TDA support of U.S. industry export efforts continues to grow strongly. The demand is generated by host countries as well as U.S. industry.

Initially, most TDA projects were public sector projects, planned by government ministries or agencies. Increasingly, however, developing countries, including many in the LA&C region, have been privatizing major sectors. As a result, infrastructure and industrial projects sponsored by private sector parties are being considered by TDA on an increasing basis.

Public and Private Sector Projects

Feasibility Studies

TDA provides funding, on a grant basis, for both public and private sector projects by commissioning studies or consultancies to determine the technical, economic, and financial feasibility of proposed projects, and to provide detailed data for making decisions on how to proceed with project finance and implementation.

Potential projects come to TDA's attention from several sources. A foreign government agency may approach TDA with a funding request directly or through a U.S. Embassy, Consulate or trade center. TDA may also be approached by the international agencies such as the World Bank or Inter-American Development Bank.

TDA is increasingly being approached directly by foreign or U.S. private sector firms soliciting assistance in developing a project as a project sponsor and/or investor. However, private sector projects require the endorsement of the host government prior to receiving TDA support.

TDA may informally review a project with a sponsor, but formal consideration begins with a written application from the appropriate foreign government agency or private sector principal and passed on directly to TDA or through a U.S. Embassy or Consulate. TDA will not accept requests through consultants or counselors, but TDA will entertain informal discussions with such parties.

TDA does not require special application forms, and generally works with a written description of the proposed project and the feasibility study support being requested. TDA has model proposal outlines that may be used by those soliciting TDA assistance. Upon receipt and review of these preliminary reports, TDA may proceed to further investigate the matter by engaging a consultant to conduct an evaluation of the proposed project (Definition Mission "DM" or Desk Study "DS") to measure its potential, to ascertain if the project meets basic TDA criteria, to evaluate its competitiveness with other TDA requests, and to make recommendations for further TDA consideration.

The DM or DS ascertains whether or not a given project meets TDA's current LA&C funding criteria. These criteria are: (1) that the potential for U.S. exports during project implementation is significant (generally defined as \$20 million or more and at least 100 times the value of the TDA grant); (2) that the project represents a development priority for the host country; (3) that project funding and/or financing has been identified or is likely if the study suggests project viability; and (4) that TDA has a facilitative role to play, without which the project would not move forward with U.S. involvement in the face of foreign competition. The report also includes the criteria for the Grantee's evaluation of the technical proposals.

If TDA decides to provide funding for a feasibility study or consultancy sponsored by a foreign government, it signs a grant agreement with the relevant Grantee. After signature of the grant agreement, a competitive selection process usually is undertaken to select the U.S. contractor to conduct the study or consultancy. The selection process is carried out by the Grantee, according to procedures developed by the DM or DS and approved by TDA. Normally, this entails publication of an RFP for the study or consultancy in the *Commerce Business Daily* (CBD). U.S. bidders then submit their qualifications and proposals directly to the Grantee. Under certain infrequent circumstances, the process may be divided into a two step process that first results in a "short list" of qualified entities that are then invited to submit technical proposals for final selection. (TDA grants call for a predefined scope of work and budget, therefore commercial bids are not accepted). The selection of the top-rated firm is made in accordance with the criteria developed by the DM or DS contractor, and the firm is then invited to negotiate a contract with the Grantee.

From time to time, TDA will entertain applications for feasibility studies where approval of a pre-selected technical consultant is requested. Generally speaking, these may be approved when either the proposed pre-selected entity can demonstrate that it has already expended considerable effort developing a project, where there is no evidence of significant interest on the part of competing U.S. firms, or when there is an investor relationship in a private sector project. TDA routinely requires cost sharing in these cases.

The Feasibility Study contractor is required to submit invoices to the Grantee for approval and when approved, they are forwarded to TDA for payment. The payment from TDA is made directly to the U.S. contractor.

Sometimes TDA becomes involved in a project after a foreign government or private sector entity has already solicited proposals for project implementation. In such cases, where a U.S. firm has already been short-listed for a major contract along with other non-U.S. firms, TDA may make an offer of a grant conditional on the U.S. firm being selected for project implementation.

TDA funding generally is reserved only for services carried out by U.S. firms, but when appropriate, a specified portion of the TDA grant, not to exceed 20%, may be used for host-country services, support staff, or subcontractors.

The demand for TDA funds has grown at a faster rate than the availability of funds; therefore, TDA is increasingly requiring cost-sharing (i.e. TDA funding only partially covers the total cost of the feasibility study). The remainder of the cost must be borne by the Grantee, another local grant agency, the investor group, and/or the U.S. company carrying out the study.

Other Activities

In situations where neither a feasibility study nor a consultancy is appropriate or as a complement thereto, TDA may provide funding for bid-related training programs, Bidders Briefings, technical seminars, technical assistance, conferences, or orientation visits to the United States. TDA frequently presents the results of positive feasibility studies to U.S. industry at TDA-sponsored bidders briefings.

TDA Projects in Latin America and The Caribbean

The following list of TDA-funded activities in the LA&C region indicates the amount of the TDA contribution, the name of the contractor or status of the contractor selection process, and the fiscal year (FY) of TDA funding. The (FY**) designates the fiscal year in which TDA approved the project.

Argentina

Agribusiness - TDA funded a \$500,000 study of agribusiness development for the Ministry of Economy. Deloitte and Touche conducted the study. (FY 91)

Cordoba Waste Water - TDA funded a \$650,000 study of a wastewater treatment project for the Lake San Roque region of Cordoba. Bechtel executed the study. (FY 91)

Tourism - TDA funded a \$240,000 tourism development program in Argentina. The Association of Travel Marketing Executives coordinated the program. (FY 91)

Electric Power Privatization - TDA funded an orientation visit to the United States by Argentine officials in connection with the privatization of SEGBA and other electric power utilities. The U.S. Energy Association organized the visit. (FY 91)

Mining - TDA funded a \$550,000 mining investment promotion program for the Directorate of Mining and Geology. Norwest Mining Services conducted the study. (FY 91)

Hazardous Waste - TDA funded a \$500,000 study of hazardous waste management for Buenos Aires Province. Dames and Moore conducted the study. (FY 91)

Gas Sector Privatization - TDA funded an orientation visit to the United States for Argentine officials in connection with the privatization of the gas distribution system. The U.S. Energy Association organized the visit. (FY 92)

Mining Investment and Procurement Conference - TDA sponsored a conference to highlight opportunities for investment, equipment and service firms. The conference was coordinated by the World Trade Center in Denver. (FY92)

Health Care - TDA is funding a \$711,000 study of a health care planning project for the Ministry of Public Health. Abt Associates is undertaking the study. (FY 92)

Neuquen Petrochemicals - TDA partially funded (\$303,000) a study for the development of investor driven petrochemical projects in the Province of Neuquen. Bechtel conducted the study. (FY 93)

Customs Modernization - TDA funded a \$362,000 study of a customs detection equipment upgrade project for the National Customs Administration . SAIC conducted the study. (FY 93)

Frequency Management - TDA partially funded (\$175,000) a study for a spectrum management modernization project for the National Telecommunications Commission. Lucas-Zeta conducted the study .(FY 93)

Waste Management and Potable Water- TDA funded a Definitional Mission to investigate two projects in waste management and potable water in the Province of Corrientes and Ushuaia. A definitional mission report is available. (FY94)

Customs Orientation Visit - TDA funded a detection equipment orientation visit for a delegation of Argentines from the National Administration of Customs. The visit was coordinated by the U.S. Customs Service. (FY94)

Spectrum Management Orientation Visit - TDA funded a spectrum management and radio monitoring orientation visit for officials from the National Telecommunications Commission. The visit was coordinated by FPC/ Experts Abroad . (FY 94)

Corrientes Potable and Wastewater Study- TDA is funding (\$650,000) a feasibility study on a potable and waste water project. The Johnson Co. is executing the study. (FY 94)

Corrientes Municipal Solid Waste Treatment Study- TDA is funding (\$250,000) a feasibility study for municipal solid waste. The Johnson Co. is performing the study. (FY 94)

Mendoza Water Utility Orientation Visit- TDA funded an orientation visit for officials from the Mendoza Water and Sanitation Utility that is to be privatized. Development Associates coordinated the visit. (FY 94)

Argentine-Chile Private Sector Pipeline- TDA is funding (\$250,000) a feasibility study for developing a natural gas pipeline project from Argentina to Chile. Tenneco Gas is conducting the study. (FY 95)

Environmental Management Projects -TDA has approved funding for a Definitional Mission to investigate environmental projects in Argentina. (FY 95)

Bolivia

Sodium Cyanide - TDA funded a \$200,000 study of a sodium cyanide plant to supply the mining industry in Bolivia, Chile, and other neighboring countries. Bechtel conducted the study. (FY 91)

Telecommunications Privatization Study- TDA is funding (\$255,000) a privatization study of ENTEL, the national telecommunications company. Telecommunications Management Group is executing the study. (FY94)

Energy Sector Privatization Study- TDA is funding (\$582,000) a privatization study of ENDE, the national electric company, and a rural electrification study. Contractor selection is underway. (FY94)

Environmental Cleanup Study- TDA is funding (\$193,200) an environmental cleanup study associated with the privatization of YPF, the national oil and gas company. Dames/Moore is executing the study. (FY 94)

Drilling Operations Divestment Study- TDA is funding (\$226,000) a study of the potential divestment of the drilling operations in the process of privatizing YPF. Arthur D. Little is conducting the study. (FY 94)

1994 Economic and Trade Summit- TDA partially funded a conference entitled "Bolivia Leads the Way: 1994 Economic & Trade Summit." The Inter-American Chamber of Commerce of Houston coordinated the confer-

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ence. (FY 95)

Bolivia Mass Transit Project- TDA funded (\$25,000) a Definitional Mission to investigate a mass transit project. A definitional mission report is available. (FY 95)

Bolivia Air Traffic Control Modernization- TDA funded a Definitional Mission to investigate an airport and air traffic control system modernization project for Bolivia. A definitional mission report is available. (FY 95)

Mining and Smelting Capitalization Project-TDA is partially funding (\$399,000) a study for a private sector smelting plant capitalization and expansion project. (FY 95)

Brazil

Telecommunications Visit - TDA funded an orientation visit to the United States for Brazilian public and private sector telecommunications officials. (FY 91)

Retail Sales Electronics - TDA funded an orientation visit by Brazilian businessmen focused on electronics related to retail sales (data processing and inventory control hardware and software, etc.) The visit was coordinated by the Electronics Industry Association. (FY 92)

Cement Industry Visit - TDA provided partial funding for an orientation visit to the U.S. by Brazilian private sector cement industry officials to promote the export of U.S. coal for their operations. The National Coal Association coordinated the visit. (FY 92)

São Paulo Environmental Visit - TDA funded an orientation visit/water treatment and distribution equipment conference in April for São Paulo officials with jurisdiction over the Guarapiranga river basin and Tietê river environmental projects. The Institute of the Americas coordinated the conference. (FY 93)

Tietê Paraná Development Program-TDA sponsored a two-day conference in New Orleans to discuss commercial opportunities associated with the Tietê-Paraná Inland Waterway Development Project. Consultants Group of Latin America coordinated the conference. (FY 93)

Telecommunications Industry Visit - TDA provided partial funding for an orientation visit in June 1993, for a delegation of Brazilian legislators responsible for drafting the changes in the constitution that would establish the regulatory framework allowing the privatization of the telecommunications industry in Brazil. The U.S. Foundation for World Communication Development (FWCD) coordinated the visit. (FY93)

Brazilian Energy Sector Officials Visit- TDA provided partial funding for an orientation visit in April 1994 for government and private sector energy officials from Brazil who are interested in meeting with U.S. independent power producers. The visit was coordinated by Environmental Technology Export Council and subcontractor Consultants Group Latin America. For more information contact Norman Anderson of Consultants Group Latin America at 202-776-0990. (FY94)

Cogeneration- TDA funded a Desk Study to investigate a private sector U.S. investor driven cogeneration project. A Desk Study report is available. (FY94)

São Paulo Metropolitan Train Company (CPTM) Orientation Visit- TDA funded an orientation visit in July for CPTM officials who are interested in meeting with U.S. companies with experience in privatization studies and site visits to commuter rail, light rail and railway systems in the U.S. Louis Berger coordinated the visit. (FY94)

Chile

Airport Orientation Visit - TDA funded an orientation visit for two Chilean civil aviation officials. The Federal Aviation Administration coordinated the visit. (FY 91)

Health Care - TDA funded a \$750,000 study of health care/medical equipment needs study and an Orientation Visit for the Ministry of Health. The University of Southern California conducted the study. Project HOPE coordinated the orientation visit. (FY 91)

Hydro/Aluminum - TDA contributed \$1 million to partially fund a study on a hydro/aluminum project in Southern Chile. Kaiser Engineers conducted the study. (FY 91)

Port Orientation Visit - TDA funded an orientation visit for 11 Chilean public and private sector port officials. The Ports and Waterways Institute coordinated the visit. (FY 91)

Rapel River Basin Wastewater - TDA funded a \$700,000 study of a wastewater project in Region VI of Chile. Dames & Moore conducted the study. (FY 92)

Air Traffic Control - TDA funded a \$305,000 study of an air traffic control communication upgrade project for the Directorate General for Civil Aviation. AT&T, Air Inc. and ITA conducted the study. (FY 93)

Industrial Wastewater - TDA is funding a \$540,000 study for an industrial waste water treatment project for the Concepción, Chile area. A consortium comprised of Louis Berger and Hazen & Sawyer is executing the study. (FY94)

Water Privatization - TDA provided \$130,000 to support a U.S. consortia bidding on a waterworks privatization project in Chile. A Desk Study is available. (FY 94)

Telecommunications Monitoring Project- TDA is funding a \$200,000 technical assistance grant to the Undersecretary of Telecommunications in Chile to prepare operational and technical standards for a multi-carrier equal access and network monitoring project. Lynx Technologies is executing the study. (FY94)

Energy Officials Visit- TDA funded an orientation visit for public sector energy officials to visit the U.S. in order to assess long distance natural gas transmission pipelines, power generation and gas distribution. The visit was coordinated by Core International. (FY94)

Environmental Officials Visit- In order to showcase U.S. environmental technology and services, TDA funded an orientation visit for environmental officials from Conama, Codelco and others to come to the U.S. to attend the 10th Clean Air Conference in Denver and visit other sites in the United States. The Institute of International Education coordinated the visit. (FY94)

Transportation Officials Visit- TDA funded an orientation visit for transportation officials from the Ministry of Public Works to come to the Sixth National Public-Private Ventures in Transportation Conference in Washington, DC and to visit other sites in the U.S. to highlight U.S. technology and services. The American Road and Transportation Builders Association coordinated the visit. (FY94)

Chile Mass Transit Project- TDA funded (\$25,000) a Definitional Mission to investigate a mass transit project. A definitional mission report is available. (FY 95)

Chile-Argentine Private Sector Pipeline- TDA is funding (\$250,000) a feasibility study for developing a natural

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gas pipeline project from Argentina to Chile. Tenneco Gas is conducting the study. (FY 95).

Colombia

Telecommunications Orientation Visit— TDA funded an orientation visit of Colombian telecommunications officials in connection with the privatization of the telecom sector in Colombia. The U.S. Foundation for World Communication Development (FWCD) coordinated the orientation visit. (FY 92)

Colombia-Ecuador Energy Projects - TDA funded a definitional mission to assess and identify energy sector projects in Ecuador and Colombia. Contractor selection is underway. (FY 95)

National Registration System - TDA funded an orientation visit of officials from the Colombian Registraduria Nacional to visit the United States in order to meet with equipment suppliers, service providers, and view registration systems in operation in the U.S. Visit occurring June, 1995.

Ecuador

Baba River Water - TDA funded a \$500,000 study of the Baba River multipurpose water project for CEDEGE. TAMS conducted the study. (FY 90)

Petroleum Plan - TDA funded a \$750,000 master plan for the development of Ecuador's petroleum reserves for the Ministry of Energy and Mines. ICF Resource conducted the study. (FY 90)

Master Plan Debriefing Conference - TDA funded a conference in Houston to debrief U.S. industry on the results of TDA's 1990 Petroleum Master Plan study which was carried out by ICF Resources. The Inter-American Chamber of Commerce in Houston coordinated the conference. (FY92)

Paraguay

Environmental - TDA funded a \$678,000 study of an industrial and municipal wastewater cleanup project for the Ministry of Agriculture. Dames & Moore conducted the study. (92)

Oil Seminar - TDA partially funded a seminar focused on legislation encouraging foreign investment in Paraguay's oil industry. The U.S. Energy Association coordinated the seminar. (FY 92)

Mercosur Air Transport Center- TDA approved funding (\$240,000) of a feasibility study for a cargo distribution project. A grant will be signed later this month. (FY94)

Telecommunications OV- TDA funded an orientation visit for Telecom Officials from Paraguay in anticipation of cellular concession contracts to be awarded. (FY 95)

Peru

Meteorological Forecast Systems Visit- TDA funded an orientation visit for Peruvian Officials overseeing the development of meteorological data collection and forecast system project. The Republic Group coordinated the visit. (FY94)

Hydro-Meteorology Project - TDA is funding (\$316,000) a feasibility study for a weather forecasting project.

Earth Science International is conducting the study. (FY 94)

Hydroelectric and Power Sector Projects- TDA funded a Definitional Mission to investigate a private sector hydroelectric project and identify other potential power projects in Peru. The DM report is available. (FY94)

Gas Fired Power Plant- TDA is partially funding (\$360,000) a feasibility study for a private sector gas fired power plant being developed by the Maple Gas Corporation. Maple Gas is executing the study. (FY94)

Uruguay

Channel Deepening - TDA is funding a \$1 million study of the Martin Garcia channel project for the Ministry of Transportation and Public Works. Frederick R. Harris is conducting the study. (FY 90)

Power Plant Conversion - TDA funded a \$825,000 study for repowering to combine cycle of the Jose Batlee y Ordoñez and La Tablada plants in Uruguay for UTE. Southern Electric conducted the study. (FY 93)

Uruguay Power Conference- TDA funded a bidders briefing coordinated by the Inter-American Chamber of Commerce, Houston, TX on October 1993. (FY93)

Transportation Projects- TDA approved funding for a definitional mission to investigate and identify transportation projects in Uruguay. A DM report will be available shortly. (FY94)

Rice Hull Fueled Power Plant Project - TDA funded a definitional mission to investigate a rice hull fueled power plant project in Uruguay. The Commonwealth Power Corporation conducted the definitional mission and the report is available. (FY 95)

Venezuela

Carbon Anodes - TDA funded a \$550,000 study on the expansion of a carbon anodes plant for Carbonorca. Kaiser Engineers conducted the study. (FY 90).

Refinery - TDA partially funded (\$400,000) a study of a new refinery for PDVSA. Fluor conducted the study. (FY 90)

Jose Petrochemical Complex - TDA partially funded (\$350,000) a study of the Phase II expansion of the Jose petrochemical complex for Pequiven. Fluor conducted the study. (FY 90)

Tourism Development - TDA funded a \$362,000 tourism development program for Corpoturismo. The Association of Travel Marketing Executives coordinated the program, which included conferences, seminars, and investment missions. (FY 90-91)

Standards - TDA funded a visit to Venezuela by specialists from the National Institute of Standards and Technology and funded an orientation visit to the U.S. by Venezuelan standards officials. (FY 90, 92)

Telecommunications - TDA funded \$570,000 in telecommunications studies for the Ministry of Transport and Communications. Teleconsult conducted the studies. (FY 91)

Monagas Water - TDA funded a \$475,000 study of the Monagas water supply project for the Ministry of Environment and Natural Resources. Tudor Engineering carried out the study. (FY 91)

Orinoco Transportation - TDA funded a \$120,000 study of transportation on the Orinoco River for the Ministry

TDA Case Studies in South America

of Transport and Communications. TAMS carried out the study. (FY 91)

Power Expansion - TDA funded a \$200,000 electric power expansion study for Elecar. United Engineers and Constructors carried out the study. (FY 91)

DRI - TDA funded a \$300,000 study of a direct-reduced-iron project for CVG. Bechtel carried out the study. (FY 91)

Carbonorca Aluminum Smelter - TDA contributed \$175,000 to a study of an aluminum smelter to be built adjacent to the Carbonorca carbon anode plant. Davy McKee carried out the study. (FY 91)

Hidroandes Water - TDA is funding a \$700,000 study of the Hidroandes water project for the Ministry of Environment and Natural Resources. Tudor Engineering is carrying out the study. (FY 91)

Aviation - TDA funded the first phase (\$300,000) of an aviation master plan study for the Ministry of Transport and Communications. AAROTEC and Louis Berger conducted phase I of the study. (FY 91)

Water Projects Procurement Conference - TDA funded a conference focused on procurement opportunities related to water projects in Venezuela. The conference was coordinated by the Institute of the Americas. (FY 92)

Aluminum Processing - TDA funded a \$300,000 study of an aluminum processing project for Sural. MIT conducted the study. (FY 92)

Residuum De-asphalting - TDA funded a \$150,000 study of a heavy oil residuum de-asphalting project for Maraven. Fluor conducted the study. (FY92)

Residuum Gasification - TDA funded a \$100,000 study of a heavy oil residuum gasification project for Maraven. Fluor conducted the study. (FY 92)

Lube Oil - TDA funded a \$250,000 study of a lube oil project for Maraven. Badger conducted the study. (FY 92)

Arrecifes Power Plant Rehabilitation - TDA is funding a \$400,000 study on a power plant rehabilitation project for Elecar. United Engineers and Constructors Inc. conducted the study. (FY 92)

Morrocroy Environmental - TDA is funding a \$450,000 study of the Morrocroy environmental project for the Ministry of Environment and Natural Resources. Bechtel conducted the study. (FY 92)

Advanced Weather Forecasting System - TDA is partially funding (\$175,000) a study of a severe weather forecasting system project for the Ministry of Environment and Renewable Natural Resources (MARNR). The Republic Group conducted the study. (FY 93)

Alumina Expansion Project - TDA is partially funding (\$1,000,000) a study of a one million ton per year alumina expansion project. ICF Kaiser and CVG Interalumina conducted the study. (FY 93).

Oriented Strand Board Project - TDA is partially funding (\$200,000) a study of a private investor Oriented Strand Board (OSB) project in Venezuela. The joint venture of Corporacion Forestal Guayamure and the Wallace Group Companies are conducting the study. (FY 93)

Oil Pit Remediation- TDA is partially funding (\$250,000) a study for an oil pit remediation project for Corpoven S.A. Engineering Science, Inc. is conducting the study. (FY93)

Aviation- TDA is funding a \$355,000 study for Phase II of the Aviation Master Plan for the Ministry of Transport

and Communications in Venezuela. AAROTEC Airways Engineering and Louis Berger International, the consortium which completed Phase I, are continuing their work to execute Phase II. (FY93)

Health Care Modernization Project- TDA is partially funding (\$945,000) a study for a health care modernization project in Venezuela. Contractor selection is underway. (FY94)

Sidor WasteWater Treatment Project- TDA is partially funding (\$307,450) a wastewater treatment project at C.V.G. Siderurgica del Orinoco, S.A. Contractor selection is underway.(FY94)

Maticora Reservoir Water Supply Project - TDA is partially funding (\$250,000) a study to analyze a proposed Maticora Reservoir in Venezuela. Bechtel is executing the study. (FY 95).

Regional

Aviation - TDA partially funded (\$70,000) an aviation technology workshop that brought officials from 12 Latin American countries to the U.S. The FAA coordinated the workshop. (FY 89-90)

Construction Management - TDA funded a \$255,000 training program on construction management for officials of four Latin American countries. The American Water Foundation coordinated the program. (FY 89-90)

Telecom Conference - TDA funded the participation of Brazilian and Costa Rican officials in the Intercom 90 telecommunications conference in Miami. (FY 90)

Expomin 90 Mining Conference - TDA funded the participation of mining officials from nine Latin American countries in the Expomin 90 mining conference in Santiago. The Commerce Department coordinated the program. (FY 90)

Railroad Orientation Visits - TDA funded orientation visits to the U.S. by railroad officials from Bolivia, Chile, Colombia, Ecuador, Panama, Paraguay, Uruguay, and Venezuela. The Phoenix International Development Foundation coordinated the visits. (FY 90-91)

Denver Mining Conference - TDA funded a major conference in Denver on opportunities in the mining industry in Latin America. The World Trade Center of Denver coordinated the conference. (FY 91)

Medical Equipment Conferences - TDA funded regional conferences on U.S. medical equipment/ technology in Caracas and Port of Spain. (FY 91)

Petroleum Conference - TDA co-funded with the Department of Energy a regional conference on petroleum development in Houston in November 1991. The East-West Center and the Greater Houston Partnership coordinated the conference. (FY 90-91)

Privatization Conference - TDA funded the participation of officials from several Latin American countries in a major privatization conference organized by the Institute of the Americas. (FY 91)

Health Care Conference - TDA funded a regional health care conference in Houston. The Houston Inter-American Chamber of Commerce coordinated the conference. (FY 91)

Computer Software/Hardware Conferences - TDA funded the participation of officials from several Latin American countries in Data 90, a computer conference/exhibition and a software symposium organized by the Institute of the Americas. (FY 91)

TDA Case Studies in South America

USATECH - TDA funded the participation of officials from several Latin American countries in USATECH, a major Commerce Department-sponsored exhibition of U.S. goods and services, held in Caracas. (FY 91)

Ports Privatization Orientation Visit - TDA funded an Orientation Visit by Argentine and Colombian port officials. The Ports and Waterways Institute and the World Trade Center of New Orleans coordinated the visit. (FY 91)

Inland Waterways Training - TDA funded a training program on inland waterways development for officials of several Latin American countries. The Ports and Waterways Institute coordinated the program. (FY 91)

Environmental Conference - TDA funded a regional conference on the environment in San Diego. The Institute of the Americas coordinated the conference. (FY 91)

Aviation Conference/Exhibition - TDA funded an aviation conference/exhibition for Latin American officials in Orlando. The FAA coordinated the program. (FY 92)

Gas Pipeline - TDA provided partial funding (\$350,000) for a feasibility study on a gas pipeline/power plant project involving Argentina and Chile. Transandean Partners conducted the study. (FY 92)

Expomin 92 Mining Conference - TDA funded the participation of mining officials from eight Latin American countries in the Expomin 92 mining conference in Santiago. The Commerce Department coordinated the program. (FY 92)

Informatics Conference - TDA sponsored the attendance of Latin American Delegations from Argentina, Brazil, Chile, Colombia, Mexico and Venezuela to an Informatics Conference in Miami. (FY 93)

Food Processing & Packaging Show - TDA sponsored a delegation from Argentina, Colombia, Chile and Brazil to attend the International Food Processing and Packaging Exposition in Chicago. (FY 93)

Power in the Americas - TDA funded a regional conference on opportunities in the electrical generation and natural gas sector. The Institute of the Americas coordinated the conference. (FY 93)

Denver Airport Conference - TDA sponsored officials, on a multi-region basis including various LA&C countries to attend the pre-opening meetings of the new Denver International Airport. The World Trade Center of Denver coordinated the conference. (FY 94)

Renewable Energy Conference - TDA hosted a delegation from various Latin American and Caribbean countries to attend a renewable energy conference in Puerto Rico. U.S. Export Council on Renewable Energy coordinated the conference. (FY 94)

Expomin 94 - TDA sponsored delegations from Latin American countries to Expomin 94 in Santiago, Chile. (FY 94)

Central American Power Transmission OV - TDA has approved an orientation visit for six electric utility officials from each of the Central American countries participating in the development of the Central American grid project. (FY 95)

For More Information

For more information on any of the above projects or on other TDA programs in Latin America and The Caribbean, inquiries may be addressed to **Albert W. Angulo**, Regional Director, **Anne McKinney** or **John Herrman**, Country Managers for Latin America and the Caribbean.

For information on current TDA Definitional Mission consultancy opportunities, please call the "**TDA Definitional Mission Hotline**" at (703) 875-7447.

For instructions on how to order a Definitional Mission Report or Feasibility Study from our library call Chuck Reynolds at (703) 875-5578.

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Financing South American Projects

Assessing Project Financeability

The ability to source finance for a project is often the key to a successful transaction. Many fine words can be spoken by developers, contractors, host countries and international agencies - however, if the dollars do not exist to fund the construction nothing will actually happen. The purpose of this section is to provide some guidance to U.S. exporters as to the information that financiers will require and the manner in which it will be analyzed. Much of this analysis is similar to that which project developers should perform in any event as a "reality check" on private sector project development. In addition, this section provides some indications as to the criteria which will be employed by certain multilateral and bilateral agencies when assessing investment requests. This should also be tailored into the U.S. exporters thinking.

There are many ways to finance South American private sector projects. While the notes below focus on the techniques of limited recourse project finance as the most popular new tool in South America, U.S. exporters should not overlook traditional on-balance sheet export of agency lending using, perhaps, the creditworthiness of a strong local company. Many of these sources may also be available - the skill is to develop the most appropriate solution to get the transaction done.

The projects described in this report are, in general, at a development stage - reflecting local analysis of the needs and desires of the developing countries, with little attention having been given to the project parties, structure, and the development plan. It is important to note that for development stage projects the financeability methodology described below gives *only* an initial indication of project financeability. Ultimately, financeability depends on many other factors such as the track record of inherent processes and technology, the experience of the project developer, the strength of the construction contract and the experience of the construction contractor (or the creditworthiness of the completion guarantee provider), the strength of the operating contract (and the experience and creditworthiness of the operator), and the nature of the offtake and raw material supply arrangements. Any of these items could significantly alter the financeability of the project, by either mitigating or increasing the level of risk from the factors discussed below.

As will be demonstrated, financeability is not an exact science. There are very few clear cut answers. The art of the financier is to gather information about the project, assess the level of risk in the transaction, suggest ways in which risks can be mitigated (normally by passing them to a party most willing to understand, analyze, and accept these risks) and obtain finance from the sources most comfortable with the remaining risks. To do this the financier (and, consequently, the U.S. exporter) must have a feel for what is “good” and “bad” in project structures.

Information Gathering

The Financing Feasibility Information Template provides a framework for gathering the information necessary to begin to assess the financeability of a project. Information that should ultimately be obtained from host country sponsors and others in order to allow a financeability assessment to be made includes:

- A detailed description of the project or expansion that includes its capacity and the nature of the products or services to be provided.
- A statement of the economic or social rationale for the project.
- The proposed structure of the ownership and control.
- The estimated cost of the project (including legal, financing, and contingencies), and the percentage of costs that are imported versus from domestic sources.
- The proposed financial and credit structure.
- The proposed responsible parties for funding, the physical completion of the project, and operations - and the extent to which they accept risks associated with these activities.
- The preferred sourcing of equipment distribution.
- The suggested timetable for the project beginning with the formation of sponsor/ownership group to the completion or start-up of the project.

In addition to the project information U.S. exporters should seek to review general information about the country - the economic, legal, financial, fiscal, and security arrangements; the importance of the relevant industry to the country; the regulatory framework underpinning the industry; and matters related to the currency. Any information available about the potential revenue stream should also be obtained.

Financing Feasibility Information Template

1. COUNTRY:		
2. DESCRIPTION OF PROJECT:	(Identify whether a new project or an expansion; Include brief description (i) of capacity of, and products and services to be produced by, the project; (ii) raw material/feedstock required to produce products and domestic/international sources thereof and, markets to which products will be sold and basis (i.e., spot vs. long term sales contracts) and currency of sales); (iii) rationale for project - description of economic and/or social rationale.	
3. OWNERSHIP/ CONTROL:	<u>PUBLIC SECTOR</u> ___% Ownership ___% Control	<u>PRIVATE SECTOR</u> ___% Ownership ___% Control
4. OWNERSHIP INTERESTS: Names & % Interests of 3 Largest Owners:	Shareholder 1. 2. 3.	% <u>Name & Nationality</u>
5. ESTIMATED COSTS / COST ALLOCATION:	Total Project Costs (Including legal & financing costs, contingencies, etc.) \$ _____	\$ _____ Imported Goods & Services (Including freight, insurance & related costs) \$ _____ Local Costs (Including ___% incurred by foreign contractors)
6. PROPOSED FINANCIAL STRUCTURE:	___% Equity / Equity Equivalents ___% Debt	
7. PROPOSED CREDIT STRUCTURE:	(Indicate one) ___ Corporate Finance (Credit to be based on the balance sheet of the project company and/or on creditworthy shareholder / bank / government guarantees) ___ Limited-Recourse Project Finance (Credit to be based, primarily, on the assets and cash flows of the project company & on the contractual rights and obligations of all project parties)	

Financing South American Projects

8. PARTY(IES) RESPONSIBLE FOR:	1. Financing: 2. Construction: 3. Operations: 4. Revenue Stream
9. PREFERRED SOURCING COUNTRIES:	(Indicate countries and estimated maximum for procurement of imported goods & services) Up to \$ _____ from _____ Up to \$ _____ from _____ Up to \$ _____ from _____ Up to \$ _____ from _____
10. TIMETABLE (Insert date completed or estimated date of completion)	
	Formation of Sponsor / Owner Group
	Preliminary Feasibility Study
	Preliminary Environmental Impact Study
	Agreement on Financial Objectives, Preferences & Constraints
	Identification of Alternative Procurement Options
	Identification of Alternative Financing Options
	Agreement on Financing / Security Structures
	Agreement on Procurement / Financing Strategy
	Preliminary Financing Feasibility Study
	Invitations to Bid
	Preliminary Financing Commitments
	Bid Submissions
	Final Financing Commitments
	Bid Awards
	Commercial Closing
	Interim Financial Closing
	Financial Closing
	Completion / Start-up

This information together with general information about the country in which the project is being realized should then be examined in light of the financeability criteria outlined below. Within each financeability criterion “shades” are established that may indicate project’s strength or otherwise under a particular criterion. In general, the “shades” are sidebarred and listed in the order “good” through “bad”, though in some circumstances this should not be considered definitive. In certain circumstances, the criterion should be analyzed with respect to particular “pointers”, which suggest items that should be reviewed rather than “shades”.

Financeability Criteria

Country Specific Factors

- Economic Need
- Macroeconomic Factors (Other Than Currency)
- Political/Security Climate
- Legal/Regulatory Framework
- Currency Factors
- Level of Project Finance Education
- Historic Financeability

Project Specific Factors

- Strength and Quality of Revenue Stream
- Size/Technical Aspects/Location/Structure
- Nature of Benefits

“Shades” & “Pointers”

Economic Need

- Satisfies short and long term economic need.
- Satisfies long term (but not short term) economic need.
- Satisfies short term (but not long term) economic need.
- Satisfies short and long term social need.
- Satisfies short term (but not long term) social need.
- Satisfies long term (but not short term) social need.

Financing South American Projects

Macroeconomic Factors (Not Currency)

- Demonstrated economic growth, stable and predictable inflation, government budget surplus or manageable budget deficit (to the extent it is a public sector-project), long-term domestic financing available.
- These factors should be considered on a local as well as national government level.
- Reasonable, internationally competitive national and local tax regimes.

Political/Security Climate

- Stable local and national political climate. Demonstrated and largely undisputed operation of the democratic process.
- Acceptable security environment in region of proposed project. Limited evidence of terrorist or criminal activity with respect to infrastructure projects in the region.
 - Project has local and national cross-party political support.
 - Project has local and national ruling-party political support.
 - Project has national cross-party political support.
 - Project has local cross-party political support.
 - Project has national ruling-party political support.
 - Project has local ruling-party political support.

“Political support” should be considered more favorably if it based on satisfying a genuine underlying economic or social need and not purely on the basis of electoral expediency. Further “political support” should also be considered more favorably if it has resulted in an undertaking of financial support from a local or national development bank.

Legal/Regulatory Framework

Legal Framework

Comprehensive legal framework allowing settlement of disputes under a fair judicial process. Respect for contractual law. No discrimination between public or private sector parties. No discrimination between foreign or local parties.

Regulatory Framework

- Established and demonstrated regulatory framework specifically for the Project.
- Established and demonstrated regulatory framework for Project’s of similar nature.
- Established and demonstrated regulatory framework for the relevant industry.

- Established and demonstrated regulatory framework for project finance in general.
- Established and demonstrated regulatory framework for financing in general.

“Established and demonstrated” implies that the regulatory framework is clear, unambiguous, balanced and comprehensive, with provision for dispute resolution. Financeability is reduced to the extent the applicable regulatory framework is untested or in the process of development.

Currency Issues

- Exchange rate reflects underlying economic factors and currency freely convertible.
- Fixed or artificially determined exchange rate and currency freely convertible.
- Exchange rate reflects underlying economic factors and currency convertible for specific class of projects.
- Fixed or artificially determined exchange rate and currency convertible for specific class of projects.
- Exchange rate reflects underlying economic factors and currency convertibility guaranteed for specific project.
- Fixed or artificially determined exchange rate and currency convertibility guaranteed for specific project.

Level of Project Finance Education

- Local or national Government officials have experience in private sector projects of a similar nature.
- Local or national Government officials have experience in private sector projects.
- Local or national Government officials have experience in working with the private sector.
- No private sector experience.

Historic Financeability

- Country has performed with international banks.
- Country has performed with multilateral and bilateral institutions.
- Country has performed with international capital markets.
- Country has ability to attract equity investments.

Strength of Revenue Stream

- Single point revenue stream from creditworthy offtaker with payments offshore.
- Single point revenue stream from creditworthy offtaker with payments onshore.
- Single point revenue stream from credit-enhanced offtaker.
- Single point revenue stream from non-creditworthy offtaker.
- Dependent on creditworthiness, a multiple point revenue stream may be preferable to the revenue sources above.

Financing South American Projects

Consider also, if applicable, the extent to which revenue stream will provide for minimum revenue/volume/price levels (see below), and variability due to changes in inflation, interest rates, exchange rates, taxes and legislation - ie, to what extent are “economic equilibrium” conditions reflected in the revenue stream.

- Contractually fixed revenue (price & quantity).
- Guarantee on minimum revenue.
- Contractually fixed volume (but not price).
- Guarantee on minimum volume.
- Contractually fixed price (but not volume).
- Guarantee on minimum price.
- Neither price or volume guaranteed.

Size/Technical Aspects/Location/Structure

- Project of manageable size, consistent with the project development capability and existing infrastructure of the relevant country.
- Project proposes to use proven technology and demonstrated construction and operating techniques. Limited civil works.
- Accessible, economically or politically important location, with appropriate existing infrastructure.
- Structural aspects proposed by host party consistent with project financing - ownership rights, contract term, construction and operating arrangements, supply of raw materials.

Nature of benefits

- Immediate and demonstrable economic/financial benefits to specific private sector corporation.
- Immediate and demonstrable economic/financial benefits to specific public sector corporations.
- Immediate and demonstrable economic/financial benefits to the nation.
- Immediate and demonstrable economic/financial benefits to the region.

“Immediate and demonstrable” can be reviewed (in order of preference) in terms of compelling economics, competitiveness on a world scale or requiring Government support (through, for example, subsidized fuel).

Agency Financing: Sources of Funding

In the past, the principal sources of project financing in Latin America were the commercial banks and the export credit agencies (ECAs). Since the early 1980s, the availability of commercial bank finance has been substantially curtailed. Today, the primary sources of finance, particularly limited-recourse finance, are the bilateral and multilateral agencies together with a select number of international project finance banks. The three principal sources of financing for projects in South America are:

I. Multinational Institutions and Regional Development Banks

- The trend is to lend directly to private sector projects instead of relying on sovereign agencies to effectively distribute (downstream) the funds.
- They try to serve as catalyst to attract debt and/or equity for projects in developing countries.
- Agencies have shown a willingness to work on a collective basis to support a single project.

A) International Finance Corporation (IFC)

Point of Contact: Latin America Department (202) 473-8750

- Private sector arm of the World Bank.
- Substantial source of direct project financing for the developing world.
- Mission is to support and strengthen the private sector in developing countries by providing direct financing and technical support.
- Will commit funds on an equity or debt basis; sharing risks with other investors without requiring government guarantees.

IFC supported projects in 1994

Project	Assistance	Description
Satellite	\$30 million loan, \$5 million equity	Commercial satellite covering Argentina, the Mercosur region, and other Latin American countries
El Bosque Port	\$5 million loan	Colombian private cargo and container port
Gas Transmission	\$25 million loan, \$80 million syndication, \$20 million equity	Argentine project to raise the technical and operating standards of gas transmission

B) Inter-American Development Bank

- Has two arms that support projects in South America:
The Inter-American Investment Corporation—an affiliate
The Private Sector Department—five percent of new leanding

i) Inter-American Investment Corporation (IIC)

Point of Contact: Jorge Rodan (202) 623 3948

- Invests exclusively in member countries in Latin America and the Caribbean.
- Makes medium to long-term to loans and equity investments in private small to medium size businesses that cannot fully satisfy their financing elsewhere.
- Promotes and manages co-financing and syndications; supports the underwriting of securities; identifies joint-venture partners; facilitates the transfer of technology and know-how.
- Provides fee-based consulting services for financial engineering and corporate restructuring
- Will finance up to 33 percent of a project cost and hold no more than 33 percent of the capital; generally investments do not exceed six million dollars.
- Loans are made at market rates, returns on capital investment is expected to be consistent with market returns.
- Requires feasibility studies and international bidding on projects.

IIC supported projects in 1994

Project	Assistance	Description
Pesquera Diamante, S.A.	Provided \$2 million loan and 0.8 million equity investment	Peruvian fishmeal plant
Tahuamanu S.R.L.	Provided \$1.6 million loan	Bolivian plant to process nuts for export
Wilmor S.A.	Provided \$5 million loan	Argentine processor of cattle and poultry by-products

ii) The Private Sector Department

- New sector of IDB, responsible for implementing new mandate of allocating five percent of new lending to private sector borrowers without government guarantees.
- Will be operational in 1995.
- Projects with significant social benefits will be given priority.
- Will provide loans and guarantees to large infrastructure and public service projects.
- Projects can be supported with the lesser of 25 percent of total project costs and \$75 million per project, per year.

C) Andean Development Corporation (CAF)

Point of Contact: Carmen E. Carbonell 58 2 209 2361 (Venezuela)
Alfonso I Méndez 58 2 209 2342 (Venezuela)

- A financing entity of the Andean nations (Venezuela, Colombia, Ecuador, Peru, and Bolivia).
- Has focused on regional privatization and the development of infrastructure for transportation and electricity.
- In 1994, the CAF supported 41 projects with a total value of \$989 million.
- For greenfield projects, CAF is willing to commit up to 30 percent of the value; corporate loans depend on the credit worthiness of the borrower.

CAF supported projects in 1994

Project	Assistance	Description
Oil-field drilling	\$30 million financing	Maxus Bolivia, Inc. borrowed to drill 23 wells and 7 injectors in Bolivia
Cellular Telecom	\$11.5 million financing	CONECEL installed cellular system in Quito, and Guayaquil, Ecuador
Electric Generation	\$10 million financing	Construction of 340 MW Hydro facility in Colombia

II. Bilateral Agencies

- Look to assist their own national companies by creating increased business opportunities
- Will typically provide grants, loans and/or guarantees and/or insurance to facilitate exports, investments, and feasibility studies.

A) U.S. Trade and Development Agency (TDA)

Point of Contact: Albert W. Angulo (703) 875 4357

- Promotes the export of U.S. goods and services by funding feasibility studies, orientation visits, specialized training grants related to American export transactions, and various forms of technical assistance.
- Looks to provide American firms with market entry, exposure and information, thus helping them establish a position in markets that are otherwise difficult to penetrate.
- Private sector projects require the endorsement of the host government prior to receiving funding.

TDA supported projects in 1994

Project	Assistance	Description
Natural Gas Pipeline	\$250,000 feasibility study	Argentina-Chile natural gas pipeline
Industrial Waste Water	\$540,000 feasibility study	A Chilean industrial waste water treatment project for Concepcion
Mercosur Air Transportation Center	\$240,000 feasibility study	A Paraguayan cargo distribution project

B) Export-Import Bank of the United States (Ex-Im Bank)

**Point of Contact: Steven W. Howlett, International Business Development Division
(202) 565-3900**

- Provides credit support to buyers of U.S. goods and services.
- Will directly finance foreign purchases of U.S. goods and services; provide guaranteed lines of credit small to medium-sized foreign buyers; and provide insurance to protect U.S. firms from payment default by foreign buyers.
- Support is available for up to 85 percent of products and services of U.S. origin or manufacture, the equivalent of 15 percent of U.S. goods and services in local costs may also be eligible for certain environmental projects.
- All loans, guarantees, and insurance must have a "reasonable assurance of repayment."
- New project finance unit started up in 1994, initiated lending in 1995.

Ex-Im Bank supported projects

Project	Assistance	Description
Electric Generation	\$52.7 million guarantee	Three gas turbines generators in Argentina
Aircraft Leases	Guaranteed aircraft revenue	Backup support for 12 airplanes for Brazilian carrier Varig
Telecom Equipment	\$52.9 million equipment financing	AT&T equipment to Arg., Chile, Ven., Brazil, for fiber optic submarine cable project

C) Overseas Private Investment Corporation (OPIC)

Point of Contact: Cheryl Kfuri - Regional Manager Finance - (202) 336 8492
 Edith Quintrell - Regional Manager Insurance (202) 336 8573

- Finances and insures private-sector overseas projects that have a positive impact on U.S. employment, the host country and the environment, and where U.S. interests hold at least 25 percent of the equity..
- Direct loans are provided to small to medium-sized businesses. Loans will typically be between \$600,000 to six million dollars.
- Will participate in up to 50 percent of the cost of a new project and 75 percent of the cost of an expansion.
- Provides all-risk loan guarantees to U.S. banks and/or institutional investors for between six million to 200 million dollars.
- Provides insurance for three categories of political risk; 1) inconvertibility of currency, 2) political violence, and 3) expropriation.
- To assist small to medium-sized firms gain access to overseas markets OPIC has fee-based advisory services on overseas markets, joint-venture identification and pre-feasibility evaluations.

OPIC supported projects in 1994

Project	Assistance	Description
Natural Gas Pipeline	\$100 million insurance	Enron Corp. project in Colombia
Cellular Telephone	\$200 million financing	GTE Corp./AT&T project in Argentina
Electricity Generation	\$65 million insurance	LG&E Energy System project in Venezuela

III. Commercial Lending & Private Investment Funds

i) Commercial Banks

The following commercial banks were the lead arranger of deals according to Project Finance International in the Americas during 1994:

Name	Underwritten/Total Loan US\$ millions
Bank of America	260/682
Chase Manhattan	641/641
CIBC	357/953
Credit Lyonnais	199/776
Credit Suisse	133/360
Deutsche	343/383
Fuji	186/186
Lehman Brothers	130/130

ii) Private Investment Funds

In 1994, there were over 120 funds dedicated to investing in Latin American equity and debt with over eight and half billion dollars invested. Some of these funds are focused in certain industries such as the Scudder Latin American Trust for Independent Power; others are regional equity funds such as the GT Latin America funds; and there are country specific funds for Argentina, Brazil, Chile, Colombia, Peru, and Venezuela managed by a variety of different companies. These funds have become an increasingly viable source for financing for projects in the region.

Case Studies

The following four case studies provide examples of projects realized in Latin America and the factors that made these projects financeable. In reviewing these projects it readily becomes apparent that each project has its own strengths and unique attributes that make them financeable.

El Chocon

El Chocon is a 1,200 MW hydro electric generator located in the province of Rio Negro, Argentina that began operation in 1972. In addition to being one of the systems main peak suppliers, El Chocon is the main water management facility of the Limay river. Average capacity factor for El Chocon is 26.94 percent since it entered into operation. It was one of five separate operating units of the former Hidroeléctrica Norpatagónica, an Argentine hydroelectric company. As part of the privatization process, the Government broke up the company into five separate operating units: Hidroeléctrica Alicurá, Hidroeléctrica El Chocon, Hidroeléctrica Cerros Colorados, and Hidroeléctrica Pichi Picún Leufú. El Chocon is the largest of the five facilities.

In July 1993, several groups submitted bids for 59 percent of the outstanding equity, together with the respective bid bonds. Chase issued a U.S.\$ 349.6 million standby letter of credit on behalf of Hidronor, the bidding consortium composed of Endesa (Chile), CMS Energy (U.S.A), and Banco Santander (Spain).

The following two trends in the Argentine electrical sector encouraged the development of the project:

- Demand for electricity had been growing at over 4 percent per year over the past 20 years and was expected to continue to increase at ten percent into the near future as a result of economic growth in this developing country.
- Argentina's high dependence on higher cost thermal generators (85 percent in 1991) with more thermal plants being constructed to exploit gas reserves encouraged the sale of "cheaper" hydroelectric power.

The 59 percent equity ownership that was privatized was acquired for U.S.\$223 million. El Chocon also assumed \$256 million of debt that was refinanced by Chase in two tranches. A ten year, US\$ 204 million senior tranche, and a U.S.\$56 million subordinated tranche (U.S.\$ 4 million was borrowed to cover expenses/fees incurred during the privatization process). The senior tranche is non-guaranteed, purely recourse to the project, while the subordinated tranche is a seven-year-bullet guaranteed on a several basis by Endesa and CMS.

Financing South American Projects

The financeability of this project was enhanced by the following factors:

- Hidronor faces very little business risk since it is a low-cost producer; its “fuel” (water) is free; and it has low operations and maintenance requirements,
- an accelerated amortization schedule that allows no dividend distributions unless target debt levels, corresponding to a shorter schedule, are met,
- the regulatory framework provides for periodic adjustments to the tariff following U.S. dollar and U.S. inflation rates. Hidronor accounts are exposed to devaluation risk for a maximum of 60 days until the rates are adjusted,
- the experience of Endesa and CMS in operations and project development,
- proven production/operating capability of the plant, El Chocon has been in operation since 1972,
- operators have 30 year concessions to operate the facility.
- the privatization process is strongly supported in Argentina, by federal and local governments, and has come under significant international scrutiny.

El Mamonal

Mamonal is a gas-fired power generation facility in Cartagena Colombia. The project was developed at a cost of U.S.\$ 70 million, with an installed capacity of 100 MW.

The project is owned by Interamerican Energy Leasing Company (IELC), a project company formed by K&M Engineering Investment Corporation and K&M Interamerican L.P., a partnership formed by K&M Engineering and Construction Corporation, Chase, certain investment funds of Scudder, Stevens and Clark, and an investment arm of the Rockefeller family.

This project was developed to provide Proelectrica, a consortium of 24 important industrial firms a reliable source of energy. These firms were being adversely affected by a power shortage that was projected to continue until 1997 given existing Colombian investment pace. In addition, the energy provided by the Mamonal project would be much lower than the current price being charged by the local existing provider. In 1993, this difference was expected to be 0.50 cents/kwh cheaper and the power is expected to remain cheaper for the next 15 years.

For this reasons K&M Interamerican contributed U.S.\$ 14 million in equity to Interamerican, which also borrowed U.S.\$ 57 million which Chase underwrote. Chase is a holder of U.S.\$ 22 million and OPIC the remaining U.S.\$ 35 million. The financeability of this project was enhanced by the following factors:

- The project effectively has a fourteen year power purchase agreement with Proelectrica, where the shareholders of Proelectrica have individual take-or-pay agreements that can not be modified without the approval of the creditors.
- The obligations of Proelectrica are guaranteed by its shareholders on a capped-joint and several liability basis, whereby each shareholder is pro-rata liable for 50 percent the share of any defaulting shareholder up to the cumulative equivalent amount of 10 MW.
- An interest rate protection agreement was set in place to protect 100 percent of project debt against interest rate fluctuations.
- Each shareholder in Proelectrica has pledged to IELC its share in Proelectrica as collateral.
- Proelectrica has a power purchased agreement with Electribol, the regional public utility with a renewable term of three years.
- All project revenues and expenses will be in U.S. dollars, with the exception of the payments relating to the operation, maintenance and management of the plant.
- Experience and reputation of the constructor, a consortium of Stewart & Stevenson Services, Inc. and Distral; and the operator, K&M Servicios Tecnicos.
- The long-term gas purchase agreement between Proelectrica and Ecopetrol; Proelectrica has an obligation to provide fuel on a no-cost basis, guaranteed severally by its shareholders.
- OPIC has insured the project against expropriation, inconvertibility, and violent acts.
- The strong private-sector and governmental support, driven by the energy crisis.
- The technology used in the project is proven and reliable, having been used in other analogous projects worldwide.

Chihuahua Norte Water Treatment Plant

This project is a 1,200 liters per second (“lps”) municipal waste water treatment facility to serve the northern sector of the city of Chihuahua, in the State of Chihuahua, Mexico.

Atlatec S.A. de C.V. was awarded the contract to design, construct, operate and maintain the facility. Atlatec is a subsidiary of the Cydsa Group of Monterey, Mexico.

In 1990, the Mexican National Program for the Protection of the Environment and the National Program for Potable Water and Water Treatment began developing programs to increase the supply of drinking water and the treatment of wastewater in Mexico. Mexico’s participation in NAFTA, also required certain environmental standard be met. To comply with this, the State of Chihuahua has contracted the construction of three facilities, one of which was the Chihuahua Norte plant.

The U.S.\$ 17 million project was financed through a U.S.\$ 9 million senior secured note, a U.S.\$ 5.4 million grant from Chihuahua’s water municipality, and an equity infusion of U.S.\$ 2.6 million by Cydsa and Promotora de Infraestructura Mexico, S.A.

The financeability of this project was enhanced by the following factors:

- The constructor and operator of the facility have significant experience constructing and operating both municipal and industrial waste water treatment plants; to date Cydsa has executed contracts totaling U.S.\$ 161.3 million.
- The municipality committed to a 10-year “deliver or pay” contract for the supply of raw water for treatment, the city currently produces 3,500 lps of waste water which need treatment, and population is expected to grow at three percent through the year 2000.
- The waste water treatment plant employs relatively simple technology because it processes “clean” waste compared to industrial waste water treatment plants which often process more toxic waste materials requiring complex technological facilities.
- Payments are structured so that if the municipality does not deliver the necessary water volume, the tariff will be sufficient to cover the facility’s fixed costs including debt service, equity returns, operating costs, upkeep and maintenance costs.
- The Banco Nacional de Obras y Servicios Publicos (“Banobras”), a national credit institution and development bank, provided a guarantee of the municipality’s obligation that is also sufficient to cover the facility’s fixed cost as stated above, in the event the municipality is unable to comply with its payment obligations. Lenders take comfort in the federal status of Banobras; and Banobras, through its existing relationship with the municipalities and its relationship to the municipality’s funds, is happy to provide this support.
- The revenue source for the facility as well as the costs are locked through the construction and service contract and the operating and maintenance agreement thus limiting the risk of revenue shortfalls and cost overruns to debt and equity holders .

Project Profile "Financeability" Charts—Explanation of Usage

Financeability ratings are given on a scale of 1 to 3, with 3 being the highest rating. The ratings are preliminary assessments, using existing data, of the impact of a given factor on project financeability — and thus the likelihood that the project will proceed in a timely fashion. These are not based on detailed project cash flow assessments or credit ratings of individual companies or government institutions. Nor are they based on a detailed credit analysis of the project because, quite simply, the projects included in the study are for the most part in early stage development, and insufficient information is available.

Ratings are qualitative and broad stroke. A rating near "1" indicates that we consider the factor to be an extreme impediment to the project's financeability and thus its viability. On the other end a rating near "3" indicates that the factor supports the project's financeability and presents few obstacles to a potential lender or investor. A rating of "2" is important as it indicates an area that is problematic, must be carefully monitored, and needs resolution for the project to proceed. At the same time, unlike a rating of "1" we assess that the obstacles are potentially resolvable.

Financeability rating is a subjective business, *ratings should not be used to rank projects — rather to flag areas that will need to be addressed by the developer.* Many issues associated with lower rankings can be overcome with the correct financial and commercial strategy.

We assess project financeability according to the seven factors of most importance to international financial institutions as more fully described in our discussion on project financeability.

To review, these factors are:

ECONOMIC DEMAND: Is there a strong economic need driving a project with many beneficiaries?

Example: Upgrade of a country's principal port that currently has long delays for outgoing and incoming shipments. Many businesses and workers suffer losses because products can't get to market and consumers are impacted because goods are slow to arrive and costly. The rating will tend toward 3.

POLITICAL: Are there strong political pressures to push the project forward?

Example: Inadequate sewage and potable water in the capital city results in the spread of disease. There is strong public outrage at this situation, demanding that government action be taken. The rating will tend toward 3.

REVENUE STREAM: How secure is the flow of funds that will provide an adequate rate of return on the initial investment?

Financing South American Projects

Example: A toll road is to go from the capital to the major port. Congestion clogs existing older roads and there are no alternative routes. Expectations of high levels of commercial traffic will push the rating toward a three, while an inability to adjust tolls for inflation or devaluation will raise doubts on the value of the revenue stream and erode the rating.

MACROECONOMIC/CURRENCY: How stable and secure is the country's macroeconomic situation including the risk of devaluation?

Example: The country has had stable economic growth for 5 years with low inflation and an exchange rate pegged to the dollar and backed by strong international reserves. Policy is transparent and consistent over time. The rating will tend toward 3.

REGULATORY STRUCTURE: Are adequate government regulations in place to protect the rights of the investor or concession owner? Are the rules of the game clear or do ambiguities exist that might hurt the concessionaire?

Example: A country puts out a bid to build a new power plant. At the same time, new rules allowing private power are still being drafted. There are no clear rules for wheeling the power over state utility lines or directly negotiating long term power purchase agreements with individual consumers. In addition, the regulations are ambiguous on price setting mechanisms. This situation erodes the rating.

PROJECT FINANCE EDUCATION: Has the entity coordinating the project had experience in international project financing?

Example: The sponsor is the country's oil company that has financed four projects in the past five years. They have a sophisticated financial capacity and understand the key issues of importance to international investors. This situation pulls the rating toward 3.

TECHNICAL: Are there technical issues that might impact on the ability to complete the project or for the project to operate according to plan?

Example: The project is centered around a new technology that tests well in the lab but has never seen long term commercial application. The risk that unknown flaws may be revealed in actual long term application, lowers the project's financeability rating.

The relative importance of the factors across projects is not uniform, and where a factor dominates this is noted in the accompanying financeability text. For example, a bridge project that spans country borders may be heavily impacted by political factors including ratification by congress. In this case, political factors dominant the project's potential to be financed. On the other hand, a private sector project to upgrade a steel mill is dominated by market and price factors with little or no political intervention. In cases where a factor is not relevant to judging financeability, "NA" is applied.



Regional Overview: Infrastructure in South America

Introduction

This section provides U.S. exporters, project developers and financial executives with an overview of information critical to the development of South American infrastructure. The aim is to provide a solid combination of conceptual insight, with basic data in a referenceable format. The result should provide a good idea of where to put your resources and a sense of future trends—so that you may best position your business.

Complementary information is provided as introductory material for the sector profiles, and in the country business and finance reports.

The Revolution: Moving Mountains

The most striking fact about South America today is the way that economies are becoming energized by crossing borders, in a way that would have been unimaginable ten years ago. Infrastructure projects—some quite expensive—promise to create sources of comparative advantage for countries (and regions) that would otherwise become increasingly non-competitive.

The age-old dream of moving mountains is coming to pass. Think of the Bolivia/Brazil gas pipeline, which was first conceived nearly fifty years ago. The project has developed intense momentum in the last year. Bolivia has natural gas reserves, but no real use for most of its natural gas; Brazil (and

The Developing Consensus I

The Clinton Administration has prioritized South America because our own economic model sees the countries of this hemisphere as strong partners over the long term. As the economies of the region return to health it is increasingly clear that sustained growth is partly the result of a U.S. engagement with the region that assists in financing sound infrastructure projects. This is the heart of the Clinton Administration's Latin America Policy, and it is the focus of the U.S. Trade and Development Agency's project feasibility efforts.

Regional Overview: Infrastructure in South America

especially São Paulo) is running out of sources of energy, and embodies a tremendous demand for gas-fired power generation. This is no longer an engineering project; it's an imperative for national competitiveness.

There are many projects of this revolutionary nature under consideration in South America. Chile, for instance, is turning itself into a hub for South America's telecommunications with the rest of the world. Peru is providing Bolivia with access to a port, which is partly financed by the Andean Development Corporation. Private initiative is driving the expansion of export corridors (building ports, highways and railways) through Buenos Aires, the central coast of Brazil, Uruguay, Colombia and in Peru. Waterworks are being privatized. And a navigable waterway is being developed that will provide access to the sea for more than half of South America.

These projects, inconceivable in the past, will be built. This will happen because they are logical projects, increasingly well-structured, and driven by the needs of expanding economies.

The New Economic Model: The Nature of Demand

The new economic model requires private investment in infrastructure in four principal ways. First, the role of government is vastly changed, no longer an owner and operator— government is increasingly a facilitator and regulator.

In Chile, for instance, all transportation projects are initiated by the private sector. The government's role is technical and high level; once projects are brought to the government, it makes a technical decision as to feasibility—and then lets the project to bid. The project's originator is given a small but significant advantage in the bidding process.

The Chilean model is instructive. It is being adopted throughout South America. And it shows clearly how demand for infrastructure will sharply increase in specific areas. According to the World Bank, to maintain growth targets (5 percent GDP growth) Chile must increase exports at an 8 percent annual rate, and national savings and investment must be sustained at 21 percent and 26 percent of nominal GDP, respectively.

Second, the new model places a tremendous "burden" on trade, and a logical premium on anything (transportation, telecommunications, power) that will allow for internal efficiencies in production and

The Developing Consensus II

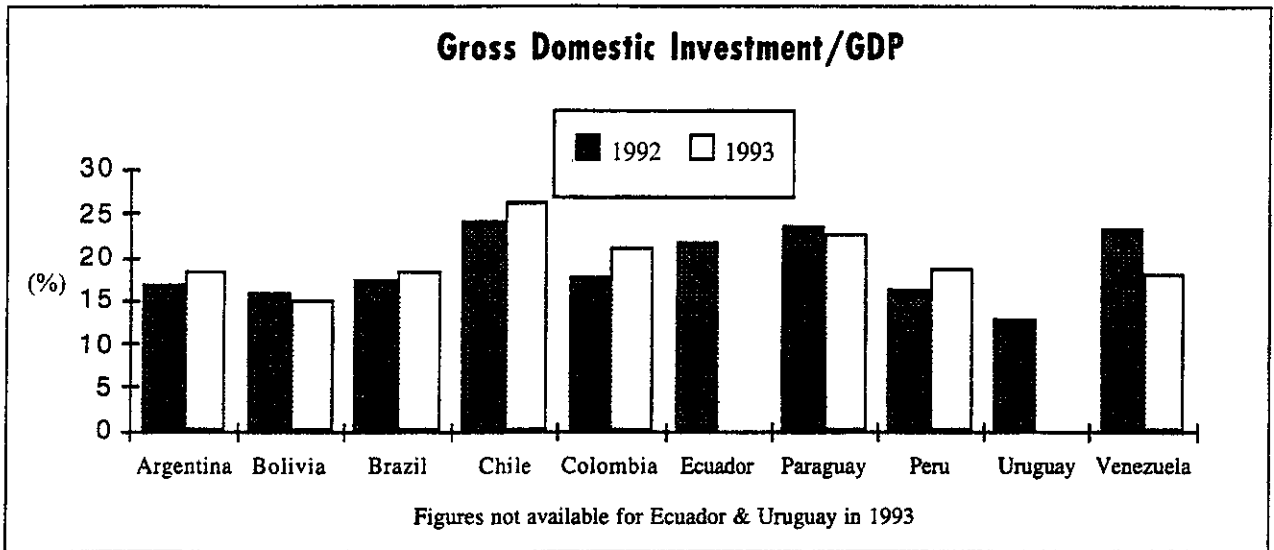
Once the state leaves the infrastructure arena as owner and operator, then an enormous area is opened for creative action by the private and civic-minded sector. New agencies spring up to become aggressive drivers of the infrastructure creation process—and this creates a civic sense in the private sector that had heretofore been restricted to government. One of the more interesting examples of this phenomena is the Tietê-Paraná Development Agency (ADTP), in São Paulo. Originally begun to develop the internal waterway system of São Paulo state, the agency is now active in five Brazilian states, along with Paraguay and Bolivia. In addition, ADTP has now expanded its scope to other regions of Brazil, and to other infrastructure sectors. The agency is now examining the possibility of becoming an authority, and eventually having the power to finance needed infrastructure projects.

competitiveness in a foreign marketplace. Projects that make a contribution at this level will move forward.

The model also places a premium on attracting long-term foreign investment. In the case of Chile, this figure is 3.5 percent of GDP — or U.S.\$1.7 billion annually. Extrapolating to Brazil, the figure for foreign investment would be more than U.S. \$20 billion annually.

Third, the new model places a premium on savings and investment. The result is that money is available internally for infrastructure projects, thus increasing the domestic financing available for good projects. Having local financing also reduces the project risk to foreign investors.

We have used the figures for Gross Domestic Investment (as a percentage of GDP) to provide *one* snapshot of the region. Chile and Colombia profile strongly on this scale, as do Ecuador and Paraguay; Argentina, Brazil and Peru are all below 20 percent, but their year-on-year rates are rising. On the other hand, the GDI/GDP ratio for the Asian countries is uniformly above 30 percent.



Source: The World Bank

The last, and perhaps most subtle, characteristic of the new model is that South American countries are beginning to see each other in broad terms as allies, rather than as competitors in a zero sum game. Because of that, the new model creates enormous opportunities, that were perhaps obvious, but were restricted by what might be called a narrow view of the national interest. Now these opportunities, the trans-border pipelines, waterways, telecom schemes, are *political* imperatives.

Funding Infrastructure Projects

One of the great unknowns is the appetite of the international financial community for long-term infrastructure investment in South America. If only in terms of the region's history, long-term investment is risky. There is, however, significant participation on the part of OECD infrastructure firms in the region's privatizations and, increasingly, in specific projects.

U.S. participation has been largely limited to energy and telecommunications. These have been highly positive experiences, and have created a magnet for suppliers in countries like Chile, Argentina, Peru and Colombia.

Perhaps the most important observation is that the region is less of an unknown than in the past. Much of this is due to the new and extensive experience base of equity investors in South America, particularly in the last five years, as they have become involved in intimate research on every country in the region.

A trend to watch might be the role of mutual funds and other new funding sources that mature projects, with proven track records, might tap.

Also: See the Chase Case Studies & Chase' Review of Financial Institutions, at the end of the Financing Section.

Trade: Driving the Process

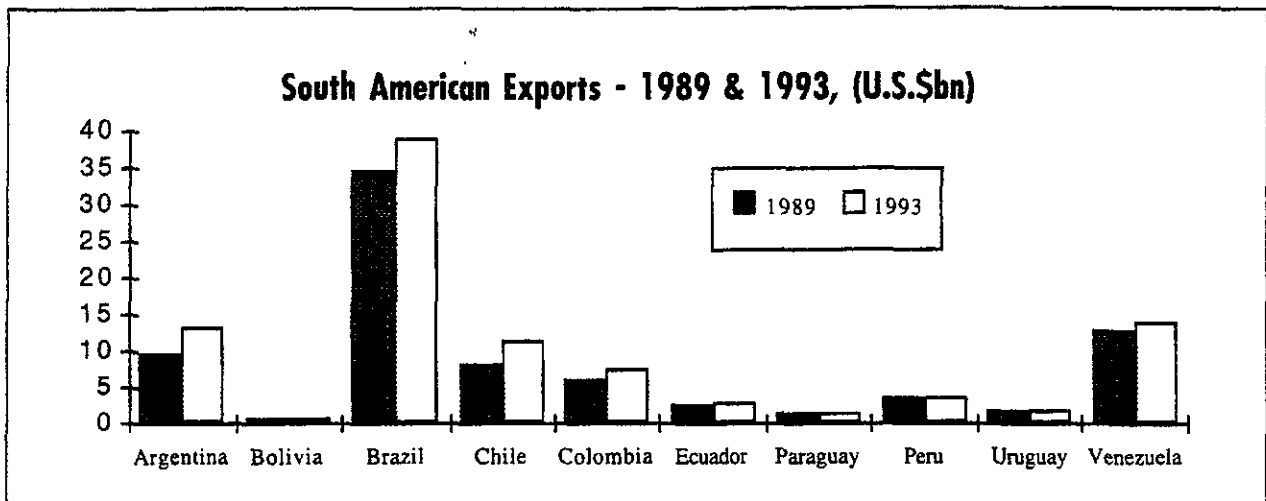
South America is becoming a continent of trading nations. In every country, government policies are focused on increasing export earnings. Tariffs have been pared to the bone on virtually all goods.

It is a business principle that is driving government policy—as you lower the price of inputs (through lower tariffs), and as you lower the price of capital (through less restrictive rules) you create significant advantages for domestic consumers.

Throughout South America in the 1990s tariff rates have been lowered, thereby increasing imports, lowering inflation, and increasing the pressure on the economies to generate exports. The process is complex, but favors the intimate participation of foreign investment and know-how in the most strategic areas of the economies of South America.

The Developing Consensus III

In identifying the 125 infrastructure projects for this report we were struck by the fact that most projects were well-developed— or at least their sponsors knew what was required to produce a financeable project. In addition, as the debt crisis recedes, countries are returning to creditworthiness, primarily through improved fiscal management, and through the creation of policies that promise sustained GDP growth. The region—in general—promises to be increasingly financeable, because it is increasingly stable.



Source: Economic Commission for Latin America and the Caribbean

The key structural change is the advent of the two great South American free trade areas. This has led to an explosion in internal South American trade — which has been given a tremendous boost by the region's free trade agreements. For a long period the South American countries lived with very high — very protective — tariff barriers, raised one against another. Protecting oneself from a neighbor's products was nearly a strategic economic priority.

The new economic models sweeping the region emphasize an opposite reality — that intra-regional trade creates winners for all parties. The year 1995 is the bellwether period for this movement, as the two key trade pacts (the Mercosur and the Andean Pact) are implementing common external tariffs, — and at the same time lowering intra-pact tariffs to near zero.

Note the explosive increase in trade. The Latin American Integration Association, intra-regional trade more than doubled over the last five years, increasing from \$12.2 billion in 1990 to \$26.3 billion in 1994. Trade with the two largest blocks was even more explosive: in the Mercosur intra-regional trade nearly tripled, going from \$4.1 billion in 1990 to \$11.4 billion in 1994; the same was true of the Andean Group, where intra-regional trade increased from \$1.3 billion in 1990 to \$3.5 billion in 1994.

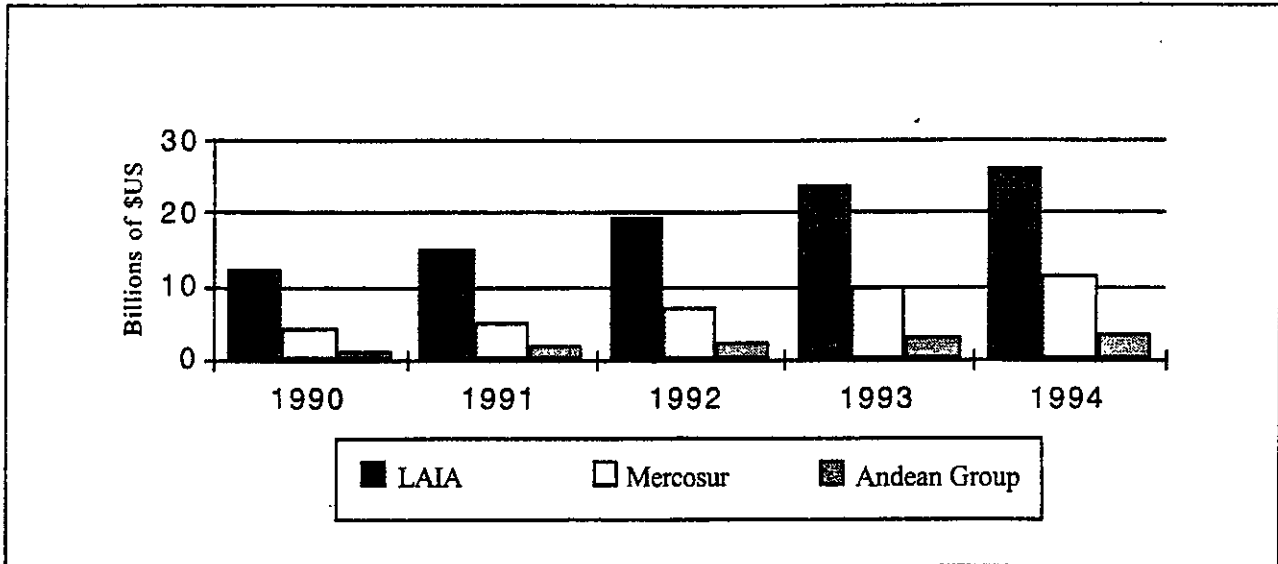
The strain that this increase has placed on transportation infrastructure is enormous.

What follows is a sketch of the two major free trade areas, as well as an overview of some of the important bilateral agreements:

The Developing Consensus IV

Democracy is also a key driver of this process. Citizens—especially middle class citizens—have no interest in paying extra for goods and services, waiting years to receive a telephone, or spending hours driving to and from their children's schools in congested traffic. This is another indicator that demand for infrastructure in South America will continue to gather momentum—and that political decision makers will be ever more forcefully driven to sound and creative financial solutions.

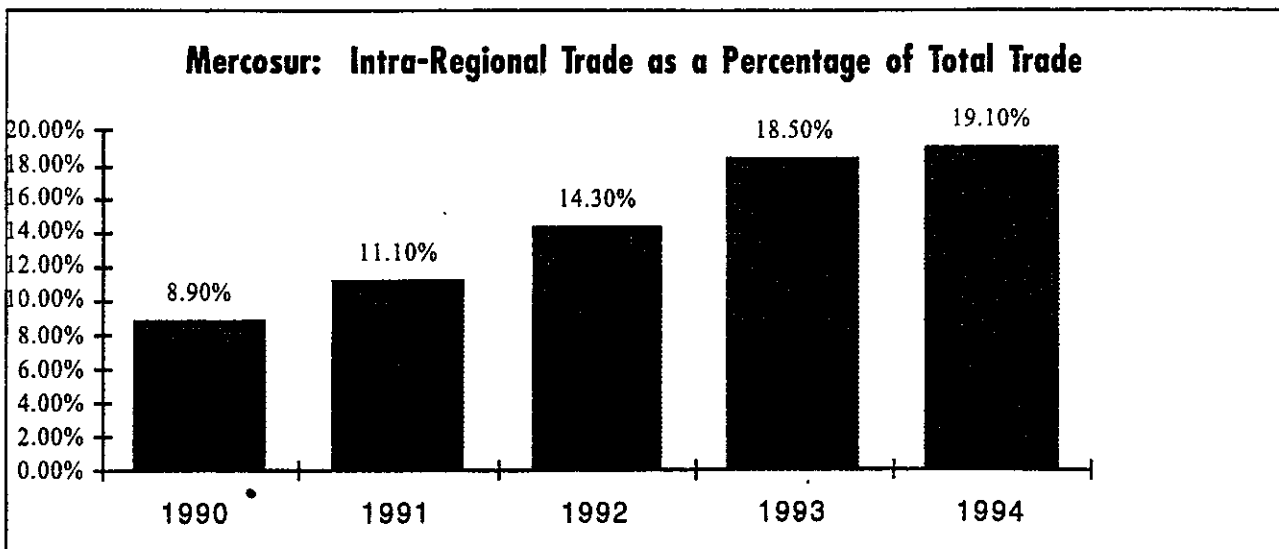
Regional Overview: Infrastructure in South America



Mercosur

The Southern Cone Common Market is the fourth largest free trade zone in the world, and includes Argentina, Brazil, Paraguay and Uruguay. Total GDP is \$892 billion; the group's population is over 200 million. If Chile and Bolivia join the group, as they are negotiating to do, then this will be a powerhouse six country bloc, dominating the entire southern half of South America.

The effects of the Mercosur have been stunning in their rapidity. The agreement was announced in 1991, and in January of 1995 a common external tariff (CET) of 15% came into being. Intra-regional trade is not only increasing dramatically, but it is increasing as a percentage of total trade.



Source: Economic Commission for Latin America and the Caribbean

Most of the transportation projects identified in the project are in these — newly congested — trade corridors, demanding improvements in waterways, bridges and highways. It is important to recognize, however, that increased trade places enormous pressure on other infrastructures. Each country in the Mercosur is desperately trying to improve telecommunications infrastructure.

And while Argentina, and now Brazil, are working to develop reliable and inexpensive sources of electrical power, both Uruguay and Paraguay are developing schemes to satisfy their power hungry neighbors.

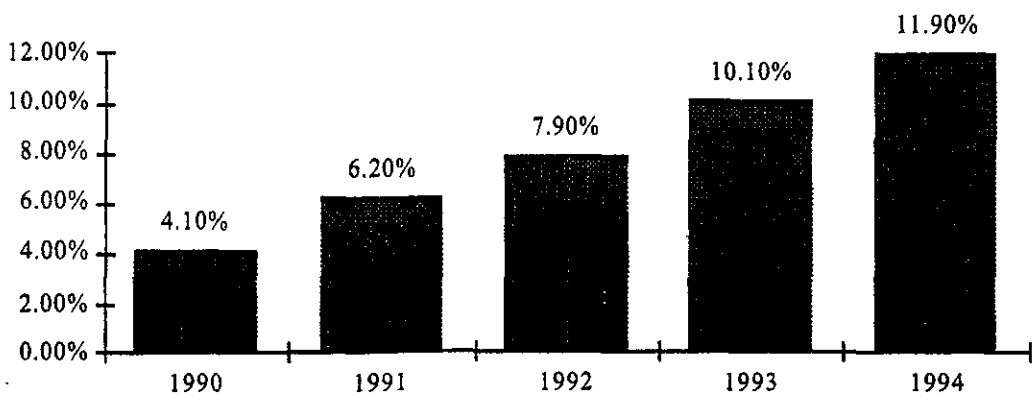
The Andean Group

The Andean Pact covers the five country northern rim of South America, and includes Colombia, Ecuador, Peru, Bolivia and Venezuela. Total GDP is nearly \$180 billion (20% of Mercosur GDP); and total population is 98 million (50% of Mercosur's population).

The Andean Pact has existed for nearly 30 years, but more as a protective zone — rather than a free trade area. Only recently, following the example of the Mercosur, has there been movement toward a common external tariff. This too, however, has come to pass in 1995 — with the February 1st establishment of a 15% CET for the five country group.

The Andean Pact is not a powerhouse like the Mercosur. Trade within the group — as a percentage of total trade — is increasing rapidly, and therefore creating mighty stresses on surface transportation (highways and railways). Perhaps the most interesting fact is that this region, which has been a political unit for some time, is well on its way to creating — very rapidly — the kind of physical infrastructure that will allow it to become an internally dynamic economic unit.

Andean Group: Intra-Regional Trade as a Percentage of Total Trade



Source: Economic Commission for Latin America and the Caribbean

Bilateral Agreements

There are a number of bilateral agreements that are relevant in terms of infrastructure demand. Arguably, these agreements are more important from the telecommunications — and eventually environmental — point of view, than they are from that of surface transport or energy. Chile is an extremely dynamic protagonist in this area.

Some of the key agreements are the following:

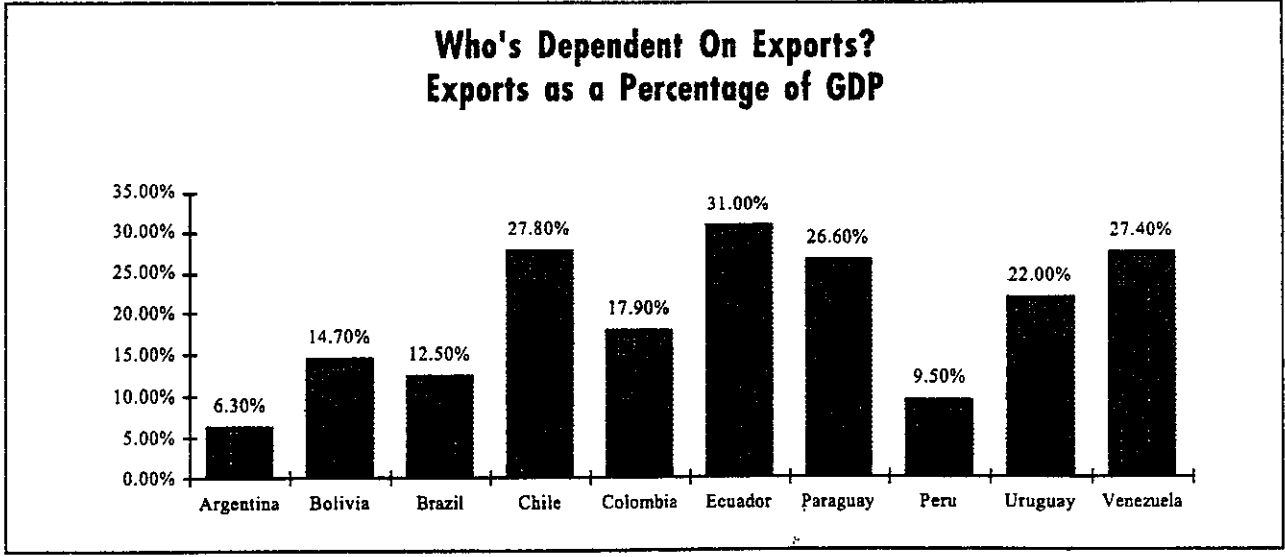
Chile/Venezuela (1993)
overall tariff reductions

Chile/Colombia (1993)
tariff reductions on a specific list of products

Colombia/Venezuela/Mexico (1994)
to establish a free trade area within 10 years

Chile/U.S (1995)
preparation for NAFTA negotiations, announced by President Clinton at the Miami Summit

The most interesting fact about these agreements is that as free trade increases the export success of individual economies, and hence their wealth, there is a positive to keep negotiators busy in generating new intra-regional trade opportunities.



Source: The World Bank

Free Trade's Big Impact: Infrastructure Demand & the Environment

If there is one special area in which free trade areas benefit infrastructure demand it is in the area of the environment. The relation between infrastructure demand and free trade areas is direct in the case of transportation; it is indirect but closely related in the case of telecommunications; and it is indirect, at best, in the case of energy demand.

In the area of demand for environmental goods and services it is overwhelming. This is particularly the case as countries negotiate free trade agreements with the U.S.

In general, in South America there has not been a take-off in the development of environmental projects. This is particularly true where the demand dynamic involves enforcement that requires private investment. The reason is obvious — there is not yet a great stress on the enforcement of new environmental regulations.

This will change drastically in the next year. Chile will once again lead the way, as that country prepares for negotiations with the U.S. — and eventual entry into NAFTA.

There will also be increasing pressure on Mercosur and Andean Pact firms, as countries come under pressure to develop and enforce environmental regulations. These are still “luxuries,” as economies — after the lost decade — strive to find productive investment to generate exports.

However, countries in free trade relationships simply cannot allow their partner's industry to bear lower carrying costs (because of less rigorous environmental standards) than their own industries. *It is this simple question of equity in competitiveness that will soon drive a powerful demand for environmental goods and services.*

Conclusion

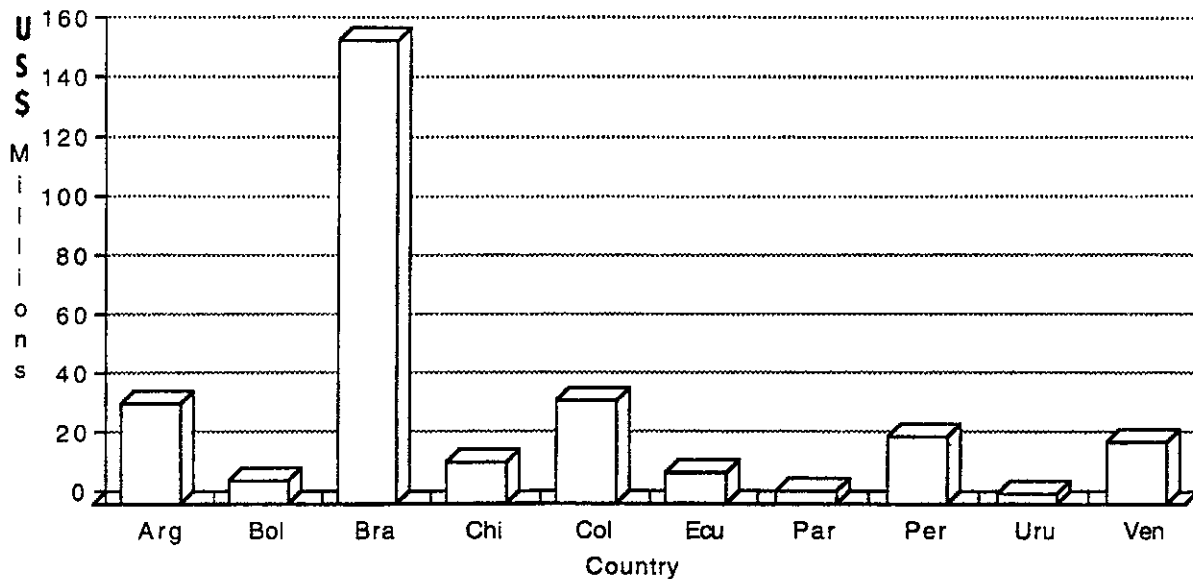
Infrastructure creation in South America is entering a new phase. This phase will be as energetic and creative as were the giant public works projects of the 1960s and 1970s. However, this phase will be driven by decentralized decision-making (in municipalities as well as in the minds of voters), and will be fueled by private investment—in all of its most creative forms.

One is more likely to see projects work where there is a strong economic rationale. That is to say, it may be less fruitful to pick winning countries, than it is to develop relationships with firms in competitive industries, or that occupy export corridors.

Regional Overview

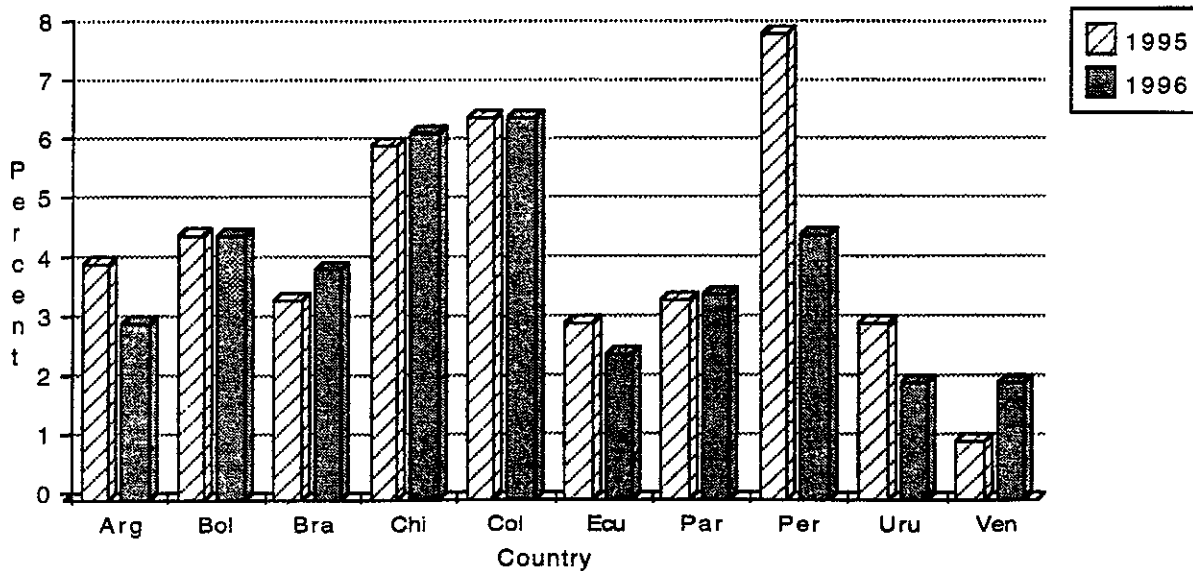
Basic Economic Information

Population by Country, 1994



Source: NTDB

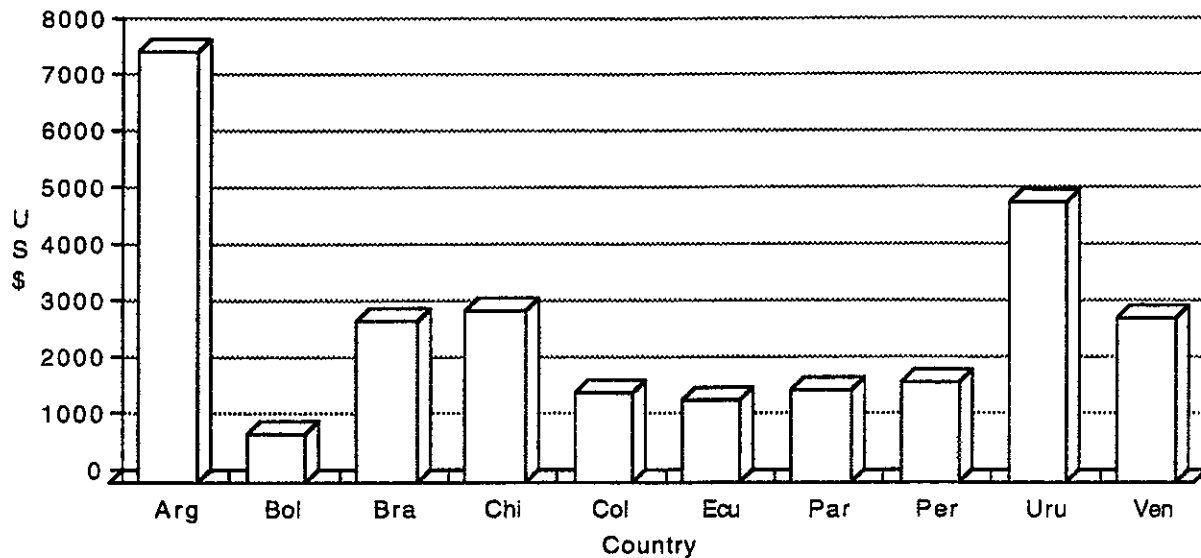
Forecasted GDP Percent Growth, 1995-1996



Source: NTDB

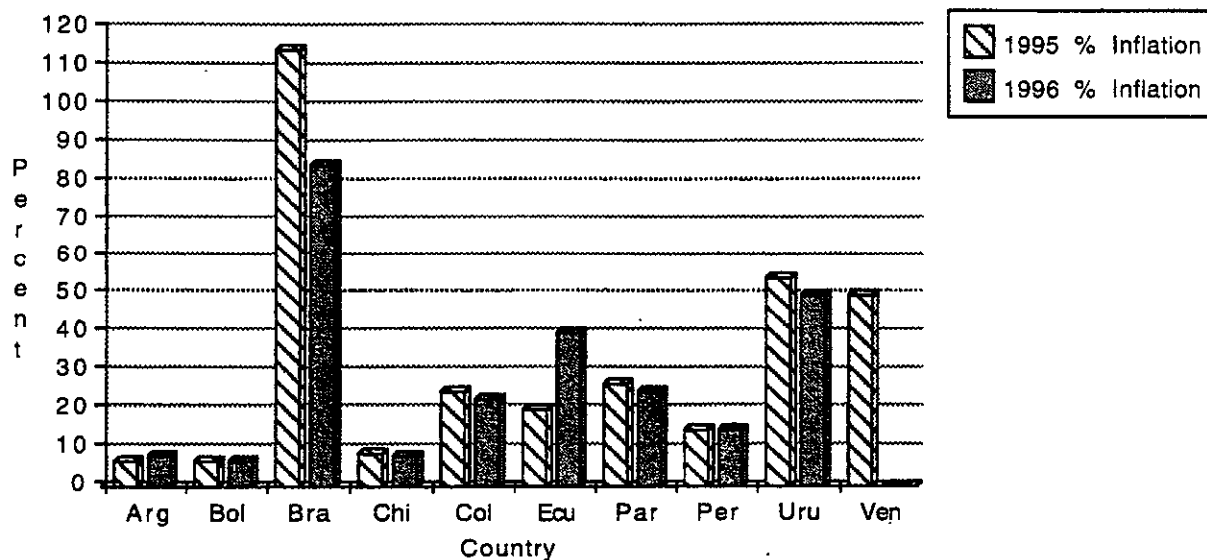
Regional Overview: Infrastructure in South America

GDP per Capita by Country, 1994



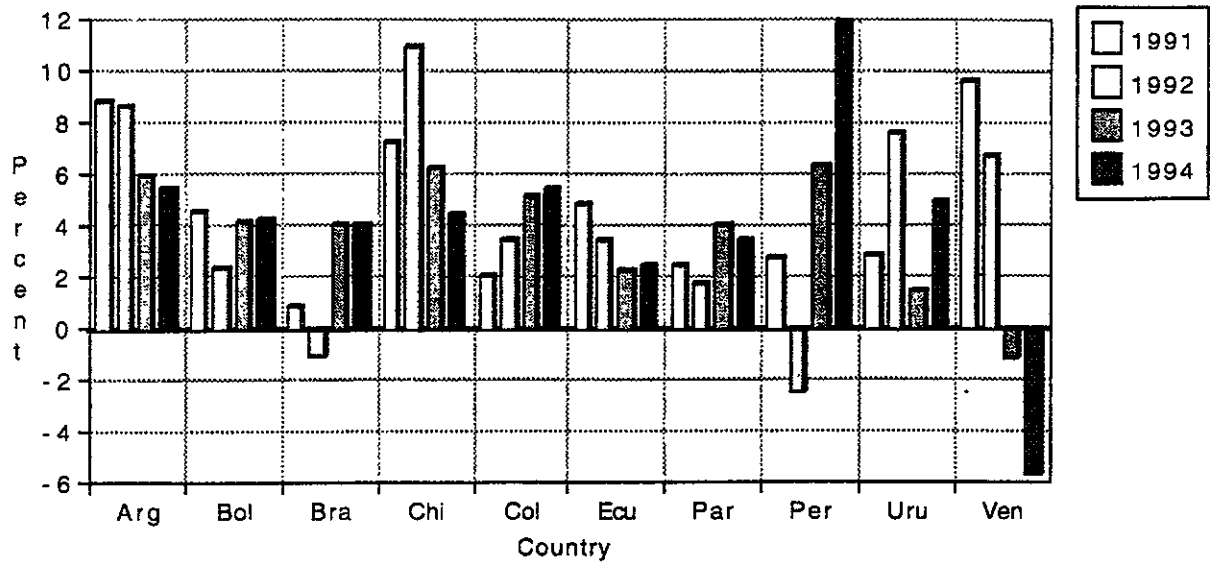
Source: NTDB

Forecasted Consumer Price Inflation, 1995-1996



Source: NTDB

GDP Growth by Country, 1991-1994

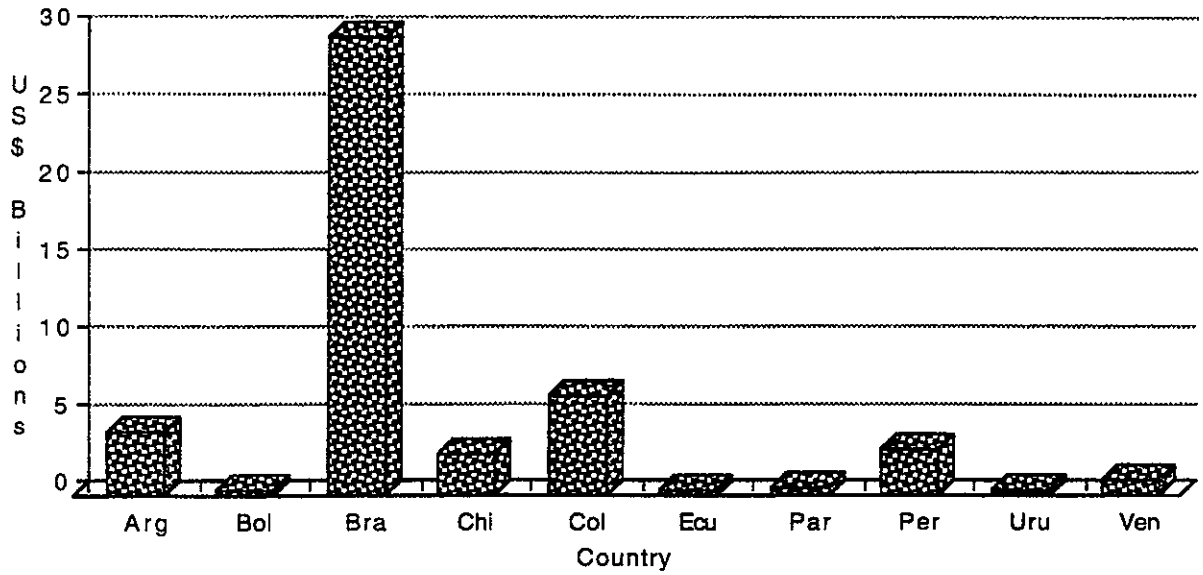


Source: NTDB

Regional Overview

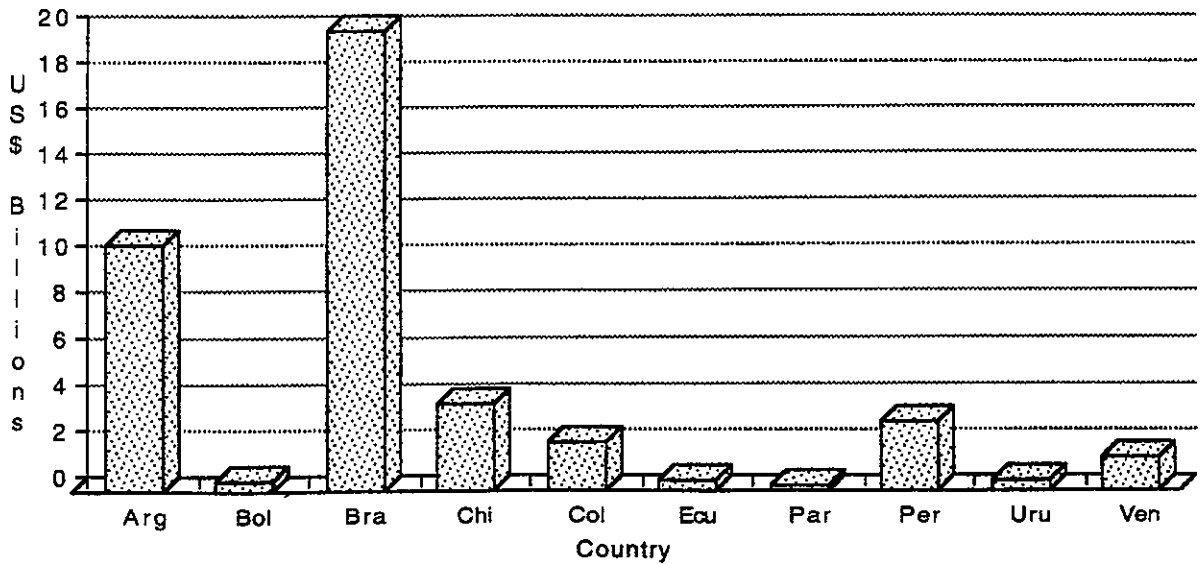
Basic Infrastructure Information

Expected Energy Sector Market, 1995-2000



Source: NTDB

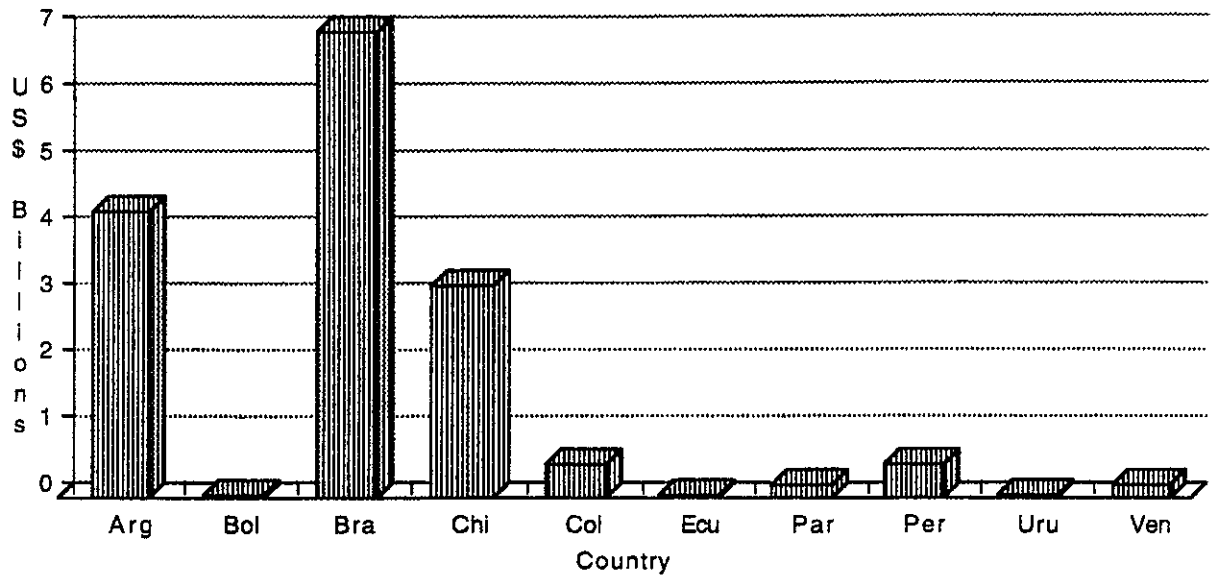
Expected Telecommunications Sector Market, 1995-2000



Source: NTDB

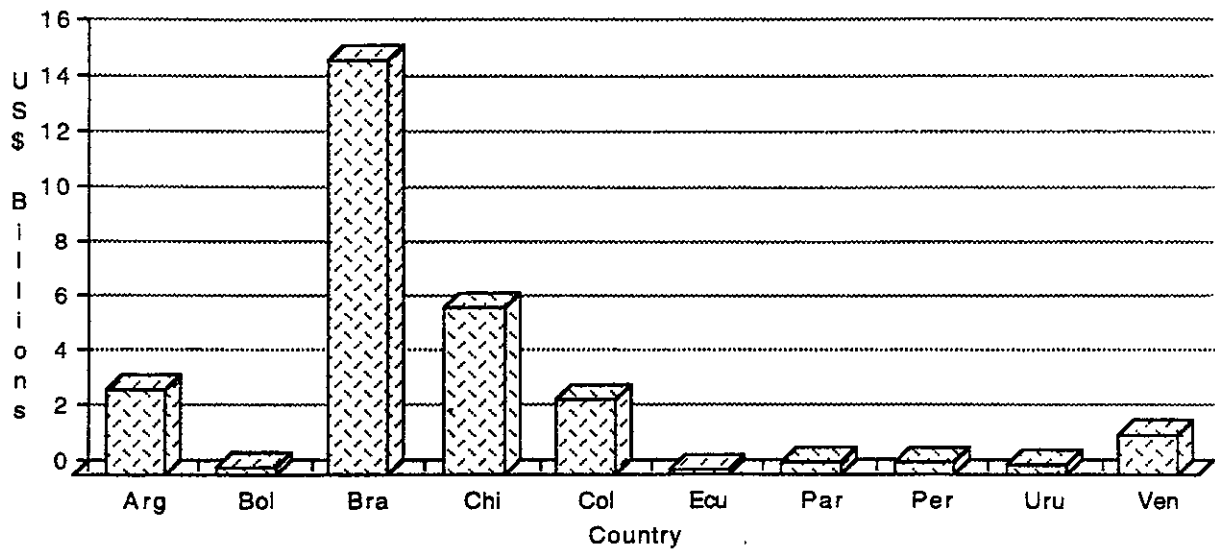
Regional Overview: Infrastructure in South America

Expected Environment Sector Market, 1995-2000

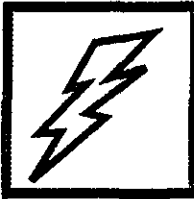


Source: NTDB

Expected Transportation Sector Market, 1995-2000



Source: NTDB



The Energy Sector in South America



Introduction

South America's energy markets are undergoing a tremendous transformation, in terms of structure, philosophy and fuels. The most startling development is that these enterprises are being run as going concerns rather than as state monopolies. This leaves decision making in the hands of executives whose overwhelming concern is price, quality and delivery — and who for the most part, welcome transparency, in all its forms.

Within this area of great transformation we have identified a number of areas of specific opportunity for U.S. equipment suppliers, project developers and investors. We believe that this is a single marketplace, with a unified set of trends. More importantly, it is clear that it is a nascent marketplace —developing its momentum *right now*.

THIRTY-ONE ENERGY PROJECTS

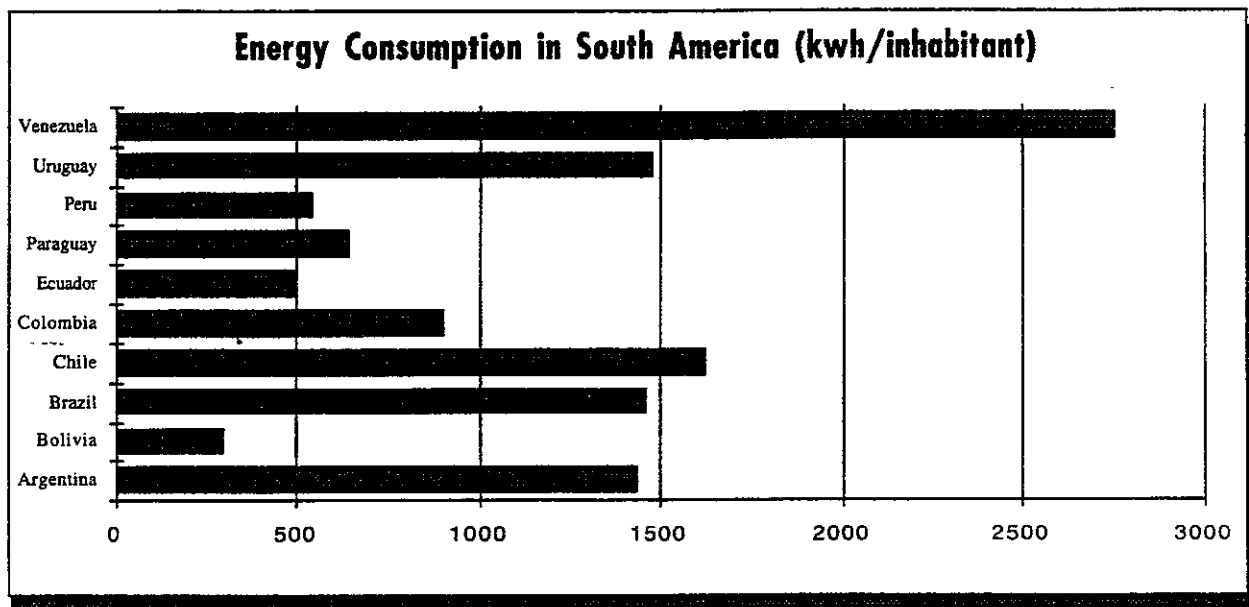
Total value:	\$15 billion
U.S. Export potential:	\$10 billion
Independent Generation	14
Distribution	3
Transmission	1
Pipelines	3
Other	10

The Energy Sector in South America

Investments in the South American energy sector will likely top U.S.\$150 billion over the next ten years, and may be higher if the current export-driven growth continues. Demand growth in virtually every country is at the 7 percent level, which means that overall demand will more than double in ten years—at current rates. Modernization and system and service upgrading will require significant investment. To be successful, businessmen will have to understand overall trends, as well as the very subtle differences that will allow them to have local success. Chile, for example, is a fairly organized market, and thinks of itself that way; Peru is chaotic, and characterized by roiling pent-up demand; and Brazil is a market being dragged to modernity by an intensely productive industrial sector.

Demand & Key Trends in South America's Energy Sector

Demand for energy in South America will at least double over the next ten years, and will do much better than that in a number of countries and regions. Driving forces will be GDP growth, tremendous increases in industrial production (among competitive industries and in export corridors, led by exports), and per capita increases in consumption. Satisfaction of this new demand will be facilitated by the overall transformation of the sector.



Source: Olade, 1993

We see three characteristics of this transformation:

- Privatization/Sector Reorganization
- Natural Gas Pipeline Development
- The Creation of an Independent Power Market

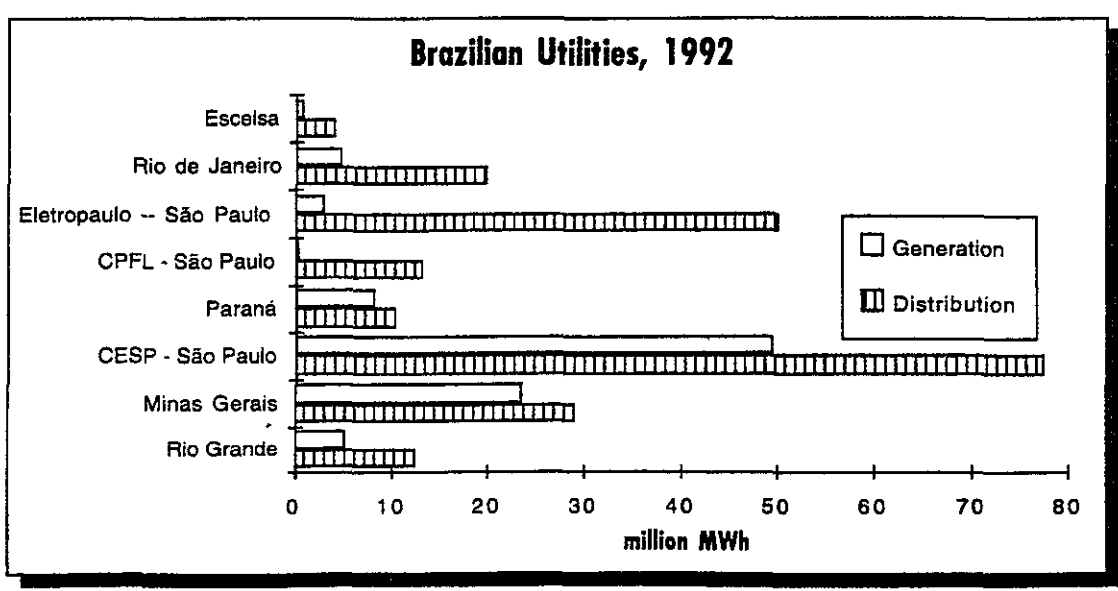
#1 Privatizations

The privatization process continues, with two Brazilian utilities scheduled for privatization this year, along with privatizations in Bolivia, Peru, Paraguay and Colombia. This is the sine qua non for market development. With privatization, subsidies end, tariffs reach their real levels, and additional capacity can be contracted for on a rational basis. In addition, because privatization is accompanied by competition, energy providers need to develop all that is required to become competitive service firms.

The driving model is that developed by Chile in the period 1978-1982 when the country divided its national monopolies into generation, distribution and transmission sectors, each with market-based competitors. The aim was to create a new system with a high incidence of competition. There are now 11 generating companies in Chile. The new system is a marginal cost pricing model, and it has served as the basis for reforms in Argentina, Peru, Colombia and—now—Brazil. Tariffs are calculated on a marginal cost basis, and dispatch is ordered by efficiency.

We have identified two privatizations as specific projects: Brazil's Escelsa and Bolivia's ENDE. The Brazilian privatization is particularly interesting, because—after a tremendous wait—it is the first of Brazil's eight major utilities to be privatized. The strategic value of this privatization merits careful evaluation.

São Paulo has plans to privatize its largest utility, CESP, along the lines of the Chilean model—breaking the firm into generation, distribution and transmission companies. The goal is to create as many as ten distribution companies. This has already occurred in the Buenos Aires area, and should extend to the provinces. The process is being replicated in Peru.



Source: Banco Votor (Brasil)

#2 The Natural Gas Pipelines & New Fuels

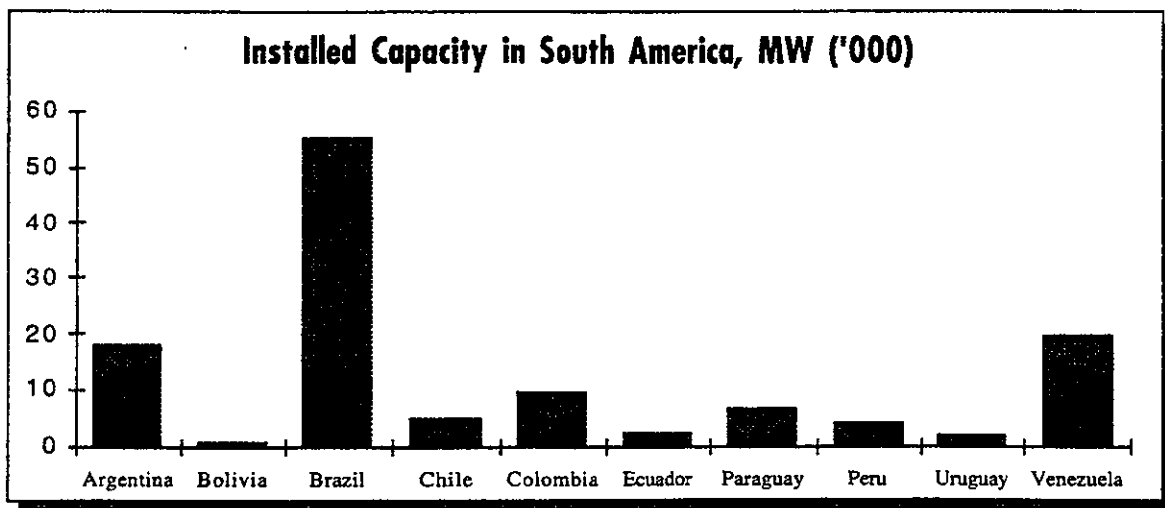
There are natural gas pipelines under consideration all over South America. The most well-known is the Bolivia/Brazil pipeline (profiled in this book). In addition, there are at least two pipeline projects that will send Argentine gas to Chile, numerous projects in Peru, and the virtual gasification of Colombia.

Each of these pipelines will create significant export opportunities, initially in terms of compressors and related equipment, and immediately thereafter in terms of power-generating plants. All told, we have identified 17 projects in this general area.

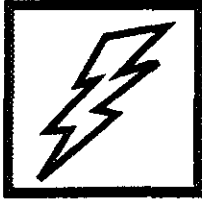
Most new generation will not be hydroelectric power. It is critical to understand, as well, that the general restructuring of the industry in South America is creating opportunities for new fuels (we have included two biomass projects), and new technologies (we have included three clean coal projects).

#3 The IPP Market

The IPP market has not begun in South America, but it will inevitably come online in the very near future. All of the new systems envision private investment in power generation. With demand increases averaging 7 percent (and as high as 12 percent in some countries) it is clear that a large part of South America's 120,000 MW requirement for the next ten years will be supplied by independent power producers.

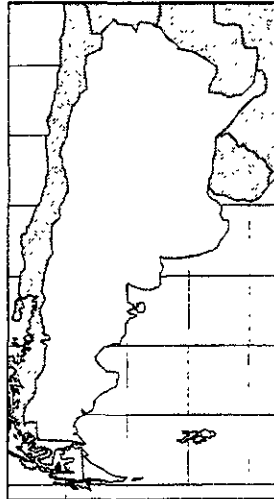


Source: Olade, 1993



Energy / Argentina

EDENOR Investment Program



Project Summary

Project No:	ENE-01
Subsector:	Power
Country:	Argentina
Project Cost:	\$330m-\$370m
Export Potential:	\$165m-\$185m
Owner:	EDENOR

Empresa Distribuidora Norte S.A. (EDENOR) holds a concession from the Argentine government to provide exclusive electricity distribution within its service area for 95 years. The concession was awarded in 1992. The service area consists of the northern portion of the city of Buenos Aires and several counties in Buenos Aires Province. As of December of 1994, EDENOR had approximately two million customers.

EDENOR is owned by three parties—Electricidad Argentina (51 percent); the federal government (39 percent) and a labor union (10 percent).

Technical Description

EDENOR inherited a distribution system that had not been operated as a profit-making business for many years. The distribution system was in poor physical condition and badly in need of maintenance—energy losses through theft were around 20 percent; worker productivity was low and featherbedding was common. Customer service and response was also poor.

The last two years have seen improvements in all these areas. For example, theft of electricity has been reduced by half. As in the concession granted to Empresa Distribuidora Sur S.A. (EDESUR), the Concession Agreement requires a long-term investment program to expand, upgrade, and improve service. EDESUR has also embarked upon an aggressive program to reduce electricity theft and thereby increase system revenues.

EDENOR Investment Program

Infrastructure Project Profiles

Site

EDENOR's service area covers the northern part of the city of Buenos Aires and several counties in Buenos Aires Province.

Timing

The first part of the expansion plan will be implemented over the next three years.

Equipment & Services Demand

EDENOR is making investments to increase efficiency, reduce theft, and improve profitability. The principal areas of investments are:

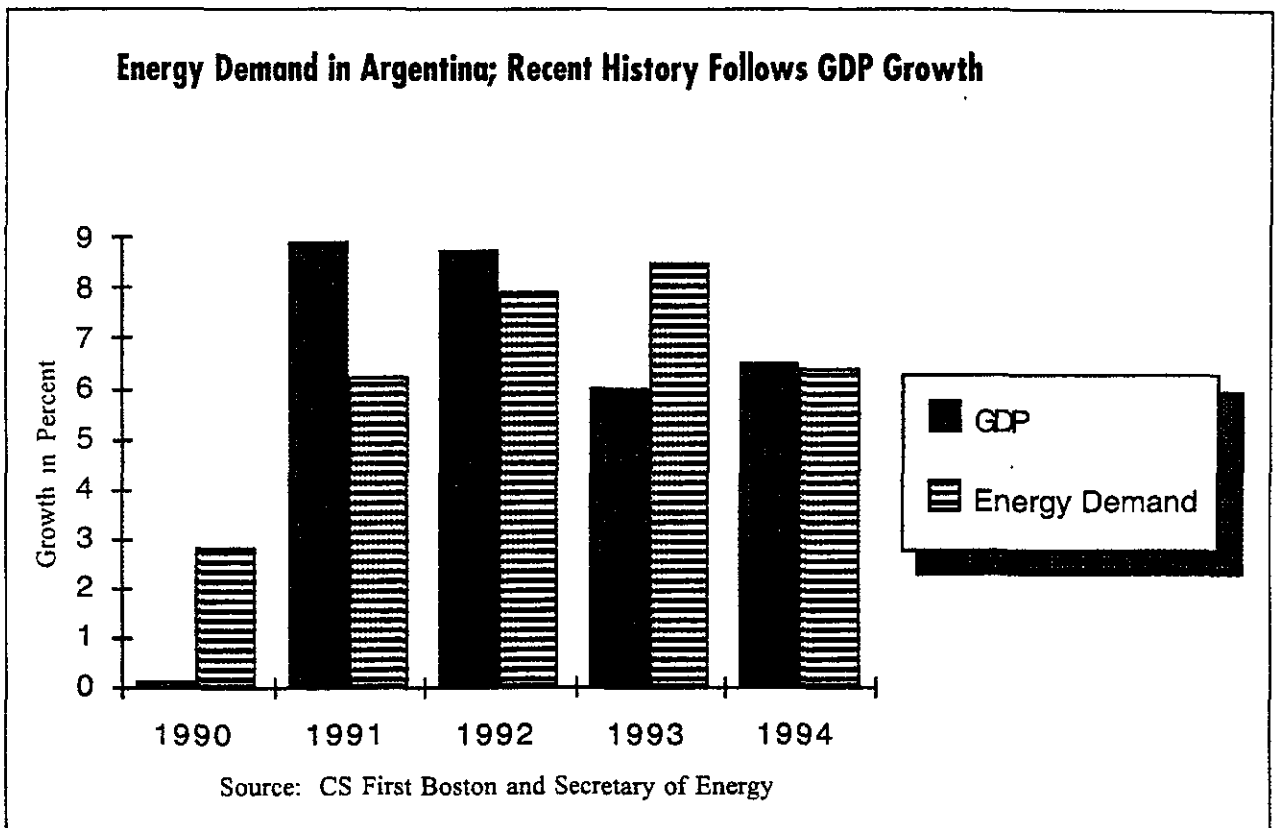
- 1) Expansion and improvement of the transmission network.
- 2) Expansion and improvement of the distribution grid.
- 3) Reduction of theft.

EDENOR will invest U.S.\$120 million to U.S.\$140 million to be spent over each of the next two years, followed by annual expenditures of U.S.\$90 million. Principal equipment purchases include: meters, transmission cable, switches, transformers and other substation equipment. In 1996, EDENOR is planning a tender for 800 transformers.

Nature of Demand

Before 1990, almost the entire electric power sector—generation, transmission, and distribution—was owned and operated by the Federal Government. Unfortunately, the sector was not operated as a business, and inefficient management, inadequate capital spending, and overstaffing resulted in high rates, poor service quality, mounting deficits, and the deterioration of physical equipment. The Menem administration concluded that fundamental change was necessary, and in January 1992 it established guidelines for restructuring and privatizing the power sector.

The sector has now been divided into generation, transmission, and distribution subsectors. Distinct, private companies now provide services in each of these subsectors, although many of the provinces still retain government ownership and operation.



EDENOR originally projected annual power consumption growth rates of 6 percent in its service area. The slowdown in the economy in the first part of 1995 has caused it to begin a downward revision of its figures. However, demand growth is expected to parallel GDP growth through the year 2000.

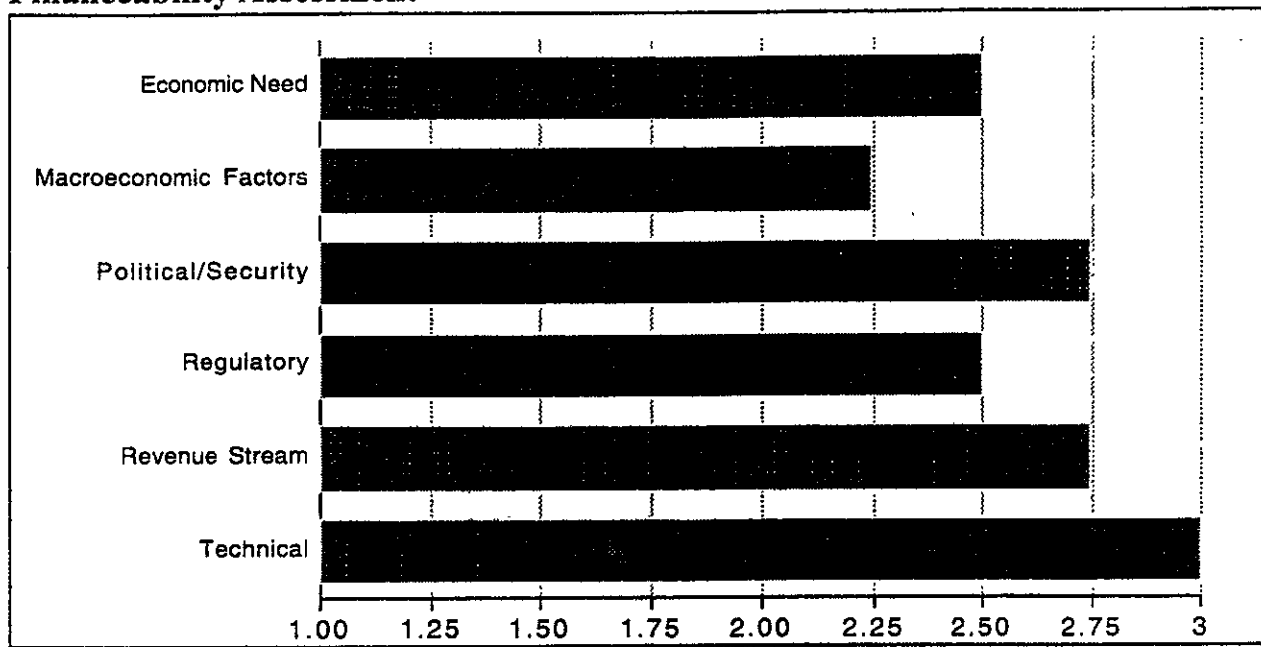
Financeability

The project will be financed by EDENOR's owners as a service and equipment procurement. Both EDENOR's owner and the system are financially strong enough to support the level of investment. We find few financial obstacles to the investment program.

EDENOR Investment Program

Infrastructure Project Profiles

Financeability Assessment

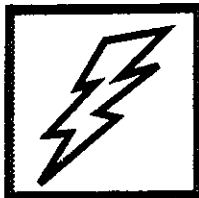


Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

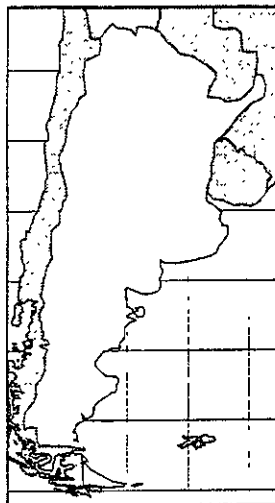
Key Decision Makers

EDENOR
 Oscar Marano, *Director, Office of Administration and Finance*
 Buenos Aires, Argentina
 ph: (54-1)-334-4229
 fax: (54-1)-348-2149



Energy / Argentina

EDESUR Investment Program



Project Summary

Project No:	ENE-02
Subsector:	Power
Country:	Argentina
Project Cost:	\$320 million
Export Potential:	\$160 million
Owner:	EDESUR

Empresa Distribuidora Sur S.A. (EDESUR) holds a concession from the Argentine government pursuant to an agreement dated August 5, 1992 to provide exclusive electric distribution services within its service area for a period of 95 years. The service areas consist of the southern portion of the city of Buenos Aires (including the central business district) and several counties of Greater Buenos Aires. Approximately 5.5 million people live within the service area. As of December 1994, EDESUR had approximately two million customers, of which 83.8 percent were residential and 16.2 percent were commercial and small industries.

Technical Description

In 1992 EDESUR took over distribution systems that were characterized by high levels of electricity theft, low productivity, poor condition of the distribution grid, and lack of client service orientation. EDESUR has made substantial progress in all areas. Requirements of the Concession Agreement and the need to increase income are the reasons EDESUR has embarked on a long-term investment program. The primary areas in which investments will be made are in the expansion of the transmission network as well as the improvement and renewal of the distribution grid.

Site

Southern part of the Buenos Aires metropolitan area.

EDESUR Investment

Infrastructure Project Profiles

Equipment & Services Demand

The principal investment areas are:

- Expansion of the transmission network
- Improvement of the transmission grid
- Expansion of the distribution network
- Improvement of the distribution grid
- Reduction of power losses

The three-year investment plan calls for U.S.\$320 million in spending. Due to the slowdown in the Argentine economy in 1995, current-year spending will likely be below the average, but economic recovery in 1996 and beyond is expected to generate higher levels of investment.

Principal equipment purchases include transmission cable and transformers.

Nature of Demand

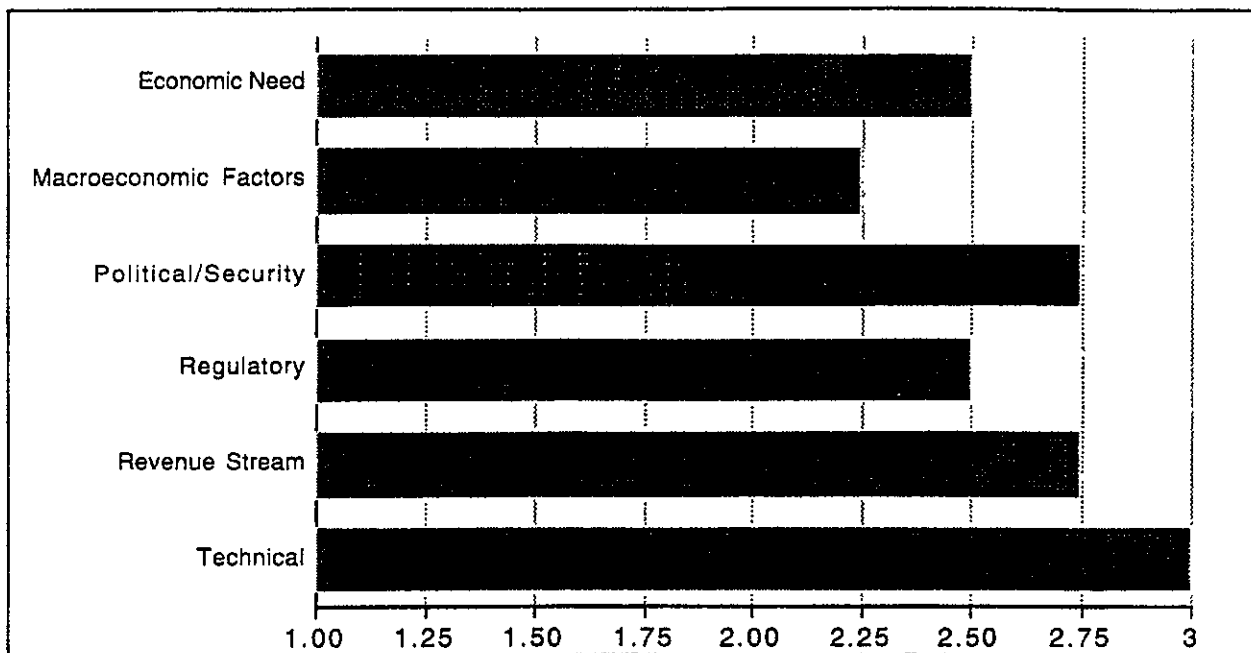
In 1990, almost all of the electricity supply industry was owned and operated by the federal government. However, years of inefficient management and inadequate capital spending had resulted in high rates, poor quality of service, a disastrous financial condition, and deterioration of the quality of the physical equipment. Accordingly, the government decided that fundamental change was necessary and, in January 1992, established the guidelines for the restructuring and privatization of the electricity sector. Basically, the sector has been divided into generation, transmission, and distribution of electricity. Separate, private companies now provide services in each of these subsectors.

EDESUR is making investments to increase efficiency, reduce losses and improve profitability.

Financeability

The project will be financed by EDESUR's new private-sector owners through operating revenues and commercial loans. Opportunities for U.S. firms exist in the direct sale of equipment and services. The pace of the investment program will be determined by Argentina's economic growth and the financial strength of EDESUR. Slow growth in Argentina is currently suppressing demand but long-term prospects are sound.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

EDESUR

Alejandro Di Capua, *Manager of Finance*

Buenos Aires, Argentina

ph: (54-1) 383-9549/4461

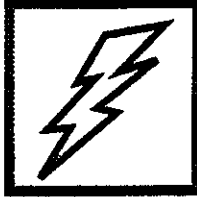
fax: (54-1) 381-7846

Horacio Areco, *Chief of Treasury and Financial Resources*

Buenos Aires, Argentina

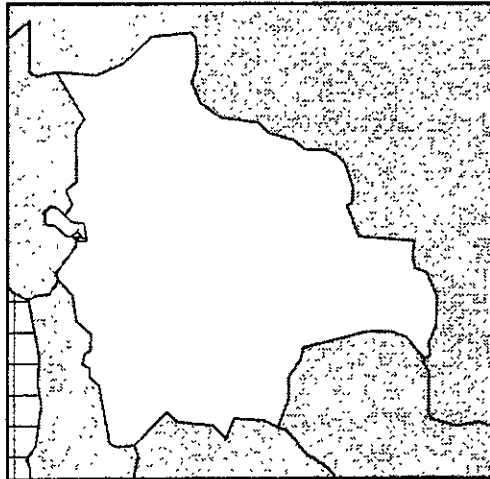
ph: (54-1) 381-2669/3920

fax: (54-1) 381-7846



Energy/Bolivia

ENDE Capitalization and Expansion



Project Summary

Project No:	ENE-03
Subsector:	Power
Country:	Bolivia
Project Cost:	\$350 million
Export Potential:	\$190 million
Owner:	To Be Determined

The Bolivian electricity system is divided into an interconnected system, the SIN, and a number of isolated systems. It includes both vertically integrated companies and separate utilities, with a mixture of private and public ownership. The state-owned part of the system is held by the National Electricity Company (Empresa Nacional de Electricidad S.A., or ENDE), and constitutes a total installed capacity of 495 MW, or 63 percent of the country's installed generating capacity and 75 percent of the capacity of SIN.

Bolivia has one of the least developed electricity industries in Latin America (total installed capacity of 783 MW, only 64 percent of the population with access to electricity and a per capita consumption of 320 kilowatt hours per year), but the market has been growing at the rate of 7 percent per year. In addition, ENDE has been a profitable enterprise and has generated considerable attention among foreign firms interested in acquiring it.

The purpose of the privatization through the capitalization process is to provide for expansion and modernization of the national electricity sector through the use of privately generated capital. Financing is to be provided by the successful bidder.

ENDE Capitalization and Expansion

Infrastructure Project Profiles

Technical Description

The Bolivian government has initiated a process to capitalize ENDE through an international sales tender. In July 1994 the government received submissions from and classified 31 bidders as "Pre-Selected Companies." Of these 31 companies, 20 were from the United States. In March 1995 the government announced that it would accept bids as outlined in the Terms of Reference until May 2, 1995. A final adjudication of the bids was postponed until July.

Technically, the bidding is for a 50 percent share in each of three generating companies (two thermal and one hydro). The successful bidder will be awarded management control of the three generating companies for a period of five years.

The three generating companies are:

Empresa Corani - includes the 54 MW Corani and 72 MW Santa Isabel hydroelectric facilities near the city of Cochabamba. Capitalization will include the right to develop certain new hydroelectric projects.

Empresa Guaracachi - consists of the 186 MW Guaracachi gas-fired facility in the city of Santa Cruz, the 46 MW plant in Sucre and the 15 MW plant in Potosí.

Empresa Valle Hermoso - consists of three gas-fired stations near Cochabamba and two 120 MW plants at Carrasco, currently under construction.

Company	Installed Capacity (MW)	Production (GWh)	Type
Guaracachi	248.1	920.3	Thermal
Corani	126.0	484.6	Hydro/Thermal
Valle Hermoso	87.2	282.1	Thermal
TOTAL	461.3	1,687.0	

Source: ENDE, 1994

In addition, bidders were also able to bid for existing studies and assets relating to the development of the 500 MW Puerto Suárez gas-fired plant near the Brazilian border and the Laguna Colorada geothermal project near the Chilean and Argentine borders. Of further interest is the fact that the three generators and the other existing generator in the SIN will have, subject to certain exceptions, exclusivity in obtaining new generation licenses in the SIN until December 31, 1999.

Site

Multiple locations across Bolivia. Corani and Valle Hermoso are located near Cochabamba; Guaracachi is located in the East near Santa Cruz.

Timing

The results of the bidding for ENDE will be announced in July 1995. Expansion and modernization plans are expected to be announced in the second half of 1995 and into 1996.

Equipment & Services Demand

To be determined by the successful bidder, expansion and modernization plans are expected to be in excess of 355 MW of installed capacity—200 MW of hydro power and 150MW of thermal. Given a nominal cost of U.S.\$1 million per MW installed, the required investment could reach U.S.\$350 million.

Company	Projects	Installed Capacity (MW)	Type
Guaracachi	Laguna Colorada	120	Thermal
Corani	Hydroelectric projects	195	Hydro
Valle Hermoso	Central Carrasco Expansion	40	Thermal
TOTAL		355	

Source: ENDE, 1994

Nature of Demand

The seven percent annual growth in electricity demand and the government's shortage of capital are driving this project.

ENDE Capitalization and Expansion

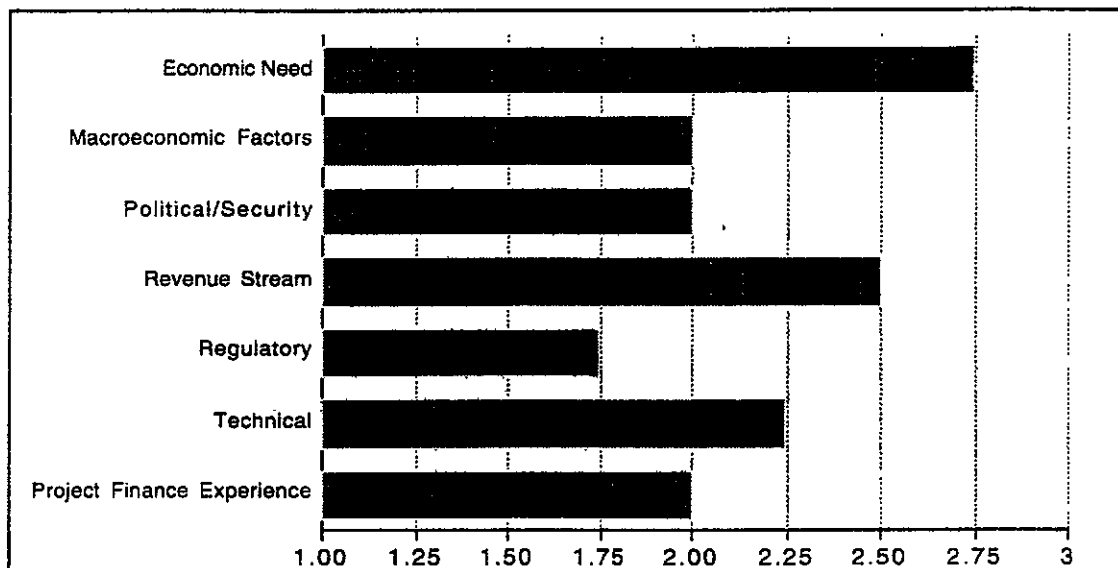
Infrastructure Project Profiles

Financeability

Political/Security: The key to financeability will be the country's stability. The capitalization program has been very controversial and consequently has experienced problems, many of them political.

Regulatory issues: The capitalization of ENDE has been delayed because regulations are not yet in place.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

U.S. companies interested in participating in ENDE's future expansion should contact the winning bidder, who will be determined by:

Ministry of Capitalization

Guillermo Ramiro Alborta Valda, *Undersecretary for Capitalization*

La Paz, Bolivia

ph: (59-12) 351-859

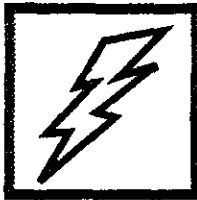
fax: (59-12) 11-2823

Edgar Saravia, *National Secretary of Capitalization*

La Paz, Bolivia

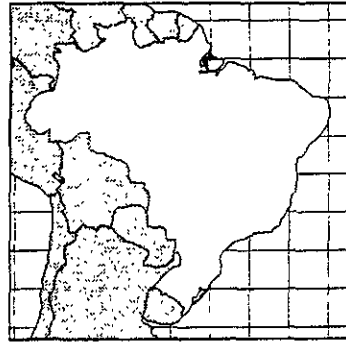
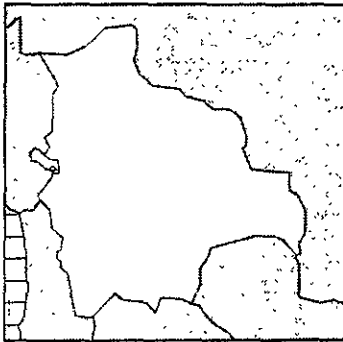
ph: (59-12) 351-859

fax: (59-18) 112-823



Energy / Brazil / Bolivia

Brazil-Bolivia Natural Gas Pipeline



Project Summary

Project No:	ENE-04
Subsector:	Gas
Country:	Brazil/Bolivia
Project Cost:	\$2 billion
Export Potential:	\$1.5 billion
Owner:	BTB, Petrobrás, YPFB, Enron

Technical & Site Description

Last year's renegotiation of the 1993 gas purchase and sales agreement increased the gas volume, pipeline diameter, and level of Bolivian participation in the project company. Under the terms of the addendum to the original take-or-pay contract, Bolivia will deliver 12 million cubic meters of gas per day—up from eight million originally—through 2003, and 24 million cubic meters from 2004 through 2017.

The project is now expected to go forward, despite last-minute maneuvering by both the Bolivian and Brazilian sides. The pre-qualification process is set to start in June.

The 13 sections of pipeline, varying from 14" to 32" in diameter, will transport natural gas 3,075 kilometers from Santa Cruz de la Sierra in eastern Bolivia to São Paulo, and then south to Porto Alegre. Phase I extends from Bolivia to Guararema (in the state of São Paulo); Phase II stretches from Campinas to Porto Alegre. Future expansion of the pipeline may include the construction of a branch to Belo Horizonte.

Brazil-Bolivia Natural Gas Pipeline

Infrastructure Project Profiles

Petrobrás has completed a description of the Brazilian route characteristics and geography as well as pipe specifications:

Pipeline Section	Country	Length (km)	Diameter (inches)	Width (inches)	Pipe
Santa Cruz-San Miguel River	Bolivia	280	32	.406	API 5 L X-70
San Miguel River-Puerto Suárez	Bolivia	280	32	.406	API 5 L X-70
Corumbá-Miranda	Brazil	200	32	.451	API 5 L X-70
Miranda-Ribas do Rio Pardo	Brazil	250	32	.451	API 5 L X-70
Ribas do Rio Pardo-Três Lagoas	Brazil	250	32	.451	API 5 L X-70
Três Lagoas-Pongai	Brazil	250	32	.451	API 5 L X-70
Pongai-Campinas	Brazil	300	32	.451	API 5 L X-70
Campinas-São Paulo (Guararema)	Brazil	155	24	.312	API 5 L X-70
Campinas-Riberão Branco	Brazil	240	22	.344	API 5 L X-70
Riberão Branco-Curitiba	Brazil	200	22	.344	API 5 L X-70
Curitiba-Tijucas	Brazil	240	18	.280	API 5 L X-65
Tijucas-Criciúma	Brazil	190	16	.250	API 5 L X-65
Criciúma-Porto Alegre	Brazil	240	14	.219	API 5 L X-65
TOTAL		3075			

Timing

Last year two international consortia of public and private companies were awarded the project. The consortia, led by Petrobrás and YPF, have yet to issue a request for bids, but a call for interest was made in December of last year. It is likely that bids for materials supply, including pipe, will come first. Subsequent rounds of bidding will contract firms for design, construction, and other services.

The construction schedule issued in December has been delayed as feasibility studies are not yet complete. However, Petrobrás estimates construction for Phase I—from the Corumbá on the Bolivian border to São Paulo—to be 21 months. Construction of Phase II—São Paulo to Porto Alegre—is estimated at 27 months. According to reliable sources, bidding for Phase I will begin in June of this year.

Equipment & Services Demand

The equipment supply portion of the contract alone could total an estimated U.S.\$1.25 billion of the U.S.\$2 billion total cost of the project. The project will require 17 compressor stations.

Major equipment purchases in the first tender include:

- coated pipe
- motorized and manual valves
- field instruments
- sleeve pipe
- materials for joints
- terminals
- tubing and connectors for instruments
- electric drainage equipment

Nature of Demand

After 50 years of reliance on hydrologically generated electricity, cost considerations and environmental concerns are causing Brazil (and especially the state of São Paulo) to prioritize thermal power. Since 1992, the government has slowly restructured the electric power sector along market lines in: a) tariff structures, b) sector finances, c) transmission network, and d) fuel use.

In January 1995 Brazil passed its Concessions Law which opens the power sector up to private participation. More specific additional legislation on independent power and cogeneration is expected to be passed in 1995, as well as implementing regulations. Since Brazil lacks sufficient coal, oil, or natural gas reserves of its own, the country is turning to Bolivia for badly needed fuel for power generation.

Electric power demand is increasing at a rate faster than economic growth. According to S.G. Warburg, the Brazilian economy is expected to grow an average annual rate of 6.5 percent between 1995 and 1997, while power demand is expected to grow at an average annual rate of 7.8 percent. Brazilian power consumption in December, 1994, was 6.2 percent higher than the same time a year earlier, exceeding Eletrobrás' expectation of a 4 percent increase.

Demand for power will grow due to a combination of the following:

- accelerated economic growth
- growth in urbanization
- electrification of rural areas
- increased use of electrical equipment
- industrial modernization and automation

The private sector has seized the opportunity to satisfy demand with ambitious plans to build thermo-electric plants along the pipeline route. Already 2,660-3,860 MW natural gas-fired thermoelectric plants are in the advanced stage of planning:

Brazil-Bolivia Natural Gas Pipeline

Infrastructure Project Profiles

Plant	Project Installed Capacity	State	Project Sponsor
Cubatão	260 MW	Sao Paulo	Zurn-Nepco
Piratininga	450 - 1150 MW	Sao Paulo	BTB
Paulinia*	350 MW	Sao Paulo	Bechtel
Campo Grande	300 MW	Mato Grosso do Sul	Enersul
Corumba	100 - 200 MW	Mato Grosso do Sul	Enersul
Enron Projects**	1200 - 1600 MW	Sao Paulo	Enron

* Studies underway to determine fuel type.

** Project under consideration.

Source: ADTP

Netherland Sewells, a Dutch company, has nearly completed its effort to certify reserves at 32 of Bolivia's natural gas fields. At the beginning of last year total reserves were 6.84 trillion cubic feet, of which 4.46 trillion are proven. Potential reserves are estimated by Bolivia to be in the range of 22-30 trillion cubic feet. In addition to the Brazil project, Bolivia is pursuing a gas export project with Chile and Paraguay, and a potential import project with Peru. To allay concerns about a lack of adequate supply, Bolivia is studying the possibility of reversing the flow on its pipeline between Santa Cruz and the Argentine border, in order to have the capability of pumping gas from northern Argentina.

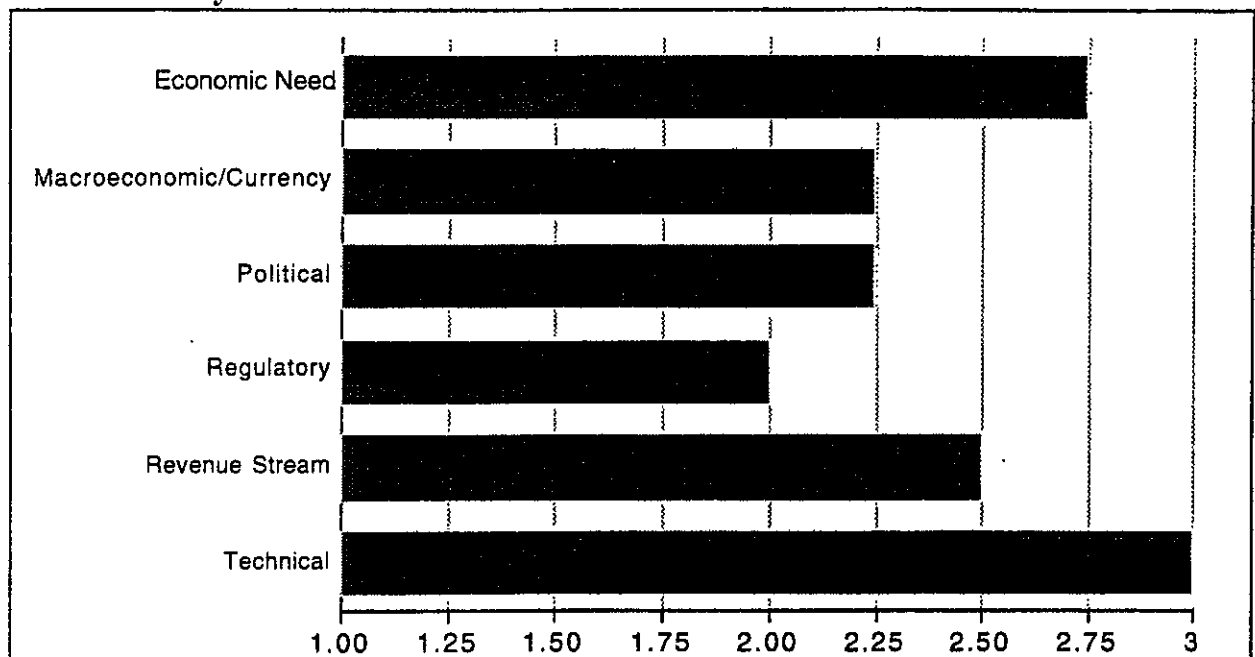
Financeability

The project is driven by Brazil's need for natural gas to build a new generation of thermoelectric plants in order to satisfy its growing demand for power. The "proving up" of Bolivian reserves also provides a critical ingredient for financeability.

The central challenge to the project's financing is its sheer size and complexity. Because of this, the importance of multilateral institutions grows, as a stabilizing force to the financing of the project. The World Bank initially opposed financing the project, particularly if state-owned Petrobrás was the majority owner of the Brazilian pipeline company. Last year, however, the Bank dropped its objection and is now studying, together with the Inter-American Development Bank, the project's financeability. The project consortium is counting on U.S.\$700 million in financing from the multilateral banks. Results of the studies will be complete in July of this year.

Brazil's unsettled regulatory environment for major foreign investments in energy projects must also be resolved. While this is a potential mine field, the government is under strong economic pressure to keep the project on schedule.

Financeability Assessment



Source: CG/LA Infrastructure.

This Finacibility Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Based on the recommendations of financial consultant CS First Boston, the project was organized with two separate companies which would build and operate the pipeline on either side of the border. On the Brazilian side, the company is led by Petrobrás with 51 percent equity; followed by BTB, a consortium made up of British Gas, Tenneco, and BHP, with 25 percent; YPFB, the Bolivian oil company with 20 percent; and a group of Brazilian equipment suppliers which maintain 4 percent. The Bolivian company is composed of YPFB, with 51 percent; followed by Enron, with 34 percent; and Petrobrás with 15 percent. Other critical players include the World Bank and the IDB, which are studying the financing of the pipeline.

Brazil-Bolivia Natural Gas Pipeline

Infrastructure Project Profiles

Tenneco Gas International

Barney Phillips, *Vice President*

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Joel Rennó, *President*

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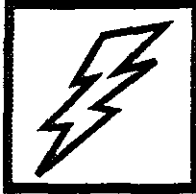
YPFB

Hugo Castaños, *President*

La Paz, Bolivia

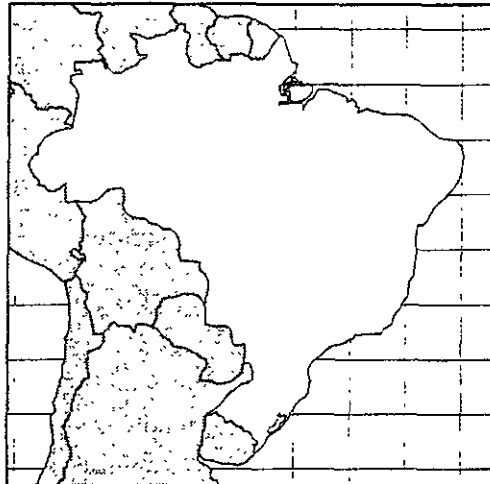
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Energy / Brazil

Center-East Thermoelectric Plant



Project Summary

Project No:	ENE-05
Subsector:	Power
Country:	Brazil
Project Cost:	\$310 million
Export Potential:	\$150 million
Owner:	To Be Determined

The feasibility of building a thermoelectric generation facility in the State of Minas Gerais stems from the movement of coal and iron ore in the Center-East transportation corridor. The quantity of iron ore exported annually through the Port of Tubarão and Praia Mole Terminal exceeds 56 million tons/year, whereas coal imports only reach 7.5 tons/year. This huge imbalance between the imports and exports is precisely what makes importing coal an extremely attractive option for supplying fuel for thermoelectric generation.

Technical & Site Description

A 350 MW coal-fired thermal power plant is to be constructed in or near the city of Ipatinga, in the state of Minas Gerais. The site is located along the Vitória-Minas Railroad, which already brings coal from Tubarão Port to the steel mills located in Ipatinga. Another advantage of this site is its proximity to the Rio Doce river, which would supply the water needed to serve the power plant. In addition, the 500 KV transmission line at the site can easily convey the power generated at Ipatinga, reducing losses and avoiding future investments in its expansion.

Center-East Thermoelectric Plant

Infrastructure Project Profiles

The project will require an investment of \$310 million, and be implemented on a BOT basis. A feasibility study conducted for Consórcio Centroleste, a regional infrastructure development organization, provided an estimate of the operating costs of the plant:

Operating Cost	US\$/Mwh
Fuel	14.27
Labor	1.95
Maintenance	1.88
Equipment	1.13
Insurance	0.20
Total Operating Cost	19.43

Timing

The project is to be implemented immediately, with commercial operation starting in 1999.

Equipment & Services Demand

Much of the equipment and services for the design and construction of the power plant will need to be imported. In addition, scrubbers or other air pollution control equipment will need to be installed, as Brazilian environmental standards are becoming more stringent.

Nature of Demand

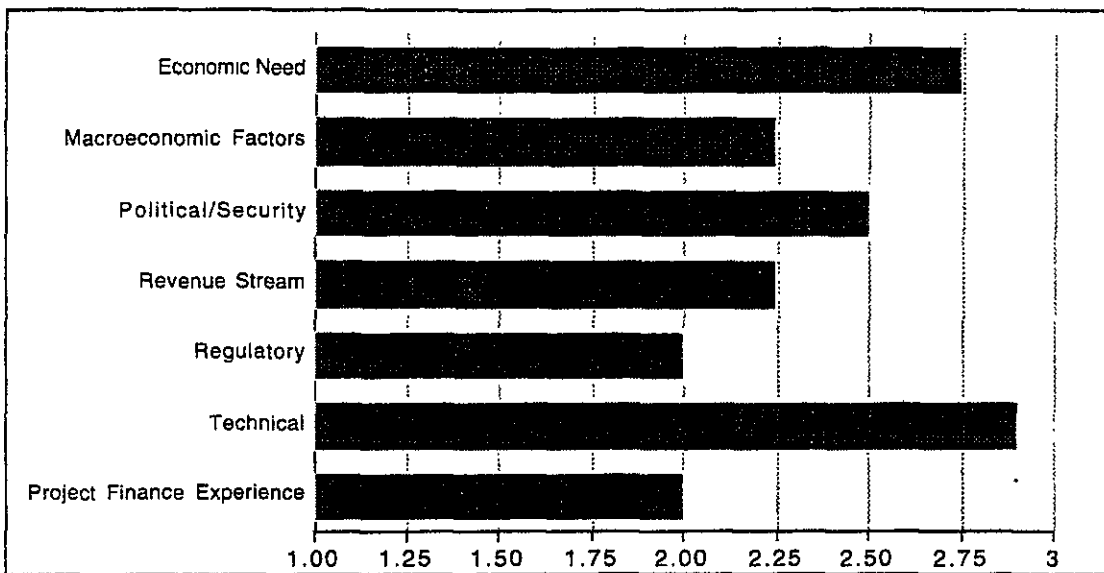
Heavy industry located in Ipatinga, such as Usiminas Steel Mills, Açominas, Cenibra Pulp Plant, Acesita, Usimec, and the city itself, have a power demand of approximately 900 MW, which is currently met by a very long 1,000-kilometer transmission line.

Construction of a new coal fired plant will reduce the industries' reliance on distant hydroelectric facilities and potential power shortages during periods of drought.

Financeability

While the project proposes to provide much needed power to a high concentration of large industrial consumers, the major uncertainty lies in electric power regulations. This project will not be able to go forward until Congress passes the Independent Power Producers Law introduced this year.

Financeability Assessment

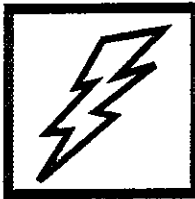


Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

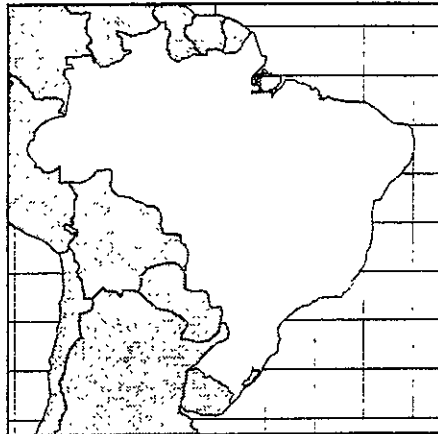
Key Decision Makers

Consr de
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Energy / Brazil

Corumbá & Campo Grande Power Plants



Project Summary

Project No:	ENE-06
Subsector:	Power
Country:	Brazil
Project Cost:	\$420m-\$450m
Export Potential:	\$360m-\$380m
Owner:	Enersul

Technical Description

This project contemplates the construction of two gas-fired generating plants in the state of Mato Grosso do Sul. When completed, Campo Grande will have an installed capacity of 300 MW. Corumbá's capacity will be between 100 and 200 MW. Initial calculations made by project sponsor Enersul, the power distributing and generating company in Mato Grosso do Sul, estimate a cost of U.S.\$420-U.S.\$450 million for the two plants.

The project is dependent on the gas from the Brazil-Bolivia Gas Pipeline, reportedly to be on line in 1998. Enersul is negotiating with Petrobrás on the gas purchase price.

Site

The project calls for the construction of two plants—one at Corumbá and the other at Campo Grande. Both are located close to the pipeline route. Enersul owns the sites likely to be selected for the plants. Enersul has authorization from the Ministry of Mines and Energy for studies and construction of the plants.

Corumbá & Campo Grande Power Plants

Infrastructure Project Profiles

Timing

Since the recent and promising activities surrounding the Brazil-Bolivia Natural Gas Pipeline Project, Enersul has been interested in the construction of thermoelectric plants. Due to insufficient funding, Enersul was not able to go forward with the project on its own. In January, 1995 Brazil passed the new Concessions Law, which has opened the door to private participation in generation facilities. In the next few months, Brazil will have independent power regulations in place permitting private owners to sell to third parties and/or to power utilities, such as Enersul.

Enersul is now interested in talking to private companies, both foreign and domestic, about a number of different mechanisms for raising capital and generating additional power, including an independent power plant which will sell power to Enersul and an arrangement to allow the private partner a minority stake in plant ownership.

With the conclusion of the agreement to import gas from Bolivia, the GCPS, Eletrobras' planning arm, approved a plan for an expansion of local generation in the state. The original plan called for 240 MW of capacity through the year 2003: 150 MW at Campo Grande and 90 MW at Corumbá. Feasibility studies for Campo Grande and Corumbá conducted under the last government are being reanalyzed. Results of a new feasibility study will be ready by the end of 1995.

In the last two years, Enersul has received expressions of interest from BTB, Marubeni, Fiat and other companies, but it has not made any decisions and is still looking for new proposals.

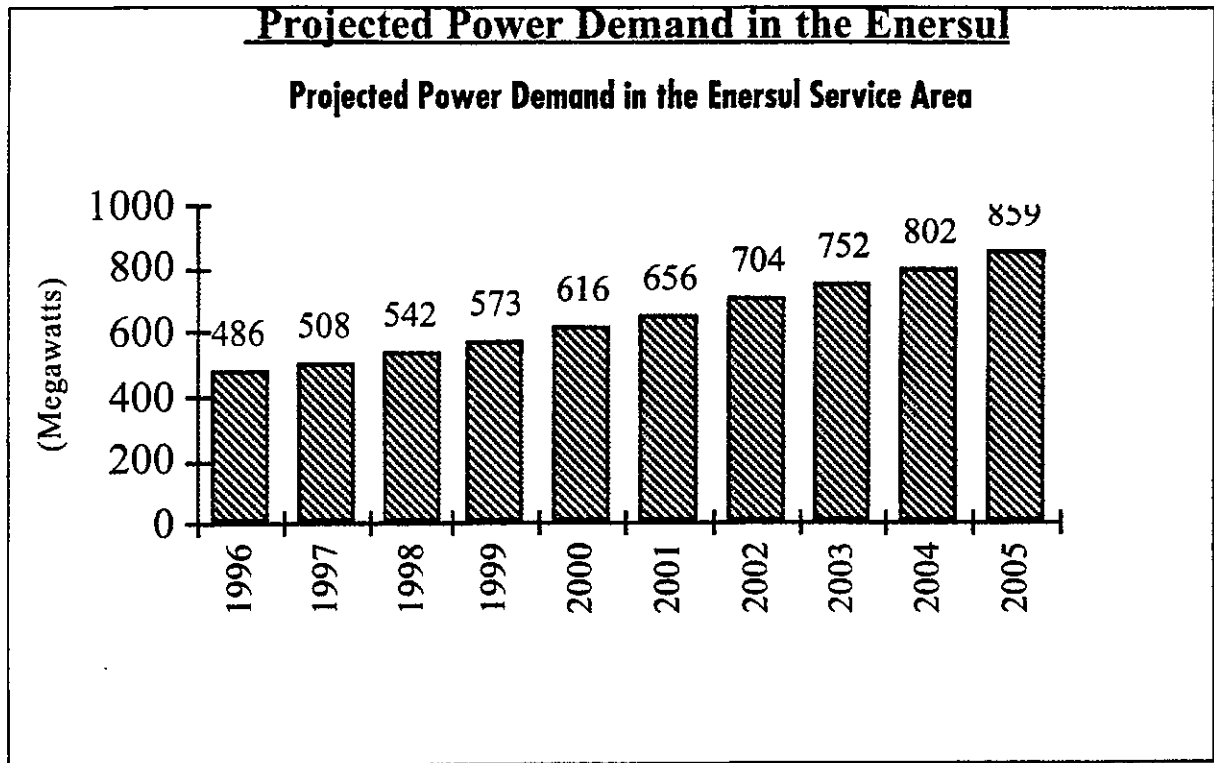
Nature of Demand

Mato Grosso do Sul, a wealthy agricultural and mining state in the Brazilian Center-West region, has tremendous potential for growth due to its location, rich farm land, and rapidly growing population. The Brazil-Bolivia Natural Gas Pipeline, scheduled to go on line in 1997, will cross Mato Grosso do Sul from Corumbá, located on Bolivia's western border, to its eastern border with São Paulo.

Corumbá is a major mining center producing iron ore, manganese, and lime. Campo Grande, the state capital, is an administrative center surrounded by a grain-producing agricultural area.

In Mato Grosso do Sul, Enersul currently has a demand of 443 MW, but only produces 8 percent of its own power. Enersul has a total installed capacity of 48 MW. Its principal generation facilities consist of the 30 MW Mimoso Hydroelectric Station and some smaller thermoelectric plants. The remainder of Enersul's power for the state must be bought from ELETROSUL, CESP, Itaipú Binacional and others.

Enersul's major industrial consumers include two cement producers, one metalworks, one agrobusiness, several refrigerator storage facilities, and a paper producer. Enersul's initial studies predict energy rationing by next year if no new generation capacity is added.



Financeability

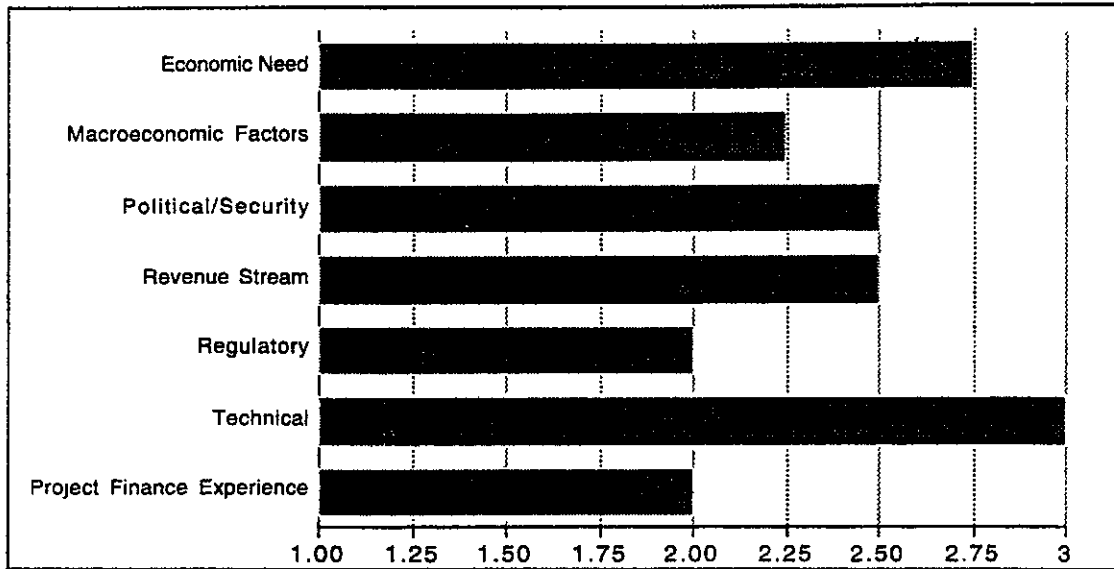
The financial and ownership structure of the project has yet to be determined but, it will be financed and constructed through private sources with revenues tied to power sales. The region's ability to support the necessary revenue stream is favorable, as the region is economically strong and will face power shortages if new capacity is not constructed.

Brazil's private power regulations are still under formulation and at this point could not be a basis of support for project financing. Market pressure for new generating capacity should ensure that Brazil will have a functioning regulatory system by year end 1995. Financeability overall is first dependent on the Brazil-Bolivia pipeline and the security of financing thereof.

Corumbá & Campo Grande Power Plants

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

The key decision makers are the Ministry of Mines and Energy and Enersul. The Ministry of Mines and Energy is working on the new power regulations—to be completed in the next few months—which will allow for independent power production.

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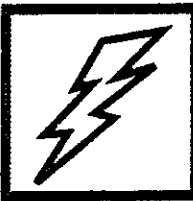
National Department of Water and Electric Energy (DNAEE)

José Said de Brito, *General Director*

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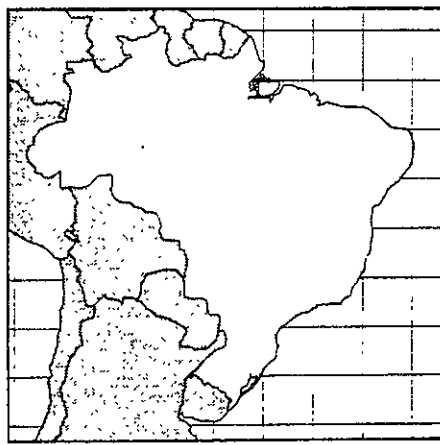
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Energy/Brazil

CSN Thermoelectric Plant



Project Summary	
Project No:	ENE-07
Subsector:	Power
Country:	Brazil
Project Cost:	\$200 million
Export Potential:	\$160 million
Owner:	CSN

Technical Description

Companhia Siderúrgica Nacional (CSN) is Latin America's largest steel producer. In order to satisfy its increasing power demands and stabilize its often erratic power supply the company, which was recently privatized, will build its own thermoelectric power plant. The first phase of the project will consist of a 240 MW co-generation facility powered by waste gases (85 percent) and natural gas (15 percent). The second and third phases will each add another 120-MW gas turbine resulting in a total installed capacity of 480 MW.

Site

CSN is located in Volta Redonda, an industrial city located some 80 kilometers northwest of the city of Rio de Janeiro.

Timing

Bids for the plant were closed in February of this year. The short list includes a number of U.S. independent power producers. CSN should complete the proposal evaluation process in the third quarter of this year.

CSN Thermoelectric Plant

Infrastructure Project Profiles

Equipment & Services Demand

Project	Installed Capacity Added (480 MW total)	Equipment
Phase I	240 MW	two steam turbines transformers switch gear boilers blast furnace blower
Phase II	120 MW	one gas turbine transformers switch gear
Phase III	120 MW	one gas turbine transformers two heat recovery steam generators two steam turbines

Nature of Demand

With production at 4.6 million tons, CSN is Latin America's largest steelmaker. CSN estimates its 1995 production will reach 5.1 million tons. CSN is also Brazil's largest private company. In 1994 the company amassed profits of U.S.\$100 million on sales of U.S.\$2.3 billion.

Previously dependent on the local utility LIGHT, CSN seeks to assure its constant power supply by constructing a thermoelectric plant and holding a stake in other hydroelectric projects.

Power generated in Phase I will be used exclusively by CSN. The company intends to sell most of the power produced in Phases II and III to outside consumers. With the passage of the independent power regulations expected in the next few months, generators like CSN will be free to sell power to any industrial clients or utilities. Using the national power network SINTREL, power producers will be able to wheel power to users anywhere in the country.

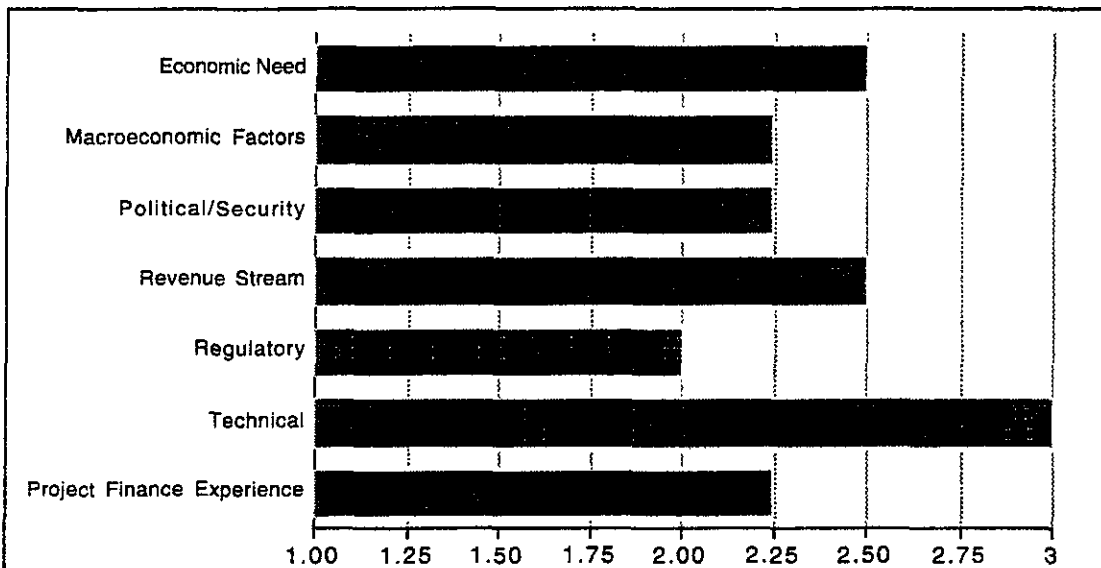
Financeability

Phase I project financeability will be based on assessments of CSN's medium-to long-term financial health—which, since privatization, has improved steadily. Productivity has nearly doubled and cost per ton of steel produced has been cut by almost a third. Profitability and cash flow put CSN above other private Brazilian steelmakers. The co-gen project is part of a U.S.\$1.1 billion five-year investment program on which it embarked after privatization in 1993.

Although CSN is waiting until final selection of the bidder to begin discussing financing options, it will probably maintain a sizeable proportion of equity in the plant. The project will likely be partially financed by the Brazilian National Development Bank, BNDES.

Financeability of Phases II and III will depend on the establishment of the necessary regulatory infrastructure to allow for third party electric sales.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

CSN Thermoelectric Plant

Infrastructure Project Profiles

Key Decision Makers

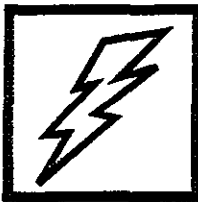
CSN

Nelson Geraldo da Cunha, *Superintendent*

Volta Redonda, Brazil

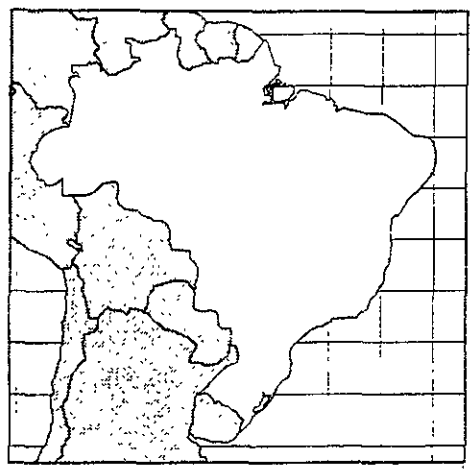
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Energy / Brazil

Escelsa Privatization



Project Summary

Project No:	ENE-08
Subsector:	Power
Country:	Brazil
Project Cost:	\$250 million
Export Potential:	\$80-85 million
Owner:	To Be Determined

Escelsa, the power utility for the state of Espirito Santo, will be the first electric power utility in Brazil to be privatized. Brazil has been trying to auction Escelsa's stock for over a year without success.

The Escelsa privatization is important because it is the first of at least 12 significant energy privatizations in Brazil. There will be important equipment demand in generation, distribution, and transmission.

Technical Description

Escelsa is scheduled to be privatized on July 11, 1995. Eletrobras, Brazil's national electric power holding company, is selling a controlling interest—50 percent plus one share—on the Rio de Janeiro Stock Exchange. The stock will be auctioned in a single block to the company or consortium that offers the highest price. A minimum price of R\$320 million (approximately U.S.\$350 million) has been set.

Eletrobras currently owns 72.2 percent of Escelsa shares. The 20.1 percent stake owned by the government of the state of Espirito Santo was sold in 1994 to a group of Brazilian banks. The remaining 7.7 percent is owned by Escelsa employees.

The purchasers of the controlling interest in Escelsa will also receive a 30-year operations concession. Although foreign investment laws are expected to change soon, the operator of an electric utility must

Escelsa Privatization

Infrastructure Project Profiles

be a majority-Brazilian company or consortium. A foreign investor must make up less than half of the group that wins the privatization. Therefore, foreign participation in the privatization is effectively limited to 25 percent minus one share.

Site

The Escelsa service area covers the state of Espirito Santo, located north of the state of Rio de Janeiro.

Timing

In 1994, the sale of Escelsa was suspended three times for lack of investor interest or failure to garner the established minimum price. The Ministry of Mines and Energy announced at the end of May 1995 that Escelsa will be put up for sale on July 11, 1995.

Equipment & Services Demand

In terms of infrastructure, Escelsa suffers from underinvestment in distribution and generation. Although not bound contractually to investment, it is likely that the new owners of Escelsa will upgrade the existing facilities and move to lower dependence on imported power for its customers.

Depending on the alternatives chosen by the new owners, the expansion of generation capacity and investment in distribution system could produce a substantial demand for equipment and services.

Escelsa will need to modernize its substations and distribution networks. In addition to procuring new transformers, and other equipment, Escelsa will probably seek detection equipment to reduce losses of power through inadequate transmission systems and through theft.

As Escelsa must buy most of its power from other generators (including Itaipu), the new owners will certainly want to develop their own generation capacity, which is likely to include thermal power. Brazil has little experience in thermoelectric power plant development. Under this scenario, U.S. firms will be very competitive in equipment supply bids.

A coal-fired thermoelectric plant, is a strong possibility for thermal power. Ships used to export iron ore would return with coal from southern Brazil, the U.S., or even Australia.

Given a cost of U.S.\$1 million per MW installed, a conventional 250-MW combined cycle plant would require investments of U.S.\$250 million. U.S. companies are much more competitive in the

production of thermoelectric equipment. If the boilers, steam and gas turbines, switchgear, transformers, and generators make up one-third of the total cost, U.S. equipment export potential for the plant could be U.S.\$80-85 million.

Additionally, the new owners will likely consider the purchase and conversion of an existing 30 MW oil-fired plant (owned by Furnas, but no longer in operation) to a natural gas-fired plant. Gas from the Campos Basin is delivered 50 kilometers from the plant site. A pipeline would be built to deliver gas directly to the plant site. Similarly, the export potential would be high.

Nature of Demand

Eletrobras' Ten-Year Plan, released in 1993, forecasted a significant increase in power demand in the Escelsa service area, from 4,024 Gwh in 1993 to 5,047 Gwh in 1998 and 5,971 Gwh in 2003. Current demand for power in Espirito Santo requires the purchase of 77-80 percent of its power from other generators. Bringing yet more power from other states will be difficult since transmission lines are overloaded and line losses are large. A very high percentage (54 percent) of Escelsa's power is sold to heavy industry. Most of the industrial consumers are located in and around Vitoria.

Financeability

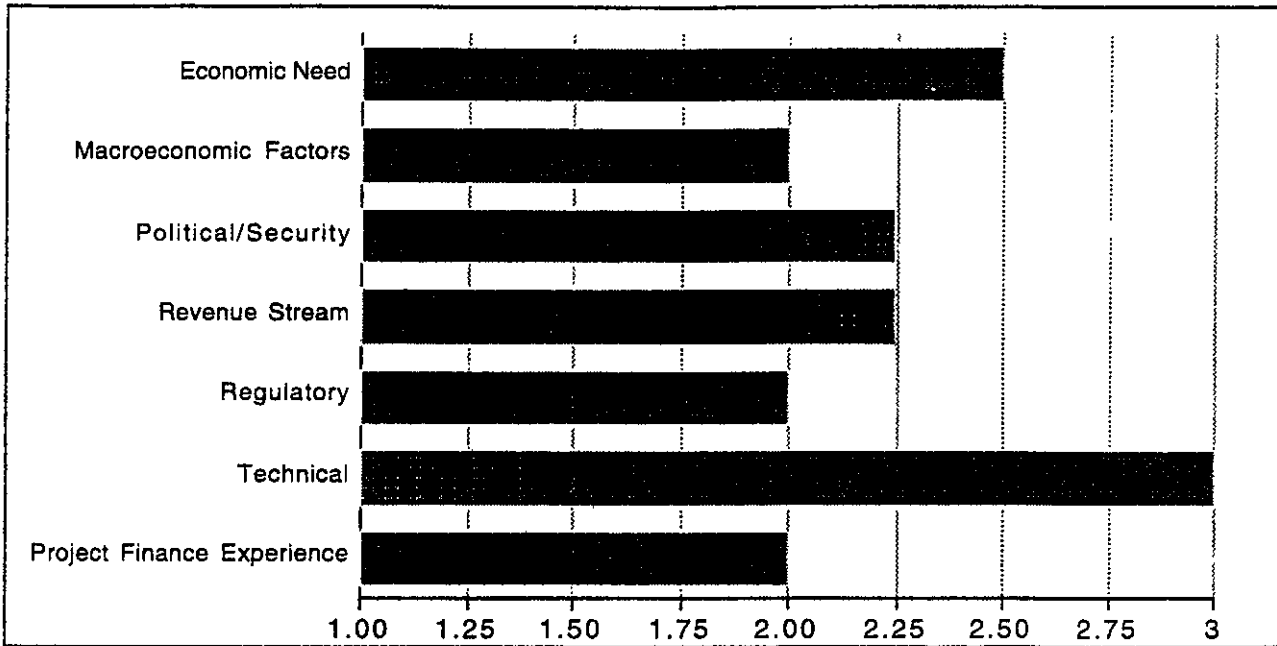
The area will need additional power and cannot continue to rely on purchases of electricity from other states—especially when Brazil overall is running out of electric power. Under the new Independent Power law expected to be passed in by mid-1995, Escelsa will lose its monopoly over distribution and will have to compete for customers. Financeability will be based on estimates of its ability to maintain its base of industrial customers in the face of competition.

Escelsa is vulnerable to revenue reductions from its industrial customers, since seven major industrial consumers account for over 70 percent of industrial-sector revenue. The new national power transmission network, SINTREL, will allow those companies to wheel power from other plants in Brazil. A number of industrial consumers are also considering building their own inside-the-fence plants.

Escelsa Privatization

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure.

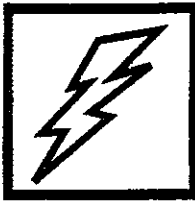
This Finacibility Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Technical Description

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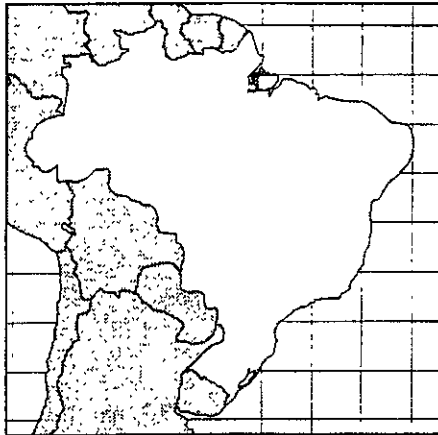
Ministry of Mines and Energy
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Energy / Brazil

Southern Brazil Coal-Fired Power Plants



Project Summary

Project No:	ENE-09
Subsector:	Power
Country:	Brazil
Project Cost:	\$5.6 billion
Export Potential:	\$4.2 billion
Owner:	General Electric-led Consortium

Technical Description & Site

General Electric is planning two massive thermoelectric power complexes in southern Brazil which will have a total installed capacity of 4240 MW and will require a total investment of U.S.\$5.6 billion. Each of the 16 plants, which will use the Integrated Gasification Combined-Cycle (IGCC) technology, will have an installed capacity of 265 MW. The cost per megawatt installed is U.S.\$1.3 million. Each plant will consume 800,000 tons of coal per year.

To reduce air pollution that is normally a by-product of coal-fired plants, GE chose the cleaner-burning IGCC technology. The integrated gasifier converts coal to cleaner burning gas which fuels the plant turbines.

The first complex—to be located in Brazil's southernmost state of Rio Grande do Sul—will consist of ten power plants. The second, to be comprised of six units, will be located in the state of Santa Catarina.

Timing

The project will be completed over a period of nine years. On March 22, 1995 General Electric do Brasil and its partner, ITS Participações e Assessoria Comercial Ltda, signed a memorandum of understanding with the government of Rio Grande do Sul.

Southern Brazil Coal-Fired Power Plants

Infrastructure Project Profiles

Demand for Equipment & Services

Each plant will utilize the following equipment: gas turbine and steam turbine generator sets, heat recovery steam generators, boilers, and an integrated gasifier. As U.S. companies are very competitive in the manufacture of this type of electric generating power equipment, the export potential is very high.

Total equipment and service exports could total U.S.\$4.2 billion.

Nature of Demand

As Brazil's coal production is centered in Rio Grande do Sul and Santa Catarina, fuel transportation distances will be reduced. Brazil contains the world's 13th largest reserves of soft coal, calculated in 1990 at the equivalent of 367.4 petajoules.

Electric power demand in Brazil is increasing at a faster rate than economic growth. According to S.G. Warburg, the Brazilian economy is expected to grow an average annual rate of 6.5 percent between 1995 and 1997, while power demand is expected to grow at an average annual rate of 7.8 percent. Brazilian power consumption in December, 1994, was 6.2 percent higher than the same time a year earlier, exceeding Eletrobrás' expectation of a 4 percent increase.

Demand for power will grow due to a combination of the following:

- Accelerated economic growth.
- Growth in urbanization.
- Electrification of rural areas.
- Increased use of electrical equipment.
- Industrial modernization and automation.

Demand for power in Santa Catarina is strong. The state buys 60 percent of its electricity from other states. Its main in-state supplier is the Jorge Lacerda A and B 482 MW coal-fired thermoelectric units owned by Eletrosul.

The critical issue to the success of this project is to closely follow other power supply projects which may increase the supply of power in southern Brazil and thereby impact the size of the project.

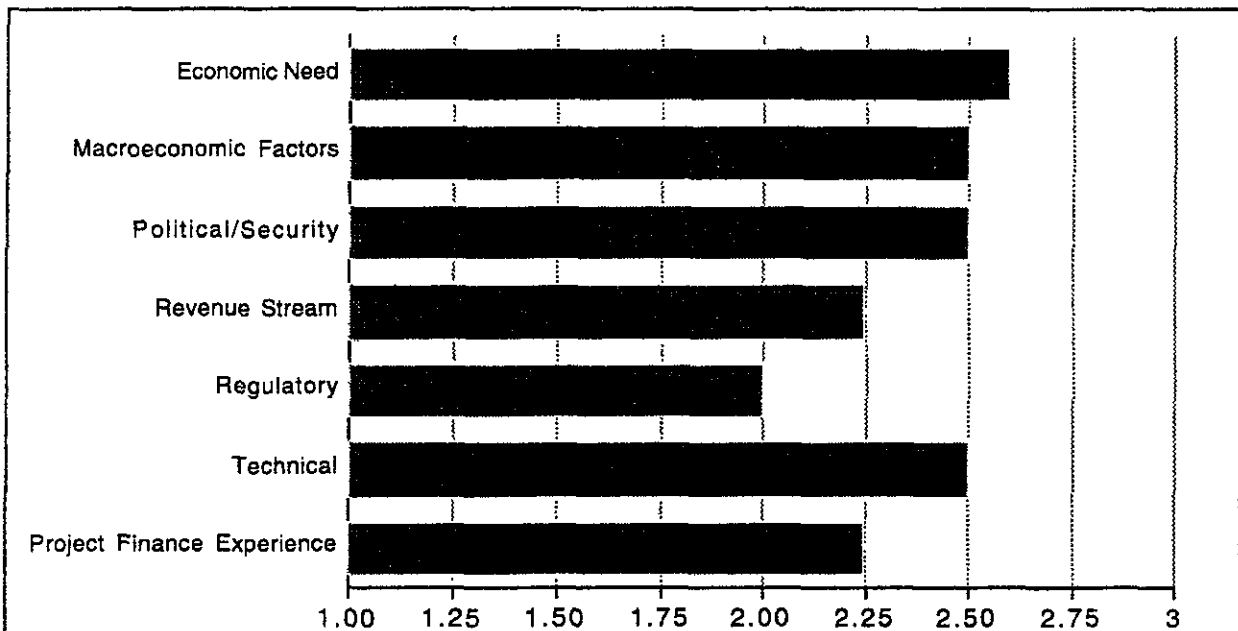
In particular, two other projects will have a direct impact on GE's plants. The first is the southern branch of the Brazil-Bolivia gas pipeline, leading from São Paulo to Porto Alegre, crossing both Rio Grande do Sul and Santa Catarina. The supply of natural gas from this branch, scheduled to go on line in the second half of 1998, could make gas-fired plants more attractive.

Additionally, a concession was awarded last year to a Brazilian private sector group to proceed with plans for a 1,450 MW hydroelectric plant (Itá), to be located on the Uruguay River in Santa Catarina. Although the concession for Itá was annulled by the courts in February, a firm commitment to proceed is being sought and if successful could alter the power supply situation.

Financeability

Demand for power in this region will be strong and additional generating capacity needed. While this project does have strong backing as indicated by the letter of understanding with the government of Rio Grande do Sul, competing power projects as discussed above could erode this base of support. This issue will not be resolved until a legally binding power purchase agreement is signed with one or more offtakers. Resizing of the project is another option.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Southern Brazil Coal-Fired Power Plants

Infrastructure Project Profiles

Key Decision Makers

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General Electric do Brasil

Claudio Vasconcellos, *Commercial Superintendent*

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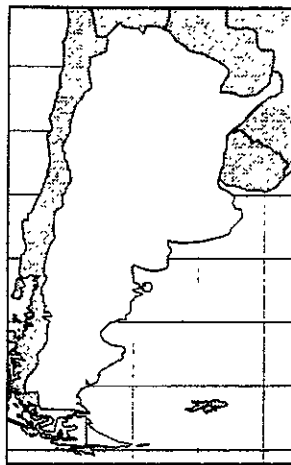
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Energy/Chile/Argentina

Atacama Natural Gas Pipeline



Project Summary	
Project No:	ENE-10
Subsector:	Oil & Gas
Country:	Chile/Argentina
Project Cost:	\$350 million
Export Potential:	\$219 million
Owner:	CMS Energy Williams

Technical Description

The Atacama Natural Gas Pipeline will provide the rapidly-growing mining area of northern Chile with a cheap fuel alternative to coal-fired electric power. The proposed natural gas pipeline would cross the Andes and provide 300 million cubic feet of gas per day, almost exclusively to power plants in northern Chile. The major power consumers will be copper mining concerns in the area of Tocopilla.

The project will be developed by two private firms, CMS Energy, a U.S. energy holding company, and the Williams Companies, one of the largest pipeline development companies in the United States.

Site

The 700-kilometer pipeline will start in the gas-rich areas of northwestern Argentina, near the Bolivian border. The prospective route will traverse the Argentine provinces of Salta and Jujuy, and deliver gas to Tocopilla, north of the Chilean port of Antofagasta.

Timing

CMS estimates the project cycle to be two years. It plans to have the development work finished by the fall of this year. Engineering studies should be completed in mid-1996, and the first gas deliveries are planned for the fall of 1997. Equipment tenders will probably not be ready until 1996.

Equipment & Services Demand

About U.S.\$219 million of the total cost will go toward equipment purchases. The major systems to be purchased are the 700 kilometers of 24" pipe, installation, and coating and an undetermined number of compressor stations and gas meters.

Nature of Demand

The increased production of the Tocopilla copper mines has produced adequate demand, according to CMS. Most of the offtake will go to power plants that serve the mining industry, or directly to the mining companies. Two power plants (owned by Chilgener and Endesa) are under construction now.

Chile has estimated that electric power demand will double over the next ten years and thereby provide substantial demand for imported gas.

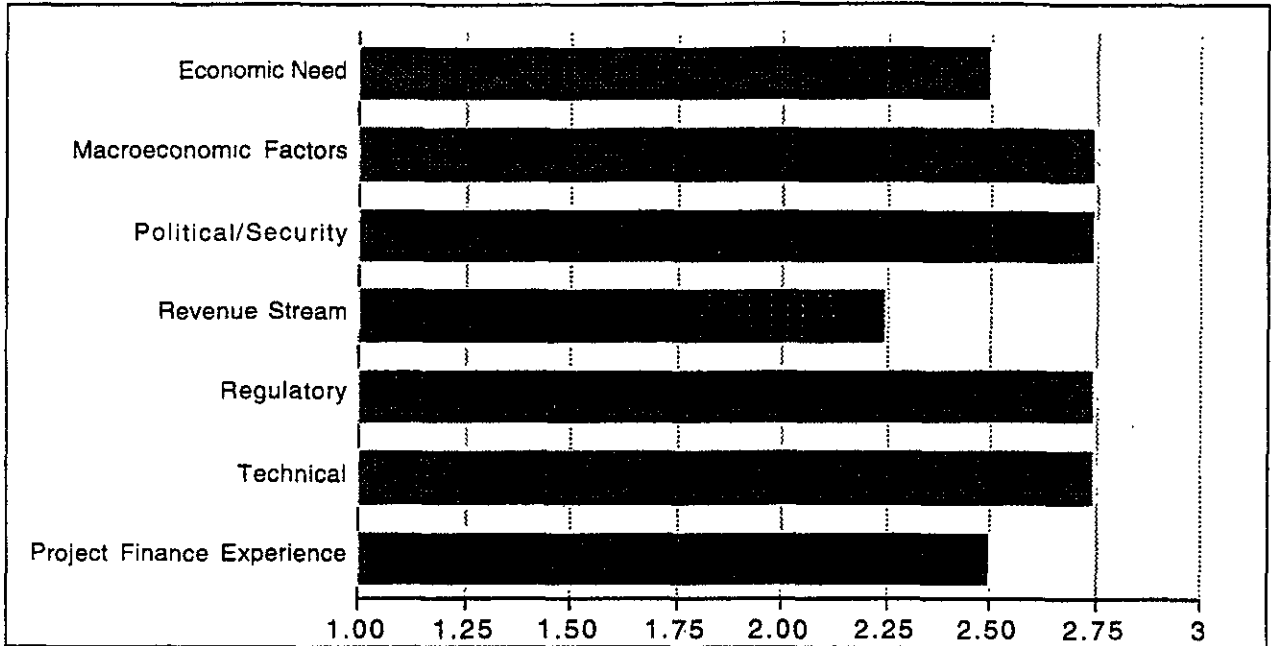
Gas from the central Chilean pipeline projects will not reach markets in the Tocopilla region.

Financeability

The project will be financed through a combination of project equity and debt financing. There is strong economic demand to substitute natural gas for currently imported coal. Strong economic growth in the mining industry over the next five to ten years is driving a demand for new gas-fired electric facilities. As mentioned, there are two natural gas-fired generating stations under construction in the region that will potentially provide the basis for long-term fuel supply agreements.

The project sponsors needs to develop firm gas purchase agreements along with a more precise construction cost estimate before the project's financeability can be evaluated further.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

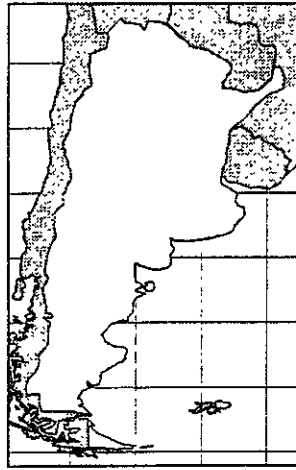
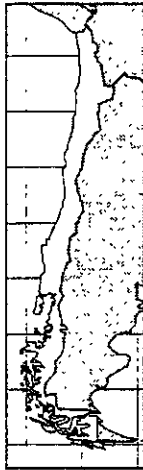
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Energy / Argentina / Chile

Gasoducto Transandino Natural Gas Pipeline



Project Summary

Project No:	ENE-11
Subsector:	Oil & Gas
Country:	Argentina/ Chile
Project Cost:	\$680 million
Export Potential:	\$170 million
Owner:	Gasoducto Transandino

Technical & Site Description

Gasoducto Transandino S.A. is proposing to construct and operate a high pressure natural gas transmission pipeline from the Neuquén Basin of Argentina west across the lower levels of the Andes Mountains toward Concepción, and north through the central region of Chile to Santiago. The pipeline will begin in Loma de la Lata, Neuquén, to which the local producers are connected at the outlet. The pipeline will cross the Andes through the Buta Mallín pass, paralleling the route of the existing oil pipeline.

The diameter of the main transmission line will be 26 inches crossing the Andes, 24 inches in Central Chile, and 20 inches in the Santiago area. The length of the main pipeline will be 800 kilometers, with four compressor stations. Lateral lines will vary from four to 16 inches in diameter, extending more than 500 kilometers. The initial pipeline volume will be four million cubic meters per day and increase over time to 15 million cubic meters per day.

The largest cities to be served by the pipeline are Concepción, Santiago, Chillán, Los Angeles, Talca, Curico, Rancagua and Valparaíso. These areas represent 70 percent of Chile's GNP and about 70 percent of its population. The main markets to be served are power plants (45 percent) and industries (45 percent). The balance includes commercial and residential users.

Gasoducto Transandino Natural Gas Pipeline

Infrastructure Project Profiles

Timing

The Gasoducto Transandino is scheduled to go into service in 1997. Some bidding for various components of the required project services and material has begun. In the next section a table will show a schedule of bids and demand.

Equipment & Services Demand

Gasoducto Transandino anticipates bidding for the following components of the pipeline project in the time periods specified below:

Type of Export	Value (Millions)	Estimated Bid Time
Steel pipeline assemblies	\$11.2	9/95
Compressors and compressor engines (4 stations)	\$56.3	1st Station 1997
Gas regulators and related piping	\$ 2.1	1996
SCADA Electronics	\$ 1.7	1996
Telecommunications	\$ 1.3	1996
Start-up and commissioning	\$ 0.9	1996

These potential U.S. export estimates include only materials consumed in the construction phase. Spin-off demand related to gas production, gas-fired equipment by new or converting power and industrial plants is not included.

Nature of Demand

The pipeline will substantially contribute to Chile's development strategy by providing opportunities for regional development and decentralization. This will also benefit the environment by reducing air pollution, which is a serious problem in both Santiago and Concepción.

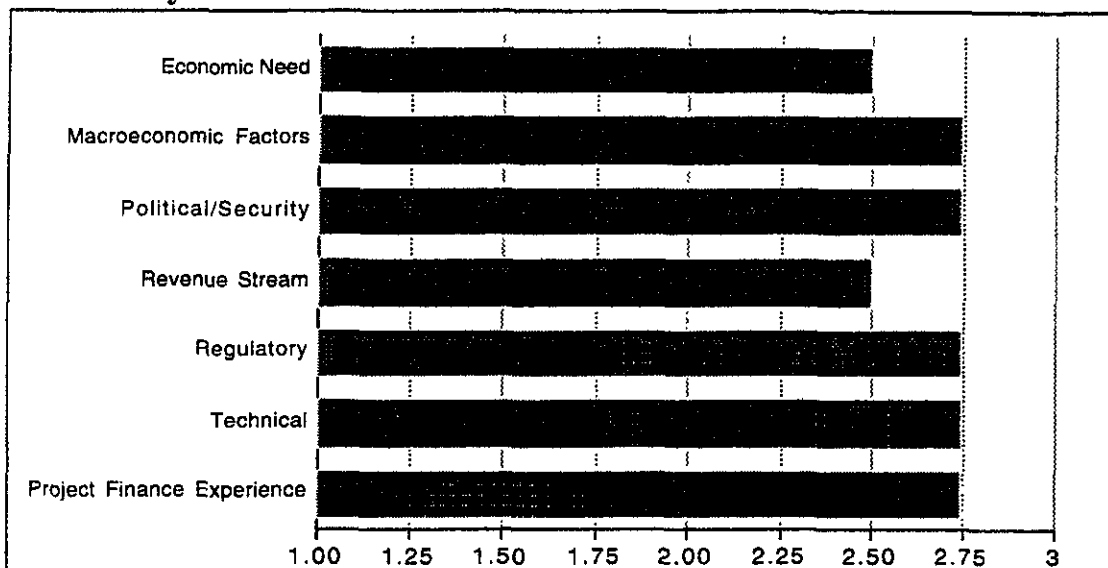
Financeability

Financeability indicators are very strong. Gas reserves are proven and a high demand for natural gas exists along the route of the proposed pipeline, which travels through the economic heartland of Chile. The project sponsors are financially solid and experienced in the construction and operation of natural gas pipelines. The project has the full support of the Chilean government as part of an overall energy strategy to limit pollution. The owner of the gas pipeline is Gasoducto Transandino S.A. which is owned by the following:

- Chile (45 percent) : Chilectra/Enersis and ENAP
- United States (25 percent): Tenneco Gas
- Argentina (30 percent): Astra, Bidas, YPF and Pluspetrol

Gasoducto Transandino has selected Chemical Bank as the project financial advisor. Tenneco Gas has entered into a protocol agreement with OPIC for assistance of up to U.S.\$400 million.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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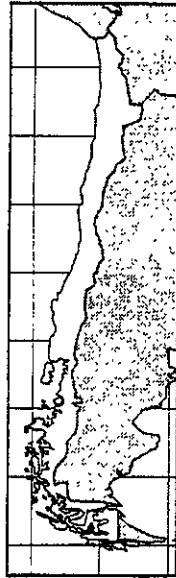
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Energy / Chile

Tocopilla Thermoelectric Expansion Project



Project Summary

Project No:	ENE-12
Subsector:	Power
Country:	Chile
Project Cost:	\$150-300 million
Export Potential:	\$120-240 million
Owner:	To Be Determined

Technical Description

CODELCO, the Chilean state mining company, is in the process of divesting non-mining assets including its power generation facilities located at Tocopilla. The power generation facilities will be formed into a new company, Central Termoeléctrica Tocopilla S.A. (CTTSA), and privatized. The new company will require investments in upgrading existing units and the construction of additional capacity.

CODELCO's power generation facilities at Tocopilla consist of four coal-fired and three oil-fired plants with a combined installed capacity of 600 MW. The expansion plan calls for one or two new plants with an installed capacity of 150 MW each. The fuel for the first one will be coal, while the second one could be either coal or natural gas, depending on the progress of the northern Chilean gas pipeline projects.

The extent of CODELCO's expansion plans for CTTSA will depend on the results of a bid for the Collahuasi mining project, to be decided by mid-June. Since Collahuasi already has power generation facilities, CODELCO will only need one power plant if it wins the contract, and two if it does not.

It is possible that CODELCO will continue its expansion program at Tocopilla after 1996, based on the increasing demand for energy in northern Chile.

Tocopilla Thermoelectric Expansion Project

Infrastructure Project Profiles

Site

The first plant will be located near CODELCO's main northern mining region in Tocopilla. The second one, if needed, will be in the nearby town of Terreno.

Timing

CODELCO, which is the sole owner of the seven existing generation plants, will form a new company likely to be called CTTSA. A British investment banking firm, Kleinwort Benson, has been hired by CODELCO to organize the formation of the new generating company and place a stock issue.

After establishing the percentage of equity to be held by Tocopilla employees (probably in the range of 10 to 15 percent), CODELCO will begin looking for a strategic partner to undertake the construction and operation of the new plant or plants. This process will most likely begin in mid-May of 1995 and last till September or October. CODELCO will then organize the issuance of 66 percent of its shares likely to occur in the second quarter of 1996.

Demand for Equipment & Services

The boilers, turbines, transformers, and other equipment will be imported, since no Chilean company currently manufactures the equipment. U.S. companies are in a good position to win the EPC, operating, and equipment supply contracts which could total U.S.\$120 million to U.S.\$240 million.

The value of the privatization of Tocopilla is not known.

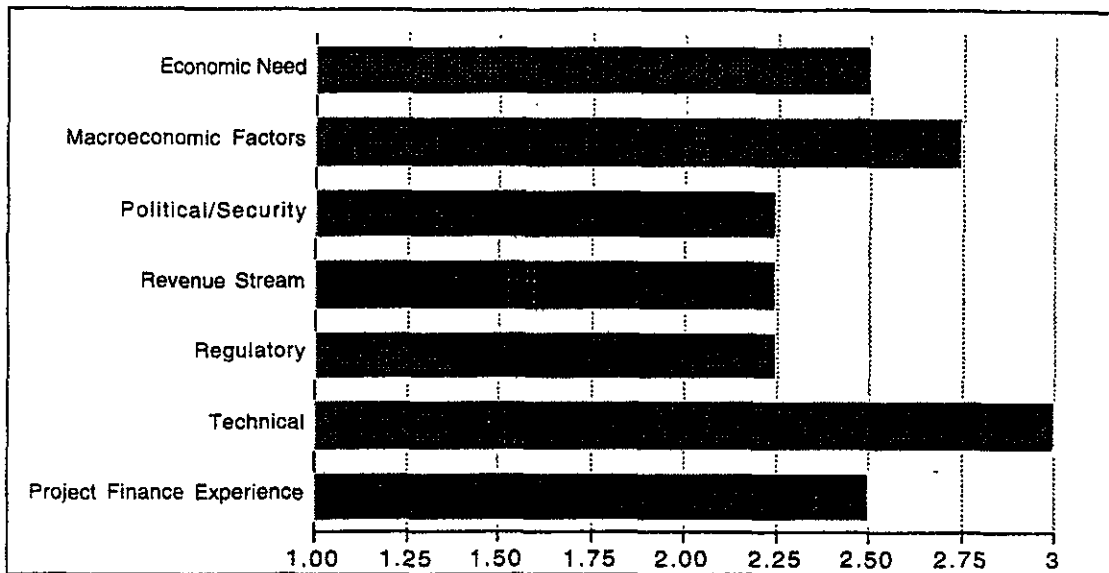
Nature of Demand

CODELCO needs to increase Tocopilla's generation capacity to supply local mining operations. To satisfy the demand, Chilgener has just completed its 132 MW Central Nueva Tocopilla coal-fired plant, with construction of an identical plant scheduled to begin in the second quarter of this year. SEI and EDENOR are building 150 MW coal-fired plants as well.

Financeability

Chile's strong credit rating and the identity of the participants enhance the likelihood of financing the project.

Financeability Assessment



Source: CG/LA Infrastructure,

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

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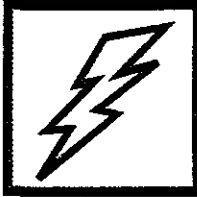
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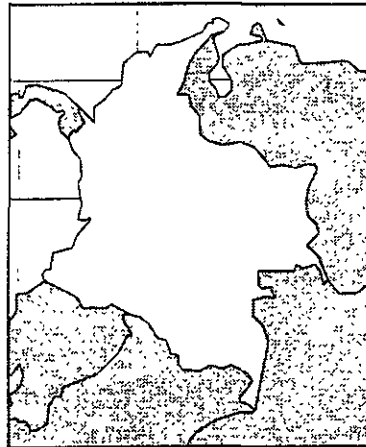
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Energy/Colombia

Buenaventura Petroleum Terminal



Project Summary

Project No:	ENE-13
Subsector:	Oil
Country:	Colombia
Project Cost:	\$95-140 million
Export Potential:	\$60-85 million
Owner:	Ecopetrol

Technical Description

While the discovery of the Cusiana and Cupiagua oil fields should prove to be a boon for the Colombian economy, it has left Colombia's state oil company Ecopetrol with inadequate capacity to refine and transport the 4.2 billion barrels of proven oil reserves. As a result of this shortfall, Ecopetrol has signed numerous contracts of association with foreign companies for the expansion of production. In the meantime, the country is a net importer of gasoline products. Due to the high demand for gasoline, Ecopetrol has prioritized projects involved in the production and transportation of gasoline.

Site

Ecopetrol plans to build a new petroleum terminal, pipelines, pumping facilities, and storage complex on the Pacific Coast. The Buenaventura Project—which will be used for the import of refined petroleum products—will improve fuel supply in the western part of the country.

Ecopetrol's plan for Buenaventura consists of five subprojects, the largest of which is the terminal. Ecopetrol is considering two designs for the construction of the terminal: a fixed pier and a floating

Buenaventura Petroleum Terminal

Infrastructure Project Profiles

buoy terminal. The investment for the complete project would be U.S.\$96 million for the pier, or U.S.\$140 million for the buoy terminal.

Terminal: The terminal —either pier or buoy—will serve oil tankers with capacity up to 600,000 barrels. The floating buoy terminal, if chosen, will be located about 30 kilometers offshore. The following four terminal configurations are being considered:

Bay	Location	Type	Total Project Cost
Buenaventura Bay	Aguadulce Area	Pier	\$96 million
Buenaventura Bay	30 km Offshore	Buoy	\$140 million
Malaga Bay	*	Pier	\$96 million
Port of Buenaventura	Existing Port	Pier	\$96 million

* Site undetermined

Pipeline 1: The first pipeline, which will have a capacity of 250 kBOD (thousands of barrels of oil per day of real capacity), will transport products from the tanker to the storage facility. Although the 32-inch pipeline will carry all types of refined products, the location has not been defined. Two options are being explored: a land pipeline and an underwater pipeline.

Pipeline 2: The second pipeline, which will have a 12-inch diameter, will connect the terminal and the existing Pacific Pipeline. This subproject has environmental approvals and construction is slated to begin soon.

Storage Facilities: The storage tanks will have a total capacity of 880,000 barrels: 680,000 for gasoline and 200,000 for diesel fuel.

Pumping Station: A pumping station, with a capacity of 40 kBOD, will be built to dispatch petroleum products to the existing Yumbo Terminal.

Site

The most probable location will be in Buenaventura Bay, with Málaga Bay as a secondary option. Since both sites are located near cities, the terminal facility will be constructed at least five kilometers outside of the nearest urban development.

Timing

Once Ecopetrol has determined the site, it will proceed with an environmental impact study, for which it is seeking financing. Construction should begin in 1997. The project should be completed in 1999.

Equipment & Services Demand

The project site study will also define the type of terminal to be constructed. Due to a lack of Colombian suppliers, most of the equipment will be imported. If the decision is to go ahead with the buoy option, there will be an additional demand for engineering services for specialized terminals of this type.

Buenaventura will require the following equipment and materials:

- Five pipeline train pumps, including motors and controls, for 250 kBOD of continuous flow with a pressure of 2,000 pounds per square inch.
- Material for the construction of the storage tanks which will have capacities of 200,000, 150,000 and 100,000 barrels.
- 32" diameter pipe, with special coating for marine service. A buoy terminal will require 30 kilometers of pipeline; the pier will require five kilometers.

For the buoy terminal, additional equipment will be needed:

- A diesel or electric pumping system with a 45,000 barrel capacity.
- A buoy, capable of serving tankers of up to 70,000 tons, will be supported by facilities with a 600,000 barrel capacity.

Nature of Demand

Colombia has only two major refineries. The capacity of the Cartagena and Barrancabérmeja refineries is about 90,000 barrels per day—insufficient capacity to satisfy the demand, which is about 125,000 barrels per day, and is growing at a rate of 4.5 percent per year.

Financeability

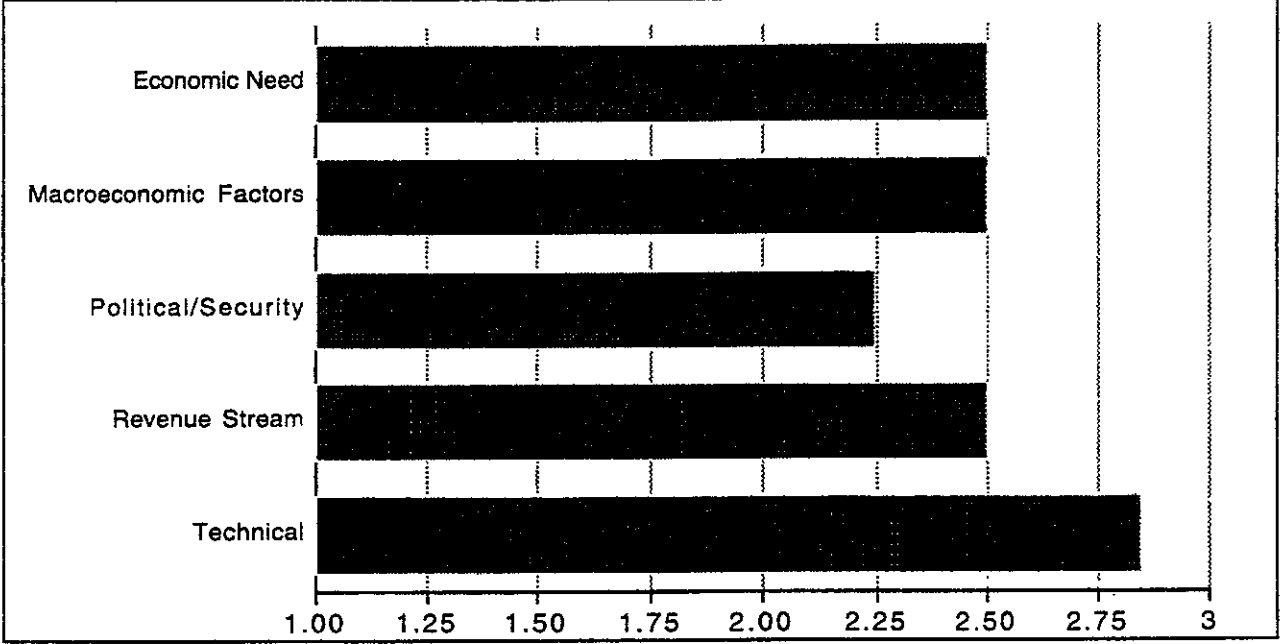
Ecopetrol usually funds projects with its own budgetary resources and from operating revenues. However, the Government has changed funding priorities, leaving Ecopetrol short of funds. Ecopetrol is finishing the study for the alternative sites of the facilities. Once this is finished, the company expects to initiate the environmental impact study, for which it may request funding from institutions like TDA.

Buenaventura Petroleum Terminal

Infrastructure Project Profiles

Ecopetrol is investigating possible solutions for its short-term financial constraints. Among them is the possibility of private funding in the form of supply credit lines, through the suppliers of the equipment needed for the Buenaventura project.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

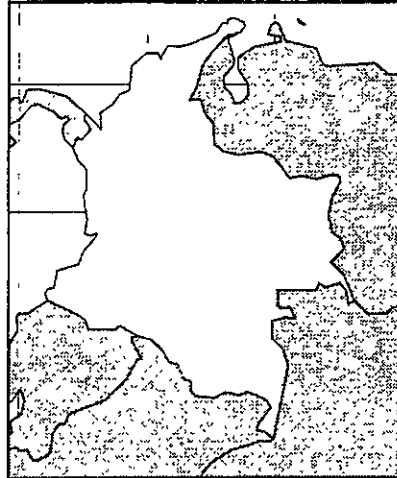
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Energy / Colombia

Cartagena Refinery



Project Summary

Project No:	ENE-14
Subsector:	Oil
Country:	Colombia
Project Cost:	\$170 million
Export Potential:	\$100 million
Owner:	Ecopetrol

Technical Description

Although recent oil and gas discoveries in the Cusiana fields will make Colombia an oil and gas exporter, currently there are shortages of high-quality gasoline. To address these needs, Ecopetrol is planning to modernize and expand the existing Cartagena refinery.

The refinery was built in 1957 with an initial capacity to process 20,000 barrels per day. Following two major expansion projects in 1963 and 1982, refinery capacity was raised to 70,000 barrels per day, producing 13,000 barrels per day of gasoline and 13,000 barrels per day of diesel.

Ecopetrol's latest expansion project will increase Cartagena's refining capacity to 100,000 barrels per day. The project is estimated to cost \$170 million.

The main points of the master plan for the refinery are:

- Expansion of refining capacity to no less than 100,000 barrels per day with the capability of accepting different crudes simultaneously.
- Incorporation of refining methods to comply with future environmental and quality requirements for national and international markets.

Cartagena Refinery

Infrastructure Project Profiles

- Consideration of the possibility of incorporating other types of processing such as LPG.

Site

This refinery is located just outside the city of Cartagena.

Timing

Ecopetrol is seeking financing for the project definition study, estimated at U.S.\$500,000. The goal is to have the development of the refinery completed by 1998.

Equipment & Services Demand

The basic equipment needed for the modernization of the refinery includes:

- Distillation towers and related equipment and infrastructure
- Pumps and compressors
- Reactors of different sizes and capacities
- Furnaces
- Cracking equipment
- Spare parts for the equipment listed above where replacement is not necessary.

Nature of Demand

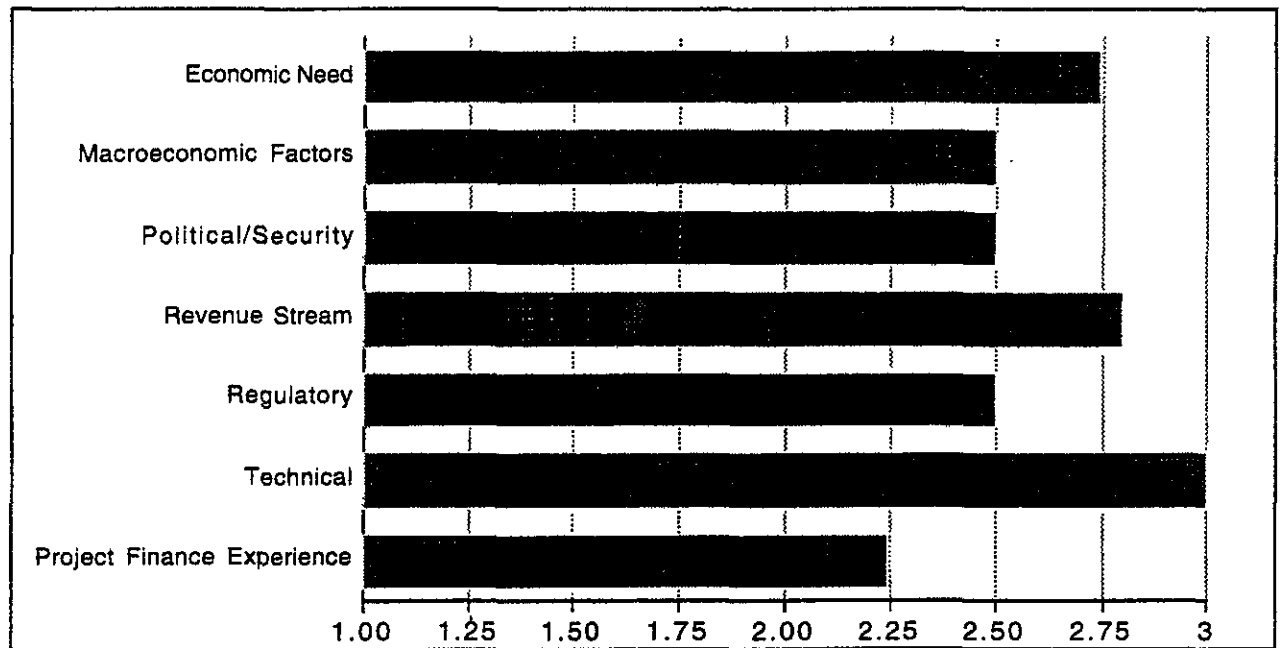
The growing demand in Colombia for gasoline and diesel has already outstripped domestic supply. The main refineries in Cartagena and Barrancabermeja produce about 90,000 barrels per day and are unable to satisfy the demand of 125,000 barrels per day. Demand is growing at an annual rate of 4.5 percent.

In addition, the Cartagena refinery suffers frequent interruptions in production due to age and mechanical problems.

Financeability

Ecopetrol usually funds its project with internal resources which are allocated in the federal government budget and through operational revenues. Since the government has changed funding priorities, Ecopetrol is short of funds to cover technical and feasibility study costs. Ecopetrol is considering possible solutions for its short term financial constraints through private funding in the form of supplier credit lines.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Cartagena Refinery

Infrastructure Project Profiles

Key Decision Makers

Empresa Colombiana de Petroleo (Ecopetrol) is Colombia's largest company with sales in excess of U.S.\$1.5 billion. It is the state-owned oil company and operates under the Ministry of Mining and Energy. It raises part of its own capital in world markets and is administratively independent and autonomous.

Empresa Colombiana de Petroleo (Ecopetrol)

Raúl Salazar, *Vice President, Refining*

Santafé de Bogotá, Colombia

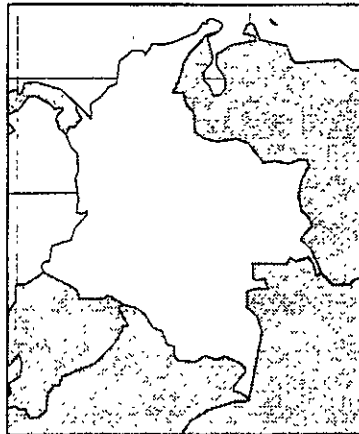
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Energy/Colombia

Providencia Biomass Cogeneration Plant



Project Summary

Project No:	ENE-15
Subsector:	Power
Country:	Colombia
Project Cost:	\$50 million
Export Potential:	\$21.7 million
Owner:	Tazcogen

Colombia's severe energy shortage two years ago spurred innovative efforts to reform the power sector and to allow much greater private-sector participation. In 1994, a major legal reform, Law 143, was passed and provides a solid legal foundation for the restructuring of the power sector. In addition, the government released its planning document "Strategies for the Development and Expansion of the Electric Sector, 1995-2007," in February of this year. Private power generation is now becoming a reality in Colombia.

Technical Description

Tazcogen, a California energy development company, plans to repower a cogeneration plant which converts bagasse—the waste from the Providencia cane processing plant—into electrical power and steam. Tazcogen will replace two old and inefficient low-pressure generators with two 300,000 pph high pressure boilers and a 42 MW condensing steam turbine generator. The new system, to be designed and constructed on a BOO basis, will consume the same amount of fuel, and produce a surplus of 35 MW of power. The estimated cost of the project is U.S.\$50 million.

Tazcogen will apply air quality standards to the cogeneration system design that result in emissions which meet the standards of the Cauca Regional Autonomous Corporation (CVC) and the municipal government of Palmira. The CVC has given the sugar mills three years to lower emissions due to severe air pollution in the Valley.

Tazcogen has signed letters of intent with Providencia, the sugar mill; and Pacific Energy, Inc. (EPSA), the local utility, which will buy the plant's surplus power. Through an energy sales agreement (ESA),

Providencia Biomass Cogeneration Plant

Infrastructure Project Profiles

the project will sell steam to Providencia, and electricity will be provided at no charge, except for a portion of the pumping/irrigation load. The majority of the project revenue will be from sales of surplus power to EPSA at an estimated price of approximately 4.5 cents per Kwh or U.S.\$10.3 million per year in the initial year of operation. A power purchase agreement (PPA) is currently being negotiated with EPSA and will have both an energy and capacity payment component. The capacity payment is expected to be sufficiently large to cover all of the debt service. In addition Tazcogen and Providencia will enter into a fuel supply contract in which the fuel will be provided at no charge to Tazcogen.

FRAMEWORK FOR THE ELECTRIC SECTOR IN COLOMBIA

- 1) The Electric Law of 1994 (Law 143) allowed for private power generation and the sale of power to the local utility, national grid, or private industrial users.
- 2) Regulations and tariffs for wheeling power to other utilities and end users have been approved.
- 3) As part of a national power generation expansion plan, a number of BOT projects have been authorized.
- 4) Colombia is separating the transmission, generation, and distribution functions of the country's power utilities and forming them into distinct companies.
- 5) Investment in power generation has been aided by a general liberalization in Colombia's foreign investment laws.

Site

The Providencia plant is located in the Cauca Valley, 20 kilometers outside of Cali, in the town of Palmira. Through EPSA, the plant will provide power for Cali, Colombia's second largest city.

There are currently 13 sugar cane processing plants in the Cauca Valley. Production of sugar cane in the Valley is expected to reach 67,000 tons in 2000, as compared to 57,000 in 1993. Providencia processes an average of 8,000 tons of sugar cane per day or 333 tons per hour. In terms of fuel for the power plant, this will produce up to 100 tons of bagasse per day or 220,000 pounds per hour.

Timing

Project development work began in 1994. TDA has funded a Definitional Mission study of the Tazcogen proposal and has approved the funding of a feasibility study, Tazcogen is now preparing a detailed study. Tazcogen plans to complete most pre-construction activities by the end of 1995. Project financing could be closed in 1996, with project completion and operation in 1997.

Demand Equipment & Services

Several equipment and service suppliers from both the U.S. and Colombia will be used to complete the Providencia project. Colombia has one boiler fabricator capable of supplying the steam generation equipment, but U.S. vendors should be more competitive than Colombian or Andean Pact manufacturers. Colombia does not have any industrial facilities that produce electrical power generation equipment.

The major equipment systems needed include the following:

- Environmental equipment: fuel, ash handling, and emissions control equipment
- Steam turbine generator
- Condenser
- Cooling tower
- Instrumentation and controls
- Boilers
- Substation and transmission lines
- Engineering and construction services

The project has a total U.S. export potential of U.S.\$21.7 million.

Nature of Demand

The Cauca Valley has a significant power deficit and brings in most of its power from northern Colombia. Although new gas-fired plants may be built near Cali, there will remain a significant shortage of electricity and an over-reliance on hydropower.

Colombia is projecting an average yearly increase of 5.8 percent to 6.2 percent in energy demand for the period 1993-2010. This will require an addition of 8,596 MW of generating capacity: 2,696 MW between 1995 and 2000, and 5,900 MW between 2001 and 2010.

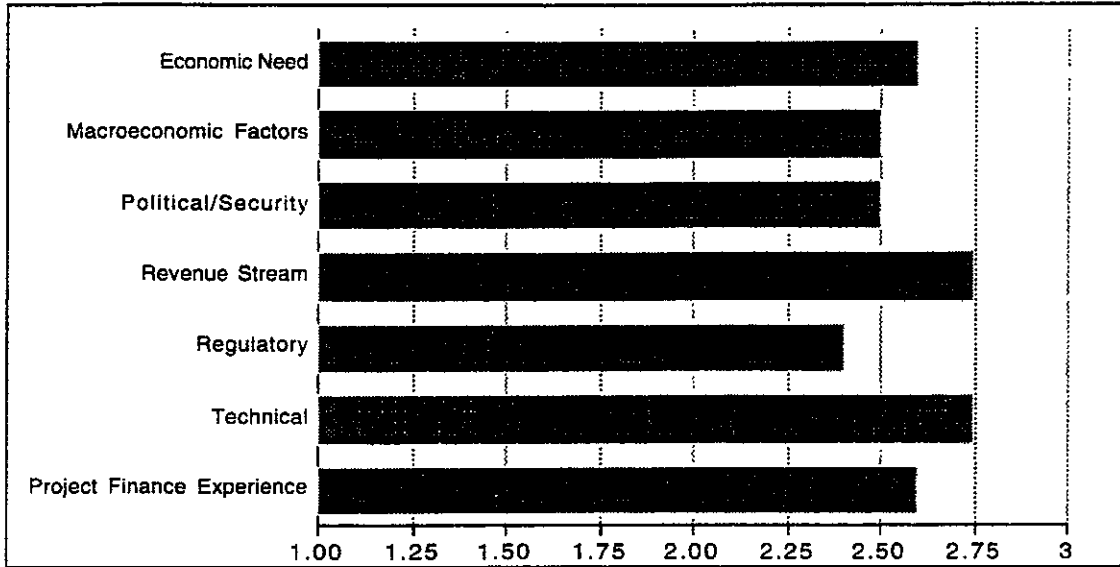
Financeability

The project will be funded through limited recourse financing, in which the supporting contracts and agreements and resulting revenues provide the underlying credit support. During 1995, Tazcogen plans to seek financing commitments from the Overseas Private Investment Corporation and the International Finance Corporation. In conjunction with seeking debt financing, Tazcogen will secure equity contributions of 20 to 30 percent of the project cost from entities such as the Energy Investors Fund.

Providencia Biomass Cogeneration Plant

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure.

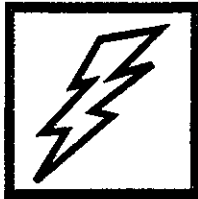
This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Tazcogen
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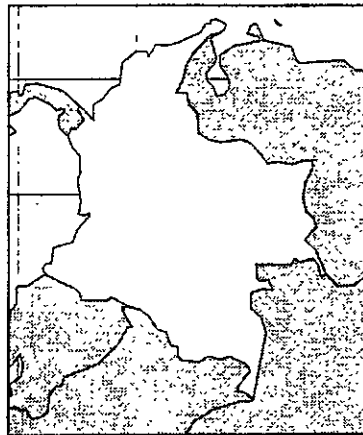
TDA Project Tip

Understanding the potential for U.S. IPPs in the Colombian market, the U.S. Trade and Development Agency funded a definitional mission which provided important preliminary analysis and the essential groundwork to enable Tazcogen to conduct a feasibility study for the Providencia project. The definitional mission—finished by Commonwealth Power Corporation of Norfolk, Virginia in April, 1995—also made an assessment of the regulatory framework of the power sector, which will be of use by other potential U.S. entrants into the Colombian power market.



Energy / Colombia

Puerto Olaya Thermoelectric Project



Project Summary

Project No:	ENE-16
Subsector:	Power
Country:	Colombia
Project Cost:	\$150 million
Export Potential:	\$125 million
Owner:	ISA

Colombia is in the process of reorganizing the electric power sector by increasing the role of the private sector, and separating generation, transmission and distribution functions of its utilities into distinct entities. Interconexión Eléctrica S.A (ISA), Colombia's largest utility, will soon be divided into two parts, ISA-GEN for the power production and ISA-T for transmission.

New regulations have opened up the power market. Generators are now allowed to sell power to large consumers, other generators, or distributors.

Technical Description

ISA is planning to open bids for the construction and operation of a 150 MW natural gas-fired power plant in Puerto Olaya. The project, at an estimated cost of U.S.\$150 million, will sell power to distribution companies in central Colombia. ISA has indicated that it would like to develop a single cycle plant, but is also studying a combined cycle option.

Originally planned to be a BOT (Build, Operate, Transfer) or BOO (Build, Own, Operate) project, ISA now favors a turnkey arrangement. The Financiera Energética Nacional (FEN) was hired by ISA to study financing options.

Site

Siting studies selected Puerto Olaya, which is located on the Magdalena River, directly across from Puerto Berríos. The plant will be located 65 kilometers south of Barrancabermeja, a major Colombian oil and gas center, and 209 miles north of Bogotá.

Puerto Olaya Thermoelectric Project

Infrastructure Project Profiles

Timing

ISA is preparing the bidding documents and is expected to call for bids in September or October of 1995. Environmental impact studies and preliminary engineering are already underway. Start-up is planned for 1998.

Demand Equipment & Services

The majority of the equipment — steam and gas turbines, generators, condensers, and switchgear — will need to be imported. The only major equipment systems produced in Colombia are boilers, an area in which U.S. companies are considered competitive. In addition, U.S. companies are expected to be competitive in engineering and construction services.

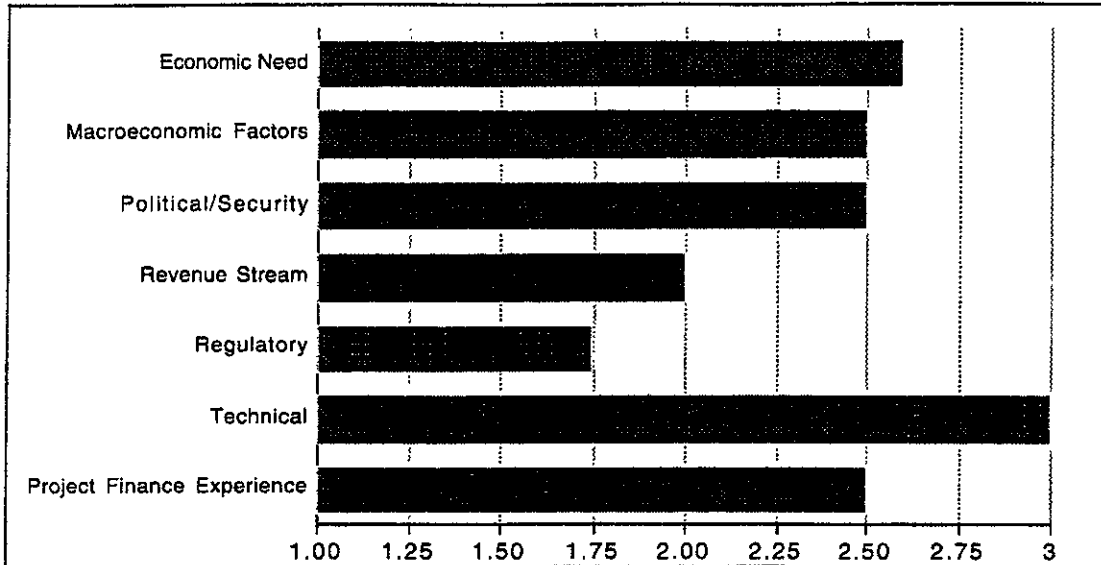
Nature of Demand

ISA expects to sell all of the power produced at Olaya to power distributors located in central Colombia, although no power purchase agreement has been concluded yet. ISA projects strong demand for electric power throughout the country. Colombia estimates an average annual increase in energy demand from 5.8 percent to 6.2 percent for the period between 1993 and 2010.

Financeability

The project could change dramatically if the Ministry of the Economy follows through on its announcement to privatize ISA. If privatization takes place, both the financing and the contracting of plant design and construction could change with the new owners. The Ministry of the Economy is in the process of contracting a local investment bank to study privatization options for ISA. Their findings should be ready in mid July of 1995.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

The most important decision makers are ISA and FEN. Financiera Energética Nacional (FEN) is a state financial institution which provides credit to the electric power sector. FEN has been contracted to advise ISA on organizing the bidding documents for the Puerto Olaya plant.

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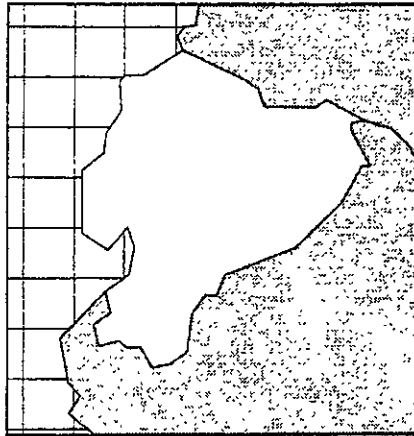
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Energy / Ecuador

La Libertad Refinery Modernization



Project Summary	
Project No:	ENE-17
Subsector:	Oil & Gas
Country:	Ecuador
Project Cost:	\$400 million
Export Potential:	\$320 million
Owner:	Petroindustrial

Petroindustrial, a subsidiary of the state oil company Petroecuador, plans a U.S.\$400 million expansion of its La Libertad Refinery. Petroindustrial will contract a private firm to restructure the existing facility, as well as construct and operate an expansion of the refinery. The project will be contracted on a BOT basis for 15 years.

Technical Description

After completing TDA funded studies to examine alternative refining processes, Petroindustrial produced a plan to upgrade the facilities in two phases:

Phase I

- Upgrade Existing Facilities
- Install a Naphthalne Conversion Unit
- Install a Power Generator—the construction of a 3 MW generator to supply power for La Libertad.
- Rehabilitate the Desalinization Plant—the plant produces 1,200 cubic meters of water per day.

Phase II

- Refinery Expansion—the refinery capacity will be increased from 46,000 barrels per day to 57,778 barrels per day
- Installation of Conversion Units.

La Libertad Refinery Modernization

Infrastructure Project Profiles

Refined Product	Current Production	Phase I	Phase II
LPG	667	1,147	7,078
Light Naphthalene	0	1,416	2,218
Converted Naphthalene	0	4,346	6,445
Gasoline	6,890	0	10,962
Kerosene, Jet , and Diesel	13,980	13,980	4,900
Fuel Oil	24,463	24,463	11,257

Phase I of the project will produce lead-free gasoline at 82 and 88 octane. Phase II will produce gasoline at 95 octane, eliminate gasoline contaminants, and raise the refining capacity from 46,000 barrels per day to 57,778.

Site

The project is located in the province of Guayas on the Santa Elena Peninsula.

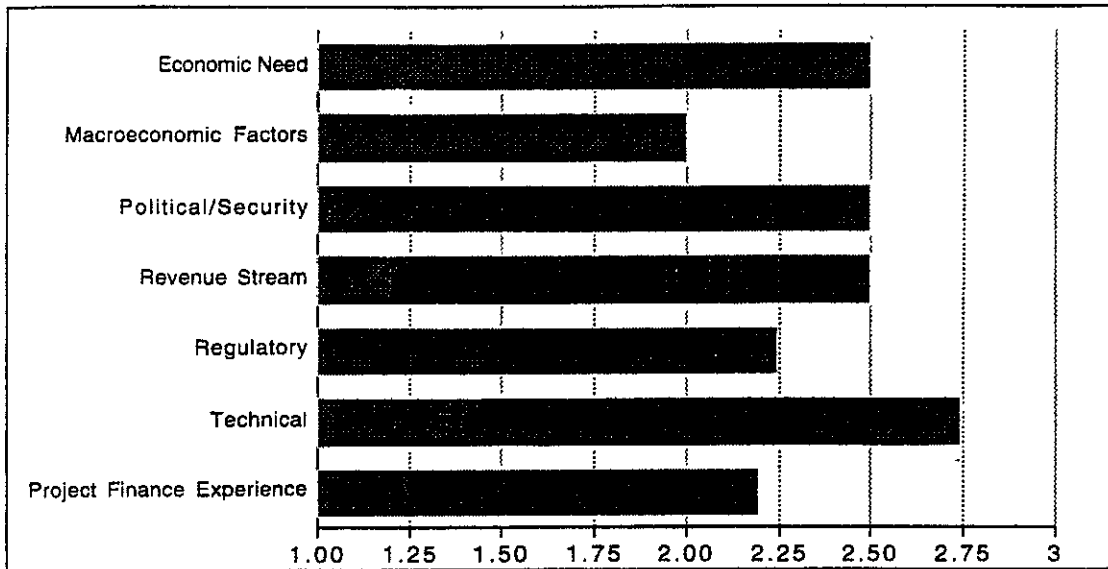
Timing

Petroindustrial is expected to call for bids in July 1995. Bidders must present an environmental impact statement with the bidding documents.

Financeability

The project will be financed by a private-sector firm on a build, operate, and transfer (BOT) basis under a 15-year contract. The exact terms of the concession are not yet known. The financeability of the project is supported by the strong demand for refined petroleum products. A guaranteed supply of crude will be supplied to the plant as part of the concession:

Financeability Assessment



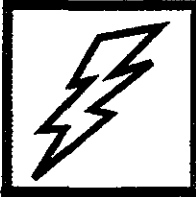
Source: CG/LA Infrastructure.

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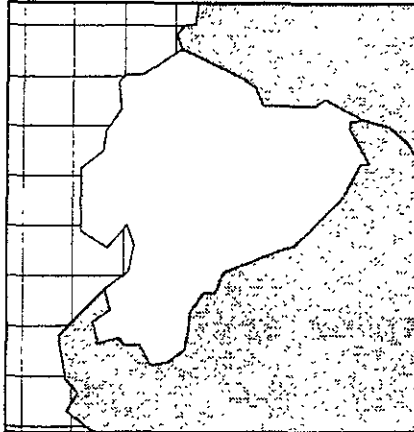
Key Decision Makers

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Energy / Ecuador Petroindustrial LPG Project



Project Summary

Project No:	ENE-28
Subsector:	Oil & Gas
Country:	Ecuador
Project Cost:	\$40 million
Export Potential:	\$20 million
Owner:	Petroindustrial

Technical Description

Petroindustrial, a subsidiary of Petro Ecuador, wants to boost its production of LPG, by recovering natural gas from three groups of wells in eastern Ecuador. Petroindustrial will contract international firms to install and operate modular plants to extract the LPG on a BOT (build-operate-transfer) basis. Although there will be three separate bid packages, Petroindustrial is prepared to award all three to a single firm. The period of the BOT contracts will be ten years. The three projects are expected to require investments of U.S.\$5, \$15 and \$20 million, respectively, for a total of U.S.\$40 million.

The contractor will recover the investment through LPG sales to Petroindustrial. According to Tec-Total, an Ecuadorean consulting engineering firm, the projected 30 percent internal rate of return will allow the company to recoup its investment within two years.

Site

The wells are located in eastern Ecuador.

Timing

Prequalification will begin at the end of June 1995.

Petroindustrial LPG Project

Infrastructure Project Profiles

Demand for Equipment & Services

Each project will require one modular plant and one group of compressors. Subproject investment estimates include investment in engineering, equipment purchases and installation as well as the construction of access ways to the sites.

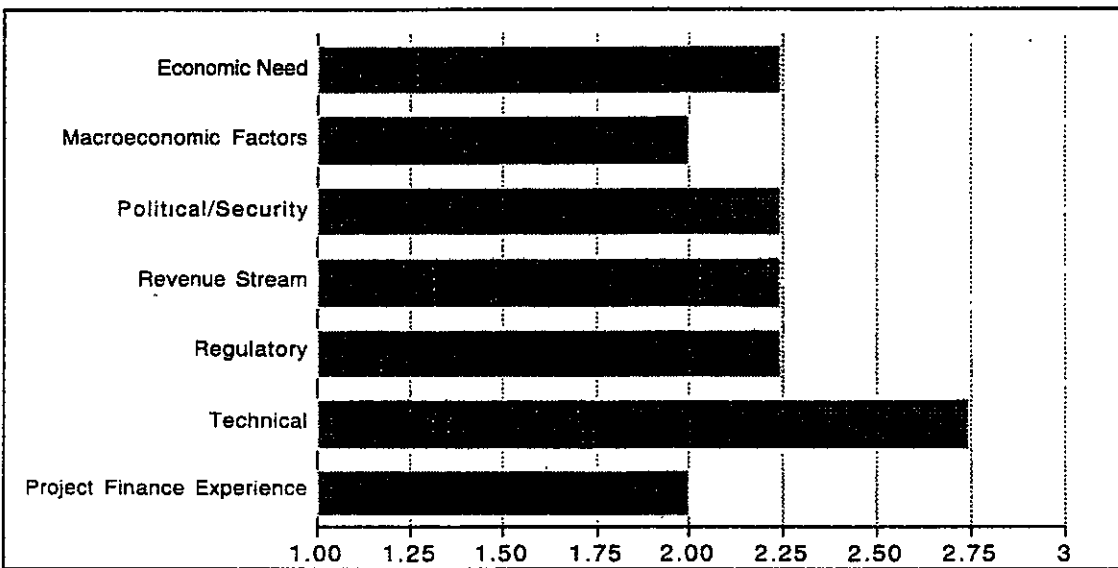
Nature of Demand

LPG produced from the wells will be directed at the internal market. Ecuador wants to reduce its dependence on imports which account for half of LPG used in the country.

Financeability

The overall strength of the Ecuadorean economy and potential continuation of Ecuador's border dispute with Peru are issues to be considered in assessing project financeability.

Financeability Assessment



Source: CG/LA Infrastructure.
 This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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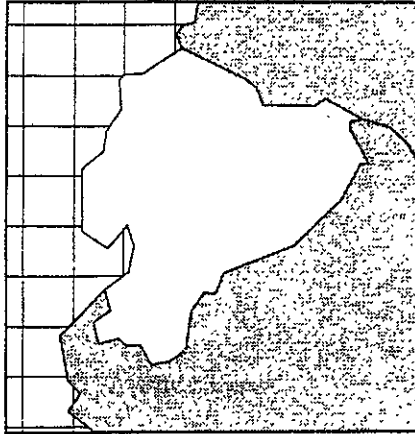
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Energy / Ecuador

San Francisco Hydroelectric Project



Project Summary

Project No:	ENE-19
Subsector:	Power
Country:	Ecuador
Project Cost:	\$222 million
Export Potential:	\$139 million
Owner:	INECEL

Ecuador is experiencing severe electric power shortages. Rolling blackouts of three to four hours a day are commonplace even in the capital. There is a dire need for INECEL, the state power company of Ecuador, to increase the country's power generation capacity. INECEL wants to organize the 254 MW San Francisco Hydroelectric project in the form of a concession to be bid by a foreign firm that can help supply the financing.

Technical Description

The San Francisco Hydroelectric Project, to be completed at an estimated cost of U.S.\$222 million, will have an installed capacity of 254 MW. The plant, equipped with two 127 MW turbines, will generate an average of 1,474 Gwh per year, increasing to 1,640 Gwh with heavy rainfall and 1,290 Gwh with little rainfall.

The project will involve interconnection with an existing 230 MW hydroelectric facility at Agoyán.

Category	Local Investment	Foreign Investment	Total
Engineering and Administration	\$8.3 million	\$8.6 million	\$16.93 million
Direct Costs	\$66.36 million	\$116.6 million	\$182.96 million
Other Costs	\$8.2 million	\$13.75 million	\$21.95 million
TOTAL	\$82.86 million	\$138.98 million	\$221.84 million

San Francisco Hydroelectric Project

Infrastructure Project Profiles

Site

The project is located in the eastern part of the Ecuadorian Andes in the middle basin of the Pastaza River on the border between the provinces of Tungurahua and Pastaza. Agoyan is also located on the Pastaza River. The basin area is mountainous, containing metamorphic rock that is appropriate for underground construction.

The prevalent Amazon climate produces an average annual rainfall of 700mm. Rainfall, however, varies up to 300mm depending both on the season and the area of the basin.

Timing

A quick start is expected on this project, since the majority of the engineering studies are complete. Seismological, hydrological, and geo-technical studies have been completed. An environmental impact analysis is finished as well.

Bidding for the San Francisco Project, expected to be called in July 1995 will be in three parts:

- Construction of the civil works.
- Supply and installation of the hydromechanical equipment.
- Supply and installation of the electromechanical equipment, including the installation of the San Francisco–Totoras transmission line.

Demand for Equipment & Services

The estimated export potential for this project is U.S.\$120 million. U.S. companies are likely to be highly competitive in the equipment supply and engineering portions of the tender, which INECEL estimates as the following:

Category	Cost
Equipment	\$78 million
Civil Works	\$105 million
Engineering, Administration, and Other Costs	\$39 million
TOTAL	\$222 million

Nature of Demand

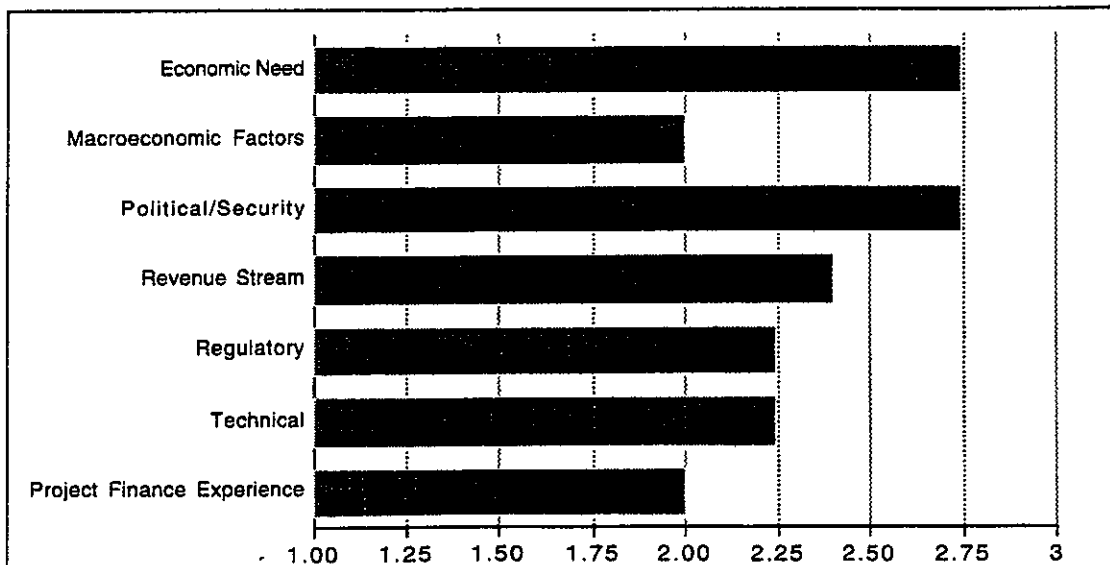
To keep up with demand, Ecuador estimates that it will need investments of U.S.\$2.6 billion in the power sector by the year 2006. Of the total investment needed, generation accounts for U.S.\$1.3 billion.

In 1993, Ecuador generated 7,023 Gwh of power with an installed capacity of 1,353 MW. INECEL estimates that, at the current rate, it will be able to increase installed capacity at an average annual rate of 3.62 percent–3.55 percent for the period 1991–2000. At the same time, it estimates average annual demand of over 5 percent for the same period.

Financeability

San Francisco will be let as a concession. The foreign partner will be expected to arrange international financing for the majority of the investment needed. The terms of the concession are not finalized and these terms are critical in assessing risk—for example, who bears the risk of drought and reduced generation capacity. At the same time, Ecuador’s need for power is driving the process and concession terms. The project site will present engineering and construction challenges.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

San Francisco Hydroelectric Project

Infrastructure Project Profiles

Key Decision Makers

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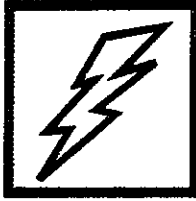
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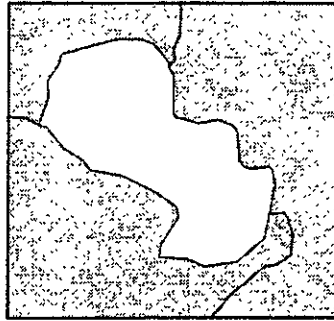
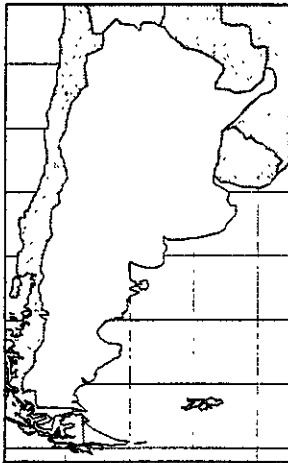
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Energy/Argentina and Paraguay

Corpus Christi Hydroelectric Project



Project Summary

Project No:	ENE-20
Subsector:	Power
Country:	Argentina/ Paraguay
Project Cost:	\$2.4 billion
Export Potential:	\$600 million
Owner:	COMIP

Paraguay and Argentina are reactivating another major project to exploit the hydroelectric potential of the Paraná River.

Since it was conceived in 1971, the Corpus Christi Project has undergone numerous revisions. In 1971 the Argentine and Paraguayan governments created a bi-national committee to explore options to develop hydroelectric power along their shared border on the Paraná River. In 1983, Lahmeyer Harza and Associates drew up a plan for a 4,608 MW hydroelectric plant to be located at Corpus Christi. The latest plan, developed by the British consulting firm of Knight, Piesold & Partners in 1993, scales back the size to 2,880 MW, and recommends that the project be developed by the private sector.

The project entails the construction of a hydroelectric station as well as a system of locks, an important step toward a fully functioning waterway on the Paraná River.

Technical Description

The Corpus Christi Project calls for the construction of a base load hydroelectric facility with installed capacity of 2,880 MW of power. The plant's 20 generator groups (144 MW each) will produce an average of 19,300 Gwh per year. The project will require an investment of U.S.\$2.42 billion. The Mixed Paraguayan-Argentine Committee of the Río Paraná (COMIP), the bi-national project sponsor, decided that the project should be developed by the private sector on a concession basis.

Corpus Christi Hydroelectric Project

Infrastructure Project Profiles

In addition, the project calls for the construction of navigational locks and supporting canal mechanisms. The locks will be 238 meters long in a canal protected by breakwaters. In addition, a draw bridge will be constructed over the site of the locks.

To assist in obtaining financing, the project will be divided into two separate contracts: the first for the hydroelectric plant and the second for navigational locks, resettlement, and environmental components of the project.

Site

Corpus Christi will be situated near the city of Itacua, 14 kilometers upstream from the cities of Encarnación (Paraguay) and Posadas (Argentina) on the Paraná River. In reference to the other two large hydroelectric dams on the Paraguayan stretch of the Paraná River, Corpus Christi is located 350 kilometers downstream of the 12,600 MW Itaipú (Paraguay/Brazil) and 100 kilometers upstream from the 3,200 MW Yacyretá (Paraguay/Argentina). Itaipú is at full generating capacity; Yacyretá is expected to be fully on line in 1996.

The reservoir behind the dam will flood an area of 600 square kilometers. The most recent population impact study, conducted in 1983, calculated that 20,000 people residing in 4,100 homes, would require relocation out of the project area.

Timing

The project schedule calls for a six-year completion schedule. Knight, Piesold & Partners estimated that the first turbine will go on line 4.5 years after the commencement of construction. The project should be fully on line in another 1.5 years.

COMIP has not fixed a date for the release of bidding documents for the concession.

Equipment & Services Demand

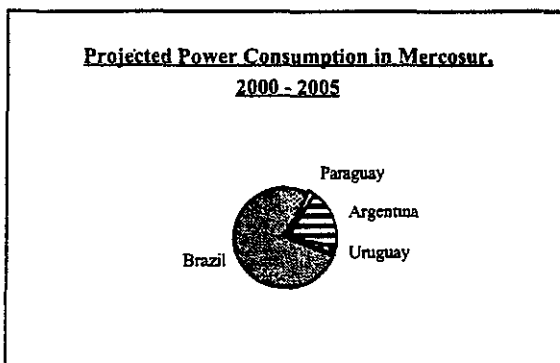
The concessionaire will be in charge of construction services, equipment procurement, operations and maintenance. In addition, government oversight agencies will contract out for project supervision. COMIP calculates that 25 percent of the total cost of the project will go to firms outside the Mercosur countries.

COMIP's cost breakdown of services required for the project is as follows:

Category	Cost in U.S.\$ millions
Preliminary Works	168.12
Relocation	169.51
Environmental	59.02
Civil Works	1,054.37
Mechanical Works	327.20
Electrical Works	319.45

Nature of Demand

Corpus Christi is favorably and strategically located to supply electricity to the markets of the MERCOSUR countries. According to statistics from the national energy authorities, the demand for electrical energy in Mercosur will reach 333, 000 Gwh per year by the year 2000 and 429,000 Gwh per year by 2005.



In terms of Mercosur power consumption between 2000 and 2005, Brazil represents 77 percent of the market, followed by Argentina at 19 percent, and Uruguay and Paraguay which share the remaining 4 percent. It is important to note that most of the consumption will be located within a 1,200 kilometer radius from Corpus Christi. The plant will be located approximately equidistant from the two major centers of consumption: South and Southeast Brazil which encompasses São Paulo and Rio de Janeiro; and the Río de la Plata Region of Argentina which encompasses Buenos Aires.

It is important to emphasize that, of the Mercosur nations, only Paraguay is assured the supply of electrical energy for more than 30 years. The forecasts indicate that Argentina and particularly Brazil will have difficulty in covering the demand for electrical energy.

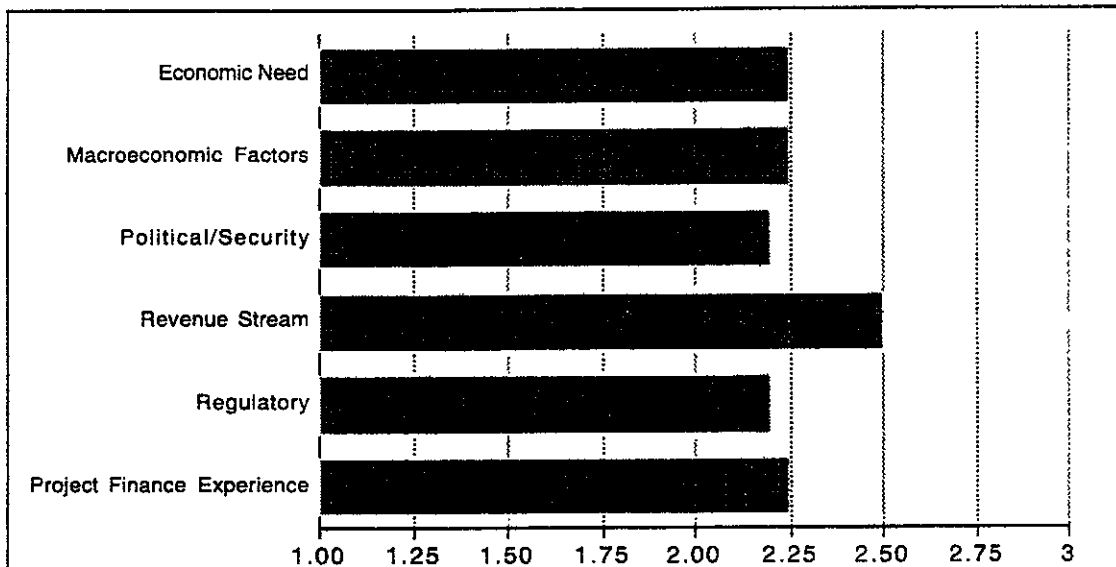
Corpus Christi Hydroelectric Project

Infrastructure Project Profiles

Financeability

The main issues in financeability concern whether alternate sources of power in Brazil and Argentina will be developed at a pace that might make the Corpus Christi Project superfluous. Also, Brazil is seeking to reduce its dependence on hydroelectric power. The planned Brazil-Bolivia Natural Gas Pipeline has the capacity to provide 3,000 MW of energy. Finally, the prior extensive delays in this project have set a bad precedent for its moving forward on a timely basis.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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Energy / Regional

Itaipú-Corpus-Yacyretá Interconnection



Project Summary

Project No:	ENE-21
Subsector:	Power
Country:	Regional
Project Cost:	\$150 million
Export Potential:	\$40 million
Owner:	ANDE

The southern cone of South America has two river systems, each offering an enormous hydroelectric potential—the Uruguay and the Paraná-Paraguay. As a result, the countries of the region—Brazil, Argentina, Uruguay and Paraguay—have developed power generation strategies based on seasonally-variable hydroelectric power. These countries are increasingly moving toward a more balanced power, generating system through thermal generation, as they still suffer from power shortages during dry periods.

A second solution to the problem takes advantage of the changes in water level on the two river systems, which are complementary. Statistics reveal that the water level on the Uruguay is high at the same time that it is low on the Paraná. Therefore, the construction of a power transmission “ring” to connect the hydroelectric stations of the two river systems would allow the region to correct the seasonal imbalances.

Technical & Site Description

ANDE, the Paraguayan state electric company, is taking the initiative toward interconnection, by planning the construction of the first phase of the project—a 500kv transmission line between three binational hydroelectric stations on the Paraná River. The 375-kilometer line will connect Itaipu, the Paraguayan/Brazilian 12,800 MW plant in operation; Corpus Christi, the Paraguayan/Argentine 2,880 MW plant in the project stage; and Yacyretá, the Paraguayan-Argentine 3,200 MW plant that will go on line gradually and be in full operation in 1996.

Itaipú-Corpus-Yacyretá Interconnection

Infrastructure Project Profiles

Equipment & Services Demand

The main opportunity will be for the supply of 500kv power transmission equipment.

Nature of Demand

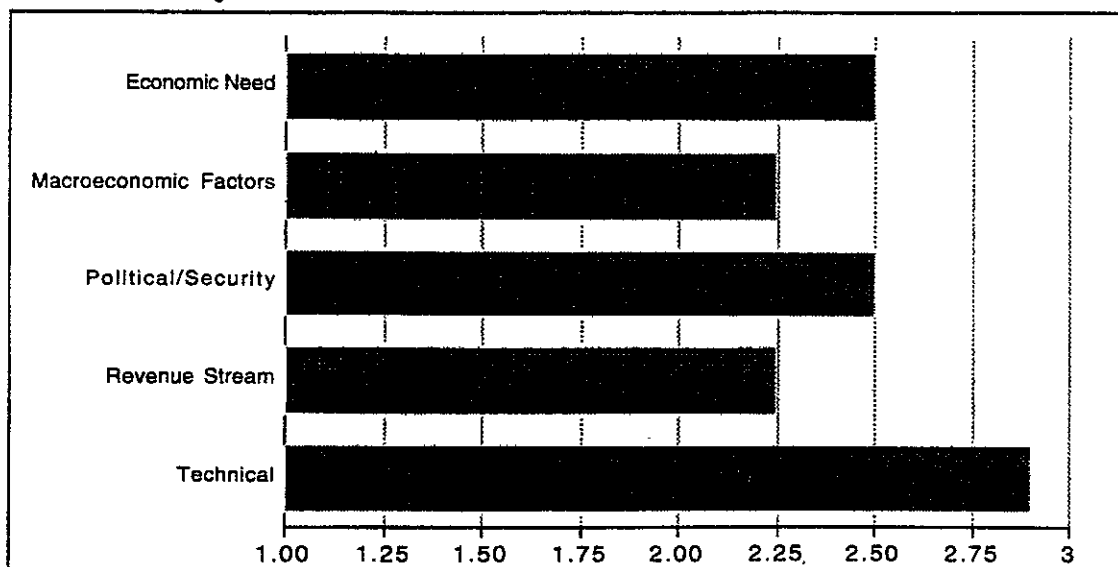
The demand for electric energy in this region will reach 333,000 Gwh per year by the year 2000 and 429,000 Gwh per year by 2005. Brazil represents 77 percent of the demand, Argentina 19 percent and Uruguay and Paraguay the remaining 4 percent. Most of the consumption will take place within a radius of 1,200 kilometers from the project.

Of the Mercosur nations, only Paraguay is assured the supply of electrical energy for more than 30 years. Forecasts indicate that by the year 2000, the other Mercosur countries, especially Argentina and Brazil, will have difficulty meeting the demand for energy.

Financeability

One of the primary issues in financeability revolves around the alternative sources of electrical power in the regional market. Brazil and Argentina both have plans to increase the thermoelectric share of their energy mix. In addition, the project's success is linked to the export of power, and therefore dependent on electrical power policies in foreign markets. In order for the project to go forward, ANDE will need to do a feasibility study on the regional power market.

Financeability Assessment



Source: CG/LA Infrastructure.

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Key Decision Makers

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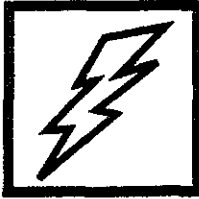
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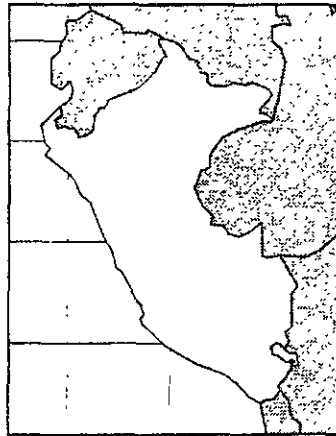
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Energy/Peru

Aguaytía Gas Power Project



Project Summary

Project No:	ENE-22
Subsector:	Gas, Power
Country:	Peru
Project Cost:	\$122 million
Export Potential:	\$73 million
Owner:	Maple Gas Corporación del Peru

Technical Description

This project, being developed by a Peruvian subsidiary of a U.S. company, consists of three main components with various sub-projects. Basically, it combines the development of an oil and gas field with the construction of a 140 MW gas-fired power plant feeding into 430 kilometers of 220 Kv transmission lines. The gas field will require the construction of production and processing facilities for 55 million cubic feet per day.

The oil field and refinery development project has three main areas of investment:

Oil Field Development

Eighteen rehabilitation projects in two oil fields (which are already completed or under way), drilling of three development wells, installation of water reinjection in each field, electrification of production operations.

Oil Field Seismic Study

Three-dimensional seismic study of 20 square kilometers to map deep lying structures beneath existing production.

Aguaytía Gas and Power Project

Infrastructure Project Profiles

Refinery Upgrades

Dike repair around existing storage tanks, asbestos abatement training and encapsulation (which has already been carried out), move existing barge facilities to a new location along the river.

The gas and liquids project has four main areas of investment:

Gas Field Development

Drilling of five new development wells with an average depth of 9,000 feet, repair wellhead deviation in existing well and prepare for water disposal.

Gas Processing and Fractionation Plants

Construction of a 55 mmcf/d cryogenic processing plant, gas inlet separation and measurement facilities, inlet dehydration facilities, one 5,000 hp residue compression to 1,000 psig and one to 5,000 psig. camp facilities, LPG storage facilities, gasoline fractionation plant, and natural gasoline pipeline delivery facilities.

Gas and Liquid Pipelines

Ten kilometers of 4.5-inch gas flowlines to the new power plant, 65 kilometers of 6.625-inch residue gas pipeline to existing power plant, 105 kilometers of 4.5-inch NGL pipeline to fractionation plant, pigging and measurement facilities for all lines.

Barge Facilities

Construction of new river barge facilities to load LPG and other products in addition to installation of new truck loading and unloading facilities.

The electric power and transmission project has two components:

1. Construction of a 140 MW gas-fired power plant, for which the contract has already been awarded.
2. Transmission Lines and Substations
 - 85 kilometers of 220 Kv single circuit transmission lines from the power plant to the substation, installation of 220 Kv to 138 Kv transformer substation at the end of the 85-kilometer line.
 - 345 kilometers of 220 Kv single circuit transmission line from the 138 Kv substation to the 220 Kv main power grid system on the west coast.
 - Expansion of the existing substation for connection with the main power grid.

Site

The oil field, refinery, gas field, gas processing plant, fractionation plant, shipping facilities, and the power plant are located in the Peruvian central jungle region in the province of Ucayali near the city of

Pucallpa. Pucallpa is located approximately 780 kilometers northeast of Lima, the country's capital. The transmission line from the power plant runs west from the central jungle region over the Andes to the west coast of Peru.

Timing

Current Status

The rehabilitation projects for the Agua Caliente oil field have been completed and projects are currently underway at the Maquia field. The asbestos training and encapsulation has been performed in the refinery. The bidding process for the power plant has closed and the contract has been awarded. Construction is expected to begin in August.

Bidding Dates

Bidding for the various items needed for the oil field project will be a continuous process on an as-needed basis. Bidding for major contractors and equipment have been performed in the gas, power and transmission projects with negotiations for contracts to commence in June.

Delays in the gas, power, and transmission projects may be experienced if government approvals for construction and rights-of-way do not come through as planned. The major consideration that could delay the completion of all projects would be weather conditions.

Equipment & Services Demand

Due to the magnitude of the different areas that will be developed, a separate lump sum turnkey contract will be used for the principal construction parts of the gas, power and transmission projects. Equipment, systems, engineering services and construction management will be performed under these contracts. Third-party inspection services will be contracted for all phases of the projects. The oil field development project will use local in-country services with the majority of the well equipment being imported. The total cost of the project is U.S.\$180 million. However, the contract for the gas-fired power plant has already been awarded.

The breakdown of the total investment is as follows:

Oil Field Development	\$3.25 million
Oil Field Seismic Study	\$1 million
Refinery Upgrades	\$0.25 million
Gas Field Development	\$8 million
Gas Processing and Fractionation Plant	\$30 million
Gas and Liquids Pipelines	\$23 million
Barging Facilities	\$1.5 million
Gas-Fired Power Plant	\$60 million*

Aguaytia Gas and Power Project

Infrastructure Project Profiles

Transmission Lines and Substations	<u>\$55 million</u>
Subtotal	\$182 million
Contracted Investment (*)	-\$60 million
Total	\$122 million

The possible foreign share in providing equipment and services is estimated at 50 percent for equipment and 75 percent for services.

Nature of Demand

Peru is currently unable to serve the growing needs of an expanding market in LPG and electricity. The country consumes 7,000 barrels per day of LPG, out of which 3,000 barrels are imported. This project will reduce the country's LPG import needs by 45 percent. In the area of electric power, demand is increasing rapidly and the country is experiencing frequent shortages of power. Ninety percent of the power on the main grid is supplied by hydroelectric plants and the remaining 10 percent by thermoelectric plants. The objective of the Peruvian government in the long term, is to achieve a 70/30 division between hydro- and thermal-electric power. The current demand growth is 150 MW per year and this is the next project scheduled to come on line at the end of 1996.

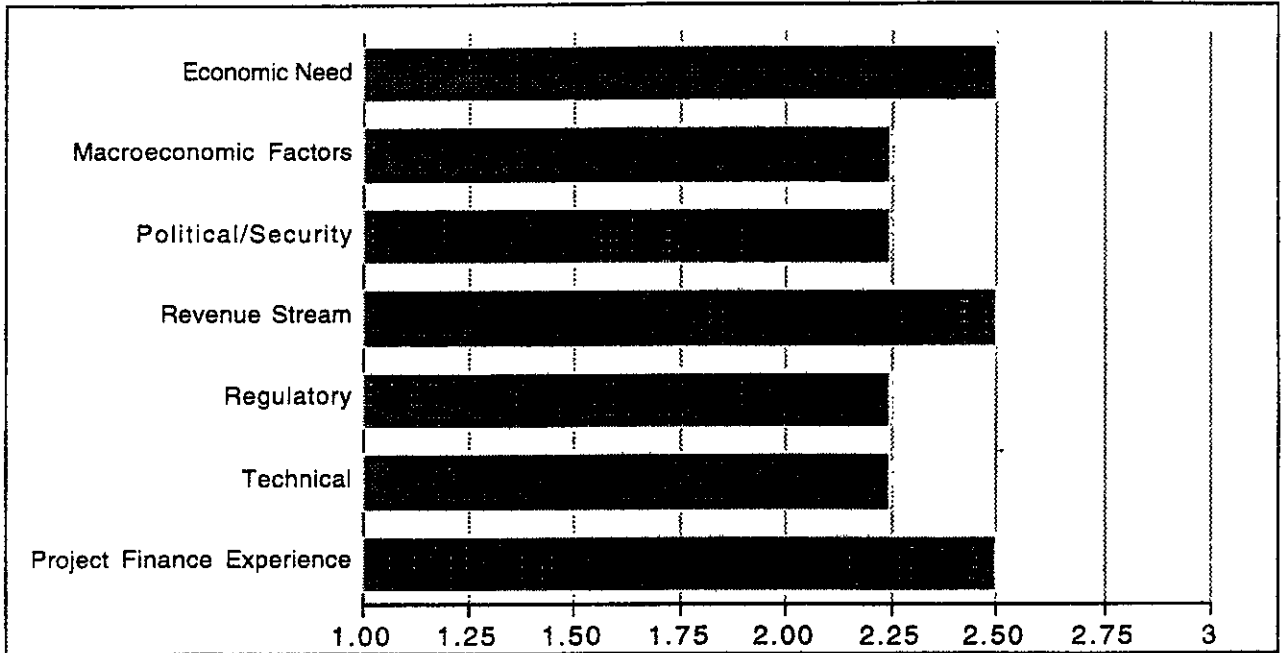
Moreover, there is currently no gas infrastructure in Peru. This project will open up a new and profitable market.

Financeability

While this is a complicated project, there are many positive factors supporting its financeability. For example, Maple Gas has certain long-term leases and license contracts with Petroperú. It does not receive any direct Peruvian government funding.

Maple is currently discussing possible debt participation with IFC, IDB, and OPIC and possible insurance coverage with the IFC and OPIC.

Financeability Assessment



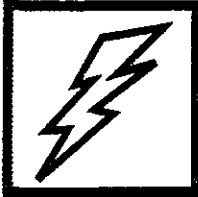
Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

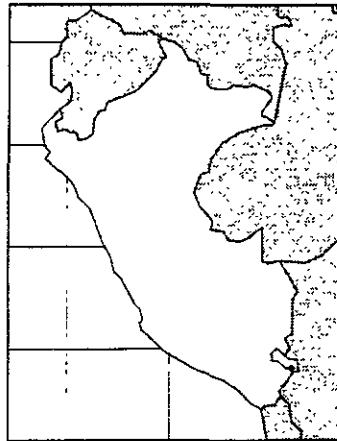
Maple Gas Corporación del Perú
 Rex Canon, *General Manager*
 Tony Hines, *V.P. Operations*
 Lima, Peru
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TDA Project Tip
TDA is partially funding a feasibility study for a private sector gas-fired power plant being developed by the Maple Gas Corporation. The feasibility study, currently in progress, is being executed by Maple Gas.



Energy / Peru

EDEGEL Thermoelectric Power Plant



Project Summary

Project No:	ENE-23
Subsector:	Generation
Country:	Peru
Project Cost:	\$70 million
Export Potential:	\$60 million
Owner:	EDEGEL

Technical Description

Lima Power Generating Company (EDEGEL) is preparing bid documents to call for an international tender, under BOO modality, for the supply of 100 MW of electricity. EDEGEL will sign a ten-year contract with the company that wins the tender.

The winning company must guarantee a minimum supply of 600 Gwh with a nominal power of 10,000 KW to 20,000 KW. The plant must use generators fueled with R6 residual fuel oil. Currently, EDEGEL is negotiating a ten-year contract for the supply of oil with Petroperu S.A. The plant should deliver 220 KV to the North-Center Grid—EDEGEL will be responsible of the construction of the connection to the San Juan Substation (220/60KV), ten kilometers from the plant.

Plant emissions must comply with international standards.

The bids on the project will be evaluated according to two separate criteria:

- Capacity Charges
- Demand Charges: broken out by charges for the minimum supply and charges for supply over the required minimum.

EDEGEL Thermoelectric Power Plant

Infrastructure Project Profiles

Site

The plant will be located in the province of Lima in the town of Villa Salvador, 1.6 kilometers from the Conchan refinery, from which the plant will obtain its supply of oil.

Equipment & Services Demand

The plant will require civil engineering and design services as well as all associated equipment needed to generate electricity. EDEGEL requires the installation of new equipment, fueled with R6 residual oil. However, the plant also must be capable of using natural gas in the future.

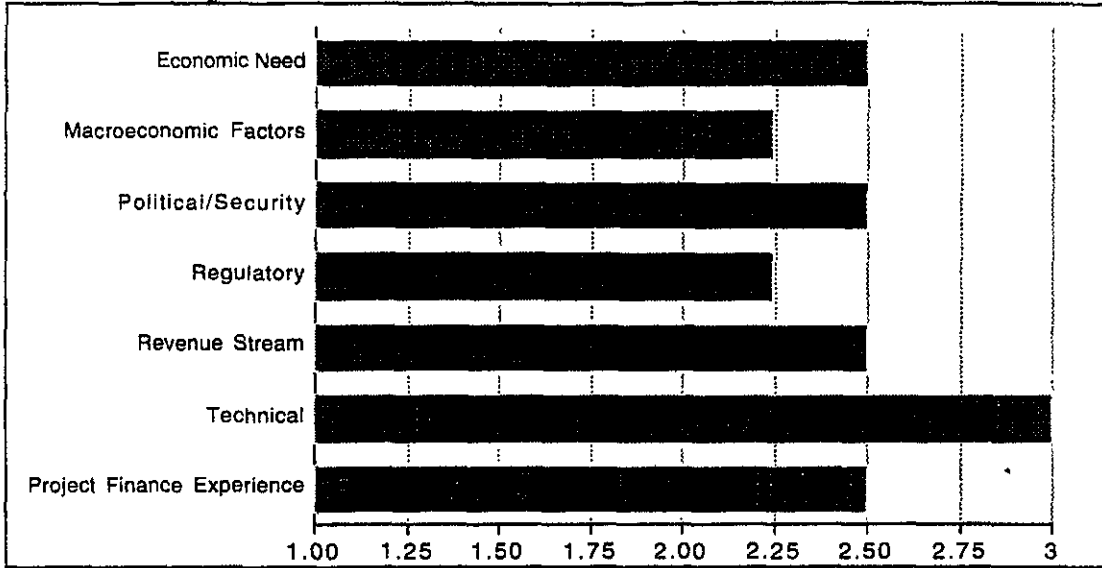
A tank farm will be constructed to store the fuel oil delivered through a pipeline from the Conchan refinery.

Financeability

Several positive factors support financeability. Demand for power in Lima is strong. Peru's private energy regulations are new but already work well. The proposed contract mitigates both fuel and exchange rate risk by allowing electricity tariffs to be adjusted by fuel and exchange rate movements.

On the negative side, no long-term fuel supply agreement exists yet.

Financeability Assessment



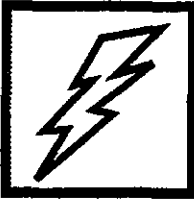
Source: CG/LA Infrastructure.

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Key Decision Makers

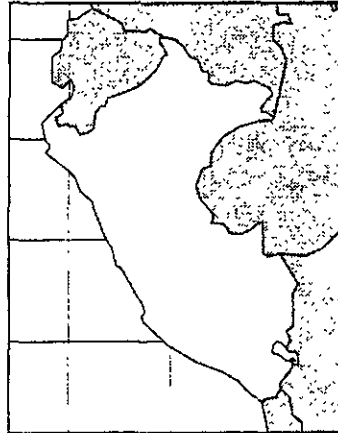
Lima Power Generating Company (EDEGEL)
 Ing. Waldo La Madrid, *General Manager*
 Lima, Peru
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Ing. Edelin Piña, *Project Manager*
 Lima, Peru
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Energy / Peru

El Caño Hydroelectric Project



Project Summary

Project No:	ENE-24
Subsector:	Power
Country:	Peru
Project Cost:	\$70m-\$80m
Export Potential:	\$30m-\$35m
Owner:	Centromin

Growth in both the mining and power sectors in Peru will continue to be strong. Centromin, a private firm that operates seven mines as well as metal refining facilities, is planning to invest U.S.\$500 million in its mining projects by 1999. However, Centromin is expanding its power plants not only to keep up with its own demand, but also to sell power to third parties.

Technical Site & Description

The 70 MW El Caño Hydroelectric Plant will be located some 400 kilometers east of Lima on the Pachitea River, which flows northeast toward the Amazon River. The plant will harness the discharge flowing downstream from the existing 120 MW Aupi Hydroelectric Plant.

Centromin has four other hydroelectric plants with a total capacity of 200 MW: Aupi (120 MW), Malpaso (57MW), Pachachaca (12MW) and Oraña (11MW).

El Caño Hydroelectric Project

Infrastructure Project Profiles

Timing

Topographical and geotechnical studies are complete. Prefeasibility studies, funded by French banks, will be finished in June. Bids for construction and procurement are expected in August or September of 1996.

Equipment & Services Demand

Centromin plans to use a configuration similar to that of the Aupi plant (two sets of three horizontal turbines). Aupi's first set contains three 20-MW Morgan Smith turbines and a GE generator. The second contains three German-made 20-MW turbines and a Japanese-made generator.

Nature of Demand

Present installed capacity for the country is 4,100 MW. Electroperú and Electrolima produce two-thirds of the total. Mining companies, like Centromin, account for the remainder.

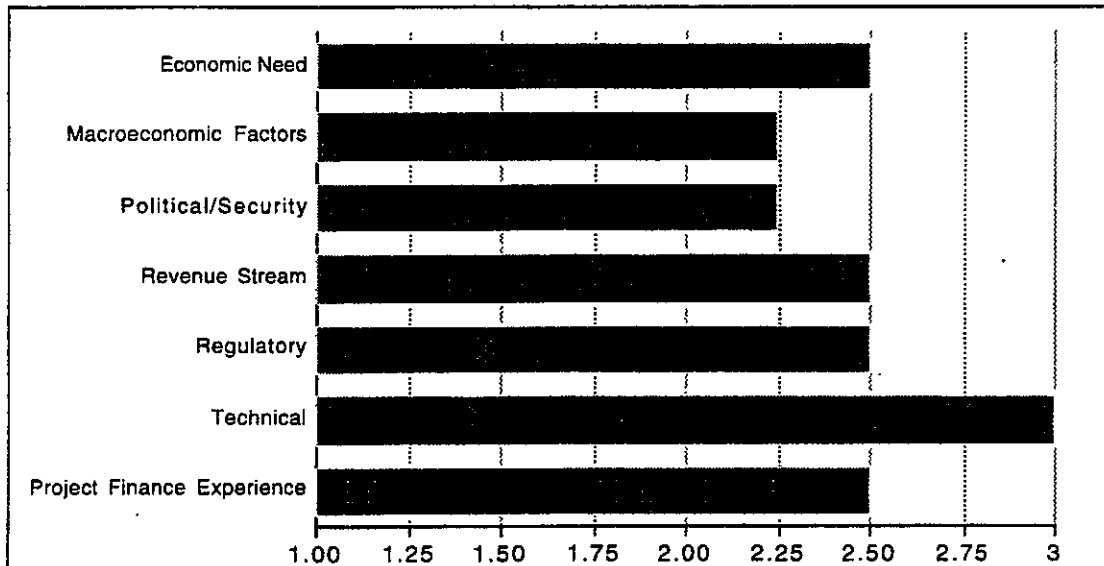
The power market in Peru is expected to grow by 6 percent in 1995 and 1996, followed by 5 percent annual growth in 1997 and 1998. Centromin estimates that there is demand for 2000 MW of additional power.

Power regulations have been implemented which allow generators to sell power to distributors and large consumers. The plant will be able to sell excess power to consumers located on the Central North Interconnected Transmission System which covers most of the country from Nazca, in southern Peru, to the northern border.

Financeability

Major concerns center on the long term strength of Centromin. This is somewhat counterbalanced by the winning bidder's ability to sell power to other customers.

Financeability Assessment

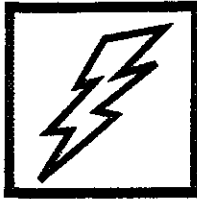


Source: CG/LA Infrastructure.

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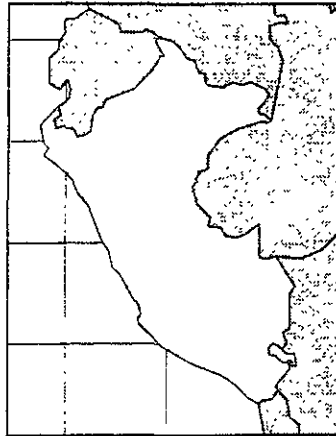
Key Decision Makers

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Energy / Peru

Lambayeque Biomass Cogeneration Project



Project Summary

Project No:	ENE-25
Subsector:	Power
Country:	Peru
Project Cost:	\$25-35 million
Export Potential:	\$15-21 million
Owner:	EPOSE

Newly developed independent power regulations are allowing private companies like the Peruvian Electrical Systems Operations Company (EPOSE) to enter the market to supply both local and nationwide needs for electric power.

Technical Description

To address an energy shortage in northern Peru, EPOSE proposes to develop a biomass-fired 20-MW to 30-MW cogeneration unit utilizing a plentiful supply of agricultural waste. The main available waste fuels are rice hulls and sugar cane bagasse.

Although power rates vary across Peru, EPOSE estimates a retail sales price for power at 12 cents per Kwh from thermoelectric sources and 7 to 8 cents per Kwh from hydroelectric sources. Wholesale prices for sales to the Central North Interconnected System (SICN) are around 5 cents per Kwh.

A 1991 feasibility study undertaken by the Swedish firm Tecnia AB demonstrated the financial viability of the project.

Lambayeque Biomass Cogeneration Project

Infrastructure Project Profiles

Site

The facility would be located in the Department of Lambayeque near the city of Chiclayo on the northern coast of Peru, 750 kilometers northwest of Lima.

Timing

A feasibility study must be carried out on the final form of the project. EPOSE believes that power demand and purchase prices are sufficient to justify construction of the facility as soon as the feasibility study is complete.

As local financing is very expensive, EPOSE is seeking international project and equipment financing. EPOSE is also looking at international sources for feasibility study funding.

Equipment & Services Demand

The feasibility study will determine the optimum size of the facility, but most of the specialized electrical generating equipment needs to be imported. Design, engineering, construction and operating services will also be required.

Nature of Demand

The Lambayeque plant will either sell power to the grid or to local agricultural and agro-business consumers.

FRAMEWORK FOR THE ELECTRIC SECTOR IN PERU

- 1) *Generation is deregulated and subject to market forces through competition.*
- 2) *Transmission provides open access to suppliers and purchasers under a common carrier system with a regulated toll scheme and node prices.*
- 3) *Distribution as a natural monopoly is regulated in regards to rights and duties of the market participants.*
- 4) *Prices are liberalized at the generation stage and regulated at the transmission and distribution stages.*

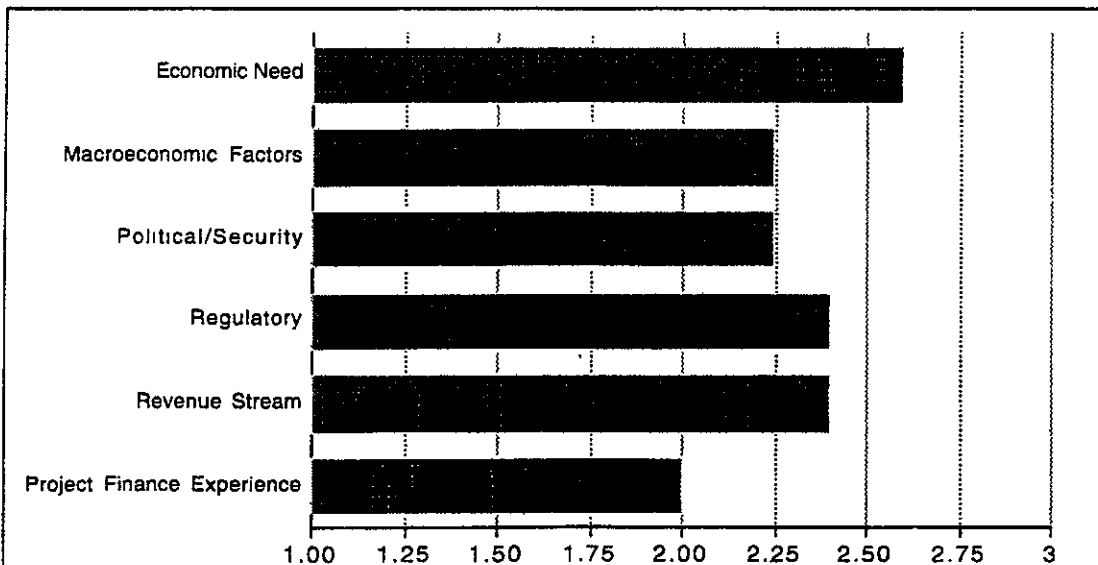
The Department of Lambayeque is primarily an agricultural region which needs energy for the irrigation of rice and vegetable farms. Farms in the Olmos and Motupe Valley currently use gasoline or diesel to pump water from the subsoil. EPOSE believes that providing electric power generated from its biomass facility will be cheaper than the continued use of power generated from gasoline and diesel. In addition, associated agrobusinesses—food processing and preserving operations—are also in need of electrical power.

Finally, power sales to the North Central Interconnected System (SICN) would allow the plant to supply power to Lima, and as far south as Nazca. Electroperú estimates that nationwide demand for power will increase by 6 percent in 1995 and 1996, and 5 percent in 1997 and 1998. Today, the power deficit on the SICN exceeds 500 MW.

Financeability

A host of questions remains to be answered, starting with the identity and financial strength of the offtakers. Important factors for the success of this project include: completion of a project feasibility study, long-term power purchase agreements, and guaranteed long-term fuel supply. The feasibility study will have to determine how much power can be sold to agricultural consumers.

Financeability Assessment



Source: CG/LA Infrastructure

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Lambayeque Biomass Cogeneration Project

Infrastructure Project Profiles

Key Decision Makers

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Ing. Fritz Vallenias, *Vice President*

Lima, Peru

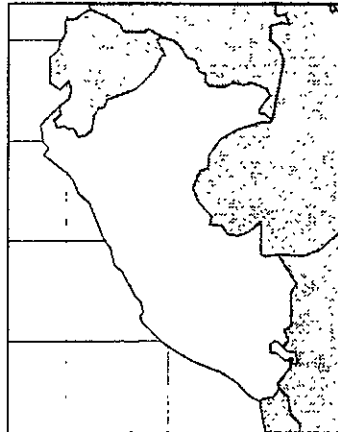
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Energy/Peru

San Ignacio Morococha Hydroelectric Plant



Project Summary

Project No:	ENE-26
Subsector:	Power
Country:	Peru
Project Cost:	\$55 million
Export Potential:	\$20 million
Owner:	Grupo Arias

The San Ignacio de Morococha Mining Company—owned by Grupo Arias—is one of a number of mining firms that is expanding its power-generation capacity for third-party sales. Sectoral reforms in the last two years have enabled companies like San Ignacio to enter this power-generation market.

Technical & Site Description

The project calls for a new 38-MW hydroelectric plant requiring an investment of U.S.\$55 million. The design of the plant and technical studies are completed. This plant will be located near the city of San Ramón, in the province of Junín, some 200 kilometers from Lima. San Ramón is located on the eastern side of the Andes. A four-hectare riverside site, with paved-road access, has been selected. Water will be forced through turbines after running through a tunnel for five kilometers.

Timing

Grupo Arias is seeking financial support for the project. Therefore, the schedule for this private bid will depend on the results of the ongoing financial evaluations and negotiations.

San Ignacio Morococha Hydroelectric Plant

Infrastructure Project Profiles

Equipment & Services Demand

Principal equipment needs are turbines, transformers, transmission lines and floodgates. The estimated value of this equipment is over U.S.\$16 million (CIF value).

Nature of Demand

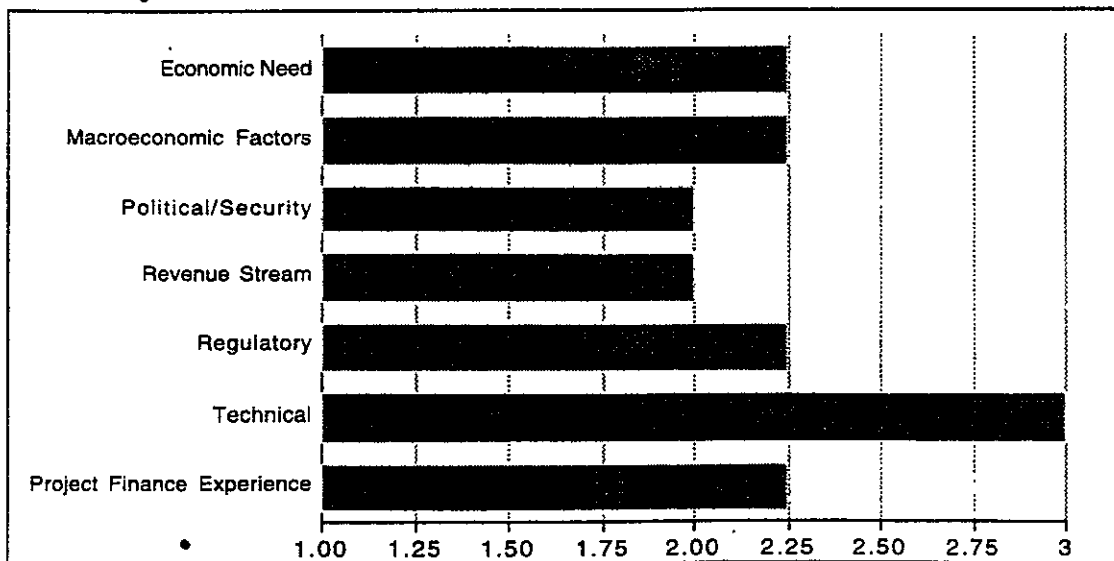
Grupo Arias has been focused in the mining sector, but is looking to diversify and would like to enter the energy sector. This project is the first step in that diversification.

Power demand in Peru will remain strong for the coming years. According to Electroperú, power demand will grow 6 percent annually in 1995 and 1996. Demand will be 5 percent annually for 1997 and 1998. In Peru today, hydroelectric power sells for 7 to 8 cents per Kwh.

Financeability

The company is currently finishing its financial studies and is in discussions with certain financial institutions, including the Inter-American Development Bank, Corporación Andina de Fomento and private banks to provide the financing for this project. The financial strength of the project sponsor is the main issue for this project.

Financeability Assessment

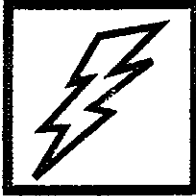


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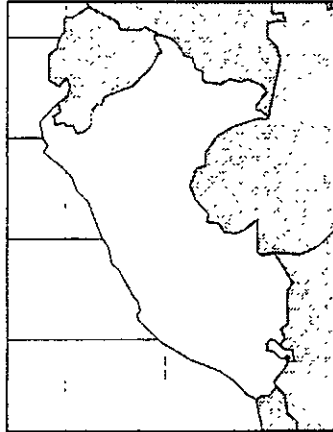
Key Decision Makers

Grupo Arias
San Ignacio de Morococha Mining Company
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Energy/Peru

Southern Peru Electric Power Generation Project



Project Summary

Project No:	ENE-27
Subsector:	Power
Country:	Peru
Project Cost:	\$105-135 million
Export Potential:	\$85-105 million
Owner:	To Be Determined

Southern Peru is a major mining center. Among the leading mining operations are Southern Peru Copper Corp., Cerro Verde (of Cyprus Minerals) and Quellaveco (of Mantos Blancos). The industry in general is recovering sharply from a period of stagnant production which has lasted almost 30 years. Indeed, some 60 foreign companies are now active in Peru and are reinvigorating a sector with tremendous growth potential.

Recent privatizations in the mining sector have resulted in increased private investment in new mining technologies and increased production. Future planned expansions will require significant new sources of electricity.

Technical Description

With the mining sector expanding, its need for electric power will increase dramatically. There is already an electricity deficit of some 30 MW in the South-East Interconnected Electrical System. With expansion of the mining sector, this deficit is expected to grow dramatically.

Empresa Peruana de Operación de Sistemas Eléctricos S.A. (EPOSE) is organizing a project to address the future energy needs of southern Peru, especially the mining sector. Although a complete feasibility study needs to be done, EPOSE believes the region can easily support the addition of three 50-MW generation units over the next six years.

Potential fuel sources are low-sulfur coal from northern Peru or natural gas.

Southern Peru Electric Power Generation Project

Infrastructure Project Profiles

Site

The site will be located in southern Peru, probably near Ilo, the city being developed as a port and industrial development for Bolivia.

Timing

The next step in the project is to secure funding for a technical feasibility study. EPOSE believes that there is sufficient demand to justify a 50-MW plant within the next two years.

Equipment & Services Demand

Demand for equipment and services includes power plant equipment of all types, engineering services, and project management services. EPOSE estimates the cost of a 50-MW plant to be in the range of U.S.\$35 and U.S.\$45 million.

Nature of Demand

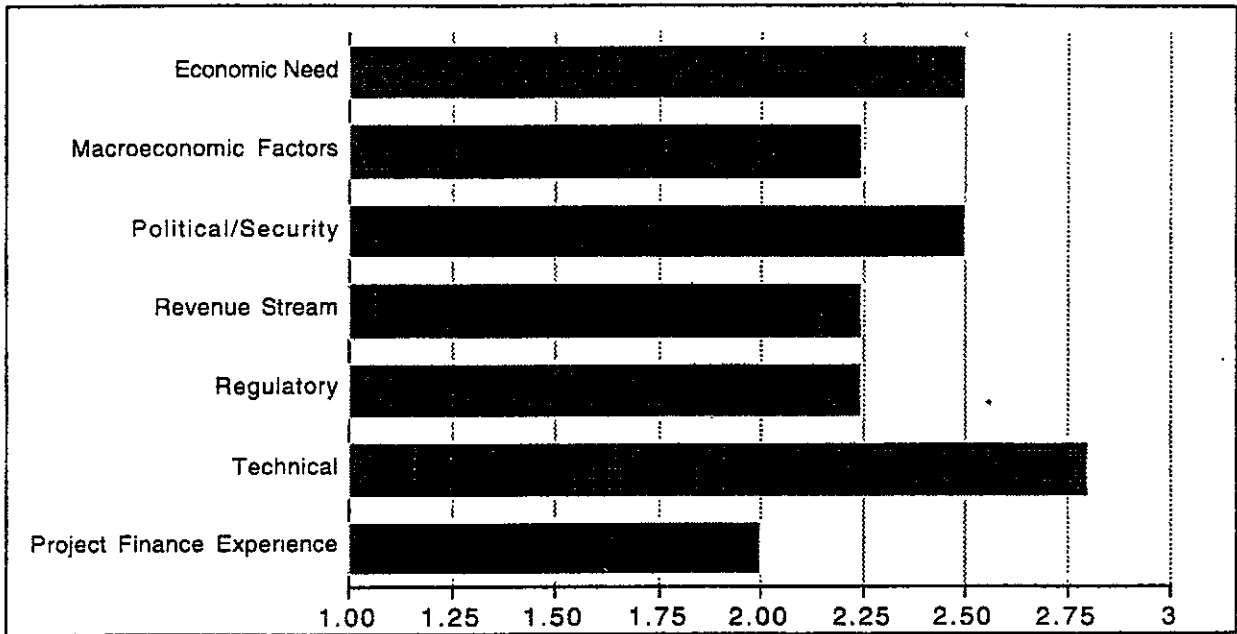
Demand is being driven by two factors: 1) expansion of the significant mining sector in southern Peru, spearheaded by private mining companies; and 2) the current obsolete state of thermoelectric generating equipment and the associated high cost of power production.

Southern Peru relies primarily on two 36 MW hydroelectric plants in Tacna, and a group of hydroelectric and thermoelectric plants in Arequipa which have a total capacity of about 200 MW. EPOSE estimates a demand for 100 MW to 150 MW of power in the region's mining sector.

Financeability

The project is in the early development phase but is driven by strong demand by major mining concerns which could form the basis for financing. At the same time, the mining industry is cyclical and this raises concerns over the consistency of the revenue stream. The project will need to develop a diverse consumer base to lessen the impact of these cycles and increase financeability. A feasibility analysis is required to further define fuel supply.

Financeability Assessment



Source: CG/LA Infrastructure.

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Key Decision Makers

Empresa Peruana de Operación de Sistemas Eléctricos (EPOSE)

Dr. Gonzalo Garland I., *President*

Lima, Peru

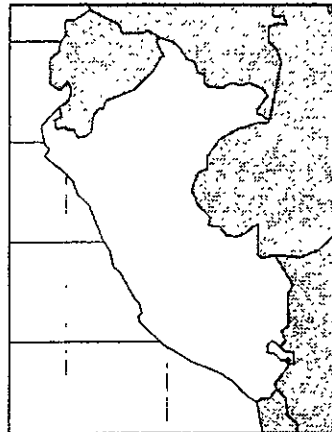
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Energy/Peru

Ventanilla Power Plant Expansion



Project Summary

Project No:	ENE-28
Subsector:	Power
Country:	Peru
Project Cost:	\$200 million
Export Potential:	\$160 million
Owner:	Electroperú

Technical Description

Ventanilla, a 200 MW thermoelectric power plant owned by Electroperú, is planning an expansion to double its installed capacity. At the present time, the plant has two 100-MW turbines fired by diesel fuel. Electroperú wants to add two new 100-MW turbines which will be powered by natural gas, coming from the Camisea natural gas fields, 1,125 kilometers to the east across the Andes.

Electroperú, one of two main power generating companies in Perú, is in the process of being privatized. The plan is to sell off the individual generating assets in stages.

According to Electroperú, the decision on the winning bid will be based on two criteria:

- The amount that the bidder is willing to invest in the expansion of the plant
- The amount of equity that the bidder wants to take in the privatized company

Timing

Electroperú has already begun the sale of six generating stations—four hydroelectric and two thermoelectric. At the end of April the company sold 60 percent of the shares of its 40-MW hydroelectric facility Cahua. Ventanilla is next on the list with bids opening on May 13 and closing at the end of August. Two more hydroelectric plants—the Caño del Pato (150 MW) and Carhuaquero (75 MW)—will go up for sale later in the year.

Ventanilla Power Plant Expansion

Infrastructure Project Profiles

Demand for Equipment & Services

This project requires both an equity investment in the company to be privatized and an infrastructure investment in the plant expansion. The expansion of the plant, requiring two turbogas turbines, will require a total investment of U.S.\$200 million.

Nature of Demand

Electric power demand in Peru is expected to remain strong. Electroperú estimates growth of 6 percent per year for 1996 and 1997, followed by 5 percent per year in 1998 and 1999.

Ventanilla is located on the Central-Northern Interconnected System which allows the plant to wheel power to locations from Piura, near the border with Ecuador, to Nazca, south of the capital. The grid includes Lima and the principal port of Callao.

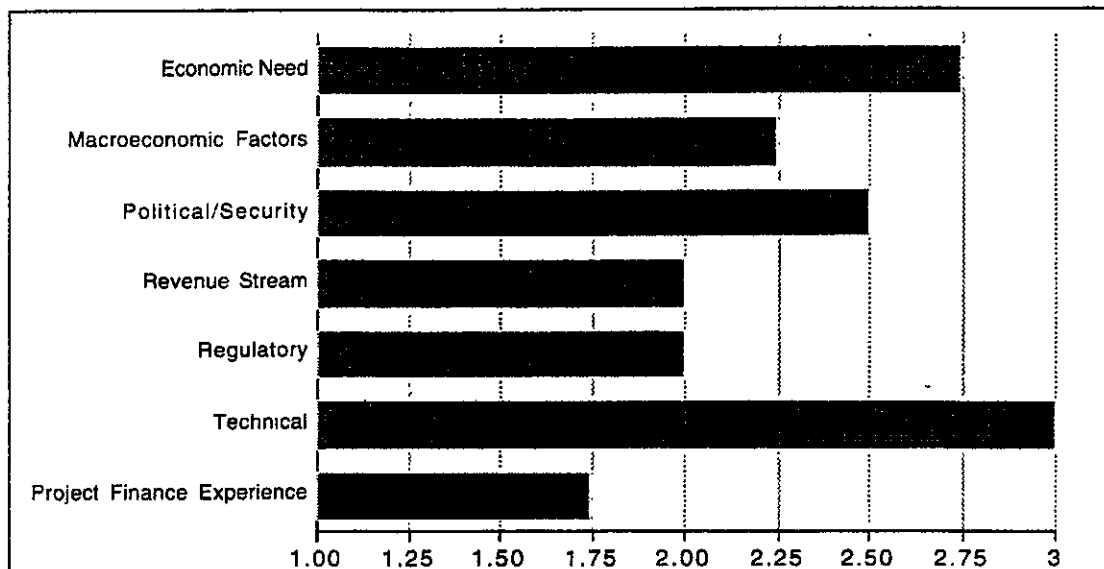
The Electric Concessions Law allows power generators to sell to distributors as well as to large power consumers. The Concessions Law divides power customers into two categories: free price customers and regulated price customers. The former are usually power distributors, while the latter are usually industrial and other large power consumers.

Financeability

Financeability of this project depends on whether Electroperú can secure long-term access to gas from the Camisea natural gas fields and negotiate an adequate long-term power purchase agreement for the additional 200 MW of electricity. Peru's need for power and the country's continued commitment to private power suggest that these issues will be resolved to the satisfaction of investors.

Peru's new energy regulations support private power but have yet to be fully tested, and important issues must be resolved before project financing will be possible. Moreover, Electroperú, having been recently privatized, lacks extensive experience in project financing.

Financeability Assessment



Source: CG/LA Infrastructure,

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Key Decision Makers

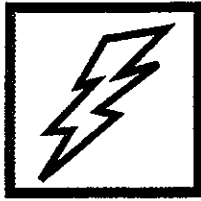
Electroperú

Luis Ortigas, *Manager, Special Committee for Privatization*

Lima, Peru

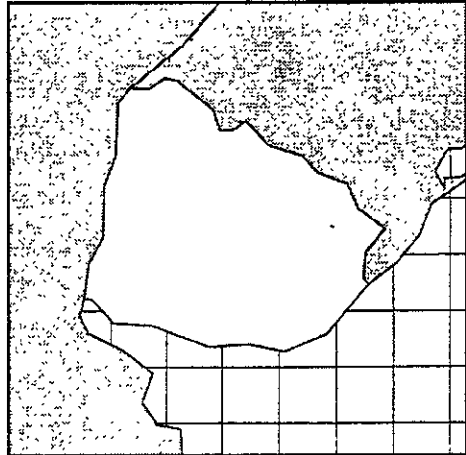
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Energy/Uruguay

Arrozur Rice Hull Cogeneration Project



Project Summary

Project No:	ENE-29
Subsector:	Power
Country:	Uruguay
Project Cost:	\$10 million
Export Potential:	\$4.7 million
Owner:	Arrozur and LATU

Technical Description

This is a biomass cogeneration opportunity using rice hulls. Rice hull combustion will take place in specialized boilers generating steam and electric power. The output from the plant or plants would be approximately seven MW, and could be higher. Additionally, the ash residue may be used as an insulator in steel-making processes, although the carbon content of the ash would have to be increased by reducing the combustion efficiency.

The supply of rice hulls is very secure. In northeastern Uruguay, where 80 percent of rice production is located, the industry generates about 120,000 metric tons of rice hull waste a year.

Site

The site or sites selected for the plant would be in northeastern Uruguay adjacent to existing rice processing facilities owned by Arrozur members.

Arrozur Rice Hull Cogeneration Project

Infrastructure Project Profiles

Timing

The project sponsors have conducted a thorough review of available technologies for hull combustion and concluded that the technology is now feasible. They have also drawn up preliminary optimizations of project configurations taking into account railway freight costs, wheeling charges, and costs and revenues involving the power sales to the Administración Nacional de Usinas y Transmisiones Eléctricas (UTE). The project is mature as currently designed.

A TDA Definitional Mission (DM) completed in April 1995 concluded that the project is viable—under the assumptions of a letter of intent signed by UTE. The DM recommended U.S. TDA funding for a feasibility study which would take seven months to complete.

Equipment & Services Demand

The project will require equipment such as turbine plant components (burner, boiler, turbine, economizer condenser), additional electrical and plant equipment, and spare parts.

Services required include engineering services and construction management. Work will likely be done in coordination with a local partner.

Nature of Demand

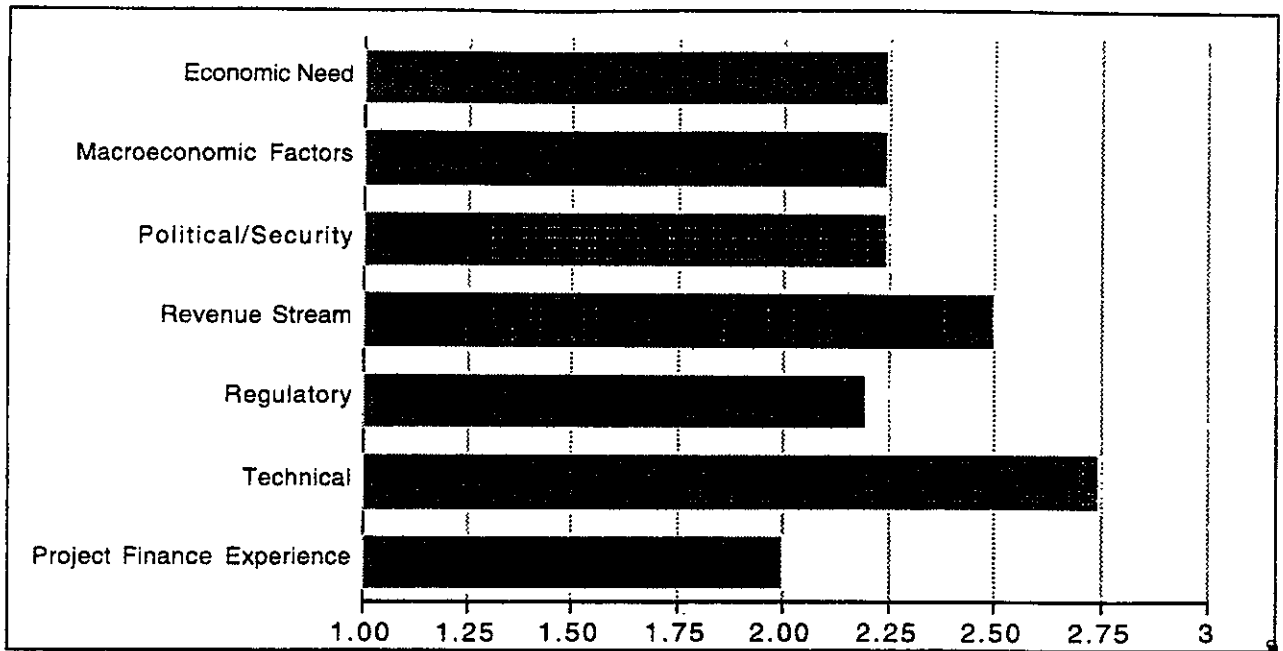
The electricity generated will be primarily aimed at supplying the rice processing mills in the surrounding area using the distribution lines of UTE. The Power Purchase Agreement (PPA) which will be concluded with UTE, will include a provision providing non discriminatory access to the transmission and subtransmission systems of UTE, with charges based on competitive market prices.

Excess power will be purchased by UTE at a price related to the Argentine spot market. This guarantee will be included in the above mentioned PPA, which is expected to follow from an already executed Draft MOU for Power Sales with UTE. Moreover, due to the terms of the PPA, the project would not suffer any adverse consequences were the current efforts to reform the Uruguayan electricity sector to fail.

Financeability

Project financeability will be high once the PPA is signed with UTE. The technology is relatively new, but it has been used successfully elsewhere in the world.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Laboratorio Tecnológico del Uruguay (LATU)

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Gremial de Molinos Arroceros

Jaime Cardoso Cuenca, *Secretario Ejecutivo*

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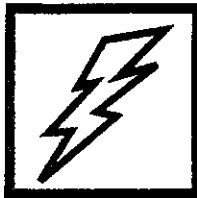
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Arrozur Rice Hull Cogeneration Project

Infrastructure Project Profiles

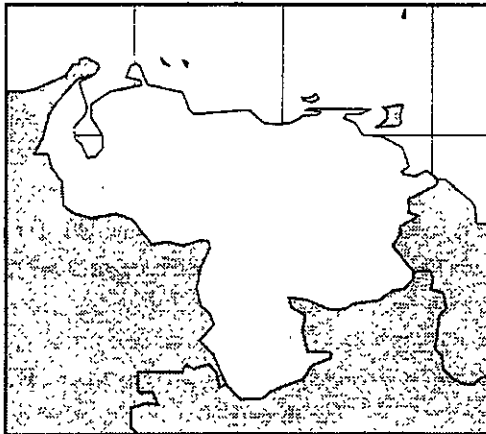
TDA Project Tip

TDA is currently funding a feasibility study for the project. A Definitional Mission report is available from TDA. There are potential projects in this area throughout South America. This project, if successful, will become the model for at least ten similar projects in South America over the next three years. This could yield as much as \$200 million in projects, and \$100 million in exports—for projects averaging 15 to 20 MW.



Energy/Venezuela

Electricidad de Caracas Power Plant



Project Summary

Project No:	ENE-30
Subsector:	Power
Country:	Venezuela
Project Cost:	\$995 million
Export Potential:	\$800 million
Owner:	Electricidad de Caracas

Venezuela's economic crisis has reduced power demand for the moment, but Electricidad de Caracas—the only major private power utility in Venezuela—is planning for a rebound in the next five years. The utility, which serves the metropolitan region around the capital, is also looking to reduce power purchases from other companies by building the capacity needed for its service area.

Technical Description

Electricidad de Caracas is planning the addition of a total of 1,350 MW of thermoelectric power to be phased in from 1999 to 2010. The finished power complex, tentatively named El Sitio, for its rural location, will consist of three 450 MW combined cycle units. The units will be primarily gas-fired, with the capability of using diesel fuel as a back up. The total investment required for the project is U.S.\$995 million.

Phase I

The single cycle phase will be implemented in 1999, 2000, and 2001. Two 150 MW gas turbines will be installed each year totaling 900 MW by the end of Phase I. The three-year first phase will require an investment of U.S.\$390 million.

Electricidad de Caracas Power Plant

Infrastructure Project Profiles

Natural gas consumption, initially at 68 million cubic feet per day in 1999, will increase to 136 million in 2000, and 204 million in 2001. While natural gas enjoys a tremendous price advantage over other fuels today (one-fifth the price of gas in the United States), the Ministry of Mines and Energy plans to let gas prices rise to international levels.

Phase II

The combined cycle phase is not due to begin until 2007. By 2010, three 150-MW steam turbines will be installed, raising the plant's total installed capacity to 1,350 MW. The second phase will require U.S.\$605 million in investment.

Electricidad de Caracas (EdC) is studying a number of contract alternatives. The first option is a turn-key arrangement. In the second, EdC organizes one bid for an engineering consulting firm to provide procurement support and construction management, but takes charge of materials purchases directly. The third option divides bids into basic engineering, procurement, and construction phases. If power regulations change, a BOT (build-operate-transfer) arrangement may be considered.

Site

The plant will be located 15 kilometers southeast of Caracas in the state of Miranda. The company is in the process of negotiating with property owners for a site. Geotechnical studies and water analyses are finished.

Timing

Basic engineering for the project will begin early next year. By September of 1996, bidding documents for Phase I equipment purchases will be ready. However, construction is not anticipated to begin until 1999.

Equipment & Services Demand

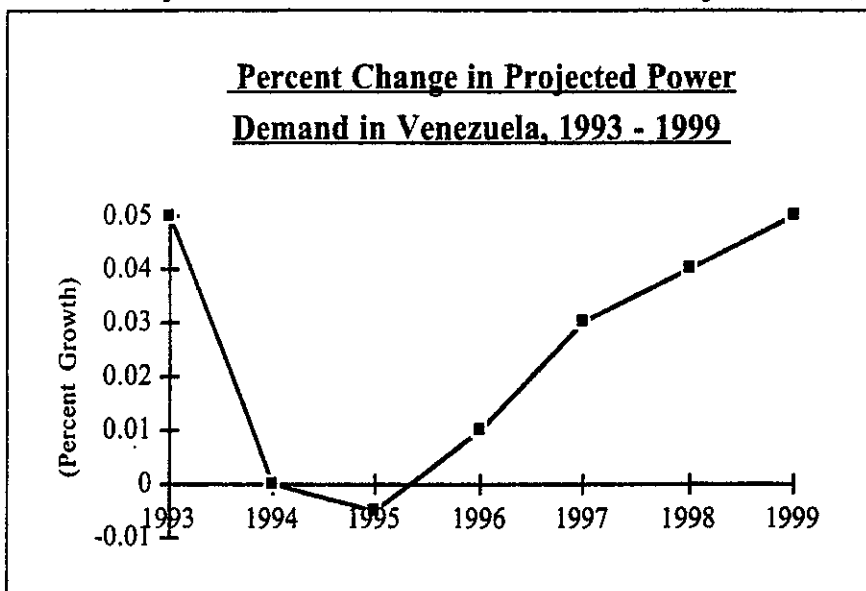
Each of the three units will require the following equipment:

- 2 gas turbines (150MW each)
- 2 heat recovery steam generators (HRSGs)
- 1 steam turbine (150MW)

Nature of Demand

Considering the current economic situation, EdC is betting on power demand recovering by the end of the decade. Before the crisis, power demand grew at an annual rate of around 5 percent in 1993. Last year demand stagnated, and this year it is expected to decline slightly. By 1999 growth in power demand should be back in the range of 5 percent.

The El Sitio plant is intended to serve the Caracas metropolitan area, which now relies on power from the hydroelectric plants in the Orinoco Basin. Although transmission rates are on the rise, EdC continues to buy power from Edelca to satisfy peaks in demand.



the hydroelectric plants in the Orinoco Basin. Although transmission rates are on the rise, EdC continues to buy power from Edelca to satisfy peaks in demand.

Source: Electricidad de Caracas

Electricidad de Caracas Power Plant

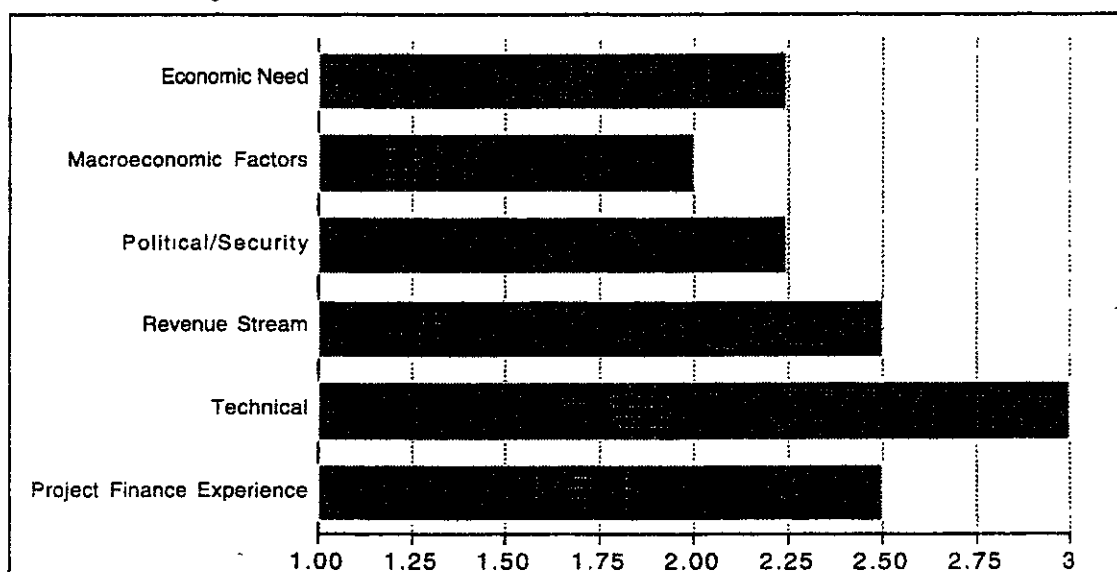
Infrastructure Project Profiles

Financeability

The project will likely be structured as a straight procurement by the utility, with the utility arranging project or balance sheet finance. Current regulations in Venezuela do not support BOT financing. Electricidad de Caracas has a strong balance sheet and likely could support the necessary level of financing.

A second key issue is how quickly power consumption will grow in Venezuela. A resumption of strong demand will be necessary to recoup the sizeable investments envisioned under the project, and this is conditional upon the resumption of economic growth.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

C.A. La Electricidad de Caracas

Luis José Díaz Zuloaga, *Executive Vice President*


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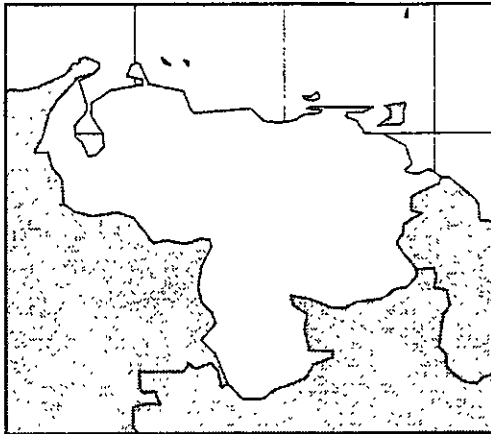
TDA Project Tip

The U.S. Trade and Development Agency helped Electricidad de Caracas develop its thermo-electric capacity through a 1993 feasibility study for the repowering of the 170 MW Arrecifes Power Plant. The study, conducted by Raytheon Engineers and Constructors, recommended the repowering of the current unit and expanding the plant to 450 MW at a total installed cost of \$198.7 million. Basic engineering has been completed, but EdC is waiting for economic growth to pick up before it proceeds. EdC is considering Arrecifes and El Sitio together in its overall plan to boost its own power-generating capacity.



Energy/Venezuela

HDH™ Heavy Crude Refining Project



Project Summary

Project No:	ENV-31
Subsector:	Oil & Gas
Country:	Venezuela
Project Cost:	\$315 million
Export Potential:	\$285 million
Owner:	MARAVEN

The HDH™ process is a new technology developed by Intevep, S.A., a subsidiary of PDVSA, to convert heavy and extra-heavy crude oils into lighter, more valuable products. This effort was recognized by UNESCO when it awarded PDVSA the 1991 Science Award for HDH™. It has been tested in a pilot plant and is now ready for commercial operations. The new technology also has environmental benefits, because it does not generate undesirable by-products associated with alternate technologies.

MARAVEN is eager to proceed with the HDH™ project because it offers a potential solution to a market dilemma in which Venezuela finds itself. Venezuela possesses vast reserves of heavy oil, but worldwide demand is for lighter grade refined petroleum products. Successful application of HDH™ technology will allow Venezuela to better respond to the market while generating fewer waste products.

Technical Description

The total HDH™ project includes the HDH™ plant, a catalyst plant and a hydrogen plant. The HDH™ plant will convert 15,000 barrels per day of heavy and extra-heavy crude oils using 85 tons per day of catalyst. Studies done since 1988 have established the technical viability of building and operating the HDH™ plant.

HDH™ Heavy Crude Refining Project

Infrastructure Project Profiles

Site

The HDH™ plant will be located at the Cardón Refinery in the Paraguana Peninsula, in northwestern Venezuela.

Timing

The engineering, procurement and construction (EPC) of the project is expected to start in the third quarter of 1995; the project should be ready for start-up in the second quarter of 1998.

Equipment & Services Demand

The total project cost has been estimated at U.S.\$315 million. This amount covers the EPC for the HDH™, catalyst and hydrogen plants. The work will require sophisticated engineering and design work and highly specialized equipment.

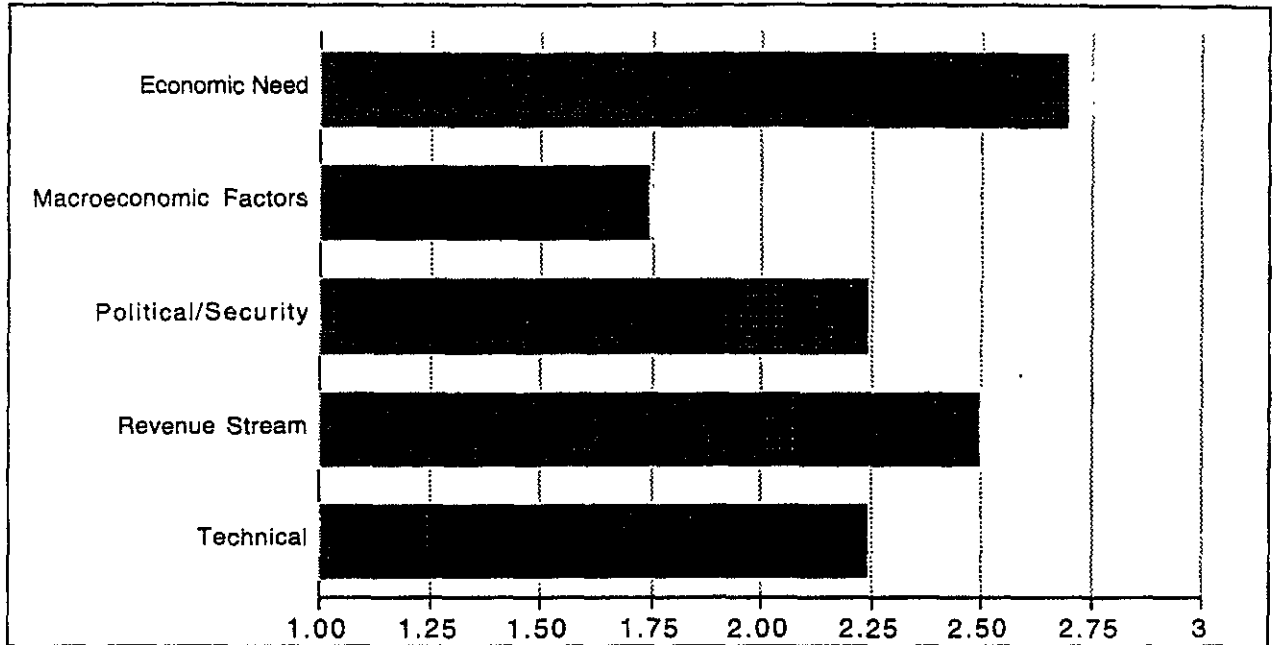
Nature of Demand

Worldwide demand for high quality petroleum products is the driving force behind the project. HDH™ technology is more efficient than conventional refining technologies and should produce more valuable end-products at less cost and with fewer harmful waste products. Furthermore, Venezuela's large reserves of heavy and extra-heavy crudes make application of the technology very important for the country's economy.

Financeability

The only significant obstacle to financing the project is the novelty of the technology. However, the careful studies that have supported development of the technology and the successful pilot project make this a less significant obstacle than might otherwise be the case. Since MARAVEN will own the facilities, the project finance approach will not be used.

Financeability Assessment

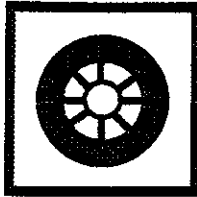


Source: CG/LA Infrastructure.

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Key Decision Makers

MARAVEN
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The Transportation Sector in South America



Introduction

Transportation in South America has traditionally been an area of prominent state control and involvement. However, with the advent of new market-oriented economic models in South America, the state's role in the transportation sector has experienced a significant transformation. The private sector is increasingly being looked to for financing and management of bridges, roads, ports, railroads, and even urban mass transit systems and airports through concession regimes or privatizations.

FORTY - FIVE TRANSPORTATION PROJECTS

Total Value:	\$8.5 billion
U.S. Export Potential:	\$4.4 billion
Airports	6
Rail	14
Roads	11
Bridges	4
Ports	10

The Transportation Sector in South America

The main driving force behind the newly discovered willingness to involve the private sector in the construction and management of transportation infrastructure is the recent trend of rising economic growth. The creation of Mercosur in January 1995 has added to the impetus of regional transportation integration, as seen in the case of the various bridges planned in Argentina, Brazil, and Paraguay. Bolivia, located in the middle of the continent, envisions itself as a center of inter- and intra-continental transportation. Hence, there are various highway concessions and the state railway company, ENFE, is about to be capitalized.

Investment in the transportation sector is likely to reach \$35-40 billion in the next ten years and numerous concessions will offer significant investment opportunities.

However, a potential investor has to pay attention to the wildly differing regulatory environments in the South American countries. Countries such as Chile, Argentina, and Colombia are at the forefront of creating a new regulatory environment amenable to both foreign private investment and local private sector entrepreneurs in transportation projects, such as ports, highways, and even airports. Brazil has advanced more slowly but progress is being made in the area of transportation concessions — the first one being the Anhanguera - Bandeirantes Highway near São Paulo.

Demand & Key Trends in South America's Transportation Sector

Demand for transportation in South America in the next ten years is expected to grow at a higher rate than economic growth. The driving force is the increasing emphasis on exports as the engine of growth requiring a more adequate internal transportation network as well as communication links with other countries. Moreover, current capacity is often inadequate to satisfy existing demand, as Chilean and Brazilian port capacity and congested highways all across South America demonstrate.

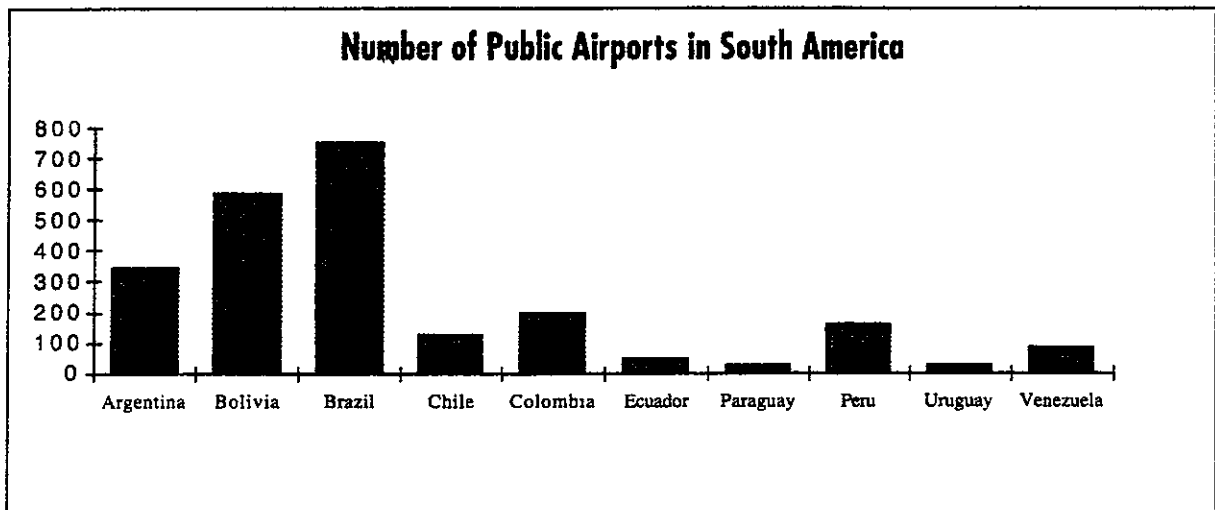
A further impetus for transportation infrastructure construction is the opportunity granted by economic growth and the new emphasis on private sector investment and management to repair and expand existing facilities. For example, 30% of Brazil's highway network is inoperable for lack of maintenance and only 3.5% of Peru's railway network is in working order. This fact offers interesting opportunities for financing maintenance and repairs of existing infrastructure by granting an operating concession, or— as in the case of the Paraguay/Brazil "Friendship Bridge"— by granting a toll concession on the existing infrastructure (the old bridge) in order to finance new infrastructure (a new bridge).

Airports link South America to the rest of the world and are the principal means of intra-regional

Airports

transportation. TDA is supporting airport projects in Paraguay (cargo), Bolivia, Peru, and Venezuela (upgrades). Colombia has struggled with the issue of airport security, which has deterred private investors. However, the Colombian authorities are in the process of altering concession provisions, leaving responsibility for airport security with the state, as in the case of the ports. Hence, substantial investment, including security as well as air traffic control systems, can be expected in Colombian airports. Ecuador is planning the expansion of the airports in both Quito and Guayaquil.

Moreover, substantial investment in airport air traffic control and navigation systems are being planned for Bolivia, Paraguay, Peru and Venezuela. The investments will be supported by TDA funded feasibility studies. The larger issue regarding air traffic control systems centers on the decision to implement land based or satellite based systems.



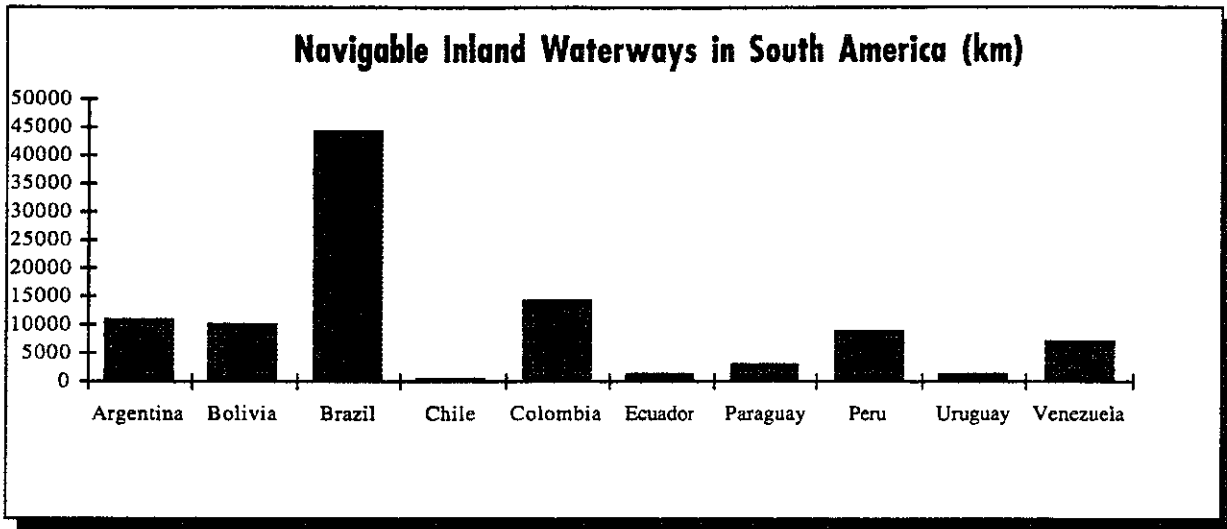
Source. World Resources Institute

Ports

Ports development promises to be an area of explosive growth, particularly in terms of the development of private, containerized, ports. There are two main trends in the area of ports. First, there are a number of projects aiming to satisfy rapidly growing demand. These projects include the expansion, modernization and containerization of existing ports, such as the ports of Sepetiba and Tubarão, Brazil, the ports of Cartagena and Buenaventura in Colombia, and Puerto Cabello in Venezuela among others.

The Transportation Sector in South America

In addition, there is a more comprehensive waterway transportation program underway, which is designed to develop multimodal port facilities on the Tietê-Paraná Rivers in Brazil with connections to Paraguay, Uruguay, and Bolivia, of which the Tietê Intermodal Port expansion is an example.

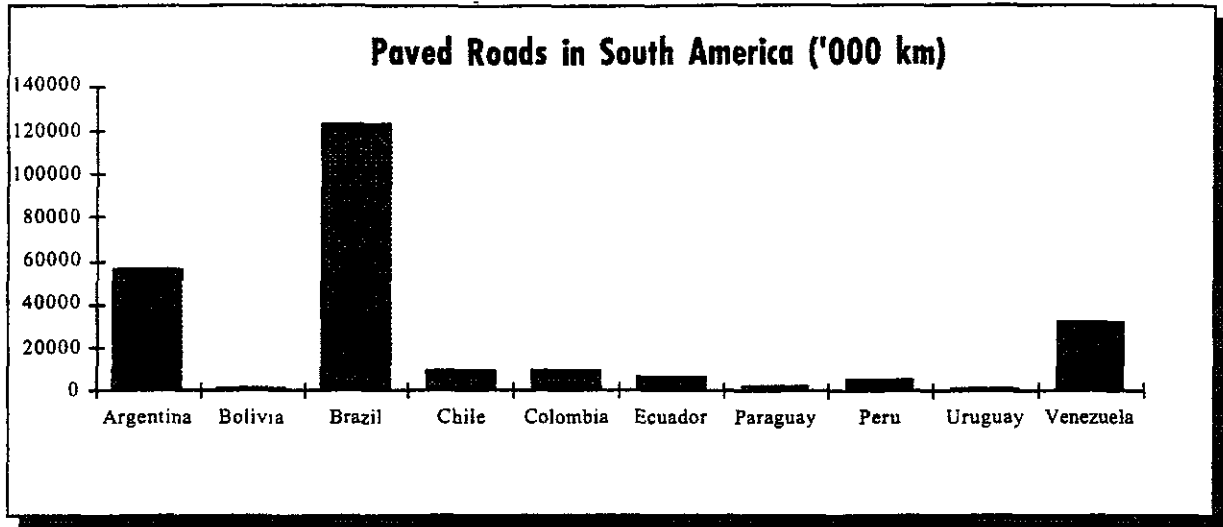


Source: World Resources Institute

Highways and Bridges

Numerous highway concessions are currently being planned in South America. Mercosur and the increasing importance of South East Asia drives the concept of an East-West Export Corridor stretching from Brazil over Bolivia and into Chile and Peru. The highway concessions in Bolivia are intended to form the backbone of this corridor linking the Atlantic and Pacific Oceans.

The electronic toll road systems, which is likely to be first installed in Chile, is a significant new development for South America. This scheme should allow for the creation of a revenue stream that will finance the construction of toll beltways, such as the Costanera Norte Highway in Chile, and the Buenos Aires and São Paulo beltways. Moreover, the implementation of the required advanced technology offers substantial export opportunities for U.S. firms.



Source: World Resources Institute

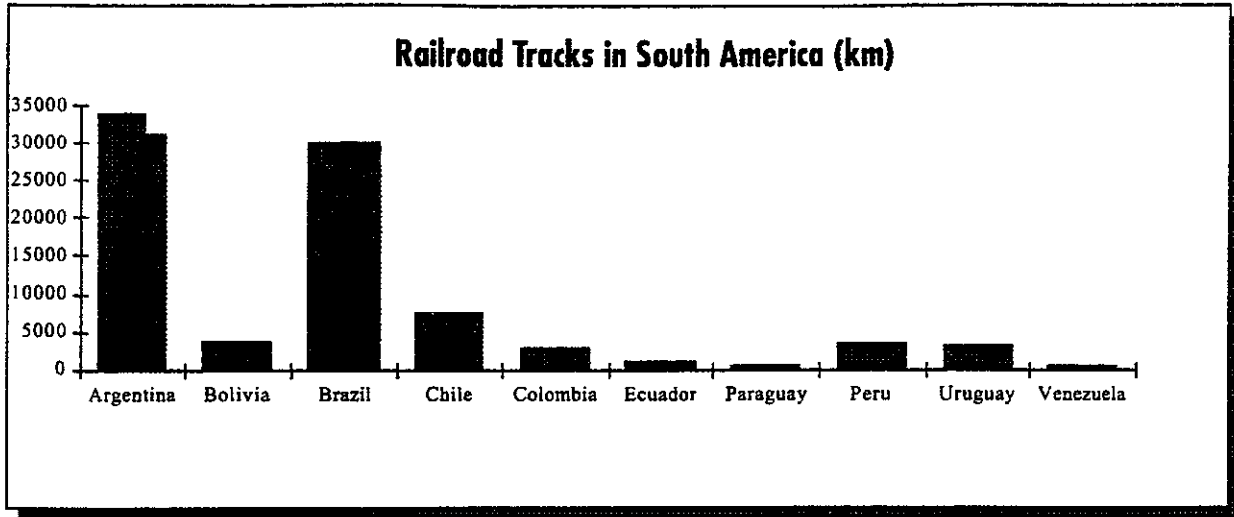
Growing regional trade should be closely monitored, because it is creating demand that is causing the existing roadway system to burst at the seams. Mercosur, for example, has created demand for new bridges integrating Argentina, Brazil, Paraguay, and Uruguay, e.g. the Puente de Amistad (Brazil-Paraguay), the Santo Tomé - São Borja Bridge between Argentina and Brazil, the Rosario-Victoria Bridge in Argentina, and the \$1 billion Buenos Aires bridge to Colonia in Uruguay.

Railroads

Chile, Colombia, Brazil, Argentina, Peru and Bolivia have already or are in the process of involving the private sector through privatization, capitalization and concessions, in railroad development and modernization.

The basic initial investment either prior to or just after the involvement of the private sector is the renewal and rehabilitation of existing tracks. There is a very high demand for high-quality concrete and treated wood cross-ties/sleepers as well as rolling stock and track to make the existing network operable. In addition to rolling stock purchases, there are exceptional opportunities in the replacement of antiquated signaling and communications equipment.

The Transportation Sector in South America

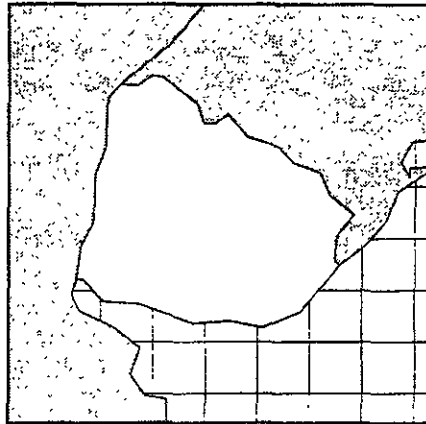
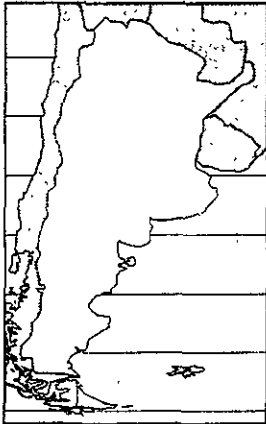


Source: World Resources Institute



Transportation/Argentina/Uruguay

Buenos Aires–Colonia Bridge



Project Summary	
Project No:	TRA-01
Subsector:	Bridge
Country:	Argentina, Uruguay
Project Cost:	\$700m-\$1.2bn
Export Potential:	\$400million+
Owner:	Binational Bridge Commission

Technical Description

The Buenos Aires–Colonia bridge will be an autonomous privately-held operation under a joint commission of Uruguay’s Ministry of Transportation and Argentina’s Ministry of the Economy. The bridge will shorten the land distance between the two countries’ capitals by almost 400 kilometers.

The length of the bridge will be approximately 50 kilometers. It will include one or two high level crossings over the existing navigation channels. Construction technology and configuration will be determined by the concessionaire.

The bridge complex will include border crossing facilities, a hotel, restaurants, duty free shopping, and other real estate developments as determined by the concessionaire.

Site

The bridge will connect Buenos Aires, Argentina with Colonia, Uruguay over the Rio de la Plata. The exact routing is still being considered.

Timing

A feasibility study was recently completed. It concluded that under reasonable growth assumptions the bridge would attract sufficient toll-paying traffic to support itself financially.

Both countries will now proceed to create the most favorable environment to facilitate the financing of the facility. Prequalification of potential concessionaires and actual bidding are expected to be completed by the end of 1996. Construction is expected to take an additional five years.

Equipment & Services Demand

A project of this size and complexity will require a substantial amount of imported equipment and services. These will include:

- Construction management
- Steel
- Construction equipment, dredges etc.
- Toll collection equipment
- Control and communications systems
- Investment banking, insurance and other financial services
- Other professional services

Nature of Demand

In 1993, over four million passengers crossed the Rio de la Plata, half of them paying fares in excess of U.S.\$50 each way. In the past few years, demand has been growing more than 5 percent a year. Forty-one percent of people on the route use modern ferryboats traveling at speeds in excess of 30 knots (34 mph).

Argentina is one of the world's most attractive, rapidly-growing, emerging markets. With a population of over 13 million inhabitants, the Buenos Aires metropolitan area is one of the world's largest. Suburban areas stretch more than 60 kilometers from the city center and the bridge would open a new, currently undeveloped area to support the city's growth.

Colonia del Sacramento, Uruguay, has 30,000 inhabitants and is a traditional tourist destination. It boasts one of the rare colonial centers and fortresses left in the region, beaches, a casino and other related amenities. Thousands of Argentines also vacation at the famous beach resort of Punta del Este, Uruguay and use hundreds of miles of undeveloped beaches.

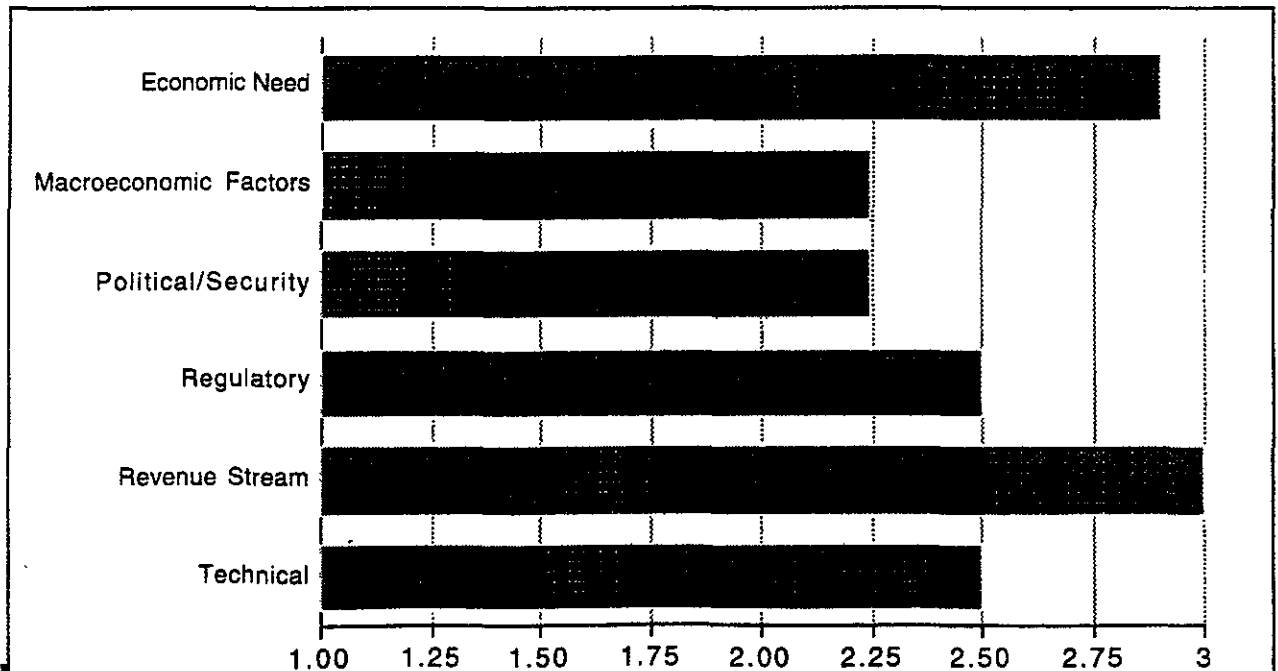
Argentina and Uruguay are partners in the Southern Cone free trade area known as Mercosur, which also includes Brazil and Paraguay. Since the signing of the Mercosur agreement two years ago, regional trade has increased by over 30 percent, with equivalent to superior increases in truck traffic. The bridge would offer a new, shorter link between Argentina and Brazil, the two countries that account for the bulk of Mercosur trade and traffic. Since most of the tariffs have not yet been eliminated and measures to facilitate border crossings still need to be implemented, strong growth in demand is expected to continue in the future.

Financeability

The privatization of the transportation sector has been extremely successful in Argentina. The International Finance Corporation recently announced the financing of a green field toll road in the Buenos Aires suburbs, an historic first. A number of concessions for rail lines were also recently awarded. The landslide reelection of President Menem indicates continued support for these policies. Although, Uruguay's record in this respect is more mixed, the country granted its first highway concession in 1994, and the new government led by President Sanguinetti is dedicated to the success of the bridge project. Moreover, the two countries have a successful track record in the realization of joint infrastructure projects, such as the Salto Grande Dam on the Uruguay River.

The basic underlying issue, however, is whether the costs of such an ambitious undertaking can be recouped through tolls reasonable enough to attract sufficient travellers and truck traffic.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

Key Decision Makers

Bi-National Bridge Commission

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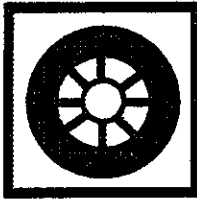
fax: (598-2) 920-876

Ing. Antonio Federico, *President-Argentina*

Buenos Aires, Argentina

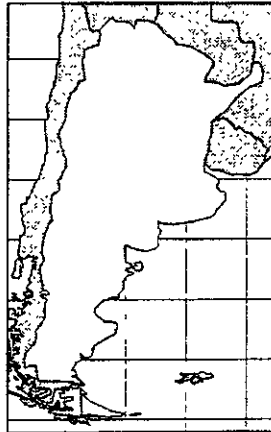
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Transportation/Argentina

Buenos Aires "Greenbelt Road", Southeast Section



Project Summary

Project No:	TRA-02
Subsector:	Road
Country:	Argentina
Project Cost:	\$300 million
Export Potential:	\$100 million
Owner:	Concession

Technical Description

The goal of this project is to construct an 83-kilometer, four-lane toll road connecting Buenos Aires provincial Route 4 with Route 6 forming a "greenbelt" around the city of Buenos Aires. The project includes the expropriation a 2,000-meter strip along the length of the highway to make up the "green belt." Currently, preliminary traffic and road siting studies are underway to determine the best location and alternatives.

Site

Greater Buenos Aires.

Timing

July, 1996 is the estimated date to publish the terms of reference and to open bidding.

Demand for Equipment & Services

The project is expected to utilize the latest in road safety design and incorporate unusual aesthetic considerations, such as large and small works of art, water courses, tree planting and landscaping. The project is being planned as a toll road. The bids will therefore require the administration and organization of a toll collection system.

Buenos Aires "Greenbelt Road", Southeast Section

Infrastructure Project Profiles

Nature of Demand

The highway system in Greater Buenos Aires has been designed essentially as "spokes in a wheel" (much the same as the railway system.) As the metropolitan area has grown and the number of vehicles has increased, not only has traffic congestion gotten worse, but excessively long trips are required to go from two points which may be relatively close "as the crow flies", but which happen to be located on non-connecting highways.

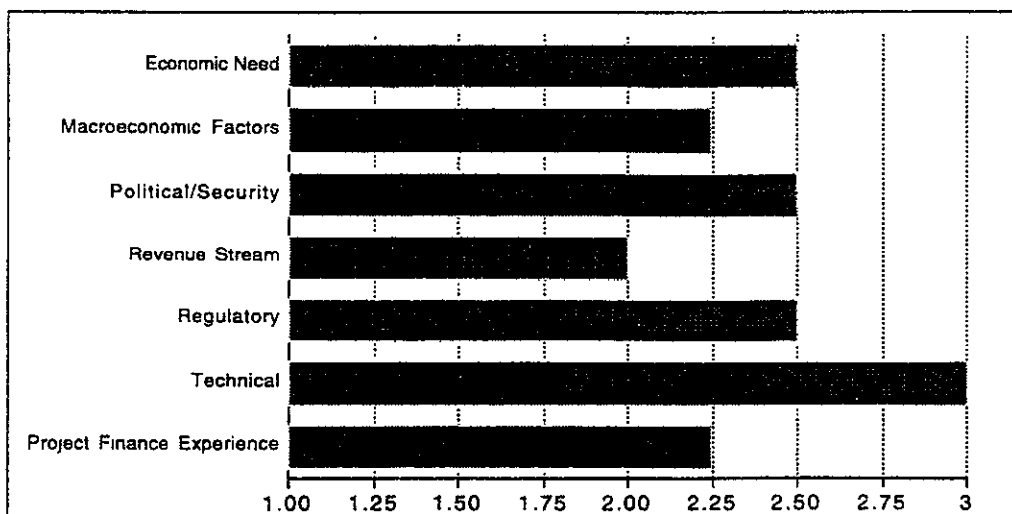
The proposed beltway is designed to not only provide more convenient access between such points, but also to open up new areas to housing and economic development. The two kilometer wide green belt is intended to mitigate the road's environmental impact.

Financeability

The government plans to award road concession by means of a national and international tender. The road a national and international tender, using the concession format. There is important economic demand for the highway. High per capita income in Buenos Aires is expected to support toll financing.

Traffic estimates for a road of this nature are very difficult to make with any level of accuracy. The proposed technical design also raises capital cost estimates. These factors and the sheer size of the project will make financing complex and could slow the project. Ultimately, the government may have to step forward with guarantees on traffic volumes or revenues to make the project financeable.

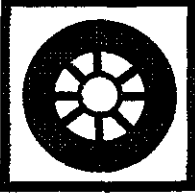
Financeability Assessment



Source: CG/LA Infrastructure.
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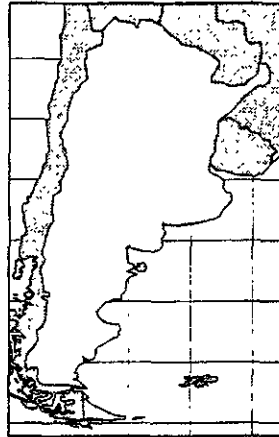
Key Decision Makers

Ministry of Economy and Public Works
Ing. Roberto Ramon Cruz, *Technical Expert*
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Transportation/Brazil

Ferrovias Investment Program



Project Summary

Project No:	TRA-03
Subsector:	Rail
Country:	Argentina
Project Cost:	\$57.5 Million
Export Potential:	\$30 Million
Owner:	Ferrovias

Technical Description

Ferrovias S.A.C. was awarded the concession for the Belgrano Norte commuter train line in metropolitan Buenos Aires in April, 1994. The concession includes an eight-year mandatory investment program.

The Belgrano Norte line is approximately 52 kilometers in length. Lack of capital investment and investment in basic maintenance under the former state-owned company produced a train system in extremely poor condition and with serious problems in all operational areas. For example, in the last year under state control, an estimated 40 percent of riders did not pay their fares. However, impressive improvements in the system have been made within the last year, including repairs to trains and stations, increased security, reduction in fare evasion, better cleaning of trains and stations and installation of a loudspeaker system in stations.

The mandatory investment program requires Ferrovias to undertake U.S.\$57.5 million in investments over an eight-year period. Investments range from track replacement and improvements to bridge rehabilitation to improved communication systems. The complete investment program is provided below.

However, rolling stock still remains to be purchased for the first stretch at an estimated cost of U.S.\$110 million, and the state government is considering a leasing arrangement with a private sector party.

Ferrovias Investment Program

Infrastructure Project Profiles

Site

The Belgrano Norte train line services the northern suburbs of Buenos Aires.

Timing

This is an on-going eight-year investment program starting in 1995.

Equipment & Services Demand

Under the mandatory investment program, Ferrovias will invest U.S.\$57.5 million during the period 1995 - 2002. The breakdown of the investment plan is shown in the table below.

Ferrovias Investment Plan, 1995-2002 (millions of US\$)

Year	1995	1996	1997	1998	1999	2000	2001	2002	Total
Track improvement km	1.44	6.58	5.49	8.22	2.39	4.69	3.05	5.05	35.47
Bridge rehabilitation (7)	0.38	-	-	2.68	2.80	1.73	-	-	7.59
Embankment construction	-	-	-	0.67	0.87	0.90	-	-	2.44
Control building construction	-	0.52	1.22	-	-	-	-	-	1.74
Automatic turnstiles	-	-	-	0.44	0.44	0.44	0.44	-	1.76
Radioelectric communication systems	-	-	-	-	-	-	2.18	-	2.18
Repositioning of signalling cable	-	0.33	0.33	0.44	-	-	-	-	1.10
Other investments	0.37	1.18	2.50	1.13	-	-	-	-	5.18
Total	7.33	7.52	12.27	7.31	8.80	8.30	5.49	0.44	57.46

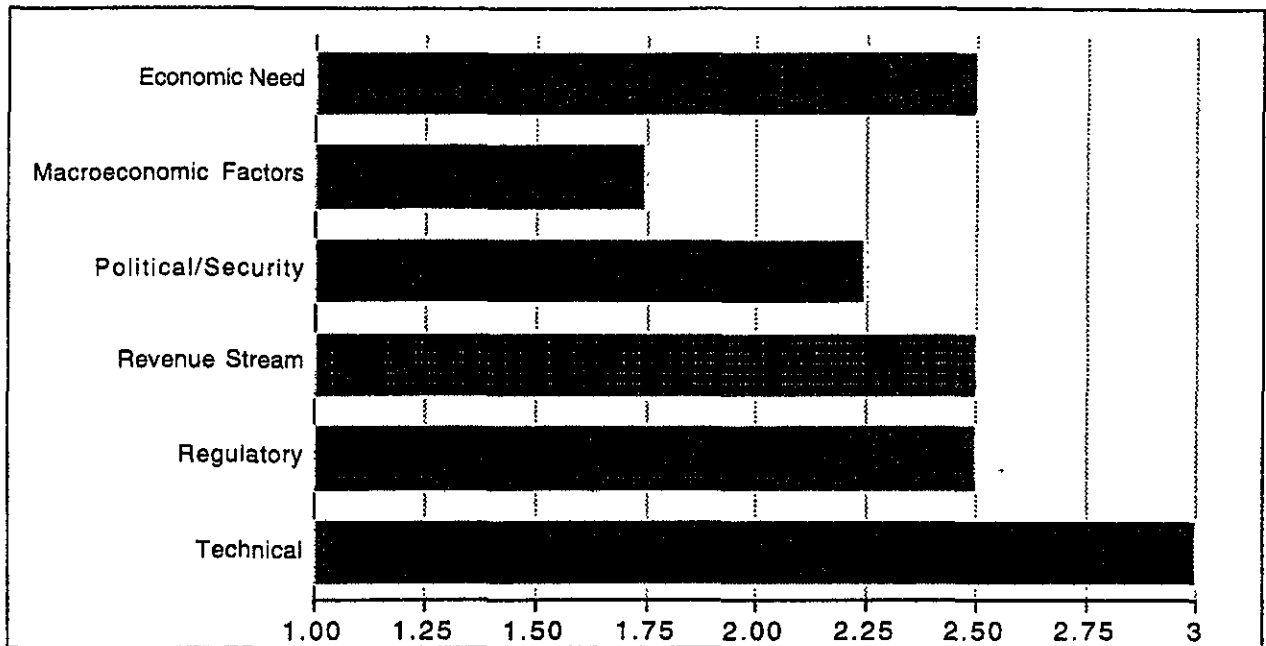
Nature of Demand

Since Ferrovias took over management of the train line, ridership has increased substantially. Compared with a similar six-month period under state management, ridership rose 37.2 percent. Further service improvements will have the effect of increasing ridership further.

Financeability

With the concession granted and many investments already made, continued financeability is based on the financial strength of Ferrovias and its ability to increase ridership (already up 37 percent). At this point, indicators are favorable that the concession is meeting financial expectations and that the financing of the expansion program will continue according to the investment plan.

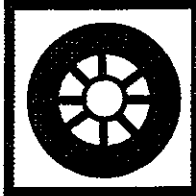
Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

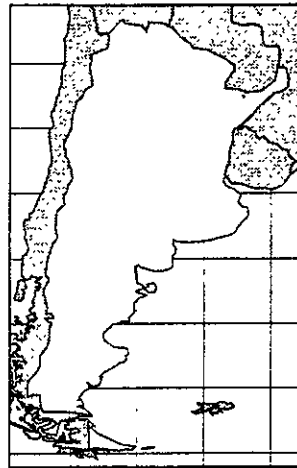
Key Decision Makers

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 Eric Rodolfo Kunath, *Executive Director*
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Transportation/Argentina

Metrovías Investment Program



Project Summary

Project No:	TRA-04
Subsector:	Rail
Country:	Argentina
Project Cost:	\$100.9 million
Export Potential:	\$75.5 million
Owner:	Metrovías

The first line of the Buenos Aires Subway was inaugurated in 1913, making it the oldest subway system in Latin America. The system consists of five separate lines and 74 stations.

Technical Description

Metrovías was awarded the concession over the Buenos Aires Subway System and the Urquiza commuter train line, also located in Buenos Aires, in June 1992. The concession, which started on January 1, 1994, runs for a period of 20 years and includes a mandatory investment program.

Under the mandatory investment program, Metrovías is required to undertake substantial investments and upgrading of the Subway and commuter line infrastructure, such as stations and rail lines. It also must modernize signaling and communications systems.

Forty-five subway cars were recently purchased from Japan; rolling stock for the Urquiza commuter line will be purchased between 1998-2000. Current efforts are also focused on increasing the quality of repair and maintenance facilities.

Site

Both the subway and the commuter line are located in the greater metropolitan area of Buenos Aires, one of the highest per capita income areas of South America.

Metrovías Investment Program

Infrastructure Project Profiles

Timing

The investment program for 1994 was delayed due to complications prior to the transfer of control to Metrovías. Hence, the investments originally considered for 1994 will be phased in with the purchases for 1995 and 1996.

Equipment & Services Demand

Under the mandatory investment program for the subway, Metrovías will invest U.S.\$394.8 million over the period 1994-2013. It will invest U.S.\$170 million over the period 1995-1998.

Under the mandatory investment program for the Urquiza commuter line, Metrovías will invest U.S.\$37.0 million over the period 1994-2003. It will invest U.S.\$18.6 million over the period 1995-1998. The break-down of the mandatory investments in the two lines is outlined in the tables below.

Buenos Aires Subway:

	(millions of US\$)						1999-2013 Total
	1994*	1995	1996	1997	1998		
Remote Control of Electrical Systems	-	3.108	2.568	—	-	-	5.676
Signaling & Communications	3.067	7.929	5.810	5.950	10.115	30.229	63.1
Electricity	2.192	5.297	3.770	3.621	5.120	3.230	23.23
Track Renovation	2.192	6.638	6.596	8.158	7.183	2.611	33.378
Escalator Replacement	1.407	1.284	1.179	1.515	1.278	3.586	10.249
Pumping Equipment	0.295	0.289	0.173	0.166	0.164	-	1.087
Ventilation Systems	-	-	0.616	0.620	0.632	4.557	6.425
Power Lines and Switches	0.648	0.66	0.239	0.247	0.237	0.213	2.244
New Maintenance Facility	-	4.971	6.037	15.349	27.258	-	53.615
Civil Works	0.425	6.644	8.298	-	-	9.636	25.003
Coaches	-	-	-	-	-	170.145	170.145
Total	10.226	36.820	35.286	35.626	51.987	224.207	394.752

Urquiza Commuter Line:

	(millions of US\$)						Total
	1994*	1995	1996	1997	1998	1999-2000	
Improvement and Partial Track Renovation	—	-	-	-	4.856	-	8.164
Signaling Reconditioning	-	-	2.012	3.308	-	-	3.905
Refurbishment of Rolling Stock	-	-	-	1.893	1.253	4.449	5.702
Other	0.97	2.138	2.011	-	-	0.740	6.039
Grade Separation	-	-	-	-	-	13.115	13.115
Total	0.970	2.138	4.023	5.201	6.109	18.304	36.925

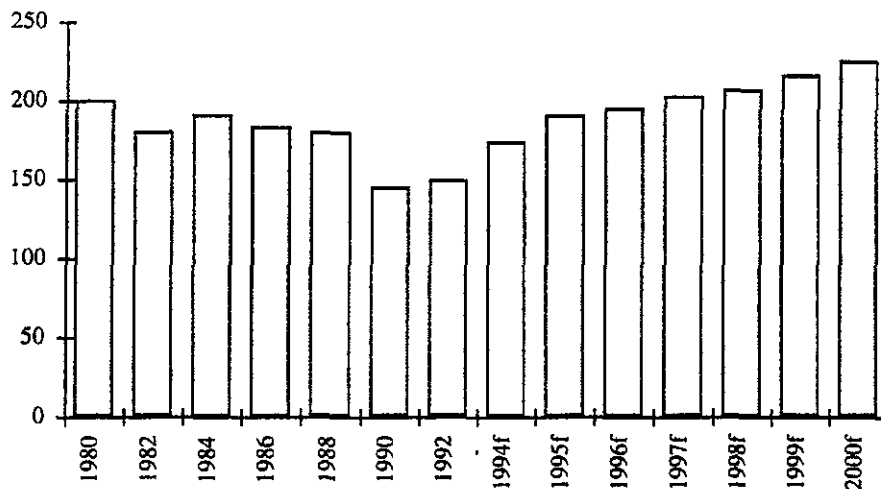
* Investment for 1994 will be carried out in 1995 and 1996.

Nature of Demand

Demand for subway and commuter line service is expected to increase substantially over the next 20 years due to a number of factors. First, Buenos Aires streets are already severely congested. Second, service improvements should attract more passengers, particularly since many passengers are currently not using the subway because of insufficient carrying capacity during rush hours. Third, the population of Buenos Aires is expected to grow by 1.5 percent annually.

The growth of demand, calculated on the basis of the factors mentioned above, is illustrated in the graph below which shows past and forecast demand on the subway system.

Ridership on the BA Subway, 1980-2000
(millions of passengers)



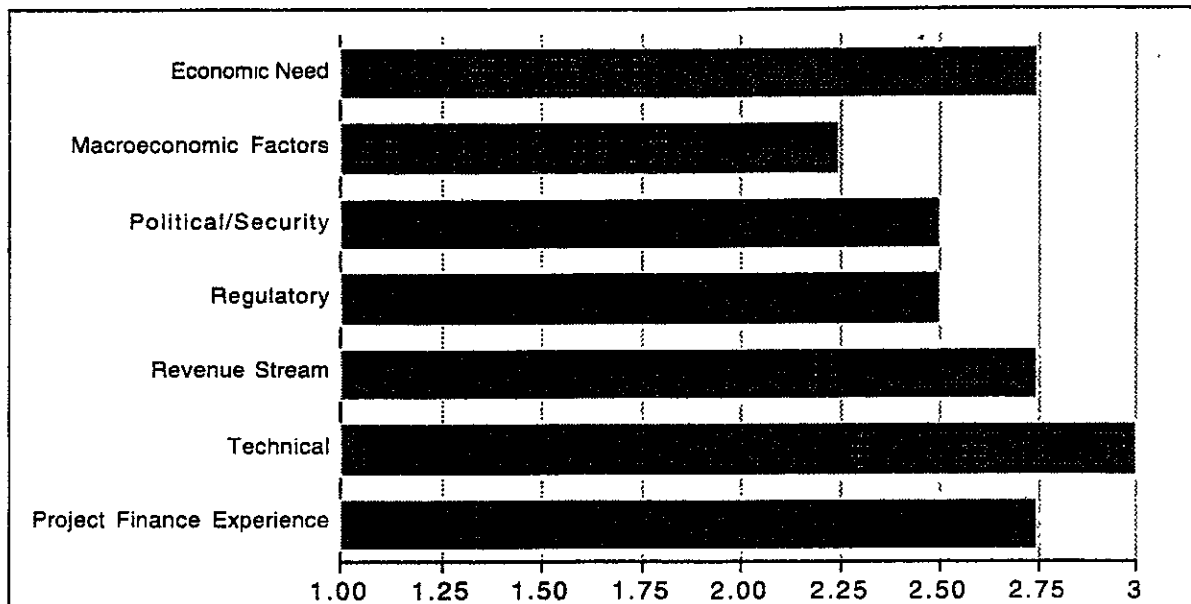
Financeability

The contract provides for the concessionaire to finance the mandatory investment program. The strong balance sheets of the companies constituting the concessionaire will facilitate the financeability of the project. Preliminary studies indicate a strong demand for ridership, although ridership figures are always difficult to forecast with certainty. Interested firms should track closely early improvements in ridership and revenue flows. At this early stage, no major obstacles exist to the project's financial viability; the project will likely proceed according to the investment plan.

Metrovías Investment Program

Infrastructure Project Profiles

Financeability Assessment

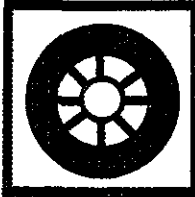


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Key Decision Makers

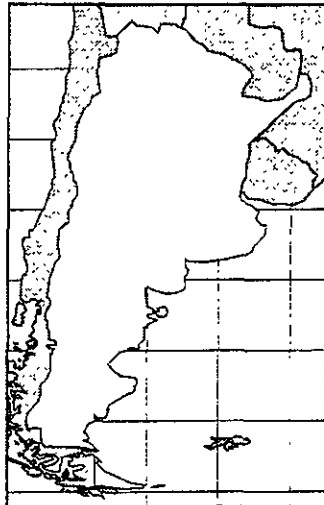
Metrovias is made up of the following companies: Benito Roggio e Hijos S.A., Cometrans S.A. , Morrison Knudsen Corporation, and S.K.S. SACCIFAyM.

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Transportation/Argentina

Rosario-Victoria Bridge



Project Summary

Project No:	TRA-05
Subsector:	Bridge
Country:	Argentina
Project Cost:	\$400 million
Export Potential:	\$175 million
Owner:	Concession

This combination bridge/roadway access project is an ambitious plan to not only link the cities of Victoria (Entre Rios Province) and Rosario (Santa Fe Province), but also to form a link in a transcontinental highway that would connect Chile and Argentina with Brazil and provide a direct highway connection between the Pacific and Atlantic Oceans. Indeed, the project has historical antecedents that date back more than 100 years.

Technical Description

The project calls for the construction of 58 kilometers of access roads, the principal bridge and a series of smaller bridges and viaducts over a series of islands and marshes.

The eastern connection is in the city of Victoria and the western connection is with the beltway around the city of Rosario. The main bridge is 550 meters long over the principal canal of the Parana River; a system of bridges, viaducts and embankments across a zone of islands for some 58 kilometers. The design provides for the initial construction of a road and secondary bridges of two lanes, while the main bridge will have four lanes. Since the main branch of the Parana River is navigable by large ships (and in fact makes up the lower end of the Hidrovia—an inland water connecting Buenos Aires with the interior of Brazil), the central span of the main bridge will be 330 meters wide and 45 meters high.

Rosario-Victoria Bridge

Infrastructure Project Profiles

The dimensions of the works are as follows:

Main Bridge:

Total length:	550 meters
Length of the center span:	330 meters
Surface area:	21,109 square meters

Viaducts to access the Main Bridge:

Total length:	2,380 meters
Surface of access roads:	34,368 square meters

Viaducts and bridges over the island zone:

Total length:	7,392 meters
Total surface area:	77,616 square meters

Earthworks:

Paving length:	47,378 meters
Volume of compacted material:	34 million cubic meters
Volume of soil material:	37 million cubic meters
Average height:	7.5 meters
Expropriations:	577 hectares

Site

Provinces of Santa Fe and Entre Rios.

Timing

Terms of reference will be published and bids will be called for in the second half of 1995.

Equipment & Services Demand

This project will require equipment necessary for large scale construction and toll road collections. Given the difficult terrain to be traversed by the project, sophisticated engineering and technical services will also be required.

Nature of Demand

The demand for the project comes from both a specific source and a general one. The specific source is the long-standing desire to provide a convenient link by road between the cities of Victoria and Rosario. This new transportation link would give a strong economic boost to both cities and their surrounding regions.

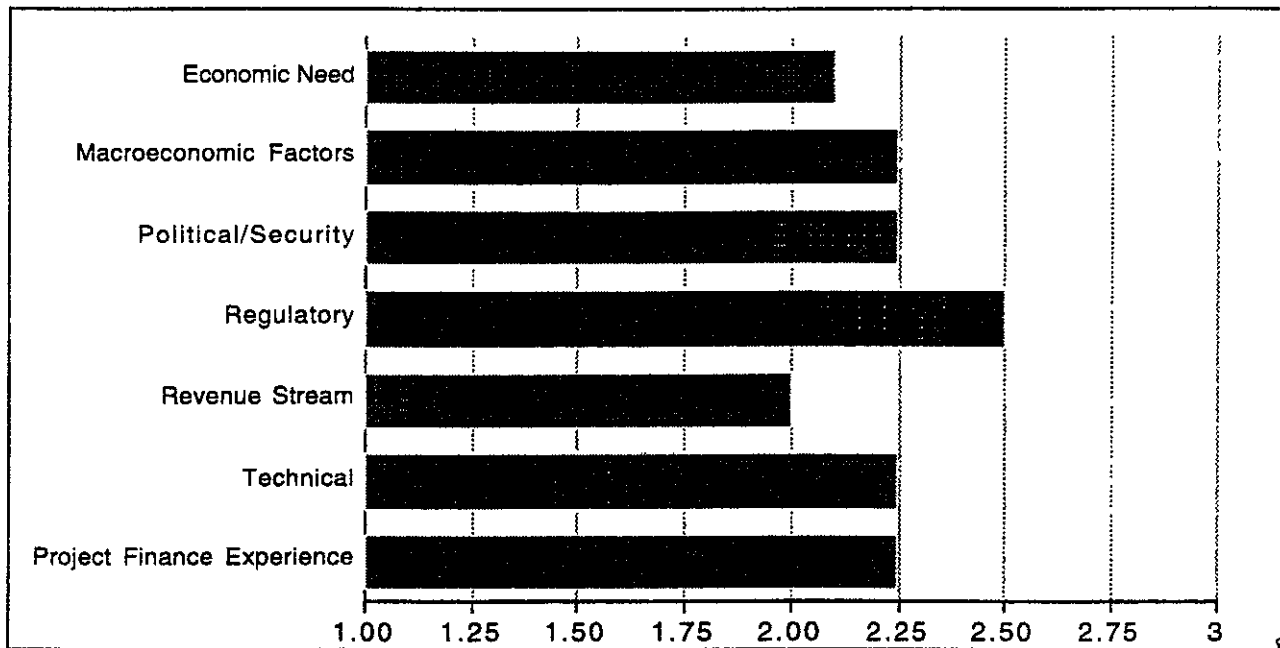
The general impetus grows out of the ever increasing regional integration of the Southern Cone region, as given concrete form by the Mercosur Free Trade Region. The Mercosur countries (Argentina, Brazil, Paraguay and Uruguay) have already seen a dramatic increase in trade between them. While Chile is not a formal member of Mercosur, it has also seen an increase in trade with the Mercosur countries. Implementation of the project would provide a key link across the Parana River and would facilitate the flow of road traffic from southern Brazil into Argentina, and eventually Chile.

Financeability

The federal and provincial governments of Santa Fe and Entre Rios are planning to provide a subsidy of U.S.\$80 million out of the expected \$400 million total cost. The balance will be financed by the concessionaire.

The key to the project is accurately calculating expected traffic flows - always a very difficult exercise. There are also technical difficulties associated with the project that will make reliable engineering cost estimates difficult. Gaining additional certainty in both these areas will be critical if the project is to be financeable.

Financeability Assessment

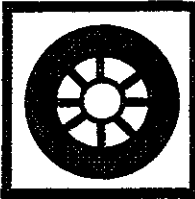


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Key Decision Makers

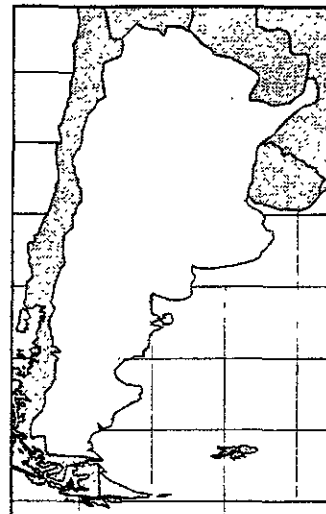
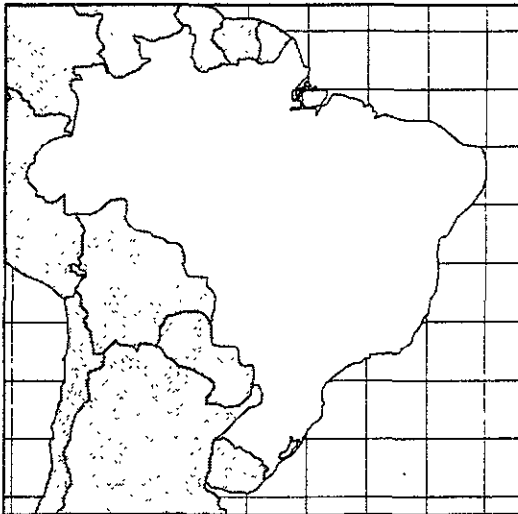
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Transportation/Argentina - Brazil

Santo Tomé - São Borja Bridge



Project Summary

Project No:	TRA-06
Subsector:	Bridge
Country:	Argentina/ Brazil
Project Cost:	\$30 million
Export Potential:	\$10 million
Owner:	Concession

Technical Description

This project consists of a 1,400 meter road bridge spanning the Uruguay River and linking the towns of Santo Tomé, in Argentina and São Borja, in Brazil. A steel and concrete structure, this road bridge will require approximately 7 kilometers of access roads on either side.

The bridge will be offered under a concession lasting 25 years and is open to international bidders. It is likely that U.S. firms must form consortia with Argentine or Brazilian firms to participate in this project. The granting of the concession will be administered by the Comisión Mixta Argentino-Brasileño (COMAB). After pre-qualification, COMAB will examine the financial and technical qualifications of the parties on the short list. The approved parties will subsequently bid on the basis of the proposed toll charge. The party offering to charge the lowest toll will be awarded the concession.

The concession will be regulated and overseen by an administrative body, dedicated to ensuring compliance with financial and technical regulations.

A rail bridge parallel to the road bridge may be built in the future and sufficient land has been expropriated and set aside for this purpose. However, construction of the rail bridge has been postponed for three main reasons. First, the low current market demand for a rail bridge does not warrant its construction. Second, the Argentine government wants to involve parties holding existing concessions on Argentine railways in the process. Third, there are different track widths in the two countries. Brazil's track width is one meter while Argentina's is 1.23 meters.

Santo Tomé - São Borja Bridge

Infrastructure Project Profiles

Site

The bridge would be located just north of the Brazilian city of São Borja in the state of Rio Grande do Sul and the Argentine city of Santo Tomé in the province of Corrientes.

Timing

Pre-qualification will open in June or July 1995, followed by a 60-day period to submit qualifying documents and close in August or September 1995. After publication of the short list, there will be a 35-day period for the submission of technical and financial qualifications, followed by opening of the bidding process 20 days later.

Demand for Equipment & Services

Required equipment and services include advanced bridge-building technology and specialized materials, as well as construction management services.

Nature of Demand

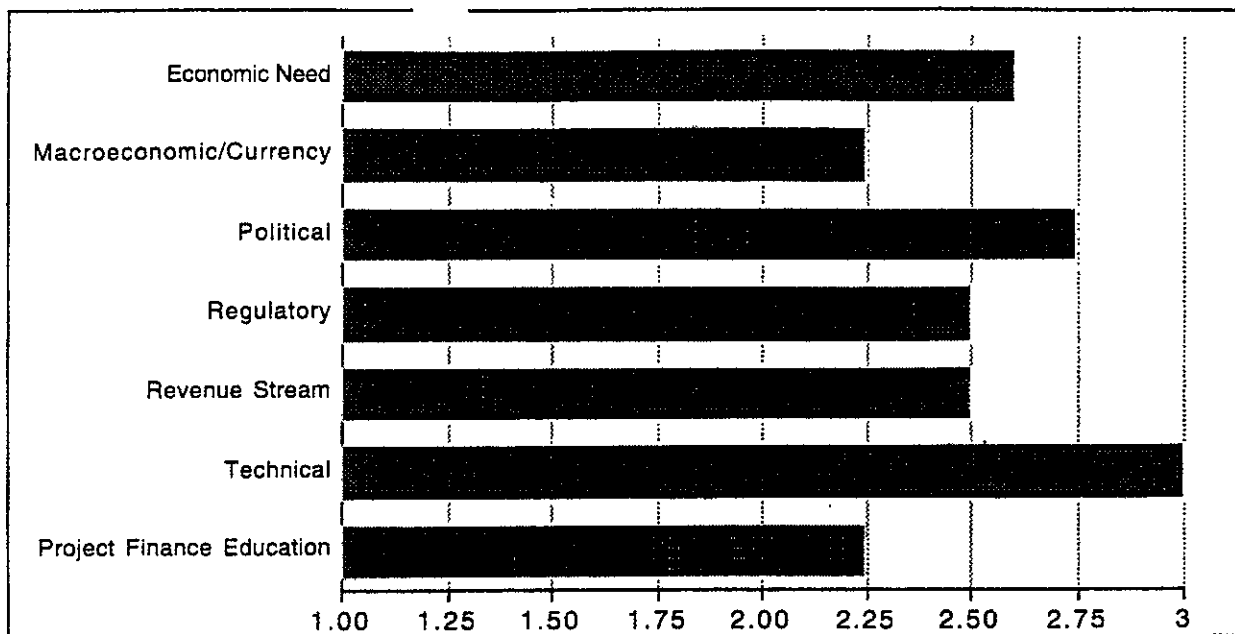
Traffic volumes across the Uruguay River in the last several years have steadily increased, overwhelming the capacity of the only existing river crossing between Uruguaiiana and Pasos de los Libres. Two or three day delays for truck traffic are now common. Regional economic growth generated by Mercosur will only exacerbate the problem. This is one of the only routes from Brazil to Chile.

Financeability

This project receives high marks for financeability. Both Presidents Menem and Cardoso have designated this project to be a high priority. The project was endorsed at a conference in March 1995. Each government has pledged a subsidy of approximately U.S.\$8 million to the project.

Traffic volumes are also expected to be high due to the regional integration implied by Mercosur, which should enable private financing of the remaining U.S.\$14 million on the basis of expected toll revenue. As always, there is risk involved in calculating accurate usage figures for new transportation infrastructure.

Financeability Assessment



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Key Decision Makers

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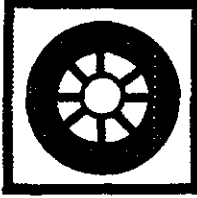
Ministry of Economy and Public Works

Dr. Wylían Rolando Otrera, *Secretary of Economy and Public Works*

Buenos Aires, Argentina

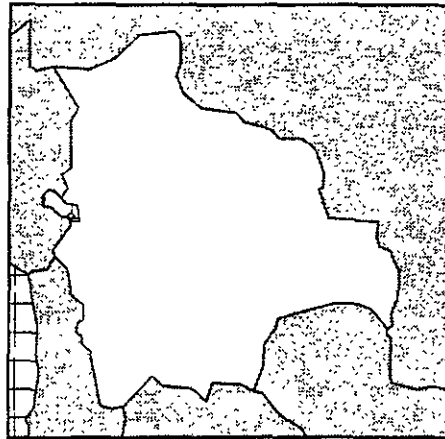
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Transportation/Bolivia

Air Traffic Control System Upgrade



Project Summary

Project No:	TRA-07
Subsector:	Air
Country:	Bolivia
Project Cost:	\$200 million
Export Potential:	\$150 million
Owner:	MTCAC

Bolivia's airports are poorly maintained and lack modern equipment, seriously compromising the safety, cost-effectiveness, and service of Bolivia's aviation sector. Air transport is critical for Bolivia because of its mountainous topography and large rural population. A U.S.\$200 million project to modernize Bolivia's four principal airports and upgrade communications within a broad network of airports is a major step toward dramatically improving the safety, service and efficiency of Bolivia's air transportation infrastructure.

Technical Description

The modernization project will focus on four airports—La Paz, Cochabamba, Santa Cruz, and Trinidad—that are operating in run-down facilities, including substandard passenger and cargo terminals, using out-dated equipment for the critical functions of air traffic control, inter-airport communication and navigation; and inadequate systems for handling passengers and cargo. The scope of this project includes making major improvements to Bolivia's principal airport facilities and developing and upgrading systems for traffic control, communications, passenger and cargo handling, and improving physical security.

The La Paz airport will be partially upgraded under a grant provided by the Japanese government worth approximately U.S.\$30 million. While most of the grant will fund the installation of VHF air/ground/air transmitters, it will also fund improvements to the airport facilities, including the passenger and cargo terminals and runway lights.

Air Traffic Control System Upgrade

Infrastructure Project Profiles

Upgrading the outdated systems for air traffic control and navigation (ATC/NAVAIDs) may be the single most important factor for enhancing the safety of Bolivian aviation. The Administración de Aeropuertos y Servicios Auxiliares a la Navegación Aérea (AASANA), which manages Bolivia's airports and ancillary systems, estimates that only two out of more than 30 traffic controllers can be considered radar qualified, in accordance with ICAO standards. New ATC/NAVAID systems will be developed and installed for each of the four principal airports.

In addition, the Aeronautical Fixed Telecommunications Network (AFTN) installed with Japanese aid at La Paz Airport will be extended to the three other major airports with dedicated communication links to 28 secondary airports. AASANA is extremely concerned about continuing to rely on the ENTEL network for communication between airports, because of its costs and chronic interface difficulties.

The project will also replace the woefully inadequate passenger and cargo handling systems at Cochabamba, Santa Cruz and Trinidad. Airport facilities at Cochabamba and Santa Cruz, both international airports, require substantial improvements to effectively handle passenger and cargo traffic in a safe, secure airport environment.

Site

La Paz, the capital, is located in eastern Bolivia; Cochabamba is located 236 kilometers southeast of La Paz; and Santa Cruz is located 542 kilometers southeast of La Paz. Trinidad is located approximately 450 kilometers northeast of La Paz.

Timing

The feasibility study funded by the U.S. TDA is expected to be completed at the end of 1995 and bidding may start in the first quarter of 1996 at the earliest.

Equipment & Services Demand

The upgrade of the Bolivian airports will require a wide range of planning and engineering services and, possibly, software development.

The equipment requirements include:

- Air traffic control equipment and navigation aids
- Surveillance radar systems, including 4-5 secondary surveillance radar systems and terminal radar ATC services throughout the La Paz Flight Information Region
- Weather radar systems and automatic airport weather observation equipment
- Runway lighting systems
- Aviation telecommunications
- Airport electric power distribution systems, and auxiliary power generators

Nature of Demand

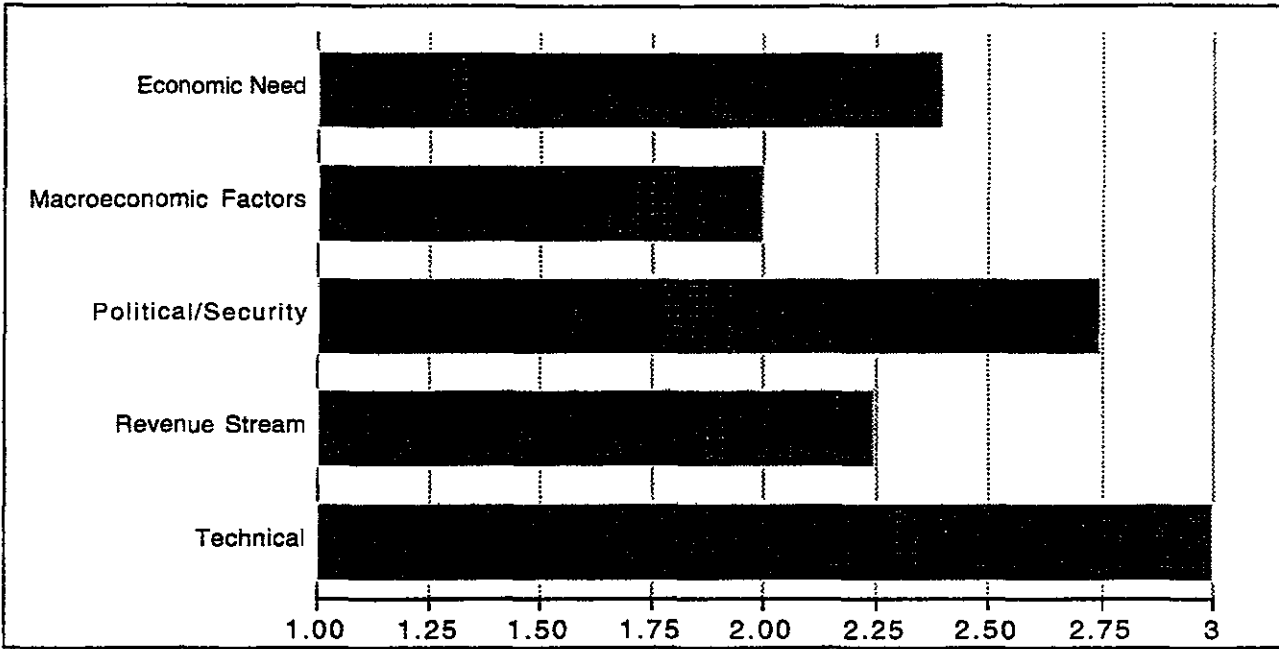
As a result of current and past economic restructuring efforts in Bolivia and the increasing importance of regional economic integration, reform of the air traffic sector has surfaced as a major priority in Bolivia. Bolivia's mountainous terrain and large rural population make air transportation particularly important, because it often serves as the primary means of long-distance transportation.

Demand for passenger traffic declined in the 1980s but increased sharply in 1992. Cargo movement at the three key airports (La Paz, Cochabamba, and Santa Cruz) rose sharply in 1993 and 1994, and is expected to continue rising as the economy grows. The total number landings and take-offs in 1992 was a low 153,000, mainly because many airports were not operational.

Financeability

Most of the improvements called for in this project will be financed through direct expenditures of the Bolivian government with potential support from international donors. However, World Bank and IDB support is commonly not granted for airport upgrades. Given the key role air transportation will play in transforming Bolivia into a vibrant regional economy, the Bolivian government will most likely allocate adequate financial resources to meet the aggressive investment goals of the project. The project's high U.S. export potential in key technology sectors also makes it a prime candidate for U.S. Ex-Im Bank support.

Financeability Assessment

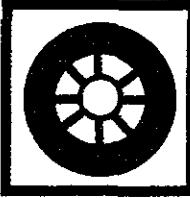


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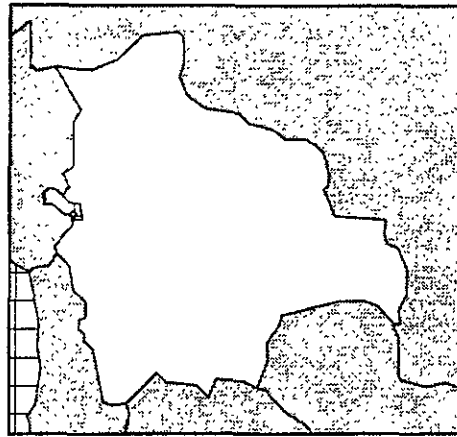
Key Decision Makers

Ministerio de Transportes, Comunicación y Aeronáutica Civil
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Transportation/Bolivia

Capitalization of the National Railway Enterprise-ENFE



Project Summary

Project No:	TRA-08
Subsector:	Rail
Country:	Bolivia
Project Cost:	\$15 million+
Export Potential:	\$8 million+
Owner:	ENFE

Technical Description

The capitalization of ENFE is one of the major components of the Bolivian government's process of capitalization. The process is designed to attract both foreign and domestic investors, to bring modern management and administration techniques into Bolivia's principal state-owned companies, and to distribute state resources among all Bolivian adults through private pension funds.

A concession will be granted to a private investor to operate and maintain the railroad system. Under this scheme, the equipment belonging to ENFE (rolling stock, signaling and telecommunications equipment, spare parts, etc.) will be transferred to the concessionaire, while the the Bolivian government will retain ownership of the tracks and ENFE real estate.

The Bolivian railway system is divided into two operational networks that are not interconnected. The Andean Network, 2,274 kilometers, serves the departments of La Paz, Cochabamba, Oruro, Potosí and Chuquisaca. The Eastern Network, 1,423 kilometers, serves the departments of Santa Cruz, Chuquisaca and Tarija. Private investors need not bid on both networks, although the Ministry of Capitalization will favor bids for the whole network, including the construction of an interconnection between the two networks.

The current value of ENFE remains to be determined, as an audit of the company has not taken place in recent years. The Ministry of Capitalization has contracted a foreign consulting firm which is expected to complete an audit of ENFE by the end of July 1995.

Timing

The bidding process will open on June 12, 1995, with a round of pre-qualifications. Pre-qualified companies will be invited to present technical and economic proposals starting August 18, 1995. The process will be concluded before the end of 1995.

The current market value of ENFE and its assets should be available to potential investors by the end of July.

Equipment & Services Demand

The main initial investment is expected to be in track renewal and rehabilitation. ENFE currently spends U.S.\$15 million on maintenance. However, in order to increase the traffic levels on existing lines, a complete rehabilitation program is required, as is the purchase of rolling stock. Such investment may amount to more than U.S.\$300 million, just for the Andean Network, and is expected to require tracks, cross-ties, ballast, and signaling and communications equipment. The exact requirements will be determined by a technical feasibility study and the plans of the winning bidder.

The Ministry of Capitalization does not require a specific investment program to be undertaken. The only requirement is that the current level of service be maintained or improved.

Nature of Demand

The railroad network of Bolivia is expected to play an important role in the construction of the East-West Export Corridor, linking the Atlantic Ocean off Brazil with the Pacific Ocean off Peru and Chile. Moreover, the railroad is expected to become a more important mode of transportation for Bolivian trade, both domestic and international. Demand for cargo rail services for import and export purposes is expected to continue to grow, as it has in the last three years (see table below).

Railroad Cargo Demand, 1993-1995

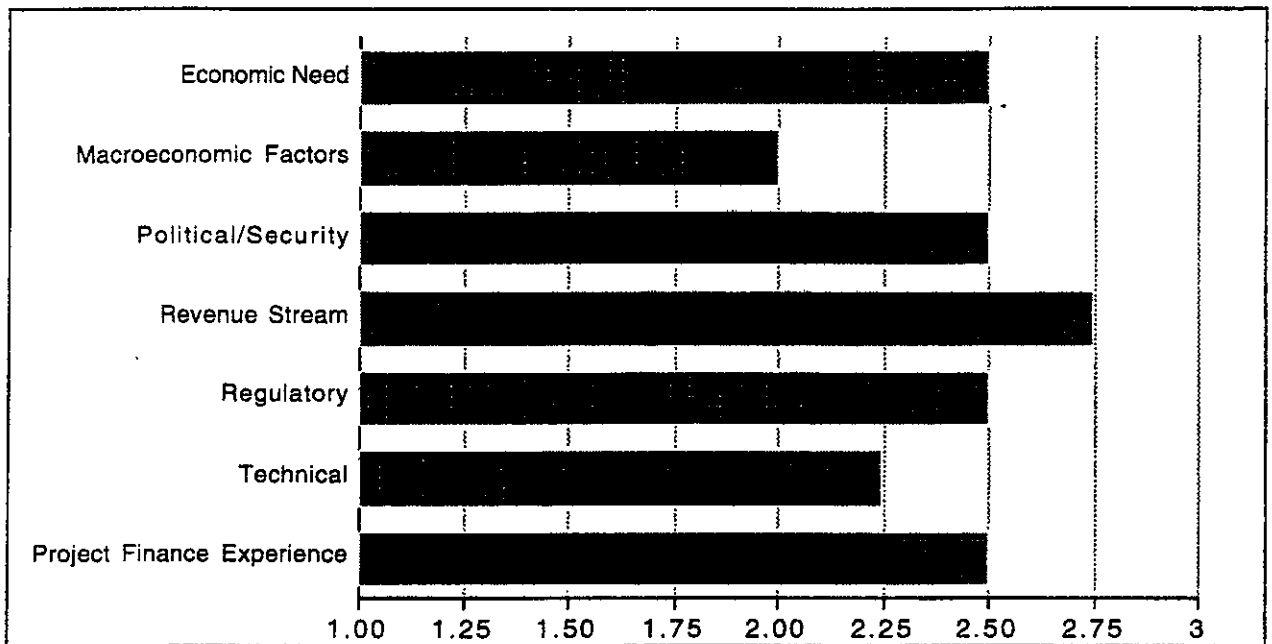
YEAR	EXPORTS		IMPORTS	
	Tons	Value (US\$ MIL)	Tons	Value (U.S.\$ MIL)
1993	568,747	14.1	609,750	26.9
1994	706,202	15.3	550,822	24.5
1995f	864,582	18.2	671,771	31.8

f=forecast

Financeability

The Bolivian economy is experiencing significant growth, as are its neighbors and trading partners in South America. This economic growth drives the demand for cargo services. The capitalization program of ENFE is supported by foreign consulting firms that provide technical and legal expertise in both the design and implementation phases of the program. Consequently, the program is expected to address the concerns of private investors.

Financeability Assessment



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Key Decision Makers

Ministry of Capitalization

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Edgar Saravia, *National Secretary of Capitalization*

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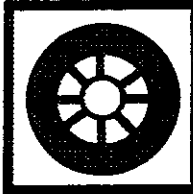
Empresa Nacional de Ferrocarriles (ENFE)

La Paz, Bolivia

José Luis Landivar, *Executive President of ENFE*

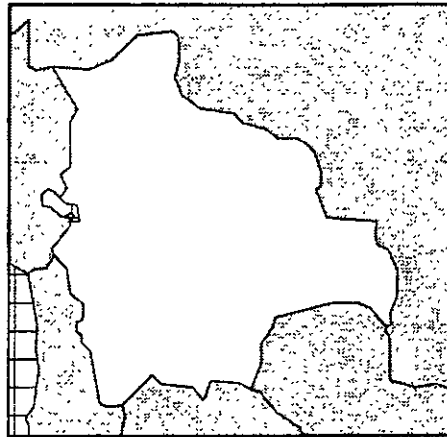
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Transportation/Bolivia

Rio Paraguay Port & Navigation Channel



Project Summary

Project No:	TRA-09
Subsector:	Port
Country:	Bolivia
Project Cost:	\$70 million
Export Potential:	\$30 million
Owner:	BISA

Banco Industrial de Bolivia (BISA) is promoting a project for the construction of port facilities and a navigable canal to serve as an inland waterway for a wide range of agricultural products from Bolivia into the Brazilian state of Mato Grosso do Sul.

Technical & Site Description

The central concept is to build a port with all the necessary facilities to handle grain, containers, equipment and the materials required by the farming and cattle industries in the Santa Cruz region of Bolivia.

The preferred site for the port facility would be close to the railroad line between Candelaria and El Carmen. The soil and feasibility study that needs to be undertaken should determine the precise location of the port.

The navigation canal would begin at the port and utilize the Tucuvaca River, which flows into the Paraguay River.

The main canal would be between 120 and 180 kilometers long, depending on the results of the soil and hydrological study. A secondary canal would connect with the iron ore deposit of Mutun. In addition, construction of the canal and other hydraulic works would make additional water available for agricultural (citrus and cattle) and forestry purposes in the Tucavaca Valley.

Timing

A complete feasibility study is needed before the viability of the project can be demonstrated. BISA estimates that this study will begin shortly and take up to two years.

Equipment & Services Demand

Equipment and services demand will be defined by the feasibility study. Nevertheless, basic equipment and material for canal construction and water control will be needed for the canal construction. The port facility will require silos, equipment, cargo transfer facilities, cranes and conveyors.

In addition, specialized engineering and construction services will be required for the construction of the canal and the port.

Nature of Demand

The dearth of low-cost transportation from Santa Cruz to export markets in Latin America and abroad has slowed the growth of agricultural exports from the fertile Santa Cruz region.

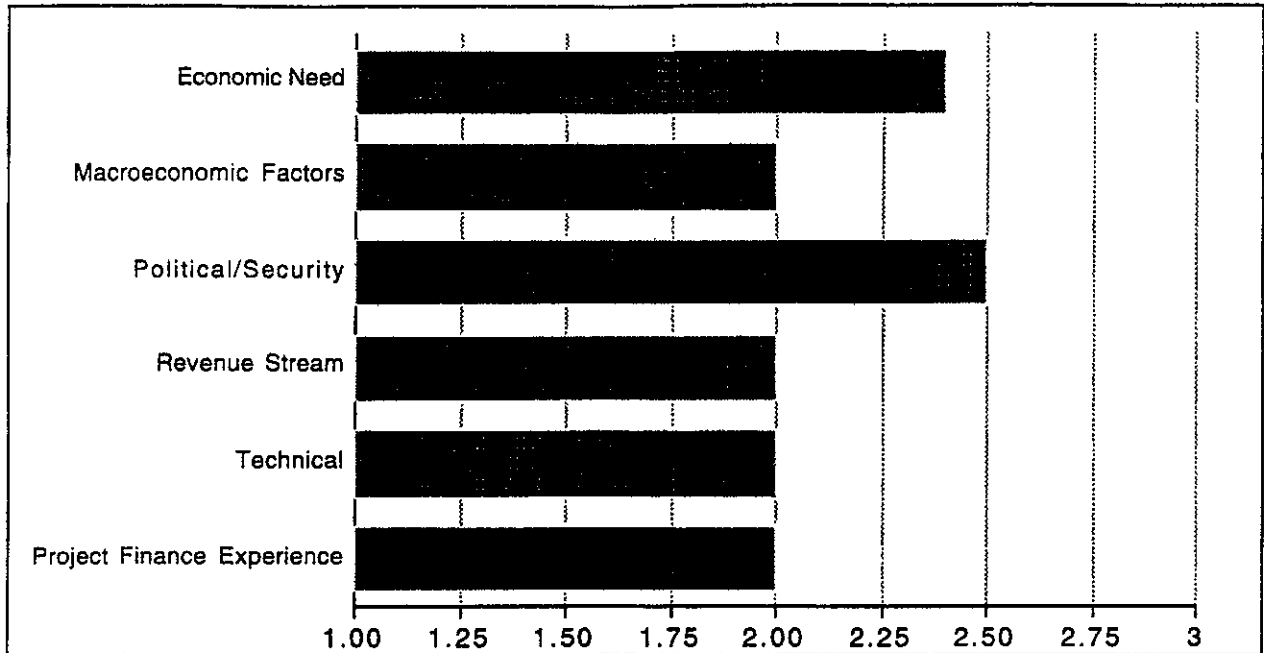
The two existing river ports in the Tamengo Canal, near the Brazilian border, are inoperable during the dry season, the busiest period of the year for agricultural exports.

This project will also enhance the development of the Tucavaca Valley, which would benefit from the water control systems through the permanent irrigation of about 200,000 hectares.

Financeability

Key technical feasibility studies need to be completed. Santa Cruz is an important agricultural and cattle producing region and requires better transportation links than are currently available. There have been no decisions on the financial structure of the project, although multilateral support will likely be sought. Financeability assessment at this stage is very tentative.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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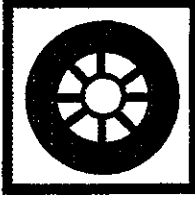
ICE Ingenieros S.A.

Ing. J. Rolando Blanco P., *Manager*

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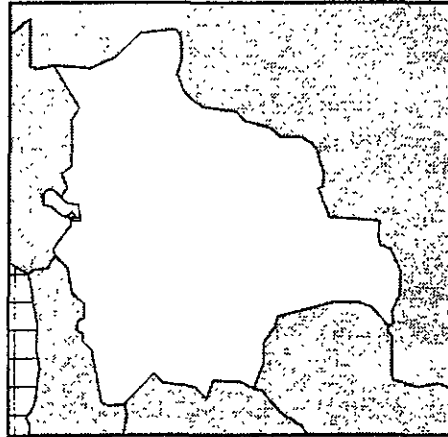
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Transportation/Bolivia

San José–Puerto Suárez Highway



Project Summary

Project No:	TRA-10
Subsector:	Road
Country:	Bolivia
Project Cost:	\$167 million
Export Potential:	\$25 million
Owner:	Concession

Technical Description

The San José–Puerto Suárez Highway, located in the eastern lowlands of Bolivia and ending at the Brazilian border, is approximately 370 kilometers long. It is a dirt road in very poor condition and is usable only during the dry season. The concession project consists of building, operating and maintaining a two-lane asphalt highway, which would constitute a main artery in Bolivia's East-West Export Corridor.

Site

The San José–Puerto Suárez Highway is one part of the Santa Cruz–Puerto Suárez Highway, located in the province of Santa Cruz in eastern Bolivia. The highway belongs to Route N° 4 of the national highway network, which in turn is part of the East-West Corridor. Its connection with Route N° 9 allows travel to Trinidad in the north and Yacuiba on the border with Argentina in the south.

Timing

Economic and technical feasibility studies are currently underway and are expected to be completed by the fourth quarter of 1995. The bidding process is expected to start in the first quarter of 1996.

Equipment & Services Demand

The project will require services and materials for highway and drainage construction, such as paving, bridge building, construction of intersections and bypasses, as well as other civil works. The exact requirements will be determined by the feasibility study currently underway.

Nature of Demand

The construction of this highway would allow the integration of the highway networks of Brazil and Bolivia, which forms part of the Atlantic-Pacific Highway Corridor from Santos, Brazil to Arica, Chile.

In addition to providing more competitive access to foreign markets for traditional exports, the existence of a viable transportation route will also allow the opening up of nontraditional export sectors.

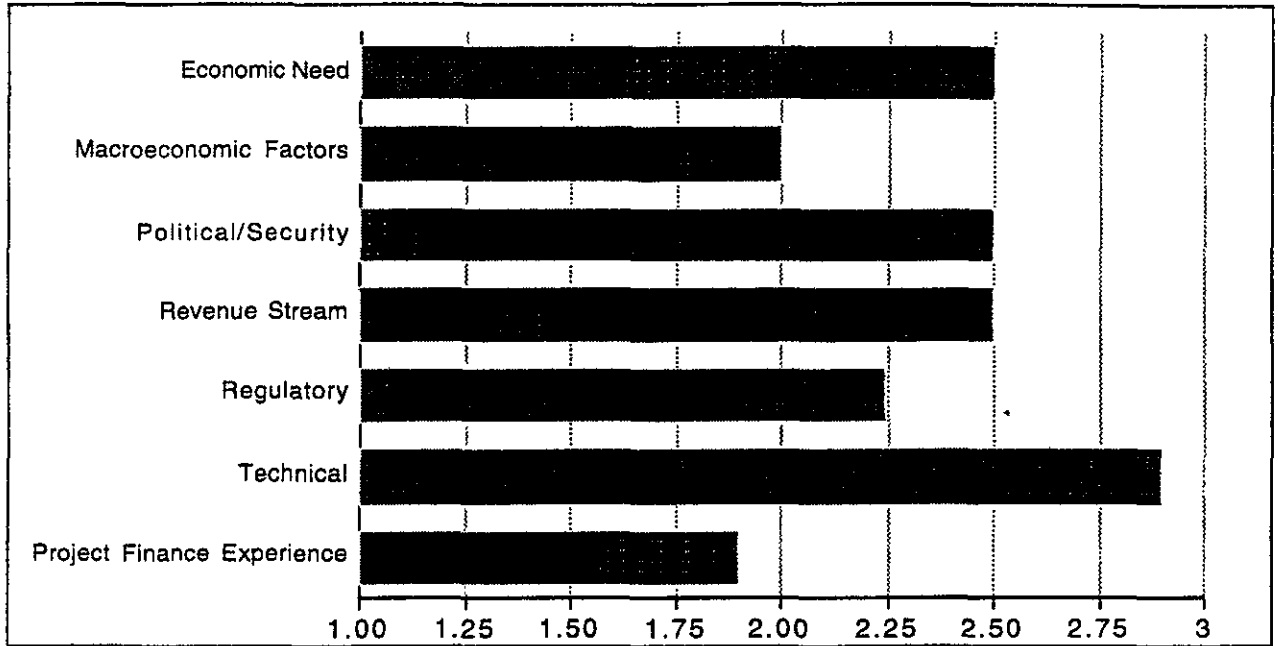
The demand for access to foreign markets in the province of Santa Cruz is strong. It accounted for approximately 20 percent of Bolivia's GNP throughout the 1980s and accounts for 71 percent of agricultural production.

Financeability

The Inter-American Development Bank has already committed U.S.\$120 million for this project. The remaining U.S.\$47 million will have to be raised by the project owner. The highway may be offered for concession to the private sector depending on the type of proposed financing. The Secretariat of Transportation's draft of the Decree on Concession, which would regulate concession regimes, is awaiting government approval.

At the present time it is unclear whether there will be sufficient traffic volume to support a concession approach for the project.

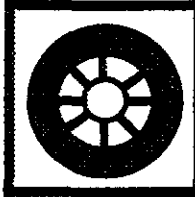
Financeability Assessment



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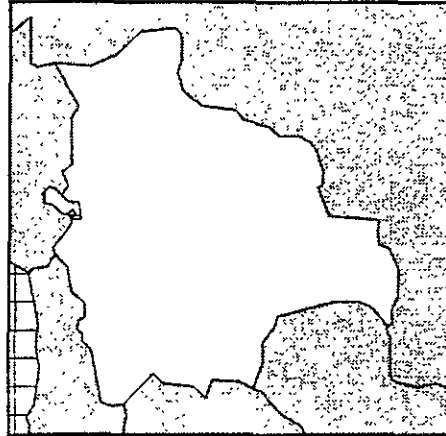
Key Decision Makers

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Transportation/Bolivia

San Ramón–San Matías Highway



Project Summary

Project No:	TRA-11
Subsector:	Road
Country:	Bolivia
Project Cost:	\$240 million
Export Potential:	\$20 million
Owner:	Concession

Technical Description

This project consists of the construction of a 652-kilometer paved highway between San Ramón and San Matías. The current connection ranges from weak to virtually nonexistent. The standard of the different parts is as follows:

- San Ramón to Concepción (115 kilometers) is gravel.
- Concepción to San Ignacio (178 kilometers) was recently improved by the G.T.Z., CORDECRUZ, and S.N.C., but requires additional asphalt laying.
- San Ignacio–San Rafael–San Matías (359 kilometers)— The first 73 kilometers to San Rafael are gravel; the following 286 kilometers are in very bad condition, and transit is not always possible.

The construction of the highway would be offered as a concession running for 30 years.

This highway would connect to the East-West Export Corridor, running coast-to-coast from Brazil to Chile, through the San Ramón–Los Troncos–Pailón segment, which is currently being paved and the San Ramón –Los Troncos–Puerto Banegas–Guabirá segment, which requires a 1,000-meter bridge over the Río Grande. Financing for the U.S.\$20 million needed is currently sought from the Inter-American Development Bank.

San Ramón–San Matías Highway

Infrastructure Project Profiles

Site

The highway would be located in eastern Bolivia and run between the cities of San Ramón and San Matías.

Timing

Economic and technical feasibility studies need to be carried out before any public offering. Feasibility studies are expected to be completed in the first semester of 1996. The bidding process will open subsequently.

Equipment & Services Demand

The highway will require services and materials for highway and drainage construction, such as paving, bridge building, construction of intersections, and bypasses, as well as other civil works. The exact equipment and services required will be determined by the feasibility study.

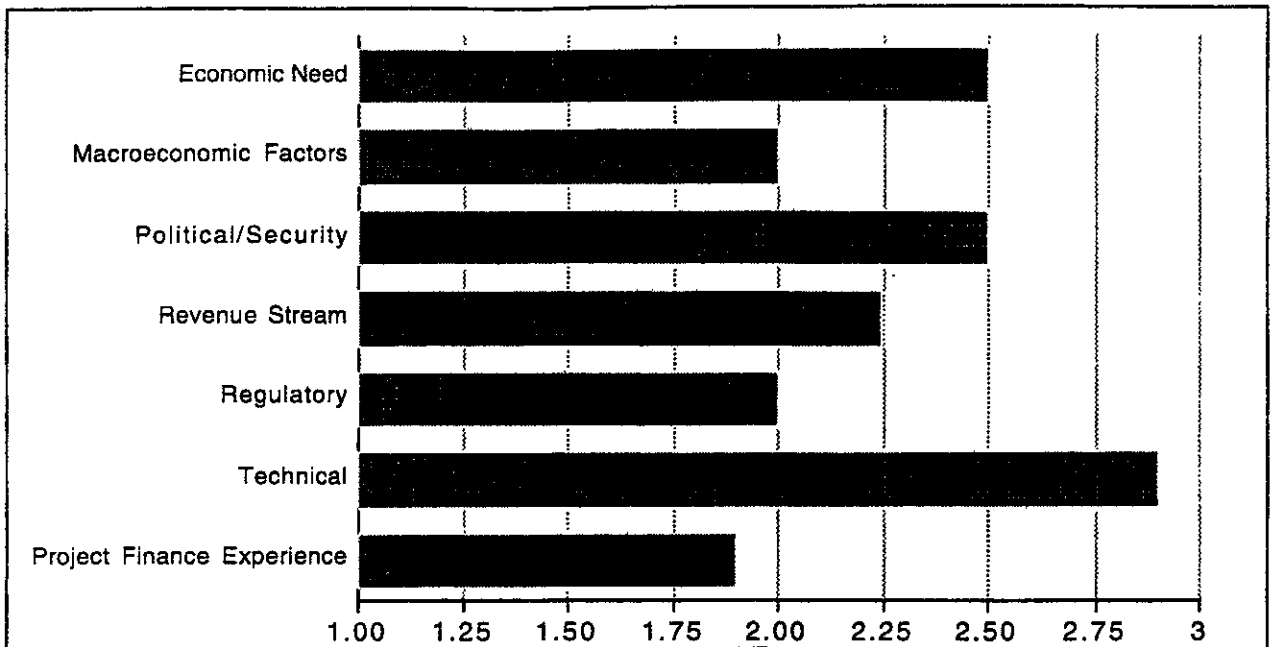
Nature of Demand

This highway would connect Bolivia to Brasília and open up a channel for trade between Chile, Peru, and Brazil. It would also serve as a major export corridor for agricultural exports to the Asian Pacific Rim. One of the main sources of such exports would be Mato Grosso, which is estimated to have an export potential of more than one million metric tons a year.

Financeability

There are many issues to be resolved before this can be said to be a financeable concession project. For example, projected traffic volume is currently unknown and may be difficult to calculate because of the number of alternate transportation projects being proposed for the region. The assumption that agricultural produce from Mato Grosso would use the road is shaky at best. Also, the Bolivian government will have to propose a flexible concession and/or financing package to interest the private sector.

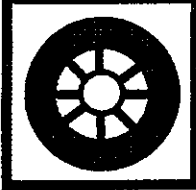
Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

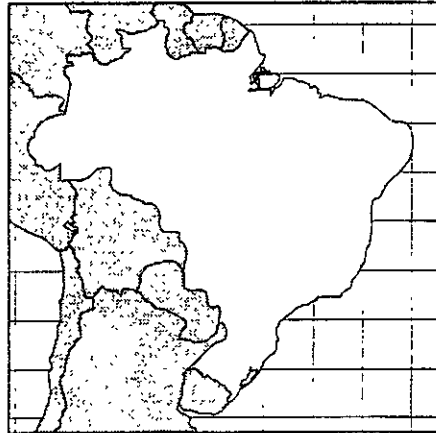
Key Decision Maker

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Transportation/Brazil

Anhanguera–Bandeirantes Highway



Project Summary

Project No:	TRA-12
Subsector:	Road
Country:	Brazil
Project Cost:	\$560 million
Export Potential:	\$225 million
Owner:	Concession

Technical Description

The Anhanguera–Bandeirantes Highway System is an existing series of multi-lane highways that runs between São Paulo and the major industrial city of Campinas. Its main components are the Anhanguera Highway, 147 kilometers long, and the Bandeirantes Highway, 89 kilometers long. The system will also include 4 kilometers of the Washington Luis Highway, 2 kilometers of the Dom Gabriel Paulino Bueno Couto Highway, and 6 kilometers of the Santos Dumont Highway.

The system will be awarded as a concession for 20 years and may be extended for another 20 years. This concession will encompass maintenance, rehabilitation and improvements. The concessionaire will also be required to undertake a mandatory investment program consisting of the following components:

- Extension of the Bandeirantes Highway
- Renovation of existing toll gates and weigh stations
- Implementation of an electronic toll system
- Implementation of a new communication system
- Construction of access roads, viaducts, and drainage systems

Anhanguera-Bandeirantes Highway

Infrastructure Project Profiles

The concessionaire will also be responsible for conducting an environmental impact assessment.

Foreign companies interested in bidding for this highway system must have legal representation in Brazil on the date that documents for pre-qualification are presented. Brazilian-foreign consortia will automatically be led by the Brazilian participant.

The final terms of the concession have not yet been defined. The São Paulo State Highway Company (DERSA) is currently revising the conditions of this project and welcomes suggestions from private developers interested in the project. Currently, certain conflicts exist between DERSA's requirements and those of potential private developers.

Site

The project is located in the state of São Paulo and runs between São Paulo and Campinas.

Equipment & Services Demand

The mandatory investment program will require services and materials for highway and drainage construction as well as for other civil works. The required electronic toll-road system will be a significant technological component.

Timing

The state government opened the bidding process on May 12, 1995.

The pre-qualification process will have two phases. Phase I includes legal, economic-financial, and corporate finance qualifications. Phase II includes technical qualification and an examination of the proposed methods of executing the concession.

Nature of Demand

The state of São Paulo is the fastest growing region in Brazil and South America's major industrial center. The current highway system is poorly maintained thereby resulting in significant bottlenecks. Campinas is São Paulo's second largest city. The Campinas metropolitan area has a population of approximately 3.5 million.

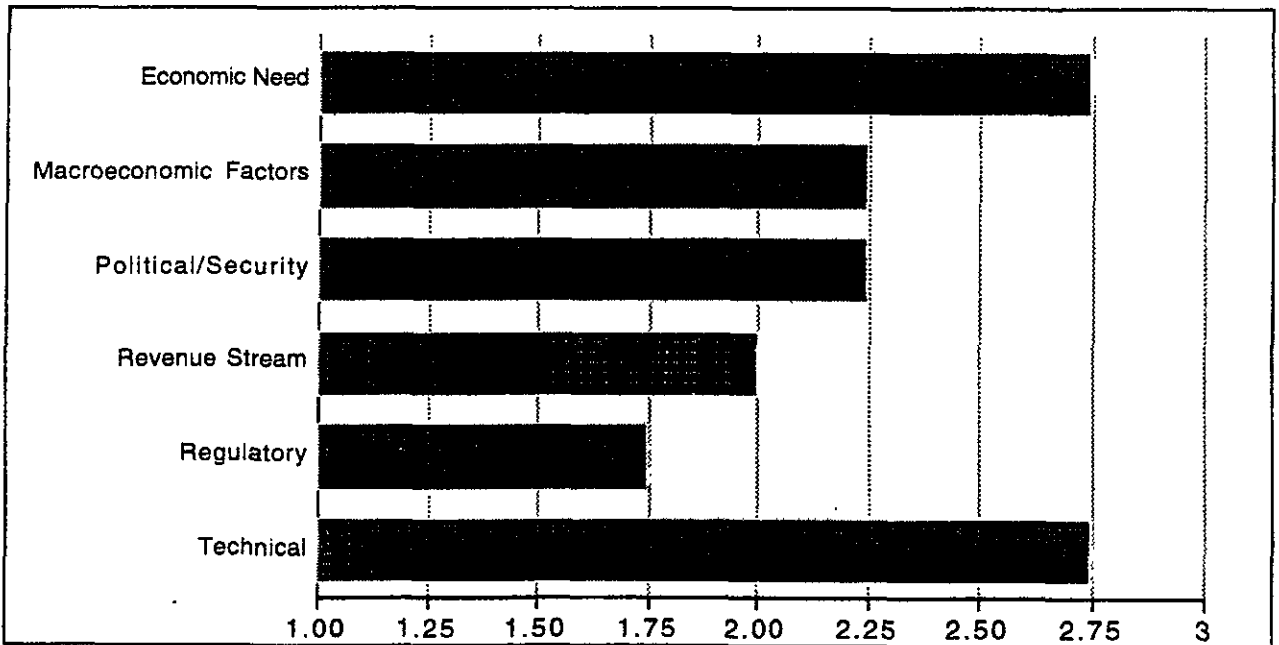
Financeability

Very high traffic volume on the existing Anhanguera and Baneirantes highways provides the economic underpinning for the project.

However, the government’s structuring of the concession will determine its financeability. There is currently a number of issues which will require difficult negotiations to resolve. These issues include:

- Government control over toll setting according to average toll rates and undefined “policy considerations.”
- Proportion of non-toll revenue i.e. revenue generated through development rights along the route; the operation of gas stations, restuarants, and repair shops; and the lease of advertising space. These non-toll revenues are difficult to quantify and will increase project risk.
- Requirement for the prioritization of payments to the state before debt and other obligations.
- Unwillingness of the government to limit or accept the risk of competing routes.
- Finally, technical studies that will better define the risk of cost overruns and other technical issues have yet to be completed.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Anhanguera-Bandeirantes Highway

Infrastructure Project Profiles

Key Decision Makers

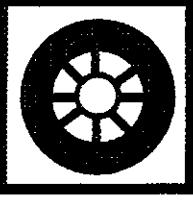
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Transportation/Brazil

Bauru–Corumbá Railroad Modernization



Project Summary

Project No:	TRA-13
Subsector:	Rail
Country:	Brazil
Project Cost:	\$230 million
Export Potential:	\$100 million
Owner:	RFFSA

The 1,600 kilometer Bauru-Corumbá stretch of the Federal Railway Network (RFFSA) forms a key artery for moving cargo from the Bolivian border and the Brazilian Center West region to markets in São Paulo and to Port of Santos on the coast. As this stretch of railroad is key to the regional economy and badly in need of maintenance, it will be among the first to go to public bidding in the upcoming privatization.

It has not yet been determined whether the line will actually be privatized or whether a long term operating concession will be granted.

Technical Description

A group of 250 employees of Region X, the RFFSA administrative entity which operates the Bauru–Corumbá Railway, has organized a company called Transfer S.A. and wants to take a stake in the privatized railroad. Transfer S.A. is looking for a partner to help carry out needed investments in infrastructure, beginning with this year’s U.S.\$45-million upgrade plan. This year’s budget allots only U.S.\$29 million toward the modernization project. Over the next five years about U.S.\$230 million will need to be invested.

The plan for 1995 includes the following:

- Replacement of 700,000 wooden railroad ties, roughly one quarter of the total on the Bauru–Corumbá stretch of railway

Bauru–Corumbá Railroad Modernization

Infrastructure Project Profiles

- Design and construction of four or five metal bridges
- Design and construction of one concrete bridge
- Repairs on nine locomotives

Site

The western part begins at the Bolivian border town of Puerto Suarez, on the Paraguay River. It continues for 1,600 kilometers through the state of Mato Grosso do Sul, crosses into the state of São Paulo and ends at the city of Bauru. After Bauru, the railroad is under the jurisdiction of FEPASA, the railroad company of the state of São Paulo. The railroad connects into the city of São Paulo and to Santos. The railroad runs through the heartland of São Paulo state.

Timing

Although the federal government has long discussed the privatization of the under-funded RFFSA, the Cardoso administration is moving forward with it this year. At the end of March, the Ministry of Transportation announced that the privatization of RFFSA would begin in August. RFFSA characterizes the Bauru–Corumbá Railway among its highest priorities in terms of need for investment.

Additionally, this stretch of railroad will be able to be combined with the sections of other railway in the state of São Paulo which, for the first time, announced the privatization of FEPASA this year.

The project will be implemented in the second half of 1995.

Equipment & Services Demand

The new operator/concessionaire will be responsible for the maintenance and operation of the railroad, which will continue to require investment. This year’s investment program of U.S.\$45 million was scaled back due to budgetary constraints. The actual figure for necessary infrastructure investment approaches U.S.\$85 million.

In the next few years, the Bauru–Corumbá Railway will continue to replace railroad ties, many of which have rotted. The railroad will also invest over U.S.\$150 million to restructure eight curves of track.

Nature of Demand

The primary west-to-east cargo flows include grain (primarily soy, but also wheat and corn) to São Paulo and Santos. Other important shipments are iron, lime, cement, and other minerals from the

Corumbá area. Railroad improvements will be able to take advantage of the export of manganese from Corumbá, which has been transported through Argentina. Annual cargo flows are 2.5 million tons per year.

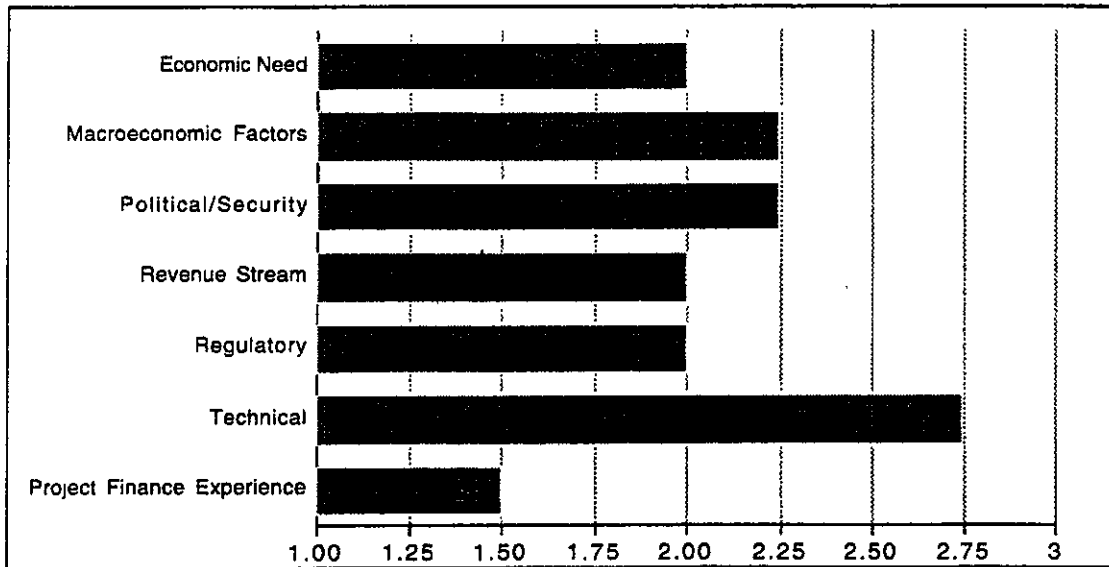
Financeability

One of the critical financeability issues is whether there is sufficient economic need for rail transportation in the Bolivia-Center-West-São Paulo Corridor, when there are highway and waterway options. A detailed feasibility study on traffic growth would need to be completed before an investor would consider bidding for an operations/maintenance concession for the railroad.

The second issue pertains to the timing of the privatization. Privatization of RFFSA was first announced in the Collor administration in 1992, but has been consistently delayed.

The third issue, a technical one, questions the value of the Bauru-Corumbá Railway without the Bauru to São Paulo stretch. The operation of a railroad from the Bolivian border to São Paulo will require bids for a second stretch of track when the São Paulo Railroad Company (FEPASA) is privatized or concessioned out.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of the project scoring process.

Bauru–Corumbá Railroad Modernization

Infrastructure Project Profiles

Key Decision Makers

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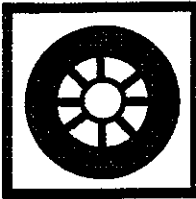
National Bank for Economic and Social Development (BNDES)

Fernando Perroni, *Privatization Superintendent*

Rio de Janeiro, Brazil

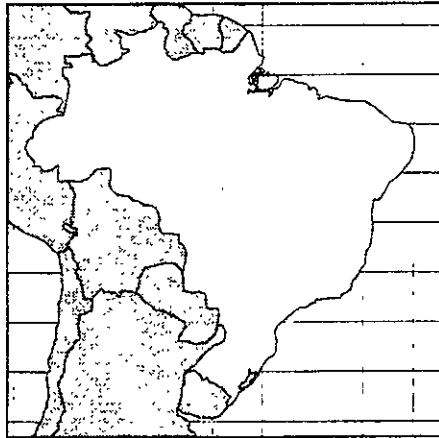
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Transportation/Brazil

Center-East Railroad: Unaí-Pirapora



Project Summary

Project No:	TRA-14
Subsector:	Rail
Country:	Brazil
Project Cost:	\$734 million
Export Potential:	\$440 million
Owner:	CVRD

Technical Description

This project consists of the first segment in the Brazilian Center-East Transportation Corridor. It consists of a 285 kilometer rail line between Unaí and Pirapora in the state of Minas Gerais and will focus primarily on the transportation of agricultural products. This railway would connect to an existing line going through Belo Horizonte (the state capital) and further on to the port of Tubarão in the state of Espírito Santo. It would also connect with the river transportation system of São Francisco River in Pirapora.

Companhia Vale do Rio Doce (CVRD), one of Brazil's largest companies, has conducted an economic pre-feasibility study which compares transportation costs using the Unaí-Pirapora Line to reach the port of Tubarão or the FEPASA line to Santos. The study concluded shipping to Tubarão is cheaper than any other alternative, independent of the combination of grain and cereals transported.

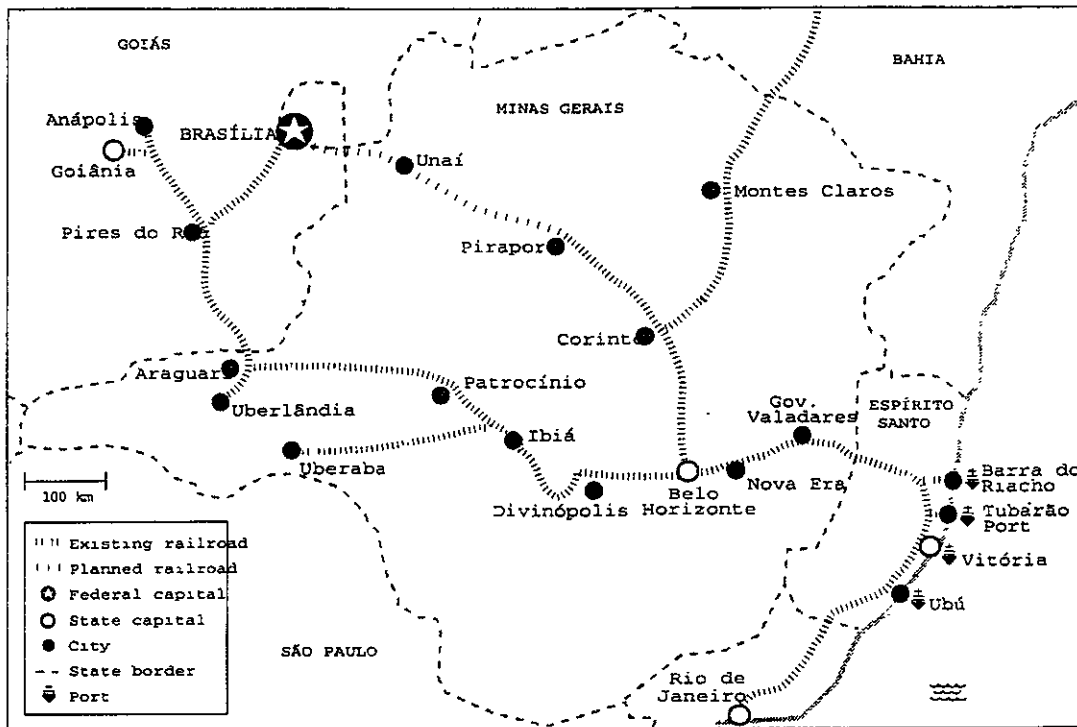
In addition, other cities in the Central-East region may be connected to this corridor. Improvements on the Pirapora-Capitão Eduardo Line (Belo Horizonte) are also under consideration.

Centro-Este Railroad: Unai-Pirapora

Infrastructure Project Profiles

Site

This railway line would be located in the northwestern area of the state of Minas Gerais, connecting Unai, which is southeast of Brasília, with Pirapora, which is north of Belo Horizonte. The railway continues to the port of Tubarão outside Vitoria, the capital of Espirito Santo.



Source: Minimax Editora

Timing

An economic pre-feasibility study has already been concluded. Feasibility studies and preparation of the bidding documents will continue until 1996. Construction is to be completed by 1999.

Equipment & Services Demand

The investment plan envisioned in the pre-feasibility study contains investment in tracks, telecommunications and rolling stock according to the following schedule:

Investment, Unai-Pirapora Line (US\$ million)

	1996	2000	2006	2010	Total
Land acquisition	1.50	-	-	-	1.5
Infrastructure	84.71	-	-	-	84.71
Superstructure	77.66	-	2.72	-	80.37
Transfer areas	8.34	0.47	1.80	-	10.61
Telecom	0.76	0.06	0.11	0.09	1.03
Special projects	6.92	-	-	-	6.92
Supervision	5.31	-	-	-	5.31
Management/ administration	2.00	-	-	-	2.00
Total tracks	187.21	0.53	4.63	0.09	192.46
Locomotives	26.00	6.00	10.0	8.00	50.0
Wagons	23.94	5.70	9.90	8.30	47.84
Maintenance posts	1.70	-	-	-	1.70
Total equipment	51.64	11.70	19.90	16.3	99.54
Total	238.8	12.23	24.53	16.39	292.0

Investment is also envisioned in connecting lines acting as feeders to the main route for the Pirapora-Corinto-Capitão Eduardo stretch according to the schedule below.

Investment in Connecting Systems, Pirapora-Corinto-Capitão Eduardo (US\$ millions)

	1996	2000	2006	2010	Total
Total - Tracks	39.45	-	-	-	39.45
Locomotives	92.00	22.00	40.00	32.00	186.0
Wagons	106.12	26.30	45.60	38.30	216.32
Total equipment	198.12	48.30	85.60	70.30	402.32
Total	237.57	48.30	85.60	70.30	441.77

Nature of Demand

The pre-feasibility study predicts that an estimated 15 million tons annually would be transported by the new line. This prediction is based on the assumption that 20 percent of the annual agricultural production in the area would be shipped by railway.

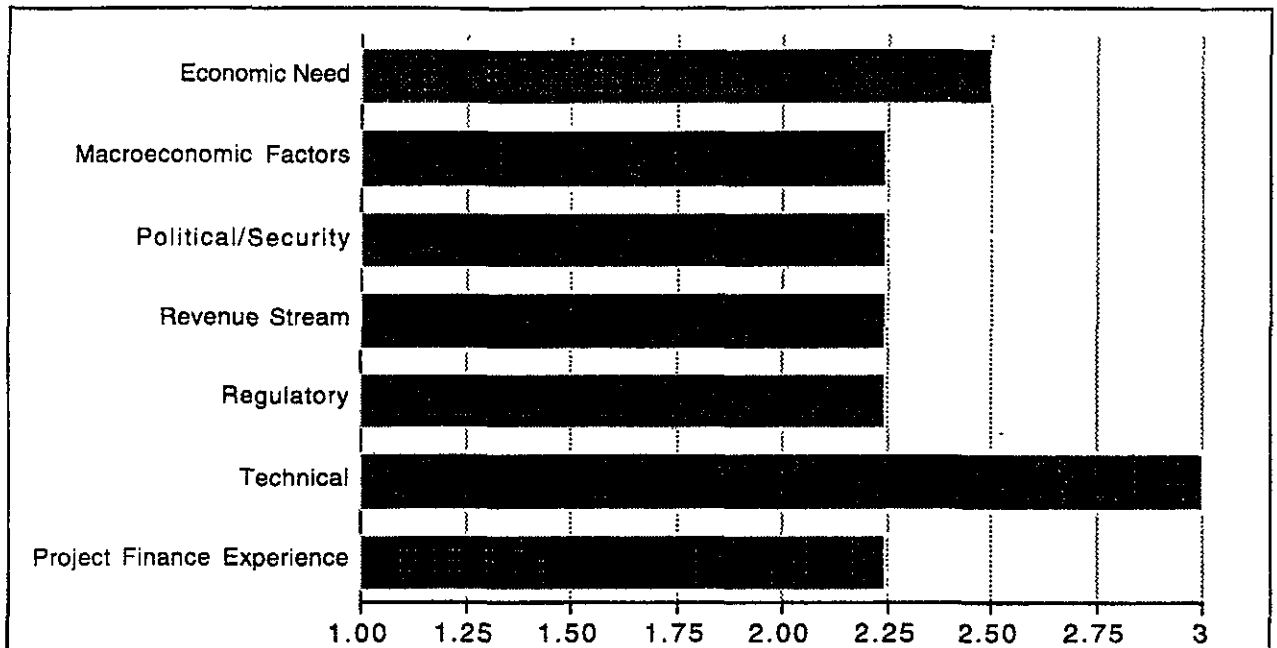
Apart from agricultural production in Minas Gerais, demand for transportation is expected to come from agricultural production on the plains of the state of Goiás and from industrial production in Minas Gerais for Brasília. In addition, the integration of the Center-West region with the river transport system of São Francisco is also expected to generate demand for rail transportation.

Financeability

There are some serious financeability issues, mainly dealing with lack of hard economic data on freight flows and overall demand. This railway line will be offered under a concession regime and privately financed. The exact length of the concession and the exact nature of the project will be determined by detailed economic and technical feasibility studies. State support in terms of subsidies and/or guaranteed minimum traffic levels is being considered, but a decision will be guided by the results of the feasibility studies. CVRD currently estimates the rate of return on invested capital to be 10 percent — too low a return to interest investors.

The project is also contingent on CVRD being awarded a section of track from RFFSA, which connects Unai to Belo Horizonte and the rest of the CVRD system.

Financeability Assessment



Source: G/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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Consórcio Operacional do Corredor Centroleste

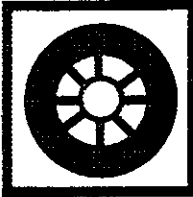
Paulo Vivacqua, *President*

Sandra Maria Ferraz Stehling, *Operations Director*

Vitória, Brazil

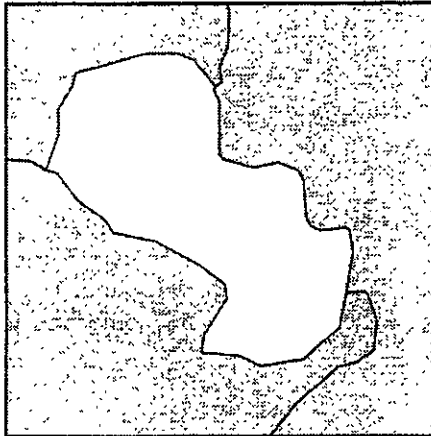
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Transportation/Brazil

Ferroeste Railroad Construction and Service



Project Summary

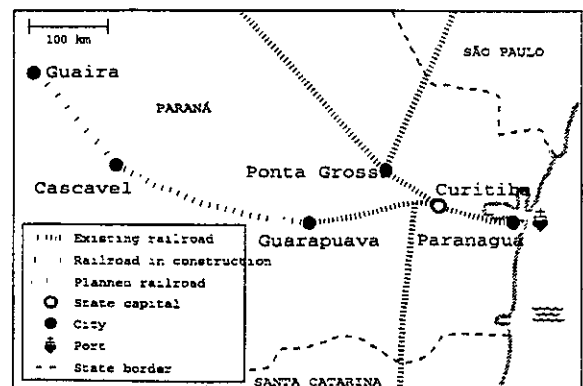
Project No:	TRA-15
Subsector:	Rail
Country:	Brazil
Project Cost:	\$260 million
Export Potential:	\$190 million
Owner:	State of Paraná

Technical Description

This project is an extension of the existing railroad network in the State of Paraná linking the rich agricultural areas of western Brazil and eastern Paraguay with the Atlantic Coast and the Port of Paranaguá. It has three components:

- The purchase of rolling stock for the existing rail-line
- Construction of a new connecting 170-kilometer railroad between Cascavel and Guaira
- A potential service contract for the railway.

An existing 350-kilometer railway link connects Paranaguá, Curitiba, and Guarapuava. The project consists of extending the railway to Cascavel and Guaira. The first stretch, from Guarapuava to Cascavel, is already under construction and is estimated to be completed in August 1995. The remaining work on this phase will be the construction of an intermodal terminal in Cascavel. Since private companies were unable to finance this segment, the state government of Paraná provided funding equivalent to U.S.\$250 million.



Ferroeste Railroad Construction and Service

Infrastructure Project Profiles

However, rolling stock still remains to be purchased for the first stretch at an estimated cost of U.S.\$110 million, and the state government is considering a leasing arrangement with a private sector party.

The construction of the section from Cascavel to Guaira (170 kilometers) is estimated to require an investment of U.S.\$150 million, excluding rolling stock. The state government has not allocated resources for the construction of this stretch and is considering private sector involvement through a concession regime or other potential arrangements proposed by a private sector party.

The state government is also considering putting out a service contract on management, operation and maintenance of the railway.

Site

This railway line is located in the state of Paraná in southern Brazil. It runs from Guarapuava to Guaira and connects with the Cascavel–Guarapuava–Curitiba (the state capital) –Paranaguá Railway.

Timing

The Cascavel–Guarapuava line is expected to be completed in August 1995. The bidding for rolling stock is expected to open in the fourth quarter of 1995 or first quarter 1996.

A schedule has not been defined for the construction of the second stretch but the State Government welcomes proposals and initiatives from the private sector.

Equipment & Services Demand

Paraná will purchase about 40 locomotives within the next two years at a price of U.S.\$2 million each. In addition, purchases are planned for 500 wagons at a price of U.S.\$60,000 each, for a total of U.S.\$110 million.

The railroad construction is expected to require track, cross-ties, ballast, and signaling and communications equipment. The exact requirements will be determined by a technical feasibility study.

Nature of Demand

Paraná is one of the richest states in Brazil. It possesses prosperous agricultural areas with large mechanized agroindustrial plantations producing grains, cereal, and cotton. A major problem, however, is the high cost of transportation to the main port of the state, Paranaguá. Currently, a large proportion of agricultural products is transported by trucks to the port of Paranaguá. This is a relatively inefficient method of transporting large volumes of produce. A cargo rail link would meet the unfulfilled demand for cheap and reliable transportation.

Demand is also expected to come from the southern part of the state of Mato Grosso do Sul and eastern Paraguay as well as from the link up with the Hidrovia Tietê-Paraná, a river transportation network, at its most southern tip.

The state government of Paraná has estimated that the finished railway will transport approximately four million metric tons of cargo per year.

Financeability

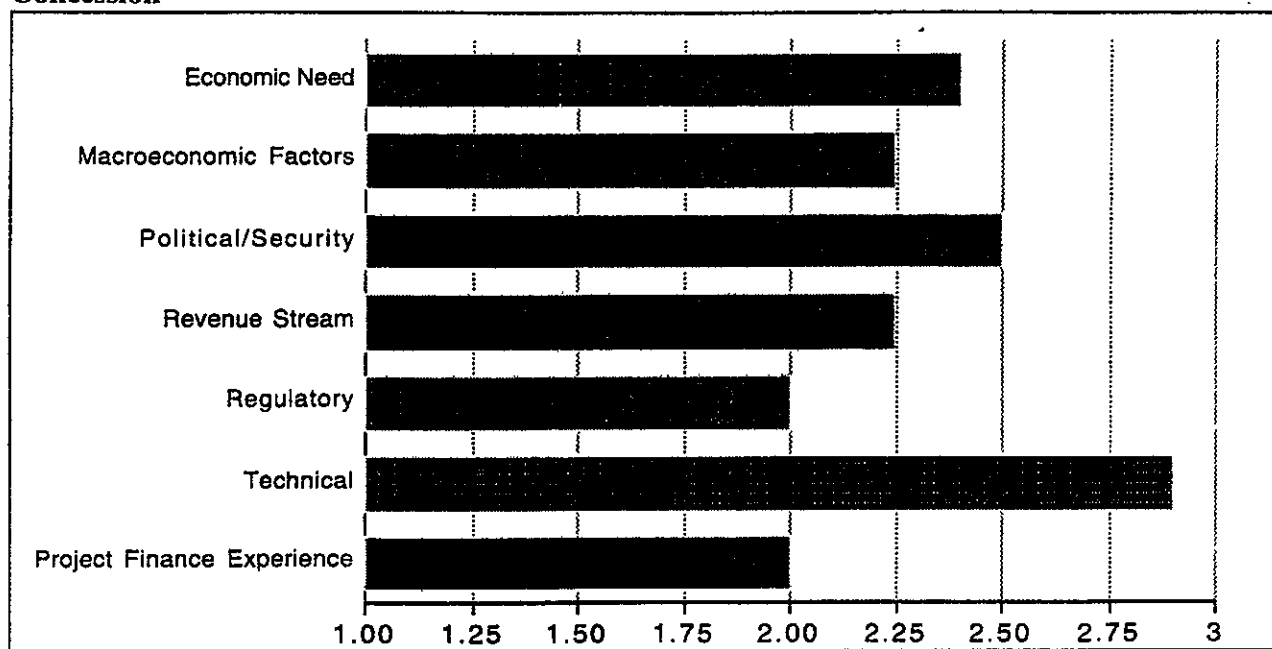
The project has two components — a straight purchase of stock and a potential concession project. The rolling stock will be purchased by the state government of Paraná, although it is also considering an arrangement whereby the rolling stock is leased to the State by a private entity.

The state government does not want to fund the construction of the Cascavel-Guaira stretch, but is interested in other options involving the private sector. The final form of this involvement will have to be determined through discussions with the state government.

While there are no specific demand estimates for cargo, the region as a whole needs cheaper and more efficient means to move production to the Atlantic Coast. The proposed line is a viable solution. A feasibility study providing more complete and definitive projections for cargo traffic will be needed to determine the viability of the project from the private sector's perspective.

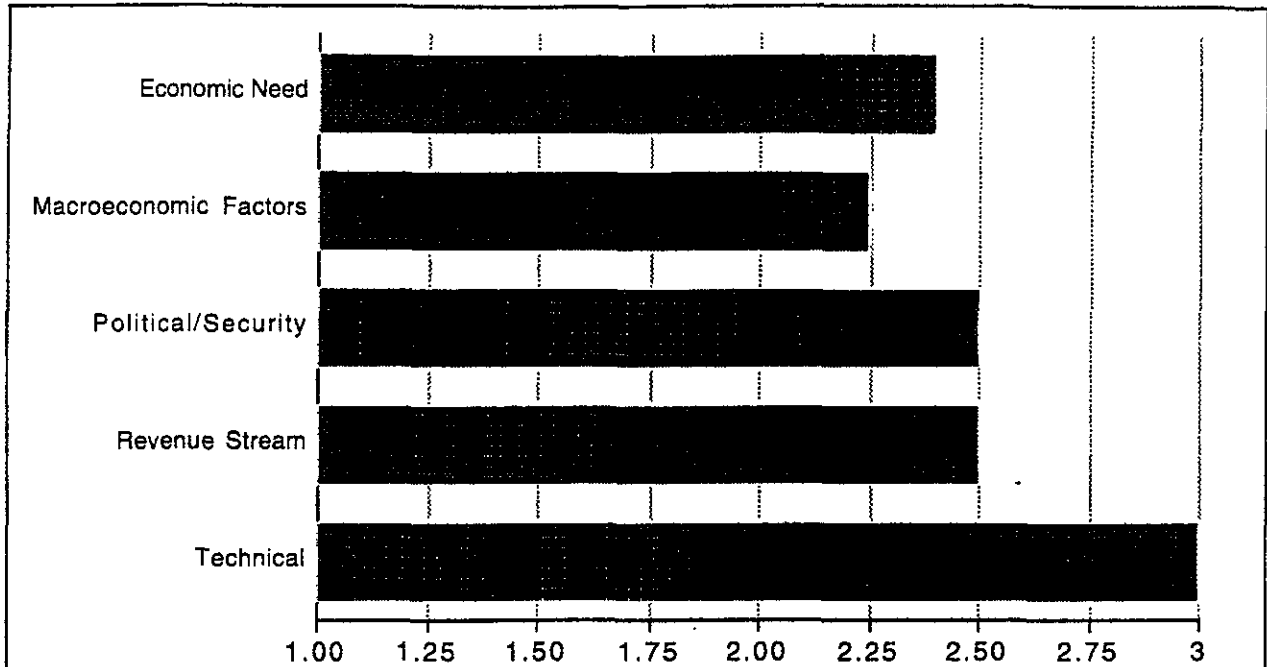
Financeability Assessment

Concession



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

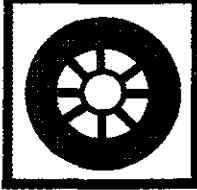
Rolling Stock



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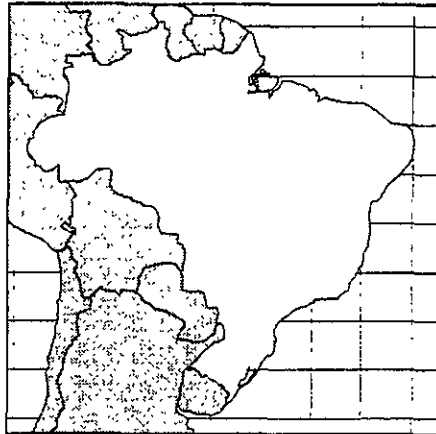
Key Decision Makers

Government of the State of Paraná
 Kalil Curi, *State Secretary of Transportation*
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Transportation/Brazil

Rio Grande-Porto Alegre Railroad



Project Summary

Project No:	TRA-16
Subsector:	Rail
Country:	Brazil
Project Cost:	\$140 million
Export Potential:	\$75 million
Owner:	STRGS

Technical Description

This project is an improvement of an existing rail line between the cities of Porto Alegre and Rio Grande in the southern Brazilian state of Rio Grande do Sul. The line is in poor operating condition. The current railway has the following characteristics:

- Length: 279 kilometers
- Curve radius: 2,500 meters
- Bridges: 2, with a total length of 2,200 meters
- Stations: 12

The current carrying capacity of the railway is limited, and the slow speeds of the trains make the line unattractive to passengers.

The goal of this project is to modernize the existing railway to permit average velocities of 60 kilometers per hour for cargo trains and 100 kilometers per hour for passenger trains. The cost for the modernization is estimated at U.S.\$500,000 per kilometer, amounting to a total of U.S.\$140 million.

Site

This railway line is located in the state of Rio Grande do Sul, and runs between the city of Porto Alegre and Pelotas (Rio Grande).

Timing

A feasibility study is currently in progress and is expected to be completed by the end of 1995. The bidding process is expected to open in May or June 1996.

Equipment & Services Demand

The improvement of this railway line will require concrete and wood railroad ties, ballast, track, signaling and communications equipment, and bridge building materials. The specific equipment and service requirements will be determined by the feasibility study to be completed by the end of 1995.

Nature of Demand

An economic feasibility study carried out by the RFFSA/SR-6 concluded that a total annual cargo volume of approximately 2.53 million metric tons, equaling a 35 percent increase on the current volume, was feasible. The breakdown of expected demand is the following:

• Current cargo volume	450,000 tons
• New Area of Access	990,000 tons
• Cargo currently using other modes of transportation	1.09 million tons
<hr/>	
Total	2.53 million tons

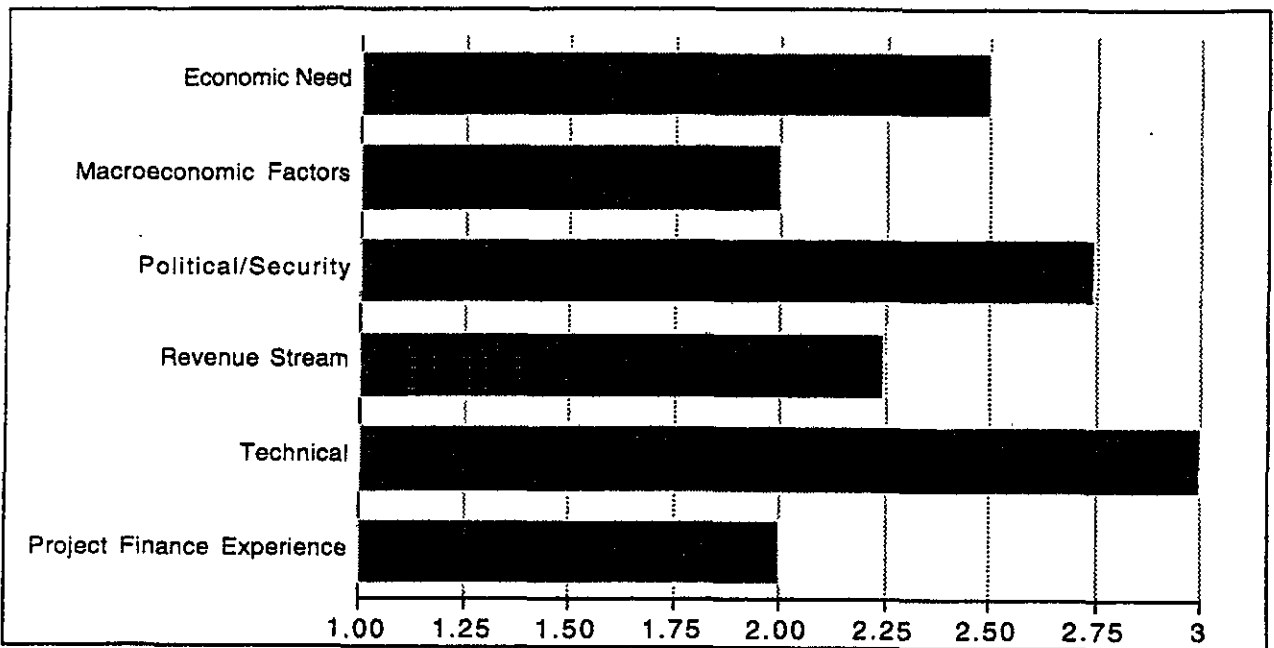
The cargo is expected to consist of grain, cereals, petrochemical products and charcoal, as well as containerized cargo.

Financeability

The modernization of the railway line will be financed directly by the state government of Rio Grande do Sul on the basis of expected revenue generated by the new level of cargo and passenger transportation. Rio Grande do Sul is one of Brazil's richest and best-managed states. It is one of the few states in Brazil that might conceivably be able to structure successful project financing.

One of the difficulties in financing the project will be the degree of credibility lenders will have in cargo and traffic projections. Some sort of government guarantee may be required.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

State Government of the State of Rio Grande do Sul

Guilherme Villela, *State Secretary of Transportation*

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Brazil

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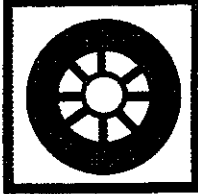
Carlos Amaral, *General Director, Secretariat of Transportation*

Porto Alegre, RS

Brazil

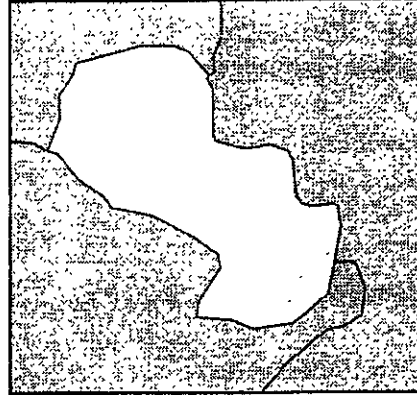
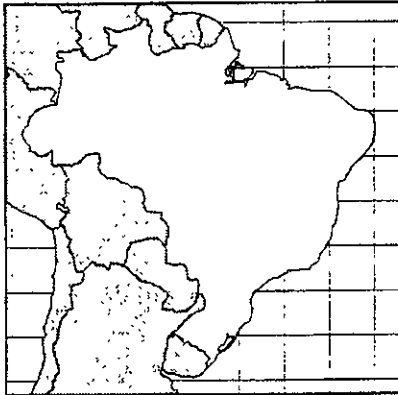
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Transportation/Brazil - Paraguay

Puente de Amistad



Project Summary

Project No:	TRA-17
Subsector:	Bridge
Country:	Brazil/Paraguay
Project Cost:	\$20 million
Export Potential:	\$10 million
Owner:	Concession

Technical Description

Brazil and Paraguay signed an agreement in September 1992 to construct a second road bridge over the Paraná River. The construction and operation of the bridge will be offered under a 30-year non-renewable concession. The concession also includes the rehabilitation, maintenance and operation of the existing bridge, Puente de Amistad, which connects Foz de Iguacu, Brazil with Ciudad del Este, Paraguay. The concession will be awarded to the technically and financially qualified bidder who offers to charge the lowest toll on the bridge.

The choice of material for the bridge is left up to the concessionaire. The requirements are that the bridge be at least 40 meters above the high water mark and that it have at least three lanes as well as pedestrian walkways.

The concession allows the concessionaire to charge tolls on the existing bridge once the new one has been constructed and opened.

Foreign companies that wish to bid on the concession must be part of a consortium where at least 25 percent of the consortium belongs to each of the Paraguayan and Brazilian partners.

Site

This bridge will connect the cities of Puerto Presidente Franco, Alto Paraná, Paraguay with Foz do Iguacu, Paraná, Brazil. The existing bridge connects Foz do Iguacu, Brazil and Ciudad del Este, Paraguay.

Puente de Amistad

Infrastructure Project Profiles

Timing

Proposals are due on July 15, 1995. The proposals will be evaluated until the middle of August and the concession should be awarded in September 1995. The final design of the project is due on March 30, 1996 and construction is expected to be completed by June 1998.

Demand for Equipment & Services

The construction of a modern road bridge and rehabilitation of the existing bridge will require advanced engineering and design services as well as specialized materials.

Nature of Demand

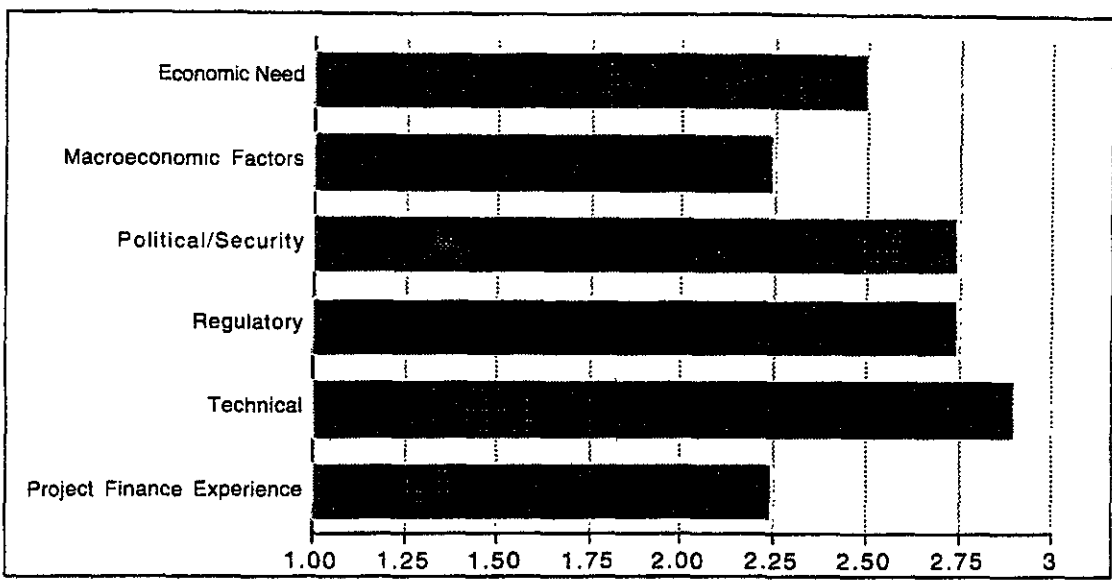
The existing Puente de Amistad currently has a traffic flow of nearly 20,000 vehicles per day. The demand for Paraná bridge crossings is expected to increase dramatically, fueled by heavy traffic originating in the border region, regional trade integration and tourism.

Financeability

Toll rate increases will follow the U.S. Consumer Price Index counted from October to January each year. The exchange rate from U.S. dollars to the local currency will be determined monthly by the central bank market exchange rate. There will also be regular reviews of the toll every five years or in the case of extraordinary circumstances.

The Brazilian and Paraguayan governments will not guarantee minimum traffic levels nor extend any credit or guarantee any loans on behalf of the concessionaire.

Financeability Assessment



Source: CG/LA Infrastructure.
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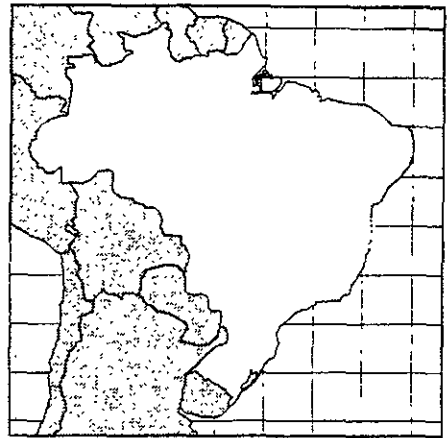
Key Decision Makers

Ministry of Foreign Relations
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Transportation/Brazil

São Paulo Beltway: West



Project Summary	
Project No:	TRA-18
Subsector:	Road
Country:	Brazil
Project Cost:	\$330 million
Export Potential:	\$50 million
Owner:	Concession DERSA

Technical Description

The São Paulo Beltway will be constructed under a concession regime in three distinct phases. The first phase, which encompasses this project, is the western and northwestern segment, which is estimated to cost U.S.\$330 million. The second phase includes the south and southeast segment of the beltway, and the third phase consists of closing the circle to the north and north east. The completed beltway is expected to cost approximately U.S.\$2.2 billion.

The completed beltway will be 171 kilometers long, at a distance of 20 - 40 kilometers from the São Paulo city center. The first segment will be 30 kilometers and is located between the Régis Bittencourt and Bandeirantes Highways. It will consist of a divided highway with two to three lanes.

Site

The metropolitan area of São Paulo.

Timing

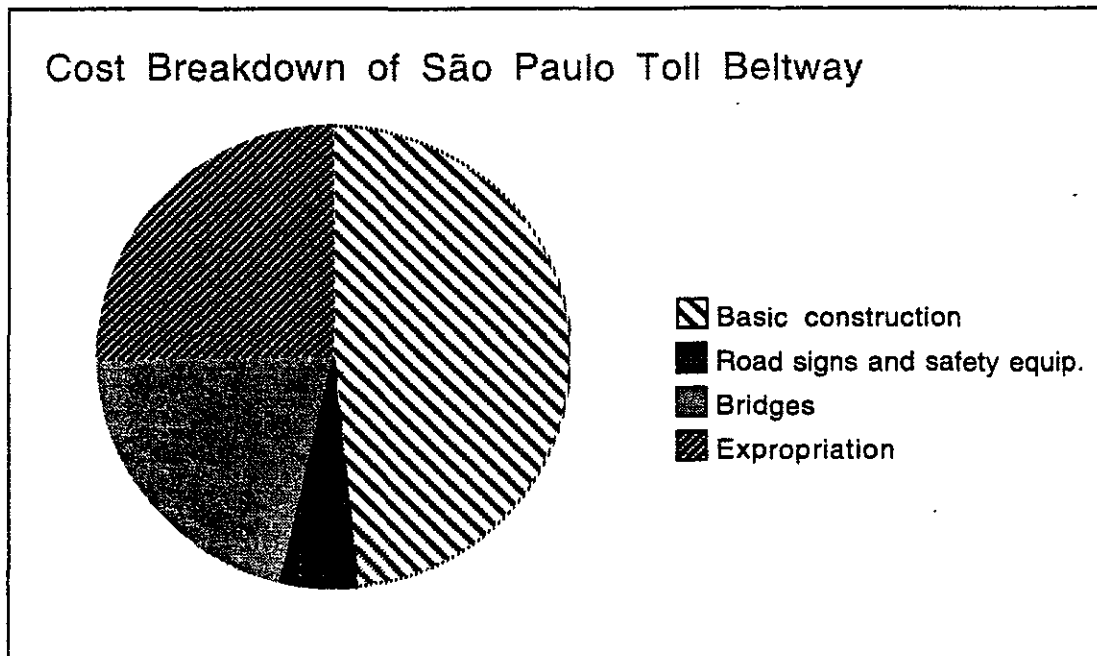
The present state government, which took office in 1995, has been undergoing a re-evaluation of public sector priorities and has not yet developed a timetable for this project. However, this project will follow the granting of the concession for the Anhangueira-Bandeirantes Highway System, which will be awarded in the fourth quarter of 1995.

Demand for Equipment & Services

The construction of this beltway requires advanced engineering services and specialized machinery. The construction costs are estimated to be divided as follows:

• Basic construction	\$159.1 million
• Road signs and safety equipment	\$17.8 million
• Bridges	\$70.0 million
• Expropriation	<u>\$83.1 million</u>
TOTAL	\$330 million

The division of the costs between the various components is demonstrated in the chart below.



Source: Agency for the Development of the Tiete - Parana

Nature of Demand

The Greater São Paulo Region has a population of 17 million and is the center of economic activity in Brazil and in the Southern Cone. São Paulo is also one of the most important transportation centers in the region.

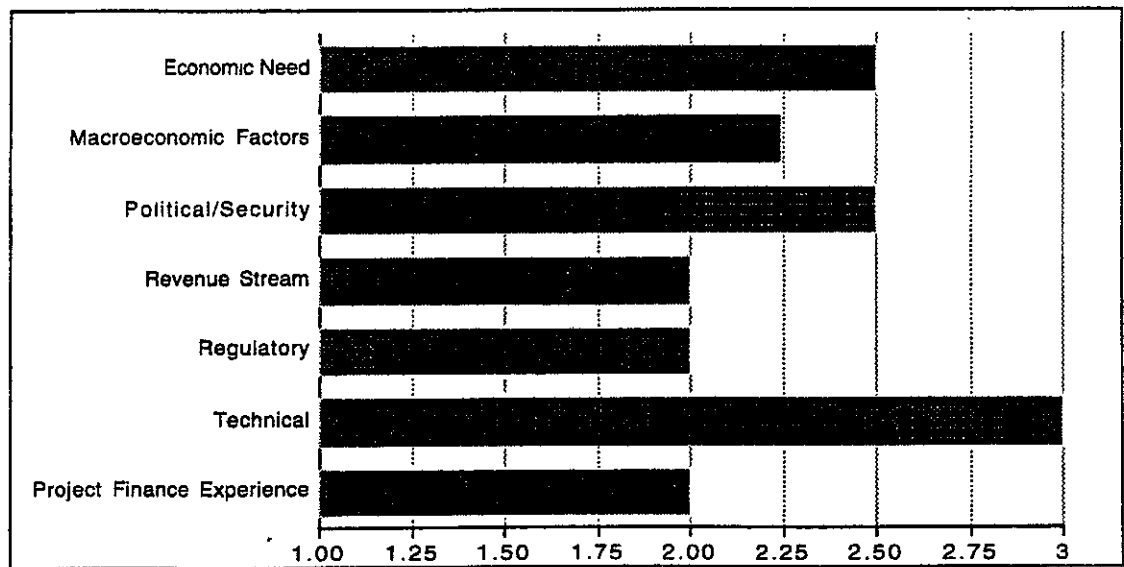
Congestion is a severe problem in São Paulo today. Eleven major highways converge on the metropolitan region, mixing commuter and thoroughfare traffic on an incomplete inner loop. The marginal expressways, which make up this inner loop, are estimated to carry 400,000 vehicles per day and cause losses of approximately U.S.\$1.2 billion per year in wasted time, extra fuel consumption and vehicle wear and tear.

Financeability

The model for the construction will be similar to the one being worked out for other highway concessions, e.g. the Anhangueira-Bandeirantes Highway System. The São Paulo State Highway Company (DERSA) envisions a combination of toll collection rights and roadside land grants combined with development permission. The land required for the construction of this segment of the beltway has already been expropriated by the São Paulo State Government.

In other concessions, the Brazilian government has not been realistic about the value of non-toll revenue streams (i.e. development rights, etc.) and has insisted on retaining the exclusive right to adjust toll fees. At the same time, the need for the beltway is strong, and São Paulo is experiencing explosive economic growth that is taxing existing infrastructure.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

São Paulo Beltway: West

Infrastructure Project Profiles

Key Decision Makers

State Government of São Paulo

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DERSA (São Paulo State Highway Company)

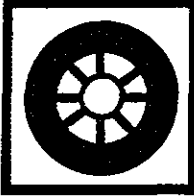
Stanislav Fereancec, *President*

São Paulo, SP

Brazil

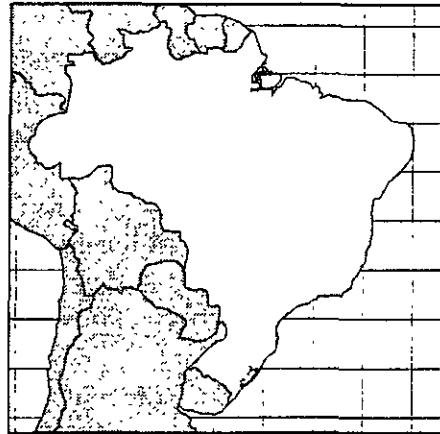
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Transportation/Brazil

Port of Sepetiba Expansion



Project Summary

Project No:	TRA-19
Subsector:	Port
Country:	Brazil
Project Cost:	\$472 million
Export Potential:	\$180 million
Owner:	Docas do Rio

Technical Description

The project consists of the expansion of port facilities and construction of rail access to provide a lower cost and more efficient alternative to São Paulo's principal and overcrowded Port of Santos. Phase I of the main port project—the Bulk Cargo and Ore Terminal, General Cargo Pier, and Grain Terminal—will cost U.S.\$186 million. Phase II consists of the expansion of the port and will cost U.S.\$286 million.

Additional projects include the following:

- Construction of an industrial center
- Dredging of the ship channel
- Development of a rail link connecting the port to the RFFSA system

Existing Port Facilities and Cargo Movements

Currently, the Port of Sepetiba has a capacity to move 7 million tons of cargo per year. In 1994, export tonnage accounted for three-fourths of port traffic. The principal export is iron ore, and the principal import is coal. Seventy percent of Sepetiba's cargo movements are accounted for by coal imports and iron exports for the large steelmaker CSN. Other imports include aluminum, scrap iron, sulfur, and other bulk cargos.

Port of Sepetiba Expansion

Infrastructure Project Profiles

The existing 540-meter pier has four berths which enable it to allow two 90,000-tdw ships and two 45,000-tdw ships to dock. The coal unloading area contains two unloaders, two conveyors, storage area of 2.5 million square meters, and a capacity of 500,000 tons. For aluminum shipments, the port has an aluminum suction loader.

Expansion

1) Bulk Cargo and Ore Terminal: At a cost of U.S.\$86 million, this subproject calls for the construction of an ore yard, a system of conveyors, bridge and ship loader, as well as the construction of a berth for ships up to 150,000 tdw. The capacity of the ore storage yard will be 7 million tons per year; the capacity of the entire terminal will be 15 million tons per year.

2) General Cargo Pier: This involves the completion of a pier with a depth of 18 meters which contains two 270-meter berths. This pier would handle general cargo, the majority of which would be iron and steel products. Completion of the pier has been estimated at U.S.\$60 million.

3) Grain Terminal: The proposed grain terminal would have a capacity of 4 million tons per year, and has an estimated cost of U.S.\$40 million.

Associated subprojects include the following:

- Construction of a major industrial park known as the Sepetiba Industrial Center
- Dredging of the shipping channel to allow for grain-carrying supertankers of 150 tdw to dock at the pier.
- Construction of a short rail link to the nearby federal railway. At present Sepetiba has no rail connection.

Site

Sepetiba is located in the state of Rio de Janeiro, west of the city of Rio de Janeiro and east of Santos. It is strategically located because construction of a short rail link would allow the huge volume of agricultural produce from São Paulo state and all of Midwest Brazil to be transported directly to the port without going through the congestion of metropolitan São Paulo, as is now required for shipments to Santos.

In addition, the federal railway (known as the Steel Railroad), built with a wide gauge to allow heavy cargo transport would also make Sepetiba a more important port for cargo movements to and from industrial parks in and around the city of Rio de Janeiro.

Timing\Status

The first tender—for the private operation of the iron ore terminal and construction of the rail link—was announced in October 1994. The primary contenders for the 25-year concession (with a 25-year option for renewal) are Ferteco, controlled by German steelmaker Thyssen, and its Brazilian partner, Itaminas. No date has been set for the remaining tenders.

The possibility of a connection to Sepetiba with the Rio-São Paulo High Speed Rail Project is currently undergoing a feasibility study.

Equipment & Services Demand

Initial works include procurement for the following:

PHASE I

Ore and Bulk Cargo Terminal	\$86 million
General Cargo Pier	\$60 million
Grain Terminal	\$40 million

PHASE II

General Cargo Pier Expansion	\$200 million
Ore and Bulk Cargo Terminal Duplication	\$86 million

Nature of Demand

There is very strong demand for the services Sepetiba could provide. Within a 500-kilometer radius of Sepetiba lies 32 percent of Brazil's population and a large percentage of its economic output: 65 percent for industry, 65 percent for services, and 40 percent for agriculture. Southeastern ports—from Vitoria to Santos—account for 64 percent of the value of Brazil's exports and 77 percent of its imports.

The Rio de Janeiro Economic Development Agency calculates a demand of 28,400 shipments of bulk cargo and 6,450 shipments of general cargo for a total of 34,850 shipments per year. Of the total shipments, 31 percent will be cargo from the planned Industrial Center.

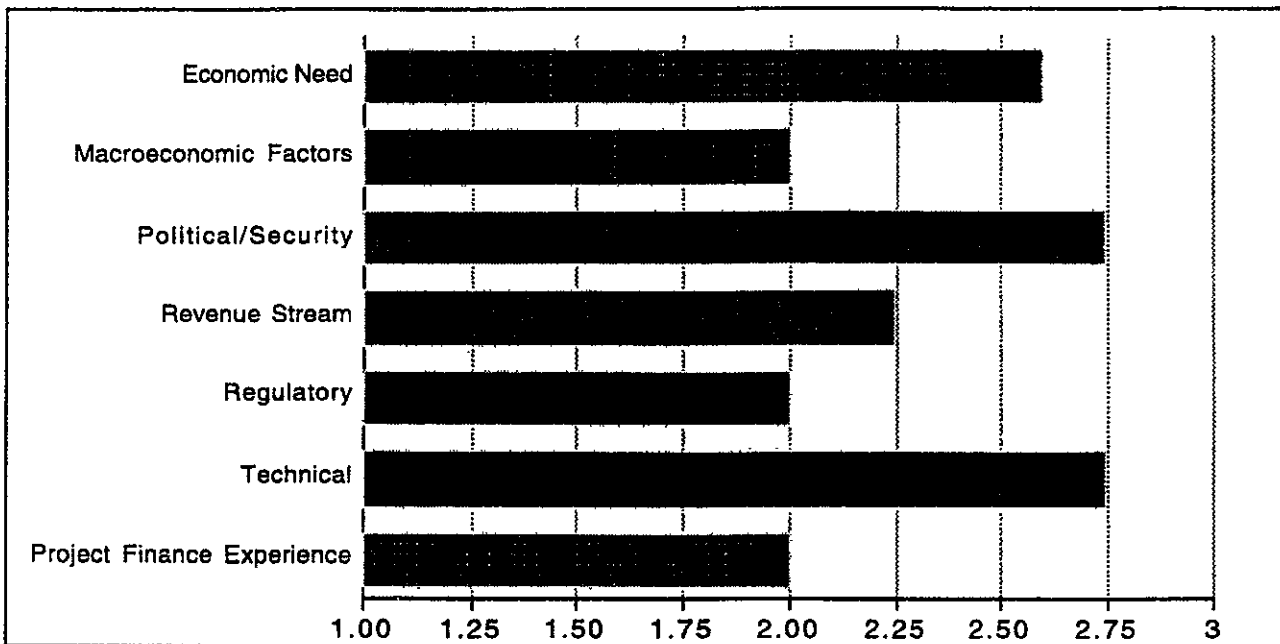
Port reform legislation passed in 1993 has not succeeded in curbing the labor disruptions which constantly impact port activity in Brazil. As a result, the efficiency of the Port of Santos, the largest port in Brazil—and in all of Latin America—continues to worsen. At a

newer port like Sepetiba, the labor unions are less likely to become so entrenched. Decision makers recognize that the key to success lies in creating a rate structure that cements Sepetiba's competitive advantage over Santos, Rio de Janeiro, Vitoria, Tubarão and other ports in south-east Brazil.

Financeability

The government of the State of Rio de Janeiro has obtained R\$11 million (U.S.\$12.2 million) in federal funds toward the dredging of Sepetiba Bay. In addition, the municipal government of Rio de Janeiro is interested in improving the competitiveness of local business and has committed R\$45 million (U.S.\$50 million) to the port. The project has strong backing from newly-elected Rio Governor Marcello Alencar and, most importantly, from President Cardoso.

Financeability



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

Key Decision Makers

The principal decision makers for Sepetiba are the port authority for the state of Rio de Janeiro (Docas do Rio) and the Rio State Secretariat for Industry and Commerce. Other important contacts will be with the end-users such as CSN and private agricultural shippers in the state of São Paulo.

Rio de Janeiro State Economic Development Agency

Reginaldo Treiger, *Director*

Rio de Janeiro, Brazil

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Secretariat for Industry and Commerce of Rio de Janeiro

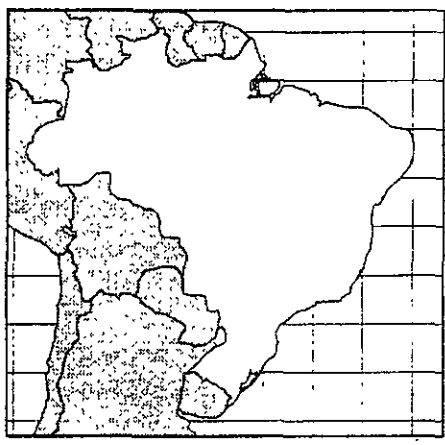
Ronaldo Cezar Coelho, *Secretario*

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Transportation/Brazil
Port of Tubarão



Project Summary

Project No:	TRA-20
Subsector:	Port
Country:	Brazil
Project Cost:	\$180 million
Export Potential:	\$55-60 million
Owner:	CVRD

Companhia do Vale do Rio Doce (CVRD), Brazil's largest mining conglomerate, is also a major force in transportation in the Center-East region of Brazil. Today, over one-half of the company's revenue comes from the transportation sector. CVRD is unique among Brazil's state-owned companies—it has a high degree of autonomy and is renowned for its "private sector" business culture. Whether CVRD is privatized or not, it will still be a source of good business opportunities in a variety of sectors.

As a vertically-integrated company, CVRD developed both the rail network and port facilities to transport ore. In 1966, the company built the Port of Tubarão, primarily for the export of minerals. Tubarão is leased from the state government, but operated by CVRD. The company is utilizing CVRD and federal railways to transport grain from the agriculturally-rich Center-East region of Brazil. To handle the increased volume of third-party cargo, the company is planning an ambitious port expansion plan.

Technical Description

CVRD is planning a two-phase expansion of the Port of Tubarão. The first phase, to be completed by 2005, will require an investment of U.S.\$180-200 million. Phase 1 will primarily increase the port's grain capacity. Phase 2, which is still in the conceptual stage, calls for the addition of two platforms and a pier, which add a total of 23 new berths sometime after 2015.

CVRD is looking for partners to work with in the implementation of the various components of the full two-phase expansion plan. The form of venture will be discussed with potential partners, both international and Brazilian.

Port of Tubarão

Infrastructure Project Profiles

Phase 1 of the plan, much more defined, is for the following:

- Construction of a new grain pier which will have three new berths dedicated exclusively to grain. Currently grain must move through Pier 1 which also loads ore. This expansion phase will double CVRD's grain loading capacity to 3 million tons annually.
- Construction of a new platform with three loading berths on each side.
- The extension of the Praia Mole coal pier and the addition of another berth.

Currently the port covers 18 square kilometers and maintains four piers: one for ore and grain, one for ore, one for steel, and one for coal. Tubarão specializes in bulk shipments and is capable of handling mixed cargoes.

Pier 1, which loads a variety of cargoes, including iron, phosphate, and grain, has a length of 15.2 meters and can handle vessels of up to 125,000 dwt. Pier 1 has two cargo loaders, the first with a capacity of 6,000 tons per hour, and the second with a capacity of 8,000 ton per hour.

In 1993, CVRD inaugurated its new grain terminal, which loads grain and meal from Pier 1 at a rate 1,500 tons per hour. The grain terminal can handle more than 1.5 million tons annually. CVRD plans to double the capacity of the terminal to 3 million tons per year.

Pier 2, which primarily handles ore, is 20 meters in length and can receive vessels up to 300,000 dwt. It has two loaders with capacities of 16,000 tons per hour.

The last terminal facility is Praia Mole, which specializes in coal, coke, sulfur, ore, and other bulk cargo. Praia Mole's 730-meter coal pier is fitted with two berths, one which handles vessels up to 170,000 dwt, and the second with handles vessels up to 250,000 dwt. Offloaders at the coal pier operate at 1,800 tons per hour.

Site

Tubarão is located 12 kilometers north of Vitoria, the capital of the state of Espirito Santo and 450 kilometers north of Rio de Janeiro.

Timing

In March, 1995, CVRD contracted the construction of the first part of the plan, a U.S.\$15 million expansion of its existing grain facility. Construction of the new platform should begin by early 1996.

Equipment & Services Demand

The expansion plan will require new bulk off-loading equipment, grain storage facilities, and design and construction services for the new platform and pier extension.

Nature of Demand

Brazil's Center-East region is an excellent, albeit underutilized, grain-producing region. This area, which covers part of the states of Minas Gerais, Goiás, Espírito Santo and Bahia, has tremendous potential for growth in the agricultural sector. According to a study performed by CVRD in 1991 an estimated 9.2 million hectares are available for cultivation. Exploiting the agricultural potential of this land could boost regional production of soybeans by 60 percent, corn by 30 percent, and rice by 10 percent, given conventional yields of 25.6 million tons per year.

Financeability

Based on the fact that CVRD has a high degree of autonomy from the Brazilian government, it should be considered apart from other Brazilian state-owned companies. It has a good project finance record, and an excellent track record in the execution of transportation infrastructure projects. Its facilities are some of the best in Brazil.

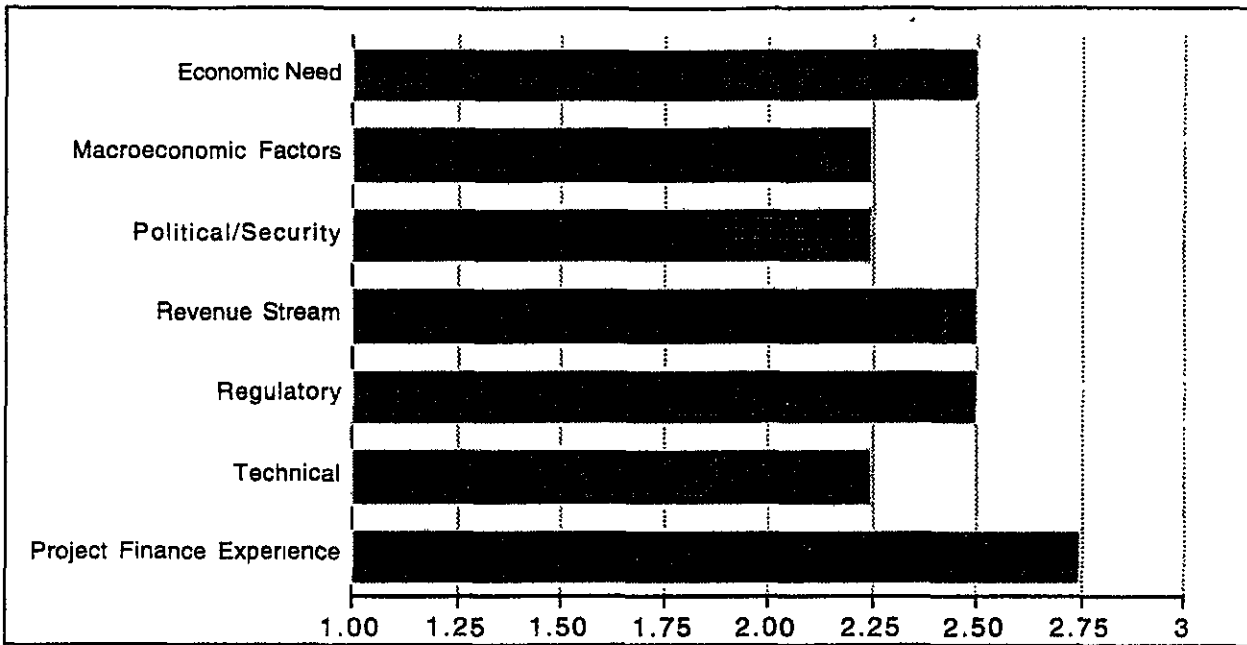
As an iron exporter, CVRD is one of Brazil's largest foreign currency earners.

Growth in the agricultural sector, aided by CVRD's plans to expand its railway network in the Center-East area, should maintain a strong revenue stream.

Port of Tubarão

Infrastructure Project Profiles

Financeability Assessment

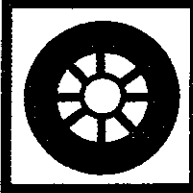


Source: CG/LA Infrastructure.

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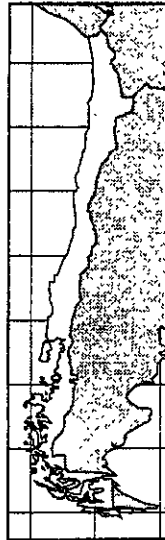
Key Decision Maker

CVRD
 Antonio Sergio de C. F. Soares, *General Manager of Infrastructure Projects*
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Transportation/Chile

Costanera Norte Highway



Project Summary

Project No:	TRA-21
Subsector:	Road
Country:	Chile
Project Cost:	\$120 million
Export Potential:	\$22 million
Owner:	Concession

The Costanera Norte Highway is the first of a series of highways equipped with electronic toll road systems being built to relieve traffic congestion in the metropolitan area of Santiago

Technical & Site Description

The highway, for which a concession will be awarded, is located in Santiago de Chile, which has a population of 5.2 million people and 600,000 cars. It will be 35 kilometers long and cross the city of Santiago from east to west. It will start at what will be the Puente de La Dehesa and will be built along the northern shore of the Mapocho River.

The highway will be three lanes in each direction, a considerably higher standard than existing road transportation in the area, and will be aimed at medium- and long-distance travelers.

The main components of the construction works are 17 multilevel intersections, 5 kilometers of river canalization, two parallel tunnels of 1200 meters, 2.5 kilometers of semi tunnel in an urban zone, 4 kilometers of elevated highway, and 22.3 kilometers of level asphalt highway.

Timing

A pre-feasibility study is expected to be finished in October 1995. Bidding for this project is expected to start in the first half of 1996 after a completed feasibility study. The highway is expected to be operational in 1999.

Costanera Norte Highway

Infrastructure Project Profiles

Demand for Equipment & Services

Specialized equipment and engineering services will be needed for elevated highways and intersections, river canalization and for the construction of tunnels in urban areas.

Nature of Demand

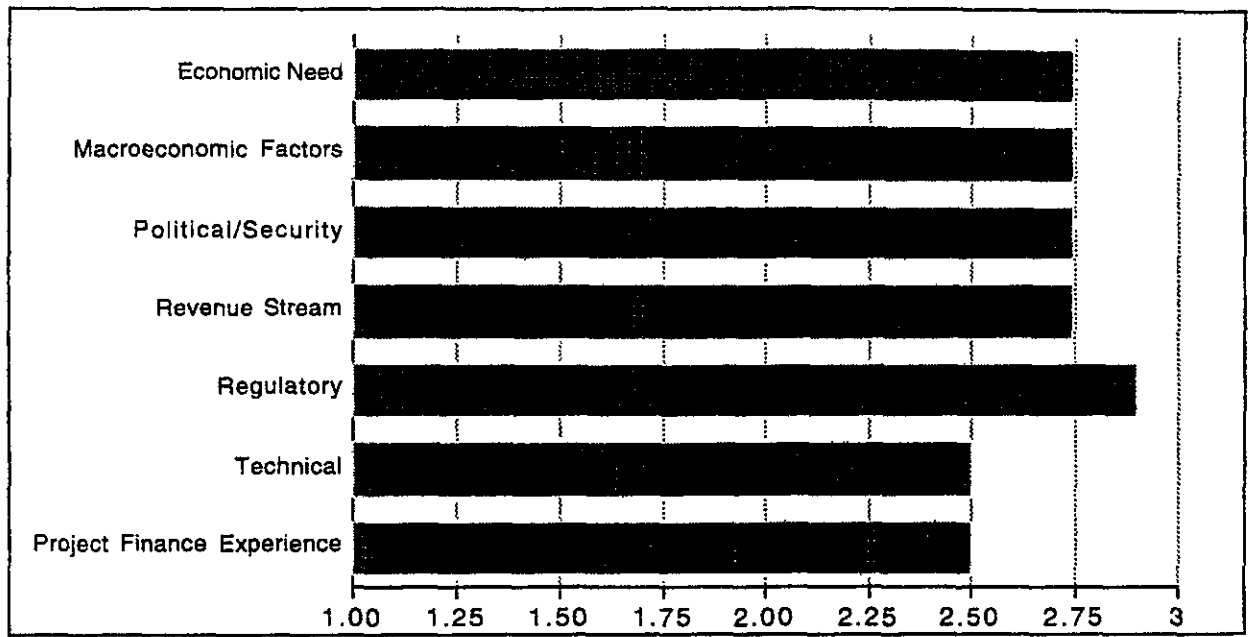
The metropolitan area of Santiago is experiencing particular stress on its physical infrastructure due to the central location of Santiago in the country's economic structure. Traffic congestion is already a serious problem. Demand growth is expected to be high; Santiago's vehicle fleet has grown by 10 percent annually since 1985, overshadowing Chile's economic growth rate which has averaged approximately 7 percent in the same period.

Demand is expected to vary from section to section of the highway. The most heavily trafficked section is expected to see a throughput of 60,000 vehicles per day in the first year and 85,000 vehicles per day in the fifth year of operation.

Financeability

This highway appears to be readily financeable. The demand is high, the regulations in place are adequate and the revenue stream should be more than sufficient. However, the technical issue of toll collection by electronic means is relatively untried and has yet to prove its viability on a large scale. Moreover, the Chilean government is considering supporting the concession through minimum transit level guarantees.

Financeability Assessment



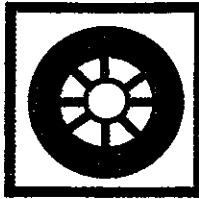
Source: CG/LA Infrastructure.
 This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Ministry of Transportation and Communication
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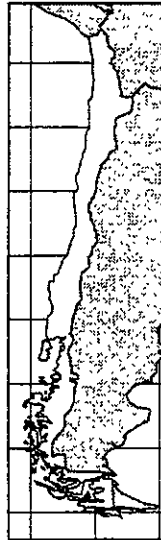
Related Projects

Santiago Electronic Toll Road System
 Santiago-Valparaiso: La Dormida and Route 68.



Transportation/Chile

EFE Track Renewal Investment Program



Project Summary

Project No:	TRA-22
Subsector:	Rail
Country:	Chile
Project Cost:	\$278 million
Export Potential:	\$180 million
Owner:	EFE

Technical Description

Over the last several decades, the volume of passenger railway transport has dramatically decreased, primarily due to lack of maintenance and the subsequent deterioration of passenger rolling stock and track. In response to this situation, Empresa de los Ferrocarriles del Estado, EFE, is planning to rehabilitate and renew 1,294 kilometers of track, gage 1.676 meters, including sections of double track. This track renewal project, which encompasses the installation of continuous welded track, the replacement of large numbers of sleepers, or cross-ties, and the adequate provision of ballast, will ensure reliable passenger service at speeds considerably higher than at present.

The track renewal program forms part of a program to revitalize inter-city railway passenger transport. Other projects include the acquisition and rehabilitation of passenger coaches and EMUs and the improvement of signaling, communication equipment and electrical distribution systems.

Site

The affected stretches of track run from Santiago to Puerto Montt in southern Chile, including the branch line from San Rosendo to Concepción.

EFE Track Renewal Investment Program

Infrastructure Project Profiles

Timing

The project has been submitted to the federal government for approval. If approved, the bidding process is expected to open in the first quarter of 1996, with construction and rehabilitation expected to run from the fourth quarter of 1996 to the year 2002.

Demand for Equipment & Services

EFE is planning to spend U.S.\$278 million divided into the following components:

Sleepers/Cross-ties

• 2,118,807 concrete sleepers	\$116.5 million
• 51,660 treated wooden sleepers	\$1.3 million
• Sleeper transportation	\$5.2 million
• Labor for sleeper installation	<u>\$15.4 million</u>
Sub-total	\$138.4 million

Ballast

• 1,725,696 cubic meters of ballast	\$29.7 million
• Transportation of ballast	\$36.5 million
• Labor for ballast installation	<u>\$20.5 million</u>
Sub-total	\$86.7 million

Switches

• 296 switches	\$9.4 million
• Transportation of switches	\$0.6 million
• Labor for installation of switches	<u>\$1.0 million</u>
Sub-total	\$11.0 million

Rails

• 28,758 meters of rails	\$24.4 million
• Transportation of rails	\$0.6 million
• Labor for laying of rail	<u>\$3.4 million</u>
Sub-total	\$28.4 million

Other

• Electric and thermal welding	\$3.9 million
• Cleaning of culverts and elimination of vegetation	\$4.9 million
• Leveling and alignment of track	<u>\$4.6 million</u>
Sub-total	\$13.4 million

TOTAL COST

\$277.9 MILLION

Nature of Demand

The railway line from Santiago to Puerto Montt runs parallel to the Pan-American Highway, on which high quality bus services currently meets most of the passenger demand. However, growing highway congestion and increasing demand have increased the pressure to revitalize passenger rail services. Moreover, it would be more costly to increase the capacity of the existing highway than to revitalize the railway network with its substantial unused capacity.

At present railway service is not competitive with bus service, but track renewal and the implementation of other rehabilitation projects would present a highly competitive alternative with greatly increased comfort, reliability and speed.

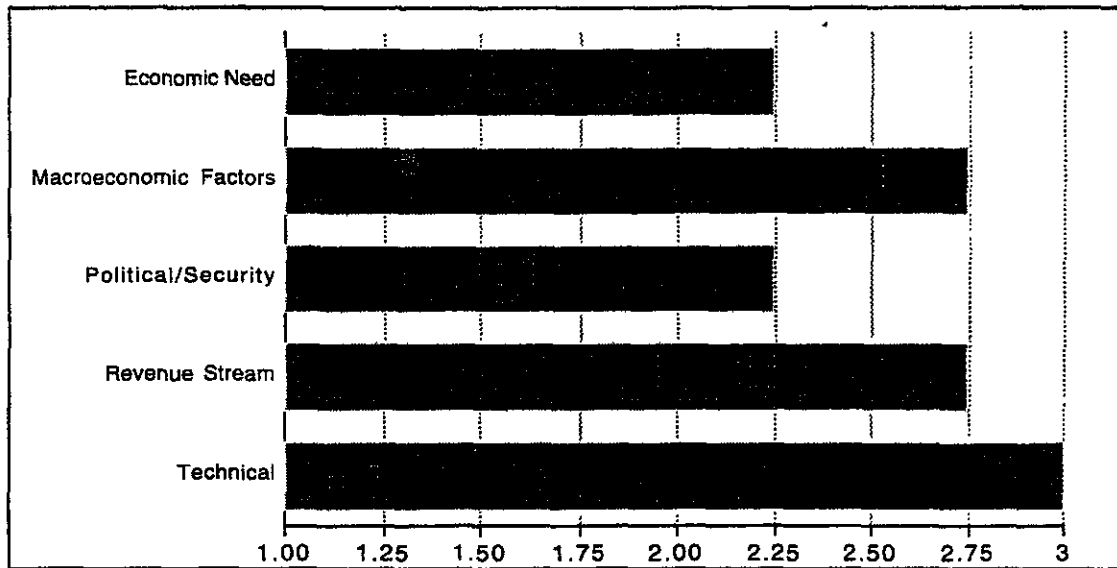
Financeability

The project will be financed through a federal government budgetary allocation. The funds have yet to be approved but there is strong support for the expenditure within Congress and the local governments along the route. Passage is expected because of 1) growing consumer demand for the project, 2) safety and environmental concerns associated with bus service and 3) the possible privatization of passenger rail services — the current state of disrepair of the rail lines is an impediment to privatization.

EFE Track Renewal Investment Program

Infrastructure Project Profiles

Financeability Assessment

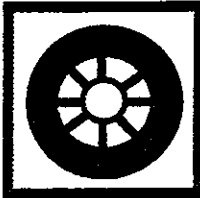


Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

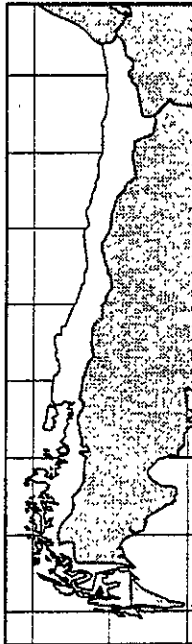
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Transportation/Chile

Santiago Electronic Toll Road System



Project Summary

Project No:	TRA-23
Subsector:	Road
Country:	Chile
Project Cost:	\$30 million
Export Potential:	\$30 million
Owner:	Concession

The Chilean government is planning a network of highways in the Santiago metropolitan area to be constructed under private concessions. An electronic toll system is seen as the most feasible way of allowing the private concessionaire to recover fees from the users of the network while at the same time avoiding the need for physical toll collections and the resulting slowdown of traffic. The system selected for Santiago is also expected to be installed in other parts of the country.

Technical Description

The specific details of the project are currently being determined by an interministerial committee. The committee is conducting a study to ascertain how to implement the toll system, and is dealing with technical, legal, administrative and other issues. However, the anticipated system would seamlessly integrate the whole highway network in Santiago and would allow the collection of tolls without obliging vehicles to slow down.

Santiago Electronic Toll Road System

Infrastructure Project Profiles

A number of different payment methods are being considered, such as prepayment in cash, automatic debit on credit cards or bank accounts, and payment through utility bills (e.g. water, electricity etc.).

Travel records would be generated by a system of video cameras. Delinquent users would be traced and apprehended through documentation associated with the vehicle, such as the annual renewal of the drivers' license, inspections, and transfers of ownership.

Site

The system would initially be implemented in Santiago, but would be extended to cover the interurban highway network as well.

Timing

Pilot projects are expected to be completed at the end of 1995 and the bidding process is expected to start in 1996. The system should become operational in 1997.

Equipment & Services Demand

The main components of required equipment purchases are:

- Intra-vehicle transmission units, TAGs or transponders
- Antennas
- Specialized software
- Video control system
- Automatic vehicle detection system
- Toll charge central

Engineering services for the construction of the toll stations will also be required.

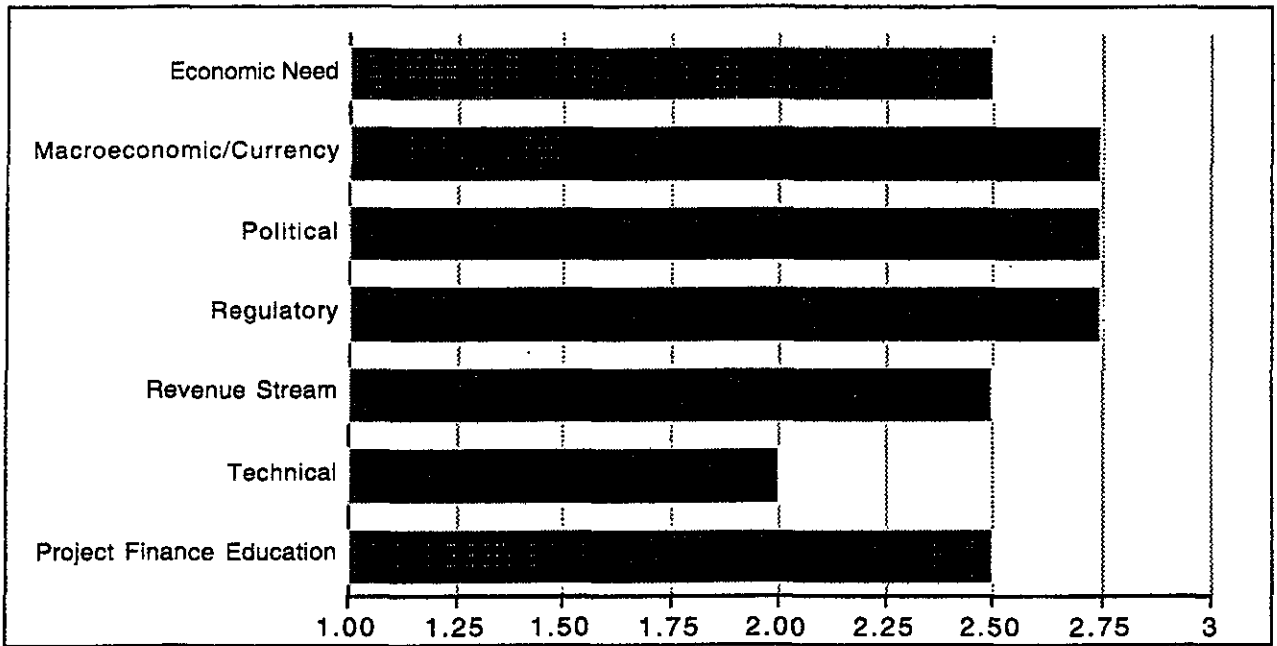
Nature of Demand

Metropolitan Santiago already is suffering from a continually worsening problem with severe traffic congestion. Santiago's vehicle fleet has grown by 10 percent annually since 1985, surpassing Chile's economic growth rate which has averaged about 7 percent in the same period. The Ministry of Public Works expects there to be approximately 500,000 electronic toll transactions per day.

Financeability

The financeability of the electronic toll road system is directly related to the progress of the specific road concessions of which it would be a part. In our assessment, road concessions in and around Santiago have sufficient demand. Moreover, the government and regulatory framework have sufficient credibility to make them financeable.

On the technical and administrative side, there are questions regarding the large scale use of electronic toll systems. Results of the pilot project now planned should be carefully monitored to determine whether electronic toll systems will ultimately be implemented.



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Santiago Electronic Toll Road System

Infrastructure Project Profiles

Key Decision Maker

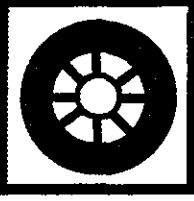
Ministry of Public Works
Gonzalo Cruzat, *Director of Projects*
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Related Projects

Costanera Norte Highway

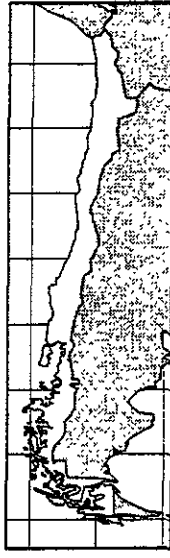
Other Toll Projects Throughout South America:

- Argentina
- Brazil
- Peru
- Colombia



Transportation/Chile

Expansion and Modernization of the Port of Arica



Project Summary

Project No:	TRA-24
Subsector:	Port
Country:	Chile
Project Cost:	\$107 million
Export Potential:	\$30 million
Owner:	EMPORCHI

Technical Description

EMPORCHI, the Chilean port authority, is seeking to expand the operational capacity of the Port of Arica in response to the growing demand for its services.

The Port of Arica began operations in 1966 with a nominal capacity of one million tons a year; subsequent expansion and improvements have increased the capacity to two million tons. In 1994 the port handled 1.024 million tons. Cargo to and from Bolivia represented 57.38 percent of the total.

The goal of this project is to expand the capacity of the port, increase the depth of the berthing docks and construct a new pier for mechanized silos. The project also calls for paving, parking areas, dredging, building of a new warehouse for grain management and reallocating warehouses for general cargo.

The port has two mooring locations with three berths each. The length and the depth of each berth is as follows:

Expansion and Modernization of the Port of Arica

Infrastructure Project Profiles

Berth number	Length (meters)	Depth (meters)
1	114	4
2	200	5
3	200	8
4 to 6	170 each	9.75 each

Expansion program:

- Dredge Berths 1 and 4 and install reinforcements against earthquakes; estimated cost: U.S.\$12.5 million.
- Construct pier for bulk products, including conveyor belts and storage places—30,000 square meters for clean bulk and 6,000 square meters for dirty bulk; estimated cost: U.S.\$21.5 million.
- Enlarge and widen Berth 6 to 200 by 30 meters and dredge to 14 meters; estimated cost: U.S.\$ 5.4 million.
- Expand breakwater to improve the protection of the port; estimated cost: U.S.\$12.4 million.
- Deepen Berths 2 and 3 to 12 meters; estimated cost: U.S.\$3.2 million.
- Construct Berths 7 and 8 for container operations over 640 by 30 meters and a depth of 12 meters; estimated cost: U.S.\$49.7 million.

Site

The Port of Arica is located in the extreme north of Chile close to the border with Peru and Bolivia.

Timing

- Preliminary studies, including the feasibility study, began in January 1995 and will be completed by the end of May 1995.
- Decision on technical/cost alternative: May 1995.
- Basic engineering study: June 1995.
- Bidding process: 1996.
- Commencement of project: 1997.

The state government of Paraná has estimated that the finished railway will transport approximately four million metric tons of cargo per year.

The project has two components — a straight purchase of stock and a potential concession project.

Equipment & Services Demand

This is primarily a construction project which will also require specialized marine engineering services.

Nature of Demand

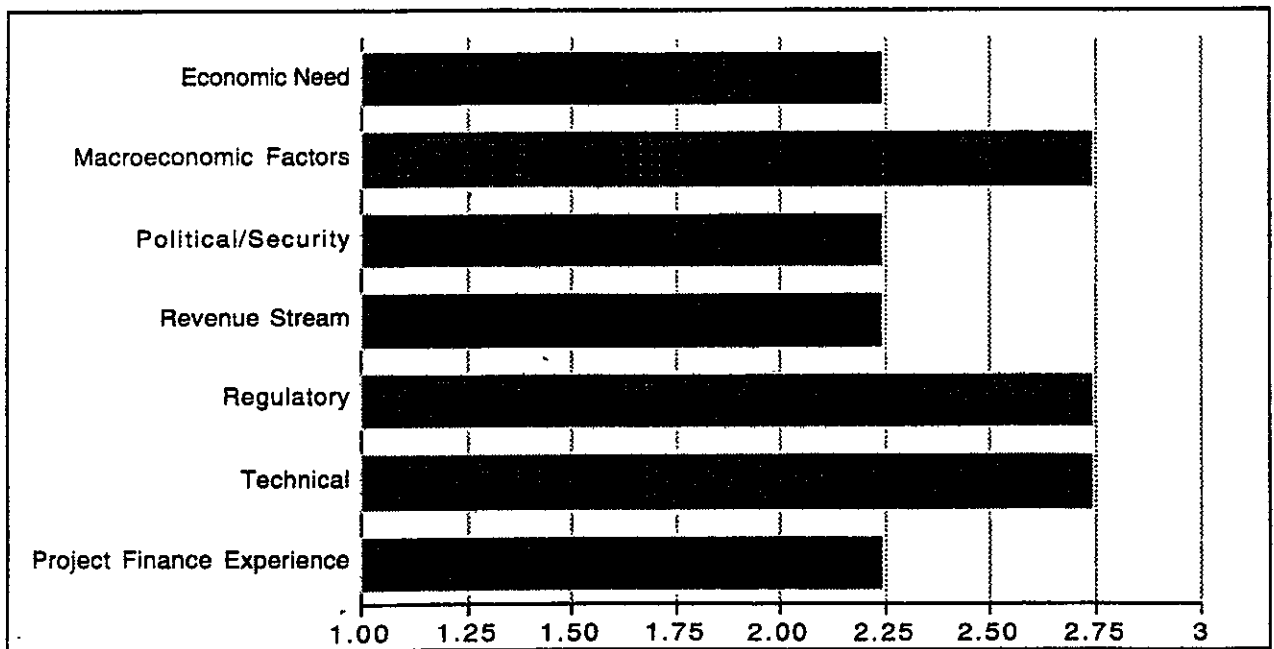
Cargo movement at the Port of Arica has been increasing steadily. In the period 1996-2011, EMPORCHI expects cargo movement to increase by at least 26 percent, and possibly, as much as 135 percent.

Financeability

EMPORCHI has not yet determined the financial structure of the project, although it is actively considering a concession approach.

Key issues for financeability are volume of port traffic and the effect of the possible development of the nearby Peruvian port of Ilo. The feasibility analysis of both ports must be viewed in tandem to evaluate volumes, since both primarily support trade in and out of Bolivia.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Expansion and Modernization of the Port of Arica

Infrastructure Project Profiles

Key Decision Makers

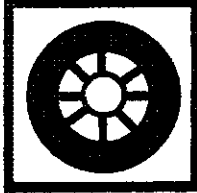
Empresa Portuaria de Chile (EMPORCHI)

Carlos Ramirez, *Manager*

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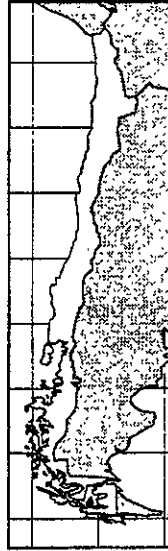
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Transportation/Brazil

Quintero Bay Maritime Terminal



Project Summary

Project No:	TRA-25
Subsector:	Port
Country:	Chile
Project Cost:	\$200 million
Export Potential:	\$150 million
Owner:	Puerto Nuevo Regional S.A.

Technical Description

Puerto Nuevo Regional S.A. (PNR) is planning to construct a new maritime terminal with six or eight berths capable of servicing ships up to 100,000 tons. Although the definite specifications of the port have yet to be determined, it will most likely have the capacity of dealing with both containerized and general cargo. The previously planned two-berth installation contemplated the construction of mooring sites for refrigerated container ship as well as facilities for general cargo.

A cost of U.S.\$25 per ton of transferred cargo has been considered.

There will also be construction of warehouses, an electrical station, and a major water treatment plant making the port facilities self-sufficient in water.

PNR is planning to complete the project in cooperation with a foreign joint venture partner.

Technical, engineering, and environmental studies are to be completed at an estimated cost of U.S.\$1 million.

Quintero Bay Maritime Terminal

Infrastructure Project Profiles

Site

The port will be located at Quintero Bay, Quillota Province, Region V, 200 kilometers north of Santiago and 46 kilometers north of Valparaiso. Quintero Bay already houses two ports, the Chilelectra Wharf which is designed for coal transportation and the R.P.C. Petroleum Terminal, designed for petroleum and derivatives. Oxiquim is also constructing a maritime terminal for bulk liquid chemical shipments.

Timing

After receiving previous approval from the Ministry of Transportation to construct a two-berth, U.S.\$80 million port facility, Puerto Nuevo Regional S.A. was granted the necessary government permits in March 1995 to construct a 6-8 bay port at an estimated value of U.S.\$200 million.

After entering a joint venture, further studies will take about one year and construction another two to two and a half years. Earliest bidding for equipment is expected in June 1996.

Demand for Equipment & Services

The exact nature of the required equipment will be determined by the final engineering studies. Required equipment will include cranes, cargo processing equipment, and pier construction materials.

In effect, all equipment necessary for this port will have to be imported, as Chile can only provide engineering and actual construction services.

Nature of Demand

The driving force for a new port at Quintero Bay is the heavy congestion and undercapacity experienced in the ports of Valparaiso and San Antonio due to Chile's rapidly expanding economy, increased imports and exports, and increasing Latin American integration. Since the costs of expanding the port at Valparaiso appear to be excessive (according to the Camara Chilena de la Construcción), Quintero Bay is the main port alternative which can service the maritime transportation needs of central Chile.

Additional demand is most likely to come from Argentine agricultural exporters, such as fruit and vegetable producers in the Aconcagua Valley, who would be shipping their goods to the Far East and Southeast Asia. This would take the form of the transportation of sealed refrigerated containers in order to avoid any potential Chilean concerns about health and sanitary issues regarding fresh Argentine agricultural products.

PNR estimates that an eight-bay containerized port will be capable of handling at least 1.6 million tons

in the first year of operation. The table below demonstrates the forecasted demand according to a feasibility study conducted for the two-berth port.

Forecast of Quintero Bay Port Cargo Movement (thousands of metric tons)

Year	Minimum Demand	Likely Demand	Maximum Demand
1992	620.2	720.4	976.6
1993	860.4	999.7	1,355.6
1994	1,042.7	1,211.5	1,642.3
1995	1,171.6	1,361.3	1,845.9
1996	1,265.6	1,493.8	2,095.6
1997	1,364.5	1,585.5	2,149.9
1998	1,468.1	1,706.2	2,313.6
1999	1,540.6	1,790.3	2,427.6
2000	1,617.4	1,879.3	2,548.3
2001	1,681.2	1,953.4	2,648.8
2002	1,739.6	2,021.3	2,740.9
2003	1,763.9	2,049.5	2,779.1
2004	1,800.3	2,091.8	2,836.3
2005	1,801.2	2,092.9	2,838.0
2006	1,803.4	2,095.4	2,841.4

Source: PNR S.A Feasibility Study

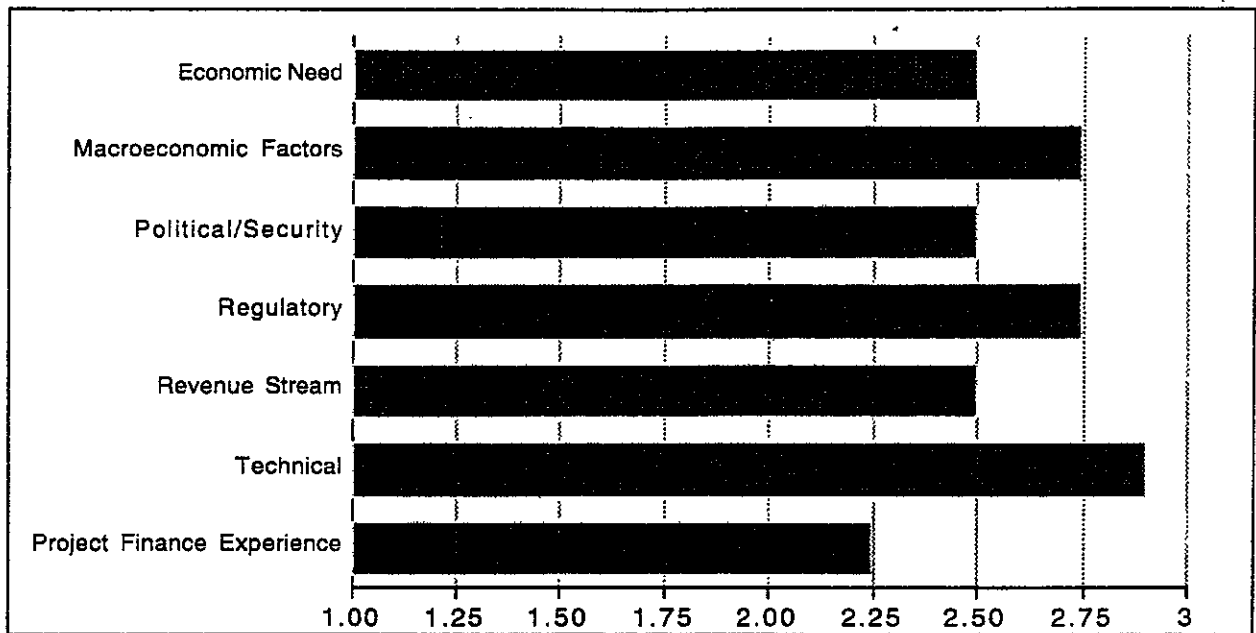
Financeability

Economic demand for the project is strong—Chile is and will continue to be dependent on ports as a major transportation link to the rest of the world. Development of Quintero appears to be the most economically viable option for easing congestion at Valparaiso. The required government permits have already been issued. An initial feasibility study carried out for the two-berth port found an internal rate of return approaching 28 percent. Additional feasibility studies are required to evaluate the cost and revenue requirements of the expanded version of the development.

Quintero Bay Maritime Terminal

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information we believe to be reliable, but CG/LA makes not warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

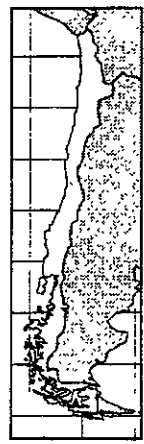
Key Decision Makers

Puerto Nuevo Regional S.A.
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Transportation/Chile

San Antonio Fishing Port



Project Summary	
Project No:	TRA-26
Subsector:	Port
Country:	Chile
Project Cost:	\$60 million
Export Potential:	\$40 million
Owner:	IPPSA

Technical & Site Description

The Port of San Antonio, the second largest in the country in terms of cargo shipped, currently serves both a fishing fleet and cargo services. In order to improve the efficiency of the port, this project calls for the construction of a specialized fishing port with an adjoining area devoted to fish processing operations.

The new fishing port would be privately owned and physically separated from the existing port of San Antonio, occupying approximately 100 hectares, including the industrial real estate.

Site

The preliminary plan places the port south of the existing Port of San Antonio. San Antonio is located 100 kilometers west of Santiago, connected to Santiago by a two-lane highway.

Timing

Feasibility studies for the Port of San Antonio are expected to start at the end of 1995, or the first quarter of 1996. At least one year is required to complete the technical, economic and legal feasibility studies, as well as detailed engineering design. The construction of the port is expected to take at least two years, making the port operative at the end of 1998 or the middle of 1999.

San Antonio Fishing Port

Infrastructure Project Profiles

Equipment & Services Demand

Specialized fishing ports do not exist in Chile today. Consequently, foreign specialized consulting services will be required both for conceptual and functional engineering as well as for the execution of the works and the installation of equipment.

The specific requirements for equipment and services have not yet been determined as preliminary studies are currently underway. Nevertheless, consulting and engineering services will be required for the following areas:

- Environmental
- Fish refrigeration
- Industrial processing of fish for human consumption
- Logistical systems for the administration of the fishing fleet
- Communication and data transmission systems

Feasibility studies are expected to cost approximately U.S.\$2 million.

Large amounts of foreign equipment will need to be imported to construct the port, including:

- Vacuum pumps
- Electrical systems
- Wastewater treatment systems
- Solid waste recovery systems (from wastewater)
- Refrigeration and ventilation systems and heaters
- Quality control laboratory equipment
- Other equipment related to port cargo handling support activities

Nature of Demand

The fishing industry plays an important role in Chilean international trade and has experienced significant growth in the last 5-7 years. Demand for port facilities is also expected to increase as a result of commercial agreements that Chile is currently negotiating, such as NAFTA, APEC, and MERCOSUR.

The growth of industrial fishing for the purposes of producing fish meal and fish oil, in addition to growth of commercial sea transportation, has created serious congestion problems in the existing port of San Antonio. In order to meet the expected demand for commercial transportation, and allow an expansion of the fishing industry, it will be necessary to develop specialized infrastructure allowing the fishing and commercial fleets to operate independently. Moreover, both activities have generated a demand for new industrial activities and support services, which require additional real estate development.

In 1995-96, the annual catch will stabilize at an estimated one million tons, a volume for which the fleet and processing capacity has been engineered. This amount also allows adequate protection for the sustainability of the local fish stock.

The problem of competition for port facilities between fishing and cargo shipping is seen in the substantial growth which both sectors have experienced in the last four years. The table below demonstrates the evolution of the industrial fishing industry in Chile in the last seven years.

Tons of Fish Caught in Chile, 1987-1994

	San Antonio	Northern Zone	Southern Zone	Chile Total
1987	95,909	2,822,438	1,949,937	5,315,592
1994	543,217	2,801,086	3,808,379	7,152,682
Percent Growth 1993-1994	110.6	23.0	26.9	29.2

It is expected that the volume of cargo handled by commercial ports will increase by approximately 12 percent a year for the next 15 years, an estimate which is below that of the state-owned port authority EMPORCHI, which estimates a growth rate of 17 percent for the same period. The evolution of commercial cargo shipments in ports administered by EMPORCHI is shown in the table below:

Development of Cargo Shipping at Ports Administered by EMPORCHI

Rank	PORT	Tons in 1994	% Change 94-93	% Change 94-92	% of Country Shipping in 1994
1	Valparaiso	4,498,285	0.2	-5.3	24.88
2	San Antonio	4,156,539	10.7	48.5	22.99
3	San Vicente	3,101,390	8.5	-2.5	17.15
4	Antofagasta	1,835,326	4.2	3.9	10.15
5	Iquique	1,034,562	31.8	29.6	5.72
6	Arica	1,024,708	22.1	6.1	5.67
7	Puerto Montt	679,952	27.0	-4.9	3.76
8	Talcahuano	453,336	11.3	-19.6	2.51
9	T. Puerto Montt	307,224	-6.3	5.6	1.70
10	Punta Arenas	301,548	7.2	5.2	1.67
11	Coquimbo	264,566	0.1	-11.7	1.46
12	T. Chacabuco	195,474	-0.1	2.0	1.08
13	Chacabuco	118,061	20.4	6.3	0.65
14	T. Punta Arenas	111,151	2.4	7.2	0.61
	TOTAL	18,082,122	9.9	7.2	100.00

San Antonio Fishing Port

Infrastructure Project Profiles

In the Region V, where San Antonio is located, the development of shipping over the last four years is demonstrated by the following table:

Cargo shipped at All Ports in Region V (metric tons)

Year	Quintero	Valparaiso	San Antonio
1990	4,777,613	3,866,838	2,132,885
1991	3,912,046	3,871,401	2,377,711
1992	3,839,405	4,519,020	2,836,767
1993	3,179,000	4,401,322	3,500,804
1994	3,335,245	4,480,285	4,156,539
Average Annual Growth Rate (%)	-8.6	3.8	18.2
1990-1994 Growth Rate (%)	-30.1	16.1	94.9

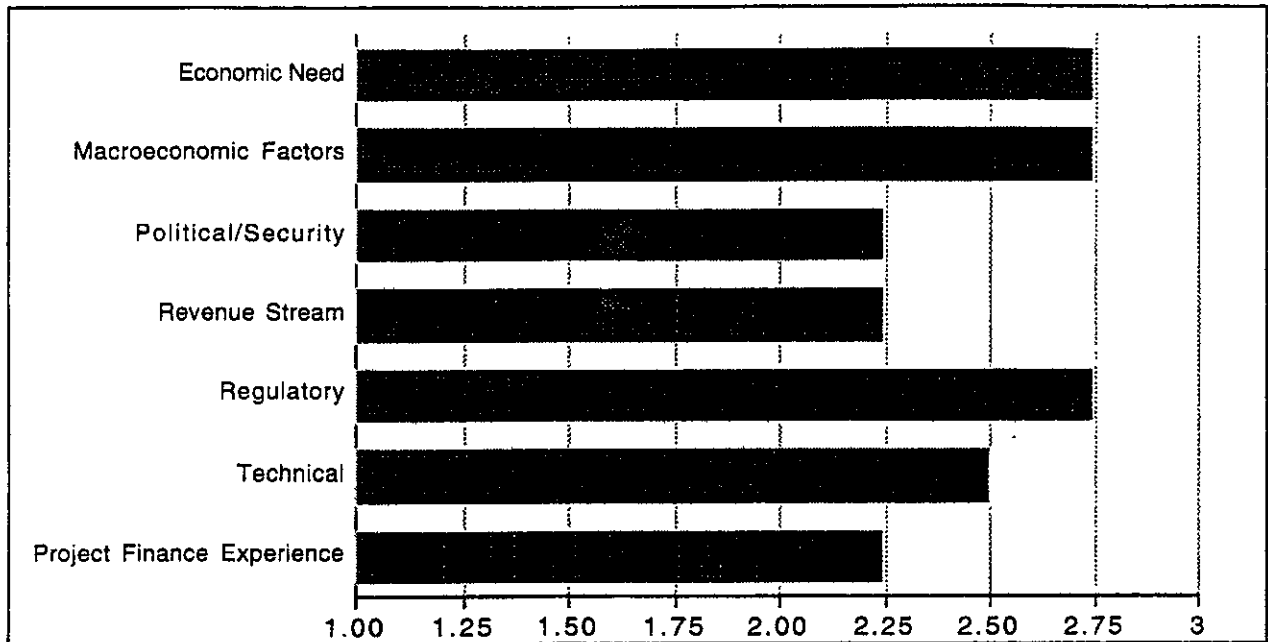
Financeability

Only a very preliminary assessment can be made of financeability given the preliminary nature of the project and the fact that the engineering and financial feasibility studies are in progress. The project's strongest features are 1) the overall economic demand — the Chilean economy is heavily dependent on a strong port system and the current one is experiencing capacity overload and 2) Chile's favorable credit rating and strong economy. Also, fishing is an important component of the Chilean economy.

The project would be 100% privately owned and operated. Project sponsors will look to raise equity, receive international credit support and increase project revenues through the development of industrial property around the expanded port facilities.

The project's timing will also be affected by the planned privatization in 1998 of the state-owned port authority EMPORCHI and plans for Valparaiso. Under the privatization it is likely that some of the fishing activity currently handled at Valparaiso would be shifted to San Antonio.

Financeability Assessment



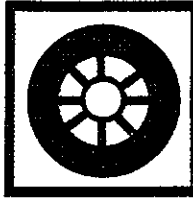
Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

Key Decision Makers

Inmobiliaria Puerto Pesquero de San Antonio S.A.
 Ms. Gloria Hutt, *Ingeniero Civil, Gerente General*
 San Antonio, V Región
 Chile
 ph/fax: (56-35) 21-1-41

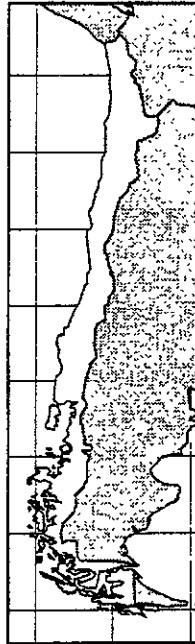
Related Projects

Puerto de Arica Modernization



Transportation/Chile

La Dormida: Santiago-Valparaiso Hwy



Project Summary

Project No:	TRA-27
Subsector:	Road
Country:	Chile
Project Cost:	\$200 million
Export Potential:	\$65 million
Owner:	Concession

Technical Description

This concession consists of two parts:

- 1) The construction of a new highway between Santiago and Valparaiso called *Autopista La Dormida*,
- 2) Improvements on the existing highway, Route 68.

La Dormida is planned as a four-lane highway, two lanes in each direction, separated by a divider for 95 percent of the length—the exception being the access roads to the La Dormida Tunnel. It should be able to sustain traffic speeds up to 120 kilometers per hour, except in the mountainous regions where the top speed would be 90 kilometers per hour. It will also include the construction of a 3.2 kilometer tunnel.

The improvement on Route 68 entails the construction of two tunnels, Lo Prado and La Zapata, and general improvements, such as new access roads and intersections, along the route.

VII-119

Highway La Dormida and Route 68: Santiago-Valparaiso

Infrastructure Project Profiles

Site

La Dormida will run between Santiago and Valparaiso over the following locations:

- Quilicura - Til Til
- Til Til - Limache
- Limache - El Salto

Timing

Bidding for this highway concession is expected to begin in the second half of 1995.

Equipment & Services Demand

Specialized equipment and engineering, as well as design services will be needed for intersections and for the construction of tunnels.

Nature of Demand

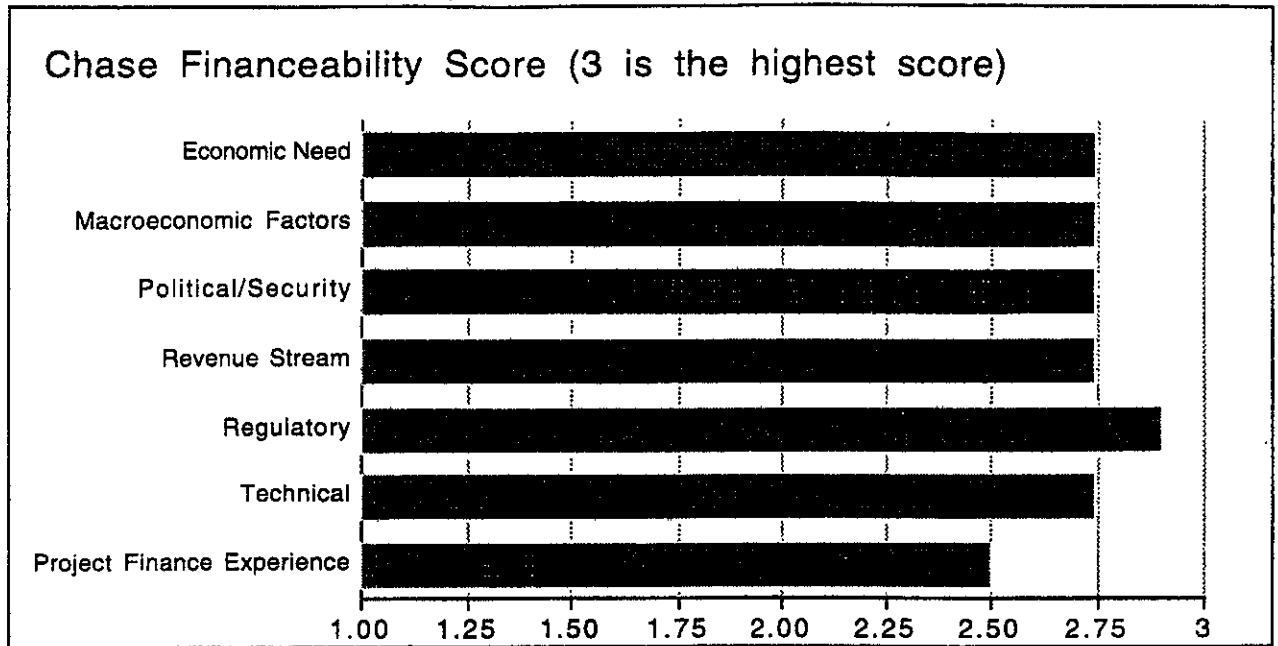
Vehicular traffic levels along the Santiago-Valparaiso corridor have exploded in the last decade due to its central location and Chile's high rate of economic growth. Demand growth is expected to be high, as Santiago's vehicle fleet has grown by 10 percent annually since 1985, exceeding Chile's 7 percent annual economic growth rate.

Traffic congestion on existing highways is expected to increase, since demand is projected to triple within the next 20 years. Under these conditions, traffic levels easily justify both improvement of Route 68, the existing highway, and construction of an alternative route, La Dormida.

Financeability

The high and growing levels of traffic along the economically important Santiago - Valparaiso corridor give this project a high financeability rating. Chile's concession programs for infrastructure development are well established. Potential concessionaires should pay careful attention to preliminary engineering cost estimates because of the difficult terrain.

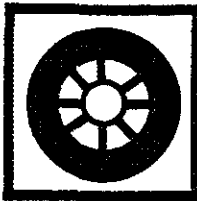
Financeability Assessment



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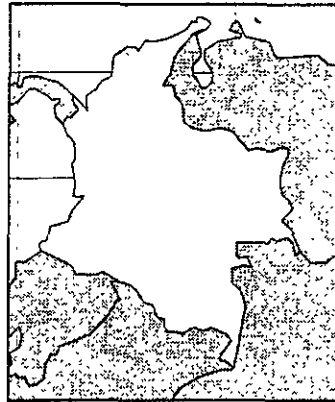
Key Decision Maker

Ministry of Public Works
 Gonzalo Cruzat, *Director of Projects*
 Santiago, Chile
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Transportation/Colombia

Concession of the Cartagena Airport



Project Summary

Project No:	TRA-28
Subsector:	Air
Country:	Colombia
Project Cost:	\$50 million
Export Potential:	\$50 million
Owner:	AC

As part of the government's expanding economic liberalization and deregulation program, the Civil Aeronautics Agency, Aeronáutica Civil (AC), is planning to grant a concession for the management of the Cartagena's Rafael Nuñez Airport. This tender follows the successful bid on the Cali Airport.

Technical Description

The main specifications of Rafael Nuñez Airport are:

OACI classification	4D
Runway	2,600 meters long, 45 meters wide
Hours of operation	24
Interconnecting runways	3, each 30 meters wide
Gate areas (domestic)	31,050 square meters with 5 positions
Gate areas (international)	40,075 square meters with 4 position
Main building	16,000 square meters with three levels
Cargo area	2,259 square meters (south wing of the main terminal)
Circulation and parking	8,628 square meters for parking
Control tower	1
Administrative area	771 square meters
Firefighting unit	472 square meters (fire station), 3 fire trucks and 1 rescue boat.
Gasoline area	8,688 square meters. Provides 100/130 and JP1
Water supply	Municipality of Cartagena
Energy supply	Electrificadora del Departamento de Bolívar. One back-up plant of 275kva
Waste management	Public Enterprises of the Municipality of Cartagena and own incinerator

Concession of the Cartagena Airport

Infrastructure Project Profiles

Site

The Rafael Nuñez Airport is located north of Cartagena and is connected to the city by an expressway.

Timing

The timing question is being determined by the Decentralization Committee, but AC estimates that tender documents will be released in July 1995.

Equipment & Services Demand

The concessionaire will be required to implement an investment program that provides for improvements and/or expansions of the terminals, the runway and gate areas. AC will also negotiate with the concessionaire a list of supplementary investments.

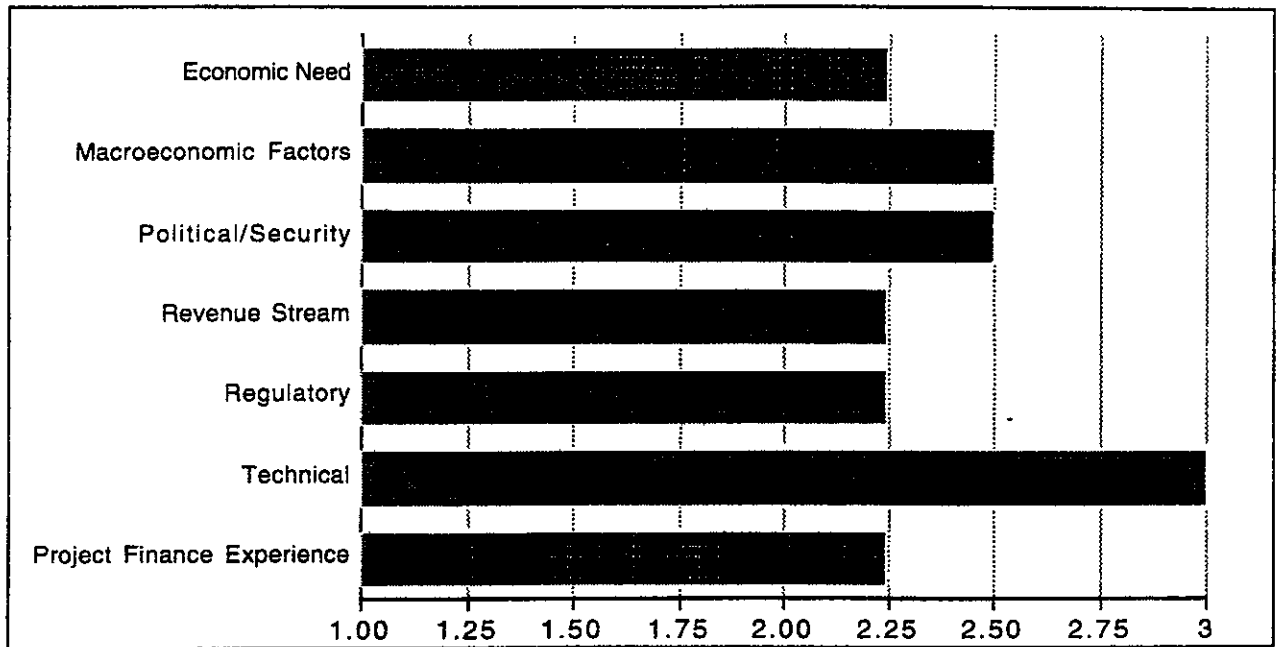
Nature of Demand

This project is part of the privatization process that is occurring in many sectors of the Colombian economy. AC and the government expect to see substantial improvements in airport management under a concession contract, while reducing government expenditures.

Financeability

This project will be developed as a concession. No government funding will be provided. As in all concession projects, the financial strength and experience of the winning bidder are the keys to the project's financeability and success. It is the government's responsibility to establish bidding procedures and a legally enforceable concession regime. Continued economic growth in Colombia will fuel demand at all major airports, but the expected rate of increase in traffic flow through the airport is one of the risks the bidders must assume.

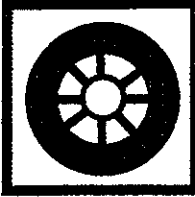
Financeability Assessment



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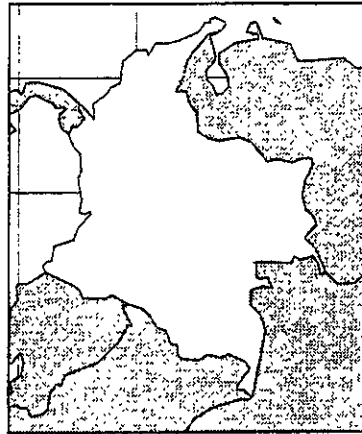
Key Decision Makers

Aeronautica Civil
 Mariela Lasso Salas, *Manager*
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Transportation/Colombia

Modernization of the Port of Cartagena



Project Summary

Project No:	TRA-29
Subsector:	Port
Country:	Colombia
Project Cost:	\$41 million
Export Potential:	\$30 million
Owner:	Sociedad Portuaria Regional de Cartagena

Technical Description

The Sociedad Portuaria Regional de Cartagena (SPRC) took over administration of the Port of Cartagena in December 1993 under a 20-year concession contract. SPRC is a private entity which was created under the First Law of 1991, which established the legal framework for the process of privatization of Colombia's ports. It has lease payment obligations and has committed to the modernization of the port.

- The overall objectives of the concession contract are the following:
- To provide Colombia with a container terminal port which is at an internationally-acceptable technological standard
- To provide Colombia with an intermodal sea port enabling the increased use of the Magdalena River for domestic and international cargo transportation
- To position Cartagena as a transshipment terminal
- To make Cartagena into an important cargo and tourist port in the Caribbean market

In order to fulfill these objectives SPRC has initiated an investment plan which will be carried out by 1998, including the purchase of Gantry-type cranes and upgrading of refrigeration facilities and other port structures.

Modernization of the Port of Cartagena

Infrastructure Project Profiles

Site

The port is located in the Manga Terminal Maritimo, Cartagena, Colombia. Cartagena is located on the northern coast of Colombia on the Caribbean Sea.

Timing

The SPRC investment plan has already been initiated and will be completed within three years.

Equipment & Services Demand

SPRC is planning to substantial upgrade the existing port facilities. The investment plan requires future purchases of the following equipment and services:

WHARVES

b. Wharf extension	<u>\$ 8.7 million</u>
Sub-Total	\$ 8.7 million

EQUIPMENT

a. Three Gantry-type container cranes	\$ 16.2 million
b. Dredging	<u>\$ 2.6 million</u>
Sub-Total	\$18.8 million

YARDS and ADMINISTRATION BUILDINGS

a. Repaving and rehabilitation/refitting of yards	\$3.1 million
b. Construction and refitting of buildings	<u>\$4.3 million</u>
Sub-Total	\$7.4 million

OTHER

a. Expansion of refrigeration facilities from 30-120 container capability	\$1.5 million
b. Electricity generator, 1.2 MW	\$0.3 million
c. Automated security system	\$0.7 million
d. Personnel facilities	\$0.8 million
e. Information systems	\$1.5 million
f. New warehouse equipment	<u>\$0.9 million</u>
Sub-Total	\$5.7 million

TOTAL

\$40.6 MILLION

Nature of Demand

Cartagena is currently the largest port in Colombia, handling 120,000 containers annually. Located on the Caribbean, it provides direct access by sea to Colombia's largest trading partners, the United States and the European Union. Currently, approximately 50 shipping lines dock at Cartagena, including: APL, Sea Land, Maersk, Hapag Lloyd, Nedlloyd, Likes, CGM, Zim Container, Dole, etc.

Colombia has one of the strongest and most diversified economies in Latin America. Future growth in the economy and international trade increase the demand for expanded and modern port facilities. A conservative estimate puts the annual growth rate for container handling in Cartagena over the next 15-20 years at 9.6 percent.

Financeability

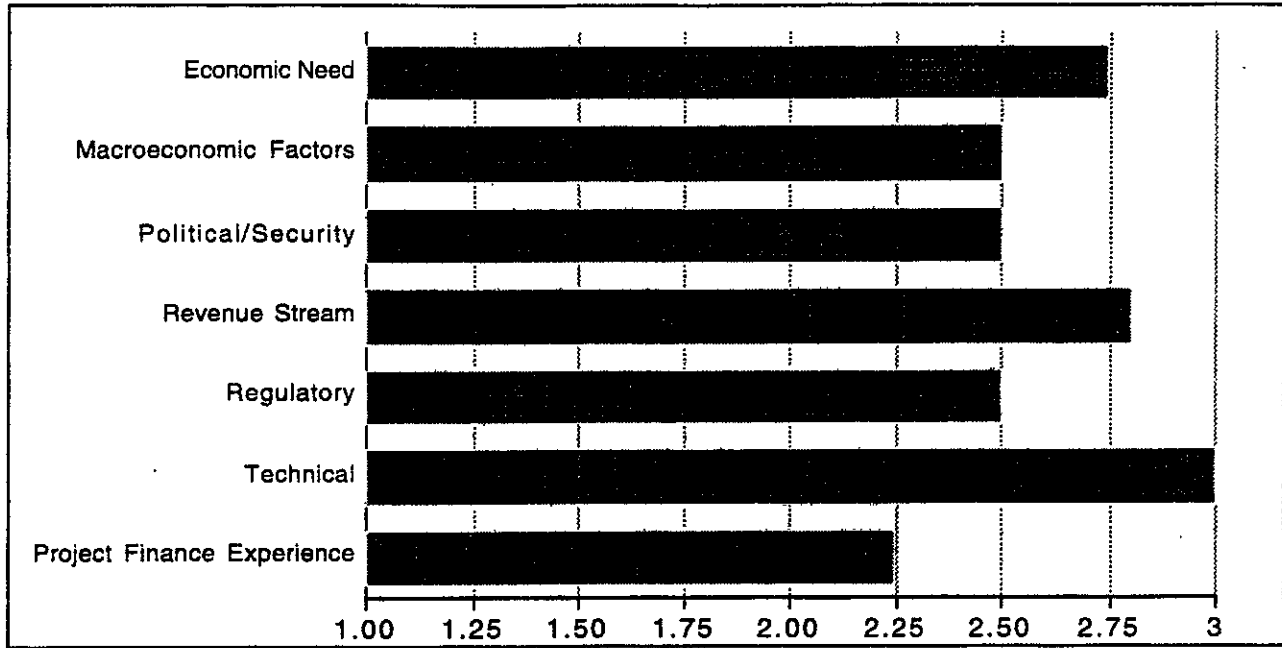
The First Law of 1991, which established the legal framework for the process of privatization of Colombia's ports, created three different kinds of organizations. It created the Port Commission, the regulatory agency that oversees national port operation, the "Sociedades Regionales" to whom the concessions were granted, and an entity to cover the existing debts of the state-owned ports. Consequently, SPRC is free of debt.

In addition, the current operations are highly profitable, and SPRC expects to be able to finance its modernization on the basis of national and international debt guaranteed by its revenue stream. Ex-Im Bank involvement is also an additional option.

Modernization of the Port of Cartagena

Infrastructure Project Profiles

Financeability Assessment



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Key Decision Makers

Sociedad Portuaria Regional de Cartagena (SPRC)

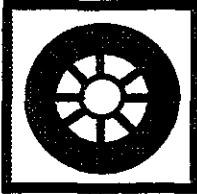
Alfonso Salas, *Gerente General*

Manga, Terminal Maritimo

Cartagena, Colombia

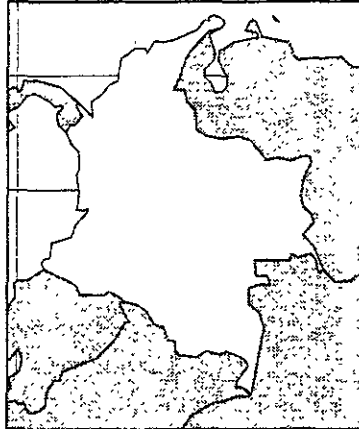
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Transportation/Colombia

Colombian Railroad Concession Program



Project Summary

Project No:	TRA-30
Subsector:	Rail
Country:	Colombia
Project Cost:	\$475 million
Export Potential:	\$300 million
Owner:	Concession

The federal government of Colombia is embarking upon a program to concession out the national railroad system. The decision was made this spring after it became apparent that Ferrovias (Empresa Colombiana de Vias Ferreas), the entity given responsibility four years ago for rehabilitating and upgrading the system, had been unable to make significant improvements.

Technical Description

Phase I of the concession program is a request for bids from suitable investment banks to structure and administer the concession program. The government has allocated about U.S.\$7 million for this effort. Phase II will be the actual awarding of concessions on various parts of the Colombian railroad system under a program designed by the investment bank contracted in Phase I.

Once the concession program has been drawn up there will be international public biddings on both cargo and passenger traffic in Colombia. An estimated U.S.\$475 million investment will be required in the four years following the granting of concessions. The concession period for cargo routes will run 30 years.

Colombia's present railroad system consists of 2,489 kilometers of track. The three main lines are:

- The Atlantic Line, from Bogotá to Port of Santa Marta, 1501 kilometers
- The Northeast Line, from Bogotá to the Department of Boyacá and the northern area of Cundinamarca, 338 kilometers
- The Pacific Line, which links important industrial and agricultural zones with the port of Buenaventura, 650 kilometers.

Colombian Railroad Concession Program

Infrastructure Project Profiles

Of the 2,489 kilometers of track, only 1,601 kilometers are included in the active rail network and will be offered for concession. The initial offering will include the following sections of the lines mentioned above:

1. The Atlantic Line: Ferrovias is planning to offer three sections of this line.

Bogotá–La Loma, 747 kilometers, all operational. Estimated required investment: U.S.\$190 million.

La Loma–Santa Marta, 217 kilometers, all operational. Ferrovias has recently approved a U.S.\$4 million maintenance plan for this section. Estimated required investment: U.S.\$83 million.

Puerto Berrío (Grecia)–Medellín, 187 kilometers, all operational. This section is attached to the Bogotá–Santa Marta route. Estimated required investment: U.S.\$42 million.

2. The Northeastern Line: Ferrovias is planning to offer one section of this line in the first phase.

Bogotá - Belencito, 257 kilometers, all operational. Estimated required investment: \$60 million.

3. The Pacific Line: Ferrovias is planning to offer one section of this line.

Buenaventura–Medellín, 347 kilometers between Buenaventura and Cartago are operational. The Cartago–Medellín section, approximately 200 kilometers, exists, but has not been in operation for over ten years. Estimated required investment: U.S.\$100 million.

The administration and operation of the remaining 888 kilometers of track that are currently inactive will, in the medium term, be transferred to the regional governments. The goal is to spark regional interest in the rehabilitation of the railroads since they may connect to future private lines. In addition to the railway lines, Ferrovias is planning to privatize multimodal transfer stations and sell some of its property.

Site

West and northwest Colombia.

Timing

The bidding process for the management contract of the concession program opened on April 10, 1995 and closed on June 12, 1995. Ferrovias plans to offer concessions on the cargo routes with the highest potential before the end of 1995. The first concessions are expected to be offered in early 1996.

Demand for Equipment & Services

The concessionaires will be required to invest in the rehabilitation of tracks as well as signaling and communication systems. In addition, stations and loading/unloading facilities must be constructed and rehabilitated. The total estimated required investment for the first lines to be offered is U.S.\$475 million. If rolling stock is acquired, the total investment is likely to rise considerably.

Nature of Demand

The Colombian railroad system is currently in very bad condition, and federal government efforts to rehabilitate the system have not been successful. The present policy of granting 30-year concessions for the most viable cargo routes is an attempt to make the railway a competitive cargo transportation alternative.

Potential demand on the routes considered for concession is high.

1. **The Atlantic Line: Bogotá–La Loma–Santa Marta:** In 1994, 800,000 metric tons of cargo were transported on this line. The potential volume is more than 7 million tons driven especially by the increasing coal production in the mines of La Jagua de Ibirico and La Loma, both in the province of Cesar.
2. **The Atlantic Line: Puerto Berrío–Medellín:** This line is not in very good condition but still ships 200,000 tons per year. The demand for transportation on this route is likely to come from coffee producers in Caldas, Risaraida and Quindo, and sugar producers in the Valle del Cauca. The potential demand lies around 500,000 tons, including 100,000 tons of coffee.
3. **The Northeastern Line: Bogotá–Belencito** (connecting the provinces of northern Cundinamarca and Boyacá with Bogotá): This line has an estimated potential market of 1.4 million tons of cargo composed of iron, steel, cement, fertilizers, and paper.
4. **The Pacific Line: Buenaventura–Cali–Cartago–Medellín.** The Buenaventura–Cartago section is used by the Sociedad Operadora del Pacifico. The existing operational line between Buenaventura and Cartago connects the industrial zone of Valle del Cauca with the Pacific. Once the concessionaire reestablishes the connection between Cartago and Medellín, this line will connect Valle del Cauca with the Atlantic seaport of Santa Marta.

Other products that may be transported on this stretch are sugar, coffee, and coal from the Amagá province. Moreover, there is also a line from Medellín to Arauca, which connects the Colombian north-east with the sea.

Colombian Railroad Concession Program

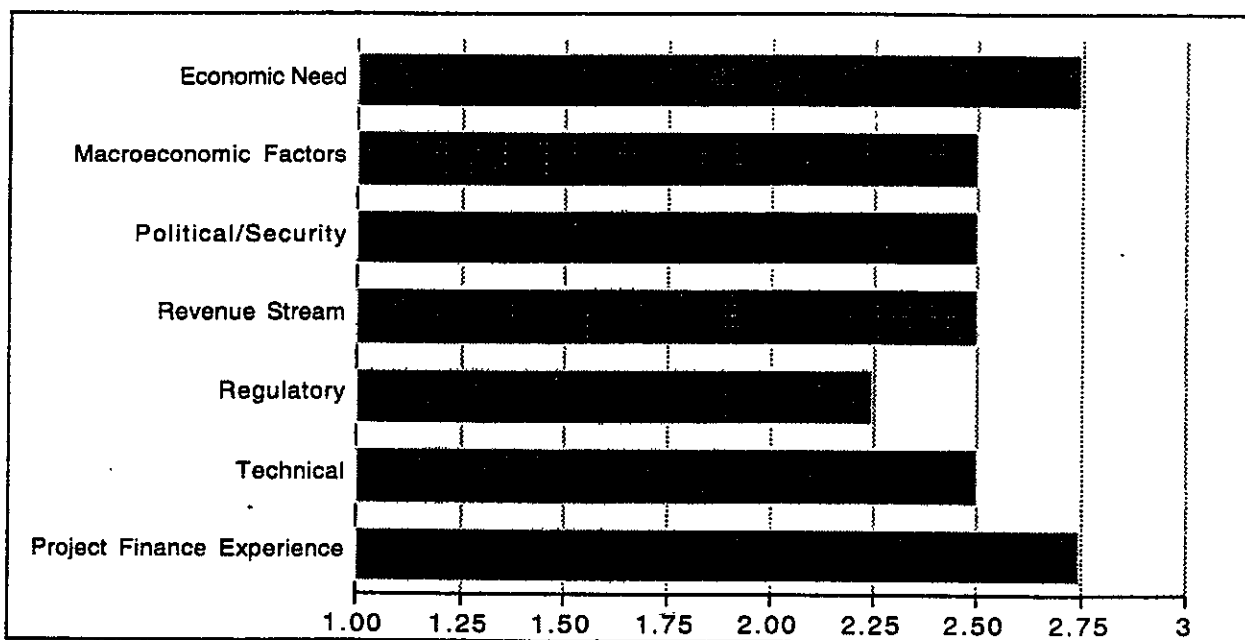
Infrastructure Project Profiles

Financeability

The government's decision to hire a foreign investment bank to advise it on how to structure the program indicates a commitment to undertake the project in a way that is attractive to the international investment community. The government is committed to the project, and demand can be expected from continued growth of the Colombian economy. Given Colombia's geography and the location of production and raw materials, rail ought to be a viable cargo option.

However, the size of the required investment is substantial and may deter all but a small number of interested parties.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Ferrovias, Empresa Colombiana de Vias Ferreas

Ministry of Transportation

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Santafé de Bogotá, Colombia

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Edgar Mac'Allister Braydy, *Director, Planning Office*

Santafé de Bogotá, Colombia

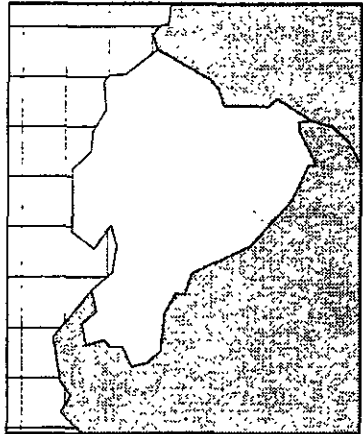
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Transportation/Ecuador

Guayaquil Airport Terminal



Project Summary	
Project No:	TRA-31
Subsector:	Airport
Country:	Ecuador
Project Cost:	\$28 million
Export Potential:	\$12 million
Owner:	DGAC

The General Office of Civil Aviation (DGAC) is undertaking a project to rebuild and expand the Simon Bolivar Airport in Guayaquil, Ecuador's second largest city. The goal of this project is to bring the airport up to international standards. This project is a part of the aeronautical infrastructure project Master Plan for the development of the airports in Guayaquil and Quito.

Technical Description

The DGAC's first project is the \$16 million construction of a new terminal for international flights and its integration with existing facilities. Studies on space allocation at the airport terminal indicate that there is a significant imbalance between the volume of passengers and public space. The current total public space for both the national and international terminals is 6,700 square meters. To alleviate congestion and allow for adequate passenger traffic flow, the study recommends the addition of public space in the following areas of the airport:

Terminal	Flights	Percent Increase
International	Arrivals	200
International	Departures	46
Domestic	Arrivals	69
Domestic	Departures	32

The airport as currently configured is deficient in many respects: passenger flow, lack of adequate air

Guayaquil Airport Terminal

Infrastructure Project Profiles

conditioning, poor luggage handling and absence of other associated services which are standard features in modern international airports.

The second major project in the renovation of Simon Bolivar is the expansion of the runway, estimated at a cost of U.S.\$12 million.

Site

The Simon Bolivar Airport is located in Guayaquil, the major port in Ecuador.

Timing

This project is expected to start by the end of 1995, once government funding is approved.

Equipment & Services Demand

The project will require engineering and construction to implement the following renovations:

Construct a new international departure terminal with the capacity to support four departures (about 700 people) simultaneously. Of the total area of 8,700 square meters, 6,350 square meters will be designated as public space for passengers. This building will be used occasionally for domestic departures.

Provide 1,400 square meters of connecting buildings.

Renovate the current international arrivals building.

Relocate domestic arrivals to the area currently used for ticketing and other airport services. This area, reserved for domestic air traffic, will total 6,000 square meters.

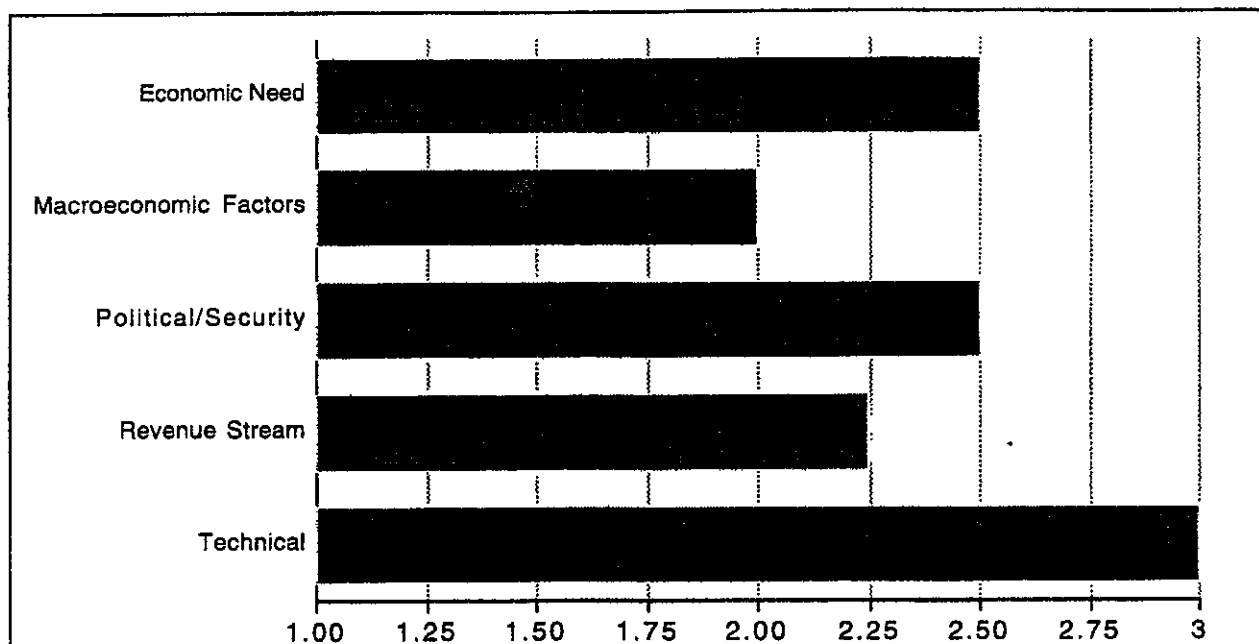
Nature of Demand

The DGAC project is based on the need to upgrade the Guayaquil Airport to international standards. Currently, the airport is unable to provide adequate public facilities and services to domestic or international passengers.

Financeability

No private investment is being sought for this project. CONADE, the government agency in charge of overseeing the modernization of the Ecuadorean economy, has endorsed the project. DGAC is currently seeking funding authorization from the Ministry of Finance and Banco del Estado, the national bank of Ecuador. The project is a priority and will likely receive approval.

Financeability Assessment



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Key Decision Makers

General Office of Civil Aviation (DGAC)
 Ing. Oscar Apolo, *Director of Planning and Projects*
 Quito, Ecuador
 ph: (593-2) 529-505
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Guayaquil Airport Terminal

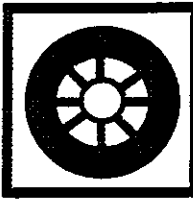
Infrastructure Project Profiles

Related Projects

The Airport Mariscal Sucre, in the city of Quito, is also undergoing renovation. The airport terminals will be refurbished and construction is planned for a new international arrival terminal and an administrative section.

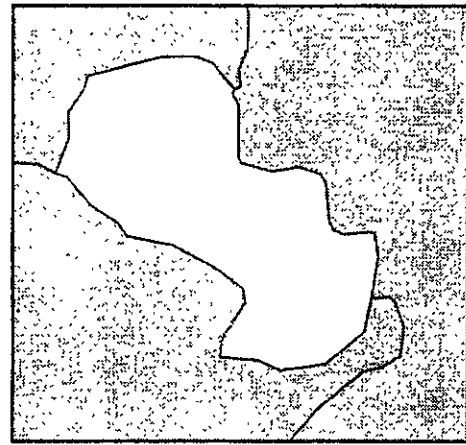
The estimated total investment is U.S.\$7 million out of which U.S.\$1 million will be dedicated to equipment purchases.

For more information please contact: Ing. José Baquero, New Airports Division, DGAC -Quito; ph (593-2) 504-535, fax (593-2) 563-995.



Transportation/Paraguay

Air Cargo Distribution



Project Summary	
Project No:	TRA-32
Subsector:	Airport
Country:	Paraguay
Project Cost:	\$45 million
Export Potential:	\$35 million
Owner:	Proparaguay

Proparaguay, the investment promotion agency of the Paraguayan government, is proposing the creation of CeMeTA, the Mercosur Center of Air Transportation, a commercial concept to promote air cargo distribution and affiliated services in the Mercosur region. The proposal envisions four components:

- An aircraft maintenance and repair facility
- Reconditioning and inventory of parts for smaller jets
- A regional school for training and development of aircraft mechanics and engineering
- An intra-continental air cargo hub-and-spoke center

Proparaguay has received a U.S. TDA grant for a feasibility study of the air cargo center.

Technical Description

Although it would be based in Paraguay, this is a regional project. It is currently at the feasibility analysis stage and also requires a comprehensive study of transportation as it relates to the two international airports. A TDA Definitional Mission proposed the following tasks for this study:

Air Cargo Distribution

Infrastructure Project Profiles

- Review existing data and facilities
- Review all available cargo forecasts and airports, as well as airspace systems requirements
- Develop an air cargo distribution plan for Paraguay
- Explore the possibility of creating a regional distribution hub
- Develop a cargo facility plan for the airports at Asunción and Ciudad del Este
- Develop an equipment specification and procurement plan
- Develop capital and operational cost estimates
- Conduct revenue and financial analyses
- Recommend optimum project sizes

The estimated cost for the initial phase of the Air Cargo Center is U.S.\$45,000,000.

Site

Although cargo traffic through Ciudad del Este, near the Brazilian border, has been increasing, the Asunción Airport has been chosen for the Center.

Timing

The project proponent is currently in the process of selecting the consultant who will conduct the feasibility study. ProParaguay is expecting to call for an international tender immediately after the feasibility study is concluded at the end of 1995.

Equipment & Services Demand

Although the exact list of equipment and services will depend on the results of the feasibility study and procurement plan, it is likely that the project will require all products related to information systems, lifts, conveyors, racks, transfer equipment and other equipment used at air cargo facilities.

U.S. companies interested in this project should monitor the situation closely. Japanese, British, Italian and German companies have strong support from their governments regarding projects in Paraguay and some of them have already been in direct contact with Paraguayan officials for support on this project.

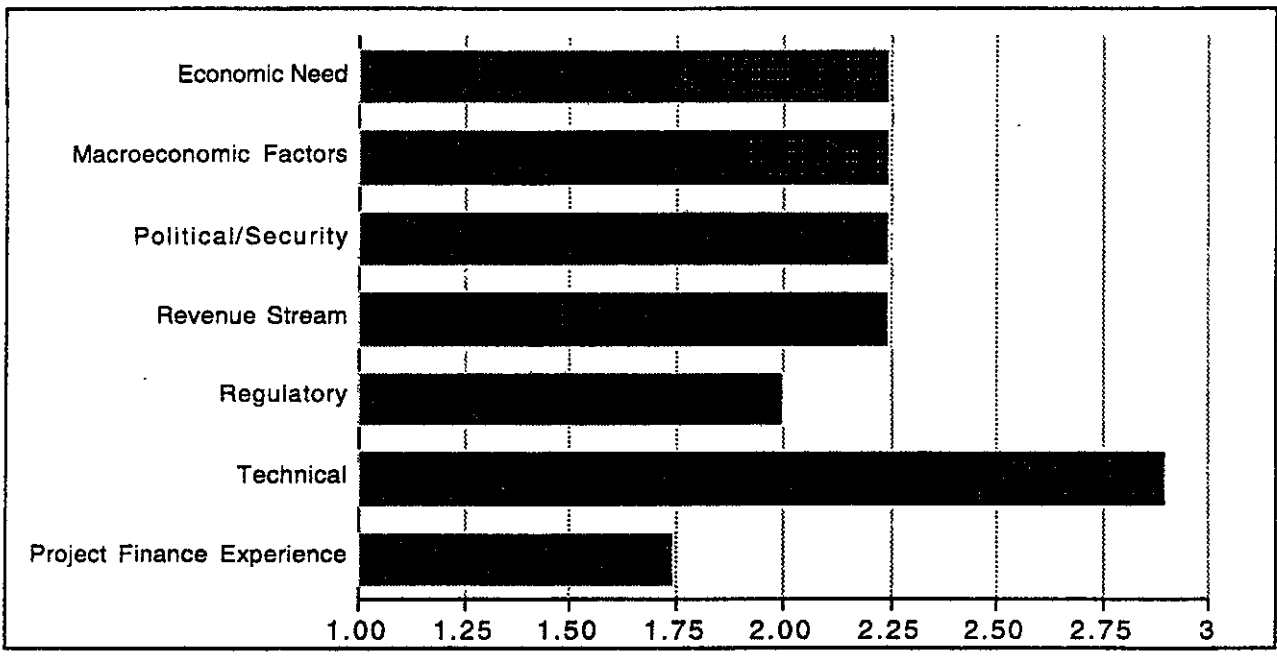
Nature of Demand

Demand for the project is driven by the rapidly growing levels of trade among the four Mercosur countries. Paraguay's relatively central location within the region makes it a logical place for the air cargo facility.

Financeability

Prior to completion of the feasibility study, it is difficult to gauge financeability. Obviously, traffic levels and general demand for the facility are key issues. Project ownership and regulation have yet to be determined. The project is not likely financeable on a purely private basis, but will require government support.

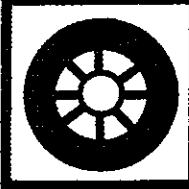
Financeability Assessment



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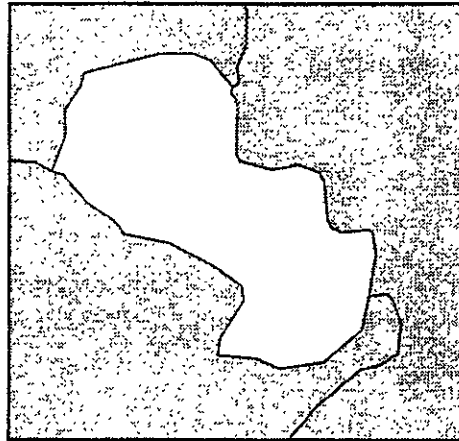
Key Decision Makers

Proparaguay
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Transportation/Paraguay

Asunción-Ypacaraí Passenger Railroad



Project Summary

Project No:	TRA-33
Subsector:	Rail
Country:	Paraguay
Project Cost:	\$20-50 million
Export Potential:	\$10-30 million
Owner:	MOPC

The great majority of passenger and cargo transportation in Paraguay is done on the country's highways. This puts an extraordinary strain on the highway system, shortens its life and imposes additional maintenance costs. Consequently, the federal government has decided to upgrade and expand the railroad system as a way of relieving pressure on the roads and in providing another cost effective alternative for moving goods and people. There is particular emphasis in attracting private sector interest in building up cargo and passenger services.

Technical Description

The 40 kilometer passenger rail line between Asunción and Ypacaraí runs in very poor condition. It has undergone little maintenance for many years and will require substantial investment in both track renewal and rolling stock.

The government is considering two options to upgrade the Asunción-Ypacaraí line. The first would use diesel fueled locomotives, at an estimated cost of U.S.\$20 million. The other alternative is an electrical light rail line estimated to cost U.S.\$50 million, since the line would also have to be electrified.

The government has not yet determined the final structure or scope of services to be provided by the private sector. It is considering an arrangement wherein the state would invest in and retain ownership of the track infrastructure, while the private sector would be responsible for operations, maintenance and possibly the purchase of rolling stock. However, it welcomes proposals from interested parties in the private sector.

Asunción-Ypacaraí Passenger Railroad

Infrastructure Project Profiles

The government of Paraguay is also considering minimum traffic level guarantees or subsidies but has yet to come to a final decision.

Site

Ypacaraí is located 40 kilometers southeast of Asunción.

Timing

The Government of Paraguay would like to initiate discussions with interested parties as soon as possible. The latest study of the Paraguayan railway system was completed in 1993. However, it is expected that a new feasibility study will have to be performed.

Equipment & Services Demand

The Asunción-Ypacaraí line will require tracks, ballast, signaling and communications systems and railroad ties of a yet to be determined material. Equipment may also be required for the electrification of the tracks.

In addition to engineering services, a management and operations contract is also a possibility.

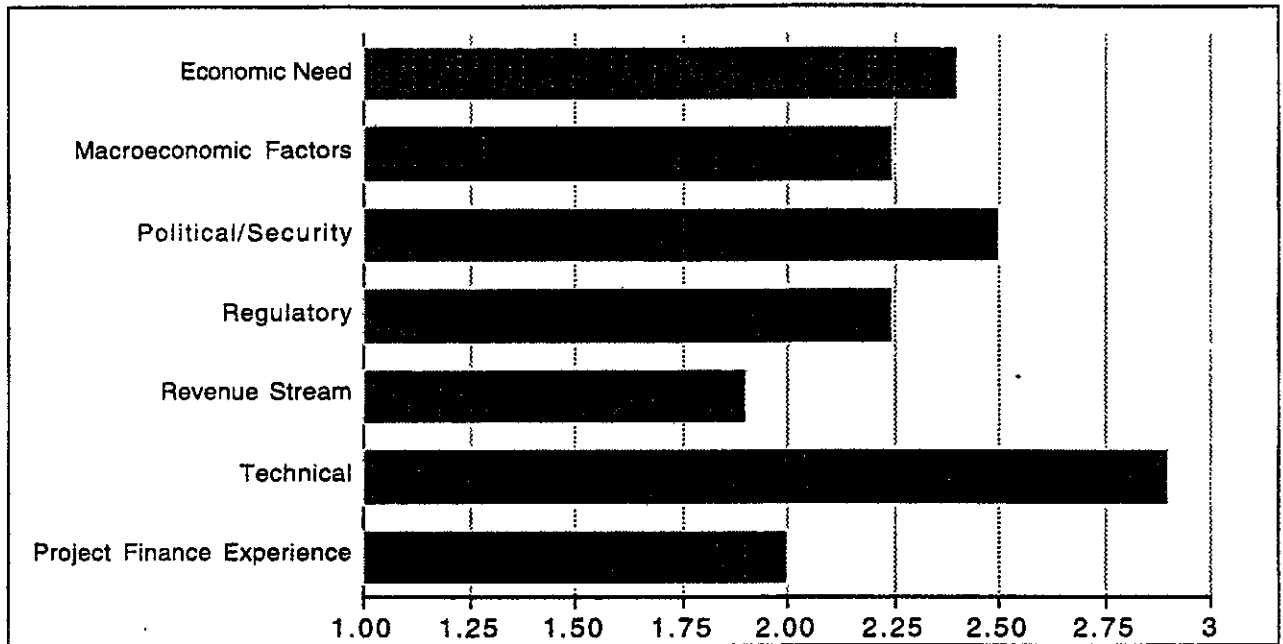
Nature of Demand

The principal factor driving demand for this railway line is the overloaded highway system and the need for a cost efficient alternative. The only existing alternative to car transportation between Asunción-Ypacaraí is a bus line which takes one and a half hours in each direction. The current ridership on the bus line is already very high.

Financeability

The two major variables are the projected traffic (both passenger and cargo) on the new railroad and the costs associated with the alternative of simply expanding the current road network between Asunción and Ypacaraí. A complete feasibility study is needed to answer these questions.

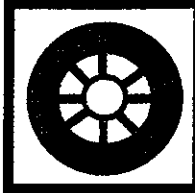
Financeability Assessment



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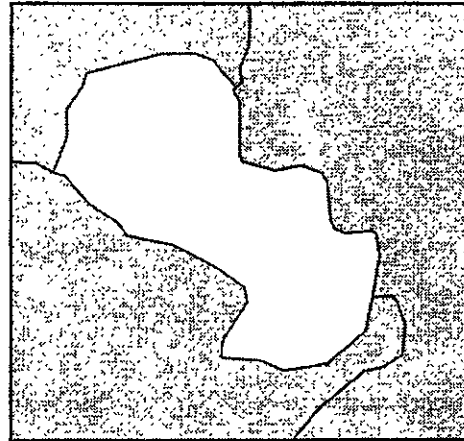
Key Decision Makers

Ministerio de Obras Públicas y Comunicaciones
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Transportation/Paraguay

Ciudad del Este–Caaguazú Highway



Project Summary

Project No:	TRA-34
Subsector:	Rail
Country:	Paraguay
Project Cost:	\$30 million
Export Potential:	\$30 million
Owner:	MOPC

The Paraguayan Ministry of Public Works and Communications (MOPC) is proposing an international tender for a 25-year concession to widen, maintain and operate 30 kilometers of Highway 7, as well as paving and improving the shoulder of additional stretches.

Technical Description

The required work is divided into three major components:

Renovation

Renovation of the highway, reconstruction of traffic signs, renovation of the toll plazas, as well as the installation of a new toll plaza with a lighting system.

Main works

Widening of Highway 7 from Kilometer 323 to Kilometer 296.85 (30 kilometers), including drainage, traffic signs, and lighting at the intersection of the highway to Itaipu and Highway 6, as well as access ramps to Barrio Don Bosco and Minga-Guazu.

Maintenance

Basic maintenance to keep the highway in good condition during the life of the concession.

Ciudad del Este–Caaguazú Highway

Infrastructure Project Profiles

The concession will be awarded for a period of 25 years to ensure that the revenues from tolls and commercial exploitation of sites will cover investments, construction and operational costs. The concessionaire should have sufficient financial resources to carry out the renovations until toll collection begins.

The MOPC will not extend guarantees or counter-guarantees on any loan that the concessionaire will take for this project. The bidding process will be done in three stages: qualification, technical proposal, economic and financial proposal.

Site

The site of the project is near Ciudad del Este, in southeastern Paraguay. Moreover, the site is near the Falls of Iguazu, a major tourist attraction.

Timing

It is believed the project will go out to bid in 1996.

Equipment & Services Demand

The highway will require engineering and design services, as well as materials for highway and drainage construction. This will include paving and construction of intersections, bypasses and other civil works. A toll collection system must also be built and operated.

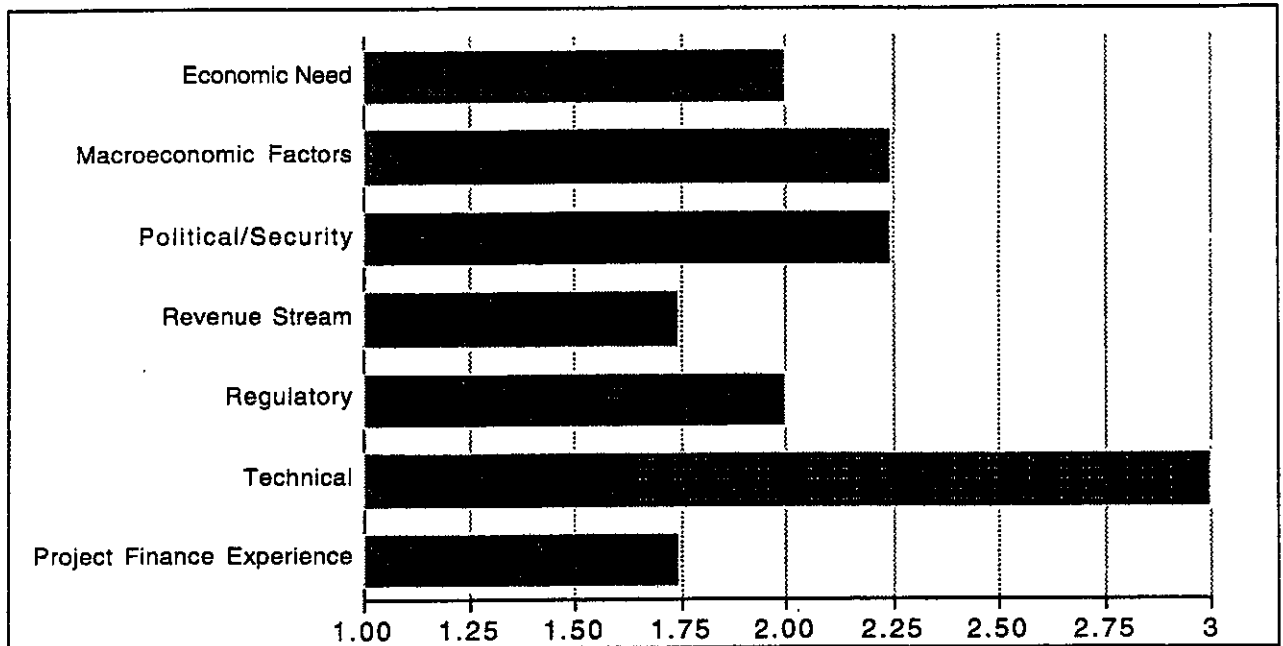
Nature of Demand

The improvement of the Highway 7 will ease the flow of traffic in the eastern part of the country towards Brazil. It will also improve internal traffic in an area of rapid development due to the Itaipu dam and the increasing international importance of Ciudad del Este.

Financeability

The main issue of concern is whether there is sufficient traffic flow to support private financing of the project, which does not connect major urban centers. In addition, the lack of project finance experience on the part of the Paraguayan government is a concern.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

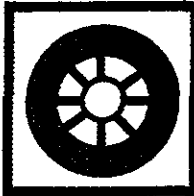
MOPC

Ing. Jorge Lamar Gorostia

Vice Minister of Mining and Energy

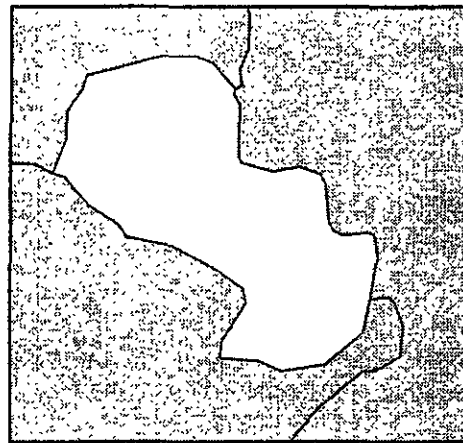
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Transportation/Paraguay

Ypacaraí-Encarnación Railroad



Project Summary

Project No:	TRA-35
Subsector:	Rail
Country:	Paraguay
Project Cost:	\$ 200 million
Export Potential:	\$ 100 million
Owner:	MOPC

The great majority of passenger and cargo transportation in Paraguay is done on the country's highways. This puts an extraordinary strain on the highway system, shortens its life and imposes additional maintenance costs. Consequently, the federal government has decided to upgrade and expand the railroad system as a way of relieving pressure on the roads and in providing another cost effective alternative for moving goods and people. There is particular emphasis in attracting private sector interest in building up cargo and passenger services.

Technical Description

The 336 kilometer railway line between Ypacaraí-Encarnación connects Asunción with Encarnación, Paraguay's main cargo entry point on the Paraná River. It has undergone little maintenance for many years and will require substantial investment in both track renewal and rolling stock. Nevertheless, private Paraguayan investors have shown an interest in the railway line as it holds the promise of a low cost shipping alternative to the highways.

The Paraguayan government has not yet determined the final structure or scope of services to be provided by the private sector. It is considering an arrangement wherein the state would invest in and retain ownership of the track infrastructure, while the private sector would be responsible for operations, maintenance and possibly the purchase of rolling stock. However, it welcomes proposals from interested parties in the private sector.

Ypacaraí-Encarnación Passenger Railroad

Infrastructure Project Profiles

Site

Ypacaraí is located 40 kilometers southeast of Asunción. Encarnación is located in southern Paraguay on the Paraná River.

Timing

The Government of Paraguay would like to initiate discussions with interested parties as soon as possible. The latest study of the Paraguayan railway system was completed in 1993. However, it is expected that a new feasibility study will have to be performed.

Equipment & Services Demand

The Ypacaraí-Encarnación line will require tracks, ballast, signaling and communications systems and railroad ties of a yet to be determined material.

In addition to engineering services, a management and operations contract is also a possibility.

Nature of Demand

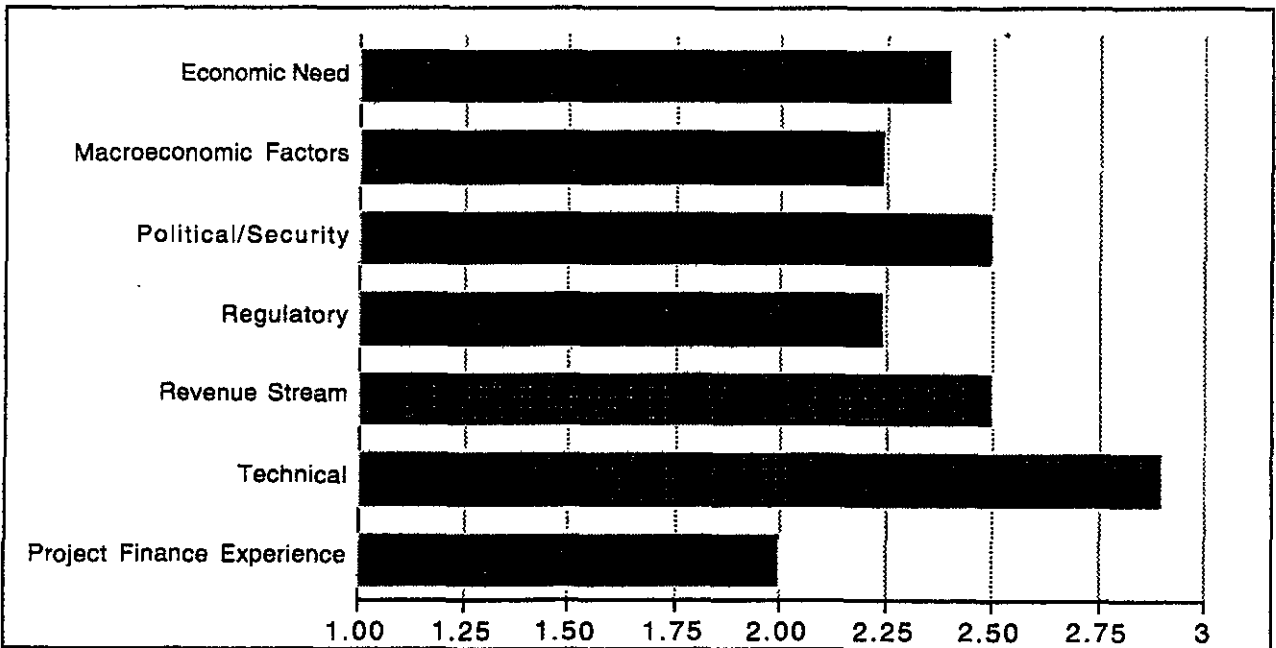
Encarnación is one of the principal transit points for Paraguayan exports and imports, a large proportion of which is subsequently shipped to Asunción. The existing railroad carries part of this trade despite its precarious condition. In the years 1990-1992, the average amount of cargo shipped per year was 210,000 tons. Paraguay's main products are cotton, grain, sugar and other agricultural and forestry products. The latest study (1993) of the Paraguayan railway network, carried out by Consultora ENDECO, an Italian consulting firm, estimates that a modernized railroad could handle more than 600,000 tons of imports and exports in the year 1999. Growth in cargo volumes is expected to range from 2 - 4% per year.

The highway network of Paraguay is already significantly overloaded. This condition will reduce its life-span and increase maintenance costs. There is also considerable interest in the cargo railroad in the Paraguayan private sector, which is looking for a low-cost and faster alternative to highway shipping.

Financeability

The two major variables are the projected traffic on the new railroad and the business/financial structure of the project. Among the specific issues is the question of the level of state subsidies, if any. Considering the substantial potential demand, government financial support may be relatively low. Nevertheless, a complete feasibility study is needed to address these issues.

Financeability Assessment



Source: CG/LA Infrastructure.

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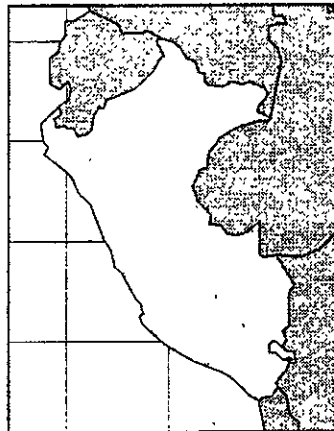
Key Decision Maker

Ministerio de Obras Públicas y Comunicaciones
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Transportation/Peru

Cuzco-Quillabamba Railway Concession



Project Summary

Project No:	TRA-36
Subsector:	Rail
Country:	Peru
Project Cost:	\$10-20 million
Export Potential:	\$7.5-15million
Owner:	Concession

Technical Description

The government of Peru is offering a 25-year renewable concession to operate the South Eastern Division of the national railroad, ENAFER. The South Eastern Division offers primarily passenger service along the Cuzco-Quillabamba Line, including travel to Machu Picchu, a major international tourist attraction. The concession also includes local passenger service and limited freight transportation between Cuzco and Quillabamba.

In addition to operating and marketing rail services, the concessionaire will maintain the 185-kilometer narrow-gauge track, locomotives, rolling stock and installations of the South Eastern Division. This equipment includes six diesel locomotives, eight rail diesel cars as well as passenger and freight cars. The track and right-of-way will remain the property of the Peruvian government.

Certain track improvements will need to be undertaken by the concessionaire, and new rolling stock will be purchased by the fifth year of the concession. The required investment is estimated to range between U.S.\$10 - 20 million.

Concessions to operate freight service in central and southern Peru, the remaining two lines of ENAFER, will also be offered to qualified bidders by the end of 1995.

Cuzco-Quillabamba Railway Concession

Infrastructure Project Profiles

Site

The Railroad is located in the southeastern region of Peru. It connects the city of Cuzco to the regional commercial hub of Quillabamba via Machu Picchu.

Timing

The terms of reference for the South Eastern Division of ENAFER will be available for purchase in June 1995. Prequalification documents for bidding must be submitted in July. A draft of the proposed concession contract will be given to prequalified bidders in mid-August. After receiving the definitive concession contract, bidders will be asked to submit a technical and economic proposal in late October, 1995. The concession will be awarded to the qualified bidder who offers the highest total in net present value terms.

Equipment & Services Demand

A certain amount of track renewal is expected during the first year of the concession. The concessionaire will be required to provide its own locomotives and rolling stock after the first five years of the concession period.

Nature of Demand

Since the end of the political disturbances of the early 1990s, international as well as domestic tourists have been steadily returning to Machu Picchu, the most popular tourist destination in Peru. In 1993, 55 percent of the visitors to the ruins were foreigners. The South Eastern Division railroad provides the only land transportation to Machu Picchu as well as the popular Inca Trail.

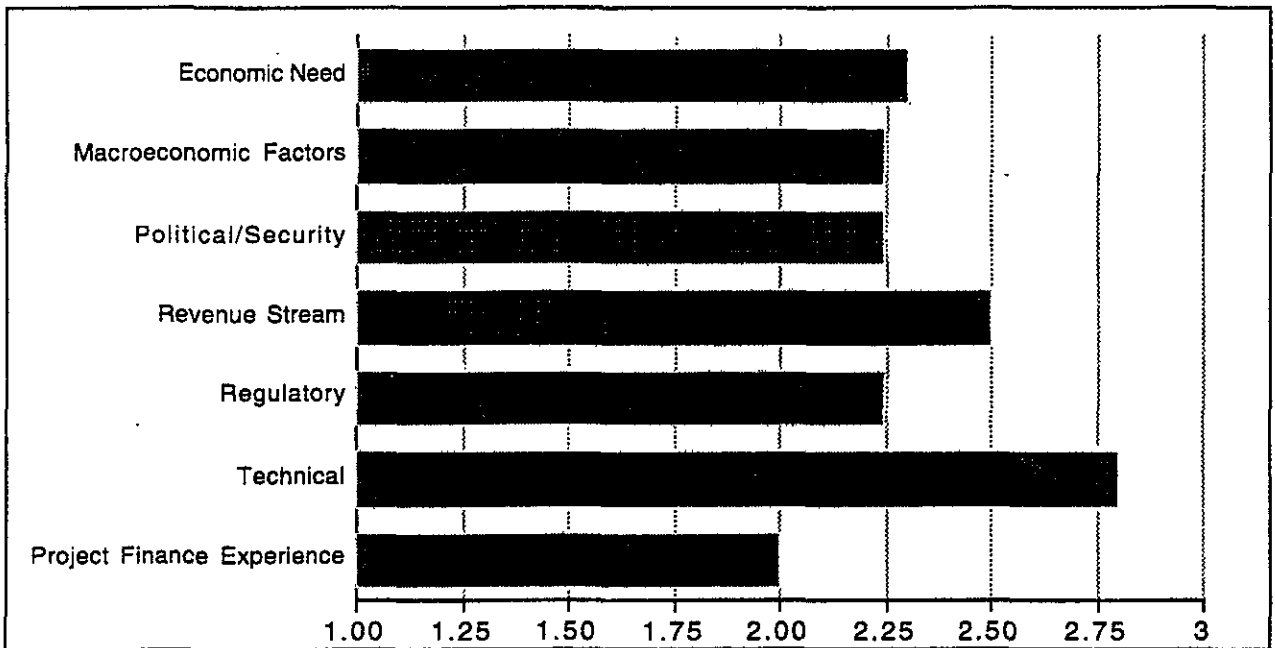
Between 1993 and 1994, the number of tourist passengers to Machu Picchu increased 77 percent. Continued strong growth is expected for the next several years. The South Eastern Division Railroad is expected to benefit not only from the overall increase in travel to Peru, but also from the growing number of U.S. and European "eco-tourists."

The demand for local passenger service is expected to remain steady over the foreseeable future. Demand for freight transport is also expected to remain relatively constant. This freight market consists primarily of consumer products (beer, soft drinks, etc.), agricultural products (coffee, fruit, vegetables) and supplies (chemical products, fertilizers.)

Financeability

The concession to operate the South Eastern Division of ENAFER will be offered for a 25-year period and will be renewed automatically every five years if the concessionaire complies with the terms of the contract. In return, the concessionaire will pay a pre-determined annual fee to the government. The concessionaire will be able to introduce its own operating and management practices, including hiring decisions. ENAFER will pay 100 percent of the severance costs associated with all former employees.

Financeability Assessment



Source: CG/LA Infrastructure. The Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for an explanation of the project scoring process.

Cuzco-Quillabamba Railway Concession

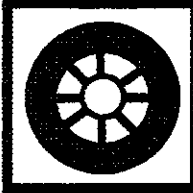
Infrastructure Project Profiles

Key Decision Makers

CEPRI-ENAFER
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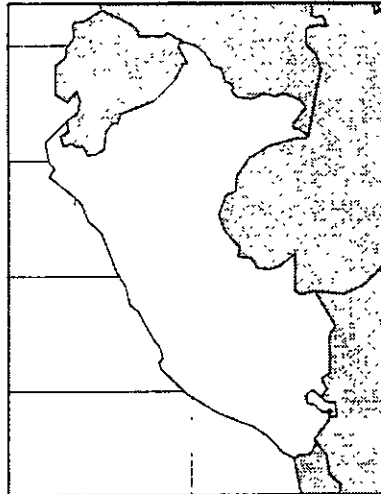
U.S. Contact Person:

Mercer Management Consulting
William Harsh, *Principal*
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Transportation/Peru

Ilo - Desaguadero Highway



Project Summary

Project No:	TRA-37
Subsector:	Road
Country:	Peru
Project Cost:	\$101 million
Export Potential:	\$16 million
Owner:	MTCVC

Technical Description

The Ilo-Desaguadero Highway is part of the Interconnection Corridor between Peru and Bolivia which will provide Bolivia direct access to the Pacific Ocean at the port of Ilo.

The current highway is 438 kilometers in length and its condition varies considerably. One hundred and two kilometers are already paved and in good condition; 109 kilometers are gravel roads; and 227 kilometers are dirt roads which are in bad condition and unusable during the rainy season.

The goal of the project is to construct a 397-kilometers asphalt highway, with a width ranging from 6.6 to 7.2 meters and a 1.2 and 1.5-meter shoulder respectively.

Construction will be carried out in 85 kilometer sections.

Site

The highway is located in the Provinces of Moquegua and Puno. It runs from Ilo, on the Peruvian coast, to Desaguadero, on the Peruvian border with Bolivia.

Ilo-Desaguadero Highway

Infrastructure Project Profiles

Timing

A \$1 million feasibility study financed by the Corporación Andina de Fomento (CAF) was completed in March 1995. Pre-qualification for the construction is planned to open in August 1995. Construction is expected to begin in 1996 and continue for 18 months.

Demand for Equipment & Services

This project will require services and materials for highway and drainage construction as well as for other civil works. Expected required equipment includes asphalt-laying machinery, minor bridge-building materials and heavy earth-moving equipment.

Nature of Demand

The objective of the highway is to provide Bolivia with a transportation link to the port of Ilo, whose viability as a port is largely dependent on the construction of the road. The completed feasibility study estimates that traffic demand will be driven by Bolivian and Brazilian trade with the Pacific Rim countries as well as Bolivian-Peruvian trade.

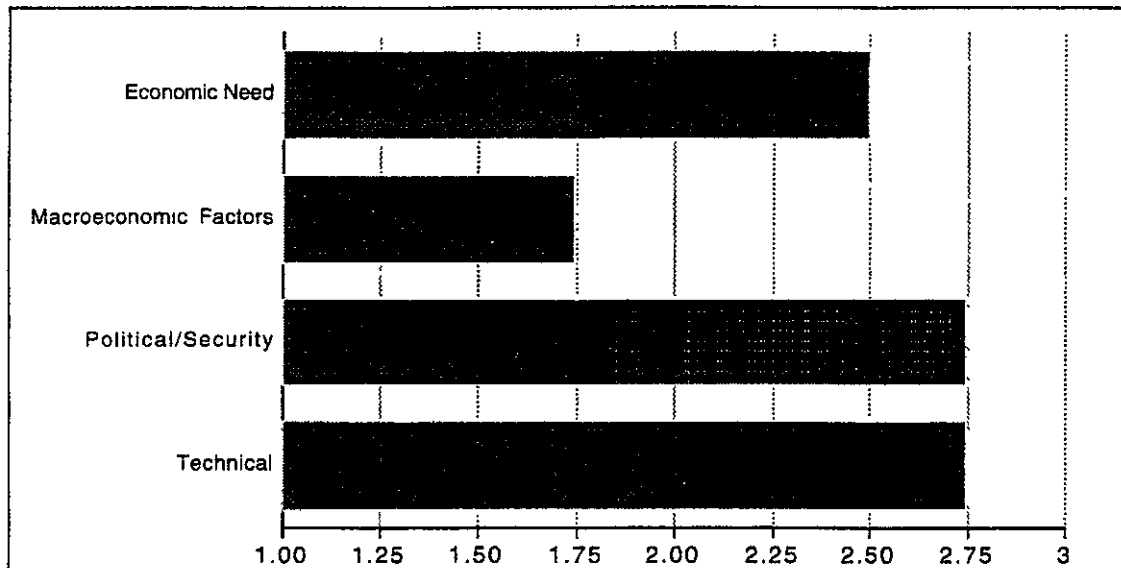
Traffic levels are estimated to range between 236 to 1200 vehicles a day with a high proportion being trucks.

Financeability

The project is a priority of both the Peruvian and Bolivian governments. Financing for the required U.S.\$101 million will be managed by CAF. Approval of the CAF's contribution of U.S.\$60 million is expected in the third quarter of 1995. Sources for the remaining U.S.\$41 million are still being sought.

There is no project finance or concession aspect to this project.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

Key Decision Makers

Ministerio de Transportes, Comunicaciones, Vivienda y Construcción

Ing. Waldo Carreño Meza, *Vice Minister of Transportation*

Lima, Peru

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Ing. Héctor Rosales, *General Director of Highways*

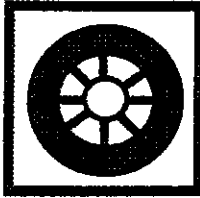
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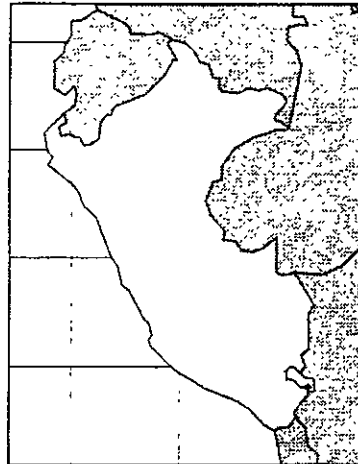
Related Projects

- Modernization of the Port of Ilo
- Desaguadero-Río Seco Highway Construction (Bolivia), which received an Inter-American Development loan of U.S.\$90 million in 1992.



Transportation/Peru

Jorge Chavez International Airport



Project Summary

Project No:	TRA-38
Subsector:	Air
Country:	Peru
Project Cost:	\$44-\$60 million
Export Potential:	\$44-\$60 million
Owner:	CORPAC

Peru's airports and air traffic control systems (ATCs) are supervised by the state-owned Corporación Peruana de Aeropuertos y Aviación Civil, S.A. (CORPAC). Operations at Lima's Jorge Chavez International Airport (JCIA) are managed by an entity called the JCIA Administration, which is responsible for passenger and cargo service, flight operations, and other administrative and business functions.

Technical Description

This project consists of upgrading and modernizing the radar environment at JCIA as a first step to modernizing the country's air traffic control systems and navigational aids, (ATC/NAVAID). The Lima Airport is approximately 30 years old and has not been improved or adequately maintained since it first went into service. The airport is both congested and inefficient.

The existing ATC/NAVAID equipment is outdated and requires significant maintenance expense. This system covers a radius of 50 nautical miles around Lima. Outside of this radius, the Area Control Center resorts to procedural separation of planes, i.e. 10 minutes between aircraft at the same flight level.

In addition to ATC/NAVAIDs, the JCIA is undertaking further improvements. These plans include the granting of a concession for the construction of a second floor, airplane access bridges at the international terminal and the operation of the terminal.

Jorge Chavez International Airport Upgrade

Infrastructure Project Profiles

Site

Lima, Peru

Timing

A feasibility study determining the exact requirements of the Jorge Chavez International Airport modernization is expected to be completed in July 1995 at the latest. Bidding is expected to start in September 1995.

Equipment & Services Demand

The first step in the Peruvian government's effort to expand surveillance radar air traffic control systems is to upgrade the JCIA. The feasibility study currently underway will define the precise requirements for the airport. Nevertheless, equipment purchases are expected to include the following:

- 5 airport surveillance radar systems (ASR) at a cost of U.S.\$1.5-U.S.\$4 million per system
- 1 airport surveillance system in ACC/APP configuration incorporating both primary and secondary surveillance radar digital systems (PSR/SSR), consoles, displays, dedicated communications switching systems etc. at a cost of U.S.\$25-33 million
- 1 radar data transfer system at a cost of U.S.\$7.5 million
- 5-6 Tomer Radar Systems (BRITE) at a total cost of approximately U.S.\$3.5 million
- Airplane access bridges

Further rehabilitation and modernization of the JCIA and the next three largest regional airports is expected to cost U.S.\$30-60 million.

Nature of Demand

The aviation sector in Peru is closely linked with the country's economic growth. The current positive growth trend experienced by the country is expected to increase the demands put on the transportation infrastructure.

The Lima Area Control Center currently handles approximately 110,000 operations annually, an equivalent of 300 per day. The number of operations is expected to increase to approximately 135,000 by 1996. Peru's overall domestic and international passenger traffic increased by 20 percent from 1993 to 1994, from 2,583,000 to 3,100,000.

In 1994, JCIA received 2.5 metric tons of domestic cargo and shipped out 6.7 tons. In the same year, it received 17.2 metric tons of international cargo and shipped out 21.6 tons. Both cargo and passenger traffic is expected to continue growing. It also handled more than 3 million arriving or departing passengers.

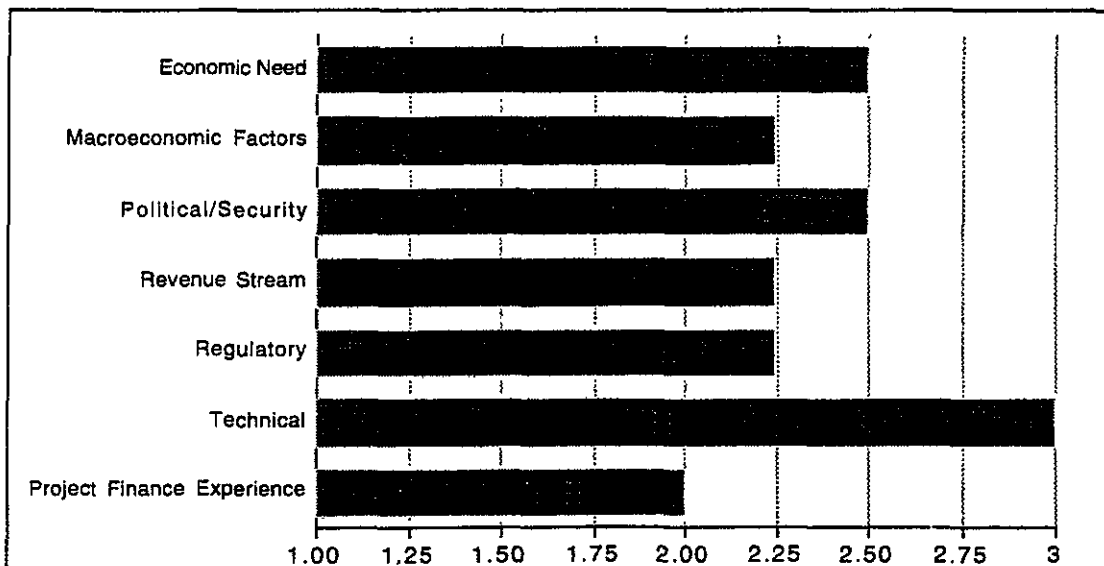
The current ATC/NAVAID systems also may serve as an impediment to economic growth due to inefficiency and safety concerns. For example, the usage of procedural separation for air traffic control causes costly traffic delays and hinders nighttime cargo transports to regional airports.

Financeability

The upgrading of the airport system is one of the Peruvian government's top priorities. The project is expected to be financed by retained earnings of the airport enterprise and commercial loans.

However, the final form of the financing package has still to be defined and may include concession options. A clear administrative structure for the entire air system upgrade must be implemented so that potential investors will know the "rules of the game."

Financeability Assessment



Source: CG/LA Infrastructure.

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Jorge Chavez International Airport Upgrade
Infrastructure Project Profiles

Key Decision Makers

CORPAC

Fernando L. Duarte Mungi, *Director Jorge Chavez International Airport*

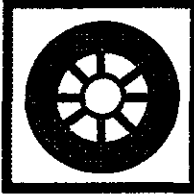
Lima, Peru

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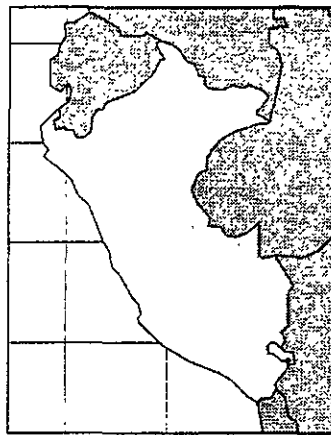
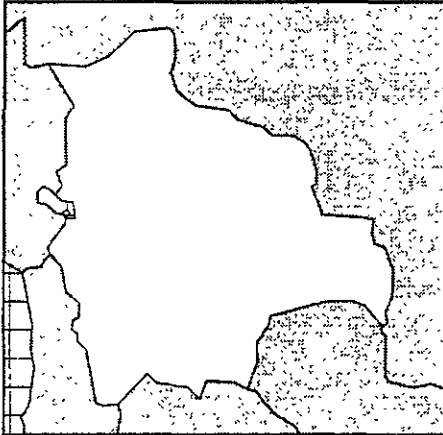
TDA Tip

The US TDA funded a Definitional Mission for this project which was completed in January 1995. The feasibility study currently underway is also funded by the TDA and the project is expected to generate up to \$60 million of US exports.



Transportation/Bolivia, Peru

Modernization of the Port of Ilo



Project Summary

Project No:	TRA-39
Subsector:	Ports
Country:	Peru, Bolivia
Project Cost:	\$10 million
Export Potential:	\$10 million
Owner:	MTCAC

In January 1992, the presidents of Peru and Bolivia signed the Declaration of Ilo. This agreement provides Bolivia with a highway between Ilo (in southern Peru) and La Paz, thereby giving Bolivia access to the Port of Ilo.

The Ilo Declaration also granted Bolivia special rights with respect to use of the Port, five kilometers of beach front to be used as a Free Tourism Zone and 165 hectares to be developed as a Free Industrial Zone.

The Bolivian Ministry of Transportation, Communications and Civil Aviation (MTCC) has the responsibility of coordinating all Bolivian interests in Ilo.

Technical Description

The Port of Ilo was constructed between 1968 and 1970, and began operations in May 1970. The port has four moorings connected to a 302-meter by 27-meter pier, a roll-on roll-off ramp, one office building, a repair and maintenance shop and four areas for storage.

The port is now only used by an average of 40 to 50 ships a year, totaling 160,000 tons of cargo. It suffers from lack of a road or rail connection with Bolivia and lack of specialized equipment to handle minerals and other bulk commodities. Fish flour represents 80 percent of the produce and materials

Concession and Modernization of the Port of Ilo

Infrastructure Project Profiles

traded through this port. Other products include fish oil and minerals. Currently, the port is operating at 60 to 70 percent of its total capacity.

The port developers wish to grant a 30 year concession, with a 10 year option, for operation of the port.

Site

The Port of Ilo is 1,300 kilometers south of Lima, Peru, and 507 kilometers west of the La Paz, Bolivia.

Timing

An international tender for private operation of the port should proceed in 1995.

Equipment & Services Demand

The feasibility study concludes that the minimum tonnage needed to make this port profitable is 175,000 tons per year. In order to reach this break even point, the port will require the following:

Improved management and port services
Cargo transfer points with highway or rail connections to Bolivia
Equipment to load minerals and bulk cargo

In addition, the port may need more storage areas, new warehouse equipment and a tug boat.

Nature of Demand

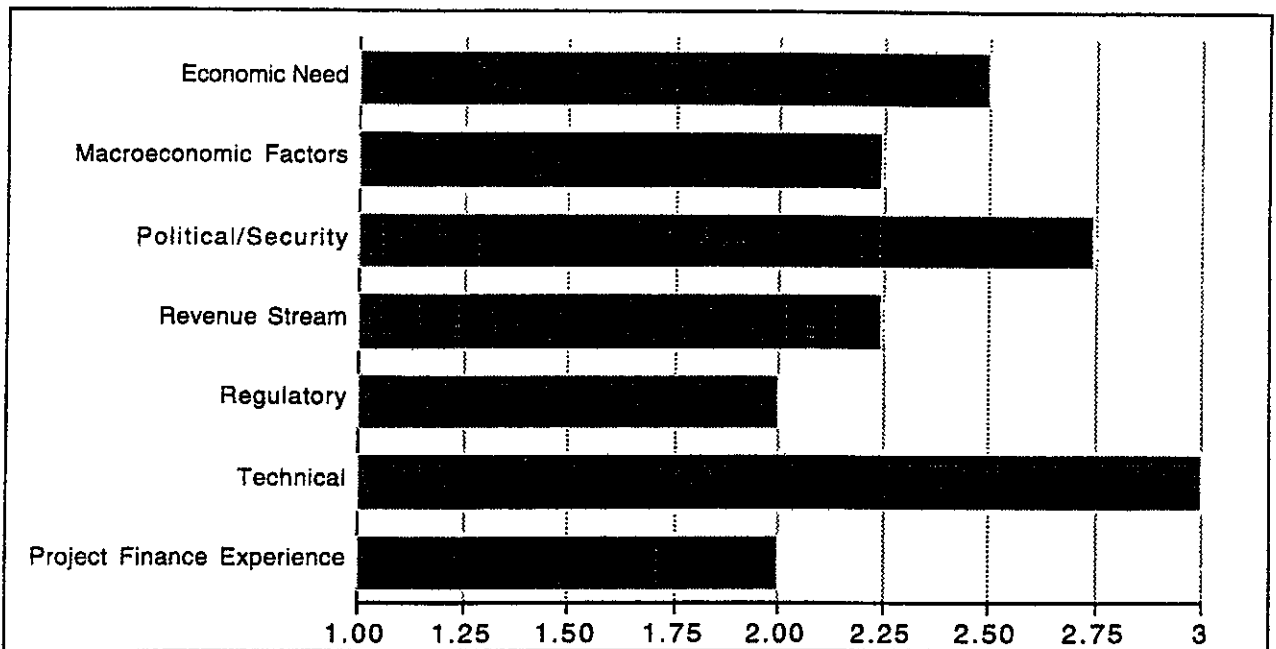
Although almost 70 percent of Bolivian trade currently goes through the Port of Arica, located in Chile, what makes this an important project for Bolivia is the relative proximity of the Port of Ilo to La Paz. A modern, fully functioning port in Ilo would substantially decrease transportation costs for Bolivian imports and exports.

Financeability

If plans for the expansion and modernization for the Chilean port of Arica come to fruition, the concession program for Ilo makes little economic sense. Ilo is no closer to La Paz than Arica and lacks the rail connection that currently links Arica and La Paz. On the other hand, if Arica is not expanded, the Port of Ilo takes on a larger economic importance for Bolivia.

There is strong Bolivian political interest in developing the Port of Ilo because it would represent, for the first time in some 115 years, direct Bolivian involvement in maritime affairs.

Financeability Assessment



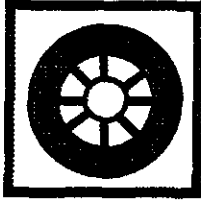
Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Concession and Modernization of the Port of Ilo

Infrastructure Project Profiles

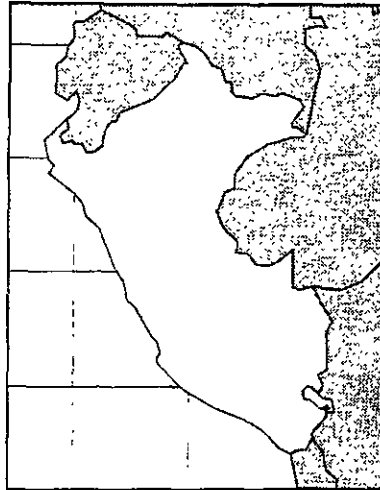
Key Decision Maker

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Transportation/Peru

Peruvian Port Concessions



Project Summary

Project No:	TRA-40
Subsector:	Port
Country:	Peru
Project Cost:	\$40-110 million
Export Potential:	\$260 million
Owner:	COPRI/ Concession

The Government of Peru is planning to award concessions for the operation and upgrading of eight Peruvian ports: Callao, Paíta, Salaverry, Chimbote, Huacho, General San Martín, Maturani, and Iquitos.

Technical Description

These eight ports currently receive about 5,000-6,000 vessel calls and approximately 10 million tons of cargo per year, generating revenues of approximately U.S.\$150-250 million, 60-70% of which is generated by Callao alone. The ports are now administered by ENAPU S.A., a state-owned company. The concession program is being planned and managed by Mercer Management Consulting, a U.S. consulting firm. The executing agency awarding the concessions is COPRI, the Peruvian privatization agency.

A preliminary plan would divide the ports into concession blocks. The port of Callao would be divided up into several components according to function. One concession would be awarded for the grain terminal, one or two for the petroleum and mineral terminals, and one for the container terminal. However, the specific arrangement will be determined by the study and plan being devised by Mercer Consulting. The remaining ports are likely to be bundled into a separate bloc.

The concessions are likely to contain a mandatory investment program, which will vary greatly from case to case. For example, the Port of Iquitos completed a \$15 million investment program in the first semester of 1995. The need for a mandatory investment program is currently being analyzed. A preliminary estimate would put necessary investment for the modernization of the system as a whole at U.S.\$40-U.S.\$110 million. However, the final amount and its distribution between the eight ports is yet to be determined.

VII-173

Peruvian Port Concessions

Infrastructure Project Profiles

Site

The Port of Callao is Peru's main port and is located close to Lima. Paita and Salaverry are located on the northern coast of Peru. Iquitos is a river port located in the northern jungle and General San Martin and Huacho are located on the coast of central Peru. Maturani is the southernmost port included in the concession program.

Timing

The basic study conducted by Mercer Management Consulting is expected to be completed in the middle of July 1995. The Development Plan, the Concessional Strategy, and the Framework for the Role of the State are planned to be completed by August 1995. Official information concerning the concession program is expected to be available in the middle of September 1995. The bidding process is expected to open in October 1995 and close at the end of November 1995.

Equipment & Services Demand

The investment plan is expected to include equipment such as Gantry cranes and grain terminal cranes as well as berth construction and rehabilitation materials. The precise requirements will be determined by the study conducted by Mercer Consulting. Additional investment will be left up to the individual concessionaire. A preliminary estimate puts the required investment at U.S.\$30-50 million.

Demand

The Peruvian port system is an essential part of the country's transportation infrastructure and has experienced rising demand with the acceleration of economic growth. The individual ports have the following characteristics:

CALLAO

Callao is one of the principal Pacific ports of South America. It is the main port for Peru and moves 70% of the country's maritime cargo, equaling approximately 7 million tons per year with about 2,000 vessel calls. It has 9 piers and 29 berths (including a container terminal) and handles minerals, oil, and general cargo.

GENERAL SAN MARTIN

This small port is a one wharf alternative and complement to Callao. The main goods handled are fishmeal and fertilizers. General San Martin handles 500,000 tons of cargo and attends 50-100 vessels per year.

HUACHO

Huacho is a small one-wharf port. Located 70 miles north of Callao it may serve as an alternative and complement to Callao. It currently moves up to 100,000 tons of cargo and attends about 20-30 vessels per year.

PAITA

Paita is the main port for northern Peru and is the only facility for imports and exports in the region, in addition to air cargo. It can serve container vessels and currently receives about 180 vessels and handles 300,000-400,000 tons of cargo per year.

IQUITOS

Iquitos is the main river port in the northern Peruvian jungle. It was recently modernized and moves exports such as wood, oil and other general cargo.

MATURANI

Maturani is the export center for southern Peru. It has three piers with modern port infrastructure, including container terminals. It currently moves 500,000-800,000 tons of cargo and is visited by 120-230 vessels per year.

SALAVERRY

Salaverry currently exports agricultural products, primarily sugar, and imports fertilizers. It moves approximately 700,000-800,000 tons of cargo and receives 70-130 vessels per year.

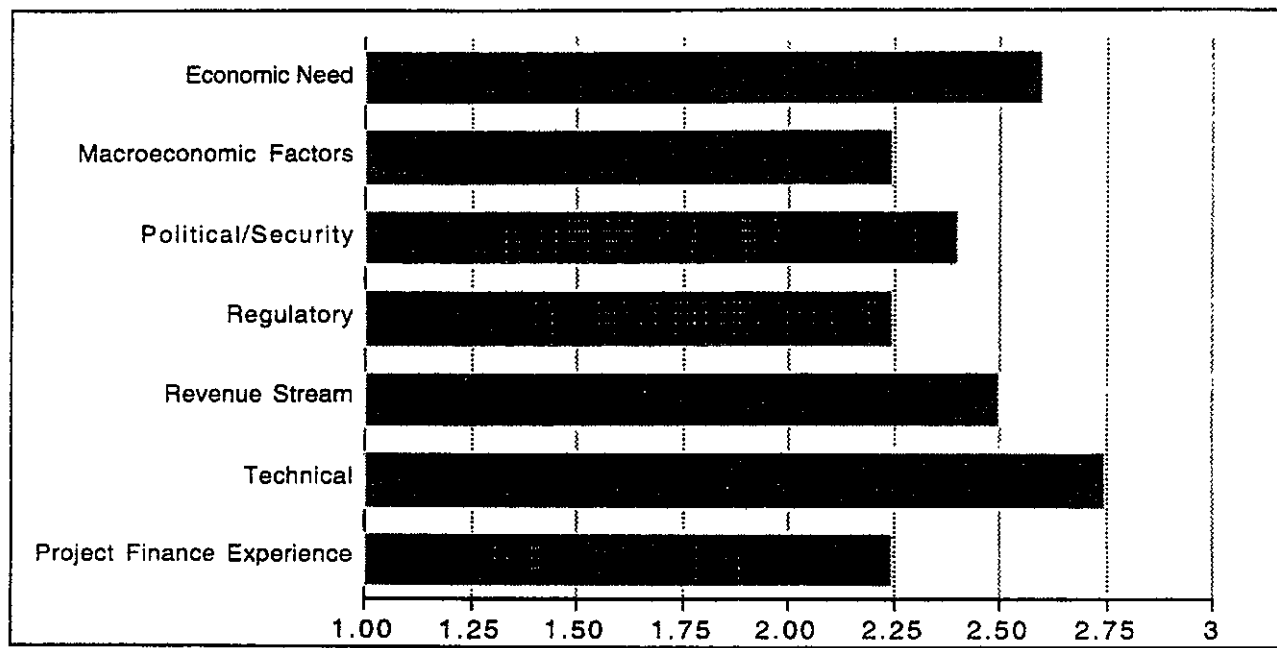
CHIMBOTE

Chimbote primarily imports coal and exports fishmeal. It moves up to 1.5 million tons of cargo and receives 150-200 vessels per year.

Financeability

The financeability of each concession bloc depends on the respective revenue stream versus the amount of required investment. From this perspective, the concession for Callao may be very attractive. The involvement of Mercer Management Consulting is likely to generate concession terms amenable both to private investors and the Peruvian state. Nevertheless, until the specific concession and privatization terms have been defined, only a most preliminary assessment of overall project financeability can be made.

Financeability Assessment



Source: CG/LA Infrastructure.
This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

COPRI

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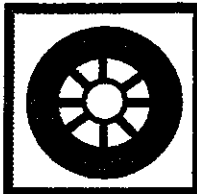
Mercer Management Consulting

Hans Jorge Luetjens

Lexington, Massachusetts

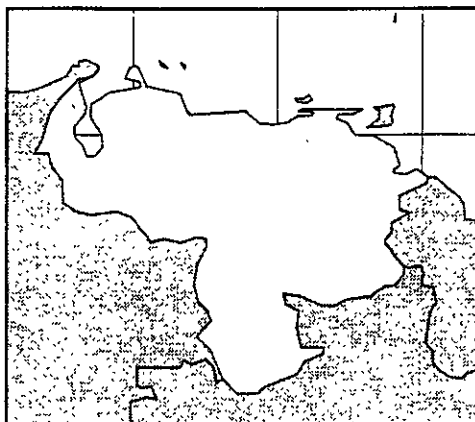
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Transportation/Venezuela

South East Caracas Light Rail System



Project Summary

Project No:	TRA-41
Subsector:	Light Rail
Country:	Venezuela
Project Cost:	\$454 million
Export Potential:	\$250 million
Owner:	Caracas Metro

Technical Description

The Caracas Metro is an independent agency operating under the Ministry of Transportation. This project consists of the construction and operation of a surface light rail line in southeast Caracas. The line will serve an area currently without any public rail transportation and connect with the existing metro system.

The Southeast Light Rail Line will be 15.2 kilometers long with ten stations. The line will be divided into two main parts, from La Trinidad to Las Mercedes, and from Las Mercedes to Plaza de Las Américas.

The section from La Trinidad to Baruta will begin as a surface line going underground as it approaches Baruta. Continuing underground through the valley of Prados del Este and Concreza, it will surface from Concreza to Santa Fé, continue underground again to Las Mercedes and Chuao, and end as an elevated line above the El Cafetal Boulevard.

The line will consist of 8.5 kilometers of twin tunnels, 3.2 kilometers of surface rail and 3.5 kilometers of elevated rail.

Site

The Light Rail Line will be located in southeast Caracas.

South East Caracas Light Rail System

Infrastructure Project Profiles

Timing

An economic feasibility study estimating ridership and economic feasibility was completed in April 1995, and concluded, on the basis of estimated ridership levels, that there is sufficient demand to make the rail line economically viable.

At present, Metro de Caracas is preparing a study on the feasibility and possible strategies for involving the private sector. After the conclusion of the study — should it prove favorable — the bidding process will begin in a period not to exceed ten months. This is estimated to be in the second half of 1996 at the earliest.

The first section, from Las Mercedes to La Trinidad, is expected to be finished by the year 2000.

Equipment & Services Demand

A substantial amount of the advanced equipment is expected to be imported. These items would include:

- Rolling stock
- Excavators
- Control and communications systems
- Escalators
- Auxiliary station systems, such as turnstiles and ticket vending machines

Services such as insurance, inspection, and technical consulting will also be required.

Nature of Demand

Current traffic congestion in Caracas, including the southeast part of the city, is severe. Although an expansion of the highway network is an option, the hilly terrain would make such an expansion very costly.

The traffic situation is expected to worsen as Caracas grows. Currently, the metro system transports 1,160,000 passengers per day. Under current scenarios ridership is expected to increase to 1,834,000 in the year 2010. The proportion of trips for which the metro is used is also expected to increase from 19 percent to 23 percent.

Southeast Caracas is one of the principal growth areas of the city. Located relatively close to the commercial sectors of the city, it offers a pleasant suburban living environment. This area is also the city's wealthiest sector with an average income twice that of the metropolitan average.

On one hand, this means that a substantially larger proportion of Southeast residents own and use cars for daily transportation. According to the economic feasibility study, in 1990, 47.7 percent of households in the Southeast had two vehicles or more, compared to only 14.8 percent in the metropolitan area. While 29.5% of Southeast residents had one vehicle, 28.5 percent of the average metropolitan residents in Caracas own one car.

On the other hand, Southeast residents can afford to use a high-end train service. Additionally, a substantial portion of trips initiated in the Southeast are destined for the center or the north of the city and are undertaken for work or study. Connections with the existing subway system would provide a very efficient and rapid method of transportation around metropolitan Caracas.

Financeability

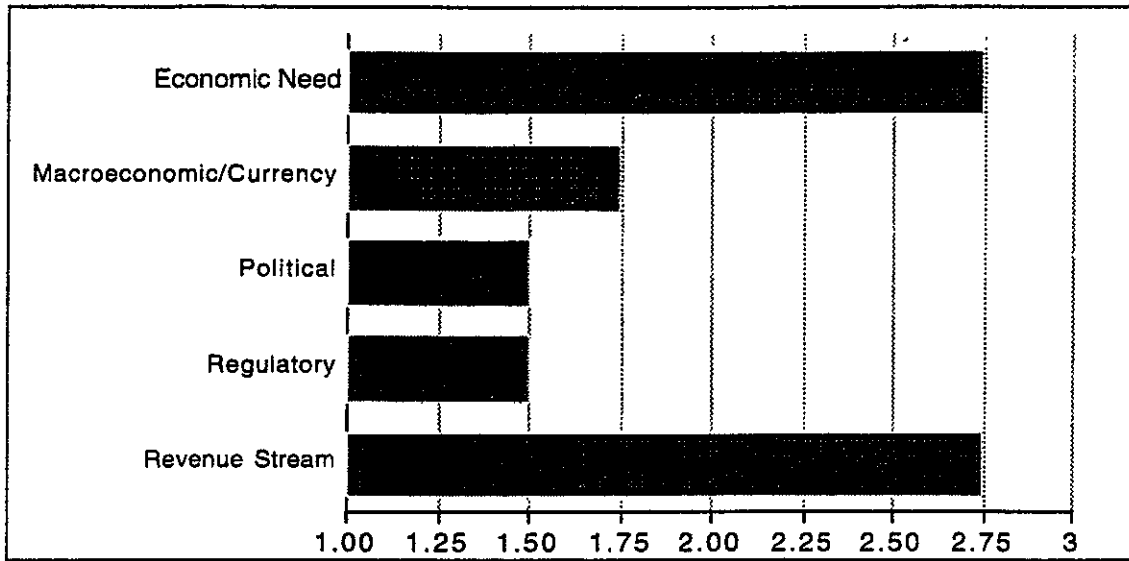
Initial feasibility studies indicate that the ridership and revenue base would be sufficient to support the construction of this light rail expansion. With the continued growth of Caracas and few other transportation alternatives, there will be increasing pressure to move forward with the project.

Financing difficulties, however, must be overcome on the national and macroeconomic level. Important legal changes will be required for the project to operate as a private concession, and it is not clear when the Venezuelan legislature will implement these changes. Venezuela's current economic and political difficulties, combined with restrictions on currency transactions, further complicates project financing efforts. These variables must be carefully monitored as the project develops.

South East Caracas Light Rail System

Infrastructure Project Profiles

Financeability Assessment

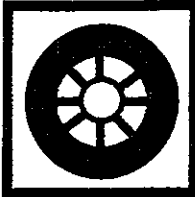


Source: CG/LA Infrastructure.

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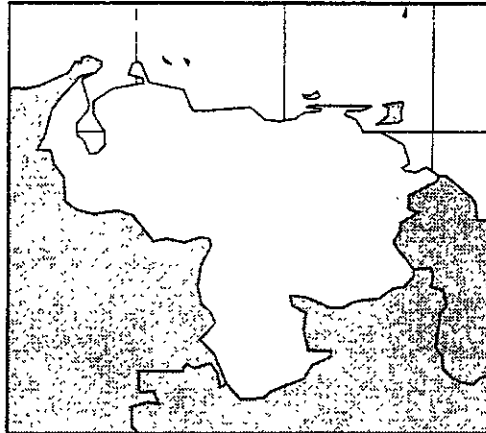
Key Decision Makers

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Transportation/Venezuela

Caracas Metro Expansion



Project Summary

Project No:	TRA-42
Subsector:	Rail
Country:	Venezuela
Project Cost:	\$443 million
Export Potential:	\$200 million
Owner:	Metro de Caracas

Caracas enjoys a modern subway system, but the city's growth and is putting an increasing strain on the existing network.

Technical Description

The Metro de Caracas is planning an expansion of the existing Line 2. The line begins at the Capuchinos station, currently in service, which was designed as a transfer point for four subterranean stations: Teatros, Nuevo Circo, Parque Central, and Plaza Venezuela. The structure of the line between stations is composed of 378 meters of single tunnels, 2,978 meters of twin tunnels, 1,268 meters of railroad trenches, and an additional 420-meter railroad trench to be used as a service connection between this line and Line 1. The rolling stock comprises of seven wagons per train, with a capacity of 1,610 passengers per train.

The construction will take place underground, without disruption of the major urban arteries. The city of Caracas will expropriate 75,793 square meters for the construction, as well 35,363 square meters of land, of which 19,866 square meters will be developed by the private sector following the completion of the project.

Caracas Metro Expansion

Infrastructure Project Profiles

Site

The project will be developed in central Caracas.

Timing

The project is expected to start in late 1995. The estimated period for construction of this project is 48 months.

Equipment & Services Demand

A substantial amount of equipment and services is expected to be imported. These items would include:

- Rolling stock
- Railroad tracks
- Train control system and communication systems
- Auxiliary station equipment such as escalators, turnstiles and ticket vending machines
- Insurance
- Accessories
- Excavators

Nature of Demand

The current traffic congestion in Caracas, especially in the downtown area, is severe. This situation is expected to worsen as Caracas grows. Currently, the metro system transports 1,160,000 passengers a day. Under current scenarios, ridership is expected to increase to 1,834,000 in the year 2010. The proportion of trips for which the metro is used is also expected to increase from 19 percent to 23 percent.

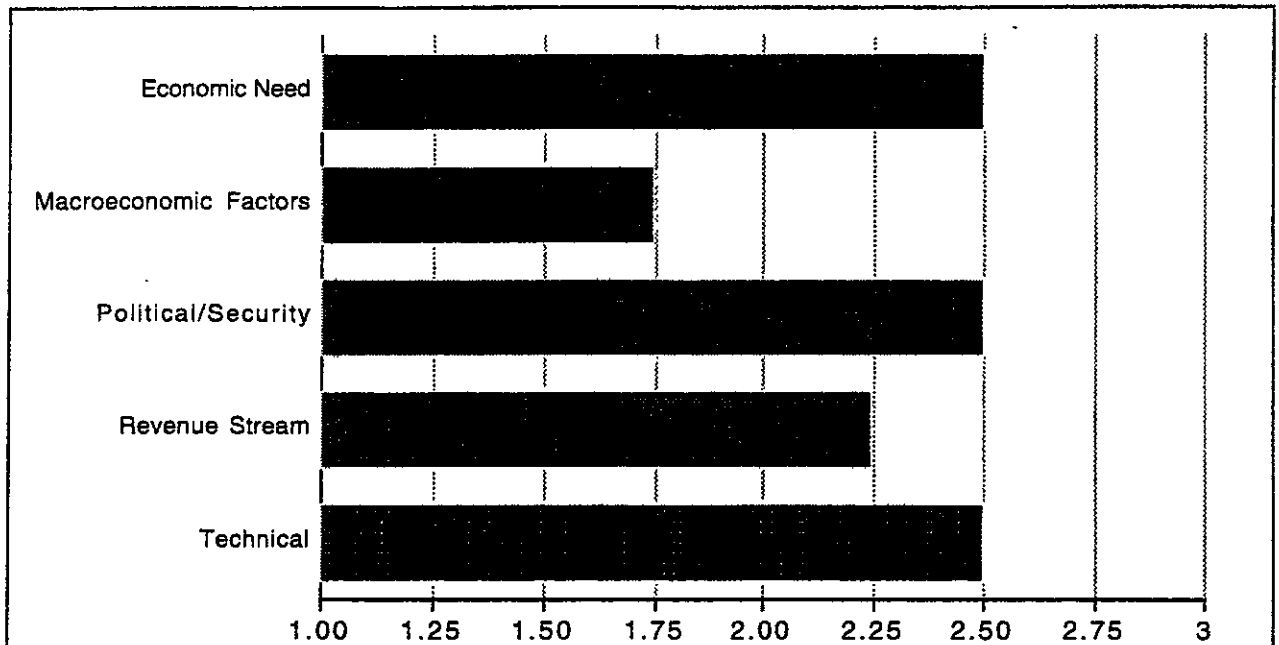
The new Capuchinos to Plaza Venezuela stretch of Line 2 will significantly expand and facilitate the metro network, especially in the densely populated central part of Caracas, which is currently serviced by Line 1. Under current conditions, the transfer stations for Line 1 and Line 2 (Capitolio-Silencio) cannot handle the large volume of passengers during the morning rush hour heading to the eastern part

of Caracas. The expansion of Line 2 will relieve the density of commuter traffic to the east of the city during rush hour. The downtown Caracas location of the new line guarantees a steady flow of passengers throughout the day.

Financeability

The project will be financed by the government of Venezuela with the support of multilateral institutions. There is a strong economic demand for the project, but Venezuela's current economic difficulties may slow financing and, consequently, project implementation.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Caracas Metro Expansion

Infrastructure Project Profiles

Key Decision Makers

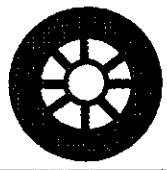
C.A. Metro de Caracas

Gregorio Tobia, *Corporate Manager, Corporate Planning*

Caracas, Venezuela

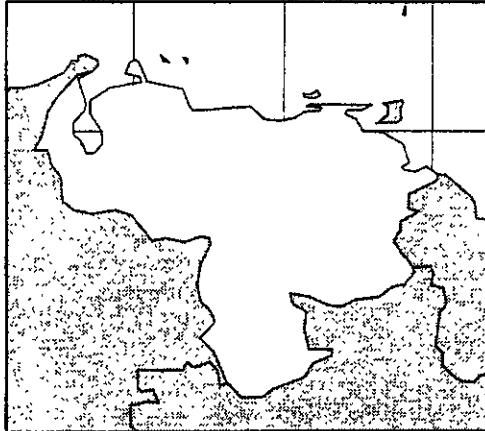
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Transportation/Venezuela

Ciudad Guayana Airport Concession



Project Summary

Project No:	TRA-43
Subsector:	Air
Country:	Venezuela
Project Cost:	\$120-180 million
Export Potential:	\$50-70 million
Owner:	Concession

Technical Description

The Venezuelan government is planning to offer a concession for a new airport located between Ciudad Bolivar and Ciudad Guayana in eastern Venezuela. This new airport would replace the existing airports of Puerto Ordaz (Ciudad Guayana) and Ciudad Bolivar. The concession would be for 20-30 years and involve building, operation, and maintenance of the airport.

In addition, a requirement to develop affordable housing complexes is currently under study. The development would be carried out according to specifications established by the Ministry of Urban Development. The revenue generated would be considered part of the revenue stream of the concession.

The new airport is planned to serve both tourism and cargo transportation needs related to the nearby petroleum installations.

The Bolivar state government has already selected the site and expropriated the property in May, 1995.

Timing

The airport will be located between Ciudad Bolivar and Ciudad Guayana, approximately 60 kilometers west of Ciudad Guayana, in eastern Venezuela.

Ciudad Guayana Airport Concession

Infrastructure Project Profiles

Timing

The earliest the bidding documents will be released will be in the first or second quarter of 1996.

Demand for Equipment & Services

In addition to air traffic control and navigational aid equipment, services and equipment to construct runways, terminal buildings, and air traffic control systems will be required. The precise amount and type of equipment will be determined by a feasibility study.

Nature of Demand

The existing airports in the area are not suitable for air cargo transportation. The airport would be located in an area which already has extensive petrochemical installations and is expected to grow substantially in the coming years. This will generate increasing demand for air cargo services.

Foreign companies are currently negotiating joint ventures to explore reserves of light oil. An agreement is expected to be signed before the end of 1995.

Financeability

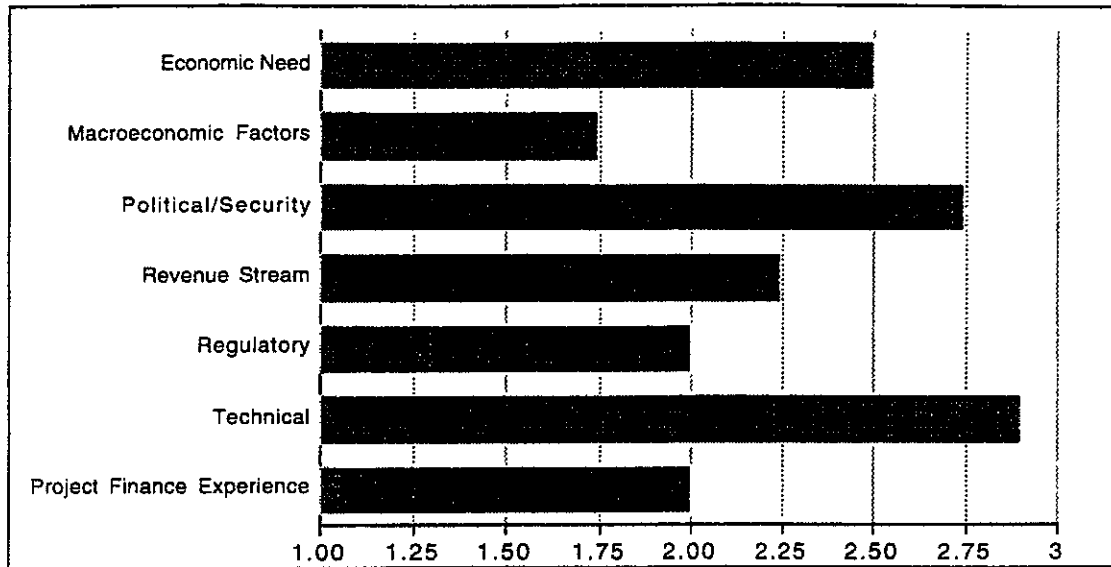
The Orinoco Tar Belt has 280 billion barrels of proven reserves of superheavy petroleum and exported as power plant fuel to countries such as Lithuania and Canada. Exports of crude oil derived from the super-heavy petroleum will also be economically viable once the price of oil exceeds \$20/barrel.

The newly discovered oil field located to the north of the airport site should also provide a steady source of hard currency revenue. The current airports do not have the capacity to provide adequate air cargo services; since they will be decommissioned upon the completion of the new airport, there will be no competition in the area.

The government is still considering on what basis the parties bidding for the concession will be allowed to recoup their investment. It is exploring options other than direct airport fees. This issue obviously needs to be further defined.

The other main variable is the projected air traffic volume. The government must determine whether it will pay any shortfalls if air traffic volume is less than anticipated.

Financeability Assessment



Source: CG/LA Infrastructure.

Thus Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see Project Finance section for explanation of project scoring process.

Key Decision Makers

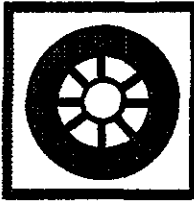
Ministry of Transportation, Ministerial Office of Concessions

Dr. Andrés Domiter, *Director of Concessions*

Caracas, Venezuela

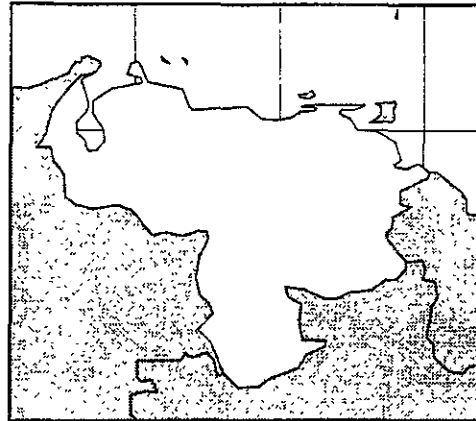
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Transportation/Venezuela

Puerto Cabello Containerization



Project Summary

Project No:	TRA-44
Subsector:	Port
Country:	Venezuela
Project Cost:	\$68 million
Export Potential:	\$58 million
Owner:	Concession

Puerto Cabello is currently the main port in Venezuela. In 1993, its operation was turned over to a private company. Since then, great progress has been made in increasing the port's efficiency. In fact, it is now a profitable enterprise after years of continual deficits.

The current Governor of the State of Carabobo, Enrique Sales-Romer, is interested in further modernizing the port by transforming it into a containerized facility. He is presently seeking outside funding for a technical/economic feasibility study.

Technical Description

This project is an expansion, modernization and upgrade of the existing port at Puerto Cabello. The program includes the construction of four new berths, berths 17-21, containerization of the port and the construction of additional warehouse space. The port upgrading would consist of two parts. First, the actual containerization and construction. Second, railroad and highway connections need to be upgraded to efficiently handle the transportation of containers to and from the port.

The container port will be built by a private company or consortium in which the state government of Carabobo may have a stake. Operations will subsequently be turned over to the private sector, as have already been done with the other services of the port, e.g. warehousing and cargo handling. This will take the form of either privatization or a long-term concession.

Puerto Cabello Containerization

Infrastructure Project Profiles

Site

Puerto Cabello is located in the State of Carabobo, northwest of Caracas.

Timing

Governor Sales-Romer leaves office at the end of 1995. It is his aim to have the project on a clear development path by the end of his term. The expansion is expected to take place in 1996-1997.

Equipment & Services Demand

The governor and people associated with current port operations are very interested in working with U.S. firms and purchasing U.S. equipment. The main component that is required consists of seven Gantry container cranes, estimated at U.S.\$7.5 million each, at a total cost of \$52.5 million, and associated equipment.

Access roads and railway connections will also need to be constructed in order to make the port fully multimodal and take advantage of the containerization. This construction is estimated at U.S.\$10-15 million.

Nature of Demand

Puerto Cabello possesses a number of qualities that could enable it to greatly expand its volume of port business and its profitability. Already Venezuela's principal port handling about 60 percent of sea cargo entering the country, it is strategically-located to serve an industrial region that should see considerable growth in the future. In 1994, the port served 1911 ships and received approximately 5.2 million metric tons of cargo. It also handled approximately 10,000 containers and 2.5 million metric tons of grain.

The containerization of Puerto Cabello would lower shipping costs significantly. This would generate demand among the direct users of the port, such as shipping companies, producers and manufacturers, who import and export goods through the port. Lower shipping costs, resulting in lower prices, should also raise demand among consumers and purchasers of goods shipped through the port.

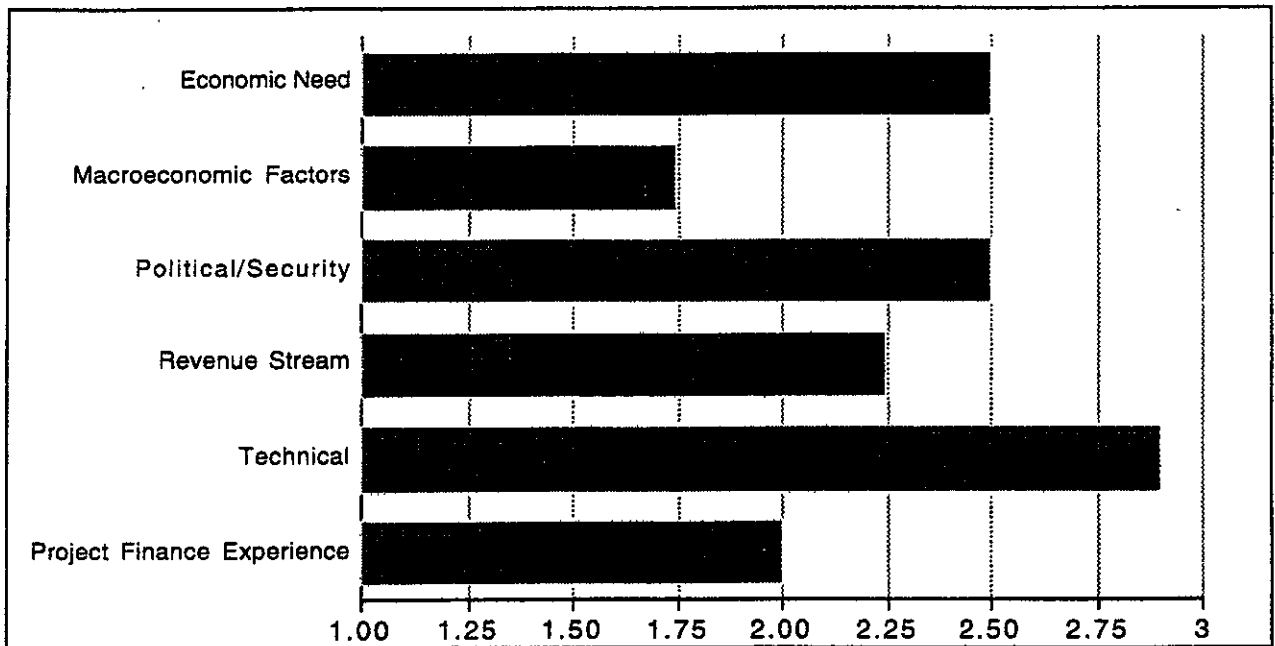
Financeability

Overall economic demand for the project is strong and Puerto Cabello is well positioned to continue to function as the country's principal port. The project also enjoys strong local political support. In addition, the positive experience of the first phase of privatization demonstrates that the port can be profitable under private management.

At the same time, the port's history of debt and mismanagement under the state (which was only recently reversed) will raise concerns among financial institutions. A second obstacle is that a successful containerization upgrade will require the creation of transportation links which currently do not support containerization. Thus both projects will need to move concurrently for either to be financeable.

The completion of a more detailed feasibility and financial assessment is required before a more definitive opinion can be made on financeability.

Financeability Assessment



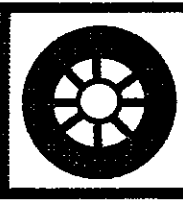
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Puerto Cabello Containerization

Infrastructure Project Profiles

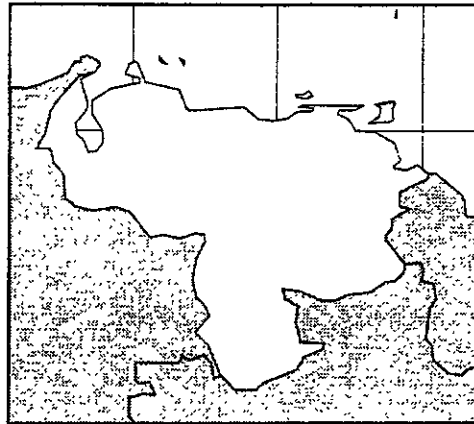
Key Decision Maker

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Transportation/Venezuela

San Cristobal-San Antonio Expressway



Project Summary

Project No:	TRA-45
Subsector:	Road
Country:	Venezuela
Project Cost:	\$150 million
Export Potential:	\$90 million
Owner:	MTC

The reduction of tariffs between Colombia and Venezuela has spurred bilateral trade and growth in highway traffic between the two countries. Under the Colombian-Venezuelan Bi-National Highway Program, the government of Venezuela is planning to open bidding by the end of 1995 for the construction of the San Cristobal - San Antonio Expressway, part of a larger highway that will connect San Cristobal, Venezuela with Cúcuta, Colombia. The Ministry of Transportation and Communications (MTC) is responsible for the Venezuelan portion of this project, as well as a smaller highway construction project on the Venezuelan side of the border.

Site & Technical Description

The San Cristobal-San Antonio Expressway will connect these two cities located in the Tachira State, in western Venezuela on the Colombian border. With the final stretch to Cúcuta, the expressway will have a total length of 50 kilometers. In addition the MTC wants to construct a new, 13-kilometer highway between La Fria and the Colombian border town of La China.

The estimated cost for the two highways is U.S.\$150 million and construction is expected to take four years. Seventy percent of the total cost is guaranteed with multilateral credit, and the remaining 30 percent will be covered by local funds.

San Cristobal-San Antonio Expressway

Infrastructure Project Profiles

Timing

After the MTC finishes pre-investment and feasibility studies, it will open the bidding process for the two highways. Bids are expected to close by the end of 1995. A four-year construction period is expected.

Equipment & Services Demand

The highway will require services and materials for highway and drainage construction. This will include paving, bridge building, tunnels, construction of intersections, and bypasses, as well as other civil works.

Due to the nature of the terrain, the MTC is expected to select a company that is highly specialized in highway engineering, with a strong topographical and geological background.

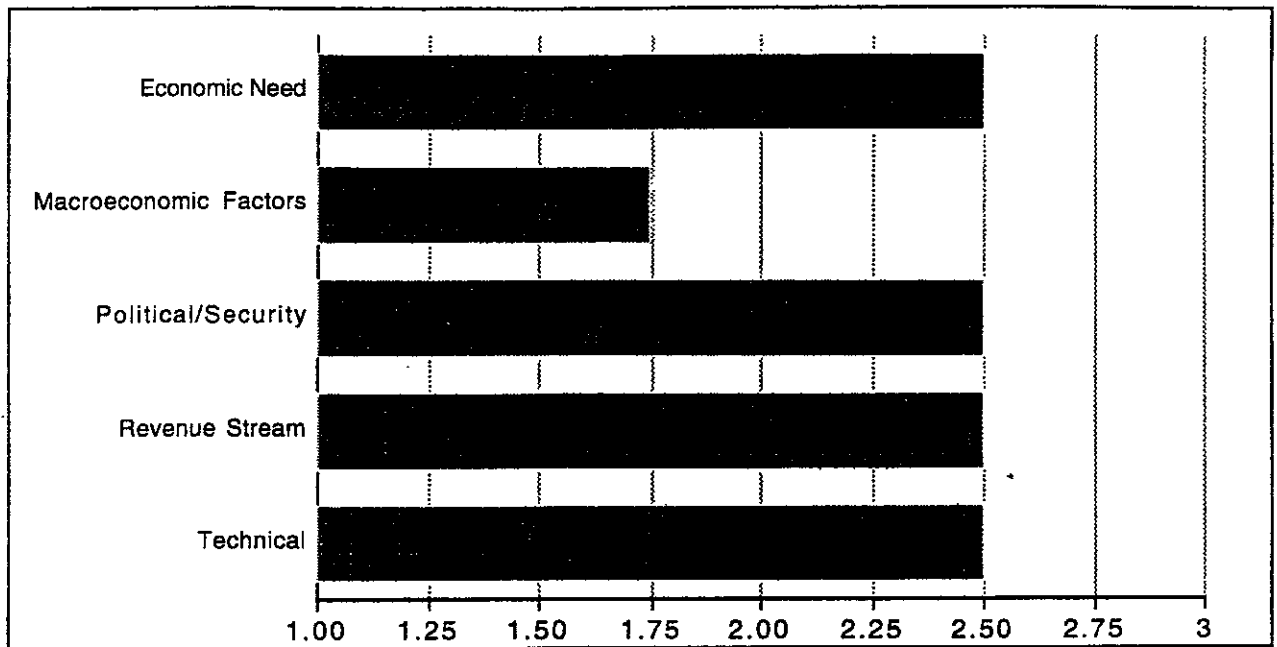
Nature of Demand

The construction of these highways would support the economic integration of Colombia and Venezuela by providing better road access between the two countries. In addition, these projects will increase accessibility to the port of Maracaibo for products manufactured in both countries.

Financeability

Financing arrangements are complete. This project will be financed by the Corporación Andina de Fomento (70 percent) and by local sources (30 percent).

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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The Environment Sector

in South America



Introduction

Two major trends characterize the South American environmental sector. First, the water/wastewater subsector is clearly the highest priority for the governments of the continent and is the market that will see the largest growth and investment. Second, governments across the continent are turning to the private sector to play a major role in areas that were traditionally reserved for government agencies. In particular, municipal water/wastewater concession projects and privatizations of sanitation companies (a trend particularly strong in Argentina) have opened up a huge new area for private sector firms.

Eighteen Environmental Projects

Total value	U.S.\$4.8 billion
U.S. Export potential	U.S.\$3.5 billion
Water/wastewater	12
Hazardous Waste	5
Air Pollution	1

The Environment Sector in South America

The development of this new kind of market is problematic for U.S. environmental firms. To date, large French water companies such as Generale des Eaux and Lyonnaise des Eaux and large British companies such as Thames Water and Bi-Water, have dominated the new concession market. Because of a lack of tradition in the U.S. of private sector companies building, operating and maintaining large municipal water and wastewater systems, few U.S. firms have even attempted to participate in a market that calls for strong turnkey credentials and strong financing capabilities.

Another caveat bears emphasizing. The South American countries are building up their environmental infrastructure from very low bases. Their needs are different from those of the United States and western European countries. These countries are generally looking to provide basic environmental services that may never have been provided before and need to do so with relatively small economic resources. With a few exceptions, the South American countries are not looking for the latest hazardous waste remediation technologies, nor are they yet focusing on hazardous air pollutants. They are focusing on present tense pollution and on major public health issues.

Financing environmental activities in South America will be a challenge, but it is a challenge that must be overcome if the U.S. is to achieve a market presence. Naturally, there is a market for equipment and services. Multinationals and the largest domestic corporations, for which financing is not necessarily that difficult, will present the best opportunities. However, for the burgeoning build-operate-transfer (BOT) or concession municipal wastewater market, putting together creative financing packages may well be more important for the successful implementation of the project than the type of technology proposed.

Finally, despite the emphasis on municipal water/wastewater projects, hazardous waste treatment and disposal is an area that presents a number of interesting opportunities and in which a creative, entrepreneurial approach may produce valuable returns.

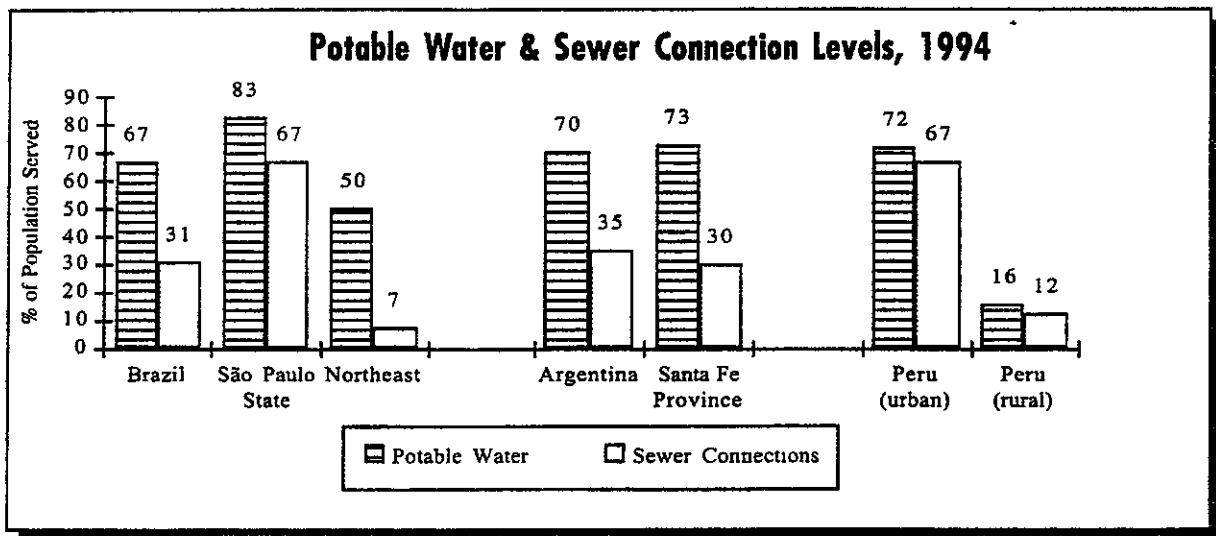
Demand & Key Trends in South America's Environmental Sector

While the energy, telecommunications and transportation sectors have a clear and compelling economic driving demand for expansion across the continent, the environmental sector is different. It is not immediately obvious that installing wastewater treatment plants or expanding potable water connections will raise a country's GDP in the short term. Rather, we believe the growing emergence and strength of the democratic movements throughout the continent is supplying the necessary support behind the willingness to undertake or at least sponsor many new environmental projects. A growing environmental consciousness among many sectors of the population is forcing elected officials to take voter's concerns very seriously.

In addition, the outbreak of cholera, principally among low income residents, in many of the countries of the continent in 1993 and 1994, has generated a level of vigilance among governments of the region to ensure that there is not a repeat. The most effective steps to prevent such a reoccurrence is to expand clean drinking water supplies and sanitation services.

Potable Water, Sewage and Wastewater

The South American countries are making major efforts to address significant shortfalls in the provision of water and sanitation services. Wide differences exist among the South American countries with respect to that percentage of the population which enjoys potable water and sewer services. Although Argentina enjoys relatively high per capita income, it has only an average record with respect to providing sanitation services. For example, even in the metropolitan area of Buenos Aires, only 60% of the population enjoy piped potable water and only 50% have sewer connections. In the provinces, the situation is even worse. In Brazil, the more developed southern part of the country enjoys slightly higher coverage for potable water and sewer connections, but the situation is dramatically worse in the Northeast.



Source: Brazil: National Health Foundation and Brazilian Association of Sanitary Engineering; Argentina: Federal Potable and Sanitation Council and Provincial Directorate for Sanitary Works, Province of Santa Fe; Peru: U.S. AID

All over South America, wastewater treatment is just beginning to be implemented. For example, a major concession project in Bogota, Colombia represents that country's first large scale urban treatment facility. Only a small percentage of São Paulo's sewage receives any kind of treatment, although construction has begun on two large facilities to increase treatment capacity significantly. Two medium sized cities in the interior of São Paulo State have completed bidding processes for wastewater concessions and many more are expected to follow suit later this year and in 1996.

Hazardous Waste

Hazardous waste treatment is an area that should soon see explosive growth. While we were able to identify only a single hazardous waste project (the Brazilian plasma project), a number of private sector groups and consortia appear to be developing projects that will create a real market where otherwise only a potential market existed.

There has been a "chicken and egg" syndrome in South America with respect to hazardous waste treatment. Heavy industry has been generating large quantities of hazardous waste, but because of few or no treatment or disposal options, on-site storage has been the preferred management method. Outside environmental firms with appropriate technology have been reluctant to invest the required funds and development time because they have been skeptical that governments in the region will enforce environmental laws and regulations requiring treatment. And in certain instances where environmental permits and licenses have been issued to proceed with construction and operation of hazardous waste treatment facilities, local opposition to siting have frustrated efforts to proceed. (This has been the case for a treatment facility to service industry in greater Buenos Aires.)

Notwithstanding these problems, there is a case in Brazil where a consortium comprised of a U.S. developer, a technology partner and various Brazilian companies and investors have worked closely with the environmental agency of the State of São Paulo (CETESB) to develop a project that uses a well established U.S. technology for blending various liquid hazardous wastes for offsite burning in cement kilns. Permits to build and operate are expected to be issued this summer. This type of approach, which required careful evaluation of the market and the most appropriate technology, and a willingness to work closely with the environmental agency in question, may serve as a model for future

Air Pollution Control

hazardous waste projects across South America.

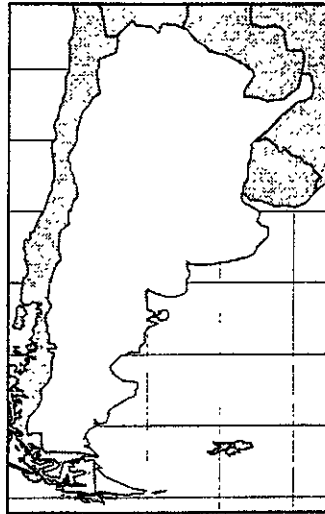
Although most large South American cities have severe air pollution problems, there is as yet little impetus to attempt to seriously address the problem. Specific industries are being targeted to install air pollution control equipment and progress is being achieved in individual cases, but the more difficult pollution problems originating from vehicular traffic have generally not been addressed.

One meaningful attempt in this area is São Paulo's recently announced vehicle emission testing program. It is being closely watched in Brazil and, if successful, will most likely be replicated in Rio de Janeiro and Belo Horizonte. TDA funded a study in Mexico City that established the feasibility of fleet vehicle conversion to utilize compressed natural gas as fuel. The contractor, PDI International, of Texas, has received inquiries from several municipal authorities.



Environment / Argentina

Buenos Aires Water Privatization



Project Summary

Project No:	ENV-01
Subsector:	Water and Sewerage
Country:	Argentina
Project Cost:	\$3bn-\$5bn
Export Potential:	\$1bn+
Owner:	To be determined

Argentina has been a leader in establishing the trends privatizing a wide range of state-owned and state-run enterprises. Successful privatizations have occurred in the energy sector (generation, transmission and distribution), the airline industry and in water and sewage (City of Buenos Aires and a number of provinces).

The Province of Buenos Aires (to be distinguished from the City of Buenos Aires) comprises an area about the size of New England and encompasses both Argentina's richest agricultural lands as well as the country's highest concentration of industries. Despite its relative wealth, basic sanitation services are surprisingly inadequate. Only 35 percent of homes are connected to sewer systems and only 58 percent are provided with running water.

The provincial government is seeking to reverse this situation by working with the municipalities, private-sector companies, and investors to establish a provincial-wide program for the provision of potable water and sewer services.

Technical Description

The project calls for providing 2.2 million homes with hookups to public sewer systems and 1.4 million connections for potable water supply. The project is in the earliest planning stage, and the provincial

Buenos Aires Water Privatization

Infrastructure Project Profiles

government is seeking advice on the best way to proceed. However, since a number of other Argentine provinces have already privatized or are in the process of privatizing state energy and sanitation companies, it is highly likely that a workable project can be structured.

If fully implemented, the Buenos Aires Province waste and sewer privatization will be one of the largest sanitation infrastructure projects ever carried out in Latin America.

Site

The entire Province of Buenos Aires.

Timing

This will be a multi-phase project, beginning this year and continuing over the next three to five years. It is unlikely that actual bidding for discrete project activities will begin before 1996.

Equipment & Services Demand

The government estimates a global cost of U.S.\$5 billion. The potable water component is estimated at U.S.\$1.5 billion and the sewage component is estimated at U.S.\$3.5 billion.

Equipment and materials required included potable water systems, pumps, pipelines and construction equipment. Engineering and design services will also be required.

Nature of Demand

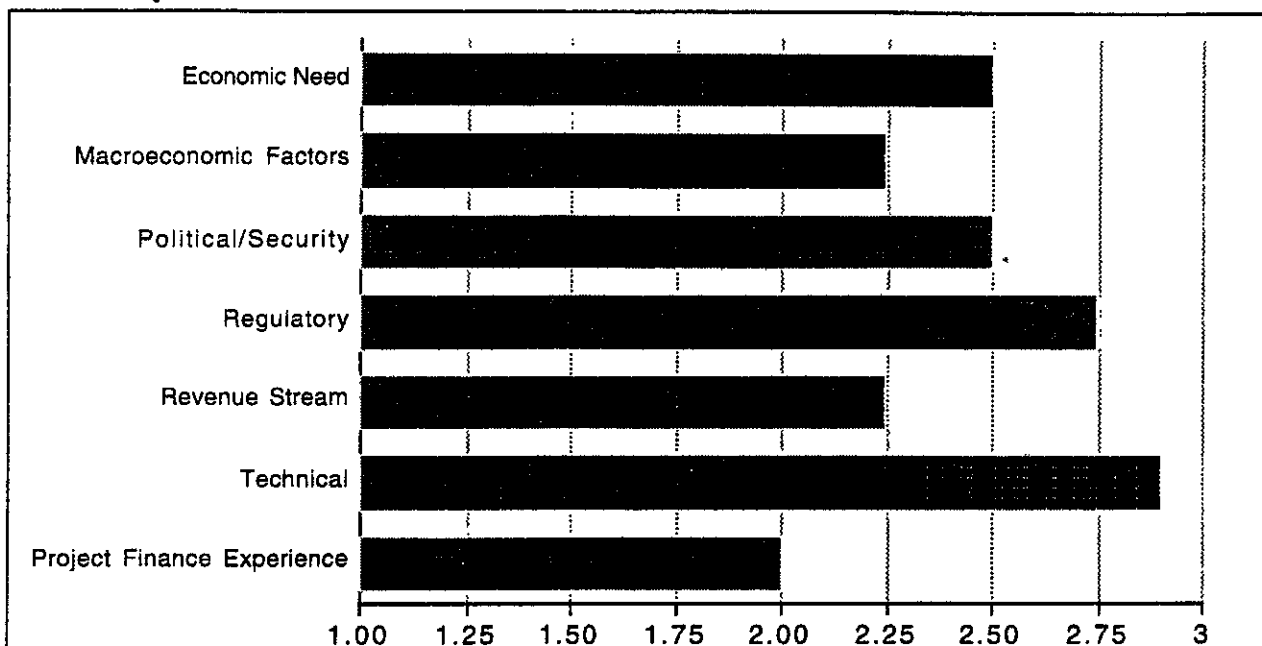
The basic demand originates in the provincial government's recognition that it must respond to the public's demand for sanitation services. Indeed, there is a general recognition at all levels of government in Argentina that the low levels of potable water and sewage coverage need to be dramatically increased.

Financeability

Project financeability will be driven by high per capita incomes within the province and a strong regulatory framework under which to operate a private water system. A positive precedent for the project is the Buenos Aires successful privatization of Buenos Aires City water and sewage system in 1994.

The project will need to overcome the difficulty of collecting fees from consumers to cover the true cost of water provision. This service was previously subsidized or even free. Our assessment, however, is that consumers in the province, when given a choice between free but inadequate water and sewer service and a high-quality paid service will opt for the paid service. At this time, there are no government guarantees or contributions planned for the concession.

Feasibility Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

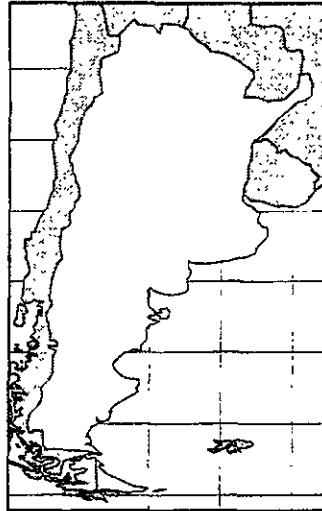
Key Decision Makers

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Environment/Argentina

Corrientes Solid Waste Management



Project Summary

Project No:	ENV-02
Subsector:	Solid Waste
Country:	Argentina
Project Cost:	\$40-50 million
Export Potential:	\$20-25 million
Owner:	To Be Determined

As is typical across most of Argentina, solid waste collection and disposal in the Province of Corrientes is carried out without regard for environmental standards. Residential, commercial and industrial wastes are comingled and disposed of in unlined landfills or are simply dumped in open areas and then burned. Access to disposal areas is often uncontrolled. The laying of daily or even weekly cover and compaction is frequently not practiced.

The provincial government is planning to improve the solid waste management programs in places across the province and to implement new ones where necessary.

Technical Description

A TDA-funded feasibility study is currently being conducted by the Johnson Co. of Vermont. At this time only the first progress report has been issued. A second progress report is due in September 1995 and the final report is due in December 1995.

The feasibility study will identify and characterize the current waste generation, evaluate current waste management trends, identify waste management needs, and present findings as well as recommendations. One of the key issues is how industrial waste should be handled so that it does not pose a threat to the local environment.

Corrientes Solid Waste Management

Infrastructure Project Profiles

Site

Specific solid waste management programs will be implemented in the major municipalities throughout the province.

Timing

The feasibility study is expected to be finished in December, 1995. The provincial government is planning to proceed with project implementation as soon as possible, but has not yet decided whether to initiate a bidding process, use direct negotiated contracts, or use a combination of both approaches.

Equipment & Services Demand

The exact list of equipment and services will depend on the results of the completed feasibility study and the specific programs the government wishes to implement. Given the demographics of the province and its rural nature, it is highly likely that upgraded landfills will be the disposal option of choice. In that case, engineering, design, and construction services will be required, as will landfill liners, bulldozers and compactors, leachate collection systems, and monitoring equipment.

Nature of Demand

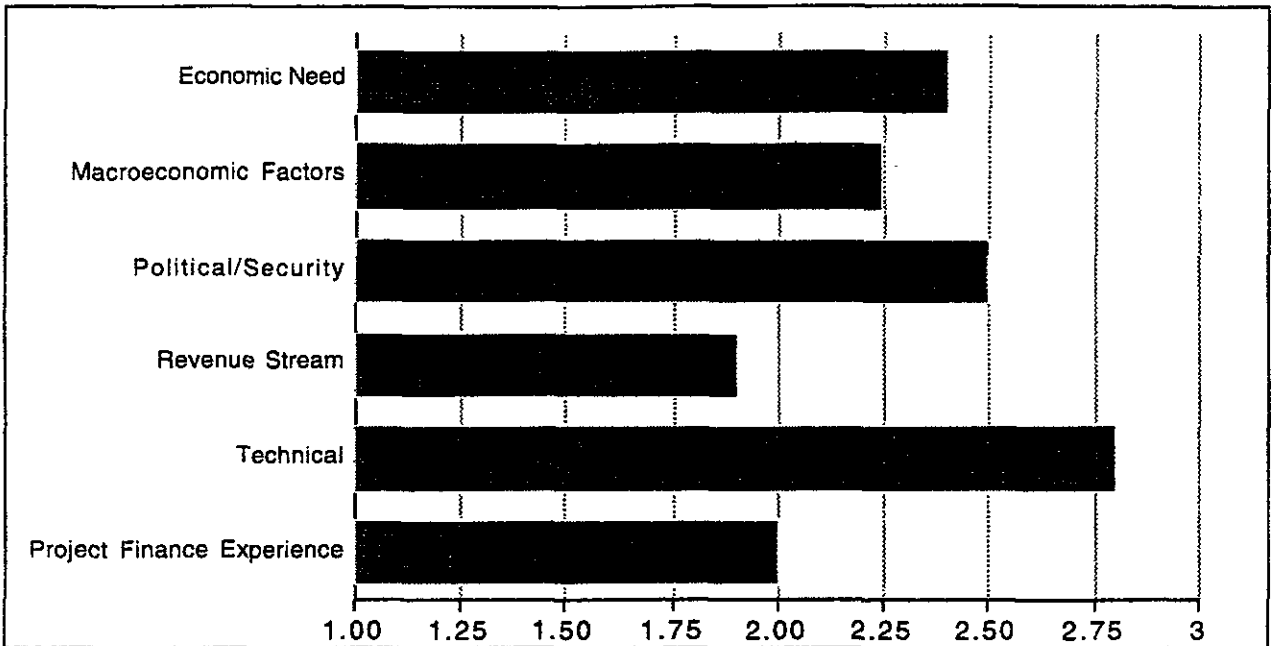
Poorly constructed and managed landfills are public health hazards. They generate unhealthy runoff, contaminate groundwater supplies, and attract rodents and birds which can then spread various diseases. In addition, the commingling of residential and industrial (including hazardous) wastes can create explosive and other imminently hazardous conditions.

The provincial government is committed to reducing public health hazards by upgrading the way solid waste is handled all across the province.

Financeability

Since the feasibility study is still in progress, a thorough financeability analysis is not possible. However, a key factor is the financial ability of the population to pay for upgraded disposal services. It is unclear whether the private sector will invest the necessary funds for such upgrading, or whether at least a part of the project must be financed from international lending institutions. On the other hand, there are few difficult technical issues to be resolved.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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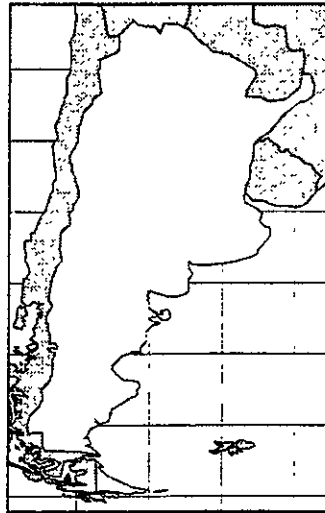
TDA Project Tip

Numerous opportunities in the Latin American environmental sector exist at the provincial or state level. Two such projects in Corrientes, Argentina, are being targeted by TDA. A TDA-funded feasibility study, conducted by the Johnson Company, will evaluate the needs of the province and recommend a solution to its waste management problem.



Environment / Argentina

Corrientes Water and Wastewater Management



Project Summary

Project No:	ENV-03
Subsector:	Wastewater
Country:	Argentina
Project Cost:	\$100 million
Export Potential:	\$50 million
Owner:	Aguas de Corrientes S.A

Aguas de Corrientes S.A. was granted a 30-year concession to provide water and wastewater services in the province of Corrientes (population 1.2 million). The company will be required to make substantial investments in water/wastewater infrastructure and recover its investments through a build-operate-transfer (BOT) approach.

The company is presently providing drinking water and sewer service in the capital city of Corrientes (population 256,000) as well as five of the province's main municipalities. The percent of residents in these cities with domestic drinking water service ranges from 70-95 percent, but sewer connections are in the 30-70 percent range.

Across the rest of the province, the figures are lower, particularly in towns with populations under 10,000. On a province-wide basis only 21 percent of the population has access to sewer systems. Depending on the municipality, 30 percent to 80 percent have domestic potable water connections.

Technical Description

A TDA-funded feasibility study is being conducted by the Johnson Company of Vermont. The first progress report has been issued. The study will recommend the best approach for providing new water/wastewater services on a province-wide basis. The global projected cost of this project is unknown because the exact scope of the project is undefined. However, preliminary estimates are in excess of U.S.\$100 million.

VIII-13

Corrientes Water and Wastewater Management

Infrastructure Project Profiles

Site

Corrientes Province is located in northeastern Argentina between the Uruguay and Paraná Rivers. A largely rural area, the site is bordered by Brazil and Uruguay to the east and Paraguay to the north.

Timing

The feasibility study will be finished by the end of 1995. It is likely that planning for the first specific project will begin in 1996.

Equipment & Services Demand

Although the exact list of equipment and services will depend on the results of a complete feasibility study, the main components include the following: engineering and design services; potable water treatment units and equipment, sewer pipes, connections, and flow meters. The quantity of these goods and services that will be required is also dependent on the specific projects to be implemented across the province.

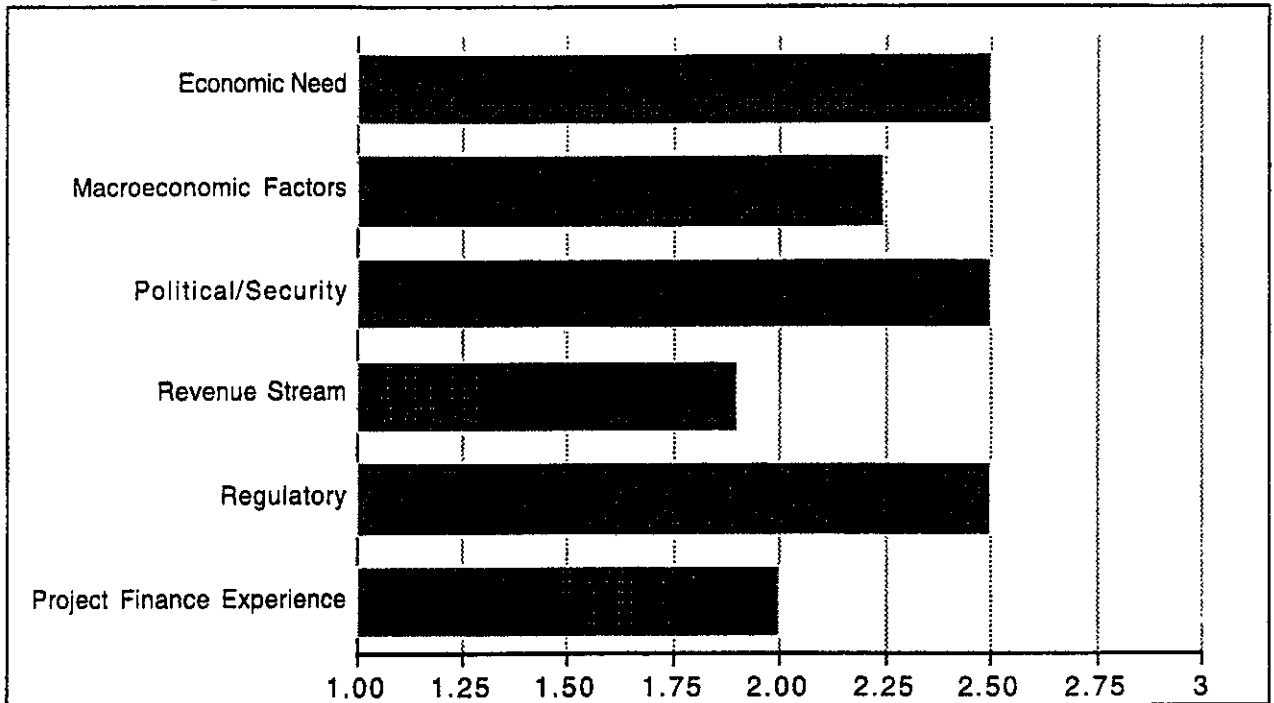
Nature of Demand

The combination of an acute shortage of sewer service and a serious shortage of potable water connections, plus the provincial government's commitment to address these issues, is the driving force behind this project. The provincial government is aware of the significant public health implications of inadequate sewer infrastructure and lack of access to treated drinking water.

Financeability

The ability of ratepayers to pay for new potable water and sewer connection services is the key to financeability of the project. Since the province has a relatively low per capita income and many of those currently without these services are poor, this may prove difficult. Also, the issue of government guarantees must be resolved for financing to be arranged.

Financeability Assessment



Source: CG/LA Infrastructure

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Key Decision Makers

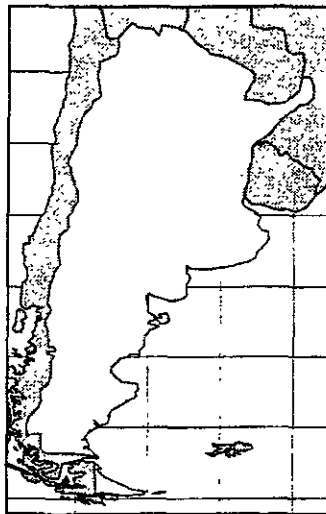
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TDA Project Tip
Numerous opportunities in the Latin American environmental sector exist at the provincial or state level. Two such projects in Corrientes, Argentina, are being targeted by TDA. A feasibility study, funded by TDA, is being conducted by the Johnson Company to determine the best approach to providing both wastewater and potable water services for the province of Corrientes.



Environment / Argentina

Dock Sud Remediation Project



Project Summary

Project No:	ENV-04
Subsector:	Hazardous Waste
Country:	Argentina
Project Cost:	\$100 million
Export Potential:	\$50 million
Owner:	IMPA

Argentina is attempting to address decades of environmental neglect. The most significant environmental protection efforts are being implemented at the provincial or state level. One important such initiative is the Dock Sud Remediation Project.

Located in the province of Buenos Aires at the mouth of the Matanzas-Riachuelo River Basin, which empties into the Rio de la Plata, Dock Sud is a heavily industrialized area which is home to more than 200 petrochemical facilities, food processors, textile companies, and tanneries. There are very high levels of contamination in the water, groundwater, and soil.

The provincial environmental protection agency of Buenos Aires (Instituto Provincial de Medio Ambiente, or IPMA) seeks to promote and support a large-scale remediation effort, financed by private industry in the Dock Sud area.

Technical Description

A definitional mission funded by U.S. TDA is providing a first cut of the exact magnitude of the problem. TDA will consider funding for a full feasibility study, which will present various remediation options. It seems a fair comparison to equate the Dock Sud areas with a serious U.S. Superfund site.

Dock Sud Remediation Project

Infrastructure Project Profiles

Ultimately, the project will not only implement remediation but will also support and promote clean-up efforts by private companies, to provide them with guidance on pollution prevention and/or safe disposal practices.

Site

Dock Sud is located in the province of Buenos Aires, on the south side of the mouth of the Riachuelo River across from the city of Buenos Aires.

Timing

TDA is funding an on going Definitional Mission. Subsequent action will depend on the results, but a full feasibility study will help to guide the actions of the provincial government of Buenos Aires.

Given of the complexity of the site and the fact that this project represents the first multi-party clean-up project in Argentina, it is expected that on-site remediation will begin in 1997.

Equipment & Services Demand

The specific services and equipment needed will be based on the results of the feasibility study and negotiated agreements between the provincial government and the private companies in the area. Nevertheless, it is possible to expect the following demand:

- Remediation services and associated equipment for groundwater recovery, contaminated soils treatment, and water treatment.
- Engineering and design services associated with planned remediation.
- Off-site treatment/disposal services.

Depending on the scope of services mandated by the provincial government, the clean-up could easily exceed U.S.\$100 million.

Nature of Demand

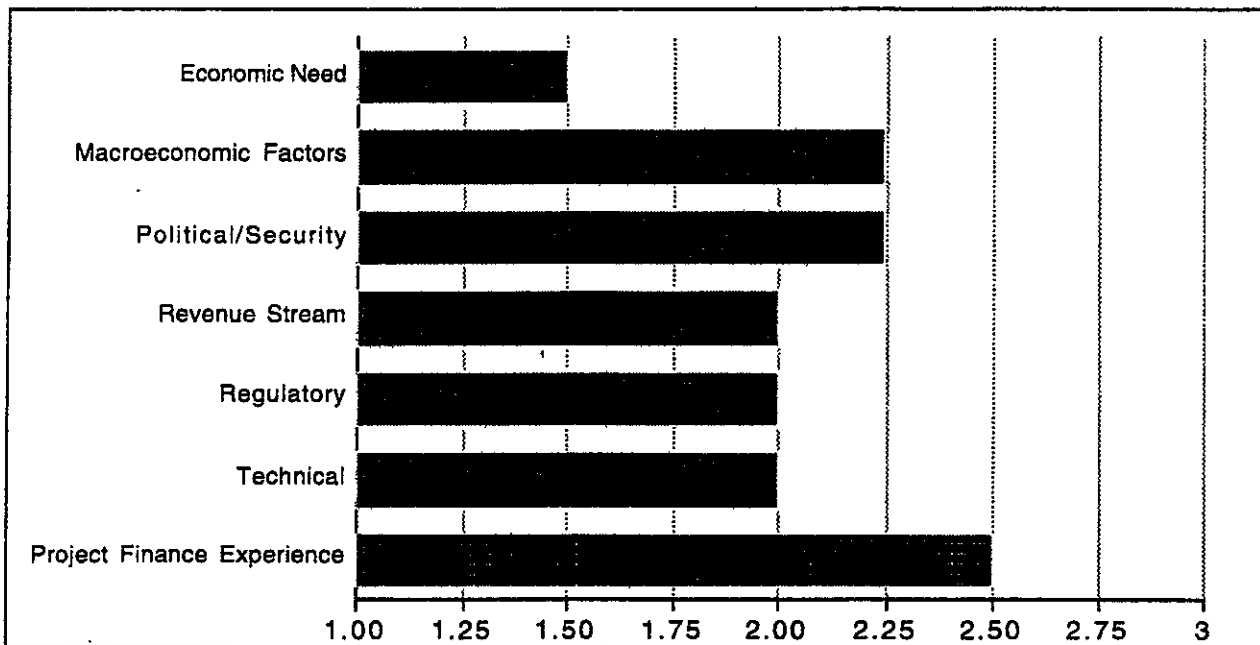
Dock Sud is the most contaminated area in the province of Buenos Aires. Many companies are already facing legal enforcement actions because of lack of effluent control systems and continuing pollution.

Financeability

Financing the actual clean-up appears to be a major challenge. Although the IPMA has stated its intention to require the private companies in the area to pay for the clean-up, there is almost certain to be significant legal wrangling over the level of contribution from each company, as well as difficult issues regarding proof of which company is responsible for each specific pollutant. The province will need to establish clear legal liability before it can expect to see a privately funded clean-up. It is also highly likely that many of the polluting companies have either gone out of business or lack the assets to pay their reasonable shares.

Multilateral agency funding, and the government's acceptance of the attendant liability, may be the only solution to the financing problem.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Dock Sud Remediation Project

Infrastructure Project Profiles

Key Decision Makers

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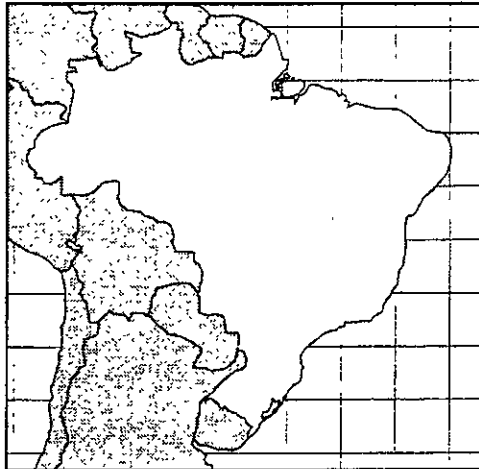
TDA Tip

TDA is sponsoring a definitional mission in an effort to assess the Dock Sud project, which is part of the Rio Riachuelo remediation efforts. TDA is also considering funding a feasibility study to analyze various options for remediation of the Dock Sud area.



Environment/Brazil

Thermal Plasma Hazardous Waste Project



Project Summary

Project No:	ENV-05
Subsector:	Hazardous Waste
Country:	Brazil
Project Cost:	\$8 million
Export Potential:	\$6 million
Owner:	Central Super

Technical Description

As the industrial center of Brazil, the state of São Paulo is home to a large number of electroplating companies. These firms, many of them in the small to medium category, use electroplating solutions containing heavy metals, such as chromium, cadmium and others. Until about two years ago, these companies were allowed to discharge their wastewater without treatment. However, new environmental legislation and regulations now require pre-treatment of wastewater prior to discharge. Electroplating companies have installed pre-treatment systems and now generate sludge which contains heavy metals, flocculant agents and other compounds. Since the sludge is considered a class I sludge and would need to be disposed of in special landfills (a very expensive proposition), an association named Central Super was formed to investigate an alternate solution.

The Plasma Group of the Institute of Technological Research (IPT) has been working independently on the treatment of industrial residues. After discussions with Central Super, successful laboratory scale tests were run on the electroplating sludge using plasma technology. Central Super and a government agency then provided funds for construction and operation of a pilot plant unit (150 kg/hour capacity). The unit will be completed in the second quarter of 1995, and tests will be run through the fourth quarter of the year.

Electroplating companies in São Paulo generate an estimated 1,000 tons per month of sludge. A number of commercial facilities, each with a capacity of between 500 and 1,000 kilograms per hour, is

Thermal Plasma Hazardous Waste Project

Infrastructure Project Profiles

Electroplating companies in São Paulo generate an estimated 1,000 tons per month of sludge. A number of commercial facilities, each with a capacity of between 500 and 1,000 kilograms per hour, is planned. Central Super is looking for financing to construct and operate commercial units in 1996.

Site

Locations in the state of São Paulo, yet to be determined.

Timing

Pilot plant testing is expected to be completed in the fourth quarter of 1995. The target date for the first commercial unit is the end of 1996.

Equipment & Services Demand

As most of the equipment and services will be of Brazilian origin. This is primarily an investment and financing opportunity.

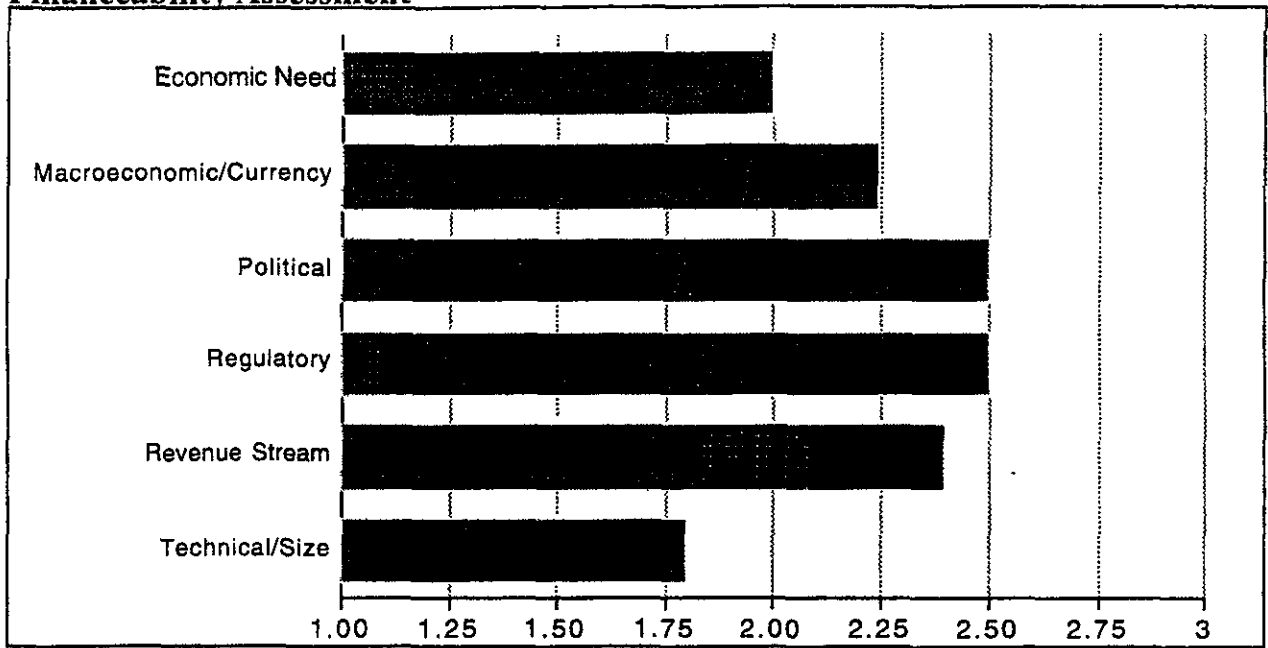
Nature of Demand

This is a classic case of regulation driving demand. Environmental legislation and regulations enacted in São Paulo over the last two years have forced electroplating companies to pre-treat their wastewater before discharge to sewer systems. The sludge removed from the treated wastewater is considered a Class I residue and would either need to be disposed of in a special landfill or treated and rendered non-hazardous. It is in response to these issues that the IPT Thermal Plasma project was developed.

Financeability

The main financing issue is the unproven technology; however, the results of the pilot plant testing should address many of the technical issues. It appears that the State of São Paulo is now ready to enforce its environmental regulations and force companies to properly dispose of hazardous sludge. Given the modest size of the investment required, obtaining the necessary capital should not be a major factor.

Financeability Assessment



Source: CG/LA Infrastructure

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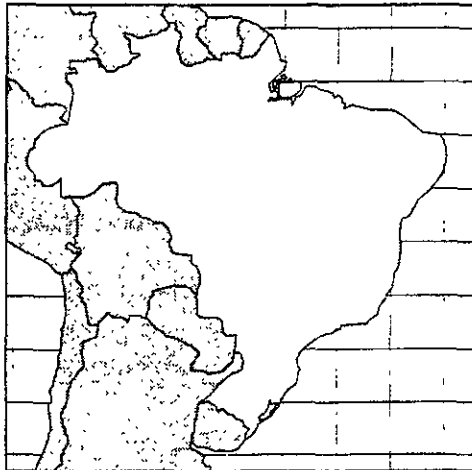
Key Decision Makers

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Environment / Brazil

Piracicaba Wastewater Project



Project Summary

Project No:	ENV-06
Subsector:	Wastewater
Country:	Brazil
Project Cost:	\$8 million
Export Potential:	\$4 million
Owner:	City of Piracicaba

Piracicaba, a city of 280,000 people located approximately 120 miles northwest of São Paulo, is planning the city's first major wastewater treatment plant. When complete, it will raise the percentage of the city's residents receiving this service from 4 percent to 25 percent. The city is required to provide 100 percent coverage by the year 2004.

While this project is relatively small in terms of cost, it is a precursor to a much larger project in Piracicaba within the next five years, and is part of the growing wave of municipal wastewater projects throughout São Paulo state. São Paulo State has more than 30 municipalities with a population of over 100,000—very few have wastewater treatment of any kind. The size of this market has already attracted intense interest from French, British and Italian firms.

Technical Description

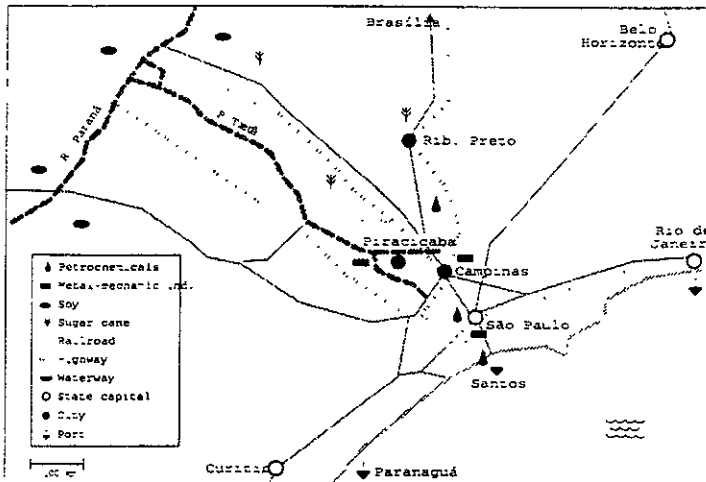
The wastewater plant will treat the wastewater from approximately 70,000 people. The city is developing plans for a plant utilizing anaerobic treatment followed by aerobic treatment.

The project is being administered and managed by a quasi-independent municipal body called SEMAE (Municipal Water and Sewage Company of Piracicaba). Foreign firms seeking to bid on the project will need to be associated with a Brazilian firm.

Piracicaba Wastwater Project

Infrastructure Project Profiles

Site



The municipality has chosen a specific site on the Luiz de Queiroz School of Agriculture in Piracicaba. This is a three-hectare site located approximately one-half kilometer from an inhabited area. It is currently in the process of being donated to the municipality.

Timing

Bid packages will be available in August 1995.

Equipment & Services Demand

Design, engineering, construction and start-up operation services will be required. A full range of specialized equipment (hydraulic and electromechanical) is needed.

Nature of Demand

The city is working with the São Paulo State Government to come into compliance with legal requirements for the treatment of the city's wastewater. By the year 2004 all of the city's wastewater must receive at least primary treatment. Currently, the city has only one small treatment plant, which services some 10,000 residents.

The wastewater project is part of a broader regional program to clean up the Piracicaba River Basin and the local Ribeirão do Piracicamirim.

Financeability

Funding for the project is coming from the municipality and the São Paulo State government. While this approach runs against the trend which is taking hold in São Paulo State of concessioning out a broad range of public services, the city administration feels it is under a tight time constraint to have this treatment plant built and operating. It is therefore proceeding with a conventional public sector approach to financing and ownership of the project. A proposed larger project in the future may be offered on a concession basis.

Since this is a 100 percent publicly-funded project, a project Financeability Assessment is not applicable.

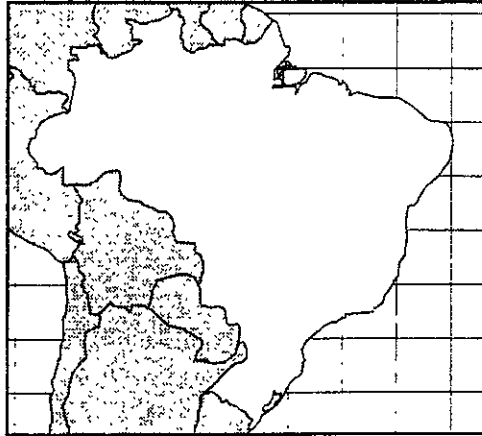
Key Decision Makers

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Environment/Brazil

São Paulo Water Loss Reduction Project



Project Summary

Project No:	ENV-07
Subsector:	Water
Country:	Brazil
Project Cost:	\$400 million
Export Potential:	\$75 million +
Owner:	SABESP

SABESP (Companhia de Saneamento Basico do Estado de São Paulo) is a state-owned company responsible for water and sewer services in the metropolitan São Paulo region and includes about one-half of the 625 municipalities in São Paulo State. SABESP typically works under long-term (30 year) concession agreements with the municipalities. In metropolitan São Paulo SABESP supplies water to over 16.2 million people and provides sewage service to over 11.6 million people.

SABESP faces a water loss problem of staggering dimensions in Greater São Paulo. Current estimates are that water losses total 44 percent of production. About one-half of this figure comes from theft of water (non-payment for water received and illegal hookups) and one-half from physical line losses.

With limited resources, SABESP has placed a higher priority on expanding service coverage (averaging 6 percent per year over the last ten years) than on maintenance. SABESP and the state government fully understand that this situation must be addressed and water losses cut significantly.

Technical Description

The original plan for the project was to divide the metropolitan region into 5 or 6 blocks; issue a request for proposals, and fund the project partially through savings from the vastly more efficient service. However, the new administration of Governor Covas is reviewing this approach and has not yet determined how to proceed.

This project may present a good opportunity for an entrepreneurial private firm, with expertise in the area, to discuss with SABESP various approaches to addressing the problem.

Site

Thirty one municipalities (population 16,000,000) across the entire metropolitan area of São Paulo.

Timing

The recently elected government in São Paulo is undertaking a reorganization of SABESP to make it more decentralized and more responsive to the needs of the individual municipalities who are its customers. Therefore, implementation of the water loss prevention program has been delayed until mid-1996.

Equipment & Services Demand

The exact equipment and services demand has not been fully determined. The types of equipment and services required will include water and sewer mains, piping, meters, as well as construction and engineering services. Given the size of the infrastructure to be addressed, the project will require a total investment in excess of U.S.\$100 million.

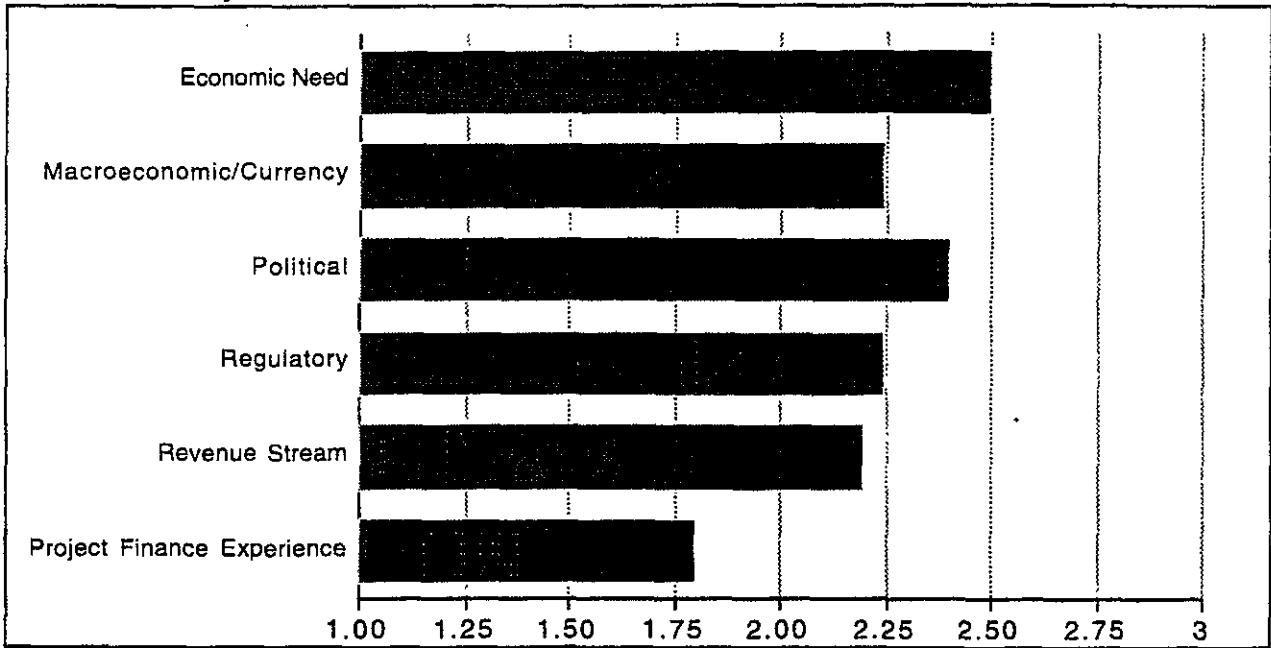
Nature of Demand

Financial losses to SABESP and the state government of São Paulo are one of the driving forces behind the project. In addition, making substantial reductions in water losses will increase the supply of water available to the constantly growing population.

Financeability

The agency has not yet determined how to finance the project. Most likely, a mix of private and agency funds will be required. Securing private funds for the project may be difficult because of the magnitude of the project and because nothing on this scale has been successfully carried out before. On the other hand, the economic savings will be dramatic and can justify proceeding with the project.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

Companhia de Saneamento Basico do Estado de São Paulo (SABESP)

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Paulo Massato Yoshimoto

Superintendent, Technical Support of Operations

São Paulo, Brazil

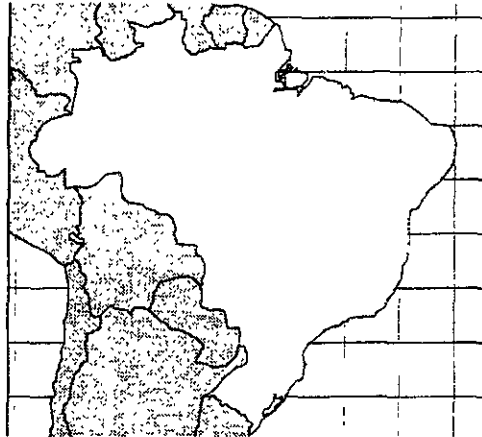
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Environment/Brazil

São Paulo Automobile Emissions Testing



Project Summary

Project No:	ENV-08
Subsector:	Air Pollution
Country:	Brazil
Project Cost:	\$11 million +
Export Potential:	\$8 million +
Owner:	Concession

To address an increasingly severe air pollution problem, the São Paulo Municipal Assembly passed a law instituting an automobile emissions testing program on March 4, 1995. The goal is to reduce by 20 percent the volume of emissions from vehicular traffic, which is estimated to generate about 90 percent of the city's air pollution.

Technical Description

The new legislation calls for a ten-year concession to a private company through a public bidding process. A formal announcement of the program is expected by the end of the second quarter of 1995.

Initially, only cars manufactured in 1989 and later will be tested. Older cars will be added to the program in succeeding years. Allowable pollutant emissions will be adjusted for the corresponding model year.

Inspection fees to motorists will depend on the winning bid, but it is currently estimated that they will be in the U.S.\$11 to U.S.\$27 range. Since there are some 4.3 million cars registered in the city, the estimated minimum gross would be U.S.\$47.3 million, with the potential for considerably more. In addition, there are on-going discussions between the city and the São Paulo State Environmental Agency, CETESB, over extending the program to the entire metropolitan region.

As in the United States, vehicles which exceed accepted emission limits will be required to be serviced within a specified period of time. Failure to comply will result in a fine (as yet unspecified) and inability to renew registration.

São Paulo Automobile Emissions Testing

Infrastructure Project Profiles

Site

The City of São Paulo. Possible extension to the entire metropolitan area.

Timing

Formal announcement of the program is expected in the second quarter of 1995. Bidding will probably occur in the second half of 1995.

Equipment & Services Demand

The city estimates that an investment of U.S.\$11 million will be required. The exact number is, of course, subject to the bidding specifications. Multiple testing sites, each with emissions testing equipment must be provided under the concession.

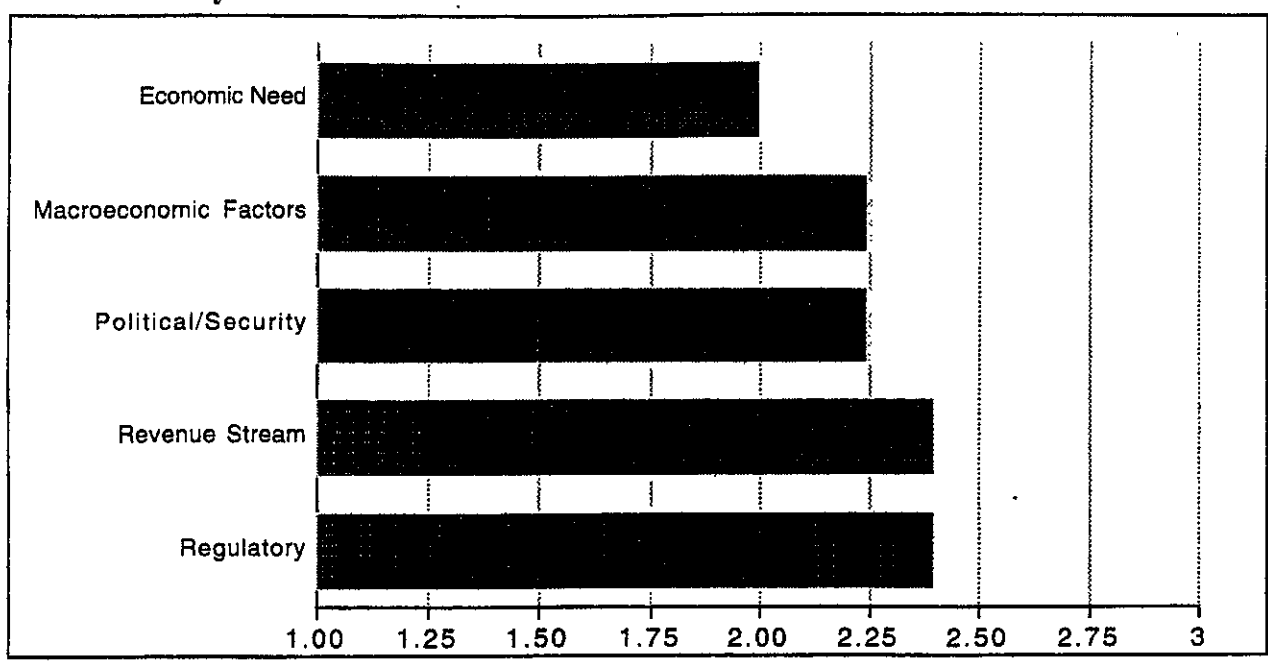
Nature of Demand

Growing recognition by city officials that action is required to address the worsening air pollution problem is the impetus behind the program. The March legislation provides the necessary legal foundation.

Financeability

It is doubtful that the project will be developed on a project finance basis. The concession winner will, however, be required to finance the establishment of the program. The main financing issue is the city's political will to implement and enforce the program. Based on the technical specifications, the project does not appear to entail any technical difficulties.

Financeability Assessment



Source: CG/LA Infrastructure.

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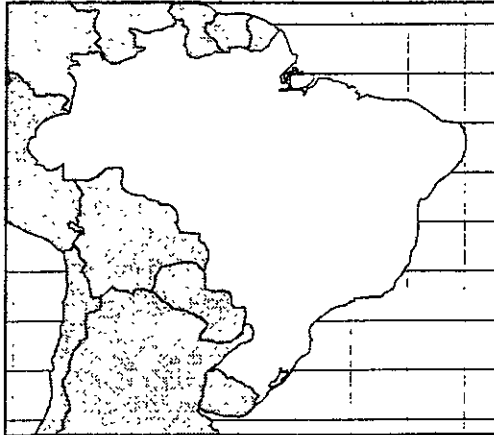
Key Decision Makers

Companhia de Tecnologia de Saneamento Ambiental
 Alfred Szwarc, *Director of Environmental Engineering*
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Environment / Brazil

Landfill Methane Gas Recovery Project



Project Summary

Project No:	ENV-09
Subsector:	Solid Waste
Country:	Brazil
Project Cost:	\$10 million
Export Potential:	\$5 million
Owner:	City of São Paulo

The city of São Paulo is proposing what is believed to be the first landfill methane gas recovery project in Brazil. The technology is well developed and used in the United States as a source of methane gas for use as an energy resource. Methane gas recovery should have a bright future in Brazil.

São Paulo has four closed landfills—Vila Albertina, Jacui, Sao Matheus and Sapopemba—which generate anywhere from 85 to 425 cubic meters per day of methane gas. As detailed below, the city would like to sponsor an international tender for private companies to develop methane gas recovery projects at the four closed landfills.

Technical Description

The project will consist of:

- Installation of equipment to extract landfill methane gas from four closed landfills in the city of São Paulo.
- Operation and maintenance of the process for the term of the contract, which is expected to be 10 years or longer.
- Maintenance of the closed landfills to minimize environmental impacts and maximize methane gas production.

Landfill Methane Gas Recovery Project

Infrastructure Project Profiles

Site

Four closed municipal landfills in the city of São Paulo.

Timing

Bidding may begin as early as the second half of 1995. However, certain institutional issues must be resolved, since management of the closed landfills was recently transferred from the municipal public works division to the municipal environmental secretariat.

Equipment & Services Demand

It is estimated that capturing methane gas from the four closed landfills would require an investment of at least U.S.\$10 million. However, because the many variables which determine not only the economic viability of the project, but also the equipment and service configuration have not been studied, this figure should only be considered as a preliminary estimate.

If successful, the city may become interested in turning over the management of portions of existing landfills to private companies so that additional methane could be produced.

Nature of Demand

A closed landfill represents a waste of economic resources—non-productive land in an urban setting. Generating methane gas has the dual benefit of generating a useable product and requiring proper management of the landfill to minimize leakage and offsite contamination.

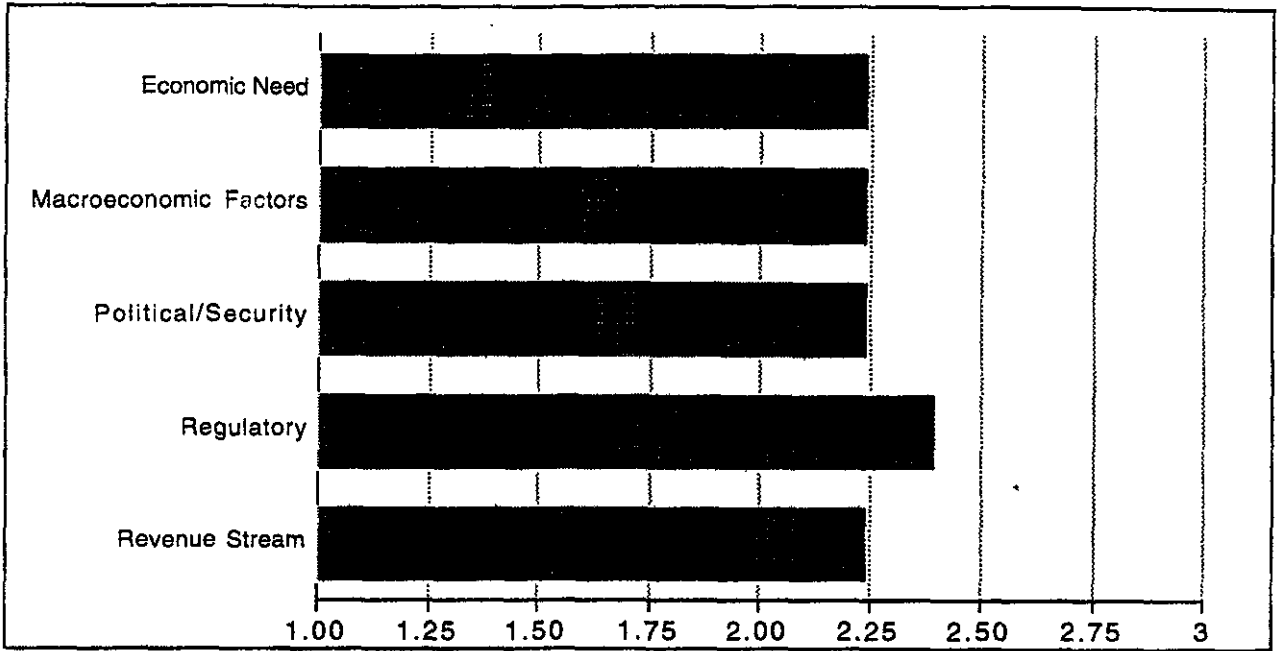
Financeability

Due to the lack of a completed feasibility study, there are many unknowns. Among the key pieces of information that would be needed to complete a financeability analysis are the following: an expected price to be received for the methane; a more exact estimate of the volume of methane that can be extracted; and the physical conditions of the landfills and the nature of the waste deposited.

The private company or consortium winning the bid will be required to finance the project.

Given the relatively modest sums required, financeability is not expected to be a major issue.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

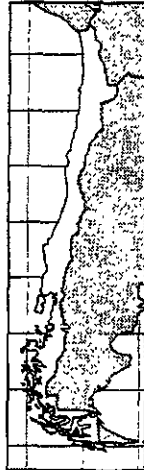
Key Decision Makers

City of São Paulo
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Environment / Chile

Santiago Wastewater Program



Project Summary

Project No:	ENV-10
Subsector:	Wastewater
Country:	Chile
Project Cost:	\$520 million
Export Potential:	\$315 million
Owner:	EMOS S.A.

EMOS S.A., the Sanitary Waterworks Company of Santiago, is implementing an aggressive ten-year program for wastewater management and potable water treatment. It is turning to the private sector to implement the program on a BOT (build operate transfer) or concession basis.

The city of Santiago currently treats less than 5 percent of its municipal wastewater. Predicted population growth will generate increased quantities of wastewater which authorities now recognize must receive treatment to avoid major public health consequences.

Technical Description

The program will be based on the following objectives and parameters:

- A technical study of current wastewater flows and quality is required.
- A feasibility study must define, for a 30-year period, the treatment plants with respect to locations; number; capacity; operational costs and investment needed; and the fees to be collected.
- The quality of water to be treated will contain a mix of industrial and domestic effluents.
- Water quality after treatment, must be such that discharges can be used for irrigation purposes.

Santiago Wastewater Program

Infrastructure Project Profiles

EMOS has devised the following strategy to achieve its objectives:

- Design, construction and operation of sewage collectors.
- Design, construction and operation of an experimental and non-conventional treatment plant.
- Development of a comprehensive construction program for treatment plants that is consistent with the construction of sewer interceptors.
- Design and implementation of a plan for industrial pre-treatment.
- Investment cost recovery through user fees.

Site

This program is for the Santiago Metropolitan Area.

Timing

EMOS is ready to begin to purchase the land for the plants and to prepare basic engineering services. The first plant, San Bernardo, should become operational by 1999 and the last plant, Zanjon Phase II, by 2009.

Equipment & Services Demand

Engineering, design and construction services, plus a wide array of equipment will be required to construct a viable wastewater treatment system. The program for the plants and the flows that will be required to process is as follows:

Plant	Initial flow (m ³ /s)	Final flow (m ³ /s)	Year of initiation of operations	Percentage
San Bernardo	2.9	5.0	1999	20
Maipo	0.5	1.5	1999	23
Zanjon Phase I	2.5	2.5	2004	41
Mapocho	6.1	8.2	2009	100
Zanjon Phase II	2.5	10.5	2009	100

Nature of Demand

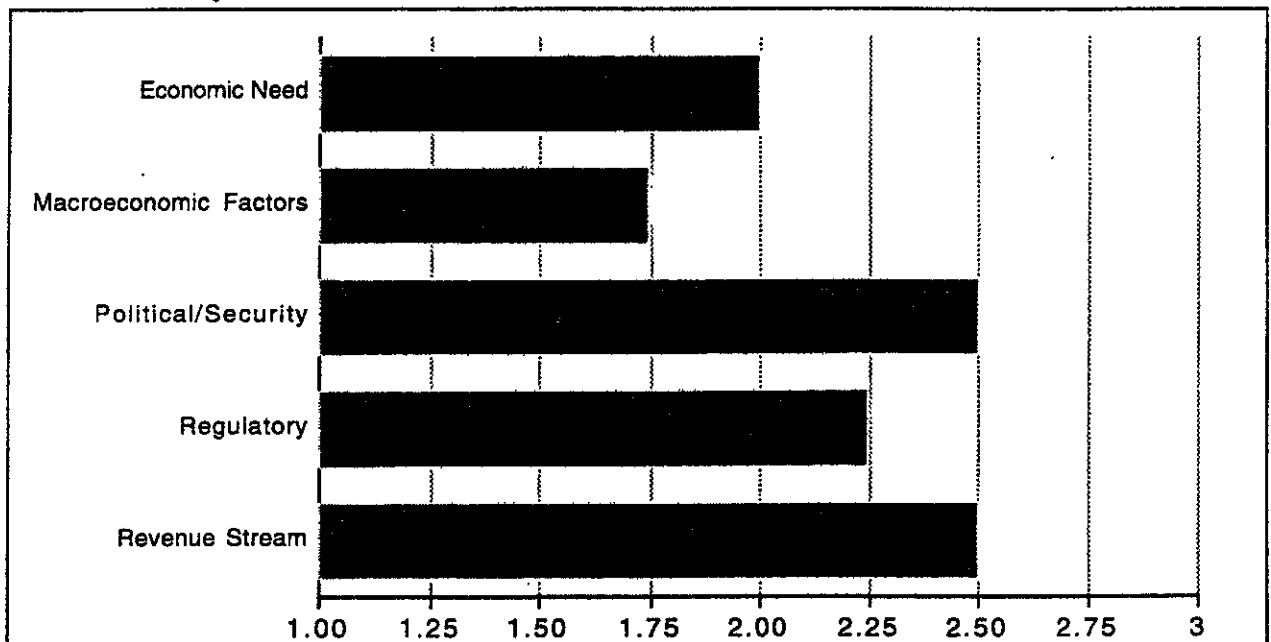
Largely untreated wastewater is currently discharged into the Mapocho, Zanjon and Maipo Rivers, producing significant contamination of water resources used for agricultural purposes.

The generation of wastewater will increase as both the population and industrial activities grow. The total flow of wastewater into the rivers is expected to grow from 16 cubic meters to 25.7 cubic meters by the year 2024. The population of metropolitan Santiago is expected to grow from 5 million to 9 million by 2024. Unless a major commitment to building and operating these wastewater treatment plants is carried out, there will be extremely serious public health consequences.

Financeability

Chile's strong credit rating and commitment to private-sector development provides a strong foundation to allow for financing the series of major projects called for in the program. However, because wastewater treatment represents a new service with substantial capital and operating costs, developing a method for charging homeowners and residential dwellers an affordable fee that earns a reasonable rate of return for investors will be a significant challenge.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Santiago Wastewater Program

Infrastructure Project Profiles

Key Decision Makers

EMOS S.A.

Raquel Alfaro, *General Manager*

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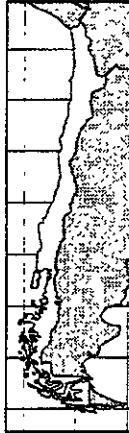
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Environment / Chile

Temuco Wastewater Treatment Plant



Project Summary

Project No:	ENV-11
Subsector:	Water
Country:	Chile
Project Cost:	\$40 million
Export Potential:	\$25 million
Owner:	ESSAR

Technical Description

The city of Temuco does not presently treat its municipal wastewater. To remedy this situation, the city has granted a 30-year concession to Empresa de Servicios Sanitarios de la Araucanía (ESSAR S.A.) to construct a wastewater treatment plant, lay sewer lines, and install connections to residences.

There are four main components of this project: 1) the pumping stations at Padre de Las Casas and the Industrial Quarter 2) the pipeline in the Industrial Quarter 3) the sewer lines to the treatment plant and 4) the treatment plant itself.

The treatment plant will probably provide primary and secondary treatment and a final disinfecting stage. However, a final decision on whether secondary treatment will be required has not yet been made.

The target efficiency of the secondary treatment lies between 75 and 90 percent, and the objective is to generate an effluent in which the biological oxygen demand (BOD) is 15-35 mg/liter. The concentration of suspended solids after secondary treatment is expected to range from 20 to 30 mg/liter, making the treated water suitable for ultraviolet disinfecting.

Temuco Wastewater Treatment Plant

Infrastructure Project Profiles

Site

The city of Temuco is located 610 kilometers south of Santiago in the center of the Araucanía Region (Region IX) and is the provincial capital. The plant would be located approximately 3-4 kilometers west of the Temuco City limits along the Nueva Imperial Road.

Timing

A feasibility study has already been completed. The project will be implemented in stages, starting with the acquisition of land in 1995. Design and construction are expected to start in 1997.

Equipment & Services Demand

Both engineering services and equipment will be required to construct a viable wastewater treatment system in Temuco. The system will have the following components:

- Wastewater treatment plant.
- Construction of two pumping stations. The Padre de las Casas station is expected to pump an average of 40.1 liters per second initially, increasing to 110.4 liters per second in 2023. The industrial pumping station is expected to pump an average of 8.3 liters per second initially, increasing to 22.6 liters per second in 2023.
- Construction of additional collector pipelines in Temuco.
- Construction of a 9.7-kilometer 1,200 to 1,600-millimeter diameter concrete pipeline from Temuco to the treatment plant.

Nature of Demand

Wastewater in Temuco is currently discharged untreated into the River Cautín. This has produced significant contamination of the city's water supply. Hence, demand for wastewater treatment in Temuco is already high and is expected to rise as the city grows, along with both residential and industrial water demand.

The generation of wastewater is expected to increase, as are both the population and industrial activities. The table below shows the expected increases in wastewater flow from residents and from industry, for which a number of "resident equivalents" has been assigned.

Forecasts of Water Consumption and Wastewater Generation

Year	Drinking Water Consumption (Lit/Res/Day)	Coverage - Drinking Water and Sewerage	Industrial Population (resident equivalents)	Potable Water Consumption (m ³ /year)	Average Flow of Wastewater (Liters/sec)
1992	187.6	85.2%	6,484	12,761,929	345.5
2003	195.8	94.0%	7,887	18,934,771	514.4
2013	198.0	99.0%	8,881	23,813,452	643.1
2023	198.7	100.0%	9,875	28,073,795	757.9

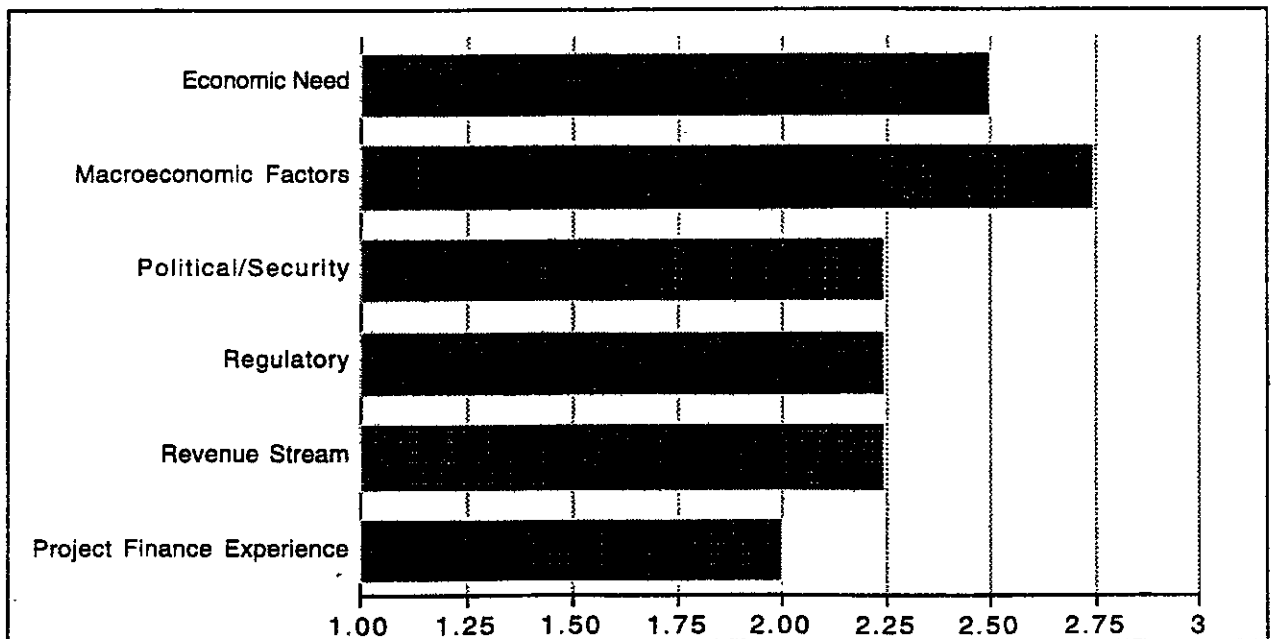
Source: ESSAR S.A.

Consequently, demand for potable water is expected to increase significantly in the next 30 years and as a result so will the generation of wastewater. As current levels of wastewater have already produced considerable contamination, future increases threaten to make the situation potentially catastrophic.

Financeability

Chile's strong credit rating and its commitment to development of the private sector provide a strong foundation for the financeability of the project. However, as in the wastewater treatment projects planned for Santiago, establishing a workable tariff for both consumers and investors may prove difficult. In addition, the financial strength of the concessionaire, ESSAR, is not known.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Temuco Wastewater Treatment Plant

Infrastructure Project Profiles

Key Decision Makers

Empresa de Servicios Sanitarios de la Araucanía (ESSAR S.A.)

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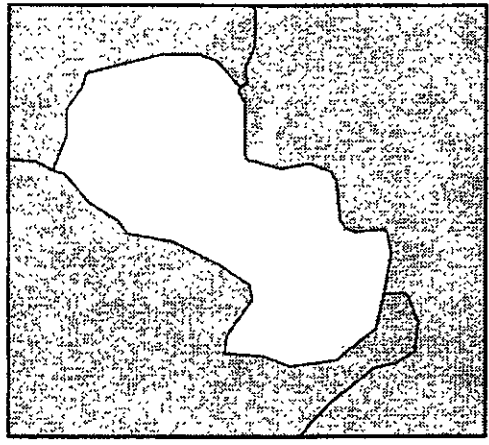
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Environment/Paraguay

Asunción Water Project



Project Summary	
Project No:	ENV-12
Subsector:	Wastewater
Country:	Paraguay
Project Cost:	\$72 million
Export Potential:	\$40 million
Owner:	CORPOSANA

The Corporación de Obras Sanitarias (CORPOSANA) is responsible for the construction, maintenance and operation of the sewer system of greater Asunción.

Technical Description

CORPOSANA needs to expand the sewer system of the Asunción area as follows:

- 50,000 new home connections.
- Construction of about 550 kilometers of secondary sewer collectors.
- Construction of a tunnel 3.2 kilometers length and 2 meters in diameter.
- Construction of a preliminary treatment plant with automatic filtering systems, for the removal of large floating material, and the construction of a discharge line to the center of the Paraguay River.
- Reopening and expansion of the discharge mouths of the Tacumbú, Sajonia and Lagerenza sewer systems.
- Control and monitoring of flows and emissions into the sewer system.

The objectives of this project are to reduce the level of contamination in the urban areas of the basin and improve the management of wastewater as well as the quality of potable water.

Asunción Water Project

Infrastructure Project Profiles

Site

The Itay Basin stretches from the city of Fernando de la Mora and runs north 12 kilometers up to the water treatment plant of CORPOSANA in Viñas Cué.

Timing

The project is scheduled to begin by the end of 1995 and is expected to be finished in the year 2000.

Equipment & Services Demand

The project will require equipment and engineering services for the construction of the new sewers and domestic connections, including construction, maintenance and operation of the wastewater treatment plant, as well as control and monitoring systems.

Nature of Demand

High levels of contamination coming from untreated wastewater entering the Itay Creek are seriously degrading the quality of water for the nearby urban areas. This project will have a direct positive impact on the health of the population, since it will reduce sites where bacteria and parasites can develop.

Financeability

Major funding for this project has been provided by the World Bank (65 percent). The balance is funded by the European Investment Bank and local contributions.

Since this is an agency-funded project, the Financeability Assessment is not applicable.

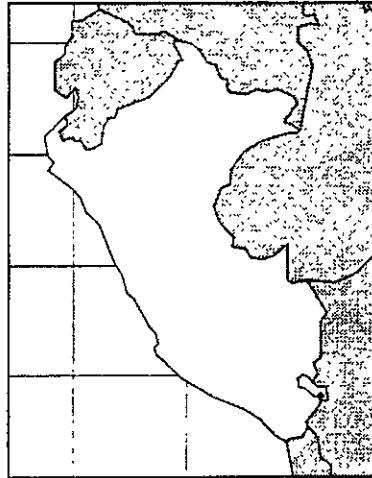
Key Decision Makers

Corporación de Obras Sanitarias (CORPOSANA) Ing. Juan Cano Fleitas, President Asunción, Paraguay ph: (595-21) 20-2095 fax: (595-21) 21-2550



Environment/Peru

Lima Wastewater and Recycling Project



Project Summary

Project No:	ENV-13
Subsector:	Wastewater
Country:	Peru
Project Cost:	\$110 million
Export Potential:	\$60 million
Owner:	Promotora El Brujo

The city of Lima and surrounding areas face rapid population growth and a growing water supply crisis. The region is located in a desert with annual precipitation averaging under 2 inches per year. The city draws its water supply from the runoff of the nearby Andes Mountains, but continued population growth may outstrip the city's ability to provide an adequate supply of potable water. In addition, lack of adequate treatment of municipal wastewater has generated health problems and severe marine pollution.

Technical Description

The project proponent is a Peruvian company that believes that there is a business opportunity for private sector companies to build and operate one or more wastewater treatment facilities in the southern part of Lima. These plants would sell services to government and private users and sell treated wastewater for agricultural purposes. Successful construction of the plants would allow the development of 5,000 hectares of agricultural land.

The total cost of the project was estimated in 1990 at U.S.\$110 million. Potential exports amount to 60 percent of the project value, depending on the type of treatment technology selected. Among the treatment technologies being considered are oxidation ponds, sequential batch reactors, and conventional systems.

Lima Wastewater and Recycling Project

Infrastructure Project Profiles

The sponsor is seeking funding to carry out a detailed feasibility study.

Site

The proposed area for this project is the southern portion of Lima. The precise site has not yet been chosen.

Timing

The sponsor is currently working with a U.S. company to put together a project proposal which will be used to formally solicit funds for a complete feasibility study. Present plans are to seek project partners and investors after the feasibility study is completed in 1996.

Equipment & Services Demand

The sponsor estimates that the non-Peruvian component of the project could be as high as 60 percent. Engineering and construction management services would comprise at least 20 percent and specialized equipment will make up at least 30 percent. The balance of the project is expected to be the cost of general construction and civil works. Depending upon the availability of materials, a portion could also be imported.

The main categories of equipment that would be required for the development of the project include:

- Surface aerators and pumping systems
- Excavation equipment
- Pond liners
- Blowers
- Skimmers
- Defusers
- Sludge handling equipment
- Chemical delivery systems and digesters
- Clarifiers
- Grit removal systems
- Primary and secondary wastewater treatment systems.

Nature of Demand

Demand for the project comes from three sources:

- The expansion of Lima and its growing population.
- Irrigation purposes in agricultural land to the south of Lima
- Industrial purposes in the southern sector of the city

Although it is not a true driver of demand, the support from relevant governmental entities, because of the public health benefits expected from the project, will also be helpful.

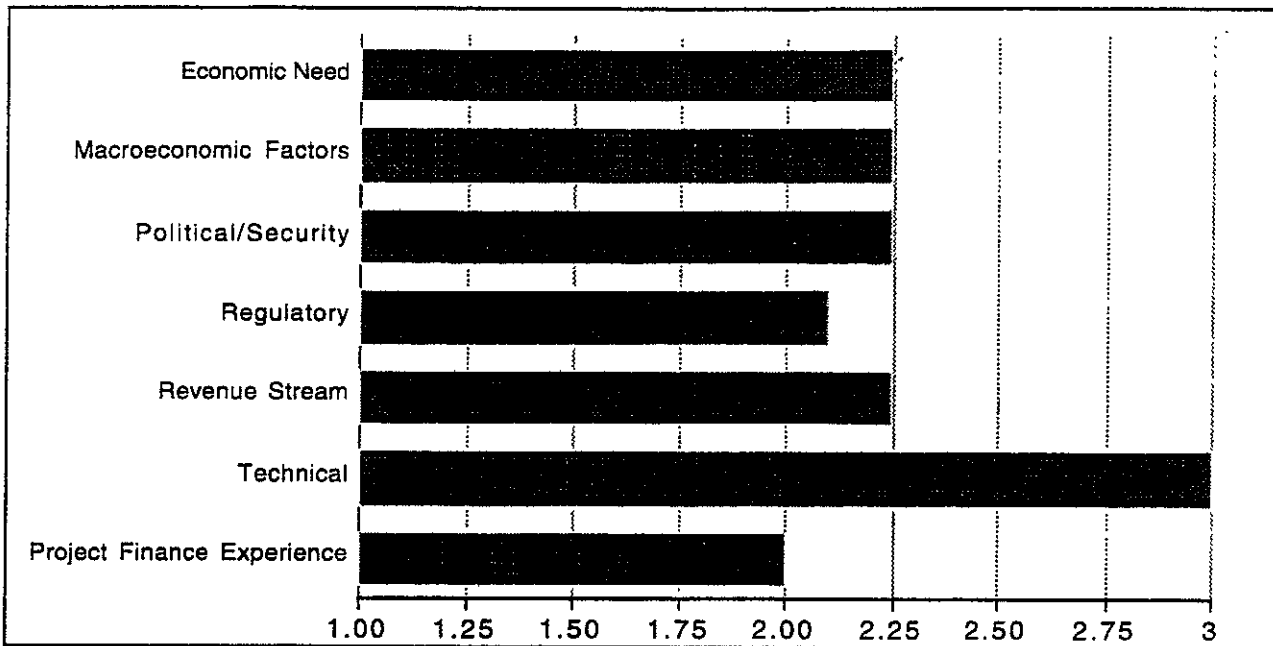
Financeability

The project is at such an early stage that it is difficult to talk specifically about financeability issues. Indeed, the project developer has not even determined whether it will seek to finance the project on an agency basis or a project finance basis. Nevertheless, the most obvious issue centers on project economics—how much would water users be willing to pay for treated wastewater? Long-term wastewater supply contracts and long-term purchase contracts would have to be signed to make the project financeable. A feasibility study will be the first step to determine the economic viability and financeability of the project. Finally, it is significant that similar wastewater reuse projects have worked in other parts of Latin America.

Lima Wastewater and Recycling Project

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

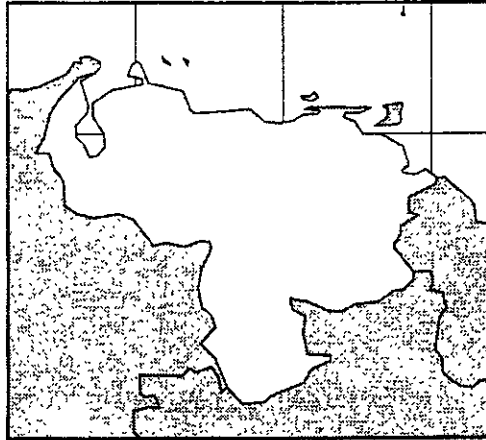
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Environment/Venezuela

Caracas Water Supply and Wastewater Project



Project Summary

Project No:	ENV-14
Subsector:	Water
Country:	Venezuela
Project Cost:	\$200 million
Export Potential:	\$190 million
Owner:	Hidrocapital

Hidrocapital is a state-owned company responsible for the water supply and sewer system management of the Caracas metropolitan area.

Technical Description

The city of Caracas is located in a mountain valley at an altitude ranging from 800 to 1300 meters above sea level. The city's water supply comes from reservoirs located below the level of the city. To ensure water supply, Hidrocapital has a number of pumping stations in the city that keep the flow of potable water at 10 cubic meters per second in the dry season and an average of 15 cubic meters per second during the rest of the year.

The sewer system consists of two main collectors, one on each side of the Guaire River, which carry the wastewater out of the city.

Hidrocapital is conducting a feasibility study for a rehabilitation program and development of the water supply and wastewater system. This study should be finished before the end of 1995.

Hidrocapital plans to rehabilitate its physical infrastructure, including its water supply network, pump-stations and water processing plants. In addition, the plan will expand the sewer system to areas that are not connected to the system yet, and replace existing septic tanks. The plan will also increase the flow of drinkable water in the supply network, upgrading the current levels to 17 cubic meters per second.

Caracas Water Supply and Wastewater Project

Infrastructure Project Profiles

Site

Caracas Metropolitan Area.

Timing

Hidrocapital is expecting to finish the feasibility study before the end of 1995. The early phase of the study has enabled Hidrocapital to reach certain conclusions with respect to particular areas of Caracas. Therefore, Hidrocapital is ready to begin its rehabilitation plan before the end of 1995. The project is expected to require five years for completion.

Equipment & Services Demand

The specific nature of the demand for services and equipment will be based on the conclusions of the feasibility study and the specific needs of the different areas of Caracas. Nevertheless, major categories of equipment and parts that would be required under this project are pumps, pipes, valves, metering equipment, motors, vehicles, computers, filtering system components, etc.

Hidrocapital anticipates spending up to U.S.\$10 million for engineering services, with the balance of the project costs being allocated to equipment and supplies.

Nature of Demand

The water supply and sewer system of Caracas has suffered from 15 years of inadequate maintenance. The federal and municipal governments are now attempting to rectify this situation by implementing a program to improve the supply of water and wastewater services to the 4.5 million people in the Caracas metropolitan area.

One of the most serious problems with the lack of sewer systems in Caracas is that septic tanks and other methods for disposing of wastewater are causing erosion and other unsanitary conditions in parts of the city.

Financeability

Hidrocapital, as a state-owned company, has a budgetary allocation of only U.S.\$10 million for the project. Hidrocapital is seeking additional funding from multilateral lending institutions. The Corporación Andina de Fomento (CAF) will contribute \$20 million and Hidrocapital still has a significant funding gap to fill.

Although Venezuela enacted a concession law in 1994, it has not extended the application of the law to the water and sanitation sector yet.

Since this will be an agency funded project, the Financeability Assessment is not applicable.

Key Decision Makers

Hidrocapital

José María de Viana, *President*

Caracas, Venezuela

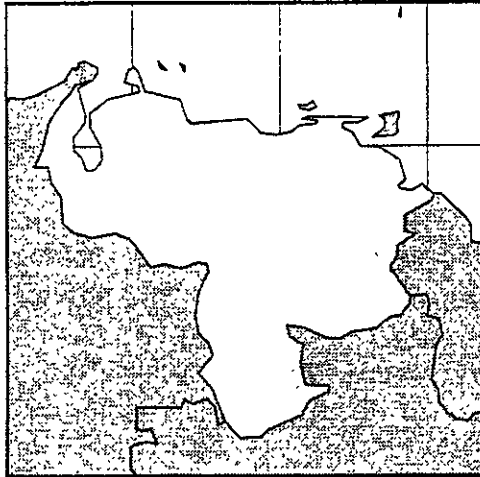
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Environment / Venezuela

MARAVEN Hazardous Waste Remediation



Project Summary

Project No:	ENV-15
Subsector:	Hazardous Waste
Country:	Venezuela
Project Cost:	\$33 million
Export Potential:	\$15 million
Owner:	MARAVEN

The Venezuelan Ministry of the Environment (MARNR) has put MARAVEN, a subsidiary of Petroleos de Venezuela S.A. (PDVSA), on notice that it will start to strictly enforce a wide range of environmental norms applicable to the oil and gas industry. MARAVEN and MARNR have agreed on a schedule of implementation on a number of major projects, ranging from industrial wastewater treatment, reduction in air emissions and proper disposal of toxic wastes.

Refinería Cardon is the most complex refinery in Venezuela and the largest of the two refineries operated by MARAVEN. It is currently upgrading its environmental control systems and equipment as well as its production capability to produce the higher quality refined products demanded by the international markets.

A hazardous waste remediation project on a 126-hectare site at the Cardon Refinery was initiated in 1994. The purpose of the project is to develop a power generating plant and expand its refinery capacity. MARAVEN is planning to complete the remediation project as quickly as possible.

Technical Description

In 1990 PDVSA selected a 126-hectare site at the Cardon Refinery for expansion. The plans included construction of a 300 MW power generating facility, a white oils plant and other production facilities. To fully implement the expansion plans a significant amount of site remediation is required, as a portion of the site has been used over the years for industrial and hazardous waste storage.

MARAVEN Hazardous Waste Remediation

Infrastructure Project Profiles

Phase 1 of the cleanup (the restoration of a 17-hectare parcel where the power and white oils plants are under construction) has been completed. International and Venezuelan engineering and construction firms worked on this phase of the project.

The next phase of the project will focus on 74 partially restored hectares and 35 hectares dedicated to present storage and future treatment.

The project includes engineering, procurement, construction and restoration. Major activities include:

- Definition of the Hazardous Waste Management Program
- Determination of future space requirements for hazardous waste storage (10-year period)
- Removal and disposal of all non-hazardous waste
- Design and construction of facilities and infrastructure for storage of current and future waste
- Identification and establishment of commercial relationships with recycling entities and re-users of present waste streams
- Construction of treatment/disposal facility (where economically feasible).

Site

The Cardon Refinery is located on the Paraguana Peninsula in the northwestern part of the country on the Caribbean Coast. A specific site on the refinery property has been identified for the treatment facility. Flat terrain, dry weather, deep salty aquifers and soil with high clay content make the area ideal for a well designed and managed hazardous waste facility.

Timing

MARAVEN is planning to continue with the balance of the project this year.

Equipment & Services Demand

A preliminary estimate of equipment and services is as follows:

Site remediation (excavation and segregation)	\$10 million
Disposal of spent catalyst	\$10 million
Solidification/disposal of other wastes	\$5 million
Construction of storage and treatment facilities	\$1 million
Technical assistance	\$2 million
Contingencies	\$2 million
TOTAL	\$33 million

Nature of Demand

The project is both enforcement and commercially driven. Completion of the project will make an important development site available for MARAVEN expansion plans, as well as put the company in compliance with Venezuelan environmental legislation.

Financeability

The project will be financed from MARAVEN cash resources, therefore, a rating assessing project financeability is not applicable.

Key Decision Makers

MARAVEN S.A.

Refineria Cardon

Jesús Docabo, *Superintendent of Environmental Affairs*

Punto Fijo, Estado Falcon, Venezuela

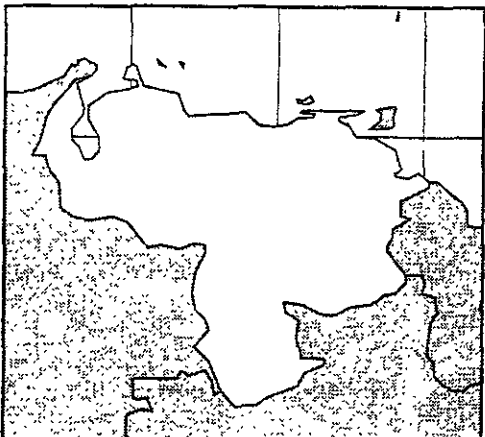
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Environment/Venezuela

MARAVEN Industrial Wastewater Project



Project Summary	
Project No:	ENV-16
Subsector:	Wastewater
Country:	Venezuela
Project Cost:	\$12.5 million
Export Potential:	\$8 million
Owner:	MARAVEN

The Venezuelan Ministry of the Environment (MARNR) has put MARAVEN, a subsidiary of Petroleos de Venezuela S.A. (PDVSA), on notice that it will start to strictly enforce a wide range of environmental norms applicable to the oil and gas industry. MARAVEN and MARNR have agreed on a schedule of implementation on a number of major projects, ranging from industrial wastewater treatment, reduction in air emissions and proper disposal of toxic wastes.

Refineria Cardon is the most complex refinery in Venezuela and the largest of the two refineries operated by MARAVEN. It is currently upgrading its environmental control systems and equipment as well as its production capabilities in order to produce the higher quality refined products demanded by the international markets.

One of the environmental projects is a wastewater treatment system that will treat all wastewater generated during the various phases of oil and gas processing, as well as the reuse of a large percentage treated wastewater.

Technical Description

The project includes engineering, procurement, construction and start-up of the following units:

- Segregation and collections systems
- Neutralization units
- Oil/water separation

MARAVEN Industrial Wastewater Project

Infrastructure Project Profiles

- Oxidation tanks
- Flotation/flocculation unit

The project calls for the treatment of all refinery generated effluents, such as ballast, oily water, tank bottoms, accidentally contaminated cooling water, and others effluents. Treated wastewater will then be sent for biological treatment to the refinery's existing sewage treatment plant, where final discharge conditions will be met. Wastewater meeting final discharge standards will then be reused for fire fighting, dust control, industrial cleaning and irrigation.

Site

The Cardon Refinery is located on the Paraguana Peninsula in the northwestern part of the country on the Caribbean Coast. A specific site on the refinery property has been identified for the treatment facility.

Timing

The agreement between MARAVEN and MARNR calls for the project to be operational by June, 1998. Basic engineering began in January 1995 and is expected to be complete by November 1995.

Equipment & Services Demand

A preliminary estimate of equipment and services demand is as follows:

Engineering	\$1.2 million
Materials and Equipment	\$4.8 million
Construction	\$3.4 million
Management and Technical Assistance	\$0.4 million
Contingencies	\$2.7 million
TOTAL	\$12.5 million

Nature of Demand

The project is enforcement driven. In addition, availability of treated water in this arid region of Venezuela will provide a social and economic benefit to communities near the refinery.

Financeability

The project will be financed from MARAVEN cash resources, therefore, a financeability review is not applicable.

Key Decision Makers

MARAVEN S.A.

Refineria Cardon

Jesús Docabo, *Superintendent of Environmental Affairs*

Punto Fijo, Estado Falcon, Venezuela

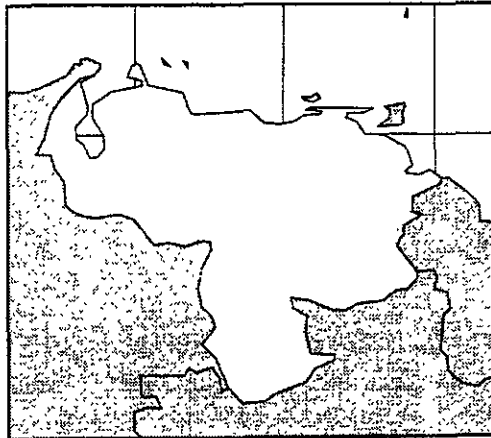
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Environment/Venezuela

Maticora Water Supply Project



Project Summary

Project No:	ENV-17
Subsector:	Water
Country:	Venezuela
Project Cost	\$134 million
Export Potential:	\$70 million
Owner:	MARNR

The Maticora Reservoir is located in the state of Falcon in northwestern Venezuela on the Caribbean Coast. The area is semi-desert and water is a scarce and expensive commodity. The Venezuelan Ministry of the Environment and Renewable Natural Resources (MARNR) has requested funding from the U.S. TDA to complete a feasibility study and recommend solutions for the water problems in the state of Falcon.

Technical Description

The project calls for the construction of a 173-kilometer aqueduct from the Maticora Reservoir to supply water to the following users:

- Zulia Refinery Complex (Petroquímica Pequiven El Tablazo) in the state of Zulia, 62 kilometers away.
- Cardon and Amuay Refinery Complexes in the Paraguana Peninsula, 173 kilometers away.
- Cities and towns with population in excess of 1,000 along the route of the aqueduct.
- Irrigation for approximately 5,000 hectares of agricultural land.
- General use in the islands of Aruba and Curaçao, either by barges or extension of the pipeline

The project will utilize proven technology and equipment. In addition to the pipeline supplies, there will be substantial requirements for pumping stations, package water treatment plants and controls and instrumentation.

Maticora Water Supply Project

Infrastructure Project Profiles

Site

The state of Falcon in northwestern Venezuela.

Timing

A TDA Desk Study was prepared by Basic Technology, Inc. and submitted to TDA on January 6, 1995. TDA has approved funding on a cost shared basis with Bechtel Corporation for the full feasibility study.

Equipment & Services Demand

The 173-kilometer pipeline will require pumping stations, package and water treatment systems, controls, instrumentation and piping. This will be a major construction and engineering effort. The feasibility study will specify the nature and quantities of required equipment and services.

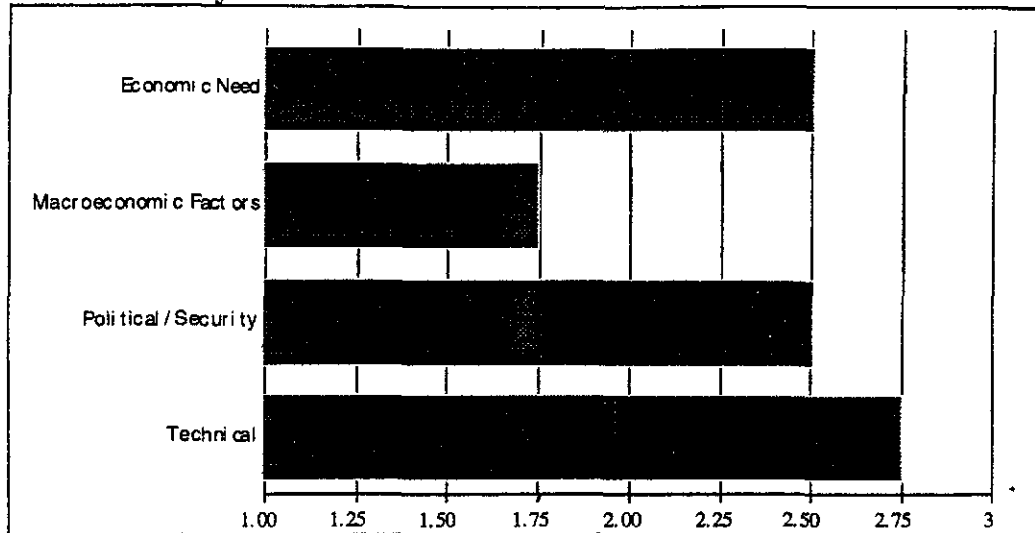
Nature of Demand

Demand is driven by water shortages and the high cost of water in the affected region. A small number of large users (refineries and industrial firms) would be the principal water consumers. Another option is to pipe treated water to Curaçao.

Financeability

Financing for this project will most likely be either official funding or a mix of private investment and official funding. Ex-Im Bank has expressed interest in the project and suggested it could finance up to 65 percent of the equipment and pipe materials. The large industrial users and refineries provide a strong customer base and good payment histories.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

Hidrofalcon S.A.

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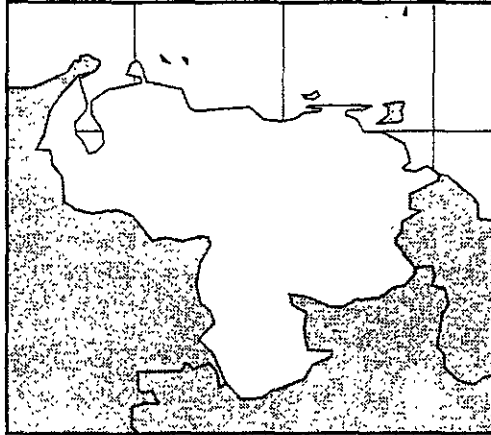
TDA Tip

Water supply projects like Maticora fulfill an important social need in Latin America. In projects of this type in the Venezuelan market, U.S. companies have a high probability of project participation. A TDA-funded desk study on Maticora was completed by Basic Technology Inc. in January 1995. TDA has approved funding on a cost-sharing basis with the Bechtel Corporation for a full feasibility study.



Environment/Venezuela

SIDOR Wastewater Treatment Project



Project Summary

Project No:	ENV-18
Subsector:	Wastewater
Country:	Venezuela
Project Cost:	\$36 million
Export Potential:	\$22 million
Owner:	Siderurgica del Orinoco (Sidor)

Siderúrgica del Orinoco (SIDOR), a major Venezuelan steel producer, recognizes that it is operating outside of compliance with Venezuelan environmental regulations. While the Venezuelan government is not fully enforcing its environmental laws yet, SIDOR would like to upgrade its wastewater treatment system so that it does not face future liability or criminal sanctions for its violation of Venezuelan law.

Technical Description

The project include the upgrading the steel mill's wastewater treatment facilities and hazardous waste disposal practices to bring the plant into compliance with Venezuelan environmental standards. While the TDA Desk Study dated June 9, 1994 pointed out that air emission standards are also being violated, Basic Technology, Inc., the authors of the Desk Study, recommended early attention to wastewater discharges and to proper disposal of certain toxic wastes.

The Desk Study recommended a two-phase approach for the feasibility study. Phase I would consist of wastewater sampling and flow studies and Phase II would consist of an engineering study of alternative wastewater treatment systems. TDA has approved funding for the feasibility study and Chester Environmental has been selected to conduct it.

Site

The SIDOR facility is located in Matanzas, Venezuela.

SIDOR Wastewater Treatment Project

Infrastructure Project Profiles

Timing

In late April 1995 SIDOR informed U.S. TDA of its choice of Chester Environmental as the contractor to undertake the full scale feasibility study. The negotiation of a formal contract is underway. Given a projected 12- to 18-month schedule for completion of the study, it is anticipated that project implementation will begin in the second half of 1996 or the first half of 1997.

Equipment & Services Demand

Although the exact list of equipment and services will depend on the results of a complete feasibility study, a Desk Study completed for TDA in June 1994 indicated that equipment and systems alone would represent a value of some U.S.\$35,600,000. The main components included the following:

Component	Investment
Tinning lines chrome reduction	\$3,030,000
Cold mill terminal treatment plant	\$10,700,000
Pipe mill recycle system	\$4,500,000
Hot strip mill oily sludge system	\$ 6,100,000
New industrial waste landfill	\$9,000,000

Nature of Demand

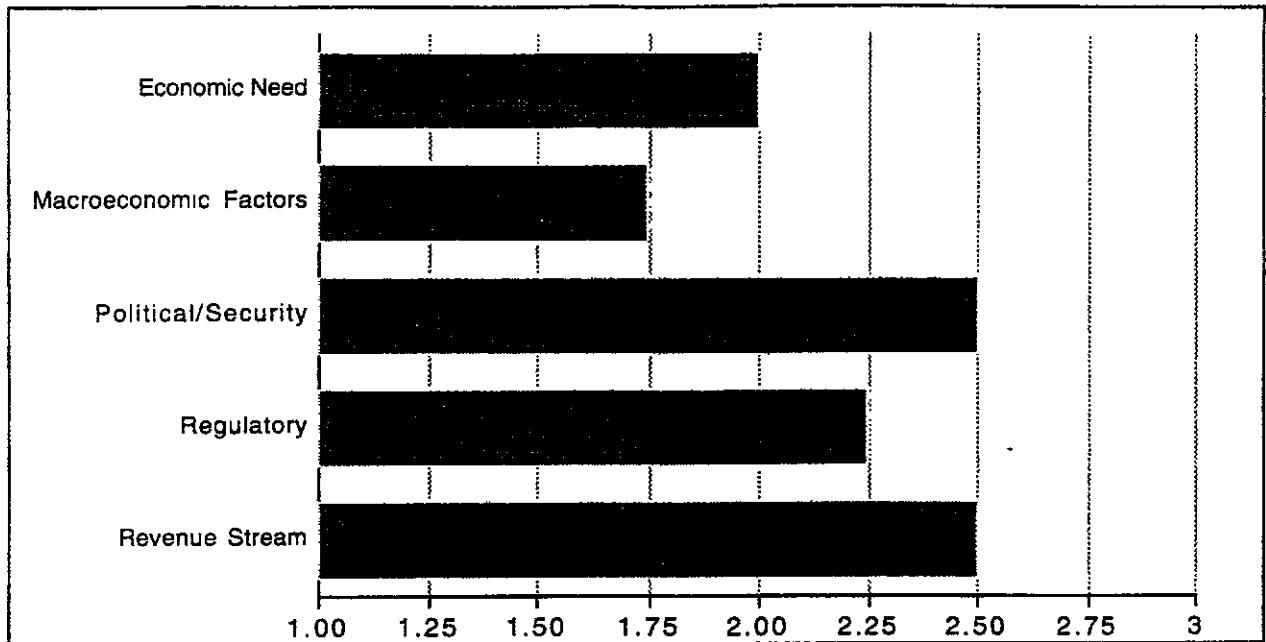
The project is being driven by SIDOR's desire to achieve compliance with Venezuelan environmental standards. The project is also consistent with SIDOR's plans to modernize parts of its production line.

Financeability

The project will most likely not proceed on a project finance basis, but require financing through a combination of official credits and SIDOR capital. SIDOR has budgeted U.S.\$7,000,000 for the environmental project. One major impediment to financing is the continuing controversy over whether SIDOR will or will not be privatized.

Key to the success of the project will be the completion of a feasibility study with cost-effective engineering solutions.

Financeability Assessment



Source: CG/LA Infrastructure.

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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TDA Project Tip

U.S. TDA believes that good opportunities exist in wastewater treatment at steel plants throughout Latin America. In 1994 TDA funded a desk study to determine the feasibility of the implementation of wastewater treatment program proposed by Venezuelan steelmaker SIDOR. TDA has approved funds for a feasibility study to be carried out by Chester Environmental.



The Telecommunications Sector in South America



Introduction

Three major trends characterize the South American telecommunications sector: privatization, demonopolization, and the introduction of new technologies. While a revolution appears at hand in Latin America, the reality is that each country is in a different phase of transformation. U.S. companies are uniquely positioned to take advantage of the demand for telecommunications equipment services.

The following 21 projects alone account for U.S.\$5.3 billion in investment opportunities:

<i>TWENTY-ONE TELECOMMUNICATIONS PROJECTS</i>	
Total value:	\$5.3 billion
U. S. Export potential	\$3.5 billion
Network Expansion	4
Cellular/ Wireless	3
Rural Telephony	4
PCS	2
Submarine Cable	2
Trunking	1
Satellite-	1
Frequency Monitoring	1
Television	1
Long Distance	1
Other	1

Privatization

The privatizations of state PTTs, complete for some time in Chile and Argentina, are still some way off in Brazil and Colombia. Contracts concluded with national telecommunications authorities generally have locked the new owners into extensive investment programs. These investment programs—involving billions of dollars in some cases—have concentrated on installation of phone lines to South America's low line penetration levels. Major line expansion projects are underway in Peru, Venezuela, Ecuador, and Paraguay. Privatization has attracted capital which has allowed countries to tackle the disparities between urban and rural areas. Peru, which was able to benefit from the experiences of other South American countries, has set up a rural telecommunications investment fund, capitalized by tapping a small percentage of the revenue of private telecommunications companies.

Demonopolization

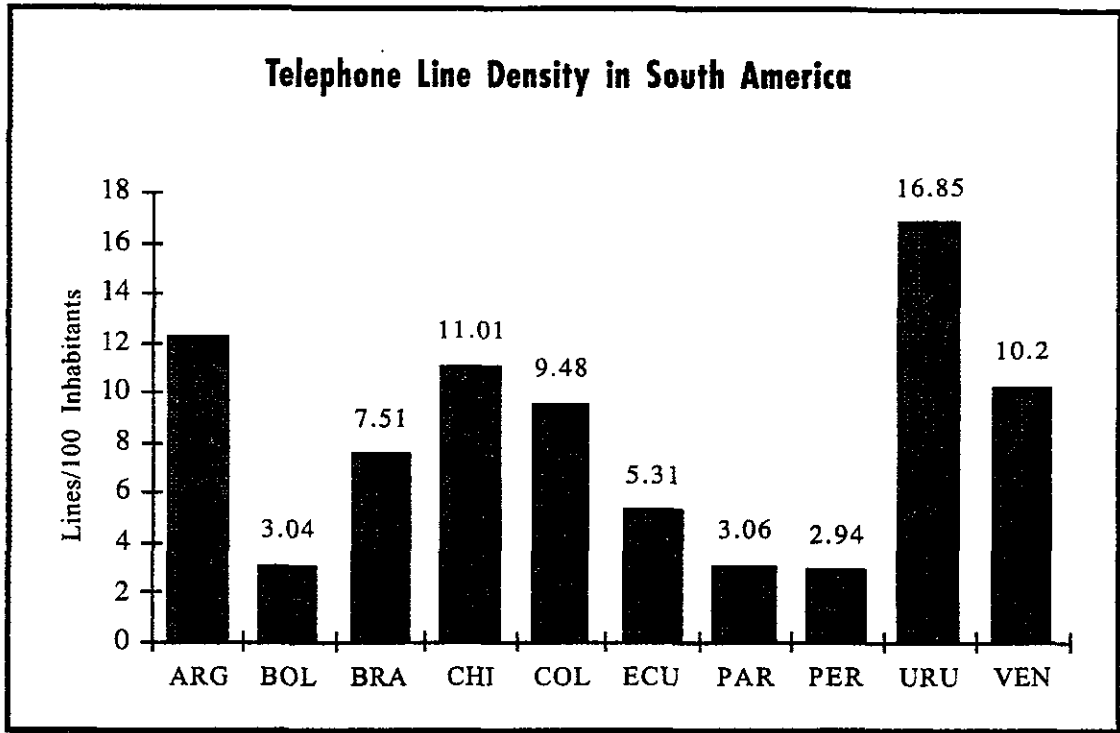
Demonopolization has the potential to bring the most dramatic changes to South America. The opening of the long distance market to free competition has brought improved service and lower rates to Chile and promises to accomplish the same in Colombia and other countries in the next few years. Faced with the impending loss of their protected markets, companies like TELECOM Colombia will have to make their operations more efficient, more customer-service oriented, and offer the value-added services to maintain their subscriber base. Competition in Chile, which allows free competition in domestic and international long-distance service, has lowered once astronomical long-distance rates; it's now less expensive to call the U.S. from Chile than vice versa.

New Technologies

The introduction of new technologies has spurred unparalleled growth in telecommunications infrastructure demand. The high consumer demand for new services such as cellular phones, fax, paging, and cable television prompted the region's first attempts to introduce free competition and private-sector involvement. The opening of the market for value-added service providers is creating numerous small and medium-sized business opportunities in areas such as paging, trunking, voice mail, image transmission, data transmission, and fax. The South American market has responded with an insatiable demand for these new technologies.

More economical than conventional phone lines, wireless-based systems have taken the region by storm. Cellular and other wireless systems are now being utilized as cost-effective ways of improving basic telephone service, for which waiting periods of up to two years are still common. To provide competition, as well as to satisfy demand, new cellular operators are being licensed in areas outside of the major cities, as in the case of Peru. As existing wireless frequencies are becoming congested, regulatory agencies are preparing to license PCS communications, as in the case of Chile and Argentina, or are exploring other wireless options, such as GSM standard cellular, as in the case of Venezu-

ela. Finally, wireless options are being turned to in areas of low phone density, most notably in rural areas. Chile and Peru are encouraging rural telephony projects with special telecommunication development funds.



Source: International Telecommunications Union, 1994

High call volumes are pushing the need for improved transmission systems, such as satellite and fiber optics. Private sector firms are quickly implementing a plan to ring the continent of South America with submarine fiber-optic cables. At the same time, the Andean countries are betting on the utilization of satellite transponder capacity with two major regional satellite projects, including the private sector Simon Bolivar Satellite Project. Within five years, the continent will be connected by fiber-optic cables from Chile to Venezuela, and from Venezuela to Brazil and Argentina. The Pan American Cable and Brazilian Fiber Optic Cable project to be finished in the next five years, will fill in the remaining gaps from Santiago to Buenos Aires. In addition, Chilean firms are planning the Trans Pacific Cable project to link the Americas with New Zealand, Australia, and Asia.



Telecommunications/Regional

Simon Bolivar Satellite Project



Project Summary

Project No:	TEL-01
Subsector:	Satellite
Country:	Andean Pact
Project Cost:	\$300 million
Export Potential:	\$240 million
Owner:	CAATEL

The concept of a communications satellite for the Andean Pact countries (Venezuela, Colombia, Ecuador, Peru, and Bolivia) has been under consideration for almost 20 years. Originally conceived as a public sector project, the Simon Bolivar Satellite Project suffered from a lack of funding by the Andean Pact nations. Several feasibility studies were conducted, and the project was restructured several times, all to no avail.

Last year, however, the Andean Pact Telecommunications Committee (CAATEL) opened the door to private sector control of the project. A CAATEL meeting in April 1995 with international satellite companies agreed that private sector firms will design, operate, and finance the project. International participation will be permitted in all phases of the project. The project now appears to be moving forward.

As a result of CAATEL's April meeting, the configuration, investment, implementation, and operation of satellite services will belong exclusively to the private sector. The letter of intent signed at the meeting created an Interim Committee made up of private sector representatives from the five Andean Pact countries. Although the Interim Committee is in charge of the project's configuration, the meeting produced a consensus on the basic plan drawn up last December by CONATEL, Venezuela's telecommunications regulatory agency.

Simon Bolivar Satellite Project

Infrastructure Project Profiles

Technical Description

The project calls for the launch of a hybrid satellite (bands C and Ku) that will have a capacity of 50 transponders. The project is expected to require an investment of U.S.\$300 million over a period of 12 years—the working life of the satellite—and generate net revenues of U.S.\$42 million annually.

The satellite is expected to include telephony, television, VSAT, and other business services. CONATEL expects the investors to be large telecommunications and television end users. However, third-party sales of transponder capacity are also expected. The Interim Committee will decide the best way to manage the project: a consortium, a mixed company, a joint venture, etc.

Site

In 1990, the Andean Pact established a technical office in Caracas. The future headquarters as well as telemetry and control stations will also be located in Venezuela.

The position of the satellite remains a point of contention. In 1990, the International Telecommunications Union (ITU) assigned the Simon Bolivar Satellite three orbits: 100°W, 103°W, and 109°W. In 1993, Mexico launched its Solidaridad Satellite in the orbit 109.2°W, a position which will cause severe interference once the Simon Bolivar Satellite is in operation. Representatives from CONATEL and CAATEL went to Mexico in May 1995 to resolve the orbit dispute.

Timing

At the request of CAATEL, Telesat of Canada is conducting pre-feasibility studies funded by ASETA, an association of basic telephone operating companies in the Andean Pact. The draft of the pre-feasibility study is due in mid-June 1995, with the final report due at the end of the month.

Equipment & Services Demand

According to CONATEL, the largest component of the project will be equipment, launching, and insurance, which will make up 28 percent, 22 percent, and 21 percent of the total cost, respectively. The estimated percentages for each component of the total U.S.\$300 million project cost are as follows:

Sub Project	%	Sub Project	%
1. Equipment	28	5. Control and Tracking Systems	5
2. Launch and Orbit Insurance	22	6. Management	6
3. Launch	21	7. Other	7
4. Operations	11		

Nature of Demand

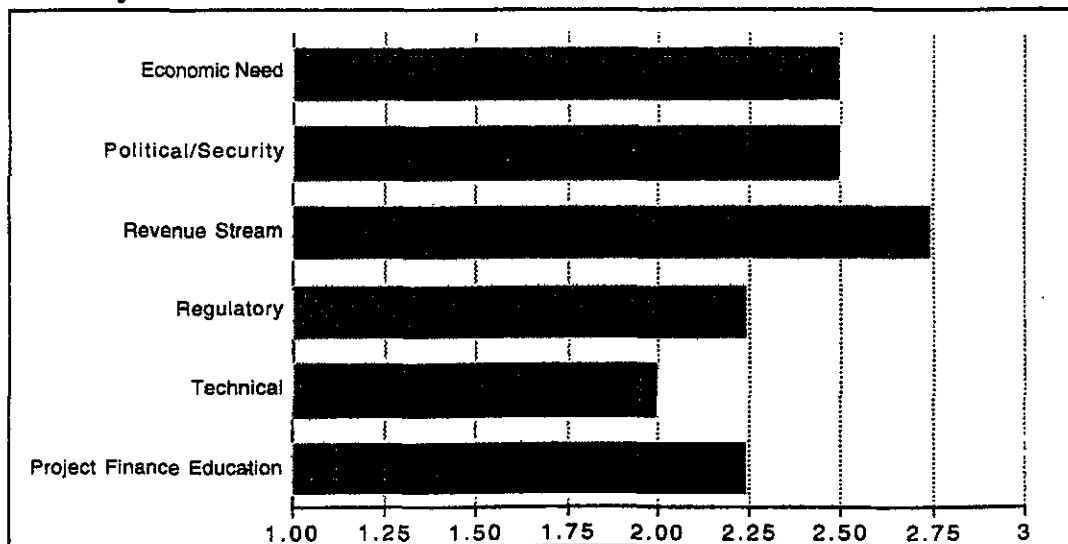
In December 1994, CONATEL prepared demand projections for satellite telecommunications services. The demand picture for satellite communications in the region must consider existing telecommunications services, both satellite and terrestrial. It must be remembered that a number of the Andean countries are entering various phases of privatization and demonopolization. These factors have spurred the installation of new telecom infrastructure, that may compete with the Simon Bolivar Satellite. Depending on the rate structures, existing alternatives (including other satellites) may be less expensive for basic telephony, television, VSAT, and other uses of transponders on the Simon Bolivar Satellite. Furthermore, major projects are underway in the various Andean countries to improve telecom capacity, including domestic fiber-optic cables and international submarine cables. In addition, INTELSAT signed an agreement last year with ASETA and the Andean countries to lease transponders at preferential rates for a 15-year period.

Nevertheless, CONATEL cites the lack of adequate transponder capacity and the elevated costs of up to U.S.\$180,000 per month. New technologies popular among businesses—VSAT and certain mobile services—are particularly well-suited to satellites. There is a growing demand for direct home television and an expanded variety of television programming in general.

Financeability

The key issues in financeability are the demand for satellite capacity and the technical issue of the orbit allocation. The latter issue has lowered the technical rating number.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

Andean Pact Telecommunications Committee (CAATEL)

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Country	Member Firms
Venezuela	CONINTEL and CASETEL
Colombia	Chamber of Telecommunications and Informatics
Ecuador	TeleAmazonas
Peru	Telefonica del Peru, Tele 2000, and SERSA/CBOCOMM
Bolivia	(two companies to be designated)



Telecommunications/Regional

Pan American Cable Project



Project Summary

Project No:	TEL-02
Subsector:	Submarine Cable
Country:	Regional
Project Cost:	\$350 million
Export Potential:	\$300 million
Owner:	AT&T, ENTEL

This project will improve telecommunications among several Andean countries and the United States by means of a new submarine cable. This project is coordinated by a group composed of telecommunications authorities (PTTs) from each of the countries to be linked by the cable. The ownership and construction of the cable, however, will be by private sector initiative.

Technical & Site Description

Originally, the submarine cable was to follow the Pacific Coast from Chile to Mexico and then to California. Now the cable will follow the Pacific Coast from Chile to Colombia, cross the Isthmus of Panama, and link up with the Americas I Cable in the Caribbean. As a result of an April 1995 meeting of the Pan American Cable Coordinating Group, the route of the project was changed substantially.

The 6,700-kilometer cable will begin in Arica, Chile at the northern end of the fiber-optic cable that runs the length of the country. From northern Chile, a submarine cable will connect Panama with landing points in Peru, Ecuador, and the Pacific Coast of Colombia. The cable will cross Panama over land and reconnect to the Caribbean Coast of Colombia. The cable will then cross the Caribbean and connect with the AT&T Americas I Cable offshore of St. Thomas, Virgin Islands. The connection to the Americas I Cable will allow access to the U.S., Venezuela, and Brazil.

Pan American Cable Project

Infrastructure Project Profiles

The project has about forty equity investors, most of which are national telecommunications authorities and private sector companies. AT&T is the largest investor, followed by ENTEL Chile.

Timing

AT&T and ENTEL Chile are co-chairing the Pan American Cable Procurement Group, which is managing equipment bids to be requested in July 1995. The Pan American Cable Coordinating Group has set the completion date for 1998.

Equipment & Services Demand

The primary systems utilized for the cable include:

- terminal equipment
- optic amplifiers and repeaters
- standard fiber-optic submarine cable

It is likely that the bulk of the investment in the project will go to cable installation (70 percent), followed by the fiber-optic cable (20 percent), and other equipment (10 percent).

Nature of Demand

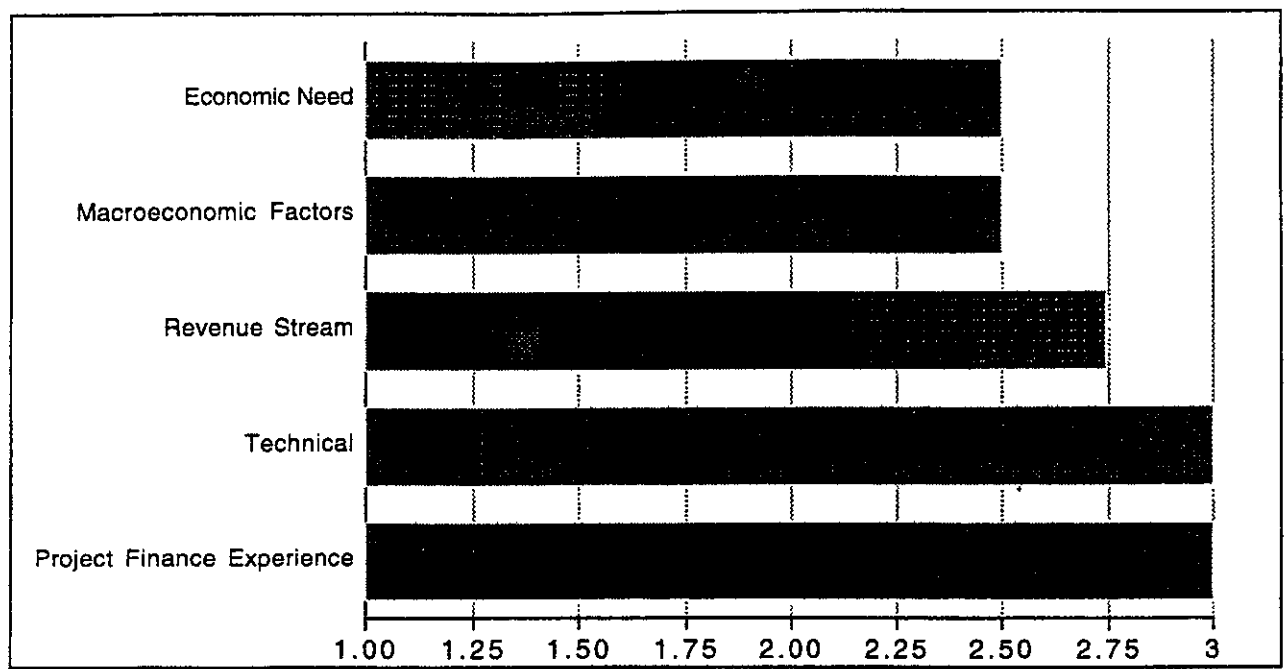
Feasibility studies undertaken by the coordinating group for the original route to Mexico revealed insufficient telephone traffic for the financial viability of the project. However, the studies recommended an alternative route that will provide sufficient projected call volumes. Therefore, the project was changed so that the cable crosses Panama and connects to the Americas I Cable near St. Thomas.

Charges for cable use will vary according to the distance of the telephone call. The coordinating group estimated the charges from Chile to the U.S, one of the major routes envisioned on the Pan American Cable, at U.S.\$950,000 per half-minimum investment unit (MIU).

Financeability

The project is being financed by the project owners—ENTEL Chile and AT&T. The financial strength of the sponsors ensures the project's financeability and thus, its viability.

Financeability Assessment



Source: CG/LA Infrastructure
 This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

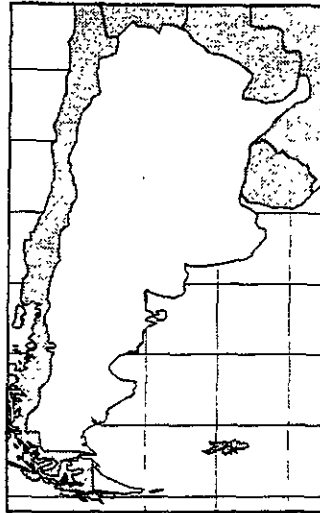
The major private sector players for the ownership and construction of the cable are AT&T and ENTEL Chile. Use of the cable for international traffic will be subscribed by the telecommunications authority of each country along the cable route.

<p>AT&T Ron Sears, <i>Co-Chairman of the Pan American Cable Procurement Group</i> Basking Ridge, New Jersey ph: (201) 326-2782 fax: (201) 326-2034</p> <p>ENTEL Chile Roberto Cofré, <i>Co-Chairman of the Pan American Cable Procurement Group</i> Santiago, Chile ph: (562) 690-2314 fax: (562) 690-2547</p>
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Telecommunications / Argentina

PCS License



Project Summary

Project No:	TEL-03
Subsector:	PCS
Country:	Argentina
Project Cost:	\$100 million
Export Potential:	\$80 million
Owner:	CNT

Argentina's privatization of the telecommunications sector ushered in a new wave of telecommunications services. Following the privatization of conventional telephony services in the early 1990's, this sector has been subject to a profound change through specific deregulation and private sector initiatives. In the wireless market, two companies, Movistar and Movicom, operate in the entire Buenos Aires metropolitan area.

The area outside of Buenos Aires is divided differently. CTI, the original provider, was given a concession for the rest of the country. As the demand for wireless communications grew, the National Telecommunications Commission (CNT) awarded a second band to be shared by two companies. The first CCPI (owned by Telecom) operates in the northern part of the country, while TCP (owned by Telefónica) operates in the southern part.

Technical Description

With the growing use of wireless communications, the CNT has decided to organize a public competition for a license to operate the country's first Personal Communications System (PCS). This concession will be awarded to the best technical and service proposals.

This system will run on the 1700-2300 MHz band with the following attributes:

PCS License

Infrastructure Project Profiles

Frequency	Services	Comments
1706.5 - 2304.5	Fixed	MXD up to 2x34 Mb/s
	Mobile	MXA with 60 to 1800 channel
	Wireless Access	TPTV (transport system for TV programs)
	System to	STSV (transport systems for video signals)
	Basic Telephone Service	RC. CCIR 283-5 RC. CCIR 382-5 1910 - 1930 MHz wireless access system to basic telephone service

This assignment of attributes for the new band range also will permit band frequency migration for existing services until 1998. After that time, they will be able to migrate only with the authorization of the CNT.

Site

The geographic area referred to as "Area II of Mobile Communications" is a 100 square kilometer area centered in Buenos Aires, going south to the city of La Plata and north to the city of Zarate. To the west, this area covers a radius of about 100 kilometers, connecting the above-mentioned cities. The population of the service area is about 12 million.

Timing

The legislation for this bid stipulates that the bidding papers will be on sale within 180 days after the publication of the regulation. Therefore, the sale would begin in August 1995 at the latest. Offers should be submitted within 90 days of the date that the bidding documents are out for sale. CNT will award licenses within the following 30 days.

Equipment & Services Demand

The exact demand for equipment and services will depend on the minimum and maximum projections of customers by the winning bidder. It is expected that much of the PCS telephone equipment and cells will be imported.

When the first wireless phone system was established in the same area several years ago, the initial projected investment was for 20 cell sites, but actual market demand exceeded projections.

Nature of Demand

PCS—a digital wireless system which can support paging, fax, and voice mail, as well as video imaging and data transmission—is considered to be in the forefront of telecommunications technology. While PCS is capable of supporting a broad range of value-added services, subscribers generally are looking for the wireless communication function. Therefore, the primary competitor to PCS will be analog cellular telephony.

The key to the success of this project will be the degree to which the market can sustain another provider of wireless services. In Buenos Aires, Movicom has 200,000 subscribers, while its competitor, Movistar, has 78,000.

For the area outside of Buenos Aires, the first licensee, CTI, just finished building its network and began operations in 1994. In the same year, two new licenses were awarded. TCP and CCPI will invest about U.S.\$400 million in their networks, which are expected to go on-line in March 1996.

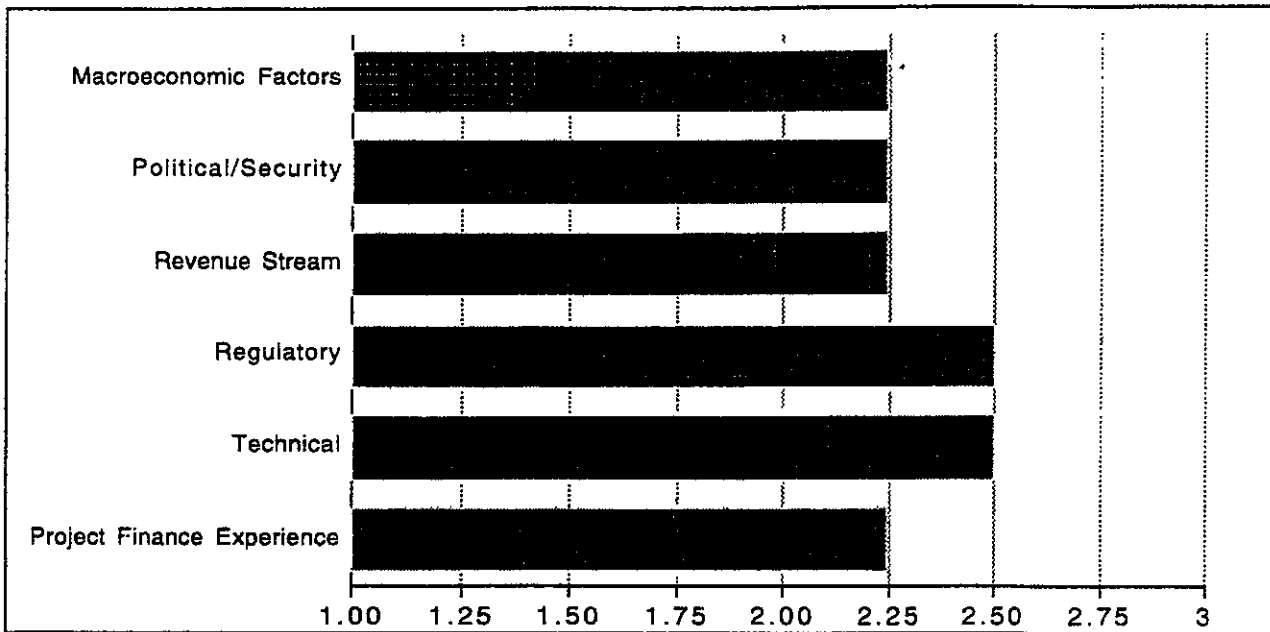
Financeability

Each of the licensees is expected to arrange its own financial program to support the investment in equipment, infrastructure, and operating costs. Their revenue stream will be focused on service fee collection. The major unknown is the real degree of demand from potential users.

PCS License

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

Key Decision Makers

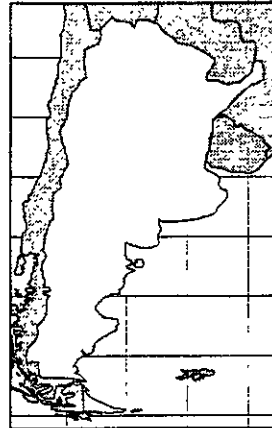
As a result of the elections in May 1995, the leadership of CNT may soon change. It is anticipated that any possible changes in the CNT leadership will not impact the progress of the project.

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Telecommunications/Argentina

Spectrum Monitoring Concession



Project Summary

Project No:	TEL-04
Subsector:	Spectrum Monitoring
Country:	Argentina
Project Cost:	\$20 million
Export Potential:	\$15 million
Owner:	CNT

Argentina continues to look for ways to turn over the delivery of public services to the private sector. After privatizing major industries in the last five years, Argentina is reexamining the role of government in almost every public service, including the monitoring of the frequency spectrum used by the large number of private telecommunications service providers.

The growth in the number of operators using radio frequencies has exploded in the last few years. With an outdated infrastructure, telecommunications authorities have not been able to monitor the airwaves adequately.

Technical Description

The National Telecommunications Commission (CNT) wants to outsource some of its monitoring functions as a means of upgrading its equipment and improving the delivery of its services. The CNT is organizing a public competition to grant a concession to a private firm that will accomplish both of those goals. Necessary infrastructure investment should reach U.S.\$20 million. The period of concession is 15 years, with a five-year option for renewal.

The CNT will continue to grant frequencies and collect fees. However, administration, spectrum monitoring, and enforcement of compliance with regulations will go to the concessionaire. In addition, it will be up to the concessionaire to invest in the modernization of the computer system and monitoring equipment.

The concession will be awarded on the best technical and service performance offered by the bidder.

Spectrum Monitoring Concession

Infrastructure Project Profiles

Site

Headquarters for the monitoring facilities will be in Buenos Aires, but the concessionaire will be responsible for the four existing and any new monitoring centers in the country.

Timing

A draft of general bidding rules was published in February 1995, however the required investment has now been revised to include hardware, software, and radio monitoring equipment. Specifications were supposed to be ready in June, but a change in leadership at CNT following the May elections may cause delays.

Equipment & Services Demand

The major investment component involves the maintenance and upgrade of the four existing monitoring centers and installation of new ones in various parts of the country. Specifications for the monitoring centers are not yet ready. Each center should require the following types of equipment:

- antennas and radio equipment
- electronic tracking equipment
- equipment for triangulation

In addition to designing a database, including hardware and software, for the administration of the monitoring system, the concessionaire will also be responsible for the maintenance and operation of the database.

Nature of Demand

As more private sector companies and value-added services enter the market, a rigorous enforcement of spectrum allocation will be needed. Today, CNT is unable to monitor all the radio transmission in the country and is therefore unable to collect the fees that operators of radio frequencies should be paying.

Financeability

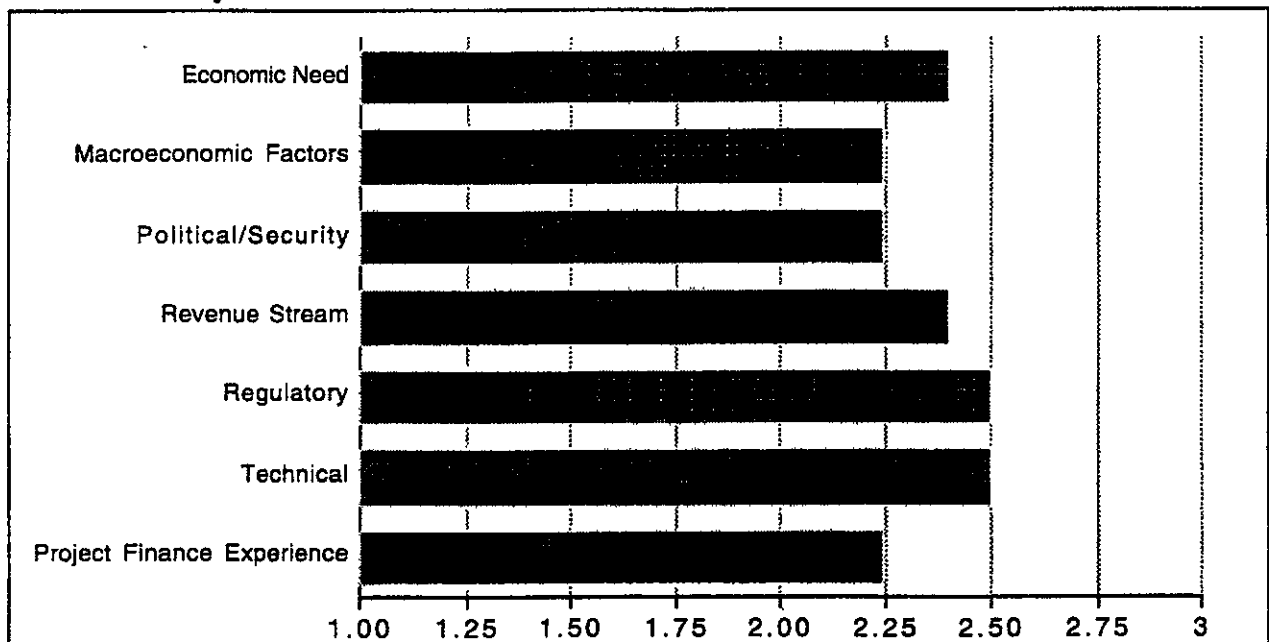
Companies looking to win this bid should be able to have their own financing package. Their revenue stream will come through a fee that will be established in the following ways:

Fixed value: Based on the actual collection of fees from users of radio frequencies by CNT. This fixed base will be adjusted by the increase of users, estimated at 80 percent in the next five years.

Variable value: This will be based on the amount of investment that the concessionaire commits to making in the first five years of operation.

The growth in the communications industry is driving the project, and fees collected should increase over time. At the same time, it is difficult to forecast with certainty the expected revenue stream. The technical specifications are quite extensive, and this introduces a degree of risk in costing out the project and meeting performance criteria.

Financeability Assessment



Source: CG/LA Infrastructure

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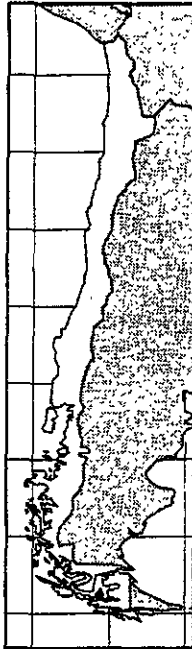
Key Decision Makers

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Telecommunications/Chile

PCS License



Project Summary

Project No: TEL-05
Subsector: PCS
Country: Chile
Project Cost: \$300 million
Export Potential: \$225 million
Sponsor: Undersecretariat of Telecommunications

Chile, equipped with one of Latin America's most advanced telecommunications infrastructures, is about to take another step toward the future by opening up the market for Personal Communications Services (PCS). PCS—a digital, wireless system, that can support paging, fax, and voice mail, as well as video imaging and data transmission—is considered to be on the forefront of telecommunications technology.

Technical & Site Description

The Undersecretariat of Telecommunications (SUBTEL) is preparing to open public bidding for licenses to operate PCS systems in Chile. Two Chilean companies have already announced their intentions to enter the market with PCS systems.

ENTEL, which operates a cellular concession with Motorola, plans to invest U.S.\$80 million in the first three years and U.S.\$200 million over the next ten years on a PCS network that will begin by providing coverage to Chile's three largest markets—Santiago, Valparaíso, and Concepción—before eventually extending to the rest of the country.

PCS License

Infrastructure Project Profiles

Telex Chile, through its subsidiary, Chilesat, intends to invest U.S.\$100 million in a PCS system planned for 22 cities.

The service areas have not yet been determined, but they may mirror the cellular service areas which divide Chile into two zones: a) the areas around Region V and Metropolitan Santiago, and b) the rest of the country.

Timing

The Undersecretariat is working with several private sector companies on technical studies that are now underway.

In May 1995, the Undersecretariat completed a draft of its plan for PCS services, which it released to interested parties for comments. Afterwards, it will develop regulations that will govern bidding documents and allow for the drafting of their fundamental principles. Public competition for licenses will take place in the third quarter of 1995.

Equipment & Services Demand

U.S. companies have an excellent opportunity to supply the equipment for the new systems. The number of licenses to be distributed has not yet been decided, but Telex Chile and ENTEL's projects alone total U.S.\$300 million.

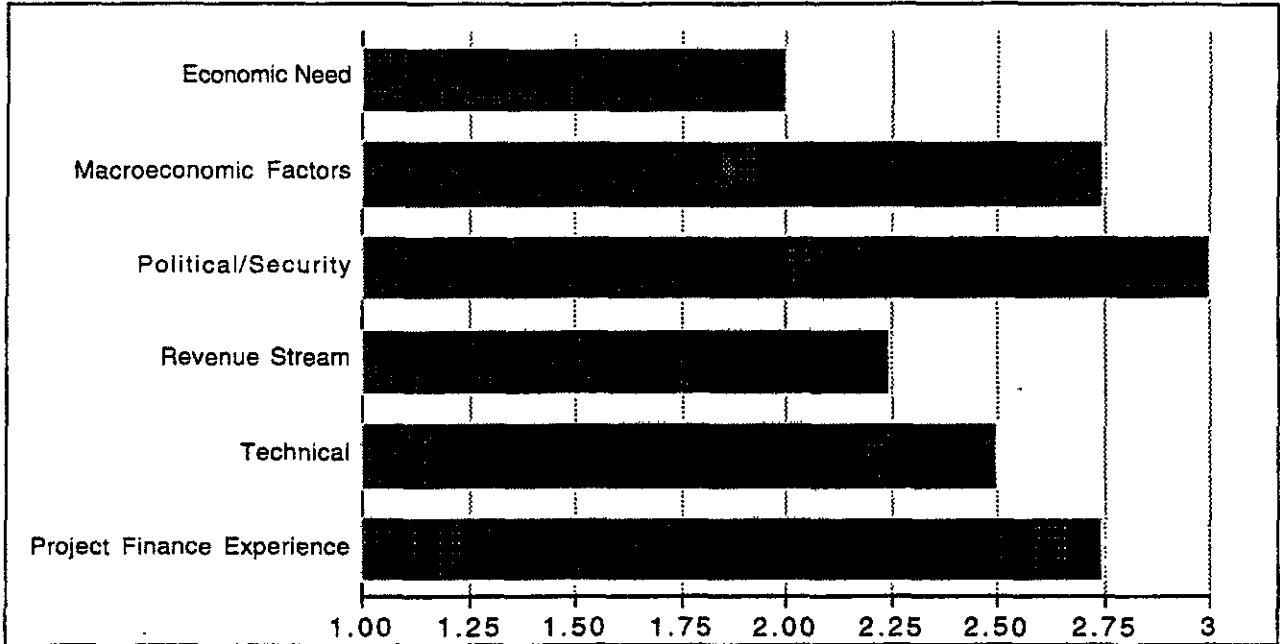
Financeability

Together, ENTEL and Telex Chile will finance the acquisition of about U.S.\$300 million of telecommunications equipment and services. Acquiring such an amount will depend on the successful and timely award of the concessions (which is likely) and consumer acceptance of the new technology.

For those firms seeking to enter the market as concessionaires, the central issue in financeability is the ability to compete effectively in what may be a crowded field and to attract subscribers from a mature cellular market by capitalizing on the improved technology and the versatility of PCS, which combines other value-added services.

Overall, Chile provides an excellent market to test the acceptance of PCS—a mature telecommunications market with an entrepreneurial and export-oriented business class in need of high-quality communication links. At the same time, it is a new technology without a proven level of demand in Chile, and this will hamper project-based finance in the early phases.

Financeability Assessment



Source: CG/LA Infrastructure

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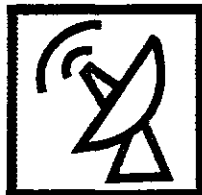
Key Decision Makers

Undersecretariat of Telecommunications

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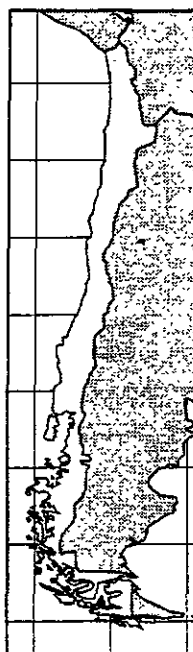
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Telecommunications/Chile

Rural Telephony Project



Project Summary	
Project No:	TEL-06
Subsector:	Rural
Country:	Chile
Project Cost:	\$30 million
Export Potential:	\$20 million
Sponsor:	Undersecretariat of Telecommunications

Technical Description

Chile is encouraging investment in telecommunications systems in areas of the country that have low telephone-line densities. This year, the Undersecretariat of Telecommunications (SUBTEL) will begin awarding concessions for systems to be installed in rural and marginal suburban areas. The Telecommunications Development Fund, with a current annual budget of U.S.\$4.5 million, will be used to support up to 30 percent of a selected project.

SUBTEL estimates that the funds budgeted for this year will be sufficient to install 2,000 public telephones and between 3,000 and 5,000 common telephone lines.

Site

The telephony projects supported by the Telecommunications Development Fund must be located in "telephone-poor" areas, many of which are located in rural areas or in communities

Rural Telephony Project

Infrastructure Project Profiles

on the outskirts of cities.

Timing

Created by the Telecommunications Law of 1994, the fund was supposed to go into operation last year, but implementation was delayed. Under the new timetable, the Undersecretariat of Telecommunications (SUBTEL) will publish technical standards and request proposals in mid 1995.

The concessions will be awarded on a lowest-subsidy basis.

Equipment & Services Demand

In addition to investment in public telephones, other equipment needs will depend on the type of system chosen. Because of the high cost of installing conventional phone lines in rural areas, projects could be based on wireless networks using antennas and cell sites.

Although the program is not defined yet, the Undersecretariat of Telecommunications estimates that wireless telephone lines will cost an average of U.S.\$1,300 each and that an average of 100 people will be served by each rural line. Based on these assumptions, an investment of under U.S.\$4 million will provide service to 300,000 customers.

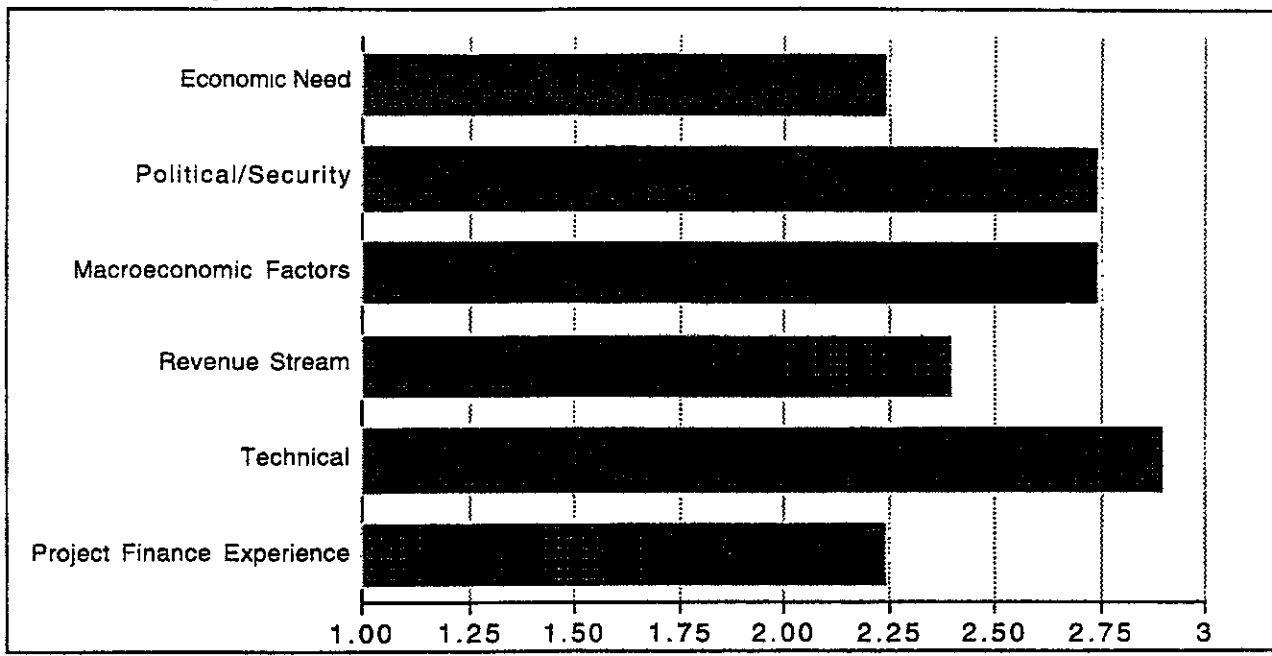
Nature of Demand

Today, Chile has a line density of 11.4 per 100 inhabitants, placing it above the Latin American average of nine per 100 inhabitants, but well below the U.S. average 50 per 100 inhabitants. Still, Chile's network expansion plan over the last four years has been impressive: the number of lines in service more than doubled between 1990 and 1994.

Financeability

The project has strong financeability parameters. There is a strong demand for new phone lines and increasing per capita income to afford them. The program has solid political support. The concession program is well structured and transparent.

Financeability Assessment



Source: CG/LA Infrastructure
 This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

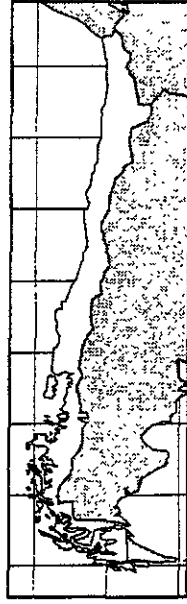
Key Decision Makers

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Telecommunications/Chile

Trans-Pacific Cable Project



Project Summary	
Project No:	TEL-07
Subsector:	Submarine Cable
Country:	Chile
Project Cost:	\$600 million
Export Potential:	\$500 million
Owner:	Undersecretariat of Telecommunications

Chile's foreign trade with the Pacific Rim countries and Asia is growing. Anticipating further growth in business with the region, a new submarine cable will improve communications between Chile and New Zealand, Australia, China, and other Pacific Rim countries. The Undersecretariat of Telecommunications (SUBTEL) of Chile is coordinating participation of the telecommunications authorities along the cable route. The project will be owned and constructed by the private sector.

Technical Description

The total investment needed for the project will be \$600 million.

The points for the submarine cable route have been established as the following:

- Valparaiso
 - Easter Island
 - Tahiti
 - Auckland
- The Trans-Pacific Cable will provide an important link between existing fiber-optic cables.

Trans-Pacific Cable Project

Infrastructure Project Profiles

- The Trans-Pacific Cable will link up with the fiber-optic cable that stretches the length of Chile.
- The Trans-Pacific Cable will link to existing cables connecting New Zealand, Australia, and Tasmania, and the cable from Australia to China.
- Additionally, the Pan American Cable Project—scheduled to go to bid in July 1995—will connect Chile to Peru, Ecuador, Colombia, Panama, and the Americas I Cable in the Caribbean.

Timing

The Undersecretary of Telecommunications will travel to China and Australia in 1995 for discussions on the project. The first stretch of the cable from Valparaiso to Auckland will be completed by 2001. A procurement commission has not yet been established, but it will likely be led by ENTEL and CTC, the leading project developers.

Equipment & Services Demand

The major equipment systems needed will be:

- Optic amplifiers
- Terminal equipment
- Standard submarine fiber-optic cable

Nature of Demand

According to the Undersecretariat of Telecommunications, studies to determine projected telecommunications traffic have not yet been undertaken.

While call volumes to Asia may be relatively low, Chile's international call volumes in general have skyrocketed in the last four years and growth rates are expected to continue.

Growth rates for both international and long-distance domestic calls have averaged 20% per year since 1990. Last year's opening of the long-distance market to multiple carriers has put downward pressure on prices and boosted call volumes. Long-distance tariffs dropped an estimated 19 percent last year due to competition from five major carriers and a number of smaller ones. Consequently, the long-distance carriers are expecting average annual growth of 25 percent.

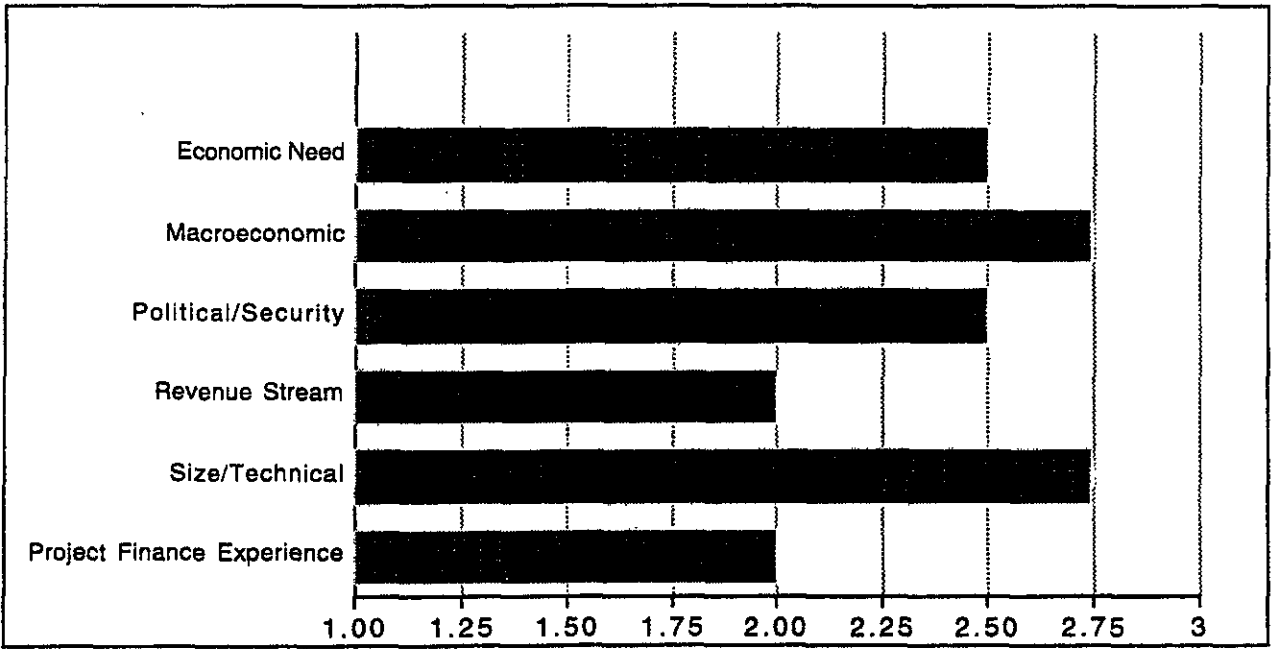
Long-distance and international calls have grown considerably in recent years. Chile spent U.S.\$220 million on international phone calls in 1993, compared to U.S.\$130 million spent on domestic long-distance calls. At least three-fourths of the international calls from Chile are made by businesses.

Financeability

Until the details of the concession are set by the participating governments, the structure of the deal—and, hence, financeability—cannot be evaluated with certainty. In addition, it will be critical to analyze the results of studies of projected telecommunications traffic among the user countries.

Despite the current lack of financing details, there are strong economic drivers behind the project—increasing economic growth and trade among the southern Pacific Rim nations. In our estimation, there is a high probability that these factors will be sufficient to move the project forward and make financing viable.

Financeability Assessment



Source: CG/LA Infrastructure
This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Trans-Pacific Cable Project

Infrastructure Project Profiles

Key Decision Makers

ENTEL and CTC—which developed the north-south fiber-optic cable along with Telex-Chile—will be major participants in the Trans-Pacific Cable Project. On the other side of the Pacific, Australian and Chinese companies have shown interest.

Undersecretariat of Telecommunications (SUBTEL)

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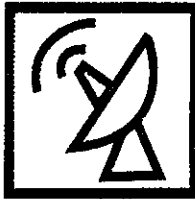
CTC

Claudio Garcia, *Vice President, Finance*

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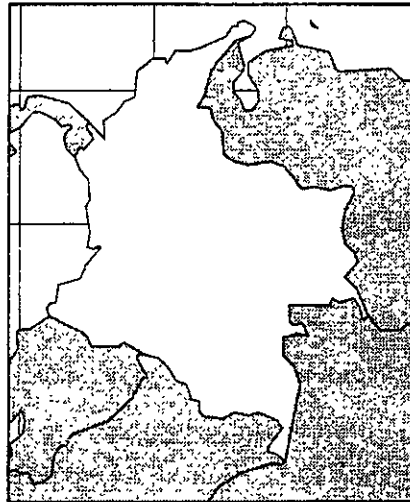
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Telecommunications/Colombia

Multicarrier Long Distance Telephony



Project Summary

Project No:	TEL-08
Subsector:	Long Distance
Country:	Colombia
Project Cost:	\$277 million
Export Potential:	\$220 million
Owner:	Ministry of Communications

Technical Description

Colombia is about to follow Chile as the next South American country to end the monopoly on long-distance telephony. TELECOM maintains a monopoly on domestic and international long-distance service. However, Congress recently approved legislation requiring a competitive regime to be in operation by January 1, 1997 for domestic long-distance and by January 1, 1998 for international long distance. Regulations to license multiple private long-distance carriers are not yet in place.

The to-be-created Committee for the Opening of Long Distance Service will make the final decisions on major long distance questions. The Committee will be composed of officials from the Ministry of Communications, the Ministry of the Economy, the National Planning Department, and the President's Secretary General. The Ministry of Communications' Telecommunications Regulatory Commission will be responsible for much of the work in structuring a competitive long-distance regime.

The Committee will grant concessions to private companies to operate long-distance services. The process of defining the details of awarding concessions, the time period for concessions, interconnection policy, and requirements for long-distance operators will be determined by the Committee.

The Committee will also resolve issues regarding telephone rates. Recent studies indicate that TELECOM's rates are 15 percent higher than the world average. They also indicate that TELECOM's rates are 29 percent over cost for domestic long distance and 10 percent for international calls.

Multicarrier Long-Distance Telephony

Infrastructure Project Profiles

Four major Colombian industrial groups are looking to apply for a concession to break into the market. These companies are discussing joint ventures and partnerships with European, U.S., and other international telecom companies.

TELECOM as well has begun looking for partners that can help it become competitive in the new regulatory climate and attempt to maintain significant market share.

Timing

The process of designing and regulating the long-distance framework should be complete in October 1995. The Ministry of Communications will be ready to issue licenses in January 1996. Concessionaires cannot begin the operations of their systems until January 1, 1997, the date decreed in last year's legislation.

Equipment & Services Demand

The Ministry of Communications expects that investment in long-distance services will be U.S.\$277 million in 1998 and the share of imported goods and services in the sector to be very high. Not only does telephone infrastructure suffer from underinvestment, but new technologies and customer-oriented business practices will be needed to compete in a free market. To win over customers (both residential and business), companies will need to offer value-added services. They will also need to improve their marketing and customer-relations operations.

Infrastructure needs include:

- transmission equipment
- switching equipment
- microwave equipment
- fiber-optic cable

Nature of Demand

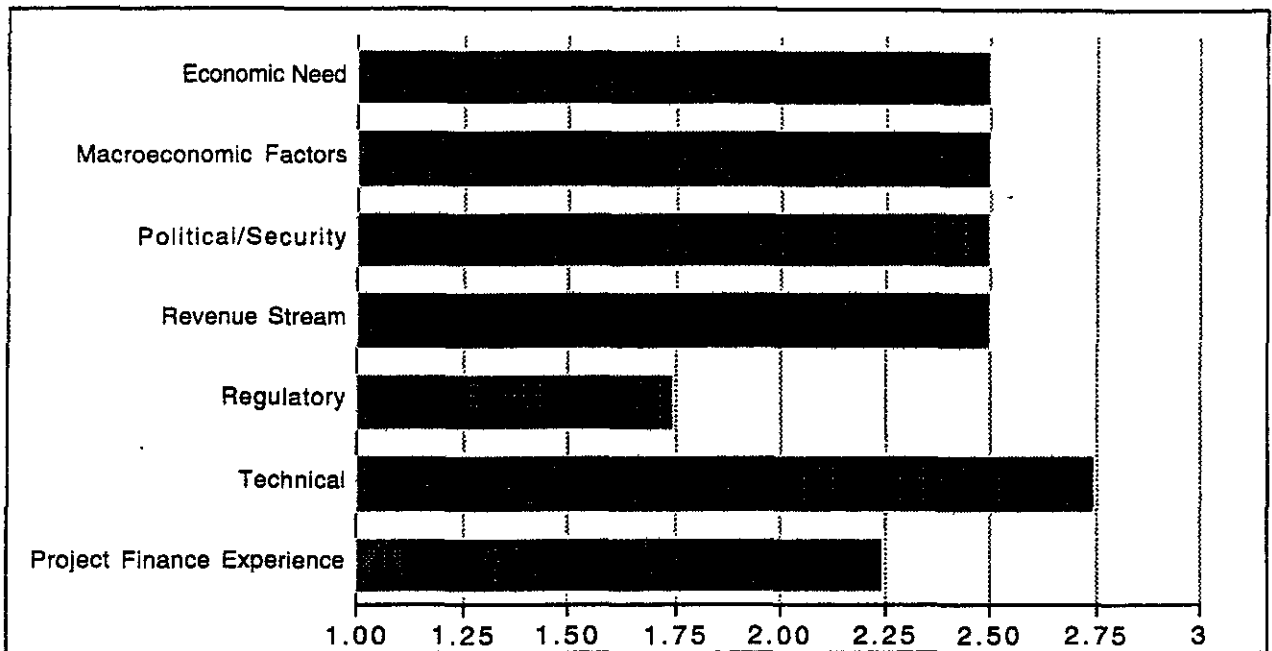
Demand for long-distance services will be strong in the next few years. Since 1994, according to TELECOM, the volume of both domestic and international long-distance calls increased about 20 percent.

The country had just over four million lines installed by the end of 1994, for a line density of 9.48 per 100 inhabitants. Over the last ten years, the number of installed lines has increased an average of 8.5 percent. Two-thirds of all lines are located in the three largest cities: Santafé de Bogotá, Medellín, and Cali.

Financeability

The main financeability issues center on the fact that the regulations implementing the new legislation have not yet been drafted. The details of the regulations will obviously have a major impact on the profitability and financeability of the project.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process

Key Decision Makers

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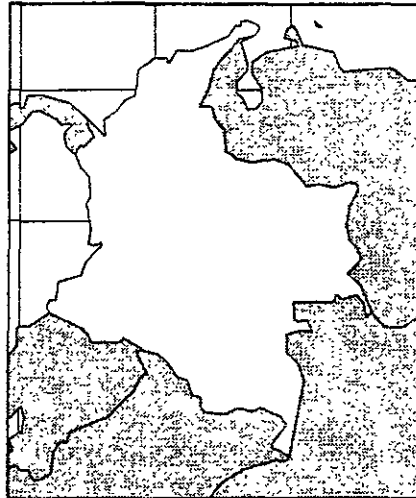
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Telecommunications/Colombia

Identification System Modernization



Project Summary

Project No:	TEL-09
Subsector:	Information Systems
Country:	Colombia
Project Cost:	\$70 million
Export Potential:	\$60 million
Owner:	National Civil Registry

The National Civil Registry manages a records system to collect and organize basic information on every Colombian citizen. The Registry is responsible for a broad range of data collection operations such as personal identification cards, voter registration documents, and fingerprints. An important application of the new system will be the modernization of the electoral system, which is coordinated by the Registry. The Registry has obtained approval to upgrade the current system.

Technical Description

The Registry's plans call for upgrading and automating the production and management of records, while at the same time maintaining security and controlling data access. The Registry is currently developing bidding documents to contract a firm to conduct a detailed study of the system plan and design. After completion of the study, the Registry will organize bids for procurement and project management.

The Registry has divided the modernization effort into five subprojects: 1) Civil Registry, 2) Personal Identification, 3) Storage and Processing of Fingerprints, 4) Recovery of Fingerprints, and 5) Communications and Interconnection. The last of the subprojects includes the Electronic Voting Plan.

The general goals of the modernization project include:

- Reducing the need for written documents.
- Improving the transmission and security of data, images, and fingerprints.

Identification System Modernization

Infrastructure Project Profiles

- Reducing the time for the production of personal identity cards.
- Speeding up the processing of identification and records requests by the security forces.
- Improving the efficiency of investigative agencies.

Specific needs of the system include:

- Converting the current records system to an automated UNIX-based system that can be easily updated.
- Providing mechanisms for processing information requests of other agencies to aid in the capture of criminals, enforcement of military services, and maintenance of airport security.
- Database cataloging identification numbers, marriage certificates, birth and death records, and all pertinent personal information, including individual photographs and signatures.
- Interconnecting notaries, security and investigation agencies, financial institutions, and municipal election authorities throughout the country. Establishing local area networks.
- Automating election systems, including voter registration, verification of electoral lists, electoral tabulation, and electronic voting.
- Automating alphanumeric data and images.
- Establishing an Automatic Fingerprint Identification System (AFIS).
- Developing an efficient vote tabulation system through the use of telecommunications equipment, infrared scanners and the necessary hardware and software.

Site

The project will require the installation of hardware, software and telecommunications equipment in the Registry headquarters in Bogotá, as well as in other cities to be chosen by the Registry. Each region will have an image and document database.

Timing

Since drafting the proposal in 1994, the Registry has taken a number of steps to move the project forward. The Inter-Institutional Committee was formed among government agencies to identify the strengths and weaknesses in personal identification. With technical assistance from the United Nations, the Registry completed a diagnostic study of system requirements. After consulting with private companies on new technologies, the Registry conducted a trade mission to France in 1994. In May that year, the Registry won approval for the project from the Planning Ministry. After completing the preliminary steps, the Registry sent out a request for proposals and received responses from 17 international firms, four of which addressed all five subprojects. Budget estimates varied widely from U.S.\$41 million to U.S.\$273 million.

After reviewing the proposals, the Registry decided to continue looking for alternatives and partici-

pated in an orientation visit—funded by the U.S. Trade and Development Agency— to the United States in June 1995.

Equipment & Services Demand

The Registry estimates the project to cost U.S.\$70 million over the next three years:

Category	Total
Servers	15,600,000
Management, Design, Analysis, Construction	5,000,000
Records Transcription	2,960,000
Production Equipment	1,800,000
Physical, Electrical, and Environmental Installations	2,200,000
Modems and Communications Equipment	850,000
Supplies for New Identification Cards	17,540,000
Satellite Link and Antennas	480,000
Administration/ Equipment for Electronic Voting Project	11,760,000
Other	3,700,000
Incidental Costs	2,730,000
VAT	4,940,000
	69,560,000

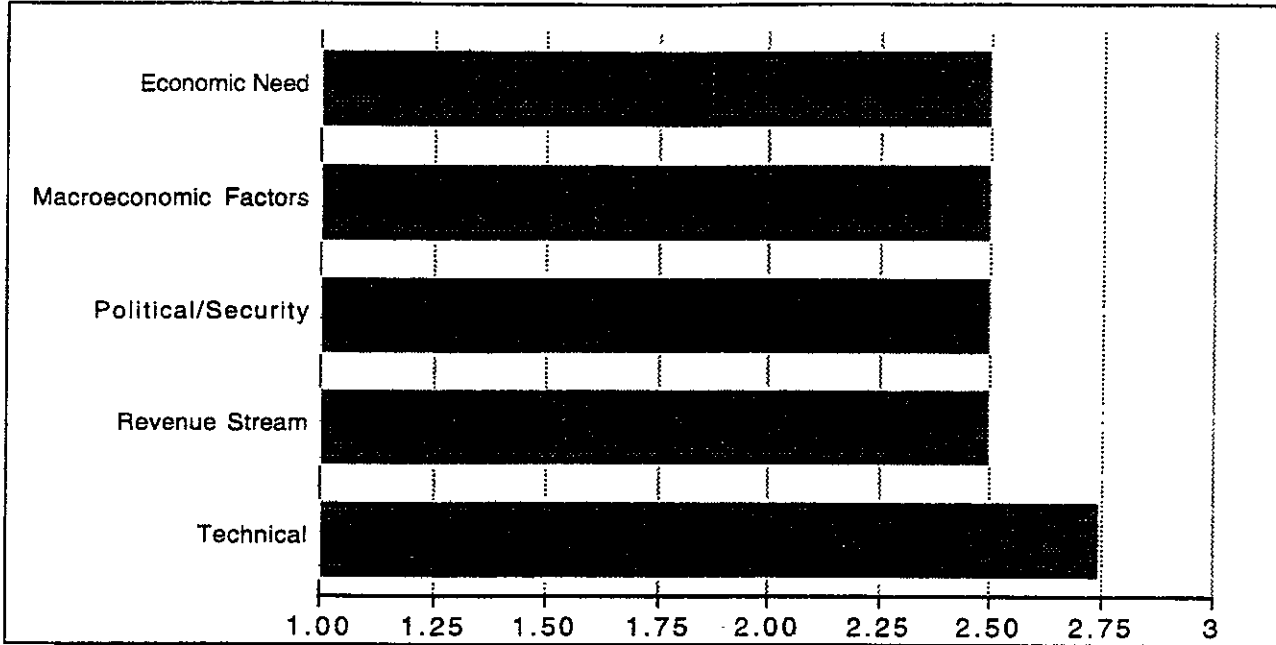
Financeability

This project is planned as a government/international agency-funded initiative. The project has approval from the Planning Ministry and other appropriate officials. Because of the need for improved information systems throughout the government, the project enjoys broad government support. The Registry has received preliminary budgetary authorization for half of the procurement and implementation of the project. It is looking for other funding sources -- including foreign aid agencies -- for the remainder.

Identification System Modernization

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

National Civil Registry
 Dr. Orlando Abello, *Director*
 Santafé de Bogotá, Colombia
 ph: (57-1) 222-3690
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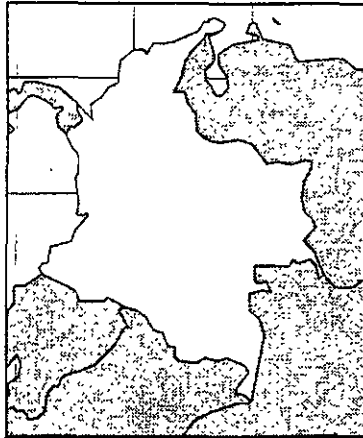
Jorge Serpa Erazo, *Director of the Modernization Project*
 Santafé de Bogotá, Colombia
 ph: (57-1) 222-2200
 fax: (57-1) 221-2388

TDA Project Tip
The U.S. Trade and Development Agency is funding an Orientation Visit for officials from the National Civil Registry. In June 1995, the officials will visit consulting engineering and informations systems firms. By introducing the Colombian delegation to promising U.S. technology, TDA hopes to give the advantage to U.S. companies that are competing for the management contract or for the supply of hardware/software for the modernization project.



Telecommunications/Colombia

Private Television Stations



Project Summary

Project No:	TEL-10
Subsector:	Television
Country:	Colombia
Project Cost:	\$300 million
Export Potential:	\$45 million
Owner:	TRC

At the end of 1994, the Colombian legislature passed a bill which will begin the process of opening the television market to the private sector. The law ensures free and open competition and guarantees multiple channels. The National Television Commission, an independent agency which will be formed by June 1995, will regulate the sector and promote free competition for services. The Commission will issue licenses, set norms, assign frequencies, and organize bids.

Technical & Site Description

The overall plan for the opening of the television sector is to license new, privately owned television stations to provide regional coverage. To maintain competition, two operators will be licensed in each of three regions: north, east, and northeast. The three regions cover the same areas as those for cellular telephony. At the same time, the new television law protects the position of INRAVISION, the national television network. Therefore, three stations controlled by INRAVISION will remain state-owned and will maintain their right to broadcast nationwide.

Timing

The members of the National Television Commission will be appointed by June 1995. The regulation of the Television Law—including the details of the competition for television licenses—will be finished in December, 1994.

Private Television Stations

Infrastructure Project Profiles

Equipment & Services Demand

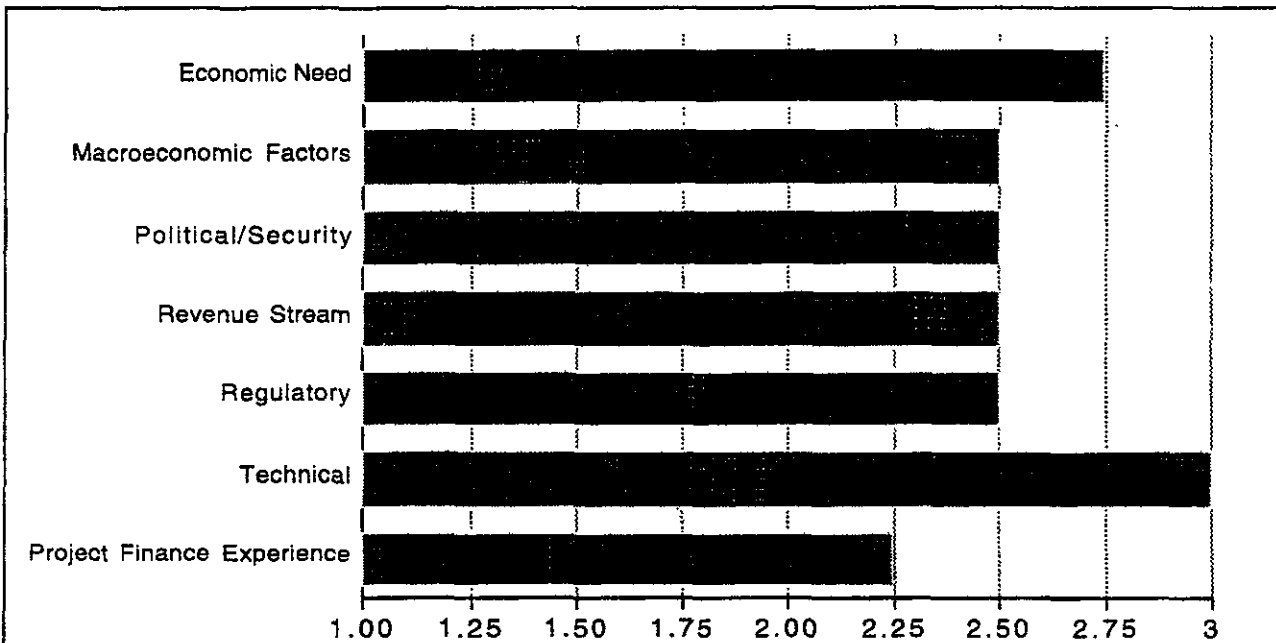
The major restriction for U.S. firms is the limitation of foreign capital to 15 percent in a broadcasting facility. Excluding programming, the six new stations should require investment of \$50 million each.

However, the competition presented by the new market entrants is likely to encourage TV networks to upgrade their operations in order to maintain their audience. Right now, the sale of TV broadcasting equipment represents only 5% of Colombia's total import market for telecommunications equipment.

Financeability

There appear to be few serious financeability issues. Major corporate interests with strong financial capabilities are expected to seek the new television licenses.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

The Commission will consist of five members: two named by the President, two by the legislature, and one by an association of regional television stations.

Santo Domingo and Ardila Lulle—two Colombian conglomerates already involved in radio and television—are likely to be the major players in the competition for the new stations.

National Television Commission

Jorge Valencia Jaramillo, *Member-designate*

Santafé de Bogotá, Colombia

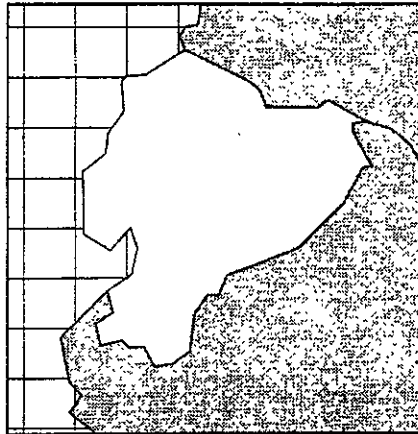
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Telecommunications/Ecuador

EMETEL Rural Telephony Project



Project Summary

Project No:	TEL-11
Subsector:	Rural
Country:	Ecuador
Project Cost:	\$7.5 million
Export Potential:	\$6.8 million
Owner:	EMETEL

EMETEL, the Ecuadorian telecommunications monopoly, is planning a general network expansion program with an emphasis on the underserved rural areas of the country. EMETEL plans to offer a concession to install and operate a rural telecommunications system in the provinces of Cañar and Loja.

Technical & Site Description

The project consists of repair and expansion of existing systems, as well as the installation of new services. The project has been divided in three parts to be developed simultaneously. This project will be developed in two provinces of Ecuador—Cañar and Loja.

Phase I

City	Current Capacity	Current # Lines/100 in.	Increase Projected	Projected # Lines/100 in.
Azoguez	5,000	17.4	1,000	20.9
Biblyan	1,000	7.32	500	10.98
Javier Loyola	----	0	500	9.32
Guaran	----	0	500	5.42
D'leg	----	0	500	9.52
TOTAL	6,000		3,000	

EMETEL Rural Telephony Project

Infrastructure Project Profiles

Phase II

City	Current Capacity	Current #Lines/100 in.	Projected Increase	Projected #Lines/100 in.
Loja	16,000	16.96	4,000	20.16
Cariamanga	1,000	4.64	2,000	9.28
Catamayo	1,000	6.81	2,000	13.62
Celica	400	5.57	800	11.14
Macara	1,000	6.99	2,000	13.98
Catacocila	300	2.45	1,000	8.17
Alamor	300	3.60	700	8.40
Saraguro	150	2.10	500	7.03
TOTAL	20,150		13,000	

Phase III

City	Current Capacity	Projected Capacity
Malacatos	12 channels	cable 36 km
Alamor	12 channels	8mb/s, 12 channels
Sozoranga	12 channels	8mb/s, 12 channels
Gonzanama	12 channels	8mb/s, 12 channels
Zapotillo	12 channels	8mb/s, 12 channels
Saraguro	12 channels	8mb/s, 12 channels

Timing

Once the contract is signed and a letter of credit is established, the project will have a 12-month term of execution. EMETEL wants to begin construction in early 1996.

Equipment & Services Demand

The major breakdown for equipment needed for this project for all three phases is as follows:

Phase I

Switching systems (3,000 lines)	US\$	600,000
Transmission (fiber optic 12km)	US\$	240,000
Operation and maintenance center	US\$	500,000
Additional works	US\$	300,000

Phase II

Switching systems (13,000 lines)	US\$	2,600,000
Transmission (fiber optic 12km)	US\$	320,000
Operation and maintenance center	US\$	500,000
Additional works	US\$	800,000

Phase III

Transmission	US\$	900,000
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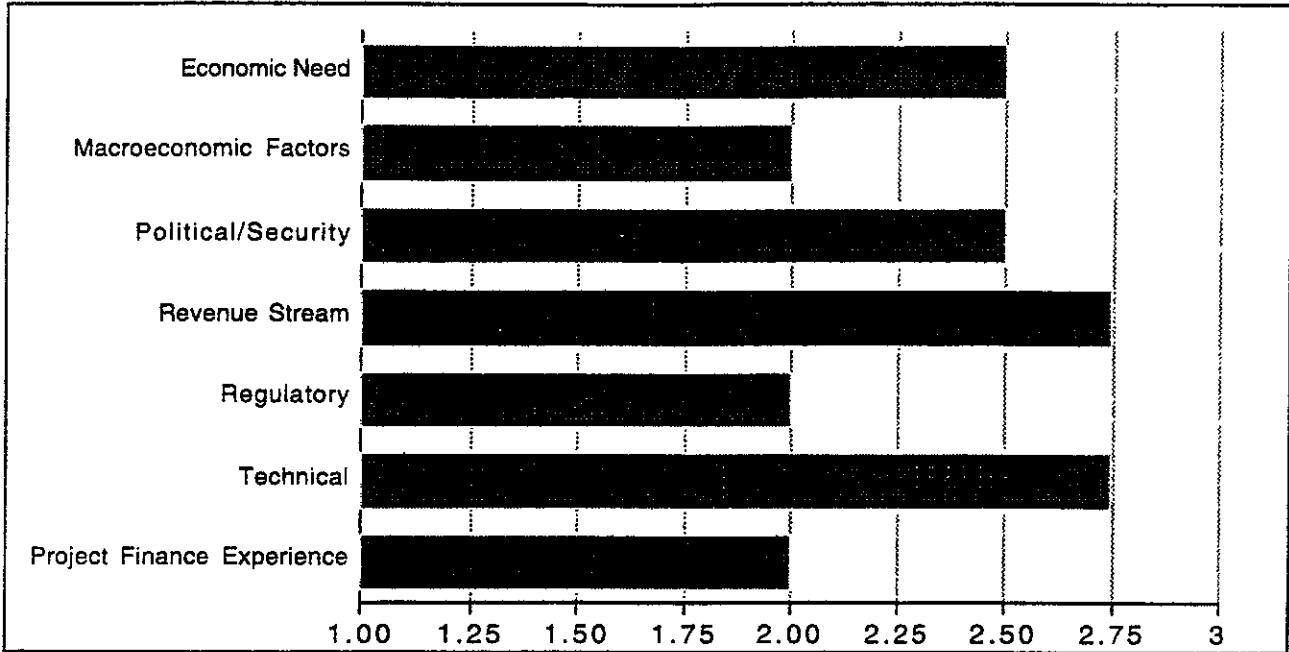
Finaceability

Based on the estimated costs and revenues, the Net Present Value (NPV) is calculated at U.S.\$ 27,522,594 with an Internal Rate of Return (IRR) of 48.37 percent. This project is highly profitable due to the fact that investment in local and national networks is relatively low. In addition, project resources will be financed in both local and foreign currency. Revenues generated through international calls will be a key sources of revenue.

EMETEL Rural Telephony Project

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

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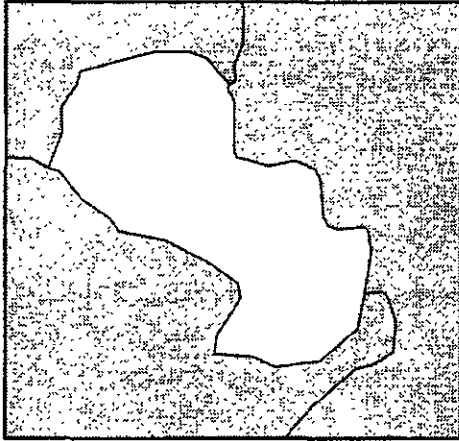
Key Decision Makers

EMETEL
 Angel Lopez, *Director of Planning*
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Telecommunications/Paraguay

Rural Cellular Telephony System



Project Summary

Project No:	TEL-12
Subsector:	Rural Telephony
Country:	Paraguay
Project Cost:	\$50 million
Export Potential:	\$35 million
Owner:	ANTELCO

Despite the controversy surrounding its privatization, the National Telecommunication Administration (ANTELCO) is going forward with a number of network expanding projects.

The goal of the rural telephony project is to provide services to communities and private users in the interior of Paraguay. The selected technology is cellular communication, which will reduce operating costs and free existing radio systems. These multi-access radio systems will then be available to the areas of the country that need them most.

Technical Description

The configuration of the system will be based on four to six subsystems, one for each of the primary areas mentioned below. Each primary area will have its own Cellular Center and, eventually, remote support units. Initially, 32 cell sites may be constructed under this project to cover the entire country.

The potential demand for this service has been estimated at 20,000 subscribers. An ongoing study is estimating the current traffic levels as well as traffic projections.

The estimated total cost of the project is U.S.\$50 million, including equipment (i.e. switchboard systems, transmissions, energy and climate control equipment) and buildings.

Rural Cellular Telephony System

Infrastructure Project Profiles

Site

The project will divide the country into regions by using the architecture of the existing national network. One program per region will be developed, and all these programs should be compatible with each other.

The current network has four primary areas: Asunción, Coronel Oviedo, Ciudad del Este and Encarnación. Expansion to new areas such as Chaco and the Western Region (Concepción or Pedro Juan Caballero) is under consideration.

Timing

ANTELCO is expected to go ahead with this project during the second half of 1995.

Equipment & Services Demand

Although the specific equipment and services needs will depend on the service configuration for each primary region, ANTELCO would like to utilize equipment and facilities that are compatible with existing systems.

In general terms, the necessary equipment will be transmission equipment and switching systems for each regional center and the main national network. Some civil works, energy supply systems and climate control systems also would be needed.

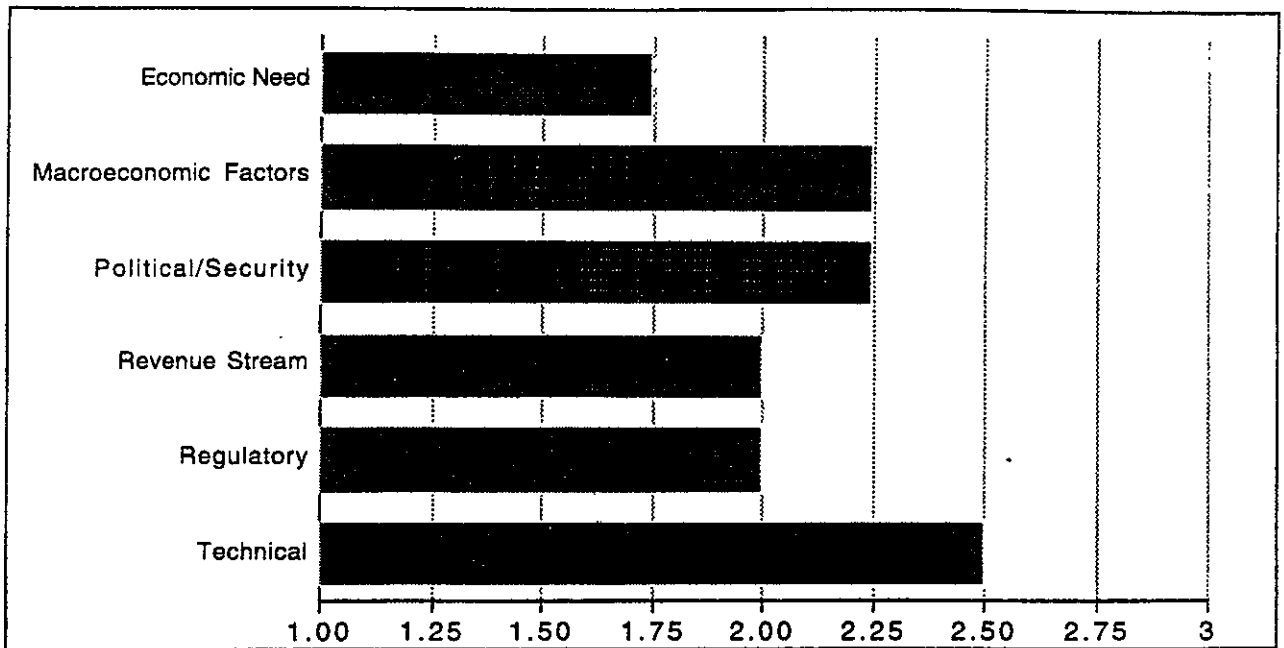
Nature of Demand

The Government of Paraguay wants to extend the telecommunications infrastructure to the entire country. Rural areas, which support the important agribusiness sector, have largely been left out of the telecommunications sector.

Financeability

The financeability of this project is not clear, mainly because there remain major questions about the strength of the demand for the service and the price potential users would be willing to pay. ANTELCO lacks a financial package to support this project. It is currently seeking low-interest loans from multilateral lending agencies.

Financeability Assessment



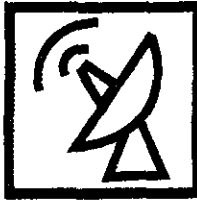
Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

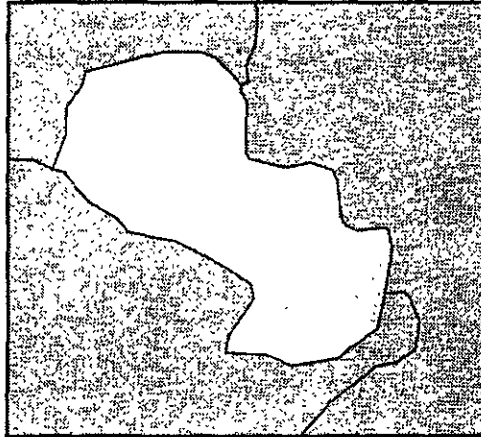
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Telecommunications/Paraguay

ANTELCO Telephone Concession



Project Summary

Project No:	TEL-13
Subsector:	Telephone Lines
Country:	Paraguay
Project Cost:	\$120m-\$150m
Export Potential:	\$60m-\$90m
Owner:	ANTELCO

Although the first attempt at a tender was cancelled in 1994, the ANTELCO telephone line expansion program is going forward. With the World Bank's technical assistance, the original documents will be rewritten to provide more transparency and to reduce the size of the expansion. The controversial privatization of ANTELCO, supported by President Wasmosy and opposed by many in Congress, is a separate issue which will not affect ANTELCO's decision to expand the basic phone network.

Technical & Site Description

Although the bidding documents are not yet complete, ANTELCO has announced that it will contract a private telecommunications company to install a total of 120,000 lines on a build/lease/transfer basis. The total investment required for the project is estimated to be U.S.\$120 million-\$150 million.

Furthermore it has announced a number of significant modifications:

- The number of new lines to be installed will be reduced from 135,409 to 80,000.
- The maximum number of analog lines to be replaced with digital lines will be reduced from 70,000 to 40,000.

ANTELCO Telephone Concession

Infrastructure Project Profiles

- The winning bidder will have the option to buy lines in the event that ANTELCO is privatized.
- A minimum revenue will be guaranteed ANTELCO through insurance policies to be offered by the winning bidder.

The new geographic breakdown of the line installations has not been released; however, the original documents emphasized line installation in Asunción, with the remainder to be divided among 36 other locations around the country.

Timing

After the first attempt at a tender was suspended, 16 companies from the U.S., Europe, and Japan submitted documents. At the end of March 1995- the Government announced that it would put the expansion program back out to bid. The new bidding documents are expected to be ready in June 1995.

Equipment & Services Demand

The original bidding documents required between 40 and 50 percent of the investment to go to local firms—including 30 construction companies—over a period of two years. ANTELCO emphasized the investment in telephone lines as important sources of income and job creation.

ANTELCO envisioned local sourcing for the following project components:

- labor
- concrete posts
- iron fittings
- plastic ducts

If the percentage of local content does not change, export potential could be between \$60 million and \$90 million.

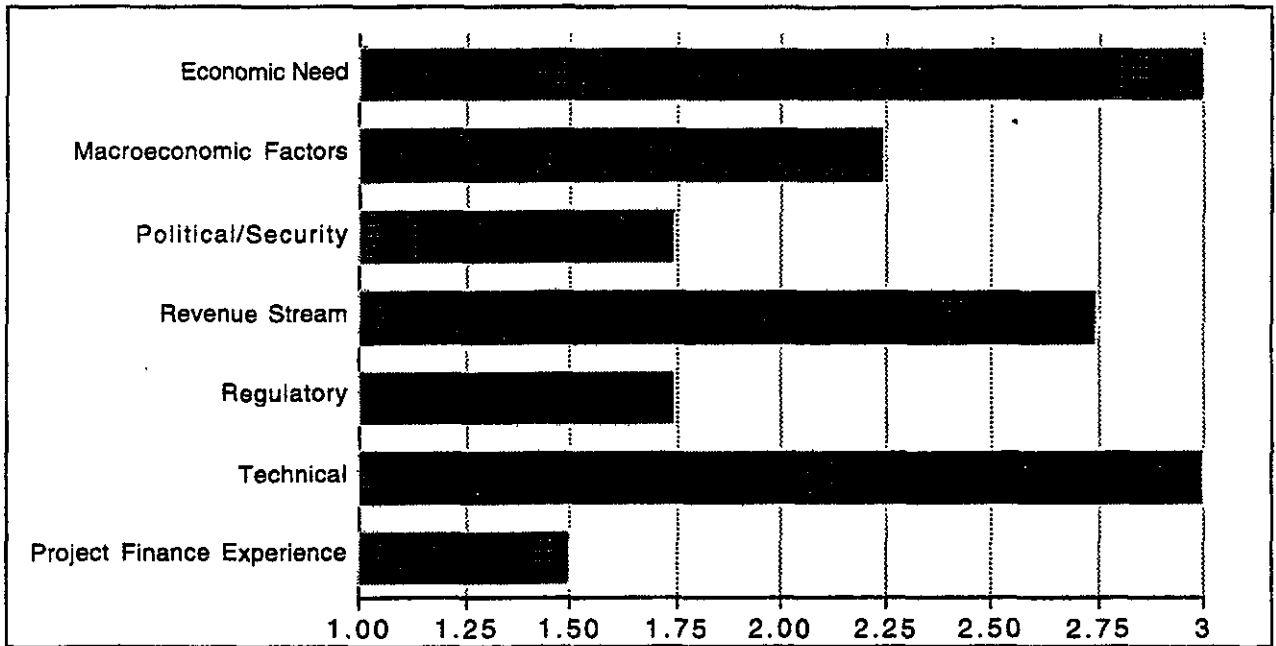
Nature of Demand

Today ANTELCO has 145,000 lines for a line density of just over four lines per 100 inhabitants, well below the Latin American average of nine per 100. Demand for basic telephony is strong, as it can take years to have a telephone line installed.

Financeability

The contract is being structured as a build/lease/transfer arrangement, with the financing responsibility falling to the winning bid. The strong demand for telephone service and continued economic growth in Paraguay should generate the revenue stream necessary to make this project financeable. A careful review of the bidding documents will be necessary to determine the adequacy of provisions for rate setting, other cost escalation provisions, and investor protection. While the expansion program is separate from the overall privatization of ANTELCO, fears of indirect impacts from the privatization add uncertainty that will affect the financeability.

Financeability Assessment



Source: CG/LA Infrastructure

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ANTELCO Telephone Concession

Infrastructure Project Profiles

Key Decision Makers

ANTELCO is dependent on the Ministry of Public Works and Communications, and both will be the principal decision makers on the upcoming bid. Price Waterhouse is organizing the bidding documents. The World Bank is providing technical support and advice on the restructuring of ANTELCO and the possible establishment of an independent regulatory entity.

ANTELCO

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Asunción, Paraguay

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Ministry of Public Works and Communications

Carlos Facetti, *Minister*

Asunción, Paraguay

ph: (595-21) 496-666/ 448-079

fax: (595-21) 443-625

Ministry of Public Works and Communications

Ing. Jorge Lamar Gorostiaga, *Vice Minister of Mines and Energy*

Asunción, Paraguay

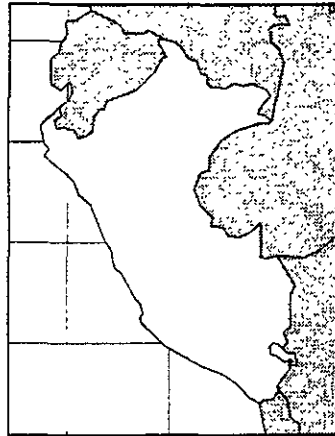
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Telecommunications/Peru

Cellular Band B Concession



Project Summary	
Project No:	TEL-14
Subsector:	Cellular
Country:	Peru
Project Cost:	\$40 million
Export Potential:	\$32 million
Sponsor:	MTCVC

Peru's telecommunications regulatory framework is based on the principle of free and open competition. With the exception of basic telephony—which remains a monopoly until 1999 — all services have at least two operators. In order to maintain a competitive system, the Ministry of Transport and Communications (MTCVC) is getting ready to grant a concession for a second cellular operator to provide service to the areas outside of the provinces of Lima and Callao.

Technical Description

The MTCVC is preparing to open an international competitive tender for a Band B cellular concession. The winning firm will obtain a license to build and operate a cellular system in a service area that comprises the rest of Peru outside of the Lima-Callao area.

The MTCVC estimates that \$40 million will need to be invested to satisfy the anticipated demand of 20,000 customers, although the configuration of the system will be left to the concessionaire.

The cellular equipment must be compatible with existing systems to allow for roaming.

Cellular Band B Concession

Infrastructure Project Profiles

Equipment & Services Demand

Prospects for U.S. exports of cellular receivers and cell sites are strong, since the equipment standards being set by the MTCVC are similar to those used in the U.S.

Timing

The bidding documents are being prepared by MTCVC, which is planning to open bids in August 1995.

Nature of Demand

The MTCVC estimates that there is sufficient demand for 20,000 lines in the region outside of the capital. At 2.94 lines per 100 inhabitants, Peru has one of Latin America's lowest line densities. Outside of Lima, the density is even lower.

Peru's first cellular concessions were given to Tele 2000 in 1990 and CPT Celular in 1991 for the provinces of Lima and Callao. Each now have roughly 10,000 subscribers. The total market for Lima and Callao of 20,000 subscribers is expected to grow to 80,000 subscribers in the next five years.

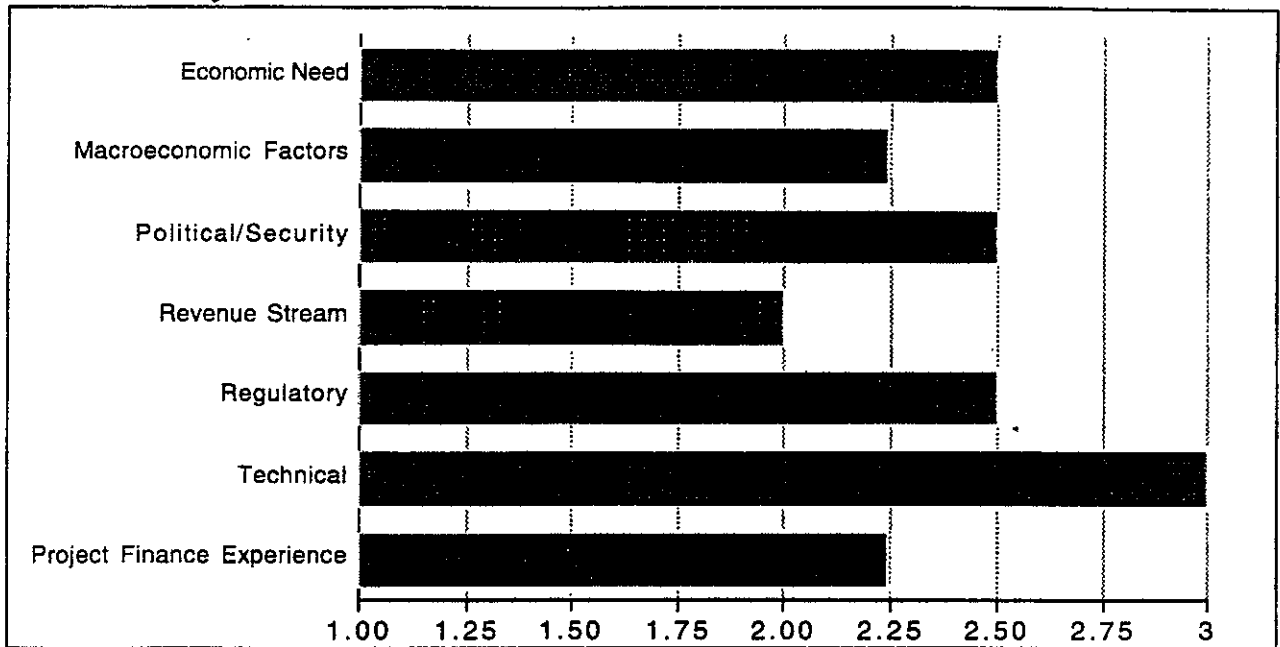
The area outside of Lima and Callao is now served by ENTEL Perú, which operates on B and A. ENTEL Perú and CPT Celular are both owned by Telefónica del Perú.

Financeability

A major consideration in the viability of the project is the demand for telephony in this service area. The new concession will compete with both an existing cellular system and the expansion of regular telephone lines, making customer acquisition challenging.

At the same time, the need for telephone services is high outside of Lima, and strong economic growth is driving higher purchasing power throughout the country. The Peruvian government is also committed to ensuring a competitive market for cellular services.

Financeability Assessment



Source: CG/LA Infrastructure

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Key Decision Makers

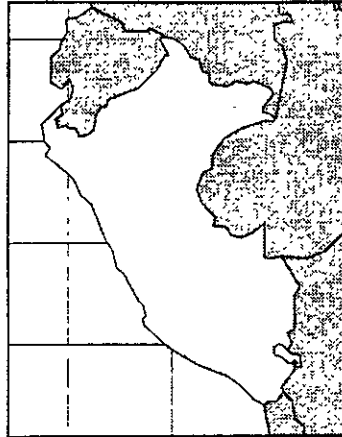
Ministry of Transportation, Communications, Housing, and Construction
 Willy Contreras, *Vice Minister of Communications*
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Telecommunications/Peru

OSIPTTEL Rural Telephony Program



Project Summary

Project No:	TEL-15
Subsector:	Rural Telephony
Country:	Peru
Project Cost:	\$10 million
Export Potential:	\$8 million
Owner:	OSIPTTEL

In an effort to correct the severe shortage of telephone lines in small provincial towns, Peru is making a concerted effort to extend telephone service to rural areas. Not only has Peru included a rural telephony requirement in the privatization of the state telephone companies, it has also founded a rural telecommunications investment fund. With World Bank assistance, Peru set up the Telecommunications Investment Fund (FITEL), dedicated to telecommunications development in rural areas or areas of special social interest. FITEL is a U.S.\$10 million fund capitalized with 1 percent of the gross revenues of all telecommunications companies in Peru.

FITEL is administered by the Private Investment Telecommunications Supervisory Agency (OSIPTTEL), an autonomous agency which supervises telecommunications concession contracts and promotes private investment in the sector. OSIPTTEL has developed a short and medium-term strategy to use FITEL to finance the extension of telecommunications services to towns currently lacking service.

The specific focus for FITEL-financed projects is the 7,800 Peruvian towns with populations between 300 and 3,000. FITEL-funded projects may not include towns covered in Telefónica del Perú's rural telephony obligation.

OSIPTEL Rural Telephony Program

Infrastructure Project Profiles

Technical Description

By the end of 1995, OSIPTEL will open an international public competition for rural telecommunications. The project consists of the design and installation of a telecommunications system in 600 towns with a population greater than 500. The participants in the competition will be responsible for financing, executing, and operating the system, as well as carrying out pre-investment studies.

The operating concession contract will be for a ten-year period, with a ten-year option to renew. The operator will have the concession for public and long-distance telephony on the same terms as Telefónica del Perú. The operator may also request a concession for telex, data transmission, and other telephone services. Telefónica del Perú will be required to provide necessary facilities for interconnection to the network.

Criteria to be applied in awarding the concession will include: subsidy level, execution time, proposed tariffs, technical aspects, as well as the use of efficient technologies. FITEL will provide funds for the implementation of networks, connections, and terminals necessary to make the required services operational. FITEL will also finance the pre-investment studies.

Site

OSIPTEL is in the process of identifying the towns to be included in the project.

Timing

OSIPTEL executed a study and pilot project in the first half of 1995. By the end of the year OSIPTEL will call bids on its first full rural telecommunications project.

The study, to be completed in June 1995, will identify and prioritize sites for future investment according to criteria of profitability, operability, social utility, and service needs. The study will also coordinate with the various entities that will carry out engineering studies, site visits, and feasibility analysis of the different projects. The U.S.\$3 million pilot project covers 30 towns with populations between 400 and 500. Begun in January 1995, the project will be completed by the end of the year.

Equipment & Services Demand

Although each bidder will design a system suited to the particular needs of the site that OSIPTEL picks for the program, it is expected that the systems will emphasize public telephony. Because of lower costs, bidders may design system based wireless technologies, rather than conventional land lines. In either case, much of the telephone exchange equipment, public phone booths, hardware, and software will need to be imported.

Nature of Demand

According to the International Telecommunications Union, Peru has a line penetration of 2.94 lines per 100 inhabitants, the lowest figure in South America. As in other countries in the region, rural areas have even lower figures. On the other hand, Lima has a line density of 6.6 per 100, more than twice the national average.

The almost non-existent state of telephony in the rural areas of the country was reflected in the requirement that the new owner of CPT and ENTEL Peru connect 1,500 towns of more than 500 people to the national telecommunications network.

Financeability

The key issues in financeability are the following:

Revenue Stream: OSIPTEL realizes that a large number of the towns in the scope of the project are below the poverty line, and may not be able to pay even the subsidized rates. The results of the pilot project, to be completed in December 1995, will give insight into the profitability of rural telephony project of this design. On the other hand, it should be remembered that 1 percent of gross revenues from other telecommunications companies in Peru will be earmarked to support this project.

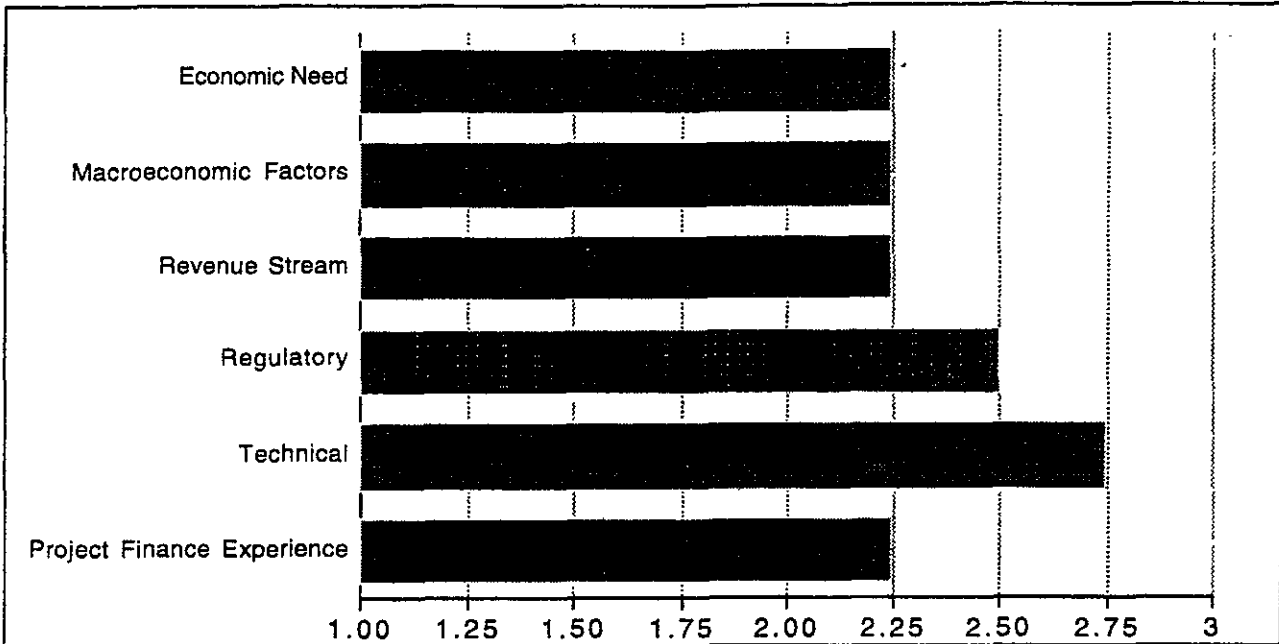
Competition: Two factors may erode the customer base of the rural telephone operator: the expiration of the basic telephony monopoly in 1999 and the licensing of a second cellular operator in the rest of the country outside of Lima.

It should also be noted that, until recently, large areas of rural Peru were plagued by armed fighting instigated by Sendero Luminoso, or the Shining Path. This group has, however, become largely inactive.

OSIPTEL Rural Telephony Program

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

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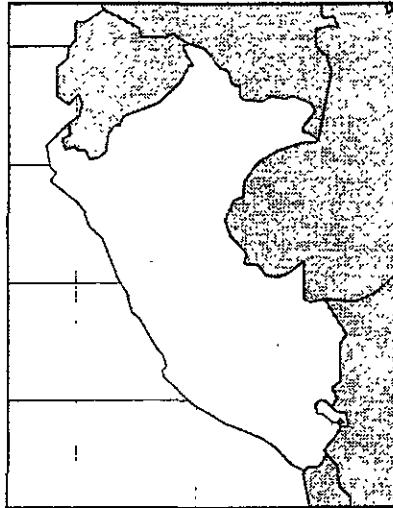
Key Decision Makers

Private Investment Telecommunications Supervisory Agency (OSIPTEL)
 Jorge Kunigami, *President*
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 fax: (51-14) 224-955



Telecommunications/Peru

2000 Investment Program



Project Summary

Project No:	TEL-16
Subsector:	Cellular, Public Telephony, Fiber Optics
Country:	Peru
Project Cost:	\$50 million
Export Potential:	\$25 million
Owner:	Tele 2000

Except for basic telephony, competition has been introduced in all telecommunications services—local, domestic long distance, and international in the last five years. New telecommunications legislation allowed for the privatization of CPT and Entel but retained their monopoly status in basic telephony until 1999. Tele 2000, a private, start-up company, is aggressively trying to take market share in non-basic services. It subsequently plans to position itself to directly challenge Telefónica del Perú—the company which bought and merged CPT and ENTEL—after 1999.

Technical Description

Tele 2000 plans to invest nearly U.S.\$50 million in 1996 to upgrade its equipment for its cellular, value-added, and public phone services. The company is divided into three divisions:

- Celular 2000:** Operates one of two cellular bands in an area encompassing the Lima metropolitan area and the Port of Callao. Celular 2000 has half of the cellular market in Lima.
- Televan:** Provides wireless value-added services to businesses, including fax and high-speed data.
- Telepoint:** Operates wireless public telephones that make use of debit cards.

Tele 2000 Investment Program

Infrastructure Project Profiles

In addition, the company has two major projects in fiber-optic cables and data transmission. Tele 2000 also owns paging and cable TV subsidiaries.

The investment plan (in millions of dollars) for 1996 is as follows:

Category	Total
Cellular	14.7
Value-Added Services	20.1
Public Phones	10.2
Data Transmission Project	1.3
Fiber-Optic Network Project	3.4
Total	49.7

Tele 2000 typically organizes open bidding for equipment procurements, unless it wants to continue with a particular system for purposes of compatibility.

Site

Tele 2000 provides cellular service to the Lima metropolitan area and the Port of Callao. Installation of public telephones will take place in and around Lima. Other services, such as paging, will cover the entire country.

Timing

This equipment procurement is part an ongoing investment program. In regards to the 1996 investment plan, Tele 2000 wants to talk to possible equipment suppliers immediately.

Equipment & Services Demand

Based on past procurement, it is likely that half of Tele 2000's equipment investment for 1996 could go to U.S. companies.

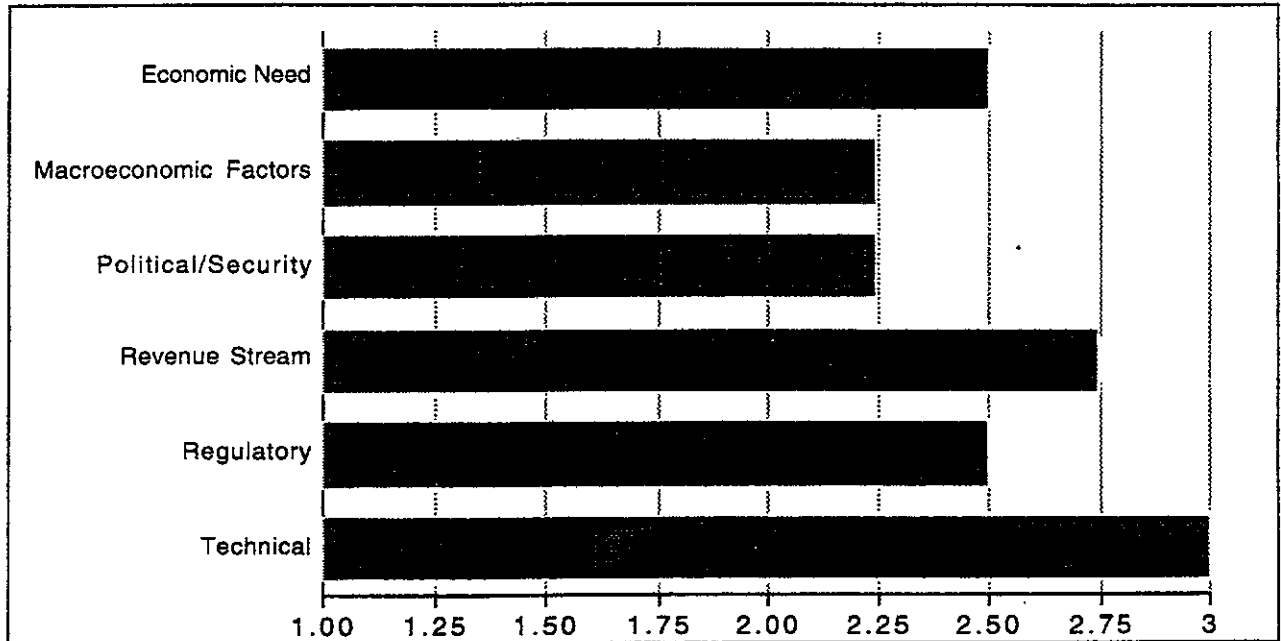
Nature of Demand

With a telephone-line density of only 2.94 per 100 inhabitants, demand for telephone service is strong. Tele 2000, while not able to enter directly into the basic telephony market, believes that wireless public phones and cellular phones can help satisfy general demand. The opening of the market has released pent up demand for value-added services.

Financeability

This project is purely an equipment-supply opportunity. Tele 2000 has budgeted to procure equipment directly from suppliers. Therefore, the major question is the financial strength of the company and the accuracy of its market forecasts.

Financeability Assessment



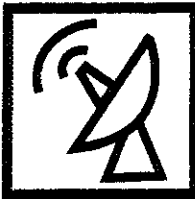
Source: CG/LA Infrastructure

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Key Decision Makers

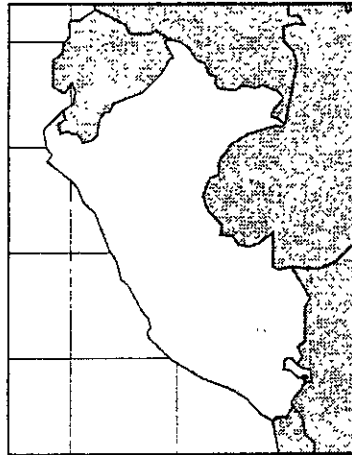
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Telecommunications/Peru

Telefónica del Perú Investment Program



Project Summary

Project No:	TEL-17
Subsector:	Phone Lines
Country:	Peru
Project Cost:	\$2+ billion
Export Potential:	\$1+ billion
Owner:	Telefónica del Perú

It is estimated that in the next five years, growth in the Peruvian telecommunications sector will exceed the growth in other infrastructure sectors by some 30 percent. The outlook for Peruvian telecommunications is so positive that a consortium headed by Telefónica Internacional (TI) of Spain paid U.S.\$2 billion in February 1994 for 35 percent of the stock of ENTEL Perú and 20 percent of CPT's stock. This purchase price greatly exceeded the price offered by any of the other qualified bidders.

The telecommunications law in Peru generally provides for free and open competition in all subsectors, however, the privatization plan allowed for the merger of the two phone companies into a new company, Telefónica del Perú (TP), and granted it exclusive rights for five years in basic telephony. In return, TP is contractually required to implement an extensive investment program, the goal of which is to elevate the telephone-line density from 2.94 to ten lines per 100 inhabitants.

In addition, financing will come from project resources in both local and foreign currency. Revenue generated through international telephone rates will be a key source of income.

Technical Description

TP will invest U.S.\$2 billion over the next four years. By 1998, the company plans to increase productivity up to international standards, with a lines-per-employee ratio of 327:1, and reduce the waiting period for a new line from three and a half years to a mere 15 days. Digitalization of the network will reach 96 percent. By 1998, TP will install 1.7 million new lines.

Telefónica del Perú Investment Program

Infrastructure Project Profiles

The investment plan puts a heavy emphasis on conventional telephone-line installation as well as on rural telephony. The privatization contract committed the company to install 1.7 million new lines by 1998 and to provide minimum telephone service to 1,500 rural towns.

The following is a year-by-year description of the program.

1995 - Investment for 1995 should be on track for outlays of U.S.\$739 million, of which U.S.\$475 million will go to the access network, the Integrated Service Digital Network. In addition to raising the quality of service, the Network will allow for voice, data, and imaging services. The digital network will be implemented in Lima, Arequipa, and Trujillo.

By the end of the year, there will be 425,000 new lines, and service will be extended to 263 towns that previously lacked telephone service. The waiting period for installation of a telephone line will be reduced from three and a half years to less than 10 months.

1996 - Network modernization next year will total \$437 million. Major projects include the installation of 362,000 new lines and a new international switching station in Lima. New digital microwave connections will link Huancayo, Cuzco, and the northeast region of Marañón.

1997 - Investment for 1997 will total \$427 million, the majority of which will go toward the installation of new lines and rural telephone systems. Roughly 342,000 new telephone lines will be installed, and basic telephony will be hooked up in 372 rural towns. TP will allocate \$40 million for interconnections to the Pan American and Trans Pacific Cable Projects, which will improve links to the U.S. and Asia.

1998 - Investment for 1998, on the order of \$400 million, will be allocated for the installation of 229,000 new lines and the extension of the digital network to 541 towns.

Site

The expansion and modernization program will cover the entire country. The following is a breakdown of the major components of the program and their locations:

Category	Regions
Telephone lines	All regions
Switching stations	All regions
International switching station	Lima
Public telephones	All regions
Integrated System Digital Network	Lima, Arequipa, Juliaca (coast)
Television and cable	Coast
Digital microwave	Huancayo, Cuzco, and Northeast Region
Submarine cable	Coast

Timing

The expansion plan covers the years 1995–1998.

Equipment & Services Demand

The concession contract obligated TP to install the equipment of the most advanced technology, much of which must be imported:

- In 1995, TP will spend \$30 to \$35 million on telephone cable. TP's principal owner is Telefónica de España, a company with a strong balance sheet and management expertise. Demand for basic phone service will remain strong in a growing Peruvian economy. .

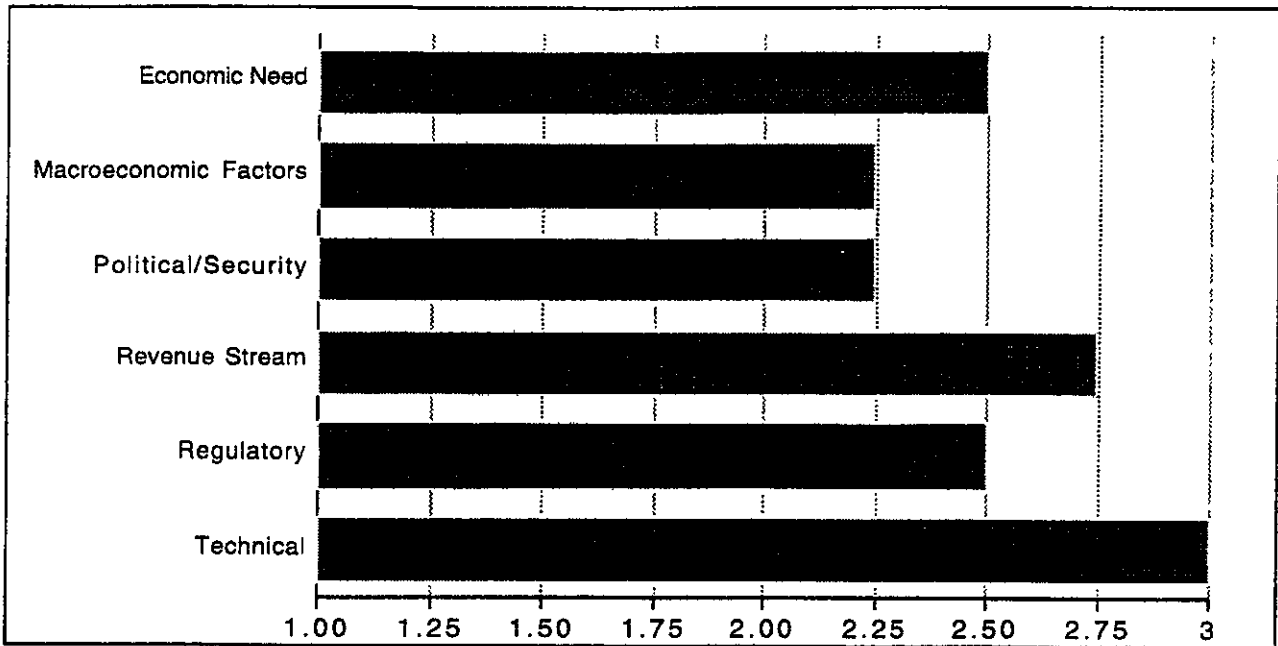
Nature of Demand

The investment plan addresses the grossly unsatisfied demand for basic telephony. Peru's 1994 density of 2.94 lines per 100 inhabitants is the lowest in South America. At the same time, the plan addresses the sharp disparity between the major cities and small towns in the interior. According to Telefónica del Perú, the four-year line expansion program will reduce installation waiting periods from three and a half years to less than a month.

Financeability

Telefónica del Perú is funding the equipment purchase through its own resources committed at the time it gained control of CPT and ENTEL Perú. TP's principal owner is Telefónica de España, a company with a strong balance sheet and management expertise. Demand for basic phone service will remain strong in a growing Peruvian economy.

Financeability Assessment



Source: CG/LA Infrastructure

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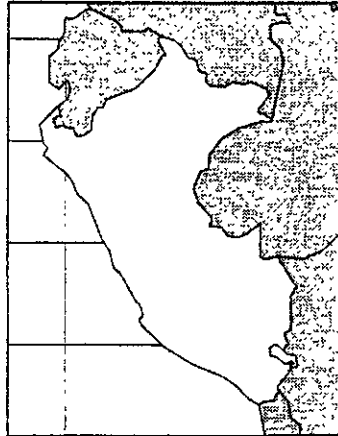
Key Decision Makers

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Telecommunications/Peru

Trunking License



Project Summary

Project No:	TEL-18
Subsector:	Trunking
Country:	Peru
Project Cost:	\$50 million
Export Potential:	\$40 million
Owner:	MTCVC

Telecommunications sector reform in Peru in the last five years has established two principles: 1) the private sector will be the motor of development, and 2) free competition among service providers will be preserved. When the monopoly on local and long distance service expires in 1999, a fully competitive regime will be in place. One of the immediate and growing opportunities is value-added services. Services like trunking—which groups together a small number of frequencies among a large number of users—is the type of service which is increasingly in demand in a rapidly modernizing and developing economy.

Technical Description

The Ministry for Transportation, Communications, Housing, and Construction (MTCVC) has opened the trunking market and is providing licenses in the 800 Mhz band. This band can carry about 700 channels, each of which can support 100 lines. Given that the MTCVC has allocated 100 channels for trunking, the potential market size can be 7,000,000 subscribers.

Although the MTCVC can issue up to 100 licenses, it estimates that sufficient market for Lima and the rest of the country exists for seven companies. Already, one license has been granted to a Mexican company that is a U.S. subsidiary. A second license, this time for a U.S. company, is under consideration.

Once licensed, the company will be responsible for investing in the necessary infrastructure and collecting fees from clients.

Trunking License

Infrastructure Project Profiles

Timing

As the number of licenses is virtually unlimited, no bidding process is being organized. The Ministry is currently accepting license applications for qualified firms; no closing date has been given. The licensee should present a technical proposal in compliance with existing regulations.

Equipment & Services Demand

Each licensee will provide all the needed equipment to run the company. It is estimated that a large percentage of the switching, retransmission, microwave, and other hardware and software will need to be imported.

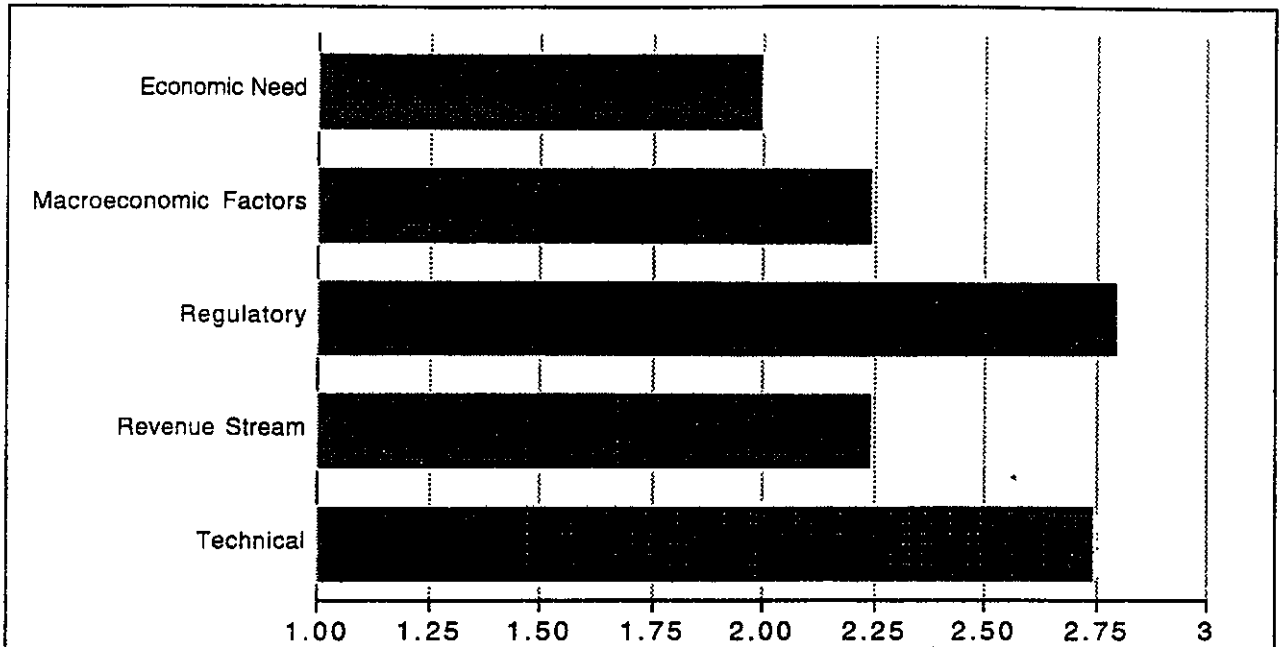
Nature of Demand

The commercial mobile industry applauded the opening of this sector, which was previously neglected by the CPT in terms of underinvestment and inadequate technology. There is significant demand for trunking service among companies that use radio dispatch such as taxis, delivery fleets, couriers, and express mail services.

Financeability

The principal issue in financeability is the economic demand. Until major clients are identified, the project will not be able to be judged as viable. Although currently there is only one direct competitor in trunking, other telecommunications services can erode the potential market. The function of radio dispatching can also be accomplished—although at a higher cost—through cellular telephony and paging. Tele 2000's paging service, affiliated with Skytel, is scheduled to begin in June 1995.

Financeability Assessment



Source: CG/LA Infrastructure.

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Key Decision Makers

Ministry of Transportation, Communications, Housing and Construction

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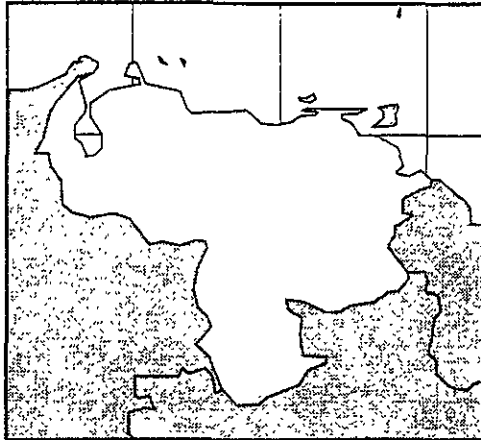
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Telecommunications/Venezuela

CANTV Isla Margarita Project



Project Summary

Project No:	TEL-19
Subsector:	Telephone Lines
Country:	Venezuela
Project Cost:	\$150 million
Export Potential:	\$120 million
Owner:	CANTV

Technical Description

The National Telephone Company (CANTV) wants to equip Isla Margarita, Venezuela's premier resort area, with state-of-the-art telecom infrastructure. If it is successful, it will use the infrastructure as a model for other tourist areas in Venezuela.

CANTV is preparing to select a telecom vendor or manufacturer for a turnkey project involving the installation of a broad range of telecommunications systems for this resort island. Rather than soliciting bids, CANTV is accepting proposals from companies or consortia of companies that can provide the needed services.

Site

Isla Margarita is located in eastern Venezuela, approximately 40 kilometers from the Caribbean coast. Margarita—350 km from Caracas—is well-connected to the capital with several flights per day.

Timing

CANTV will have a consortium selected by the end of 1995. Construction should begin in early 1996.

CANTV Isla Margarita Project

Infrastructure Project Profiles

Equipment & Services Demand

The major equipment systems include:

- transmission systems
- distribution systems
- switches

In addition, CANTV wants to install transit lines for its cellular subsidiary, Movilnet, and expand video services.

Nature of Demand

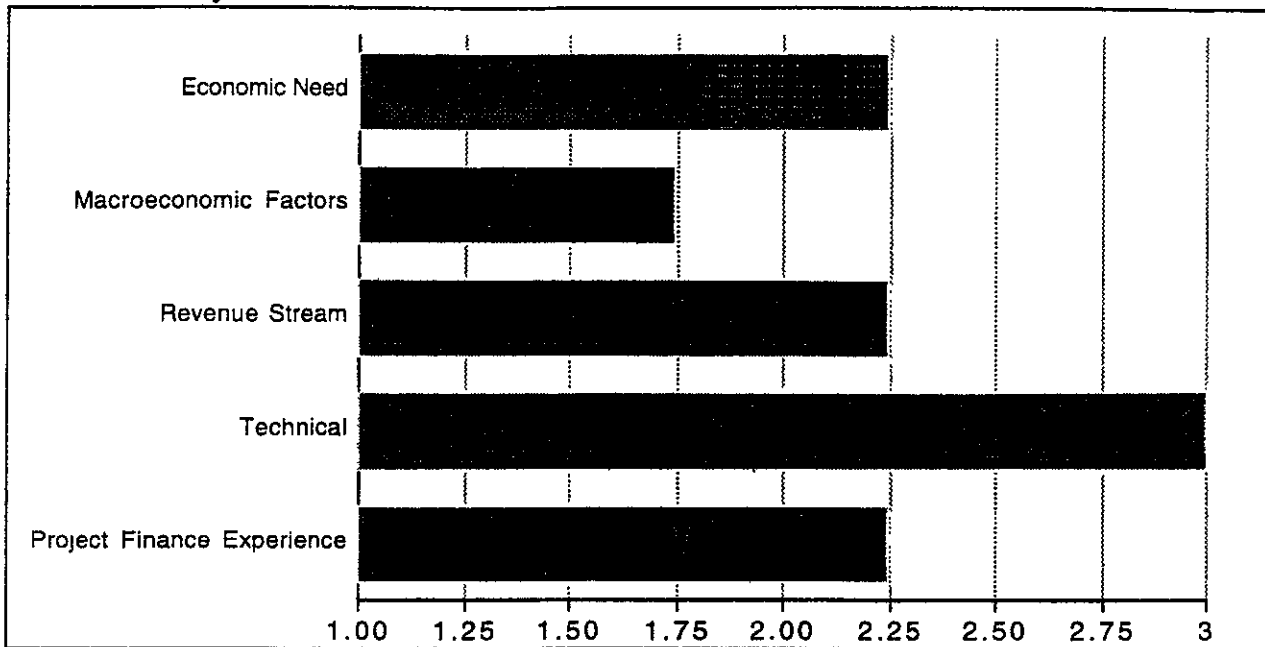
In spite of the downturn in the Venezuelan economy, the tourism sector—the mainstay of the island economy—is alive and well on Isla Margarita. Due to the devaluation of the bolivar and controls on foreign exchange, Venezuelans are going to Margarita rather than tourist destinations outside the country. The federal government, with the strong support of President Caldera, is continuing to support tourism development with tax incentives and the Margarita 2010 infrastructure development program. The legalization of casino gambling—a move that would further increase the island’s annual tourist influx—is being considered.

Finaceability

This project is a priority for CANTV, which has not yet decided on a financial structure for the project. It is likely that the selected vendor or manufacturer will be required to assume some project risk through a shared revenue scheme. CANTV represents a strong balance sheet against which to finance the project, but revenues will be in local currency only.

Isla Margarita’s economy is strong, and its long-term prospects are also favorable—meaning a likely demand for high-end telecommunications services to be offered under the project. At the same time, a detailed demand assessment for the project does not exist.

Financeability Assessment



Source: CG/LA Infrastructure

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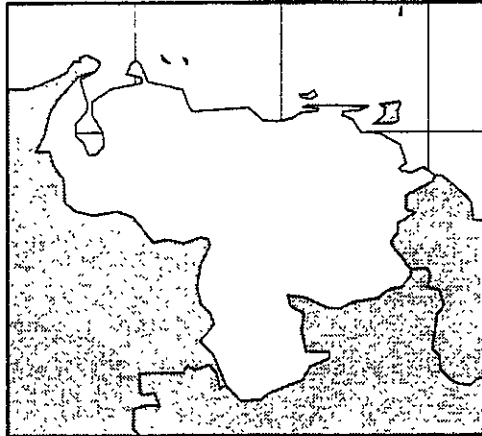
Key Decision Makers

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Telecommunications/Venezuela

CANTV Wireless Systems



Project Summary

Project No:	TEL-20
Subsector:	Wireless
Country:	Venezuela
Project Cost:	\$15 million
Export Potential:	\$5 million
Owner:	CANTV

In order to fulfill its obligation to have an operational national phone network of two million lines by the year 2000, CANTV is studying a variety of wireless systems that could be cost-effective alternatives to conventional line installation. Traditional phone line installation is prohibitively expensive and time-consuming in rural areas.

Technical Description

CANTV is now looking for partners to develop turnkey wireless projects to augment its general telephone network. CANTV is studying a number of wireless transmission options:

- Digital Point-to-Multipoint
- Analog Point-to-Multipoint
- Satellite Point-to-Multipoint
- Fixed Cellular
- Digital Point-to-Point

CANTV has begun discussions with a number of firms, including AT&T, Motorola, and a consortium made up of Atlantic Telecom and Qualcomm. The first to announce plans to build a wireless system was the Atlantic Telecom/ Qualcomm team.

The team will employ a new technology patented by Qualcomm called Code Division Multiple Access

CANTV Wireless Systems

Infrastructure Project Profiles

(CDMA). CDMA offers higher capacity than older analog technologies, and costs less. According to Atlantic Telecom, CDMA systems cost approximately \$500 per line, roughly half the cost of other wireless systems. For CDMA systems, tariffs are usually slightly higher than those for conventional phone service, but less than those for cellular service.

At a cost of U.S.\$15 million–U.S.\$20 million, Atlantic Telecom and Qualcomm will install 25,000 to 30,000 wireless lines. Installation time is estimated at three to six months, so the system should go on line at the end of 1995 or early 1996.

Site

CANTV is still studying locations where wireless technology can best be applied. The company envisions a wireless system being installed in both rural and urban areas.

Atlantic Telecom and Qualcomm have signed an agreement to manufacture cellular telephones in Venezuela.

Timing

CANTV will continue reviewing technologies and begin concluding agreements with companies by the third quarter of 1995.

Nature of Demand

The Venezuelan telecommunications sector has made great strides since privatization and liberalization in 1991. In 1994, the country had 2.3 million conventional lines installed. This figure is projected to grow to 4.8 million by the year 2000, according to CONATEL, Venezuela's telecom regulatory agency. Last year, cellular phone subscribers totaled 230,000 and are projected to reach 830,000 by the year 2000. Demand for cellular lines from the two cellular operators—Movilnet (a subsidiary of CANTV) and Telcel (a joint venture between Bell South and local companies)—has been particularly strong. Conventional phone line installation has not kept up with demand, and service is often unreliable. CONATEL is considering licensing a GSM cellular operation, using the 900 Mhz European standard, to relieve congestion and interference on the two existing bands.

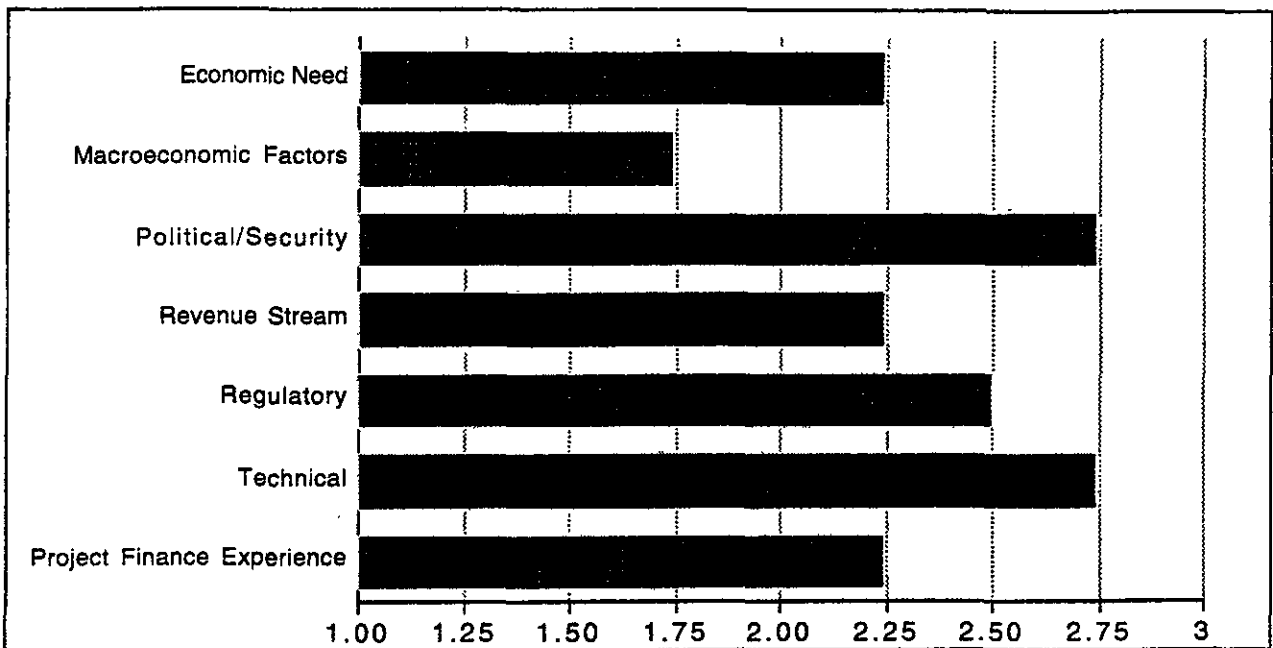
Financeability

The government is pushing this program to meet its ambitious goals for providing increased telephone coverage, therefore potential concessionaires will have a receptive partner in the Venezuelan government. The Qualcomm concession points to some initial studies showing that an adequate demand

exists to support investment payback. Despite current economic difficulties, Venezuela boasts the second-highest per-capita income in the region.

The main challenges to financeability will be selecting regions with adequate purchasing power and overcoming Venezuela's economic woes, including concerns over its restrictive policy on capital flows and repatriation of profits.

Financeability Assessment



Source: CG/LA Infrastructure
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CANTV Wireless Systems

Infrastructure Project Profiles

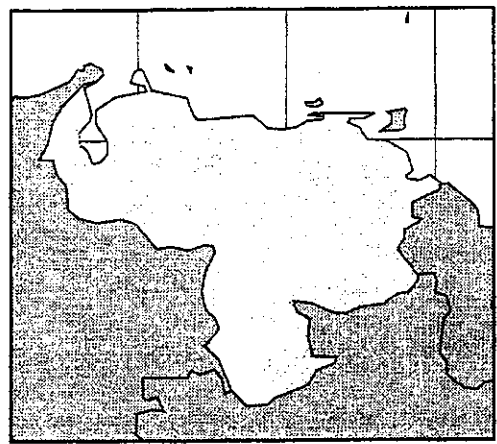
Key Decision Makers

In addition to CANTV and the equipment providers, the other major decision maker is CONATEL, the telecommunications regulatory agency, which is responsible for developing and implementing the rules on rural communications.

<p>CANTV Norman Dennis, <i>Director of Strategic Planning</i> Caracas, Venezuela ph: (58-2) 500-3037 fax: (58-2) 500-3038</p> <p>CONATEL Abdénago Garcia, <i>Director of Telecommunications Services</i> Caracas, Venezuela ph: (58-2) 92-66-11 fax: (58-2) 92-21-55/ 92-58-68</p> <p>Qualcomm Harvey White, <i>President & Director of Operations</i> San Diego, California ph: (619) 658-4805 fax: (619) 658-2500</p>
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Telecommunications/Venezuela

GSM Cellular Concessions



Project Summary	
Project No:	TEL-21
Subsector:	Cellular
Country:	Venezuela
Project Cost:	\$500 million
Export Potential:	\$500 million
Sponsor:	CONATEL

Since the privatization of the National Telephone Company (CANTV) and the liberalization of telecommunications in 1991, this sector has made impressive advances. Between 1991 and 1993, investment in this sector reached U.S.\$1.7 billion and over 40 operators/service providers entered the market in addition to CANTV.

Although communications are improved, the availability of conventional phone lines has not kept up with the demand. Therefore, end-users have come to rely heavily on cellular providers to get telephone lines. The existing cellular systems are saturated, with over 230,000 subscribers. Interference on the frequencies has led CONATEL, Venezuela's telecommunications regulatory agency, to explore other wireless options, particularly GSM.

Technical Description

CONATEL will open the market for two cellular concessions, using the European standard GSM. The new concessions -- which will operate on the 900 MHz band -- will be auctioned by the end of 1995. CONATEL estimates that the two concessionaires will need to invest a total of U.S.\$500 million to satisfy demand.

Until now, CONATEL had granted only 800 MHz band concessions: one to Movilnet, managed by GTE, and the other to Telcel, a joint venture between Bell South and local partners. Both operate throughout the entire country.

GSM Cellular Concessions

Infrastructure Project Profiles

Site

The GSM concession areas will cover the entire country. The largest portion of the market should be located in Caracas, but other sites also should be of interest to concessionaires.

Timing

CONATEL is still working on the technical specifications and deciding on the form of concession to be granted. A preliminary report will be ready in June 1995. The auction is expected to be open before the end of the year.

Equipment & Services Demand

Although the perception may exist that European suppliers have an advantage in GSM, U.S. companies, including AT&T, Northern Telecom, and Motorola, all manufacture high-quality GSM cellular equipment, including switches, cell sites, and telephones. In the past, the Venezuelan market has been highly receptive to U.S. equipment as well as operators.

Nature of Demand

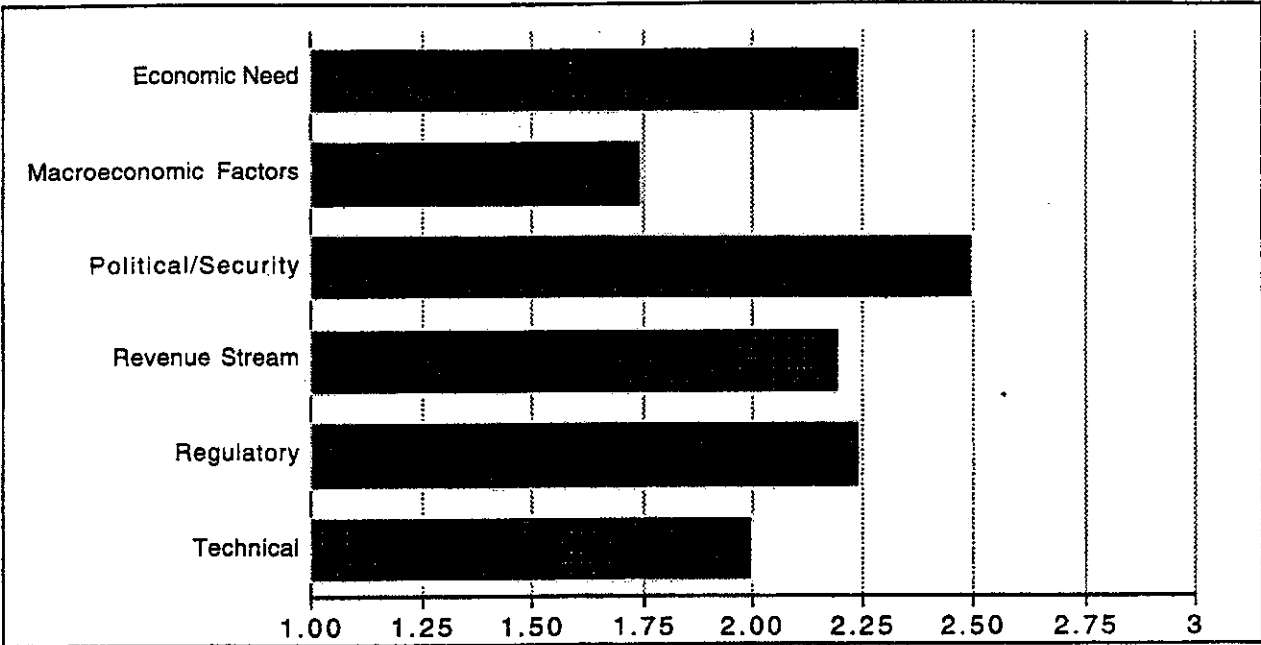
Due to a basis telephone system that is persistently unreliable, the demand for cellular services, despite its higher cost, is increasing. CONATEL expects the cellular market to add an additional 500,000 users, for a total of 830,000 by the year 2000.

Financeability

The main issues impacting financeability are:

- A) **Currency:** Recent controls on repatriation are raising concerns about the security of long-term investment in Venezuela.
- B) **Macroeconomic:** In spite of repressed demand, another year of low or no growth may hold back demand for new cellular subscriptions.
- C) **Technical Structure:** Since GSM uses a different standard than the existing cellular systems, GSM users will not be able to communicate with Telcel and Movilnet subscribers. This incompatibility issue could present problems.

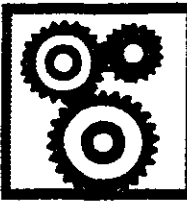
Financeability Assessment



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Key Decision Makers

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The Industrial Sector

in South America



Introduction

The industrial sector presented here is diverse but offers exceptional opportunities for U.S. equipment suppliers and investors. These are projects that have come to our attention and are only the tip of the iceberg in terms of potential projects. In many countries, industrial growth is in the double digits (in Brazil, for instance, April's industrial growth figures were 17% over previous years' figures). Industrial plants are nearing capacity. *The main characteristic of this sector is its intense requirement of high-technology equipment and services, ranging from information management systems to highly specialized processing and survey equipment.*

The following 11 projects alone account for over U.S. \$1 billion in export opportunities:

<u>TEN INDUSTRIAL PROJECTS</u>	
Total value:	\$3.2 billion
U.S. Export potential:	\$1.1 billion
Forestry	3
Hydrometeorological Forecasting Systems	3
Industrial Parks	2
Petrochemical	1
Public Health Information Systems	1

The Industry Sector in South America

The forestry projects in Chile, Paraguay, and Venezuela all require U.S. equipment and engineering services to operate efficiently and be environmentally sound. They represent an opportunity for the countries involved to apply sustainable development management methods in the exploitation of renewable resources. Each of these projects might be thought of as pilot projects with opportunities for replication many times over.

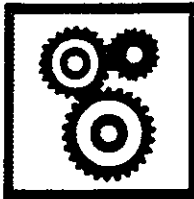
The Argentine public health modernization and information systems project is a pioneering effort to reorganize a somewhat neglected public hospital system within the structure of a public-private partnership. The project plan, developed by Abt Associates and funded by TDA, is intended to become a blue-print for the modernization of the entire public hospital sector in Argentina. President Menem also announced in May 1995 his intention to modernize 40 public hospitals as part of his five-year investment plan. The opportunity for the U.S. computer industry, as well as hospital equipment suppliers further on, is important. This project is also a significant port of entry into the South American market for hospital modernization.

The modern high-technology hydrometeorological systems, in Peru, Venezuela, and regionally, will provide critical forecasting services to the affected countries. Billions of dollars are lost annually due to unpredictable severe weather. Accurate forecasting systems have applications in sectors ranging from tourism, transportation, and construction, to hydroelectric energy, water management and disaster prevention. The technology used involves both land and satellite-based systems and offers excellent opportunities for U.S. high-technology companies.

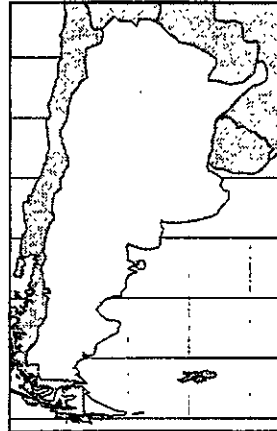
A number of industrial parks are featured. These are the best examples of the vibrant economic development taking place in South America and reflect both aspiration and intense ambition. The New City of Curauma, Chile, is envisioned to grow around an industrial park targeting and providing services to high-technology companies. It is an effort directed at fostering innovation in an increasingly well-to-do, but natural resource based, economy.

The Sepetiba Industrial Park reflects the ambition to create the infrastructure for an efficient metalworks complex, as well as to provide a location for other export-oriented industries, with direct and immediate access to an efficient and modern port. The private sector is expected to invest over \$1 billion in the construction of these new industries.

The Olefin Cracker Plant also offers immense opportunities for U.S. equipment suppliers in its attempt to build value-added production to Colombia's recently discovered oil and natural gas fields.



Industrial/Argentina Public Health Services Improvement



Project Summary

Project No:	IND-01
Subsector:	Health
Country:	Argentina
Project Cost:	\$200 million
Export Potential:	\$200 million
Owner:	MH&SA

Public hospitals in Argentina have historically been financed by the federal government and administered centrally from Buenos Aires. Recent national economic and legal reforms have transferred management control and fiscal responsibilities for public hospitals to provincial governments and allow public hospitals to recover costs from third-party insurers.

Technical Description

National legislation establishing the Hospital Público de Autogestión (Public Self-Sustaining Hospital) has given public hospitals full authority to recover costs by billing third-party insurers, a well-established practice for private hospitals. This change in legislation should provide public hospitals with a significant new source of revenue.

The plan for the modernization of potentially all of Argentina's public hospitals is being developed in the province of San Juan by Abt Associates Inc., a U.S. consulting firm. The objectives of the planning project are as follows:

- Define the requirements for a successful implementation of the Public Self-Sustaining Hospital'
- Determine the financial and technical feasibility of adopting modern hospital management and material purchasing systems
- Develop, install, and demonstrate the use of modern hospital management systems in public hospitals

Argentine Public Health Services Improvement Project

Infrastructure Project Profiles

- Develop a cost-effective materials purchasing and management system.

The information systems component of the modernization of three hospitals and two ambulatory units in the province of San Juan is estimated to cost U.S.\$1.3 million. The implementation of the plan devised by Abt Associates (in the province of San Juan), is the pilot project and, if successful, will serve as the blueprint for the modernization of the remaining public hospitals in Argentina. It will provide technical specifications and guidelines for adoption and installation of modern hospital management systems suitable for the Argentine public hospital sector and will provide information on the financial feasibility of increasing public hospital investment in service delivery, supplies, plant and equipment, and human resource development supported by cost recovery.

President Menem recently announced plans for the modernization of up to 40 more public hospitals in Argentina within the next five years. The Ministry of Public Health is planning to use the San Juan model as the blueprint which would entail an investment in information technology of U.S.\$18-24 million; in addition export opportunities for hospital equipment and supplies bring the amount to over U.S.\$200 million.

Site

The province of San Juan, is located in central Argentina on the border with Chile. If the San Juan approach is successful, it could be used in all of the Argentine provinces.

Timing

The development and installation of the information systems, a local area network and group purchasing programs for the San Juan Public Hospitals network are scheduled for completion in 1995. Similar actions by other provinces will depend upon political decisions and the results of the San Juan model.

Equipment & Services Demand

The main component of the demand for equipment and services in the short term is information systems, including software, hardware and networking. In the medium and long term, the requirements will include:

- Supplies: through purchasing consortiums
- Capital equipment: modernization and purchase of new equipment, including x-ray equipment; testing and laboratory equipment; diagnostic equipment, outpatient and surgical services.
- Structural Analysis: estimates of construction necessary to make the hospitals viable.

The specific requirement of capital equipment and supplies will be determined by the technical study carried out by Abt Associates Inc.

Nature of Demand

The driving factor of public hospital revitalization is the legislative reform that allows public hospitals to recover costs from third-party insurers. An estimated 60 percent of Argentines are covered by employment- and union-based social health insurance, providing a major source of new revenues for public hospitals.

The current reforms put public hospitals in the same competitive market with private hospitals. The need to compete with private hospitals for patients has greatly increased the importance of materials and supplies purchasing programs and management systems as a strategy to control costs and increase efficiency and patient satisfaction.

There are over 9,500 public and private health care facilities in Argentina—over 3,000 of these are inpatient facilities—divided into three main sectors:

- Public sector hospitals and ambulatory care facilities: throughout Argentina's 21 provinces there are 5,100 facilities, including 1,300 inpatient facilities
- Private sector health facilities: 4,000, including 1,700 inpatient facilities
- Trade union social security-owned health care facilities: 375 institutions, 114 of which are inpatient facilities

The first step in the modernization of public hospitals will be the reequipping of the 40 most important hospitals as part of a five-year plan recently announced by President Menem.

Financeability

Provincial governments are the primary buyers of health care information systems through public bidding processes. Investment in automation will be financed by cost recovery from third-party billing and increases in efficiency rather than by direct investment using other financing approaches.

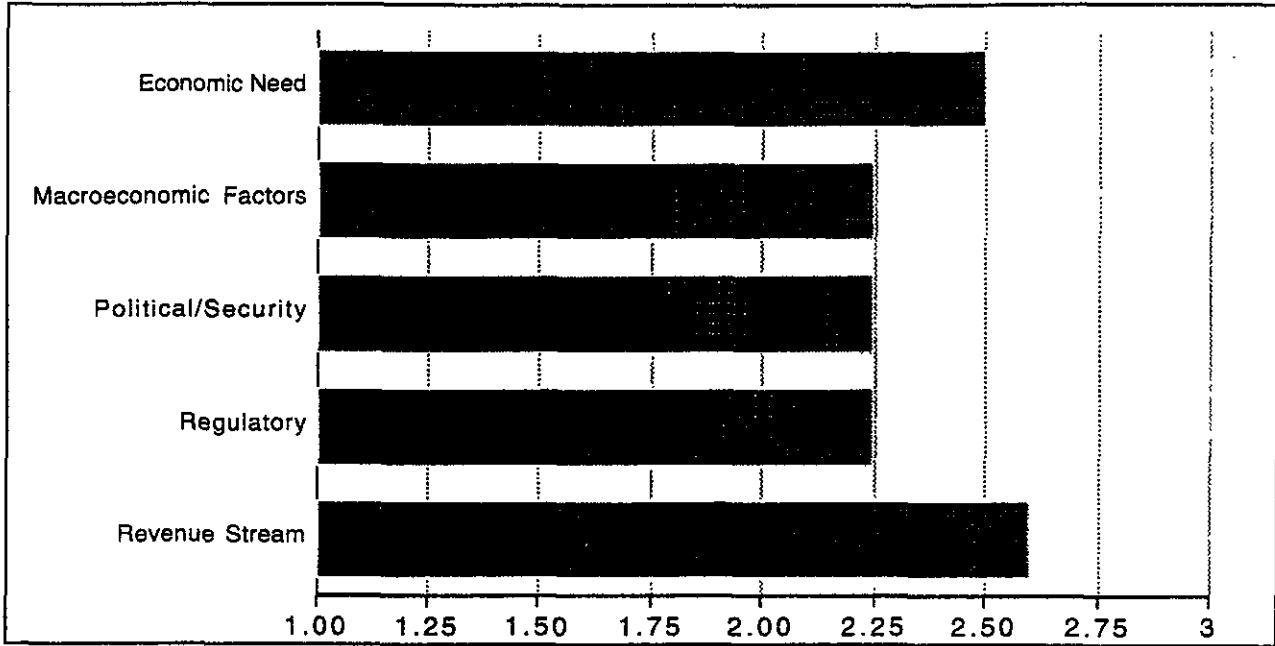
Investments in modern information system technology and purchasing programs are cost-justified by revenues that can be generated through reimbursements of services provided.

Anticipated difficulties include dealing with each province on a case-by-case basis and possible political influence on the process.

Argentine Public Health Services Improvement Project

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources believed to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

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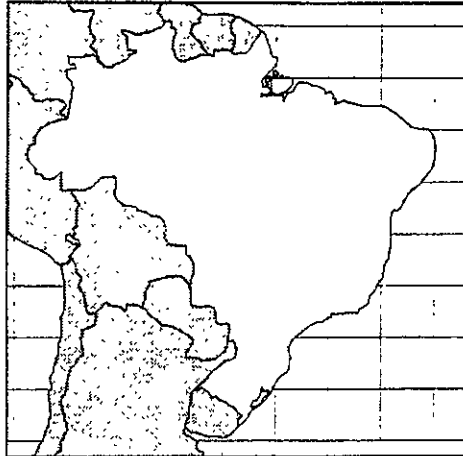
TDA Tip

Abt Associates is devising the model and plan to be implemented in San Juan Province. The study, "Technical Study for the Argentine Health Services Improvement Project," is funded by the U.S. Trade and Development Agency and is expected to be used as the model for the rehabilitation of the Argentine public health system.



Industrial/Brazil

Sepetiba Industrial Park



Project Summary	
Project No:	IND-02
Subsector:	Real Estate
Country:	Brazil
Project Cost:	\$1.5 billion
Export Potential:	N/A
Owner:	Rio de Janeiro State Government

Technical and Site Description

This industrial park will be developed in conjunction with the expansion of the Port of Sepetiba. The park is to provide high-quality real estate — adjacent to a highly efficient port — to industries with extensive port transportation requirements. The area to be developed will contain 3,500 hectares with the possibility of expanding it by an additional 3,200 hectares. The Rio de Janeiro Economic Development Agency (AD-RIO) envisions over \$1.5 billion in private sector industrial investment in next three years. The Rio de Janeiro state government, which will own and manage the park, is expected to invest \$200 to \$250 million next year in access roads and other necessary infrastructure for the park and port complex. Additional funds are being requested from the Inter-American Development Bank.

The area to be developed offers geographic as well as financial advantages. Located on a flat area in the town of Itaguaí, it will require minimal landscaping and drainage construction and is also safe from possible flooding. Moreover, future tenants of the industrial park will have access to existing water and electrical connections located nearby. Relocation costs will be low since the site is sparsely populated.

The Sepetiba Industrial Park will be located in an area contiguous to the Export Processing Zone (EPZ). Goods manufactured for export in the EPZ will be exempt from federal and state taxes.

Sepetiba Industrial Park

Infrastructure Project Profiles

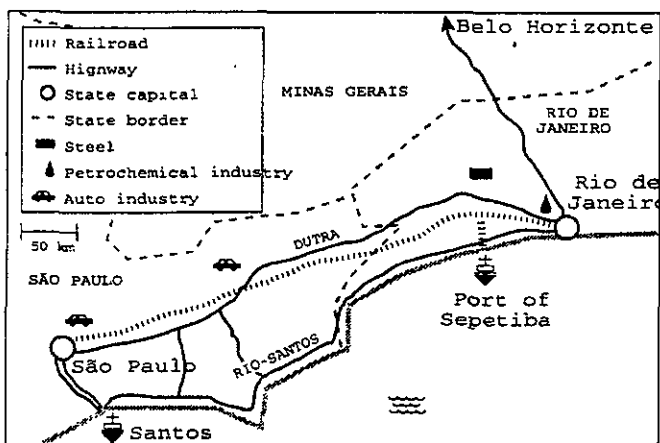
Investment will come from a variety of industries and operations which are heavy users of port facilities. One of the main proposed activities of the industrial park will be heavy industrial activities such as the following:

- Coke plant with a capacity of 2 million tons per year (US\$500 million.)
- Mini-Steel Mill with a capacity of 500,000 tons per year (US\$300 million.)
- Pellet Plant with a capacity of 4 million tons per year (US\$240 million.)
- Pig Iron Plant using coke to produce 1 million tons per year (US\$100 million.)

Other proposed projects include:

- Specialty Steel Plants
- Fertilizer Manufacturing Plants
- Aluminum Lamination Plants
- Vehicle Assembly Plants
- Fruit and Vegetable Export Center

The success of the industrial park project is closely tied to the expansion of the Port of Sepetiba which currently has a capacity to move 7 million tons of cargo per year. In 1994, export tonnage accounted for three-fourths of port traffic. The principal export is iron ore, and the principal import is coal. Seventy percent of Sepetiba's cargo movements is accounted for by coal imports and iron exports for the large steelmaker CSN. Other imports include aluminum, scrap iron, sulfur, and other bulk cargos. The capacity of the ore storage yard will be 7 million tons; the capacity of the entire terminal will be 15 million tons.



The industrial park will have a central location, within easy reach of the major economic centers of Brazil: São Paulo and Rio de Janeiro. The industrial park is located in the state of Rio de Janeiro, just west of the city of Rio de Janeiro. The distance to railroad connections to Rio and São Paulo is approximately six kilometers. The Rio-São Paulo High Speed Rail Project, currently undergoing a feasibility study, is considering the possibility of a connection to Sepetiba. The nearby cargo railroad, the federal railway (known as the Steel Railroad), is built with a wide gauge to allow for heavy cargo transport. The construction of a

direct link from Sepetiba to this rail line will be required. Highways connecting to RJ-99, which connects Rio and São Paulo, are from three to six kilometers away from the park.

Timing

The development of the industrial park is integrally linked to the expansion and development of the Port of Sepetiba. The State Economic Development Agency (AD-RIO) expects to break ground on the construction of necessary infrastructure for the industrial park in September or October, 1995. The project is expected to take 16 months to complete.

The Rio state government is in the process of conducting environmental and population impact studies.

Equipment & Service Demand

The development of the 6,700 hectares of the industrial park is expected to require private sector industrial investment worth more than \$1.5 billion over the next three years.

Nature of Demand

Sepetiba is strategically located within a 500 kilometer radius of 32 percent of Brazil's population and than 50 percent of its economic output: 65 percent of industry, 65 percent of services, and 40 percent of agriculture. The southeastern ports today – from Vitoria to Santos – account for 64% of the value of Brazil's exports and 77 percent of its imports.

AD-RIO calculates a demand of 28,400 shipments of bulk cargo and 6,450 shipments of general cargo for a total of 34,850 shipments per year. Of the total shipments, 31 percent, or 10,800 shipments per year, are expected to be cargo related to the Industrial Park.

AD-RIO envisions a significant element of synergy both inside the park itself as well as between the park and the port. The planned heavy industrial complex would enable producers to create a closely integrated process with easy access to suppliers and customers through the port.

Other advantages for the Sepetiba Industrial Park are its location and the significant reduction of land transportation costs. These advantages will benefit industries that rely on maritime transportation, such as metalworks, fertilizers, and auto assembly plants.

Sepetiba Industrial Park

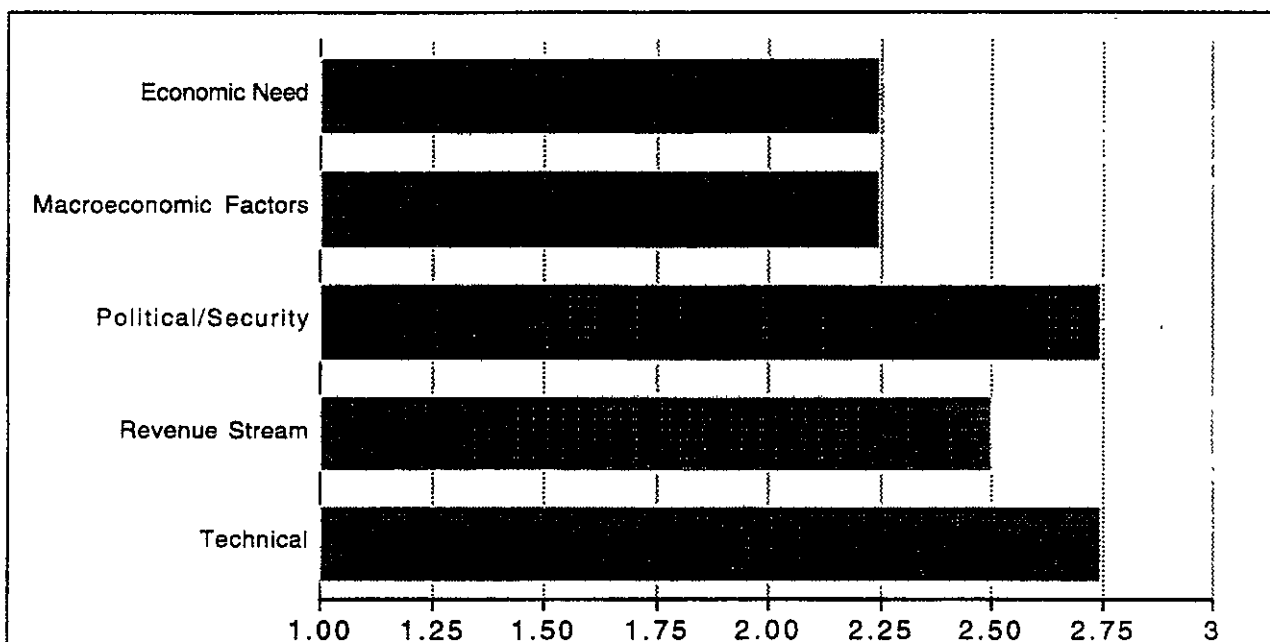
Infrastructure Project Profiles

Financeability

While the concept of the Industrial Park is attractive, there are many issues that will first have to be resolved before the project's financeability can be established. First, it depends on the successful completion of the expansion of the Port of Sepetiba, being undertaken by the government of the state of Rio de Janeiro. Second, financeability depends on the allocation of state funds for infrastructure improvements. Finally, private sector companies must commit substantial funds to build production facilities and must sign long term leases. It is unclear whether there exists sufficient demand for the contemplated products to justify the level of investment required.

The Port project has received strong backing from newly elected Rio Governor Marcello Alencar and, most importantly, from President Cardoso. Moreover, the government of the State of Rio de Janeiro has obtained R\$11 million (U.S. \$12.2 million) in federal funds toward the dredging of Sepetiba Bay. In addition, the municipal government of Rio de Janeiro has committed R\$45 million (U.S.\$50 million) to the port with the objective of improving the competitiveness of local business. Furthermore, in 1996 the state government is expected to allocate U.S.\$200-U.S.\$250 million for infrastructure in the area of Sepetiba Port and Industrial Park.

Financeability Assessment



Source: CG/LA Infrastructure. This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring process.

Key Decision Makers

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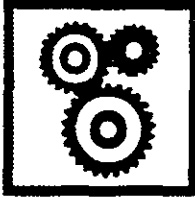
Secretariat for Industry and Commerce of Rio de Janeiro

Ronaldo Cezar Coelho, *Secretary*

Rio de Janeiro, Brazil

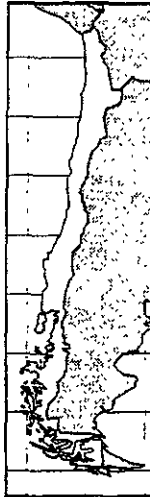
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Industrial/Chile

New City of Curauma Industrial Park



Project Summary

Project No:	IND-03
Subsector:	Real Estate
Country:	Chile
Project Cost:	\$14 million
Export Potential:	N/A
Owner:	Inmobiliaria Curauma S.A.

Technical and Site Description

Inmobiliaria Curauma S.A., a subsidiary of the Chilean pension fund Cruz Blanca, is planning the construction of a new city, Curauma, covering a total of 3,800 hectares. The master plan calls for a 22 year development period starting in 1995 and envisions a city of some 180,000 people with an industrial park, commercial areas, and university campus.

The industrial park, designed for high technology sectors, is intended to be the economic engine of the new city. The park would include industrial and commercial real estate, a technology transfer research center, a convention center, and sporting facilities. The industrial park is expected to cover approximately 125 hectares.

The industrial park will be divided into two parts; the Northern Park, which will cover 25 hectares designed for large-scale industrial development, and the Southern Park, covering 100 hectares, which will be the High Technology Industrial Park (HTIP).

1. Residential areas which will cover approximately 1,900 hectares.
2. Urban commercial and service center, and a regional mall. This area, covering up to 50 hectares, would combine commercial, service, recreational, cultural, and residential functions, as well as provide office space.

New City of Curauma Industrial Park

Infrastructure Project Profiles

In addition to the high technology industrial park, the city will also include the following components:

1. Residential areas which will cover approximately 1,900 hectares.
2. Urban commercial and service center, and a regional mall. This area, covering up to 50 hectares, would combine commercial, service, recreational, cultural, and residential functions, as well as provide office space.
3. University Campus, in response to demands for expansion of the University of Valparaíso. This would cover an area up to 50 hectares.
4. Tourism and service centers. These would be located at the waterfront and include a sailing center, a conference center, and a sporting complex.

Although substantial preliminary studies have been completed, a complete study of development and urban planning is now required.

Site

The city of Curauma will be situated just outside Valparaíso and 100 kilometers west of Santiago, along Route 68. This location is convenient, involving travel times of 15 minutes to the city and Port of Valparaíso and 90 minutes to Santiago. The proximity to the Port of San Antonio puts the city in close proximity to the two ports which handle close to 100 percent of central Chile's maritime transportation.

Timing

The city of Curauma will be developed in stages.

Stage 1 (first two years)

Development of 12 hectares for industrial use, with the possibility of immediate expansion depending on demand.

One hundred hectares of residential area would also be developed to permit construction of 700 houses for approximately 2,800 people.

Stage 2 (Years 2-4)

Development of an additional 13 hectares for industrial and commercial use.

Construction of an additional 3,300 houses for approximately 5,200 people.

Further stages would be developed depending on demand and strategic considerations. At year 10, it is forecasted that Curauma would have a population of 60,000 people (15,000 households), a regional mall, a university campus, and a functioning High Technology Industrial Park.

Equipment & Services Demand

The development of the 125 hectares of the HTIP, in addition to the residential and other commercial areas, is expected to require investment in construction and zoning worth more than U.S.\$14 million spread over time according to the following break-down:

HTIP Preparation (U.S.\$millions)

Year	Investment
1-4	\$3.5
5-10	\$10.6
Total	\$14.1

Nature of Demand

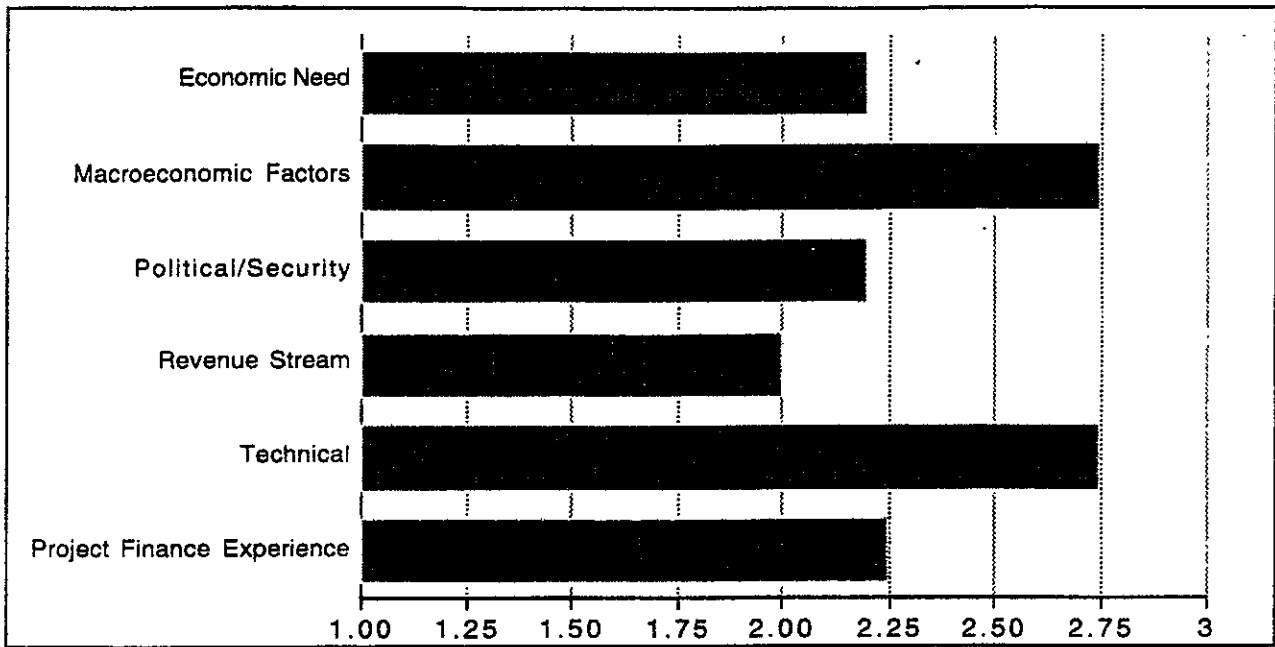
The market for a new city based around a high technology industrial park is generated by the explosive economic growth which Chile has experienced since the mid-1980s. An important factor is the current congestion of Santiago and the overloading of its support infrastructure, which makes a new city within reach of the capital attractive.

Financeability

The project is to be financed through the private sector. This is essentially a real estate project that must be evaluated on that basis. Financeability will be based on the ability of the project to precisely define the sources and flows of revenues in the period of development. Financeability will be difficult to evaluate until more detailed feasibility studies are completed.

New City of Curauma Industrial Park
Infrastructure Project Profiles

Financeability Assessment



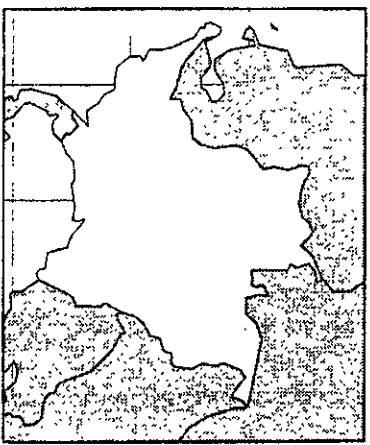
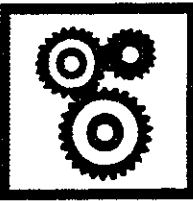
Source: CG/LA Infrastructure.

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Key Decision Makers

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Industrial/Colombia
Olefin Cracker Plant



Project Summary	
Project No:	IND-04
Subsector:	Petro chemicals
Country:	Colombia
Project Cost:	\$1.2bn
Export Potential:	\$800m
Owner:	CPOAC

Technical Description

This project consists of a petrochemical processing complex using a catalytic cracker to transform crude oil into:

- OLEFINS: ethylene, propylene, butylene, and butadiene
- AROMATICS: benzene, toluene, and xylene
- PYROLYSIS GASOLINE and FUEL OIL

The current initiative, led by Compañía Promotora de Olefinas y Aromáticos del Caribe Ltda. (CPOAC), founded in November 1994, is driven by two factors:

1. The discovery of ample quantities of crude oil and gas in the Piedemonte Llanero region (Cusiana, Cupiagua, and Volcanera), which would ensure steady supply.
2. The growth and opening of the Colombian market, substantially increasing demand.

The presently planned plant envisions the production of 600,000 metric tons per annum (MTA) of ethylene, 350,000 MTA of propylene, and, in cooperation with other plants, 400,000 MTA of polyethylenes, e.g. LDPE, LLDPE, and HDPE.

The supply of raw materials is expected to come from the recently-discovered oil and gas fields in the Piedemonte Llanero region which would supply the following products:

Olefin Cracker Plant

Infrastructure Project Profiles

- Light crude oil from Cusiana and Cupiagua will be produced by Ecopetrol and BP.
- Natural gas from Cusiana, Cupiagua, and Volcanera.
- Minor amounts of gas would come from Barrancabermeja and Cartagena.
- Virgin naphta would be available from the Cartagena Refinery (25,000-30,000 barrels a day).

Site

The petrochemical complex will be located nine miles outside of Mamonal, Cartagena.

Timing

The first attempt to construct an olefin cracker plant in Cartagena, Colombia, took place in the second half of the 1980s. A pre-feasibility study was completed but did not lead to further action. The current project sponsor, Compañía Promotora de Olefinas y Aromáticos del Caribe Ltda. (CPOAC), was founded in November 1994 for the purpose of pursuing this project in response to recent discoveries of oil and natural gas in Colombia and in response to more favorable macroeconomic policies of the Colombian government.

CPOAC will award a pre-feasibility study at the end of June 1995. The new pre-feasibility study is expected to take two to three months and be followed by a full economic and technical feasibility study. Upon completion and a favorable outcome, equipment purchases and construction should commence immediately.

Equipment & Services Demand

The completion of this project requires specialized engineering services and equipment to construct a cracker plant. The initial separation of gas and distillates from the crudeoil will require an atmospheric distillation process.

Nature of Demand

A plant-specific port terminal is also being considered. The demand for petrochemical products has grown at an increasing rate fueled by strong economic growth. Current installed capacity of ethylene production in Colombia is approximately 56,000 MTA, and 660,000 MTA in the Andean Group countries (Colombia, Venezuela, Peru, Ecuador, and Bolivia). The estimated demand in the year 2000 is expected to far exceed this capacity (see tables below).

Projected Demand for Polymer:, Colombia and the Andean Region in 2000 (MTA)

POLYMERS	COLOMBIA	ANDEAN REGION
PVC (S&E)	156	485
LDPE	189	499
LLDPE	50	129
HDPE	102	413
PS	55	168
PP	120	330

The above shown projected demand for polymers implies the requirement of ethylene at the following levels:

Projected Demand for Ehtylene: Colombia and Andean Region in 2000 (MTA)

ETHYLENE FOR:	COLOMBIA	ANDEAN REGION
PVC (S&E)	74	228
LDPE	192	507
LLDPE	55	120
HDPE	105	425
PS	17	52
PP	2	6
TOTAL	445	1338

Demand is expected to be more than sufficient to absorb the production of this project.

Olefin Cracker Plant

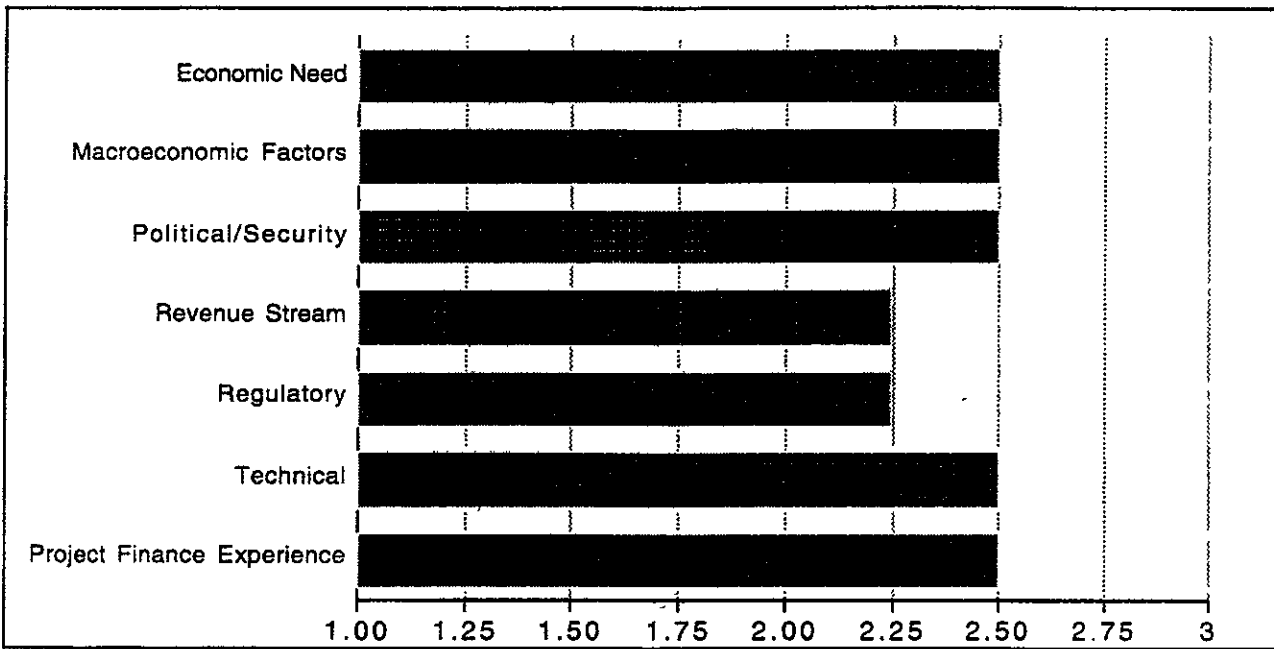
Infrastructure Project Profiles

Financeability

The open economic policy pursued by President Ernesto Samper is considered essential for the successful completion of this project. In particular, political support has generated an agreement between the Instituto de Fomento Industrial and Ecopetrol and Compañía Promotora de Olefinas y Aromáticos del Caribe Ltda. (CPOAC). Moreover, Ecopetrol policy has been changed to allow the supply of raw materials to the project, although a supply contract is yet to be signed. The proposed site of the project is eligible to be declared a duty-free zone.

The sheer size of the project will present difficult financing issues, but the economic need is strong and the project is being driven by an experienced group of Colombian businessmen.

Financeability Assessment



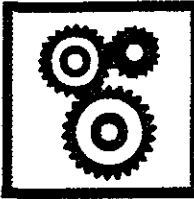
Source: CG/LA Infrastructure.

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Key Decision Makers

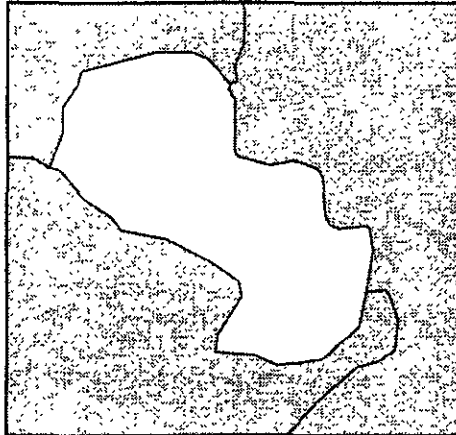
The company promoting the Olefin Cracker Plant is Compañía Promotora de Olefinas y Aromáticos del Caribe Ltda. (CPOAC). The contact person is:

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Industrial/Paraguay

Paraguay Oriented Strand Board Plant



Project Summary

Project No:	IND-05
Subsector:	Forestry
Country:	Paraguay
Project Cost:	\$125 million
Export Potential:	\$74 million
Owner:	Federation of Wood Producers

This project takes advantage of Paraguay's inexpensive electric power supply and abundant availability of eucalyptus trees to produce boards for export.

Technical Description

The Paraguayan Federation of Wood Producers is working on this project with the Wallace Group of Houston and Intertech from Dallas. The two U.S. companies serve as project developers.

The Parana River Oriented Strand Board Plant is a limited partnership for the purpose of developing and operating an OSB eucalyptus plant in the city of Encarnación. The goal of the plant is to establish a low-cost production facility with a primary focus on the latest technology for economical and efficient conversion of eucalyptus into high-quality, competitively-priced, oriented strand board.

The total estimated cost of this project is U.S.\$125 million. This includes construction and equipment with a U.S. export potential estimated at U.S.\$74 million.

Site

The plant will be built on a 250-hectare site near the city of Encarnación, on the Parana River. The two U.S. companies are expected to become major stakeholders in the limited partnership that will develop and operate the plant.

OSB is considered an environmentally-friendly product due to the optimal use of planted forests.

Paraguay Oriented Strand Board Plant

Infrastructure Project Profiles

Timing

The project's feasibility study has just begun and is expected to be complete in four months.

Equipment & Services Demand

The major equipment categories required by this product are: wood chippers, wood and flake conveyors, as well as heat generation and electrical systems.

Additional information will be available upon conclusion of the feasibility study.

Nature of Demand

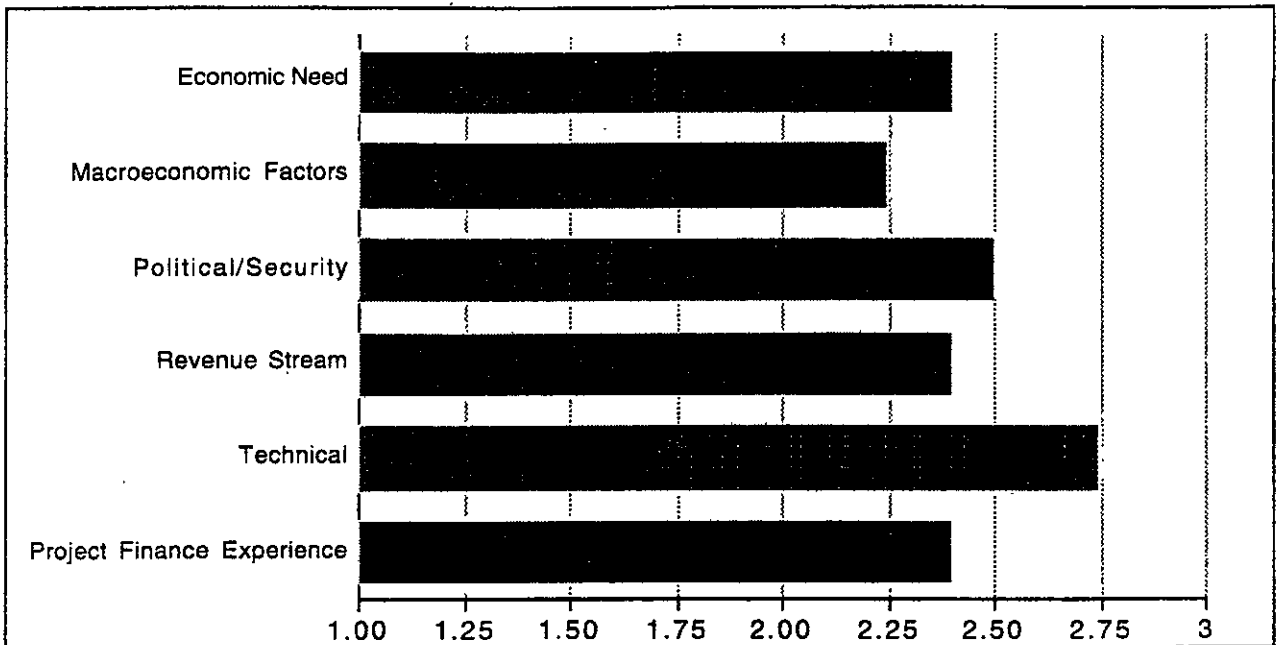
There is strong market demand for this type of wood product. Low energy costs and tax incentives from the government of Paraguay further provide a strong economic basis for the project.

Financeability

The project sponsor is planning to finance the project with 70:30 debt-equity. Potential financing sources for this project includes equity investment from the project sponsors and debt financing from such sources as Ex-Im Bank, OPIC and the IFC.

The feasibility study would address this question and propose a specific financing package.

Financeability Assessment



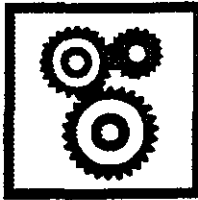
Source: CG/LA Infrastructure.

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Key Decision Makers

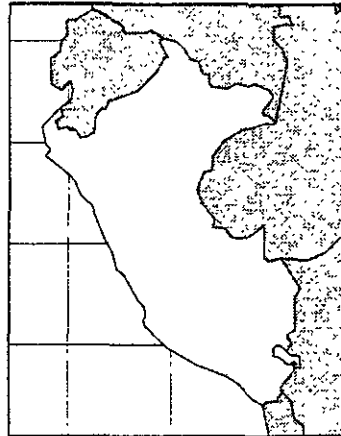
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Industrial/Peru

Hydro Meteorological Forecasting System



Project Summary

Project No:	IND-06
Subsector:	Meteorological
Country:	Peru
Project Cost:	\$45 million
Export Potential:	\$30 million
Owner:	SIGAP

Peru's hydro meteorological forecasting system requires an urgent upgrade. In addition, a consolidation of the various government agencies that input raw data into the central data distribution system is in need. As a consequence, the Ministries of Agriculture and Transportation, as well as the National Development Council (CONADE), have proposed the establishment of the Integrated Geophysical and Environmental System of Peru (SIGAP).

Technical Description

SIGAP is a project to modernize the hydro-meteorological forecasting services of Peru. Several government bodies have overlapping meteorological requirements and many have been conducting their own observations. However, all have now agreed to a common integrated approach. This approach is the Integrated Hydro-Meteorological System for observation, collection, processing and distribution of meteorological, oceanographic, hydrographic and seismic information, all of which require the purchasing of equipment.

The project goal is to generate an environmental database that will be fed by real time data. A second database will hold the environmental archival data, based on the prior database and the existing historical archives. Both databases will be directly accessible to end users.

Hydro Meteorological Forecasting System

Infrastructure Project Profiles

Site

The center of SIGAP will be located in Lima. There will also be approximately 50 remote sites located throughout Peru.

Timing

The feasibility study for SIGAP is being funded through a TDA grant and is expected to be completed in August 1995. Project sponsors intend to initiate the bidding process for the implementation stage as soon as the feasibility study is finished.

Equipment & Services Demand

The major equipment categories are: communications; weather radars (synoptic, hydrological, oceanographic), and climatological observation systems, lightning detection and location systems, upper air sounding systems, satellite imagery receiving systems, and computers and workstations for central and field offices.

Service requirements include training, installation and maintenance of equipment and A&E experts.

The following chart details the suggested list of systems, quantities and estimated costs, that the TDA funded Definitional Mission Report indicated U.S. companies should be in the position to supply:

Item	Quantity	Unit Price (U.S.\$)	Total
Doppler weather radars	4	1,400,000	5,600,000
Smaller weather radars	8	350,000	2,800,000
Surface automation	200 sites	18,000	3,600,000
Airport surface observation systems	7	150,000	1,050,000
Upper air sounding system	1	500,00	500,000
Upper air consumables (5 years)	3650	150	547,500
Seismic equipment	40	15,000	600,000
Oceanographic instrumentation	10 sites	37,500	375,000
Telecommunication equipment	1 lot	1,000,000	1,000,000
Satellite communications	5 centers	200,000	1,000,000
Lightning detection systems	1 lot	360,000	360,000
Operations center equipment	1 lot	5,000,000	5,000,000
Agency and field work stations	50	25,000	1,250,000
Meteorological model development	1	1,250,000	1,250,000
Program management, system engineering and integrators		2,500,000	2,500,000
Spare parts and maintenance equipment		2,500,000	2,500,000
Training		500,000	500,000
TOTAL			30,432,500

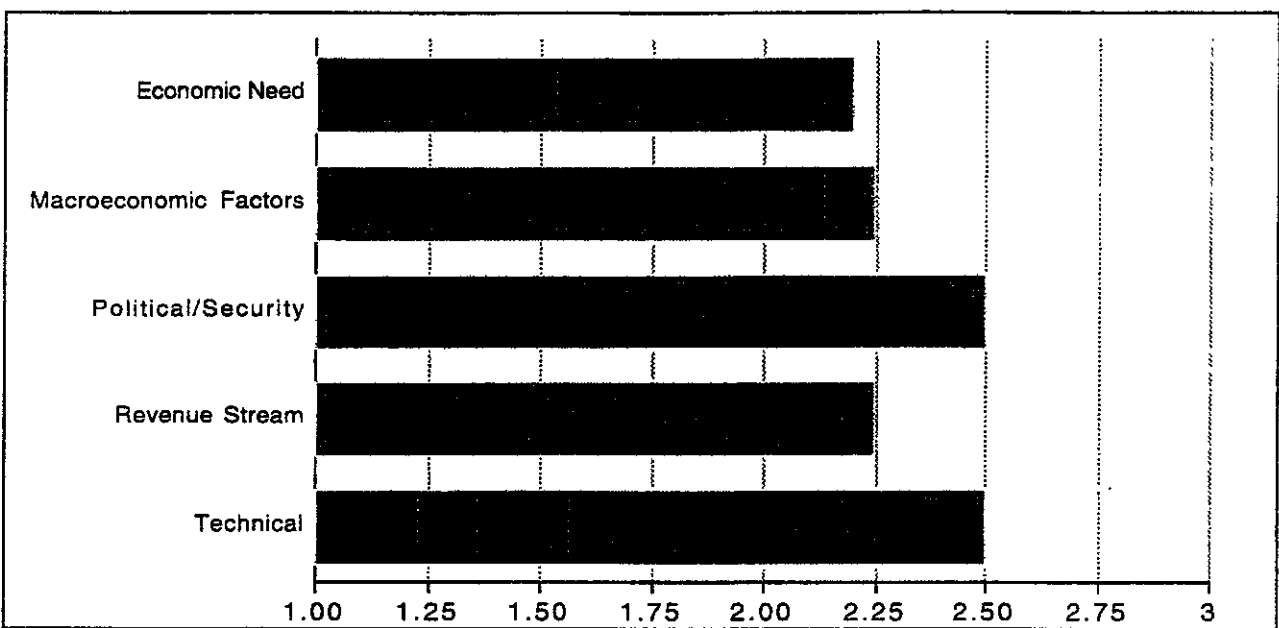
Nature of Demand

Seismic activity and weather phenomena, such as the hurricane El Niño, have a significant impact on the population and economy of Peru. Most of the existing meteorological, seismic and oceanographic equipment is in poor shape. Moreover, there is considerable duplication between different agencies and information often does not reach the intended end user.

Financeability

The government of Peru is the primary source of funding. Financing will be dependent on the continued success of Peru's economic plan and the availability of scarce governmental resources.

Financeability Assessment



Source: CG/LA Infrastructure.

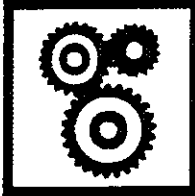
This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Key Decision Makers

Institute of Geophysics
 Dr. Manuel Chang, *President*
 Lima, Peru
 ph: (51-14) 36-8437
 fax: (51-14) 36-8437

TDA Tip

A feasibility study funded by TDA will be completed in August 1995. TDA has also funded a feasibility study for a similar project in Venezuela. These projects will serve as a models for a larger regional project currently in the feasibility stage.



Industrial/Regional

Ibero American Climate Project



Project Summary

Project No:	IND-07
Subsector:	Meteorological
Country:	Regional
Project Cost:	\$160 million
Export Potential:	\$120 million
Owner:	WMO

The World Meteorological Organization (WMO) is sponsoring the Ibero-American Climate Project. Studies of this nature are already being funded by TDA in Venezuela and Peru, and is complementary to a regional project to be carried out in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Paraguay and Uruguay.

Technical Description

The goal of the project is to develop an integrated system capable of providing reliable and detailed forecasts of meteorological and climatic conditions in Latin America, which can be applied to a broader range of social and economic uses.

The meteorological forecasting system will protect against the negative affects of adverse atmospheric conditions by improving regional capacity in very short term forecasting (hours), short range forecasting (up to two days), medium range forecasting (up to 10 days), and long range forecasting. To achieve this objective the project will carry out the following tasks:

- Expand and upgrade existing observation and data collection networks that provide information on atmospheric conditions.
- Upgrade existing communications systems used to transmit data from the National Meteorological and Hydrological Services (NMHS) at the national and regional level.
- Upgrade the climatological data banks of each country's NMHS.
- Create one or more regional centers to store climatological data to support modeling and forecasting activities.

Ibero American Climate Project

Infrastructure Project Profiles

- Improve the NMHS institutional capabilities, including the training of NMHS personnel.

The project's feasibility study will begin during the second half of 1995 and should last for at least 18 months. The feasibility study will be carried out with funding being provided by the IDB, TDA, the government of Spain and CIDA from Canada.

Site

Participating countries include Argentina, Bolivia, Brazil, Colombia, Costa Rica, Chile, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela.

Timing

This project is in the feasibility stage. Project sponsors intend to implement the project as soon as the feasibility study is finished. The project will continue for a five-year period.

Equipment & Services Demand

Major equipment categories are: communications; weather radars; synoptic, hydrological, oceanographic, and climatological observations systems; lightning detection and location systems; upper air sounding systems; satellite imagery receiving systems; and computers and workstations for the main and field offices.

Service requirements would include training, installation and maintenance of equipment and A&E experts.

The feasibility study should provide the precise list of equipment and services that would be needed to carry out the project.

Nature of Demand

This project is based on the fact that meteorological observations, communication and data processing in Latin America are inadequate, with large areas of the region lacking coverage.

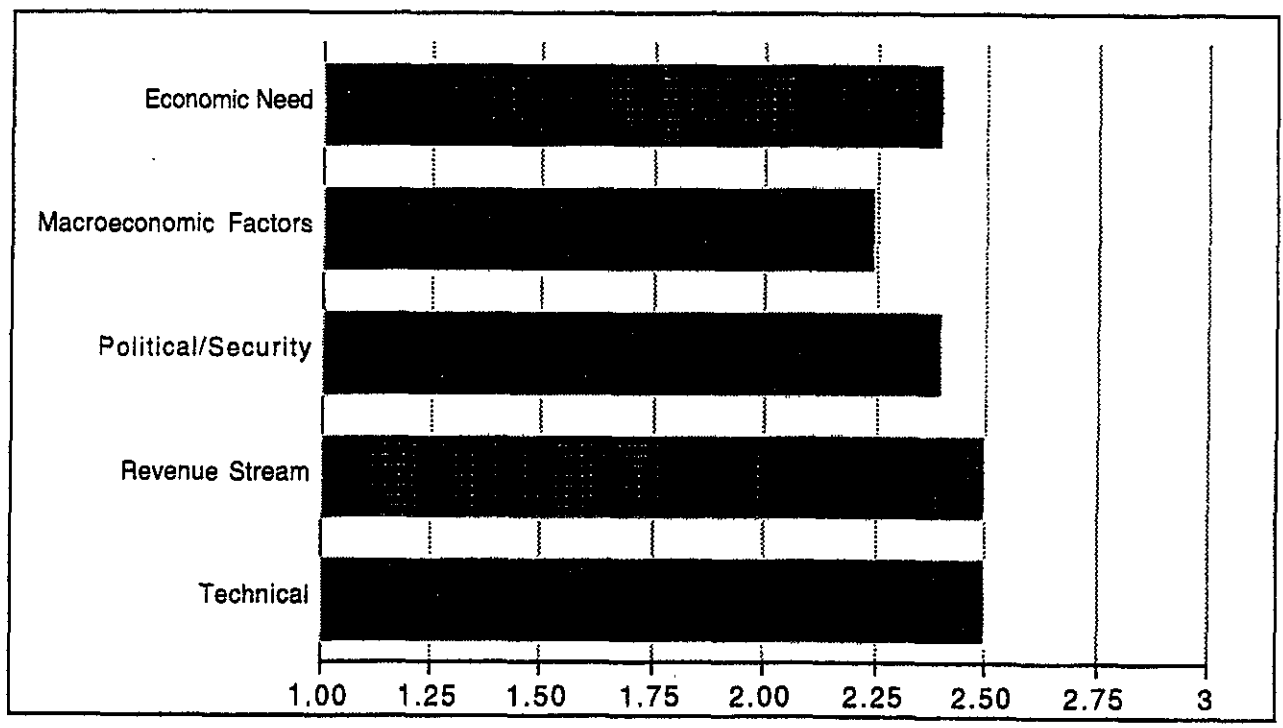
The effectiveness of Latin American meteorological station networks has important repercussions both within and beyond the region. In the short term, more accurate weather forecasts have important economic and social ramifications because they provide early warnings of natural disasters such as droughts, floods, and unique weather phenomena such as El Niño.

Over the medium to long-term, accurate and reliable meteorological forecasting promotes sustainable development by positively affecting agricultural practices, aviation, land and maritime transport, water resource planning and management, and environmental conservation.

Financeability

Although the feasibility study will suggest financing alternatives for this project, it is expected to receive support from the Inter-American Development Bank (IDB) by 1997. It is anticipated that additional financing will be available through the U.S. Ex-Im Bank. The project is not financeable on a private basis and will require multi-lateral or governmental support to proceed. Interested parties should carefully track the funding process upon conclusion of the feasibility analysis.

Financeability Assessment



Source: CG/LA Infrastructure.
This Financeability assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Ibero American Climate Project

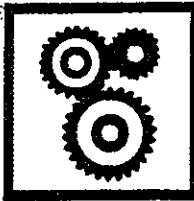
Infrastructure Project Profiles

Key Decision Makers

World Meteorological Organization
Andrei Levy, *Chief, Resource Mobility Unit*
Geneva, Switzerland
ph: (41-22) 730-8111
fax: (41-22) 734-2326

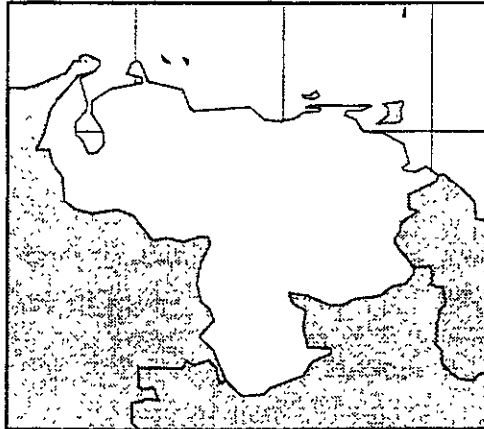
TDA Tip

TDA funded the feasibility studies for both the Peruvian and Venezuelan meteorological projects. Both of these projects are possible participants in the regional project. The feasibility study for this project is funded by various sources, including TDA. The feasibility study is scheduled to begin in the second half of 1995.



Industrial/Venezuela

Licaima Sustainable Forest Management



Project Summary

Project No:	IND-08
Subsector:	Forestry
Country:	Venezuela
Project Cost:	\$40 million
Export Potential:	\$30 million
Owner:	LICAIMA

To implement long-term, sustainable development of tropical forests, the Venezuelan government grants 35-year concessions (renewable for equal periods of time) of large forest areas. Chivapure is one of these large tropical forest areas (300,000 acres), currently under study for future (rational and sustainable) forestry management and development by the LICAIMA consortium. Preliminary studies indicate that the concessioned area can easily support the annual harvesting of 75,000 cubic meters of solid tropical woods through the entire 35-year concession period.

Technical Description

The LICAIMA consortium, whose lead company is Venezuela's Madisca, with over 45 years of experience in the business of forest products, is seeking to partner with a U.S.-based firm, or group of firms willing to provide financial and technical support to develop a major concession in southeastern Venezuela. This will be a multi-phase project whose first step is a comprehensive Forest Ordering and Management Feasibility Study (FOMFS). There are very clear requirements for the content of the study, which will cost approximately U.S.\$300,000.

Stringent forestry management practices will be incorporated in the concession, which will necessitate the use of the latest techniques and equipment for timber harvesting.

Licaima Sustainable Forest Management

Infrastructure Project Profiles

Site

The Chivapure lot consists of approximately 300,000 acres (121,000 hectares) and is located in the southeastern portion of the state of Bolivar, some 100 miles from the Orinoco River.

The land is almost completely virgin, and is home to some 50 Piaroa Indians. The nearest urbanized town is located 30 miles away. Roads are impassable in the rainy season (January - April and July - October).

Timing

Time is of the essence for this project. A complete Forest Ordering and Management Feasibility Study (FOMFS) must be prepared and submitted to the Venezuelan Government on or before January 24, 1997 or the concession will not be granted. Since it normally takes 18 months to complete an FOMFS, work on the document should be started no later than August 1995.

Equipment & Services Demand

Preliminary estimates indicate that the project would require over U.S.\$30 million of U.S.-sourced machinery, equipment and engineering and consulting services over the first five-year time period. After completion of the FOMFS and granting of the concession, Phase I would require the construction of several bridges and upgrading of approximately 60 miles of dirt roads for heavy truck traffic. Phase II would require the purchase of efficient transportation equipment (heavy duty trucks) and/or large barges. Phase III would require the purchase of a complete and integrated manufacturing complex. At this point it is not clear whether final wood products assembly and finishing would be done in Venezuela or the United States

The harvesting and forestry services work will require appropriate machinery and equipment, spare parts, etc. on an on-going basis.

Nature of Demand

The worldwide demand for all species of tropical woods is the foundation on which this project rests. Currently, an average FOB price for such wood is a significant U.S.\$200 per cubic meter.

In addition, the Venezuelan government is imposing very stringent and environmentally conscious requirements on all future forestry concessions. This is to guarantee long term sustainability and avoid environmental degradation.

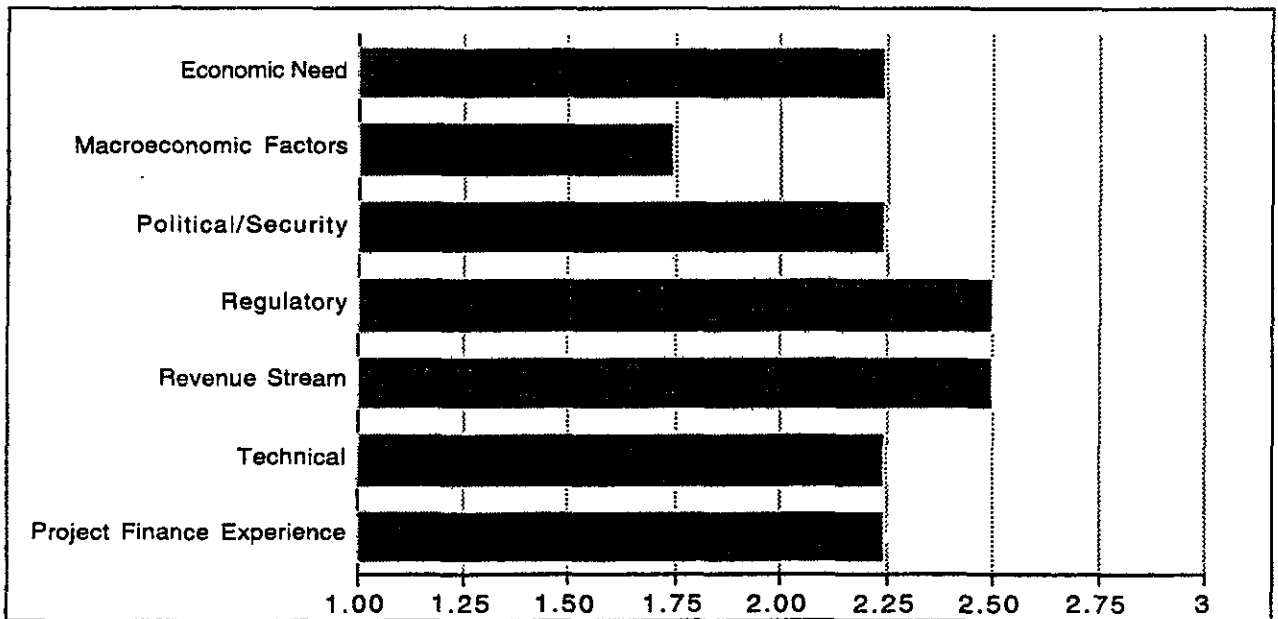
Financeability

LICAIMA expects to finance the Chivapure project through its joint venture agreement with a U.S. partner and capitalize project revenues as collateral for foreign and domestic debt.

Project financeability hinges on the evaluation of expected revenues. Revenues will be based on the market for tropical hardwoods (currently very strong) and the ability of the concessionaire to get the product efficiently to market from a remote location. Operating revenues will be generated in hard currency.

Interested participants must also be aware of and deal with the potential for disputes between indigenous groups and the concessionaire.

Financeability Assessment



Source: CG/LA Infrastructure

This Financeability Assessment is based on information from sources we believe to be reliable, but CG/LA makes no warranty as to its accuracy or completeness. Please see the Project Finance section for an explanation of the project scoring results.

Licaima Sustainable Forest Management

Infrastructure Project Profiles

Key Decision Makers

Consortio LICAIMA

Hector Ramos, *President of the Board of Directors*

Oswaldo Hernandez, *Board Member and Financial/Legal Advisor*

Ivan Ramos, *Board Member and Economic Advisor*

Caracas, Venezuela

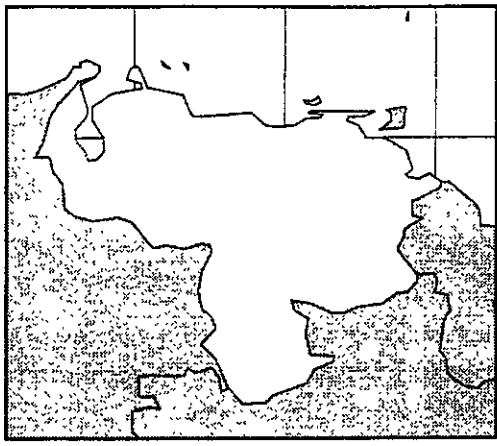
ph: (58-2) 285-2852

fax: (58-2) 561-2679



Industrial/Venezuela

Doña Barbara Forestry Project



Project Summary	
Project No:	IND-09
Subsector:	Forestry/ Agriculture
Country:	Venezuela
Project Cost:	\$8 million
Export Potential:	\$4 million
Owner:	Private

The Venezuelan government is implementing policies to avoid the destruction of valuable tropical rainforests through a policy of rational, sustainable development. At the same time government policy seeks to expand the country's trade with the other Andean Pact nations and the United States. A soon to be completed highway linking Venezuela to Colombia through the Venezuelan state of Apure will open up further development opportunities.

Technical Description

A small family owned enterprise is seeking investment and technical assistance to develop a forestry project on its landholdings in Apure State. The focus of the project is on sustainable timber harvesting; supplemental income will come from agricultural production, cattle raising and an eco-tourism business.

The proposed site is a 75,000 acre ranch of which 25,000 to 50,000 acres are suitable for timber harvesting. Studies already completed by the Venezuelan Forestry Service (SEFORVEN) and Universidad de los Andes indicate that the highly valued *tece* tree (*Tectona grandis* L.F.) grows in concentrations of 1,111 trees per hectare and at a size and growth rate that would yield a volume of 8.00 cubic meters per hectare per year.

The ranch already provides *eco-tourism* services (the 21 room "Doña Barbara Tourist Lodge"), with considerable potential for expansion. There is also a grass landing strip with a 5,000 foot runway.

Doña Barbara Forestry Project

Infrastructure Project Profiles

Site

La Trinidad de Arauca, Apure State (approximately 400 kilometers south-southwest of Caracas). Apure State borders Colombia on the south and is very thinly inhabited.

Timing

Formal announcement of the project is expected in the first quarter of 1996 after a number of feasibility and pre-feasibility studies are completed. These studies are currently underway in the areas of forestry management, agriculture and tourism.

Equipment & Services Demand

The bulk of the equipment and services required will be for the forestry operations. Expansion of agriculture and cattle raising are also planned. Initial needs are: 4 bulldozers, 2 landgraders, 4 all terrain vehicles, 10 equipped tractors, 3 water pumps and irrigation systems; a small power plant (60 kw); a saw mill; as well as airplanes and boats for tourist activities.

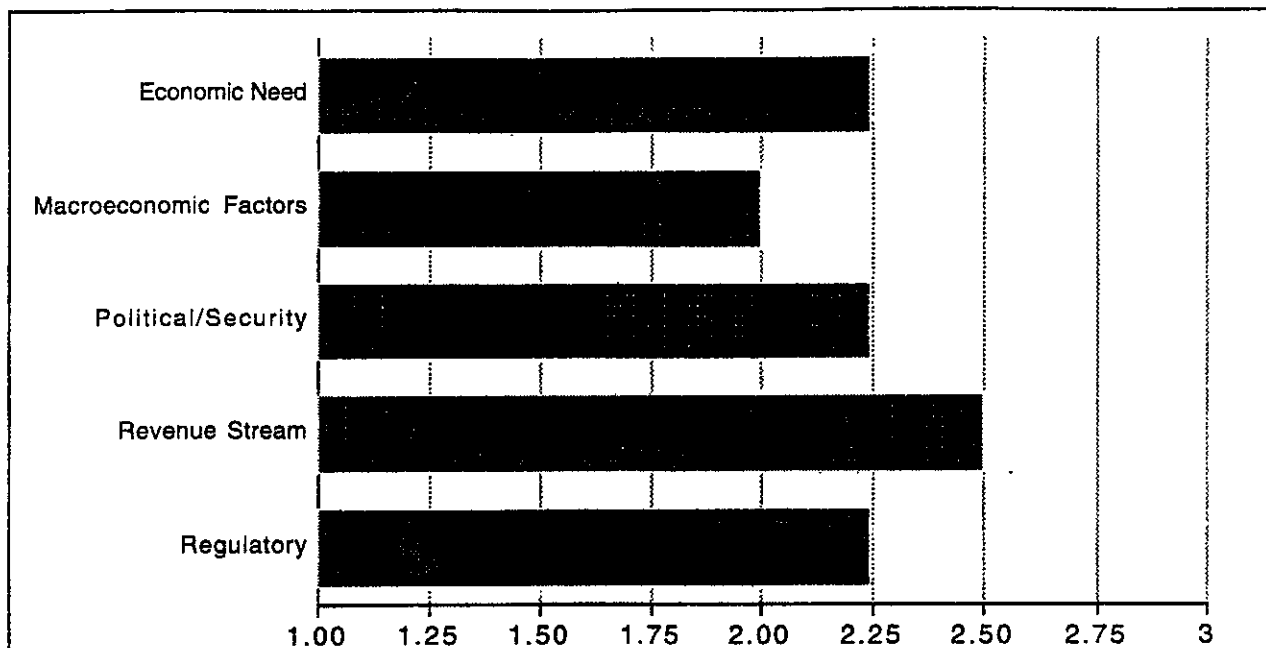
Nature of Demand

Demand for high quality tropical woods is increasing worldwide. Growing trade between Venezuela and the other Andean Pact nations (Colombia, Ecuador, Peru and Bolivia) is also a factor in expanding production of forestry products as well as certain agricultural items.

Financeability

Private financing is being sought from a U.S. partner. Among the issues to be studied further are: creditworthiness and business history of the project proponent, how harvested timber will be delivered to markets, and basic project economics, including expected supplemental income from the agricultural and eco-tourism businesses.

Financeability Assessment

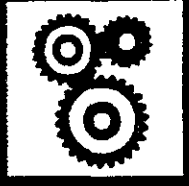


Source: CG/LA Infrastructure.

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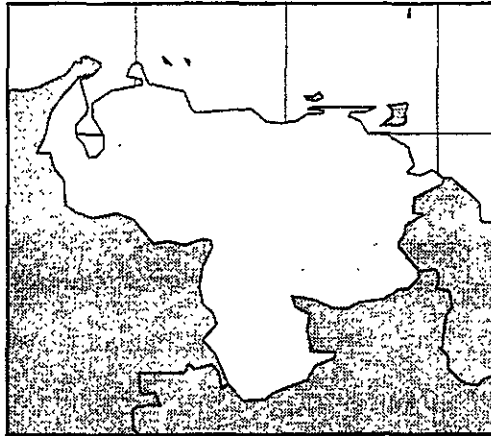
Key Decision Makers

Fundación Ecológica Doña Barbara
 Hugo Estrada Ripari
 San Fernando de Apure, Venezuela
 ph: (58-47) 25003
 fax: (58-47) 25003



Industrial/Venezuela

VENEHMET Hydrometeorological Project



Project Summary

Project No:	IND-10
Subsector:	Meteorological
Country:	Venezuela
Project Cost:	\$89 million
Export Potential:	\$70 million
Owner:	NHC

Technical Description

VENEHMET is a structured plan to modernize the Hydrometeorological forecasting services of Venezuela. The plan involves the formation of a National Hydrometeorological Center (NHC) and coordination of the major agencies within Venezuela with the goal of providing world-class real-time forecast products. Centro de Alerta y Pronóstico Hidrometeorología Nacional (CAPHN) is a new center to be established under the direction of the National Committee of Hydrometeorology.

The new NHC will provide its services to and in collaboration with:

- Users of Weather and Climate Information: (i.e. government agencies and other organizations, mass media, oil companies, private sector and tourist groups.)
- Meteorology and Hydrology Facilities: (i.e. Armed Forces meteorological services, Ministry of Environment and Natural Resources, Ministry of Transportation and Telecommunications, Universidad Central de Venezuela, Centro de Estudios Avanzados del Clima Tropical, and other organizations.)

The total project cost is \$89 million. Fifty percent of the total will be for equipment, and up to 90 percent of goods and services for the project could come from the United States. Services in the area of installation and maintenance of equipment and training of personnel will be required. A long term contract with the provider of installation and maintenance services is expected.

VENEMET Hydrometeorological Project

Infrastructure Project Profiles

Site

The central site will be Caracas, with field sites at airports and other locations, including the above-mentioned organizations that will be working on operational meteorology and hydrology with NHC. VENEHMET has been conceptualized as a four phase process:

Timing

The project schedule has been delayed for one year, because VENEHMET was not included in the budget. In the current budget bill for 1996 — in preparation for submission to Congress in June 1995 — VENEHMET is one of the top priorities.

	Stage 1	Stage 2	Stage 3	Stage 4
Stage Description	Approval of the plan, interim funding, establishment of the VENEHMET Program Office and Stage 2 planning	Construction of infrastructure, provision of interim weather and hydrological services from CAPHN	Operation of VENEHMET with forecast and warnings from CAPHN and regional offices	Addition of regional mid-scale model, and transition to self-sustained operations
Export Opportunities		Extensive foreign support	Reduced foreign support	
Schedule	1995	1996 >> 1997	1998 >> 1999	2000

Equipment & Services Demand

Major equipment categories include: communications; weather radars, airport, synoptic, hydrological, oceanographic, and climatological observation systems; lightning detection and location systems; upper air sounding systems; satellite imagery receiving systems; and computers and workstations for the main and field offices (including air traffic control facilities).

Service requirements include: training, installation and maintenance of equipment and A&E experts.

Nature of Demand

Each year, severe weather causes several billions dollars worth of losses to Venezuela and seriously impacts the quality of life in the country. The government's goal is the modernization of hydrometeorological mission activities, including reliable communications and sensing systems. Accurate forecasts should improve operations in the tourism, transportation, construction, energy, water management and disaster prevention sectors.

The project is included in the FY96 budget proposal as one of the top five investment projects.

Financeability

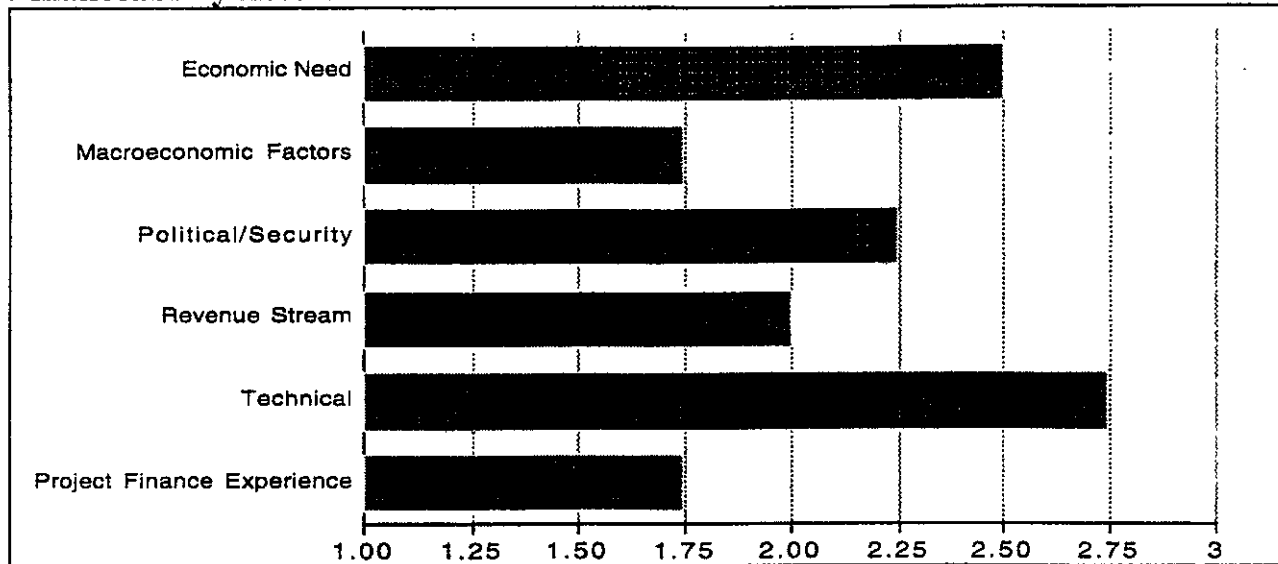
The Ministry of Environment and Renewable Natural Resources expects approval this year. The need for the project is being driven by a wide range of both economic and social factors, including improvements in transportation, water management, tourism and disaster prevention.

It is likely that the budget authorization, in some form, will be approved this year allowing the project to proceed. Given the high likelihood of U.S. services and equipment forming the backbone of the project, the Venezuelan government hopes to receive U.S. Ex-Im Bank support.

VENEMET Hydrometeorological Project

Infrastructure Project Profiles

Financeability Assessment



Source: CG/LA Infrastructure

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Key Decision Makers

Dirreción General Sectorial de Información Ambiental
 Ing. Claudio Caponi T., *Director*
 Caracas, Venezuela
 ph: (58-2) 408-1601/1602
 fax: (58-2) 541-8375 or 545-0607

TDA Tip

A TDA funded feasibility study is currently being conducted by the Republic Group. Both VENEHMET and the Hydro-meteorological Data and Forecasting System will serve as models for a larger regional project. TDA has funded a feasibility study currently in progress.



Background Information Infrastructure in South America

U.S. Trade and Development Agency

**J. JOSEPH GRANDMAISON
ALBERT W. ANGULO
BARBARA R. BRADFORD
JOHN D. HERRMAN
ANNE MCKINNEY
STEVEN MAVIGLIO
NED CABOT
NINA MICHELS**

CG/LA Infrastructure

**NORMAN F. ANDERSON
THOMAS B. BOREIKO
BENNETT C. JAFFEE
JON F. BILDNER
ÅKE DENSERT**

Background Information



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

J. Joseph Grandmaison

Mr. Grandmaison is the Director of the U.S. Trade and Development Agency (TDA). He was nominated for the position by President Clinton and confirmed by the Senate. He was sworn in on August 10, 1993.

TDA is an independent government agency whose mission is to enhance market opportunities for American businesses with respect to infrastructure and capital projects in developing and middle-income countries. It does this by working closely with foreign governments and other entities to get American businesses involved in the early stages of planning these projects. These opportunities in turn provide U.S. companies with market entry, exposure, and information, thus helping them establish a position in markets that are otherwise very difficult to penetrate.

Mr. Grandmaison has an extensive background in both business and government. Before coming to TDA, he was Vice President of Weil & Howe, a management consulting and project development company specializing in energy and environmental matters. He has also served as a consultant to both public and private sector clients, specializing in community and government relations, politics and economic development.

From 1977 to 1980 he served as the Federal Co-Chairman of the New England Regional Commission. He was appointed to this position by President Carter and served as a co-equal with the six New England Governors to develop policies to improve the regional economy.

The Commission conducted programs in the areas of transportation, energy, economic development, international trade, tourism promotion and hazardous waste management.

He also served as Chairman of the Federal Regional Council, which is comprised of the major Federal officials in the region. The Council was responsible for streamlining and coordinating the delivery of Federal programs in New England.

Mr. Grandmaison was the Democratic nominee for Governor of New Hampshire in 1990. He served as Chairman of the New Hampshire Democratic Party from 1987 to 1990.

He has taught at Boston University's School of Public Communications and served as a Fellow at Harvard University's John F. Kennedy School of Government.

Mr. Grandmaison is a graduate of the Burdett College School of Business Administration. He attended the Senior Management Program at Harvard University's John F. Kennedy School of Government.

Background Information



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

ALBERT W. ANGULO

Albert W. Angulo serves as Regional Director for Latin America and the Caribbean. Prior to his present position, Mr. Angulo served as Deputy Director for the USAID sponsored PROFIT project.

In June 1989 Mr. Angulo was appointed Special Assistant to the Assistant Secretary of the Treasury for International Affairs where he dealt with Latin American and Caribbean development issues.

From January 1985 to June 1989, Mr. Angulo managed and owned Argent Consultants, an international management consulting firm that assisted small and medium size businesses in the development of strategic business plans, financing programs, acquisitions, international joint ventures and international organizations such as the World Bank.

Mr. Angulo began his international financial career in commercial banking in Philadelphia where he specialized in Latin America and Iberia. He moved to Houston in 1970 to become the Treasurer of a Fortune 500 multinational engineering, construction and financial services company, and President of its project finance subsidiary. Mr. Angulo has held senior management positions in engineering and construction companies serving the energy, agriculture, environment and natural resource development industries. He also provided financial management and arranged worldwide project finance, on behalf of private and public sector clients.

Mr. Angulo was born in Madrid, Spain and lived in France, Venezuela and Mexico prior to coming to the U.S. He has traveled extensively throughout the world and currently resides in Washington D.C. He has served as a member of the Budget and Fiscal Affairs Advisory Committee in Alexandria, VA. He earned his B.S. in Business Administration from Lehigh University in 1959, and his M.B.A. in International Business from Temple University in 1968, the same year that he attended the London Bankers Association's International Banking Summer School at Trinity College, Dublin. Mr. Angulo is married to the former Jeanne Oates. He has a son and daughter, from an earlier marriage, both residing in Houston, Texas.



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

Barbara R. Bradford

Barbara R. Bradford is the Director for Special Projects of the U.S. Trade and Development Agency (TDA). She has been at TDA for the past nine years. Prior to coming to TDA, she was an attorney in the Office of General Counsel of the Agency for International Development (AID). Ms. Bradford specialized in the area of international corporate finance.

Ms Bradford has her JD from Georgetown University Law Center, her MBA from the School of Business Administration of Georgetown University and her B.A. in Political Science from Pitzer College, Claremont, California.

Ms. Bradford was in private law practice on Wall Street and in Washington prior to joining AID. She also founded and was President of Georgetown Export Trading, Inc. (GETI) for three years.

Background Information



U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602

John D. Herrman

John Herrman is a Country Manager for Latin America and the Caribbean. He has responsibilities for projects funded by TDA in Mexico, the Caribbean, Central America, Venezuela, Colombia, and Ecuador. Prior to beginning work for TDA, Mr. Herrman worked for Purolator Products, Inc. in their management training program. At TDA, Mr. Herrman worked for three years in the Asia region as country manager for Thailand, Malaysia, Indonesia, and Singapore before beginning his responsibilities as Country Manager for Latin America.

John Herrman received an undergraduate degree in History at the University of Kansas and a subsequent Masters Degree in Latin American Studies from Tulane University. While at Tulane he obtained a research fellowship on the development of free trade zones in Central America.



U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602

ANNE MCKINNEY

Anne McKinney is a Country Manager for Latin America and the Caribbean. She is responsible for TDA projects in Peru, Bolivia, Chile, Argentina, Paraguay and Uruguay.

Ms. McKinney joined TDA in April 1995. She has seven years of experience working on Latin American public policy issues. Most recently, she worked on environmental management projects in Mexican and U.S. cities in the border region for a local government association. She authored a report on Financing Water and Wastewater Infrastructure in the "Colonias" in Texas and New Mexico. Ms. McKinney was the Program Coordinator for Latin American Studies at the Johns Hopkins University School of Advanced International Studies (SAIS). She managed SAIS programs on Mexico and Venezuela, was responsible for program development and fundraising for Latin American Studies, and oversaw the publication of three books on US-Mexican relations.

Ms. McKinney has a Master's Degree in International Relations from Johns Hopkins University-SAIS, with concentrations in International Economics and Latin America. She has a B.A. in International Studies from The American University and spent a semester studying in Bogotá, Colombia. Ms. McKinney holds a Certificate in Translation and is fluent in Spanish. She is a member of the Latin American Studies Association and Profmex (the consortium for research on Mexico).

Background Information



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

Steven Maviglio

Steven Maviglio is Special Assistant for Policy and Public Affairs at the U.S. Trade and Development Agency, where he is responsible for TDA's marketing, public relations, and publications.

He joined TDA in April 1995 after serving as Director of Public Relations for the Student Conservation Association, Inc., Charlestown, N.H. Previously, he was a Senior Legislative Assistant for the New Hampshire Senate and served three terms in the New Hampshire House of Representatives. His background also includes positions as editor of national consumer and trade publications and in congressional, gubernatorial, and local political campaigns.

He holds a B.S. in Communications from Boston University and a Master's in Public Administration from the University of New Hampshire.



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

Ned Cabot

Ned Cabot serves in the newly created position of Export Promotion Director where he is responsible for expanding efforts to identify export opportunities associated with TDA-assisted projects. He served two years in the Peace Corps in the Dominican Republic and has been a legislative aide both on Capitol Hill and in the Connecticut State Legislature. He also has several years experience living in Europe and assisting U.S. firms with investments overseas.

Mr. Cabot is a graduate of Oberlin College and holds a Masters Degree in International Economic Relations from the Braunschweig Technical University in Braunschweig, Germany. He speaks German, Spanish and French.

Background Information



**U. S. TRADE AND DEVELOPMENT AGENCY
Washington, D.C. 20523-1602**

Nina A. Michels

Nina Michels is a Program Analyst for the Latin America and Caribbean. She received her undergraduate degree in International Relations at Pomona College and a Masters Degree in International Trade, Finance, and Business from Georgetown University School of Foreign Service. In a highly competitive process, Ms. Michels was selected for an internship at TDA in the Latin America and Caribbean region, and has been interning since September 1994. She worked at TDA for more than twenty hours every week while carrying a full load of graduate courses. In February 1995, she was selected for a contractor position, with pay, to serve as a consultant to TDA. She assists the Latin America and Caribbean region in reviewing and analyzing proposals for TDA financing. Ms. Michels also plays a key-role in drafting action memoranda recommending approval or disapproval of funding for projects.

In addition to being proficient in Spanish, Ms. Michels was raised in Japan and is bilingual in English and Japanese. Her undergraduate studies focused on comparing the foreign policies of the United States and Japan.

CG/LA Infrastructure

NORMAN F. ANDERSON

Norman Anderson is a Managing Director and founding principal of *CG/LA, Inc.* and *CG/LA Infrastructure*. Mr. Anderson focuses on infrastructure project prospecting and development, business-to-government relations and business strategy development and problem-solving.

He specifically manages *CG/LA's* client work in Brazil and South America, with a focus on the firm's rapidly growing business in São Paulo state. In addition, he is overseeing the development of *CG/LA's* office in Santiago, Chile.

Mr. Anderson also manages the *CG/LA* Special Project Division, which is currently working with Chase Manhattan Bank, under contract with the U.S. Trade & Development Agency (TDA) to identify South America's top 125 infrastructure projects. He also recently produced the books Infrastructure Development in Latin America (June, 1994) and Managing Mexico's Environmental Challenge (August, 1994), both published by the Economist Intelligence Unit. The Special Projects Division is also responsible for *CG/LA's* active series of conferences, seminars and trade missions.

Mr. Anderson is a member of numerous project development groups, including the joint Brazil/U.S. Commission for the development of the Tietê-Paraná basin, which is developing policies and business opportunities in a five state area of Brazil, Paraguay and Bolivia.

He is a member of the advisory board of the Center for What Works, a New York City -based foundation that examines successful social programs around the globe, and of the Environmental Export Council's Brazil Advisory Group.

Mr. Anderson has over sixteen years experience working in Latin America, including five years living in the region. He served in the Peace Corps in Paraguay, and worked for a private foundation in that country, from 1979 to 1984.

Mr. Anderson has an undergraduate degree in history (with distinction) from the University of Virginia, and a master's degree in public administration (MPA-2) from Harvard University.

He is fluent in Spanish, Guaraní, and Portuguese.

Background Information

THOMAS B. BOREIKO

Thomas Boreiko is a Managing Director and founding principal of *CG/LA*, Inc. Mr. Boreiko is a professional economist who specializes in joint venture creation, the assessment of Latin American economic trends and infrastructure project development.

Mr. Boreiko has over seven years experience working in Latin America, primarily in Mexico. He oversees *CG/LA*'s Mexico City office, which manages the development of joint ventures and major project opportunities throughout Mexico.

Mr. Boreiko has worked to create and develop a number of joint venture and project opportunities for leading U.S. firms. Among his successes was the 1994 closing of a joint venture between a top U.S. environmental firm and the prestigious Mexican Petroleum Institute. Also in 1994, Mr. Boreiko was involved in developing a joint venture and long term concession for an industrial water re-use project in the State of Mexico.

Currently he is heading a major project with a U.S. utility and cogeneration designer and constructor to develop industrial cogeneration projects in Mexico.

Mr. Boreiko has led numerous Latin American trade and investment groups in the Boston area. He has spoken and published extensively on Latin American issues, with a principal focus on developing business opportunities and professional relationships in Mexico through a unique blend of detailed analysis and cultural mediation. He was the lead writer on *CG/LA*'s book Infrastructure Development in Latin America (June, 1994), published by the Economist Intelligence Unit.

Mr. Boreiko has a degree in economics (summa cum laude) from the University of Massachusetts, and a master's degree in public administration (MPA-2) from Harvard University

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BENNETT C. JAFFEE

Bennett Jaffee is a Managing Director of *CG/LA, Inc.*, Mr. Jaffee focuses on project development and joint venture creation in the environmental and energy sectors in Mexico, Brazil and the Southern Cone.

Prior to joining *CG/LA* in 1991, Mr. Jaffee was a practicing attorney for thirteen years. Formerly Assistant General Counsel at Wheelabrator Technologies, he worked on the development of major projects in the areas of waste-to-energy and cogeneration projects and associated operational issues. He was the lead project attorney for the \$100 million Spokane, Washington waste-to-energy facility and negotiated waste supply contracts with over twenty Massachusetts municipalities for the company's Millbury facility.

Mr. Jaffee also served as Assistant General Counsel at SCA Services, one of the nation's leading waste disposal companies. He directed the company's legal efforts to secure a Part B permit for SCA's hazardous waste storage facility in Greenbrier, Tennessee and represented the company in numerous Superfund proceedings, including service as the Chairman of the Potentially Responsible Parties Committee for the McAdoo, Pennsylvania Superfund site.

He is currently working on the development of large scale municipal wastewater projects and cogeneration facilities in Brazil and Mexico. He is a frequent speaker on Latin American environmental and energy business opportunities at national and international conferences and a regular contributor to specialty trade publications and reports of the Economist Intelligence Unit. He was the lead writer on *CG/LA's* book, Managing Mexico's Environmental Challenge (August, 1994), published by the Economist Intelligence Unit.

Mr. Jaffee served in the Peace Corps in Mato Grosso, Brazil. He is a Phi Beta Kappa graduate of Trinity College (CT) and has a master's degree in Latin American history from Columbia University and a J.D. from Columbia Law School.

He is proficient in Portuguese and Spanish.

Background Information

JON F. BILDNER

Director of Trade and Investment, CG/LA Infrastructure. Mr. Bildner has lived and worked in Brazil, helping U.S. firms to participate in the marketplace at a policy, business and practical level. He is the author of CG/LA's pamphlet "Doing Business in São Paulo," and co-wrote Infrastructure Development in Latin America, a special report for the Economist Intelligence Unit. He has over two years with CG/LA in positions of ever-expanding responsibility. Mr. Bildner is a graduate of Georgetown University. He is fluent in Portuguese and Spanish.

ÅKE DENSERT

Director of Special Projects, CG/LA Infrastructure. Mr. Densert has written extensively on the Latin American infrastructure market, has also developed an expertise in the country's policy and economic trends. He holds a B.Sc. in International Relations from the London School of Economics and a masters degree in International Economics and Latin American Studies from the Nitze School of Advanced International Studies. He is fluent in Spanish, Portuguese and Swedish.



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