



Gas and Power in Peru¹

Peru restructured its electricity sector in the early 1990s. In a short period of time and despite the fact that privatization has been limited, the Peruvian electricity sector already started to benefit from higher efficiency as evidenced by lower marginal costs and electricity prices, increased reliability as evidenced by declining transmission losses and improved service quality. On the other hand, the government's desire to develop the country's natural gas reserves led to some regulations to promote gas-fired power at the expense of hydro and other thermal units. These regulations distorted the market and led to complaints by market participants. Resulting series of modifications in regulations and

political gaming associated with the process damaged the attractiveness of the investment environment. Moreover, the government still has a significant share of the market.

- *How did regulatory adjustments distort the market for electricity?*
- *Why did the government feel it was necessary to manipulate the rules of the electricity market to promote gas development?*
- *What alternative strategy could have led to healthier gas and power markets?*

Background

Peru's 27.5 million people live in an area of 1.3 million square km. Peruvian economy, which is mostly industrialized, proved more resilient than many of its neighbors during the Asian crisis. Between 1990 and 1998, GDP grew at an average rate of about 5.7% a year. GNP per capita was about \$2,400 in 1999. After slow growth in 2001 (0.2%), the economy rebounded in 2002 and grew 4.5%. The fiscal deficit, running at nearly 3% of GDP is above the IMF target of 1.9%. High interest rates and a credit crunch have led to a decrease in foreign investment. Uncertainty associated with political turmoil is partially responsible for reluctance of investors. But, Peru also has around \$27.5 billion debt (50% of GDP). Inflation, though, remains low, due to tight fiscal and monetary policies, high unemployment and underemployment, depressed domestic demand, and a relatively stable exchange rate.



Peru followed a strong policy of liberalization in the 1990s. But, efforts of privatization slowed recently. In early 2000, before the elections, President Fujimori decided against selling state

refineries, hydroelectricity plants, and water companies. During the first nine months of 2000, Peru was able to raise less than half of the \$650 million goal for the year from

¹ This case study was prepared using publicly available information.

privatization. In July 2001, Alejandro Toledo assumed the presidency after national elections, pledging to boost the economy and to reduce unemployment. In 2002, the Toledo administration managed to raise only half of the expected \$700 million in the face of stiff popular opposition.

Peru is a member of the Andean Community (ANCOM), set up in March 1996 by Bolivia, Colombia, Ecuador, Peru, and Venezuela. At that time, the intent was to create a single market similar to that of the European Union. But, there were significant policy differences. Also, there are many political issues among and within these countries that need to be addressed. For example, the border dispute between Peru and Ecuador was not resolved until late 1998 after almost five decades of occasional military conflict. This may help improve the future of ANCOM, but political and economic stability remains uncertain in almost all of these countries but especially in Colombia, Venezuela and Ecuador. In November 1997, Peru also joined the Asia Pacific Economic Cooperation (APEC) forum.

Energy Sector

Peru has not been a significant producer of oil, gas or coal. The country is a net importer of both oil and coal. In 2001, oil imports decreased to 1.8 million tons a year (MT/yr) from 1.9 MT/yr in 2000. The country also imports almost all of its limited coal consumption of 680,000 tons. Oil exploration investment in Peru fell to only \$30 million in 2000, and only three oil wells were drilled during 2001. The country hopes to increase drilling to at least 30 wells per year over 2002-2004. In early January 2002, President Toledo signed two bills into law aimed at encouraging oil and mining exploration.

Peru is currently self-sufficient in gas but consumes only 40 MMcf/d. There is little gas infrastructure, but the country would like to expand it in order to develop large gas deposits in Camisea and elsewhere. Peru's gas reserves may reach 16 trillion cubic feet (tcf) when all the areas currently under consideration are developed.

Fossil Fuel Reserves, Production and Consumption in Peru (2001)

	Proved Reserves	Production	Consumption
Oil	42 million t. (310 million b.)	5 MT/yr (102,000 b/d)	6.8 MT/yr (145,000 b/d)
Natural Gas	246 bcm (8.7 tcf)	0.42 bcm/yr (40 MMcf/d)	0.42 bcm/yr (40 MMcf/d)
Coal	1.2 billion short tons	23,000 short tons	680,000 short tons

Sources: Energy Information Administration, BP World Energy

Camisea

Peru has been trying to promote the development of the country's gas reserves, in particular those in the Camisea region. The Royal Dutch/Shell Group discovered the Camisea fields in the early 1980s. Block 88 has estimated reserves of 13 tcf of gas and 600 million barrels of condensate. Block 75's gas reserves are estimated at 3 tcf. Camisea gas reserves are found in two reservoirs, San Martin and Cashiriari in the Ucayali basin, in the remote jungle east of the Andes, about 300 miles from Lima. Development of Camisea has been delayed numerous times, largely for political reasons, in the past few years.

Shell and Mobil formed a consortium to develop the fields with Shell as the operator with 57.5%, and Mobil with 42.5%. But, the consortium withdrew from the Camisea in July 1998 after completing a two-year appraisal contract while keeping Block 75, for which it had a separate E&P license signed on March 18, 1997 and where it had found gas in early 1998. In early 2001, the consortium decided to return Block 75 when the next stage of its contract expires March 17. The consortium did not like the economics of the project with difficulties

in financing, which was expressed to be related to the lack of a significant gas market in Peru. The government was unwilling to renegotiate the deal.

Government Incentives

In September 1999, Peru passed a detailed set of natural gas regulations under its Law for the Promotion and Development of the Natural Gas Industry that essentially sets the rules for the development of Camisea. According to the Law, the Energy Tariffs Commission (CTE) will regulate tariffs for the sale of gas and the cost of T&D. CTE also regulates electricity tariffs. All gas sales will be made at the reception point, which can be either the wellhead or the "production inspecting point." The regulations guarantee T&D concessions "a real annual profitability of 12%."

The \$2.6-billion Camisea project has been split into a 40-year contract covering E&P, and a 33-year contract dealing with T&D. On February 16, 2000, a consortium led by Argentina's Pluspetrol (and including Hunt Oil and the SK Corp.) won the bidding for upstream work on Camisea. On October 20, 2000, Peru issued a tender for this latter part of the Camisea project, which includes separate pipelines for gas and liquids. The sole bidder was a six-company consortium, Transportadores de Gas, led by Argentina's Tecgas, and including Pluspetrol (Argentina), Hunt Oil (US), Grana y Montero (Peru), Sonatrach (Algeria), and SK Corp. (Korea) with a \$1.45-billion offer.

The companies have up to 44 months to start up operations but agreed to make every effort to begin commercial operations within 36 months. Tecgas is holding talks with Colombia's Promigas, in which Enron is a partner; and another company for the distribution of natural gas in Lima and Callao. Spain's Gas Natural withdrew from the consortium shortly before the bid was presented.

The investors have also committed to give preference to using national goods, services, and labor when competitive during the development and construction of the Camisea project. Consumers in Cuzco will pay a special price of \$1/MMBtu for gas delivered to customers using less than 10 MMcf/d. In other areas, the price is \$1 for electricity generation but higher for other purposes (\$1.90 delivered in Lima).

Overall, Camisea is expected to generate \$5-6 billion in royalties and tax revenues for Peru over the next 30 years. In early 2001, Peru approved early reimbursement of the 18% general sales tax on the import and/or local purchase of new capital goods and intermediate goods and services for the operators of the Camisea contracts signed late last year after exempting them from an earlier legislation on a tax increase in late 2000.

The Role of Electricity Sector Regulations

Gas from Camisea is slated to fuel power plants in Lima and north-central Peru. Power generators and large industrial customers are considered the largest potential customers for Camisea gas. Shell had estimated that Camisea eventually could produce up to 500 million cubic feet per day (MMcf/d) of gas and 50,000 b/d of condensate. Gas and condensate were to be transported across the Andes to Lima (via Pisco on the southern coast) by at least two parallel pipelines. In the Pisco area, the fish industry and an iron-carbide plant represented potential customers. In Lima, the cement industry would have been the largest customer.

Lima's private electric generating company Etevensa also promised to be a customer for the Camisea gas. The gas would have been used in Etevensa's 480-MW power plant (the country's largest) in Ventanilla. Development of Camisea would have involved construction of a private 300-MW power plant to serve Peru's central northern grid and the south.

Customers were planned to include large mining companies, utilities, and cement manufacturers.

The take-or-pay gas contract signed by government-controlled ElectroPerú in an attempt to raise the confidence of potential investors in the Camisea project, was taken as a disconcerting signal by the private investors in the generation sector. Specifically, in the eventuality that Camisea gas comes on line without a sufficient market, ElectroPerú is in a preferential position to private investors for the construction of gas-fired generation with respect to cost and IRRs. Currently, ElectroPerú has no plants that can easily be converted to use natural gas.

In addition, the Impuesto Selectivo al Consumo imposes a selective tax on coal used in power generation, thus creating a price distortion in favor of gas. If gas can be sold to electricity generators at \$1/MMBtu as mentioned before, coal becomes more expensive, especially after the tax. Finally, capacity payments structure in the electricity sector has been modified several times to promote gas. But, hydroelectric plant operators (mostly state-owned) complained about this payment scheme, which led to further changes in regulations.

In December 2000, Ministerio de Energía y Minas (MEM) announced that the government would lift restrictions on new hydroelectric power projects. Congress had approved a law in December 1999, which suspended construction of hydro plants for five years. The aim of the law was to favor development of thermal power plants, which would use natural gas from the Camisea field. According to the last change in the Electric Law, MEM has full discretionary power to grant or deny a hydro concession.

However, despite the efforts of the government to promote Camisea, electricity consultants say that the lack of a large enough market remains a deterrent. Electricity generators, which will make up the bulk of the initial market, are seeking more flexibility in the take-or-pay contracts the project offers. Their basic objection is that they generally operate between the peak hours of 6:00 p.m. and 11:00 p.m., while the Camisea committee wants a round-the-clock commitment. From the gas developer side, despite the intentions of building at least 10 gas-fired plants before 2005, the demand for gas remains questionable. Camisea gas will be coming as a relatively expensive alternative to other fuels in both power generation and industrial use. There is no infrastructure for developing residential and small commercial use of natural gas in cities such as Lima with about 5.7 million people. These concerns about local demand recently led to an increased interest in exporting Camisea gas to the U.S. as LNG. The GTL option is also under consideration.

Aguaytia

The Aguaytia project includes development of Aguaytia gas field and construction and operation of: gas processing and natural gas liquid fractionation facilities; 299 km of gas and NGL pipelines; a 160-MW power plant; and a 392-km electric transmission line to the coast. Its 55 MMcf/d of gas output fuels AEP's \$260 million integrated natural gas and electric power project, on which construction started July 30, 1996, and was completed in 1998.

The Aguaytia natural gas project was the first development initiated under the current hydrocarbons law. Gas from Aguaytia fires a 160-MW power plant that feeds Peru's North Interconnected Power grid. It also produces about 1,300 b/d of liquefied petroleum gas and 2,500 b/d of natural gasoline. Aquaytia could increase production from its estimated 440-bcf reserves, but it remains unclear whether Peruvian electricity demand will warrant an increase. Furthermore, the unresolved future of the Camisea project is relevant to Aguaytia. The project is operated by an independent management team, and companies

with shares in the project include Maple Gas Corporation, Duke Energy International, El Paso Energy International Company, Illinova Generating Company, Power Markets Development Company, and Scudder Latin America Power Fund.

Plans of expanding the generation capacity of Aguaytia have been shelved mainly due to the increased supply of hydro and coal-based electricity into the Peruvian system. As a result, Aguaytia has been reinjecting most of the gas and dispatching electricity only during the peak hours. Planned expansions of state hydro facilities are expected to further challenge Aguaytia.

Electricity Sector

Peru has about 5,900 MWs of installed capacity. About half of generation capacity was hydroelectric, with thermal plants fired by diesel, fuel oil and coal supplying the remainder. The rate of electrification in Peru remains low (under 75%), but power demand is growing rapidly. Due to the country's diverse geographical characteristics and scattered population centers, the nation is composed of two interconnected systems and several smaller isolated systems. A new north-south transmission line (Mantaro-Socabaya) unified Peru's central-north (COES-SICN) and southern (SIS) grids in 2000. In December 2000, the Inter-American Development Bank (IDB) approved a loan of up to \$53 million to help upgrade the power transmission and distribution system of southern Peru.

Industry Structure

Much of Peru's electric sector remains in the hands of the government (see table below). Many utilities are wholly or partially state-owned, including ElectroPerú, Electro Andes, Egasa, Egemsa, San Gaban and Egesur. Mining and industrial self generators and private companies also generate electricity. Much of the focus of Fujimori's overall privatization plans has been on the electricity sector, and price subsidies to electricity consumers have been reduced in recent years.

In 1992, an Electricity Concessions Law was passed, which allowed for private generation, transmission, and distribution of electricity in Peru. The state utility ElectroLima and most of ElectroPerú's assets were privatized in the wake of the law. In November 1997, Peru's Congress approved legislation, limiting firms to a 15% market share in electricity generation, transmission or distribution. But, after recent acquisitions Endesa's market share passed 37%. The industry is waiting to see how the new government will respond to this violation of the 1997 law.

Generation capacity of market participants in COES		
Company/Group	MW	Share
State-owned companies	1,572	35.0%
Endesa Group	1,691	37.7%
Duke/Egenor	542	12.0%
Enersur	358	8.0%
Others	329	7.3%
Total	4,492	

The law also allows the government to block any acquisition giving a private company more than a 5% market share in more than one electric power sector. Finally, the legislation gives the government the right to veto any acquisitions deemed contrary to the "national interest." About 65% of generation capacity and 50% of distribution now is handled by private companies.

However, the pace of power privatization in 1999 and 2000 was slower than expected. At least part of the assets of Electroperú, Electro Andes, Egemsa, Egasa and Egesur remain state-owned with no plans for transfer control to the private sector. The size of these assets allows the state to exercise a significant degree of control over the market, particularly through decisions made by Comité de Operación Económica del Sistema (COES). Furthermore, a large share of transmission assets (held by Etecen and Etesur) and several distribution companies remain state-owned. Recent changes in COES structure, however, has not been proportional to the state's and Endesa's shares in the market, which gives other market participants a more equal say in the COES Board.

Also, President Fujimori decided to retain government control over key hydroelectric plants. This includes the 1,200-MW Mantaro hydro plant, which supplies 35% of Peru's electricity. Ownership of Mantaro likely will be transferred to the country's public pension fund (Fonahpu), possibly making privatization less likely. In 1999 the Peruvian government announced that privatization plans for the 100-MW Macchu Picchu hydro plant (Egemsa) and the 110-MW San Gaban project, both would be scrapped.

But, the government continues with the development of new hydro facilities including Chevez (560 MW), Platanal (270 MW), San Gaban I (100 MW initially, with possible expansion to 460 MW), Tarucani (100 MW), Marañon (100 MW), Huanza (86 MW), Poeches I and II (27 MW each), Quitarasca I (112 MW), Pias (20 MW), Ocona (140 MW), and Yuncan (130 MW). In December 2000, the Ministerio de Energía y Minas (MEM) lifted restrictions on these projects. Such announcements left the impression that government policy was driven by self-interest for state-owned enterprises and concerned many private investors.

Sources:

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