

Results of Electricity Sector Restructuring in Chile¹

Chile is a leader of the privatization movement in South America. In 1986, to meet the growing demand for energy, Chile began restructuring of the state-owned power sector. Before selling the electricity companies, the state unbundled them into generation and transmission companies and distribution utilities. The distribution utilities were divided according to the service areas, but no exclusive rights were granted. The National Energy Commission (CNE) was created as the main policymaking and regulatory body. A new electricity law established free entry and competition in generation, a nonexclusive concession system for distribution and a pricing scheme based on marginal costs.

During the process of privatization, the GDP has grown at almost 7% per annum, while inflation has declined steadily. The overall productivity growth has been formidable, domestic savings have increased rapidly, allowing the country to expand investment greatly; and the labor force has been used more effectively. Despite the recent economic problems, Chile's experiment with privatization in general and restructuring of the electric power industry in particular appear to be successful.

➤ *How did sector reforms proceed? How were they nested within the overall economic reforms?*



➤ *What were some of the characteristics of the Chilean model that yielded the positive results?*

Background

The Republic of Chile is one of Latin America's strongest economies. It has a population of 15 million people and with a growth rate of 1.18% per year. Chile has a market-oriented economy characterized by a high level of foreign trade. Chile had a GDP of \$70 billion in 2000, growing 5.5% annually in 2000 and 4.9% in 2001. The growth of GDP has been reduced by the slowdown in the U.S. economy, slow Asian import demand (which represents 30% of Chile's international trade), and low international copper prices (copper is Chile's largest export).

During the early 1990s, Chile's reputation as a role model for economic reform was strengthened when the democratic government of Patricio Aylwin deepened the economic reform initiated by the previous military government. Growth in real GDP averaged 8% during 1991-97, but fell to half that level in 1998 because of tight monetary policies implemented to keep the current account deficit in check and lower export earnings - the

¹ This case study was prepared using publicly available information.

latter a product of the global financial crisis. A severe drought exacerbated the recession in 1999, reducing crop yields and causing hydroelectric shortfalls and electricity rationing, and Chile experienced negative economic growth for the first time in more than 15 years. Despite the effects of the recession, Chile maintained its reputation for strong financial institutions and sound policy that have given it the strongest sovereign bond rating in South America. By the end of 1999, exports and economic activity had begun to recover, and growth rebounded to 5.5% in 2000. Unemployment remains stubbornly high, however, putting pressure on President Lagos to improve living standards. Meanwhile, Chile has launched free trade negotiations with the US.

Energy Sector

Chile does not have much hydrocarbon reserves, 150 million barrels of oil and 3.5 trillion cubic feet (tcf) of gas. Accordingly, the country imports about 231,000 b/d of oil mostly from Nigeria and Venezuela, and about 0.4 bcf/d of gas from neighboring Argentina. Gas demand is expected to increase as it fuels an increasing share of electricity generation.

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

	Proved Reserves	Production	Consumption
Oil	20.5 million t. (150 million b.)	0.7 MT/yr (14,000 b/d)	12.7 MT/yr (0.25 mb/d)
Natural Gas	99 bcm (3.5 tcf)	1.9 bcm/yr (0.19 bcf/d)	5.8 bcm/yr (0.6 bcf/d)
Coal	1.3 billion short tons	0.6 million short tons	6.9 million short tons

Sources: Energy Information Administration (EIA), BP World Energy

Chile's hydropower from westward flowing rivers from the Andes Mountains is its single largest electricity source, comprising about 50% of installed electric generation capacity of about 8,400 MW. The severe drought that gripped Chile from late 1997 until well into 1999 hobbled the country's electricity sector. Chile's capital city, Santiago, experienced rolling blackouts from November 1998 until May 1999. Natural gas is expected to become an increasingly important electricity source in coming years. Electricity generation is more than 38 terawatt-hours.

Privatization Process

The privatization of the Chilean power sector was implemented through legal and institutional changes. Private participation was encouraged by establishing new investor-financed enterprises to purchase existing facilities or to construct new facilities. General electricity rates were based on marginal costs and reflected the opportunity cost of producing electricity. Prices for larger users were set largely through market forces by negotiations between investor-funded generation companies and the consumers. This approach served to create competition among producers.

Privatization in Chile was financed through three mechanisms: public auction, stock exchange listing, and sale of shares to the public in small quantities (so-called popular capitalism). The process took place over several years, with the separation of distribution from generation and transmission and the creation of several independent generation and distribution companies. The government sold some distribution subsidiaries in 1980 by public auction.

The two main government power companies, Endesa and Chilectra, were divided into six generating companies and eleven distribution companies. By 1983, Endesa was listed on the stock exchange, with capital advances received from new consumers converted into shares

in the company. Between 1985 and 1987, the government sold three small hydro stations by public auction. Other distribution subsidiaries were also sold, with employees of the companies purchasing shares from their pension entitlements. Pension funds and banks also participated by investing in shares in listed power companies. By mid-1989, virtually 100% of distribution was in private hands, most of Endesa was privately owned, and it operated approximately 80% of Chile's transmission lines. Chilectra became 100% private in January 1988, when two U.S. banks bought at public auction the 40% of the stock that was publicly owned. The last Chilean government-owned utility, Edelaysen, was privatized in 1998.

Current Power Sector Structure

Most Chilean power generation companies are now organized around four grid systems: (i) the Sistema Interconectado Central (SIC) - the Central Grid - which is serving over 90% of Chile's population and more than 40% of the land area; (ii) the Sistema Interconectado Norte Grande (SING - owned by Codelco and private sector power generator Edelnor), the Northern Grid, which is mainly thermal and serves mostly mineral-processing centers in the region; (iii) the Aysen Grid and (iv) the Magallanes Grid, located in the south of the country, serving remote areas, with a combined capacity of about 1% of the total. Private sector power transmission companies transmit electricity sold by the generation companies to power distribution companies, regulated and unregulated customers and other power generation companies.

Coordination within each system is carried out by the Economic Dispatching Center (CDEC), an autonomous entity composed of members from all utilities within each system to ensure efficiency and security of the electric system. Aside from these four grids, "self producers" account for about 12% of national generation.

The National Energy Commission's (CNE) functions include setting prices for consumers, whose demand is 2 MW or less, establishing Chilean energy policy, forecasting energy demand, coordinating growth planning, supervising the operation of the power system and performing cost studies. Based on legal and regulatory mandates and established practices, the Superintendence of Electricity and Fuels (SEC) has oversight of the power sector's technical, operating and financial performance.

Electric companies operating in Chile are virtually unregulated. However, they must coordinate their operations through the CDEC and follow the prices for consumers whose demand is 2 MW or less that are set by the CNE for six-month periods.

Restructuring Outcomes

A competitive power generation market has been established. In 1996 there were 11 shareholder controlled generation companies, and by 2000 their number grew to 26. The private companies provide 100% of Chile's electricity.

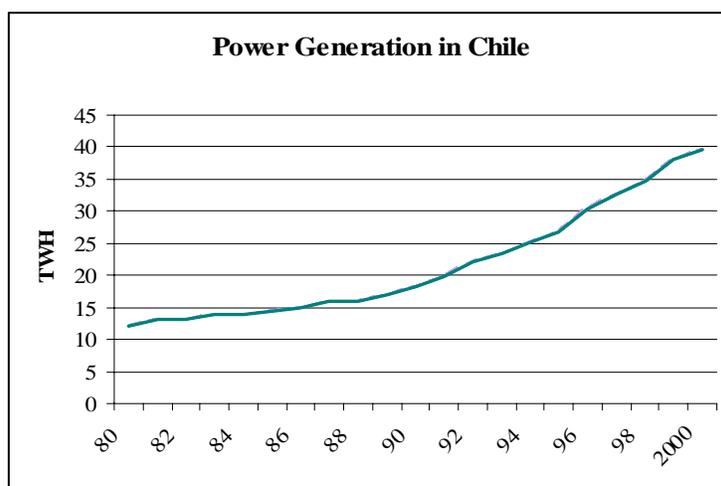
Privatization also removed constraints on new investment and access to capital. This elimination of constraints partly explains why state-run companies operating in competitive or regulated markets under the same conditions as private companies turned in a better performance after privatization. Overall direct foreign investment in Chile in the period 1974-2001 totaled \$47 billion, out of which \$8 billion were in the electricity, gas and water industries.

Foreign Direct Investment in Electricity, Gas and Water (in nominal \$ million)

Investment	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001*	Total
Materialized	3.0	17	19	54	406	1,395	481	3,990	858	826	8,049

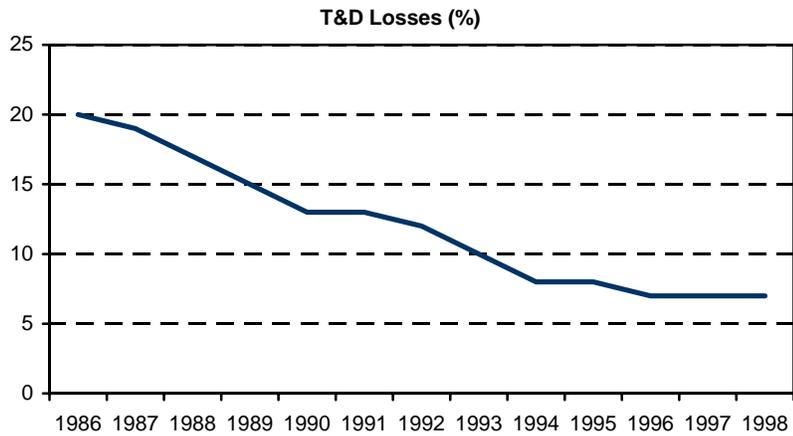
Source: Foreign Investment Committee, Chile

In 2000 and 2001, several additional international firms have become involved in the Chilean electricity sector through purchases of shares in generation and distribution companies. Despite the similarity between Chile's electricity deregulation and the deregulation and privatization in Argentina, Bolivia, and Peru, notably less investment has been made in Chile. Perhaps part of the reason is that Chile's privatization preceded these countries' privatizations by several years. Chilean electricity companies, however, are making numerous investments in other Latin American countries' electricity industries. But, these companies also increased the generation capacity in Chile substantially: annual generation more than doubled from 1980 to 1998 (see chart below).



Source: Energy Information Administration (EIA)

Additional benefits were also observed in the areas of percentage of population with access to electricity and transmission and distribution (T&D) losses. Electricity coverage rates have increased from 70% to 97% while T&D losses (including theft) decreased significantly over the first several years of privatization. The following chart shows that the T&D losses went down to 7% in 1998 from 24% in 1986.



Source: ieee.prcaribe.org/files/rudnickpuertorico.pdf