

# Electric Power Services

## Recent Reforms in Selected Foreign Markets

Investigation No. 332-411  
USITC Publication 3370  
November 2000



# U.S. International Trade Commission

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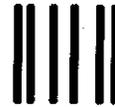
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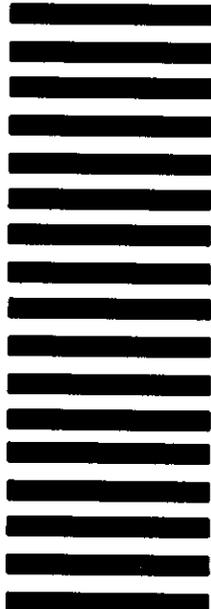
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Electric Power Services: Recent Reforms in  
Selected Foreign Markets



# U.S. International Trade Commission

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## Electric Power Services: Recent Reforms in Selected Foreign Markets

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# ABSTRACT

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Following receipt on November 23, 1999, of a request from the United States Trade Representative (USTR) (see appendix A), the U.S. International Trade Commission (USITC) instituted investigation No. 332-411, *Electric Power Services: Recent Reforms in Selected Foreign Markets*, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)). As requested by the USTR, this report provides (1) a discussion of the nature and extent of market reform, privatization, and liberalization undertaken in selected foreign electricity markets; (2) an examination of current and evolving conditions of market access, investment, and regulation; and (3) to the extent possible, a listing of common regulatory practices insofar as these exist. Copies of the notice of the investigation were posted in the Office of the Secretary, U.S. International Trade Commission, Washington, D.C. 20436, and the notice was published in the *Federal Register* (Volume 65, Number 23) on February 3, 2000 (see appendix B). In addition, interested parties were invited to submit written statements concerning the investigation and a public hearing was held on June 6, 2000.

For the purpose of this study, USTR defined the electric power industry to include core areas such as electric power generation, transmission, and distribution, as well as the electricity-related aspects of construction, engineering, consulting, and marketing services. The foreign markets specified for examination are those where significant market reform, privatization, and liberalization have occurred or are ongoing. These are: Argentina, Australia, Brazil, Canada, Chile, the European Union, Japan, New Zealand, and Venezuela.

The findings in this report document a clear trend toward regulatory reform of the electric power sector. The countries examined here appear to be leading this trend, and the policy reforms undertaken bear a striking similarity to each other in terms of objectives and approaches. While regulatory reform takes place within individual countries, international coordination of regulatory policies concerning the electric power industry could support growth in international trade in services, facilitate regional initiatives to achieve market efficiencies, provide a means of ensuring equitable access to competitive opportunities, and encourage direct investment from abroad. The General Agreement on Trade in Services may offer a vehicle for pursuing such policy coordination, as the regulatory reform programs are generally compatible with the principles found in the agreement.



# EXECUTIVE SUMMARY

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On November 23, 1999, the United States Trade Representative (USTR) requested that the United States International Trade Commission (USITC) conduct an investigation into recent electric power market reforms undertaken in selected foreign countries. USTR requested that this report include (1) a discussion of the nature and extent of market reform, privatization, and liberalization undertaken in foreign electricity markets; (2) an examination of current and evolving conditions of market access, investment, and regulation; and (3) to the extent possible, a listing of common regulatory practices insofar as these exist.

The foreign markets specified for examination are those where significant market reform, privatization, and liberalization have occurred or are ongoing. These are: Argentina, Australia, Brazil, Canada, Chile, the European Union, Japan, New Zealand, and Venezuela. As a group, these countries account for approximately 35 percent of global electric power consumption.

As specified by USTR, for the purpose of this study, the electric power industry is defined to include core areas such as electric power generation, transmission, and distribution, as well as the electricity-related aspects of construction, engineering, consulting, and marketing services. In keeping with General Agreement on Trade in Services (GATS) coverage of all service supply modes, the study focuses on issues related to the establishment of a foreign commercial presence, such as when a U.S. company acquires and operates facilities in foreign markets, as well as issues regarding cross-border trade in electric power services.

In the course of research, it became apparent that none of the electric power reform programs contain regulatory measures that significantly alter the structure or competitive environment of the construction, engineering, and consulting industries. While these industries may benefit from increased opportunities should regulatory reform result in capacity expansion or increased demand for consultants, these effects are more a byproduct rather than a direct objective of reform. As a result, the report addresses these industries only to a limited degree. The report does provide coverage of electric power marketing to the extent that this is an element of retail supply, which is addressed by regulatory reform programs.

## Overview of Market and Regulatory Reform

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- In countries pursuing regulatory reform of the electric power industry, the fundamental elements of reform are a change in industry structure and regulatory focus.
- The traditional industry structure consisted of a large, single provider of electric power services with a monopoly franchise for a given region. This entity was responsible for generating electric power, transmitting power across large

distances at high voltage, distributing power to end users at lower voltage, and maintaining a retail relationship with end users (i.e., installation, metering, and billing). The single service provider could either be a government-owned entity or a regulated private monopoly.

- As a result of technological advances, many governments have concluded that a single-provider industry structure may no longer be necessary, and that competition in the generation and retail supply segments offers greater efficiency. However, an economic rationale does remain for maintaining a regulated single-provider structure for the transmission and distribution functions as, in many situations, it may be impractical to physically construct competing grids.

## **Nature and Extent of Market Reforms**

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- Countries are pursuing various approaches to market reform, some of which are more comprehensive than others. In general, a comprehensive reform program consists of three elements:
  - 1) Privatization of state-owned assets;
  - 2) Restructuring of management control; and
  - 3) Regulatory reform.
- *Privatization* is relevant only in those countries where the government actually owns some or all of the electric power system. The sale of state-owned assets to private enterprises may improve efficiency by removing traditional weaknesses that tend to negatively affect performance.
  - ▶ Privatization has occurred, or is planned, in most of the subject countries. Both Chile and the United Kingdom have completely privatized state-owned electricity sector assets, but in many countries, the state has sold only a portion of its assets. Countries that have not privatized, or do not plan to privatize, state-owned electricity assets include Denmark, France, and Sweden. Privatization is not an issue in some countries, such as Belgium or Japan, where electric power assets traditionally have been privately-owned.
- *Restructuring of management control* may be necessary to introduce market forces and thereby improve efficiency. Competition is enhanced through both vertical and horizontal restructuring of management control.
  - ▶ *Vertical restructuring* entails unbundling the four major activities provided by the monopoly (i.e., generation, transmission, distribution, and retail supply) into distinct stages of production and ensuring clear separation between the still-monopoly transmission and distribution activities and the competitive generation and retail supply functions.

Vertical restructuring has taken place in all of the subject countries to some degree. In some countries, vertical restructuring has entailed separation on an accounting or management basis, while in other markets, complete ownership separation has been required. Vertical restructuring methods employed by these countries also differ with regard to which market segments are subject to separation. Some countries require the complete disaggregation of all four market segments, but most countries only require the separation of competitive segments from those with monopoly power.

- ▶ *Horizontal restructuring* generally entails reducing the extent to which a limited number of firms control a large amount of generation capacity. High concentration of generation assets can reduce the degree to which competitive pressures hold down prices.

Horizontal restructuring has been brought about in some countries by breaking up incumbent firms, by auctioning the rights to use certain facilities without changing ownership, or by establishing a maximum permissible market share for participants in a certain segment. However, over half of the subject countries have not, or do not plan, to horizontally restructure their electric power markets.

- *Regulatory reform* is necessary because countries that previously had state-owned systems may not have had any regulatory structure and even countries with existing regulatory bodies will need to adapt the scope of regulations and the nature of regulatory incentives.
  - ▶ In general, regulatory oversight is being reduced or eliminated in the generation and retail supply segments, and the attention of regulators is shifting to oversight of the transmission and distribution functions to ensure that all producers and consumers have equal access to the transmission and distribution system.
  - ▶ System access has been addressed relatively consistently. In all of the subject countries, the transmission and distribution segments remain under monopoly control with some level of regulation over prices. All of the subject countries guarantee nondiscriminatory third-party access to the electricity transmission and distribution networks, or plan to guarantee such access once electric power sector reforms have been fully implemented. In addition, most countries have designated a transmission system operator that is independent from any competitive market participants.
  - ▶ Most of the subject countries have established, or are planning to establish, a single industry regulator. Many of these regulators are organized as independent government agencies, but the degree of independence exercised by these regulators differs.

# Current Market Conditions

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- The market reforms implemented by the subject countries have essentially entailed a shift from an industry framework characterized by few choices and captive customers to a new framework with an array of choices and participants. This has in turn created new opportunities for private sector participation in all four of the major segments of the electric power industry (generation, transmission, distribution, and retail supply). Reform has also created a fifth segment: electric power trading.
- In the generation segment, new opportunities for foreign participation principally entail investment to construct or acquire facilities. In the transmission and distribution segments, the monopoly structure has been preserved in all cases, so new opportunities are limited to private investment. At the retail supply level, the introduction of consumer choice may create a new marketing and customer relations function, which involves metering, billing, and the provision of additional services like electricity management and advisory services.
- Electric power trading and marketing is a new business activity made possible by regulatory reform. Power traders serve as intermediaries by matching electric power producers with consumers, or aggregations of consumers. Traders also mitigate risk for both parties by underwriting various financial contracts, such as options and futures.
- As a result of the wide variety of electric power sector reforms undertaken by the subject countries, new entrants face varying levels of opportunity in each of these markets. Market opportunity is influenced by a number of factors, principally including:
  - ▶ *Level and Extent of Consumer Choice:* In New Zealand, Finland, Germany, Sweden, and the United Kingdom, all consumers are able to choose their electricity supplier, and Australia, Denmark, Ireland, and Spain plan to extend choice to all consumers in the near future. The degree of consumer choice in other subject countries typically is based on consumption thresholds which range from 50 KWh per year in Argentina to 100 GWh per year in Belgium and Luxembourg. Customers who meet these minimum energy-use thresholds may choose their electricity supplier. Currently, Brazil, Greece, and Venezuela do not permit any electricity consumers to choose their supplier, but each of these countries plans to extend consumer choice to a portion of electricity customers in the near future.
  - ▶ *Extent of Competition in Generation:* With the exception of Brazil and Venezuela, all of the subject countries permit some degree of market access in the electric power generation segment. However, in most of these countries, the extent of competition in generation remains small. For example, in one-third of the subject countries, a single firm continues to account for more than 50 percent of national electricity production. In several other countries, generation markets are not highly competitive because a small number of

entities dominate the market, or because industry incumbents exercise regional market power.

- ▶ *Extent of Trading Market Development:* Although trading in many of the subject countries remains limited in size, most countries grant market participants some degree of choice regarding how electricity is bought and sold. Over two-thirds of the subject countries permit, or will soon permit, eligible consumers and suppliers to buy and sell electricity through bilateral contracts or an electricity market or power pool. In addition, at least five of these countries have established, or will establish, an electricity futures market.

## **Remaining Impediments to Competition**

- A common theme in regulatory reform programs is the importance of fostering favorable conditions for market access. This entails crafting a range of policies that provide appropriate incentives and controls to encourage competition and limit anticompetitive behavior. These policies address a host of issues, which may be grouped into those concerning establishment or market entry, interconnection, regulatory practices, market power, wholesale market development, treatment of foreign firms, and other public policy objectives. To a large extent, the subject countries have addressed these factors in their regulatory reform programs. However, problems appear to persist principally with respect to creating equivalent competitive opportunities for all market participants.
- Providing for equal access to transmission and distribution facilities presents a major challenge. In all countries studied, the transmission and distribution segments of the industry have remained monopolies. A few of the transmission and distribution companies have been privatized, but most remain state-owned. Two types of problems with access to the transmission grid appear to be most prevalent: unreasonably high access charges or discriminatory scheduling of which generation facilities may dispatch power, particularly at peak load times. Either of these problems can seriously impact the ability of new entrants to compete with incumbent utilities.
- Countries have tried to develop appropriate competitive safeguards to ensure that new entrants have the opportunity to compete in these markets. Such safeguards include policies to prevent firms from engaging in anti-competitive cross subsidization, using information obtained from competitors with anti-competitive results, or withholding timely information regarding access to common transmission and distribution networks. Despite these efforts, firms trying to compete with incumbent service providers frequently allege that they are at a disadvantage due to anti-competitive behavior.
- Difficulties with market power and anti-competitive behavior can be compounded by the absence of a strong regulatory authority completely separate from, and not accountable to, any provider of electric power services or any government bodies responsible for making policy concerning the electricity sector. In several of the

countries studied, observers have voiced concerns that close ties between the regulator and incumbent utilities tends to favor the incumbent.

## **International Trade Implications**

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- To some degree, regulatory reform programs are more a matter of domestic rather than international policy. However, in the case of the electric power industry, there appear to be some international implications. Regulatory reform has resulted in new opportunities for firms to compete to build, own, and operate generation, transmission, and distribution facilities, as well as to establish power trading and marketing enterprises. These opportunities often result in international trade, both on a cross-border basis and through foreign-based commercial establishments. Thus regulatory reform programs have the potential to influence international trade flows, and international trade and investment practices may similarly have bearing on regulatory reform.
- Regulatory reform has also created a greater need for international cooperation among governments, particularly concerning the development of a competitive market for trading electric power and related financial instruments. In larger markets where there are more participants, there may be more choices available, potentially leading to more intense competition and lower consumer prices. This in turn creates an incentive to expand market size beyond the boundaries of a particular country, as evidenced by the European Union's single market initiative, Nord Pool, and regional interconnection efforts underway in South and Central America. Such initiatives require the negotiation of agreements governing international trade in electric power and related physical and financial contracts.
- A final international aspect of regulatory reform involves the importance of foreign investment. Despite technological advances that have decreased minimum efficient scale, the electric power industry remains capital intensive. Countries that have relatively few private firms with the necessary investment capital and technical expertise will need to attract foreign investment. But countries with uncertain economic, political, and regulatory environments pose a greater risk and may have difficulty attracting investment. Coordinating regulatory policy internationally may foster domestic stability that in turn may create a more favorable investment climate.

# WTO Negotiations on Trade in Services

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- Multilateral negotiations presently underway in the World Trade Organization are intended to widen and deepen the scope of the GATS, an agreement signed by all 136 members of the WTO, which entered into effect on January 1, 1995.
- In broad terms, the GATS provides a set of principles or rules designed to remove impediments to trade and investment in services. Depending upon how the electric power industry is defined,<sup>1</sup> the GATS may already have some bearing on the provision of generation, transmission, distribution, retail supply, and trading services provided from one country to another or provided by a locally-established enterprise that is owned or controlled by a foreign firm. Current WTO negotiations therefore offer the potential of more directly applying the GATS to the electric power industry.
- There are many similarities between the common regulatory objectives being pursued by the subject countries and the trade principles contained in the GATS. Regulatory reforms tend to be oriented toward encouraging the entry of new competitors by ensuring effective market access and equivalent competitive opportunities. GATS principles are similarly oriented toward enhancing competitive opportunities by eliminating barriers to market access and policies that unnecessarily discriminate against selected service providers. Regulatory reform objectives appear to be particularly compatible with GATS principles pertaining to market access, nondiscrimination, transparency, domestic regulation, and monopolies.
- GATS provisions concerning the negotiation of commitments regarding specific industries or circumstances may provide additional flexibility in addressing some unique aspects of the electric power industry, such as guaranteeing nondiscriminatory access to transmission facilities, addressing stranded costs, and providing for universal service.

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<sup>1</sup> The scope of the industry definition adopted under the GATS has yet to be determined. The central question concerns whether electric power generation constitutes a service or a manufacturing process. On the one hand, electric power is an intangible commodity that must be produced as it is consumed. These are characteristics of a service. Alternatively, a power plant “materially transforms” energy stored in various fuel sources into electrical energy. Such material transformation is characteristic of a manufacturing process. Should WTO members choose to define generation as a manufacturing process, then foreign firms that seek to own or acquire power generation facilities will have no rights or privileges under the GATS. In the United States, generation activities represent 74 percent of the cost of providing electricity and 55 percent of investment in facilities. For the purpose of this study, as requested by USTR, power generation is considered to be a service. Energy Information Administration, *Financial Statistics of Major Investor-owned Utilities 1996*, DOE/EIA-0437(96/1) Washington, DC, December 1997, and industry and government representatives, USITC staff interviews, Washington, DC, June 2000.

## Conclusion

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- There is a clear trend toward regulatory reform of the electric power sector. The countries examined appear to be on the cutting edge of this trend, and the policy reforms undertaken bear a striking similarity to each other in terms of objectives and implementation.
- While regulatory reform must take place within individual countries, international coordination of regulatory policies concerning the electric power industry could support growth in international trade in services, facilitate regional initiatives to achieve market efficiencies, provide a means of ensuring equitable access to competitive opportunities, and encourage direct investment from abroad. The General Agreement on Trade in Services may offer a vehicle for pursuing such policy coordination, as the regulatory reform programs are generally compatible with the principles found in the agreement.

# GLOSSARY OF TERMS

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**Amperage-** The strength of an electric current as measured in amperes. An ampere is equal to the current yielded by one volt acting across a resistance of one ohm.

**Capacity-** The amount of electricity that a generation plant is capable of producing at peak operation. The combined capacity of the generation plants located in a certain country is frequently referred to as that country's total capacity.

**Captive Customer-** A consumer that is not free to choose his or her electricity supplier. Captive customers are also referred to as non-eligible customers or non-contestable customers.

**Combined-Cycle Gas Turbine (CCGT)-** A generator that produces electricity using both a gas and a steam turbine in a two-cycle process. The first cycle entails the combustion of gas to drive a gas turbine, while the second cycle captures the heat from the exhaust gases to produce steam, which in turn drives a steam turbine.

**CPI-X Regulation-** A form of regulation whereby regulators determine a price ceiling which is subsequently permitted to increase by the rate of consumer price inflation (CPI) minus the value of X, a value determined by the regulator to reflect efficiency gains. This form of regulation provides an incentive to reduce costs in order to increase the margin between operating costs and the regulated price, and thereby increase profitability.

**Dispatch-** The control of the flow of power across the transmission system. Such control is typically the responsibility of the transmission system operator. The transmission system operator also determines dispatch priority, or the order in which the electricity produced by different generation plants is sent across the system.

**Distribution-** The movement of electrical energy over low-voltage power lines. Typically, this involves the transportation of power from a transmission grid to a consumer.

**Eligible Customer-** A consumer that is free to choose his or her electricity supplier.

**Fossil Fuel-** Any naturally occurring organic fuel, such as petroleum, coal, and natural gas.

**Futures Market-** A market in which traders buy and sell contracts for the delivery of a commodity at a specified date and price in the future. A futures market for electricity is one in which electricity is the subject commodity.

**Generation-** The act of producing electrical energy.

**Geothermal Energy-** Natural energy found within the Earth. Geothermal energy is commonly in the form of steam, hot water, or heat trapped in rocks.

**Grid-** A network of power lines and substations. Both transmission and distribution networks are referred to as grids.

**Lignite-** A grade of coal falling between bituminous coal and peat. Lignite, also called brown coal, is distinguished by a brownish-black color and a high volatile matter and moisture content.

**Microturbine-** A small turbine that generates power for a single consumer, or a small number of consumers.

**Node-** A point of access to an electric power transmission system.

**Power Pool-** A market for the sale and purchase of electricity.

**Retail Supply-** The act of selling and arranging the delivery of electricity to end-users.

**Spot Market-** A market in which traders buy and sell commodities for immediate delivery. A spot market for electricity is one in which electricity is the subject commodity.

**Stranded Costs-** Costs incurred by a firm that become unrecoverable due to a change in the regulatory regime.

**Tariff-** A price or fee. For example, a transmission tariff is a fee charged for the use of a transmission grid.

**Thermal-** A term used to describe any generation plant that uses heat to produce electricity. This heat is generally produced by burning fossil fuels such as gas, coal, or oil.

**Transmission-** The movement of electrical energy over high-voltage power lines. Typically, this involves the transportation of power from a generation plant to a distribution grid.

**Transmission System Operator-** The entity that controls and manages the transmission system.

**Turbine-** A rotary engine activated by a stream of fluid, such as steam, air, or water. Such engines are used to generate electricity.

**Unbundling-** The separation of a utility's generation, transmission, distribution, and/or retail supply assets for the purpose of introducing competition into the market. Unbundling is also referred to as vertical unbundling.

**Utility-** Any state-owned or privately-owned firm engaged in the provision of public infrastructure services subject to special government regulation. Utilities may include, inter alia, electricity generation, transmission, and distribution firms.

**Voltage-** A measure of the electric force or pressure that pushes a current through a circuit, as expressed in volts. One volt equals the potential difference between two points, when a 1 ampere current dissipates 1 watt of power between those points. Voltage is expressed as follows:

$$1,000 \text{ volts (V)} \quad = \quad 1 \text{ kilovolt (kV)}$$

**Watt-** A unit electrical power equaling the amount of power produced from the expense of one joule of energy in one second. Wattage is expressed as follows:

1,000 watts (W)	=	1 kilowatt (KW)
1,000 kilowatts (KW)	=	1 megawatt (MW)
1,000 megawatts (MW)	=	1 gigawatt (GW)
1,000 gigawatts (GW)	=	1 terawatt (TW)

**Watt-hour-** A measure of electricity consumption. One watt-hour (Wh) is equal to the steady expense of one watt of power over one hour. Electricity consumption is expressed as follows:

1,000 watt-hours (Wh)	=	1 kilowatt-hour (KWh)
1,000 kilowatt-hours (KWh)	=	1 megawatt-hour (MWh)
1,000 megawatt-hours (MWh)	=	1 gigawatt-hour (GWh)

**Wheeling-** The movement of electricity over a transmission system.



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**PART I**  
**INTRODUCTION AND OVERVIEW**



# CHAPTER 1

## INTRODUCTION

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### Objective and Scope

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This document reports the findings of an investigation into recent electric power market reforms undertaken in selected foreign countries. The United States International Trade Commission (USITC or the Commission) initiated the investigation at the request of the United States Trade Representative (USTR) (see appendix A) to support trade negotiations at the World Trade Organization (WTO) under the General Agreement on Trade in Services (GATS).

As specified by USTR, for the purpose of this study, the electric power industry is defined to include core areas such as electric power generation, transmission, and distribution, as well as the electricity-related aspects of construction, engineering, consulting, and marketing services. In keeping with GATS coverage of all service supply modes, the study focuses on issues related to the establishment of a U.S. commercial presence in foreign markets as well as issues regarding cross-border trade in electric power services. In the course of research, it became apparent that none of the electric power reform programs contain regulatory measures that significantly alter the structure or competitive environment of the construction, engineering, and consulting industries. While these industries may benefit from increased opportunities should regulatory reform result in capacity expansion or increased demand for consultants, these effects are more a byproduct rather than a direct objective of reform. As a result, the report addresses these industries only to a limited degree. The report does provide coverage of electric power marketing to the extent that this is an element of retail supply, which is addressed by regulatory reform programs.

The foreign markets specified for examination are those where significant market reform, privatization, and liberalization have occurred or are ongoing. These are: Argentina, Australia, Brazil, Canada, Chile, the European Union, Japan, New Zealand, and Venezuela. As a group, these markets account for approximately 35 percent of global electric power consumption (See tables 1-1 and 1-2 for relevant market characteristics for each country).

USTR requested that this report include (1) a discussion of the nature and extent of market reform, privatization, and liberalization undertaken in foreign electricity markets; (2) an examination of current and evolving conditions of market access, investment, and regulation; and (3) to the extent possible, a listing of common regulatory practices insofar as these exist.

**Table 1-1**  
**Selected market characteristics, 1998**

Country	Net generation capacity	Net generation	Net electricity consumption	Average annual growth rate of consumption 1994-98
	<i>Gigawatts<sup>1</sup></i>	<i>Terawatt hours<sup>2</sup></i>	<i>Terawatt hours<sup>2</sup></i>	<i>Percent</i>
Argentina . . . . .	22	75.2	75.6	4.6
Australia . . . . .	39	186.4	173.3	3.8
Austria . . . . .	15	56.1	51.9	2.0
Belgium . . . . .	14	78.7	74.5	2.4
Brazil . . . . .	62	316.9	336.2	5.5
Canada . . . . .	112	550.9	484.5	1.0
Chile . . . . .	8	28.7	26.7	3.9
Denmark . . . . .	12	40.3	33.0	1.7
Finland . . . . .	16	75.3	79.3	3.0
France . . . . .	108	481.0	389.3	2.0
Germany . . . . .	107	525.4	488.0	1.0
Greece . . . . .	9	43.7	42.2	4.1
Ireland . . . . .	4	19.7	18.4	5.6
Italy . . . . .	64	243.0	266.7	2.7
Japan . . . . .	219	996.0	926.3	3.0
Luxembourg . . . . .	0	0.4	5.9	3.7
Netherlands . . . . .	19	88.7	94.3	3.7
New Zealand . . . . .	8	35.8	33.3	0.4
Norway <sup>3</sup> . . . . .	27	115.5	111.0	1.7
Portugal . . . . .	9	38.6	36.2	5.1
Spain . . . . .	43	179.5	170.3	4.1
Sweden . . . . .	34	156.8	135.0	1.0
United Kingdom . . . . .	69	343.1	331.5	2.4
Venezuela . . . . .	23	70.4	65.5	0.5
United States <sup>3</sup> . . . . .	779	3,619.6	3,367.0	2.3
World <sup>3</sup> . . . . .	3,133	13,615.6	12,637.0	2.6

<sup>1</sup> Watts are units of electrical power equaling the amount of power produced from the expense of one joule of energy in one second. One billion watts constitute a gigawatt. The net generation capacity of a country then equals the amount of electricity that could be produced in one second.

<sup>2</sup> Watt-hours measure physical electricity production and consumption. One watt-hour is equal to the steady consumption of one watt of power over 1 hour. Terawatt hours comprise one trillion watt-hours. Net generation is the quantity of electricity produced during 1 year.

<sup>3</sup> While not included within the scope of this study, data for Norway, the United States, and the World are presented here for comparative purposes.

Note.—The difference between net consumption and net generation equals the sum of imports, exports, and transmission losses.

Source: U.S. Department of Energy, Energy Information Administration.

**Table 1-2**  
**Fuel used for electricity generation, 1998**

	Fossil <sup>1</sup>	Hydropower	Nuclear	Geothermal/ other
	<i>Percent</i>			
Argentina .....	44	46	10	0
Australia .....	80	20	0	0
Austria .....	42	57	0	0
Belgium .....	57	1	43	0
Brazil .....	5	91	1	3
Canada .....	29	59	12	0
Chile .....	43	56	0	1
Denmark .....	90	0	0	10
Finland .....	65	18	16	0
France .....	23	19	58	0
Germany .....	74	4	20	0
Greece .....	74	26	0	0
Ireland .....	93	6	0	1
Italy .....	78	21	0	1
Japan .....	70	10	20	0
Luxembourg <sup>2</sup> .....	0	0	0	0
Netherlands .....	96	0	2	2
New Zealand .....	30	60	0	0
Norway <sup>3</sup> .....	1	99	0	0
Portugal .....	53	47	0	0
Spain .....	55	27	17	1
Sweden .....	22	48	30	0
United Kingdom .....	79	2	19	0
Venezuela .....	23	77	0	0
United States <sup>3</sup> .....	72	13	13	3
World <sup>3</sup> .....	66	22	12	1

<sup>1</sup> Any naturally occurring organic fuel, such as petroleum, coal, and natural gas.

<sup>2</sup> Luxembourg imports virtually all of its electric power.

<sup>3</sup> While not included within the scope of this study, data for Norway, the United States, and the World are presented here for comparative purposes.

Source: U.S. Department of Energy, Energy Information Administration.

## Background Information

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The GATS, one of the Uruguay Round agreements, broke new ground as the first international agreement to apply to trade in service industries. In addition, since the GATS includes the provision of services through a commercial presence in its definition of services trade, the treaty also became the first multilateral, legally enforceable agreement to cover the right of establishment through foreign direct investment.

However, the successful conclusion of the GATS represented only the first step toward achieving full liberalization of international trade in services as many countries were unable or unwilling to open their markets completely. For some, opening markets to participation by foreign firms involved making regulatory, legislative, and even constitutional changes that would take considerable time to implement. Others may have withheld liberalization due to political pressure from special interest groups, or out of concern that foreign competition may destabilize markets or adversely affect domestic firms. Still others may have delayed liberalization to gain bargaining leverage. Regardless of the reasons, negotiators recognized that full services trade liberalization would be a lengthy, incremental process, and so built into the agreement provisions requiring successive rounds of negotiations.<sup>1</sup> In accordance with these provisions, WTO members began a new round of services trade negotiations in January 2000.

These renewed negotiations are intended to broaden and deepen the coverage of GATS obligations<sup>2</sup> by extending the scope of the agreement to a wider range of industries and eliciting stronger commitments from WTO members. Electric power services figure prominently among the list of industries that may benefit from more thorough coverage under the GATS. Presently, the coverage of electric power services is not clearly defined under the GATS, which means the GATS does little to foster international trade in electric power services.<sup>3</sup> This lack of coverage is of increasing concern as technological advancements, privatization programs, and regulatory reforms have

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<sup>1</sup> Article 19 of the GATS states that “Members shall enter into successive rounds of negotiations, beginning not later than five years from the date of entry into force of the WTO Agreement, and periodically thereafter, with a view to achieving a progressively higher level of liberalization.” General Agreement on Trade in Services (GATS), *Article 19*, found at Internet address <http://www.wto.org/wto/services/4-prolib.htm>, retrieved May 17, 2000.

<sup>2</sup> Principle GATS obligations address market access, national treatment, most-favored-nation treatment (MFN treatment, also referred to as normal trade relations (NTR) in the United States), transparent regulation, restraints on anti-competitive measures, and fair and objective domestic regulation. Each of these is defined and explained in Chapter 21.

<sup>3</sup> Rachel Thompson, “Integrating Energy Services into the World Trading System,” (Washington, DC), Apr. 10, 2000, p. 4.

vastly expanded the opportunities for private sector participation in electric power markets worldwide.<sup>4</sup>

The rapid pace of regulatory change, the complexities of the industry, and the relative novelty of addressing the sector within the framework of the GATS pose many challenges to trade negotiators. This report endeavors to address some of these challenges by examining the nature of regulatory reforms undertaken in a range of foreign energy markets and analyzing how these reforms affect market access conditions for foreign firms.

## **Approach and Data Sources**

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The information and analysis contained in this report was developed by Commission staff using primary and secondary data sources. ITC staff reviewed published sources and conducted interviews with technical experts from industry, government bodies, academic organizations, multilateral organizations, and consultancies in the United States and in a number of the countries listed in this investigation. In addition, a public hearing was held on June 6, 2000, to elicit the views of interested parties.

One of the most challenging aspects of this study was developing comparable information on each of the subject countries. The nature of information available concerning regulatory reform programs varies considerably. For some countries, extremely well organized and detailed descriptions of reform programs are presented on official internet sites, whereas for others, relatively little information is available through any published sources. In part, this is due to the fact that some countries implemented reform several years ago, permitting time for a body of research and analysis to be developed, while others have only just begun regulatory reform. Language differences also play a role, as, even when translation is not necessary, the same words may not have the same meaning across countries. For example, simple terms such as “pool” and “supply” may or may not mean the same thing from one country to another. Commission staff has made every effort to provide reliable information and to reconcile differences in terminology, but variations in country coverage nevertheless persist.

## **Organization of the Report**

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This report consists of five parts. Part I, includes this introduction and a literature and industry overview to provide the theoretical and technical context for the report. This is followed by regional discussions contained in Parts II, III, and IV that focus on the Asia/Pacific region, the European Union, and South America, respectively.

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<sup>4</sup> Ibid., p. 5.

These sections provide a detailed examination of market reform in each of the subject markets and indicate the extent to which impediments to competition persist.<sup>5</sup> Part V then provides a cross-country analysis which 1) compares and contrasts the market reforms to develop a list of common elements; 2) summarizes the nature of new competitive opportunities presented by the reforms; 3) discusses remaining impediments to participation by foreign firms; and 4) examines the international trade implications of electric power market reforms.

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<sup>5</sup> Information concerning remaining impediments is presented to the extent that it was reported by industry and government representatives, analysts, and published sources. This information does not represent a finding by the Commission concerning barriers to trade and investment.

# CHAPTER 2

## OVERVIEW OF MARKET AND REGULATORY REFORM

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Electric power market reform is a broad concept that means different things in different places. Government intervention in each country has evolved within a set of specific historical, economic, and institutional circumstances. These circumstances have much to do with a reforming government's choice of the speed, depth, and structure of reform. The new structures will inevitably be heterogeneous to some degree. While this study acknowledges the important differences that do exist, the emphasis of this chapter is on commonalities of reform programs.

Commonalities arise because a number of technical, economic, and political changes have affected the environment surrounding electricity markets. Reform efforts are typically based on the premise that traditional state intervention has imposed certain inefficiencies, and that these inefficiencies must be addressed. While the scope of free market activity in the electric power sector has expanded considerably, a broad consensus remains that some activities, particularly transmission and distribution, require continued oversight by regulatory authorities.

This chapter supplements a brief review of the literature on electric power market reform with a broad overview of technical, institutional, and economic idiosyncrasies that distinguish electric power markets from those of most other goods and services. Because electric power market reform efforts are ongoing and of relatively unprecedented scope in some countries, the empirical literature documenting the effects of comprehensive reform is somewhat limited by the relative absence of post-reform data. While some rigorous *ex post* empirical research has recently become available, much of the literature about reforms is a compilation of economic theory, informed opinion, and anecdotal evidence. The prevalence of such commentaries in the available literature on recent reforms is reflected in this review.

This chapter focuses on five broad questions concerning the nature of electric power market reforms undertaken by the subject countries:

- What special characteristics of electricity markets are important for policymaking?
- How (and why) have governments intervened in the electric power services sector?
- What changes have prompted concurrent reform efforts across countries?
- What constitutes a comprehensive reform program?
- How have reform programs affected the performance of the electric power services sector?

# **What Special Characteristics of Electricity Markets Are Important for Policymaking?**

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The provision of electricity differs in important ways from the provision of other goods and services. This section explores the important technological, economic, and institutional features that distinguish electricity markets from other markets. Most analysts divide electricity provision into four distinct activities:<sup>1</sup>

- 1) **Generation** of electric power using falling water, internal combustion engines, turbines powered by steam produced from fossil fuels, nuclear fuel, and various renewable fuels, wind driven turbines, and photovoltaic technologies.<sup>2</sup>
- 2) **Transmission** of electricity involving the “transportation” of electricity between generating sites and distribution centers, the interconnection and integration of dispersed generating facilities into a stable synchronized network, the scheduling and dispatching of generating facilities that are connected to the transmission network to balance demand and supply in real time, and the management of equipment failures, network constraints, and relationships with other interconnected networks.<sup>3</sup>
- 3) **Distribution** of electricity to residences and businesses at relatively low voltages using wires and transformers along and under streets and other rights of way.
- 4) **Retail supply** functions including power procurement and sales functions such as making arrangements for supplies of power from generators, metering, billing, and various demand management services.

These four activities have traditionally been bundled together and provided by a single entity. A key component of most comprehensive reform efforts is the unbundling of these activities so that they might be provided by different institutions. Once the activities are unbundled, it is thought that at least two activities - generation and retail supply - might reasonably be treated as competitive markets, requiring substantially less government oversight than they currently receive.

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<sup>1</sup> These definitions taken from Paul Joskow, *Deregulation and Regulatory Reform in the U.S. Electric Power Sector*, Massachusetts Institute of Technology (MIT) discussion paper, Feb. 2000, p. 3.

<sup>2</sup> Photovoltaic technologies, such as solar panels, produce a voltage when exposed to radiant-energy like sunlight.

<sup>3</sup> Some analysts offer a somewhat narrower definition of transmission, and add a fifth activity, “system control.” System control includes the dispatch and load balancing activities that are necessary to instantaneously match supply and demand across the entire network and to insure reliability. The distinction recognizes that, under some systems, responsibility for system control might be assigned to institutions that are not in the business of selling transmission capacity. Masayuki Yajima, *Deregulatory Reforms of the Electricity Supply Industry* (Westport, CT: Quorum Books, 1997), pp. 1-3.

However, some technical hurdles complicate the unbundling of the above activities. First, electricity cannot be stored efficiently, requiring electricity networks to provide instantaneous matching of supply and demand. Single-entity providers can more effectively accomplish this instantaneous matching, as markets are not so efficient as to allow perfect matching at every moment in time.<sup>4</sup> Second, the efficiency and reliability of the entire electricity network depends upon the actions of each participant. Market participants may not consider the effects of their decisions on the reliability of the network as a whole.<sup>5</sup> These hurdles suggest that reform efforts trade off important coordination advantages of single-entity suppliers in the hope that competition will improve operating efficiency.<sup>6</sup>

## **How (and Why) Have Governments Intervened in the Electric Power Services Sector?**

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Government intervention in electric power markets has traditionally been quite significant. State ownership of electric power assets has been common, and regulatory oversight of private firms has included setting prices and approving investments. Some segments of the electric power industry have natural monopoly characteristics, such as the transmission segment, and the primary purpose of state intervention has been to limit the ability of private firms to use those characteristics to exert market power over consumers. Secondary objectives have included providing relatively inexpensive power, reducing emissions, limiting dependence on imported fuels, and insuring universal access to electricity by households.

### ***State Ownership***

In many countries, the government owns a significant share of the electric power sector. State ownership allows the government considerable flexibility in pursuing a number of policy objectives. In developing countries, state ownership has often reflected a lack of interest among private investors, who tended to avoid the large capital-intensive investments that were common in the electricity sector.<sup>7</sup> Developed countries have seen state ownership as an alternative to direct regulation, allowing

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<sup>4</sup> David Newbery and Richard Green, "Regulation, public ownership and privatization of the English electricity industry," *International Comparisons of Electricity Regulation*, ed. Richard J. Gilbert and Edward P. Kahn, (Cambridge: Cambridge University Press, 1996), p. 29.

<sup>5</sup> Catherine Wolfram, "Electricity Markets: Should the rest of the world adopt the United Kingdom's reforms?" *Regulation*, 1999.

<sup>6</sup> Newbery and Green, "Regulation, public ownership and privatization of the English electricity industry," pp. 29-31.

<sup>7</sup> Pablo Spiller and Luis Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay and Chile," *International Comparisons of Electricity Regulation*, ed. Richard J. Gilbert and Edward P. Kahn, (Cambridge: Cambridge University Press, 1996).

more direct influence over prices and quality of service, and as means to achieve social objectives such as universal access.<sup>8</sup>

While state ownership can reflect a government's interest in having direct control over decisions made in the sector, in many cases it represents the absence of private sector interest in providing the sector with adequate capital.<sup>9</sup> Efficient scale in the electric power sector has traditionally been quite large, and the profitability of private sector investments requires that a long period of sufficiently remunerative electricity prices follow the initial investment. Private sector investors may be reluctant to make such large investments in countries with unstable politics or weak regulatory and judicial institutions.<sup>10</sup> Spiller and Martorell did a cross-country survey of ownership in Latin America in the early 1990s, and concluded that Argentina's, Brazil's and Uruguay's difficulties attracting private investment in earlier years had been caused by political instability and the absence of regulatory institutions that were perceived to be transparent and independent.<sup>11</sup>

State ownership gives governments flexibility to pursue public policy objectives like achieving universal access, reducing reliance on imported fuels, and minimizing emissions. However, the line between legitimate public policy objectives and narrow political interest is not always clear, and state control sometimes appears to have produced decisions that are difficult to justify. Historic examples that frequently appear in the literature include the United Kingdom's subsidies of its domestic coal industry,<sup>12</sup> Latin American governments' use of electricity pricing to fight inflation,<sup>13</sup> and cross-customer rate differentials in a broad range of countries that subsidize consumers and heavy industry at the expense of mid-size commercial users.<sup>14</sup>

There is also some evidence that state-owned electricity providers make less efficient hiring and investment decisions than do private sector providers. State-owned

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<sup>8</sup> Rauf Gonenc, Maria Maher, and Giuseppe Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," Organisation for Economic Co-operation and Development (OECD), Economics Department Working Paper Series No. 251, 2000, p. 36.

<sup>9</sup> Spiller and Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay and Chile."

<sup>10</sup> David Newbery, "Competition and Regulation in the Electricity Industry," presentation at the OECD/World Bank Conference on Competition and Regulation of Network Industries, 1994.

<sup>11</sup> Spiller and Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay and Chile."

<sup>12</sup> Newbery and Green, "Regulation, public ownership and privatization of the English electricity industry," p. 57.

<sup>13</sup> Spiller and Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay and Chile," p. 91.

<sup>14</sup> Richard J. Gilbert, Edward P. Kahn, and David Newbery, "Introduction: International comparisons of electricity regulation," *International Comparisons of Electricity Regulation*, ed. Richard J. Gilbert and Edward P. Kahn, (Cambridge: Cambridge University Press, 1996), pp. 10-12.

electric power sectors tend to employ larger than efficient workforces.<sup>15</sup> In some developed economies, state-owned utilities appear to have overinvested in capacity,<sup>16</sup> while in developing countries, governments have sometimes been unable to provide sufficient capital investment in the sector.<sup>17</sup> State-owned utilities also appear to have made costly errors in choice of technology and the replication of chosen technologies.<sup>18</sup>

## *Regulation*

Short of outright state ownership, governments have used regulation to control the market power of private sector monopolies. Regulation in the electric power services sector is usually quite extensive relative to most other sectors. Government intervention often includes restrictions on rates, the size and siting of investments, and the choice of fuels. However, effective regulation faces an important barrier, the absence of detailed information about the regulated firm's costs.<sup>19</sup>

Regulators' objectives have been similar to those that motivated state ownership. Political authorities have an interest in limiting the pricing power of private monopolies, and in achieving public policy objectives. Achieving these objectives can be difficult for regulators, who have the additional burden of acquiring relevant cost and technical information from private firms. Much of the difficulty arises because firms and regulators have different objectives, information, and choices available to them. An efficient electricity sector requires decisions on the appropriate types and levels of investment, operating procedures, pricing policies, and input mix, among other things. Regulators can only indirectly affect these decisions because the information they have is of lesser quality than the producing firms, and because they can only direct firm behavior through incentives that are often not entirely compatible with their intended objectives.

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<sup>15</sup> For example, evidence of excess employment by state-owned utilities in Canada is reported in Leonard Waverman and Adonis Yatchew, "Regulation of electric power in Canada," *International Comparisons of Electricity Regulation*, ed. Richard J. Gilbert and Edward P. Kahn (Cambridge: Cambridge University Press 1996), pp. 10-12.

<sup>16</sup> David Newbery suggests that state-owned utilities in Norway and Sweden may have overinvested in hydro-electric capacity.

<sup>17</sup> Douglas Houston, "Worldwide power privatizations," *Electric Perspectives*, (Washington, D.C., July/Aug. 1996).

<sup>18</sup> The consensus view of Britain's experience with state ownership is that "power stations cost between 50 and 100 percent more than in other developed countries, took as much as twice as long to commission, and rarely achieved the economies of replication that a large buyer might reasonably have expected." Newbery and Green, "Regulation, public ownership and privatization of the English electricity industry," p. 57.

<sup>19</sup> Gilbert, Kahn, and Newbery, "Introduction: International comparisons of electricity regulation," p. 15.

# What Changes Have Prompted Concurrent Reform Efforts?

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Despite important cross-country differences in initial conditions, many dissimilar countries are pursuing reasonably similar reform packages at about the same time. The concurrent timing of reform efforts is due in large part to technological changes that have reduced minimum efficient scale in generation and lowered the cost of transactions among multiple firms. Other factors contributing to the pressure for reform include relative changes in input fuel prices and a political climate that is supportive of market-based reforms. Analysts attach varying degrees of significance to each of these changes as motives for reform.

## *Technological Changes*

There are two significant technological changes that have facilitated electric power sector reform - the development of Combined Cycle Gas Turbine (CCGT) generators, and communications technology that facilitates system control among disparate market participants. Many authors cite the development of CCGT as the primary impetus for reform.<sup>20</sup> Joskow<sup>21</sup> discounts the importance of CCGT, arguing that improved command and control systems have been more significant. The two technological changes are reviewed here.

## **Combined Cycle Gas Turbine Technology**

The introduction of Combined Cycle Gas Turbine (CCGT) generation technology has dramatically reduced the efficient scale of generation, bringing about a significant change in industry cost structure. The development of high-efficiency gas turbines is one of several developments that have made natural gas competitive with other fuel inputs.<sup>22</sup> The most important difference between CCGT generators and other generating technologies is that combined cycle generators have substantially smaller fixed costs than other generating technologies. Smaller fixed costs afford firms (1) the ability to set up small scale capacity, and so bypass the transmission grid by physically locating generation facilities closer to consumers,<sup>23</sup> (2) reduce up-front capital costs, and (3) more rapidly install new capacity. Combined with the

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<sup>20</sup> See, for example, "Power to the People," *The Economist*, Mar. 28, 1998; and Sally Hunt and Graham Shuttleworth, *Competition and Choice in Electricity* (John Wiley and Sons Ltd.: Chichester, United Kingdom 1996).

<sup>21</sup> Joskow, *Deregulation and Regulatory Reform in the U.S. Electric Power Sector*, p. 17.

<sup>22</sup> Hunt and Shuttleworth, *Competition and Choice in Electricity*, p. 3.

<sup>23</sup> Catherine Wolfram reports current investments in plants with as little as 200 to 300 MW of capacity, about one-fifth the size of nuclear power plants.

falling price of natural gas relative to other fuels, the smaller efficient scale of CCGT has made it the technology of choice for new investments in generating capacity.<sup>24</sup>

Small-scale generating capacity facilitates reform because it limits the degree to which owners of existing generating (and to a lesser extent, transmission) capacity can exercise market power. The initial impact of the technology was that it allowed large industrial users to produce their own power, bypassing the grid. When and where owners of alternative generating capacity were given access to the transmission grid, small-scale generators could also compete with existing producers to sell to smaller-scale consumers of electricity. Finally, the speed with which CCGT generators can be installed can serve as an effective deterrent to the exercise of market power, even when the capacity is not actually installed.<sup>25</sup>

## System Control

Another change that has made some level of competition feasible is the development of technologies that allow more efficient coordination among multiple suppliers of electricity.<sup>26</sup> In an early analysis of the prospects for reform, Joskow and Schmalensee pointed out that technical and institutional barriers to such coordination inhibited effective competition in electricity supply.<sup>27</sup> In recent years, technological improvements in network control technologies, communications, and computing speed have reduced the transaction costs associated with multi-firm interaction. Joskow argues that these developments are a substantially more important cause of reform than CCGT-related reductions in the efficient scale of generating capacity.<sup>28</sup>

## *Relative Price Changes*

Relative price changes have also affected the pace of reform by reinforcing the trend toward natural gas and away from nuclear energy. Important relative price changes include changes in the costs of input fuels and in the implicit costs associated with

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<sup>24</sup> The switch toward gas has been dramatic. In Britain, all of the 20 GW installed since 1989 have been gas-fired, and Continental Europe looks likely to follow. *The Economist*, May 28, 1998.

<sup>25</sup> Catherine Wolfram, "Measuring Duopoly Power in the British Electricity Spot Market," *American Economic Review*, Sept. 1999, pp. 805-826.

<sup>26</sup> In economic terminology, vertical integration allows a network to achieve economies of scope, which are more difficult to achieve when multiple parties must contract to use the network. Reform of the legal framework in which firms interact may allow the economies of scope to be achieved through contractual interaction. Gonenc, Maher, and Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," p. 21.

<sup>27</sup> Paul Joskow and Richard Schmalensee, *Markets for Power, an Analysis of Electricity Utility Deregulation*, (MIT Press: Cambridge, MA, 1983).

<sup>28</sup> Joskow's comments are made in the context of the U.S. experience, where adequate transmission capacity and the existence of multiple owners of generating capacity meant that competition among generators in the U.S. might have been viable, even without the development of CCGT. Joskow, *Deregulation and Regulatory Reform in the U.S. Electric Power Sector*.

meeting stricter environmental standards. Contrary to what was expected in the 1970s and early 1980s, fossil fuel prices declined in real terms through the 1980s and 1990s, making the continued operation of nuclear plants difficult to justify on a cost basis. In addition, tighter environmental standards raised the implicit costs of both coal and nuclear plants relative to natural gas.

Substantial gas exploration, as well as deregulation of gas distribution services, have led to a dramatic increase in the availability of proven gas reserves.<sup>29</sup> Absolute and relative declines in natural gas prices during the late 1980s and early 1990s contributed to the viability of gas as an input into electric power generation.<sup>30</sup> In the United Kingdom, one of the most highly deregulated markets, existing coal-fired plants are competitive with new gas plants, but new coal-fired plants cannot compete with new gas plants,<sup>31</sup> and it has become increasingly clear that nuclear power is not currently viable as a purely commercial enterprise.<sup>32</sup>

The adoption of gas-fired generating capacity has also been hastened by tighter environmental standards, including carbon emission limitations and tightening nuclear power plant standards. Many subject country governments are attempting to meet their commitments embodied in the Kyoto Protocol on Climate Change. Compared to coal-fired plants, gas plants emit substantially lower levels of sulfur dioxide (SO<sub>2</sub>), nitrous oxide (NO<sub>x</sub>), and greenhouse gases such as carbon dioxide (CO<sub>2</sub>) per unit of electricity generated.<sup>33</sup>

## *Climate of Market Deregulation*

Finally, the move toward deregulation appears to be related to a broader political climate in which privatization and market-based regulation is replacing state control in many sectors of the world economy. In many countries, comprehensive electric power services reform has followed similar reform efforts in other sectors. In addition, electric power market reforms occurred earlier, and were more complete, in those countries that intervene less often in other sectors of the economy.

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<sup>29</sup> At current rates of consumption, the world's known reserves should not be exhausted for about 200 years. "Power to the People," Mar. 28, 1998.

<sup>30</sup> Matthew White, Paul Joskow, and Jerry Hausman, *Power struggles: Explaining deregulatory reforms in electricity markets*, Brookings Papers on Economic Activity, 1996.

<sup>31</sup> Newbery and Green, "Regulation, public ownership and privatization of the English electricity industry," p. 67.

<sup>32</sup> Gilbert, Kahn, and Newbery, "Introduction: International comparisons of electricity regulation," p. 18.

<sup>33</sup> According to OECD data on levels of generation and emissions for selected fuel types in the United States in 1995, coal generated roughly 5 times as much electricity as gas in that year, but produced more than 11,000 times as much SO<sub>2</sub>, more than 12 times as much NO<sub>x</sub>, and more than 10 times as much CO<sub>2</sub>. The OECD report also explains that the adoption of gas plants can increase emissions if the gas generation replaces nuclear power, but that there are several other scenarios in which regulatory reform could produce a reduction in emissions. OECD, "1999 Regulatory Reform in the United States," p. 290.

Over the last two decades, many governments have embarked on liberalization programs that have reduced the role of the state in several broad sectors of the economy.<sup>34</sup> Megginson and Netter cite evidence of substantial cross-country privatization, with public sector enterprise's share in overall OECD output falling from about 10 percent in the 1970s to 5 percent at present.<sup>35</sup> Gonenc, Maher and Nicoletti use the OECD International Regulation database to track cross-country reform efforts in several sectors through 1998. They find that by 1998, almost all OECD countries had implemented considerable reform of domestic transport and air passenger transport services.<sup>36</sup> While there had been some reform efforts in electricity, telecommunications, and railways, far fewer countries had made significant changes in these sectors.<sup>37</sup> In most OECD countries, economic gains from electric power reform may have been somewhat inhibited by the slower pace of reform in natural gas markets, as continued regulation of natural gas may have resulted in higher prices for an important input to power generation.<sup>38</sup> Outside the OECD, Argentina and Brazil are examples of countries that have comprehensively reformed other sectors before turning to electricity.<sup>39</sup>

Several market participants tied the depth and speed of electric power services reform in a given national market to the political culture in that market.<sup>40</sup> There does appear to be evidence that the earliest reforms occurred in those countries with relatively less regulation of other products markets. Nicoletti, Scarpetta and Boyland use factor analysis to construct an index of economy-wide product market regulation in OECD countries.<sup>41</sup> According to their index, which appears in table 2-1, the earliest reformers of electric power markets (particularly the United Kingdom and

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<sup>34</sup> Gonenc, Maher, and Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," p. 5.

<sup>35</sup> W.L. Megginson and J.M. Netter, "From state to market: a survey of empirical studies on privatization," *Economics Energy Environment*, Fondazione ENI Enrico Mattei, Nota di lavoro, Jan. 1999.

<sup>36</sup> Gonenc, Maher, and Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," figure 1.

<sup>37</sup> *Ibid.*, figure 3.

<sup>38</sup> OECD, "1999 Regulatory Reform in the United States," p. 272.

<sup>39</sup> Spiller and Martorell, link privatization of electricity sectors in Latin America to earlier privatization in other sectors, Spiller and Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay and Chile," p. 82.

<sup>40</sup> Industry representatives, interviews by USITC staff, Slough, United Kingdom; and Utrecht, The Netherlands, June 22, 2000.

<sup>41</sup> Nicoletti, Giuseppe, Stefano Scarpetta, and Olivier Boyland, "Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation," OECD Working Paper Series No. 226, 2000.

**Table 2-1**  
**Indices of economy-wide regulation and electric power services regulation, selected OECD**  
**countries, 1996**

Country	Economy-wide product market regulation index (0=no regulation)	Degree of privatization in electricity markets (2.5 = most liberal)	Degree of liberalization in electricity markets (2.5 = most liberal)
United Kingdom . . . .	0.5	1.9	1.3
Ireland . . . . .	0.8	( <sup>1</sup> )	( <sup>1</sup> )
Australia . . . . .	0.9	1.0	1.0
United States . . . . .	1.0	1.1	-0.7
New Zealand . . . . .	1.3	( <sup>1</sup> )	( <sup>1</sup> )
Denmark . . . . .	1.4	-1.1	0.2
Sweden . . . . .	1.4	-0.6	1.1
Germany . . . . .	1.4	0.3	-0.3
Netherlands . . . . .	1.4	-0.9	-0.9
Austria . . . . .	1.4	( <sup>1</sup> )	( <sup>1</sup> )
Canada . . . . .	1.5	-0.3	-0.8
Japan . . . . .	1.5	1.9	-1.1
Spain . . . . .	1.6	-0.2	-0.5
Portugal . . . . .	1.7	-0.4	-0.5
Finland . . . . .	1.7	-0.7	1.6
Switzerland . . . . .	1.8	( <sup>1</sup> )	( <sup>1</sup> )
Belgium . . . . .	1.9	0.6	-0.5
France . . . . .	2.1	-0.9	-0.9
Norway . . . . .	2.2	-0.7	1.7
Greece . . . . .	2.2	( <sup>1</sup> )	( <sup>1</sup> )
Italy . . . . .	2.3	-0.9	-0.9

<sup>1</sup> Information not available for these countries.

Sources: Nicoletti, Giuseppe, Stefano Scarpetta, and Olivier Boyland, 2000, "Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation," OECD Economics Department Working Paper Series No. 226. OECD staff provided underlying data used in Steiner, Faye, 2000, "Regulation, Industry Structure and Performance in the Electricity Supply Industry," OECD Working Paper Series No. 238.

Australia) have very low levels of product market regulation in their respective economies.<sup>42</sup>

Comparisons of economy-wide regulation with similar electricity-market indices reveal a reasonably strong relationship between a country's general attitude toward deregulation and the pace of electricity reform. Steiner uses a subset of the OECD regulation database in a factor analysis of privatization and liberalization in electricity markets.<sup>43</sup> A simple correlation of the measures of economy-wide product market regulation and privatization in electricity (-0.63) suggests that countries with relatively little economy-wide regulation tend toward private ownership of electricity. The correlation between economy-wide regulation and electricity market liberalization is considerably weaker (-0.23), though of the appropriate sign to indicate that economies with liberal economy-wide product markets have more liberal approaches to electricity regulation.<sup>44</sup>

## **What Constitutes a Comprehensive Reform Program?**

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The details of the many reform programs undertaken in the countries of interest are extensive and vary from one country to another. Nonetheless, it is possible to outline a basic, aggressive reform program that may serve as a guide for cross-country

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<sup>42</sup> The index was created from the OECD international regulation database, which contains 1407 indicators of government regulation in a broad cross-section of product markets. The index measures regulation of product markets (firms selling goods and services), as opposed to factor markets (i.e. labor selling its services to firms). Nicoletti et al's index runs from 0 (no government intervention other than competition law) to 6 (no market activity allowed) in theory, though no countries reach the bounds. In Nicoletti et al's sample of countries (which includes formerly socialist economies in Eastern Europe) the index runs from 0.5 (United Kingdom) to 3.3 (Poland).

<sup>43</sup> Faye Steiner, "Regulation, Industry Structure and Performance in the Electricity Supply Industry," OECD Working Paper Series No. 238, 2000.

<sup>44</sup> The correlation between Steiner's electricity liberalization and privatization indices (0.00) suggests that there is no relationship between privatization and liberalization in electricity markets. The absence of such a relationship appears to be driven by two sets of outliers. The nordic countries (Denmark, Finland, Norway, and Sweden) have relatively high liberalization scores and low privatization scores. Countries that entered the period of recent reforms with substantial private ownership (Belgium, Germany, Japan, and the United States) have relatively high privatization scores and relatively low liberalization scores. Steiner explains that low liberalization scores in countries with a tradition of private ownership are due largely to the lack of unbundling in these markets.

comparisons.<sup>45</sup> The objective of such a reform program is to enhance the efficiency of supplying electrical energy, both in the short and long-term.<sup>46</sup>

Not all of the steps outlined below are necessary in every country, as some of the reforms discussed here may already be in place. In addition, not all countries will choose to pursue the full extent of reform, as they may choose to address other policy objectives or be limited by political constraints. The activities in a comprehensive reform program can be grouped into three parts: **privatization** of state-owned assets, **restructuring** of ownership control, and **regulatory reform**. While reform efforts generally contain elements of all three parts, they are distinct activities, and each has its own objectives and hurdles.

## *Privatization*

Due to the natural monopoly features of electricity markets, many governments enter this period of reform as owners of the electrical grid, as well as much of the available generation capacity. While state ownership reduced concerns that private ownership might result in the abuse of market power, it also tended to produce a number of other weaknesses that negatively affected the performance of the electricity sector over time.

First, state-owned electricity producers face a “soft budget constraint,” which means that they do not have the same incentives to minimize production costs as do private firms. Managers in state-owned firms may be less likely to be disciplined for a failure to hold production costs down. Consequently, state-owned facilities may tend to employ more factors of production (capital, labor, and intermediate inputs) per unit of output than do private firms.

Second, state-run electric power facilities may be more likely to be charged with accomplishing a number of “public policy” objectives that are unrelated to efficient electricity production. Public policy objectives that might undermine the ability of state-run firms to produce efficiently include: 1) the purchase of high cost fuel sources from politically powerful lobbies; 2) the employment of marginally productive workers as part of government efforts to reduce unemployment; and 3) keeping electricity prices below the cost of production as a means of subsidizing the poor and/or politically connected industries that use electricity intensively.

Third, state ownership may induce inadequate investment, as other budget needs crowd out improvements in the electricity infrastructure. This can be a problem for fast-growing developing economies in which the demand for electricity outpaces the ability of the state sector to construct more plants. State-owned utilities may also be slower to invest in new technologies that make the electricity sector more efficient over time.

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<sup>45</sup> This section benefitted substantially from similar discussions in: Paul Joskow, “Regulatory Priorities for Reforming Infrastructure Sectors in Developing Countries,” *Annual World Bank Conference on Development Economics*, Apr. 1998; and OECD, International Energy Agency (IEA), *Electric power market reform: An IEA Handbook*, (Paris, France: OECD/IEA 1999).

<sup>46</sup> OECD, “Regulatory Reform in the Electricity Sector,” found at Internet address <http://www.oecd.org/subject/regreform/electricity.htm>, retrieved July 6, 2000.

These weaknesses may have resulted in poor performance while sapping resources from other segments of the economy. Placing electricity sector assets in private hands can motivate managers to minimize costs and undertake investment while removing many of the political constraints, which may subsequently lead to more efficient energy supply.

While full privatization of state-owned assets is the most aggressive way to remove political constraints from managers, a more incremental approach would be the removal of state-owned facilities from direct political control. State-owned utilities are sometimes “corporatised,” with management required to be self-financing, and with the understanding that the government’s political objectives are to be met through other means. The OECD argues that corporatisation with appropriate incentives would improve efficiency, but that privatization is preferable.<sup>47</sup>

## ***Market Restructuring***

Whereas privatization may promote more efficient management of electric power firms, it does not necessarily introduce competition as a means of enhancing the efficiency of the entire industry. In many countries, concentrated ownership of physical assets (either within a segment or across segments) can limit competition. In such cases, the restructuring of ownership may be necessary before competition is effective.

## ***Vertical Restructuring***

Electricity supply has typically been a “vertically integrated” industry in which several stages of production (i.e., generation, transmission, distribution, and retail supply) are owned and operated by the same entity. In many cases, the physical assets are all controlled by the government or a single firm. A vertically integrated market structure impedes the development of competition because those firms that own transmission and distribution lines could restrict access to competing generators to favor their own generating activities.

Comprehensive vertical restructuring would separate ownership of generation from ownership of transmission and distribution so that all generators have equal access to transmission and distribution lines. Governments have taken various approaches to achieving this separation, ranging from prohibiting owners of transmission lines and generation facilities from owning a substantial share of the available generating capacity to imposing regulatory safeguards that compel owners of transmission and distribution assets to allow effective access to all generators. Gonenc *et al.* argue that these weaker forms of separation “do not overcome the incentives of the incumbent to restrict competition in the competitive activities...”<sup>48</sup>

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<sup>47</sup> OECD, “Regulatory Reform in the Electricity Sector.”

<sup>48</sup> Gonenc, Maher, and Nicoletti, “The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues,” p. 22.

## ***Horizontal Restructuring of Generating Capacity***

Electricity generation in some countries (especially those with recent state-ownership) is also horizontally concentrated, meaning that a limited number of firms control most (if not all) of the generation assets. Concentration of generating assets can reduce the degree to which competitive pressures hold down prices. For example, the initial privatization of generation assets in the United Kingdom was accompanied by minimal restructuring that left the majority of generation assets in the hands of only three companies. Subsequently, high concentration in generation has been shown to have raised prices above the fully competitive level.<sup>49</sup> Official strategies to avoid horizontal integration in the generating sector can include a variety of responses. Perhaps the most aggressive policy is the forced divestiture of existing generation assets to reduce the level of market power held by individual firms. Ensuring relatively easy entry of new generation capacity can also reduce the harm associated with concentrated holdings of generation assets, as can policies that ensure sufficient transmission capacity exists to permit competition from generators in other geographic regions.

## ***Regulatory Reform***

The third area of reform is associated with changes in the regulatory institutions that oversee the electricity sector. In countries that privatize state-owned monopolies, regulatory institutions may not exist, as ministries of energy saw no need to regulate themselves. In those countries that do have regulatory institutions, there may be a need for significant changes in both the scope and form of regulation.

The most basic objective of a regulatory reform effort is to remove most regulatory oversight of privately-owned generation capacity. Provided that there is equal and adequate access to transmission and distribution facilities, and that generation assets are not overly concentrated in the hands of a few owners, reformers believe that market incentives are sufficient to restrain market power in generation. Because the primary justification for government intervention in electricity markets is to restrain market power, the structural reforms discussed above should be sufficient to allow regulators to shift their focus toward the oversight of transmission and distribution activities.

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<sup>49</sup> Richard Green and David Newbery report that “the generators have been successful in gaming the transmission constraints to increase profits.” Newbery and Green, “Regulation, public ownership and privatization of the English electricity industry,” p. 63.

Catherine Wolfram measures market power in the British spot electricity market during 1991-94. She finds that prices do exceed their competitive level, though not by as much as would have been expected, given the level of horizontal integration at the time. The abuse of market power appears to have been limited by 1) imports from Scotland and France, 2) potential entry by firms with combined-cycle gas turbines, and 3) threatened regulatory action in response to high prices.

As mentioned above, the success of reform relies upon giving generators equal access to transmission and distribution assets, so as to ensure effective competition among multiple generators. A second objective is to ensure that transmission and distribution assets have sufficient capacity and perform reliably, yet at as low a price as possible. One way to ensure reasonable prices for access to these assets, while at the same time improving efficiency in the transmission and distribution sectors, is to switch the regulatory regime toward giving owners **performance-based incentives**. For example, British reforms have set ceilings on the prices that transmitters can receive for their services. Price ceilings are allowed to increase at the rate of consumer price inflation (CPI) minus a value (X) that is intended to reflect efficiency gains. This form of regulation, known as CPI-X regulation, gives transmission and distribution firms an incentive to reduce costs, for reducing costs will increase their profits.<sup>50</sup> Traditional rate-of-return regulation provides relatively little incentive for firms to reduce costs, as a profit margin is built into the price-setting formula.

While the introduction of CPI-X pricing in the United Kingdom appears to have reduced transmission and distribution charges significantly,<sup>51</sup> the regulator's choice of a high value for X has been criticized by the new owners of capacity.<sup>52</sup> The timing of the regulators choice of X (after the owners have purchased their assets, given their expectations about future values of X) presents a general problem for the use of such pricing regimes. Gonenc *et al.* explain that regulators often use observed efficiency gains to set X values for future regulatory periods. This behavior by the regulator can reduce firms' incentives to cut costs in the current period, reducing the regulations expectations of future efficiency gains, and thereby reducing the benefits from a performance-based incentive scheme.<sup>53</sup>

Finally, regulatory reform includes substantial changes in the way a government hopes to achieve social, or non-economic, objectives that have traditionally been achieved through direct or indirect control of the electricity sector. There are a number of legitimate non-economic goals, including universal service and reductions in emissions, that will require new policies if they are to be met in a deregulated environment. Gonenc *et al.* argue that "where competition and cost-based pricing can impact favorably on the affordability of non-economic objectives, policy-makers should attempt to achieve social or universal service objectives through the use of public funds and not through cross-subsidies and other inefficient regulations, such as restrictions on entry."<sup>54</sup>

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<sup>50</sup> While the change to new forms of regulation offers important incentives to decrease costs, it may reduce quality in the longer term, as CPI-X regulation can reduce the incentives for regulated firms to invest in capacity. CPI-X regulation probably needs to be accompanied by additional mechanisms that give firms appropriate incentives with regard to investment.

<sup>51</sup> United Kingdom Government Official, interview by USITC staff, London, United Kingdom, June 13, 2000.

<sup>52</sup> Industry representative, interviews by USITC staff, London, United Kingdom, June 14, 2000.

<sup>53</sup> Gonenc, Maher, and Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," p. 19.

<sup>54</sup> *Ibid.*, p. 7.

One argument frequently raised against reform efforts is that they threaten social obligations typically undertaken by the incumbent monopoly. Monopolies have typically met these obligations by cross-subsidizing poor and underserved consumers by charging above market rates to other consumers. Experience from telecommunications reforms suggests that these objectives need not be threatened by reform.<sup>55</sup> Gonenc *et al.* argue that direct transfer payments to the poor and underserved, or subsidies to firms that meet specific objectives, are probably more efficient ways to achieve non-economic objectives than are regulatory control or restrictions on entry.<sup>56</sup>

## **How Have Reform Programs Affected the Performance of the Electric Power Services Sector?**

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Because subject country reform efforts are generally quite recent, academic studies have only recently had sufficient data to make conclusive statements about the impact of reforms on electricity markets. With the exception of a few early reformers - notably the United Kingdom, Argentina, and Australia - there appears not to have been sufficient data to allow a within-country assessment of the effects of reform. The number of recent reform efforts have provided some data for cross-country studies, but cross-country studies suffer from the inability to represent the broad variety of institutional detail embodied in the reforms.

Reform efforts have a number of objectives, not all of which are easily quantified. Policymakers are interested in the effect of reform on prices and consumer welfare, as well as on non-economic objectives like emissions and universal service. Perhaps the most easily quantified outcomes are those of firm performance, particularly efficiency measures like output per worker. Much of the literature on privatization examines firm performance outcomes.

Two broad methodological choices are present in these studies, econometric/statistical analysis and numerical simulation. Econometric/statistical studies typically use a broad data set, identifying statistical relationships between specific reform measures and economic outcomes. These studies are useful for answering broad questions like "Does privatization improve firm performance?", but may lack the institutional detail to address cross-country deviations in specific areas. Simulation studies allow the analyst to consider a number of scenarios with more institutional detail, and to estimate the outcomes that policymakers more likely care about, such as changes in prices and consumer welfare. The potential disadvantage of simulations is that they rely on model and parameter choices made by the analyst.

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<sup>55</sup> Ibid., p. 31.

<sup>56</sup> Ibid., p. 7.

While few studies have addressed the scope of the reforms that are underway, the existing results suggest that reforms have been beneficial. Broad-based reform packages may have improved the performance of the electric power services sector in a number of ways. In particular, there is evidence to suggest that reforms have 1) reduced the price of delivered electricity (particularly to industrial consumers), 2) improved the technical efficiency of electricity suppliers, and 3) reduced the emissions of greenhouse gases, a policy objective that many subject countries committed to in the Kyoto Protocol. The role of each component of the reform packages in achieving these objectives has not been concretely established. Some analysts believe that while both privatization and liberalization are beneficial, the gains from privatization are significantly larger.<sup>57</sup>

## *Econometric/Statistical Studies*

A sizable econometric literature documents the effect of privatization on firm performance. This literature has established fairly strong results about privatization in general, though academics have lacked a large enough sample of electricity firms to make these conclusions about the electricity sector specifically. The large move toward privatization in other sectors has provided sufficient data for some strong conclusions. D'Souza and Megginson<sup>58</sup> use a sample of 85 privatized companies in 28 countries finding evidence of significant increases in profitability, real sales, operating efficiency, and dividend payout. These results are similar to those found elsewhere in the literature, such as in Boubakri and Cossett's study of privatizations in 21 developing countries.<sup>59</sup> D'Souza and Megginson find that privatization improves firm performance most in those sectors that had previously been non-competitive (e.g., electricity and telecommunications).

Most other studies of privatization predate recent efforts to privatize electric utilities and so are less directly relevant for this study, yet the results from these studies confirm results from Megginson and D'Souza. Gonenc, Maher and Nicoletti provide an exhaustive list of recent studies of privatization, and summarize the results as follows: "The results of recent studies reviewed here on balance suggest that, private (or privatised) companies perform better than public enterprises in terms of productive efficiency and profitability."<sup>60</sup>

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<sup>57</sup> Carlos Ocana, International Energy Agency, interview by USITC staff, Paris, France, June 16, 2000; and Carole Pellegrino and Julia Nielsen, OECD, interview by USITC staff, Paris France, June 15, 2000.

<sup>58</sup> Juliet D'Souza and William Megginson, "The Financial and Operating Performance of Privatized Firms during the 1990's," *The Journal of Finance*, Aug. 1999, pp. 1397-1448.

<sup>59</sup> Narjess Boubakri and Jean-Claude Cossett, "The Financial and Operating Performance of Privatized Firms: Evidence from Developing Countries," *The Journal of Finance*, June 1998, pp. 1081-1110.

<sup>60</sup> Gonenc, Maher, and Nicoletti, "The Implementation and the Effects of Regulatory Reform: Past Experience and Current Issues," p. 39.

Steiner<sup>61</sup> uses a cross-country econometric analysis to assess the impact of recent electricity supply reforms on industrial prices and the ratio of industrial to consumer prices. With respect to industrial prices, she finds that the estimated effects of various components of reform efforts are generally those predicted by economic theory, though many are not statistically significant.<sup>62</sup> Steiner finds that the existence of a wholesale electricity pool reduces industrial prices, but that the effects of legal third party access and vertical unbundling on prices charged industrial consumers are not statistically significant.<sup>63</sup> The estimated coefficient on private ownership suggests that privatization increases prices, a counterintuitive result that might arise if there has been insufficient horizontal unbundling and the newly privatized firms can exercise market power. Steiner finds that vertical unbundling and the existence of a wholesale pool reduce the ratio of industrial to residential prices, while privatization increases it. Steiner concludes that these results suggest that the benefits of reform accrue disproportionately to industrial consumers.

Steiner also estimates the effect of various reforms on production efficiency in generation, with efficiency measured by capacity utilization and the difference between actual and optimal reserve margins. The theory being tested is that competitive markets with privately owned participants will use a larger percentage of available capacity, and keep reserve margins closer to their optimal level. She finds that vertical unbundling raises capacity utilization as expected, but private ownership and third party access had no measurable effect. The estimates for the second efficiency measure, the difference between actual and optimal reserve margins, are similar.

Wolfram estimates price/marginal cost ratios in the post-reform United Kingdom to determine the extent to which the two largest privatized generators were able to exploit pricing power in the British market.<sup>64</sup> Wolfram finds evidence that pricing power exists, but that it is substantially smaller than had been predicted by earlier simulation models of British reform, such as those developed by Green and Newbery. Wolfram argues that incumbents' pricing power was probably limited by the threat of entry by new CCGT plants, the availability of imports from France and Scotland, and the threat of regulatory action if prices were too high.

## *Simulation Studies*

Simulation studies allow a consideration of the gains from various types of reform. Under some basic assumptions about the ways in which firms operate, analysts can model the effects of distinct policy experiments on the electricity sector. With

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<sup>61</sup> Faye Steiner, "Regulation, Industry Structure and Performance in the Electricity Supply Industry."

<sup>62</sup> Econometric procedures may have difficulty identifying the impact of specific reforms because reforms are often implemented in a bundle. If the reforms are too often concurrent, the regression estimates will suffer from multicollinearity, which means that variables are too highly correlated to allow causation to be attached to any one variable.

<sup>63</sup> Steiner argues that legal TPA, the variable used in the regression, may differ from actual TPA, which would explain the absence of a statistically significant impact on prices.

<sup>64</sup> Catherine Wolfram, "Measuring Duopoly Power in the British Electricity Spot Market," *American Economic Review*, Sept. 1999, pp. 805-826.

parameters selected to replicate key features of the data, simulation results can be taken as representative of the relative magnitudes of each stage of reform on the policy outcomes.

Perhaps the best known simulation study is that done by Newbery and Pollitt, who simulate the effect of the 1990 reforms on a parameterized model of the British electricity sector, using 1996 data.<sup>65</sup> Their simulations suggest that the likely effect of the British reforms is 1) increased efficiency in generation, with non-fuel, non-capital costs falling by 8 percent, 2) substantial fuel switching, which lowers costs in some scenarios and reduces emissions in all scenarios, 3) higher imports of electricity from France, and 4) relatively small decreases in real prices. Newbury and Pollitt find that most of the benefits arise because privatized firms become more efficient and switch fuels. They find that the non-privatized firms could have achieved most of the fuel-switching gains, though they doubt that a state-owned firm would have switched so quickly.<sup>66</sup>

Chisari, Estache and Romero use a Computable General Equilibrium model to simulate the macroeconomic and distributional effects of both privatization and changes in the regulatory oversight of utilities in Argentina.<sup>67</sup> The model uses observed changes from privatized utilities in the Buenos Aires region to parameterize the effect of similar changes in water, gas, and electricity supply throughout the country. Chisari *et al.* estimate that privatization of these utilities alone (without any effective regulatory restraint on prices in the newly privatized sectors) would increase Argentina's gross domestic product (GDP) by 0.7 percent. Effective regulation, which is modeled as setting the price of output in each newly privatized sector equal to marginal cost, adds an additional 0.09 percent to GDP. Chisari *et al.* estimate that privatization of electricity supply alone raises GDP by 0.05 percent, and effective regulation after privatization raises it by an additional 0.05 percent. Chisari *et al.* also consider the distributional effects of deregulation, finding that all income groups benefit from both privatization and effective regulation. Higher income groups benefit most from privatization, while lower income groups benefit most from effective regulation.

## *Environmental Outcomes*

The direct environmental effects of reform are somewhat difficult to quantify. As noted, new gas-fired generating plants emit substantially smaller amounts of SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> per unit of electricity generated than do coal-fired plants.<sup>68</sup> To the extent that reform efforts shift the fuel mix from coal to gas, they may eventually be judged to have reduced emissions. Newbury and Pollitt report substantial emission reductions after reforms in the United Kingdom, attributing the fall to a reform-induced shift to

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<sup>65</sup> David Newbery and Michael Pollitt, "The Restructuring and Privatization of Britain's CEGB - Was It Worth It?" *The Journal of Industrial Economics*, Sept. 1997, pp. 269-303.

<sup>66</sup> *Ibid.*, p. 297.

<sup>67</sup> Omar Chisari, Antonio Estache, and Carlos Romero, "Winners and Losers from the Privatization and Regulation of Utilities: Lessons from a General Equilibrium Model of Argentina," *World Bank Economic Review*, vol. 13, No. 2, pp. 357-378.

<sup>68</sup> OECD, "1999 Regulatory Reform in the United States," p. 290, table 2.

gas generation.<sup>69</sup> The OECD argues that electricity reform facilitates the reduction of emissions in a number of ways, including 1) increasing the share of gas relative to coal, 2) speeding the retirement of inefficient plants, 3) reducing the use of inefficient plants that continue to operate, and 4) adding pressure to innovate toward more efficient technologies.<sup>70</sup> If reform induces a shift from nuclear to gas, it may increase emissions while reducing the amount of spent nuclear fuel that must be stored.<sup>71</sup>

## Conclusion

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Recent technical, economic, and political changes have motivated electric power sector reform. Changes in generation and communication technologies have allowed governments to reconsider their role in some segments of the electricity supply system. Some of the subject countries have embarked upon aggressive reform efforts, privatizing and restructuring the electric power services sector, and substantially amending their approach to regulation of the sector. The academic community has only just begun to acquire sufficient data to assess the outcomes of the earliest reform efforts. Empirical studies suggest that reforms have reduced electricity prices, particularly among industrial customers. The concurrent adoption of many reform measures makes it difficult to assign responsibility to specific measures of reform, but it appears that privatization is one of the more important reform measures. Simulation studies suggest that subsequent restructuring and regulatory reform help pass efficiency gains on to consumers. To the degree that reforms facilitate the adoption of gas as the fuel of choice over coal, it appears that they are capable of providing a substantial reduction in emissions. Firmer conclusions await consideration of more recent data, which would contain substantially more variation in the type of reforms initiated, and in the outcomes that each reform produced.

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<sup>69</sup> Newbery and Pollitt, "The Restructuring and Privatization of Britain's CEGB - Was It Worth It?" p. 283.

<sup>70</sup> OECD, "1999 Regulatory Reform in the United States," p. 290, box 9.

<sup>71</sup> Ibid.

## PART II

# ASIA/PACIFIC REGION

*The following chapter examines the electricity markets of four countries located on the Pacific Rim: Australia, Canada, Japan, and New Zealand. Of these four countries, Australia and New Zealand have achieved the most progress in electric power sector reform. Significant power sector reform in Canada has taken place in just two provinces, Alberta and Ontario. Japan has only begun to deregulate its electric power market to permit competition in the generation and retail supply segments.*



# CHAPTER 3

## AUSTRALIA

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*Victoria and South Australia lead reform of the Australian electricity market, with progress in these states entailing privatization and industry restructuring. A nation-wide electricity pool begins to form, with 100-percent consumer choice by 2003. Continued state ownership of electricity assets and a complex regulatory regime adversely affect the competitive environment.*

### Nature and Extent of Regulatory Reform

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Australia's ongoing reform of the electricity industry began in 1991,<sup>1</sup> when the Council of Australian Governments established the National Grid Management Council to draft the National Electricity Code (NEC), which established rules pertaining to the formation and operation of the National Electricity Market (NEM).<sup>2</sup> The NEC's major elements include (1) freedom of choice for electricity consumers (first for large, commercial users, and later for smaller businesses and residential customers); nondiscriminatory access to transmission and distribution networks; (3) prohibition of legislative or regulatory barriers to entry for new generation or retail distribution companies; and (4) prohibition of barriers to interstate or intrastate trade in electricity.

Reform of the Australian electricity market has been comprehensive, entailing a mix of vertical restructuring, horizontal restructuring, and privatization, but there are distinct differences between states at present. Reform has entailed vertical restructuring in most states. As a practical matter, generation has been separated from transmission and distribution services, and distribution and retail supply functions have been separated for eligible customers. Western Australia and the Northern Territory, where utilities have remained vertically integrated monopolies, are the exceptions. Privatization and horizontal restructuring have also been carried out, principally in two Australian states, Victoria and South Australia. Victoria sold all four of its state-owned generating plants to British and U.S. firms between 1992 and 1996,<sup>3</sup> bringing

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<sup>1</sup> Treasury Department of Australia, "Developments in Electricity," found at Internet address <http://www.esaa.com.au/new.htm/>, retrieved Feb. 18, 2000.

<sup>2</sup> International Energy Agency (IEA), *Energy Policies of IEA Countries: Australia 1997 Review* (Paris: OECD, 1997), p. 90.

<sup>3</sup> U.S. Department of State telegram, "Generator-Loy Yang A-A Sale for U.S. \$3.8 Billion," message reference No. 000254, prepared by U.S. Consulate, Melbourne, Apr. 29, (continued...)

the number of private generators to seven. South Australia corporatized the state-owned, vertically integrated utility in 1995; split generation operations into four separate, state-owned companies in October 1998; and sold one of the companies, Optima Energy, to U.S.-based Texas Utilities in May 2000. South Australia has released a short list of bidders for Synergen, a second generation plant. The list includes five U.S. power companies.<sup>4</sup> Other generation facilities in the state will also be privatized.<sup>5</sup> The New South Wales Government plans to sell off the assets of its three generators, but as of August 2000, no privatization plans had been formalized.<sup>6</sup>

Several state and federal agencies share responsibility for regulating the electricity market. The three principal federal agencies are the National Electricity Code Administrator (NECA), the National Electricity Market Management Company (NEMMCO), and the Australian Competition and Consumer Commission (ACCC) (table 3-1). NECA enforces participants' compliance with the NEC, collects data, presides over amendments to the code, and resolves disputes. NEMMCO, the system operator of the National Electricity Market, has responsibility for balancing supply and demand for electricity, maintaining system security, and administering the spot market.<sup>7</sup> ACCC establishes price and revenue caps for transmission businesses and reviews amendments to the NEC.<sup>8</sup> NECA, NEMMCO, and ACCC appear to share responsibility for ensuring that access to the national grid is nondiscriminatory. Most of the states also have regulatory offices responsible for local issues, such as regulation of the low-voltage distribution networks, the licensing of retail supply companies, and price regulation for non-eligible customers.

All Australian consumers in states that participate in the NEM will be able to choose their supplier by January 2003. Victoria was the first to identify eligible consumers, in 1994. Other states did so during 1996-98. Consumers and suppliers from four

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<sup>3</sup> (...continued)

1997; and U.S. Department of Energy (USDOE), Energy Information Administration (EIA), "Electricity Reform Abroad and U.S. Investment," Sept. 1997.

<sup>4</sup> "South Australian Privatisation of Electricity Generation Assets," South Australian Treasury media release, Feb. 24, 2000, found in "Global Energy Regulation," p. 17.

<sup>5</sup> Electricity Supply Association of Australia (ESAA), "News and Issues," found at Internet address <http://www.esaa.com.au/>, retrieved May 3, 2000; and "Texas Utilities buys Optima Energy," *The Daily Deal*, May 5, 2000, p. 19.

<sup>6</sup> Ministry of Energy and Utilities, New South Wales Government, "Restructuring and the introduction of competitive market arrangements," found at Internet address <http://www.doe.nsw.gov.au/>, retrieved Feb. 18, 2000; and Ministry of Energy and Utilities, New South Wales Government, "Energy in New South Wales, 1998," found at Internet address <http://www.doe.nsw.gov.au/>, retrieved Feb. 18, 2000. No updated information was available as of August 14, 2000.

<sup>7</sup> The National Electricity Market Management Company (NEMMCO), "The Role of NEMMCO," found at Internet address <http://www.nemmco.com.au/nemmco/>, retrieved Mar. 8, 2000.

<sup>8</sup> Australian Competition and Consumer Commission, "Making Markets Work," Oct. 1999, found at Internet address <http://www.accc.gov.au/electric/>, retrieved Sept. 9, 2000.

**Table 3-1  
Functions of Australian state regulatory agencies responsible for the electric power industry**

State	Regulatory Agency	Functions
New South Wales . . . . .	Independent Pricing and Regulatory Tribunal (IPART)	Electricity pricing (non-eligible customers), distribution network services charges
Victoria . . . . .	Office of Regulator General (ORG)	Electricity pricing (non-eligible customers), distribution network services charges, distribution access, distribution licensing and compliance, retail licensing and compliance
Queensland . . . . .	Queensland Competition Authority (QCA)	Electricity pricing (non-eligible customers), distribution network services charges, distribution access, distribution licensing and compliance, retail licensing and compliance
South Australia . . . . .	South Australian Independent Industry Regulator (SAIIR)	Electricity pricing (non-eligible customers), distribution network services charges, distribution access, distribution licensing and compliance, retail licensing and compliance
Tasmania . . . . .	Office of the Tasmanian Electricity Regulator (OTTER)	Electricity pricing (non-eligible customers), distribution network services charges, distribution access, distribution licensing and compliance, retail licensing and compliance
Western Australia . . . . .	Office of Energy (OOE)	Electricity pricing (non-eligible customers), distribution network services charges, distribution access
Australian Capital Territory . .	Independent Pricing and Regulatory Commission (IPARC)	Electricity pricing (non-eligible customers), distribution network services charges

Note: The Northern Territory does not have an independent regulatory agency.

Source: Electricity Supply Association of Australia, *Electricity Australia 1999*, p. 72.

states and the Australian Capitol Territory (ACT) participate in Australia's wholesale electricity market. Electricity is bought and sold through a mandatory pool.

## **Current Market Conditions**

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### ***Generation***

With the commencement of the NEM in December 1998, Australia introduced a significant amount of competition into its electric power industry. As of May 2000, the NEM was operating in the states of Victoria, New South Wales, Queensland, and South Australia, as well as the ACT. The NEM aggregates all electricity output from generators in Victoria, New South Wales, South Australia, and the ACT into a single pool. The pool, managed by NEMMCO, allows generators and large customers to trade across the interconnected system, with spot prices calculated every half hour. A separate pool, also managed by NEMMCO, operates in Queensland until an interconnection with NSW is completed, and Queensland joins the NEM's central power pool.<sup>9</sup>

Generators of 30 megawatts or larger compete by offering electricity to the national market at price levels up to a ceiling (currently \$5000 per megawatt hour). Generators are paid the spot price for the quantity of electricity they supply during the time period, adjusted by a loss factor specific to the location of each generator in the transmission network. Generators are charged a fee for connection to the network, and this charge is passed along to consumers. Privately-owned and state-owned generators access the NEM on an equal basis.

Wholesale market customers can bid for prices and quantities of electricity in the national market. A spot price is calculated by NEMMCO by matching the bids and offers for each half-hour period. Wholesale customers pay the spot price, adjusted by a loss factor based on location.<sup>10</sup>

An electricity derivatives market is also operating, permitting both generators and retailers to hedge against financial risks posed by fluctuation in the spot price. The NEC does not regulate the form of bilateral contracts between generators and retailers, and neither NEMMCO, the ACCC, nor the state regulatory agencies regulate the derivatives market.<sup>11</sup> At least one U.S. company, Enron, is a participant in the derivatives market.<sup>12</sup>

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<sup>9</sup> Ibid., p. 19; and Gerry George, "Privatization 'genie' is out of the bottle," *Transmission & Distribution World*, Apr. 1998, found at Internet address <http://proquest.umi.com/>, retrieved Feb. 28, 2000.

<sup>10</sup> George, "Privatization 'genie' is out of the bottle." For further information, see NEMMCO, "An Introduction to Australia's National Electricity Market," Aug. 1998, available at Internet address <http://www.nemmco.com.au/>.

<sup>11</sup> NEMMCO, *An Introduction to Australia's Electricity Market*, pp. 17-18.

<sup>12</sup> Industry representative, telephone interview by USITC staff, Apr. 13, 2000.

## ***Transmission and Distribution***

Under the NEM, most transmission and distribution companies remain regulated monopolies (table 3-2). In Victoria and South Australia, these companies have been sold or leased to the private sector. They remain state-owned in the other states that participate in the NEM. Open and non-discriminatory access to the transmission and distribution networks is provided for in the National Electricity Code. Network service providers must be registered with the ACCC, which will determine revenue caps for transmission businesses using a methodology based on CPI-X. In June 1999, the ACCC began serving as the price regulator in NSW, and it plans to do the same in Victoria as of December 2000.<sup>13</sup> The transmission and distribution pricing arrangements are currently undergoing a major review.<sup>14</sup>

## ***Retail Supply***

Electricity retailers must be authorized to access the wholesale electricity market, and must be licensed by each state in which they operate. Most distribution companies hold retail licenses in the area of their distribution networks, and many are licensed as retail supply companies in other states as well. Companies in other industries also hold retail licenses in several states, including electric power generators, gas retailers, one telecommunications company, and several financial sector firms. The distribution companies have agreed to “open access undertakings,” through which customers can purchase electricity from any of the licensed retailers, with the local distributor continuing to provide its network services. Retail supply companies may only compete for the business of eligible customers. All customers within the NEM will be eligible by January 2003. Presently, most non-eligible customers receive retail supply services from the retail arm of their local distribution company.<sup>15</sup> Table 3-3 provides the schedule for the introduction of competition in Australia’s retail electricity supply sector.

Considerable information is available on Australian electricity prices (table 3-4). According to the Electricity Supply Association of Australia (ESAA), average electricity prices decreased by 15 percent in real terms between 1990/91 and 1997/98.<sup>16</sup> ESAA believes that prices for commercial and industrial establishments fell substantially in Victoria and New South Wales, at least in part as a consequence of eligible consumers successfully negotiating their power contracts. In Victoria as of 1996, 40 percent of consumers who were able to choose their suppliers (users of more than 750 megawatt hours) had switched to obtain better prices.<sup>17</sup> During 1990-97, the increase in nominal electricity prices was 2.4 percent less than the total CPI increase.

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<sup>13</sup> USDOE, EIA, “Electricity Reform Abroad and U.S. Investment.”

<sup>14</sup> ESAA, *Electricity Australia 1999*, (Gotham City Press: Sydney), p. 17.

<sup>15</sup> ESAA, *Electricity Australia 1999*.

<sup>16</sup> ESAA, *Electricity Australia 1999*, p. 35.

<sup>17</sup> IEA, *Energy Policies of IEA Countries*, p. 97.

**Table 3-2  
State-by-state outline of the generation, transmission, distribution, and retail supply businesses**

State	Generation	Transmission	Distribution <sup>1</sup>	Retail Supply <sup>1</sup>
New South Wales	4 state-owned firms, 1 private	TransGrid - state-owned monopoly	6 state-owned firms, each a regional monopoly	25 licensed firms
Victoria	7 firms, all privately owned	PowerNet - privatized monopoly	5 privatized firms, each a regional monopoly until December 2000, when all customers will be eligible	23 licensed firms, 5 of which share the State's non-eligible customers
Queensland	2 state-owned firms, 2 privatized	Powerlink, state-owned monopoly	7 state-owned firms, due to be combined into 2 firms	20 licensed firms, 2 of which share the State's non-eligible customers
South Australia	3 state-owned firms (1 sale underway), 1 privatized	ElectraNet, scheduled for privatization in April 2000	1 monopoly firm, privatized on a long-term lease	13 licensed firms. ETSA Power, privatized in 2000, supplies non-eligible customers
Tasmania	1 state-owned firm	Transend Networks, state-owned monopoly	Aurora Energy - state-owned monopoly	Aurora Energy - state-owned monopoly
Australian Capital Territory	None -previously supplied by NSW generators, now participates in NEM	TransGrid - the state-owned monopoly of New South Wales	3 licensed firms	17 licensed firms, one of which shares the State's non-eligible customers

<sup>1</sup> In most cases, the distribution firms serve as retail supply firms for the state's non-eligible customers. The remaining retail supply firms compete for business from a state's eligible customers. Several retail supply firms have operations in more than one state.

Note: Western Australia and the Northern Territory have vertically integrated, state-owned, monopoly electric power firms.

Source: Electricity Supply Association of Australia, *Electricity Australia 1999*; USDOE, *Electricity Reform Abroad and U.S. Investment*, and press reports.

**Table 3-3**  
**Timetable for competitive retail trading**

State	Consumption threshold greater than or equal to (Megawatt hours)	Date Eligible	Number of Customers
Victoria	5,000	11/30/94	47
	1,000	7/1/95	380
	750	7/1/96	1900
	160	7/1/98	8900
	All customers	12/1/2000	2,100,000
New South Wales	40,000	10/10/96	47
	4,000	4/1/97	660
	750	7/1/97	3560
	160	7/1/98	13,000
	All customers	1/1/2001	2,750,000
Australian Capital Territory	20,000	10/1/97	5
	4,000	3/1/98	40
	750	5/1/98	247
	160	7/1/98	781
	All customers	1/1/2001	126,730
Queensland	40,000	3/29/98	37
	4,000	10/1/98	390
	200	7/1/99	6400
	All customers	1/1/2001	1,600,000
South Australia	4,000	12/20/98	150
	750	7/1/99	635
	160	1/1/2000	2600
	All customers	1/1/2003	720,000

Source: Electricity Supply Association of Australia, *Electricity Australia 1999*, p. 18.

**Table 3-4**  
**Percentage changes of electricity prices during 1992/93 - 1996/97 (inflation adjusted)**

	Residential	Commercial/Industrial	Total
Australian Capital Territory . . .	-5.8	-12.6	-8.9
New South Wales . . . . .	-10.3	-28.0	-23.4
Northern Territory . . . . .	-10.0	-10.4	-10.6
Queensland <sup>1</sup> . . . . .	-10.1	1.3	-2.6
South Australia . . . . .	-2.6	-23.8	-14.3
Tasmania . . . . .	-9.8	-1.4	-4.4
Victoria . . . . .	-0.9	-19.1	-11.6
Western Australia . . . . .	-11.3	-18.5	-16.0
Australian average . . . . .	-7.0	-18.6	-14.6

<sup>1</sup> The price increase of commercial and industrial electricity reflects the effect of the loss of a large industrial customer who was previously under a very low negotiated price.

Source: Electricity Supply Association of Australia.

## *Remaining Impediments to Competition*

Industry representatives generally indicate that the Australian electricity market is open to foreign investment but some barriers to market access remain. The first of these is the extent to which the electric power sector remains controlled by Australia's State governments. As noted above, significant privatization has taken place only in Victoria and South Australia. In the other NEM participant states (Queensland and New South Wales), most of the electricity assets remain state-owned. This has the effect of limiting investment in those states, but U.S. industry representatives have also cited continued state ownership of electricity assets as a problem for privately owned firms in Victoria.<sup>18</sup> In the generation industry, foreign investors find it difficult to compete with state-owned companies in New South Wales, since these companies have low debt levels compared to privately financed plants, and they reportedly receive support from the State government.<sup>19</sup> Several industry representatives stated in interviews that they are planning to leave the Australian market due to this problem, or that the issue is preventing them from making new investments in Australia's electricity sector.<sup>20</sup>

Transmission capacity has also been a problem in Australia. Although in most cases there is enough interconnection capacity to meet demand, some contend that the capacity is not enough to foster a truly integrated national market.<sup>21</sup>

Several industry representatives have also reported a number of problems with the electric power regulatory regime. The combination of three national regulatory bodies, in addition to the state-level regulators, has created a very complex system. Regulators may have differing views on the same issues, making it difficult for companies to respond to their separate concerns. One source identified four issues in connection with the regulatory structure:

- There are not enough resources, skills, and experience in the field to staff so many separate regulatory agencies;
- The large number of regulators, with widely varying responsibilities, makes it difficult to gain agreement on needed system reforms;
- It is possible for market participants to play regulators off against each other, locating electricity assets in jurisdictions that provide the most favorable regulatory rulings; and

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<sup>18</sup> Almost all of the U.S.-owned electricity assets in Australia are in the state of Victoria. These privately owned firms primarily compete with state-owned firms in New South Wales and more recently with privately owned firms in South Australia.

<sup>19</sup> U.S. industry representative, E-mail response to questions by USITC staff, May 24, 2000.

<sup>20</sup> U.S. industry representatives, E-mail response to questions by USITC staff, May 17, 2000 and May 24, 2000.

<sup>21</sup> U.S. industry representative, interview by USITC staff, Tokyo, Japan, June 6, 2000; and "Australia's Energy Reform: An Incomplete Journey," *Report for the Business Council of Australia*, found at Internet address <http://www.bca.com.au>, retrieved June 26, 2000, pp. 18-19.

- The different regulatory rules imposed by the State governments raise costs for those market players operating nationally.<sup>22</sup>

In addition, ongoing legislative changes and amendments to the National Electricity Code have made corporate planning difficult. Market participants have also raised the issue of a recent, significant increase in fees charged by NEMMCO, reporting that there is no oversight of this agency.<sup>23</sup> Several U.S. companies have announced decisions to sell their investments in Australia.<sup>24</sup>

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<sup>22</sup> “Australia’s Energy Reform: An Incomplete Journey,” p. 31.

<sup>23</sup> *Ibid.*, p. 32.

<sup>24</sup> U.S. industry representatives, telephone interviews by USITC staff, May 16, 2000 and May 22, 2000. See also, “Australia’s Energy Reform: An Incomplete Journey.”



# CHAPTER 4

## CANADA

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*Alberta and Ontario pioneer the privatization and restructuring of the electricity industry in Canada, with the former planning to extend consumer choice to residences in 2001. Ownership of electricity assets by other provinces and low-cost hydropower limit market entry in the generation segment. Side-by-side market reform in Canada and the United States could promote U.S. access to Canadian transmission networks.*

### Nature and Extent of Regulatory Reform

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Canada's energy policy reflects a constitutional division of power between the federal and provincial governments. Energy resources within the provinces belong to the provinces, whereas resources outside the provinces and in offshore areas belong to the federal government.<sup>1</sup> As a result, electricity reform is primarily under the jurisdiction of the provinces, with the Federal Government limited to international electricity trade, inter-provincial trade, and nuclear energy.<sup>2</sup> As such, regulatory reform is expected to proceed at the discretion and pace of the various provinces, and currently only two provinces, Alberta and Ontario, have made substantial steps to introduce competition in their electricity markets.

In Alberta, the Electric Utilities Act, passed in 1995, and the Electric Utilities Amendment Act, passed in 1998, set the objectives for reform of the provincial electricity market. Objectives for the restructuring process are to 1) establish an efficient market for electrical power generation; 2) ensure that the benefits and costs associated with existing regulated plants would continue to be shared equitably by current and future customers; 3) ensure that investment in new generation is guided by competitive market forces; and 4) where regulation remains necessary, minimize its cost and provide incentives for efficiency.<sup>3</sup> In November 1998, the Ontario

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<sup>1</sup> International Energy Agency (IEA), *Energy Policies of IEA Countries: Canada 1996 Review* (Paris: OECD, 1996), p. 21.

<sup>2</sup> Ibid., p. 77.

<sup>3</sup> Ibid.

Legislature proclaimed the Energy Competition Act.<sup>4</sup> The objectives of the Act are to establish a competitive electricity market in the Province, provide new tools for environmental protection, and ensure a reliable supply of electricity at the lowest possible cost.<sup>5</sup>

Reform of the Canadian market has entailed relatively little privatization. Some Canadian utilities are owned by private investors, but most of the large utilities are Crown corporations that remain under the ownership of the provinces or territories (table 4-1). In terms of vertical restructuring, Alberta is in the process of separating the various segments of the electricity industry. In Ontario, generation has been separated from transmission and distribution, and distribution and retail supply are undergoing accounting separation. In terms of horizontal restructuring, Alberta has required three dominant generators to auction the rights to their capacity to retail marketers, essentially creating more electricity sellers. Ontario has required its single dominant generator to reduce its share of the provincial market.

In Alberta, the Energy and Utilities Board (EUB) is the principal regulatory body.<sup>6</sup> In Ontario, the Ontario Energy Board is the principal regulator. In both Alberta and Ontario, nondiscriminatory system access is guaranteed and system operators are independent from dominant utilities. Alberta has established a wholesale power pool, and currently permits industrial customers to choose suppliers. Alberta plans to extend choice to household consumers in 2001. Ontario initially planned to have a competitive market by November 2000,<sup>7</sup> but this schedule has been delayed indefinitely.<sup>8</sup>

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<sup>4</sup> The Energy Competition Act was passed by the Ontario Legislature on October 29, 1998, and received Royal Assent on October 30, 1998. A majority of the Act's sections were proclaimed on November 7, 1998, others on November 14, 1998. Sections of the Act that pertain to the changeover from Ontario Hydro to the successor corporations were proclaimed in early 1999. The Act's sections that pertain to open access will be proclaimed sometime in 2000.

<sup>5</sup> Ontario Ministry of Energy, Science and Technology, "Electricity Restructuring," found at Internet address [http://www.est.gov.on.ca/english/en/en\\_elec.html](http://www.est.gov.on.ca/english/en/en_elec.html), retrieved Apr. 28, 2000, p. 1.

<sup>6</sup> The Alberta Energy and Utilities Board (EUB) is responsible for development of the province's energy resources, including generation and transmission, and also regulates rates and terms of investor-owned electricity services. EUB, "Restructuring," found at [http://auctionppa.com/html/aem\\_restructuring.html](http://auctionppa.com/html/aem_restructuring.html), retrieved Apr. 30, 2000, p.1.

<sup>7</sup> U.S. Energy Information Administration, "Canada Country Report," found at Internet address <http://www.eia.doe.gov/emeu/cabs/canada.html>, retrieved Apr. 4, 2000, p. 6.

<sup>8</sup> Industry representative, telephone interview by USITC staff, Aug. 14, 2000.

**Table 4-1**  
**Major electricity generating companies and utilities by province**

Province	Electric Utility	Ownership
Newfoundland	Newfoundland and Labrador Hydro	Provincial
	Newfoundland Light & Power Company Limited	Private
Prince Edward Island	Maritime Electric Company Limited	Private
Nova Scotia	Nova Scotia Power Incorporated	Private
New Brunswick	New Brunswick Electric Power Corporation	Provincial
Quebec	Hydro-Quebec	Provincial
Ontario	Ontario Power Generation	Provincial
	Ontario Hydro Services Company	Provincial
	Bruce Power Partnership	Private
Manitoba	Manitoba Hydro-Electric Board	Provincial
	City of Winnipeg Hydro-Electric System	Municipal
Saskatchewan	Saskatchewan Power Corporation	Provincial
Alberta	Alberta Power Limited	Private
	Edmonton Power	Municipal
	TransAlta Utilities Corporation	Private
British Columbia	British Columbia Hydro & Power Authority	Provincial
	West Kootenay Power	Private
Yukon	Yukon Energy Corporation	Territorial
Northwest Territories	Northwest Territories Power Corporation	Territorial

Source: International Energy Agency, 1996, p 78; and U.S. industry and government representatives, telephone interviews by USITC staff, Washington, DC, Aug. 16-18, 2000.

## Current Market Conditions

### *Alberta*

#### Generation

In Alberta, the electricity market is dominated by three previously regulated utilities (see table 4-1), which generate about 90 percent of the province's power. Several industrial cogenerators and independent power producers (IPPs) account for the remainder of generation. Only pre-1996 generation capacity is subject to regulation. Owners of pre-1996 generation capacity receive regulated cost-of-service payments to cover fixed costs and stranded investment.<sup>9</sup> Such payments will be discontinued by 2020. Generation facilities built during or after 1996 can compete directly in an open market, enabling both IPPs, cogenerators, and importers to compete on an equal basis with the existing regulated utilities.<sup>10</sup> These generators compete with each other by submitting bids to Alberta's power pool, which has operated a wholesale spot market for electricity since 1996.

<sup>9</sup> IEA, *Energy Policies of IEA Countries: Canada 1996 Review*, p. 81.

<sup>10</sup> Alberta Resource Development, "Reduced Regulatory Burden," found at Internet address <http://www.resdev.gov.ab.ca/electric/general/regulate.htm>, retrieved Apr. 30, 2000, p. 2.

In 1999, Alberta established a new plan to auction the electricity generated by the three privately-owned utilities built before 1996. In February 2000, Alberta announced the initiation of Power Purchase Arrangements (PPAs) with terms that range from three to twenty years, depending upon the remaining life of the generating facility. The power, or actually the capacity to produce power, was sold in an electronic auction<sup>11</sup> held in August 2000 to marketers who will, in turn, sell the power to distributors through the provincial power pool.<sup>12</sup> The objective of the auction is to increase competition by bringing additional companies into the market without forcing privately-owned corporations to sell off some of their assets. As of August 2000, there were seven certified marketers participating in the auction. Successful bidders will negotiate PPAs with the owners of the generating stations to determine how the owners will be paid for the electricity produced.<sup>13</sup> There are restrictions included in the rules so that no bidder can win PPAs that represent more than 20 percent of the available capacity.<sup>14</sup> The proceeds of the power auctions will be allocated by the EUB, with one portion continuing to pay off the stranded costs in 31 generating units, and the remainder being returned to consumers.<sup>15</sup>

## **Transmission and Distribution**

A separate provincially-owned entity, ESBI Alberta Ltd., operates as an independent transmission administrator (TA) and sets tariffs for system access. Buyers and sellers trading through the power pool arrange transmission through the TA, which ensures that access to the system is offered in a transparent and non-discriminatory manner.<sup>16</sup> Transmission services remain fully regulated, and the EUB determines the province-wide “postage stamp” transmission rate to ensure that electricity rates paid by consumers are independent of location in the province. The current regulatory structure does not accommodate direct retail purchases from the pool or from suppliers other than the monopoly distributor.<sup>17</sup> The buyers from the pool are the wholesale and retail distributors that service their retail customers. Participation in the power pool’s market, where prices are set hourly, is mandatory for distributors.

## **Retail Supply**

Starting January 1, 2001, the retail electricity market in Alberta will be open to competition, meaning that all consumers will be able to choose their power suppliers. During transition, consumers will have the option to retain regulated service from their

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<sup>11</sup> The auction was designed and is being operated by Charles River Associates, Boston, Massachusetts.

<sup>12</sup> Alberta Resource Development, “Reduced Regulatory Burden,” p. 2.

<sup>13</sup> Industry representative, telephone interview by USITC staff, Aug. 15, 2000.

<sup>14</sup> Alberta Power Pool, “Auction Rules,” found at Internet address [http://www.auctionppa.com/html/apr\\_rules.htm](http://www.auctionppa.com/html/apr_rules.htm), retrieved Aug. 15, 2000, p. 2.

<sup>15</sup> Alberta Resource Development, “Reduced Regulatory Burden,” p. 8.

<sup>16</sup> Alberta Power Pool, “PA Auction,” found at Internet address <http://www.auctionppa.com/html>, retrieved Apr. 30, 2000, p. 1.

<sup>17</sup> IEA, *Energy Policies of IEA Countries: Canada 1996 Review*, p. 87.

existing supplier for a specified term.<sup>18</sup> Residential and farm customers may elect this option for five years, and small businesses, for three years.<sup>19</sup> Retail services, including rate design and billing, are to be fully deregulated by 2006, or the end of the five-year transition period.<sup>20</sup>

## *Ontario*

### **Generation**

In 1998, Ontario became the second province to begin regulatory reform in its electricity industry. Prior to the reforms, Ontario Hydro, the incumbent monopoly provider of electricity in the province, had accumulated substantial public debts and had posted the highest electricity rates in Canada.<sup>21</sup>

Ontario Hydro ceased operation on April 1, 1999, and its primary functions were reorganized into two provincially-owned commercial corporations and a non-profit corporation. Ontario Hydro Services Company (OHSC) is a holding company for the transmission, distribution, and retail service operations. Ontario Power Generation Inc. (OPG) assumed ownership and operating control of Ontario Hydro's generation assets. OPG currently controls about 85 percent of Ontario's generation capacity.<sup>22</sup> However, OPG is required to relinquish control of 4000 MW of this capacity within 42 months of market opening, as a step toward reducing its market share to no more than 35 percent. OPG announced in February 2000 that it would relinquish control more than three years earlier than required by the Market Power Mitigation Agreement.<sup>23</sup> The CAN\$3.1 billion long-term lease arrangement with British Energy to operate the new Bruce nuclear power plant is part of the plan to reduce the dominance of OPG. The Bruce plant, at 4000 MW, accounts for about 13 percent of generating capacity in Ontario.<sup>24</sup>

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<sup>18</sup> At least two of the three regulated generators in Alberta are reportedly preparing to divest themselves of some, if not all, of their retail operations.

<sup>19</sup> Alberta Resource Development, "Effects of Competition," found at Internet address <http://www.resdev.gov.ab.ca/electric/restruct/euaa.htm>, retrieved Apr. 30, 2000, p. 9.

<sup>20</sup> Alberta Resource Development, "Backgrounder on the Electric Utilities Amendment Act, 1998," found at <http://www.resev.gov.ab.ca/electric/restruct/euaa.htm>, retrieved Apr. 30, 2000, p. 9.

<sup>21</sup> Ontario Ministry of Energy, Science and Technology, "Electricity Restructuring, and Bill 35," the Energy Competition Act, 1998, found at [http://www.est.gov.on.ca/english/am/am\\_faq.html](http://www.est.gov.on.ca/english/am/am_faq.html), retrieved Apr. 8, 2000, p. 3.

<sup>22</sup> Toronto Hydro Corporation, "Some Pertinent Facts About Bill 35, The Energy Competition Act," found at Internet address [http://www.torontohydro/corporate/corp\\_deregulation.htm](http://www.torontohydro/corporate/corp_deregulation.htm), retrieved May 5, 2000, p. 3.

<sup>23</sup> Canadian Electricity Association, "Ontario Power Generation Announces Faster Decontrol," found at Internet address [http://www.canelect.ca/connections\\_onl;ine/this\\_week/canada/OPG3.htm](http://www.canelect.ca/connections_onl;ine/this_week/canada/OPG3.htm), retrieved Apr. 27, 2000, p. 1.

<sup>24</sup> Industry representative, telephone interview by USITC staff, Aug. 14, 2000.

## Transmission and Distribution

A new, non-profit corporation, the Independent Electricity Market Operator (IMO), will operate the transmission system, ensure nondiscriminatory system access, and guard against abuses of market power.<sup>25</sup> The Ontario Energy Board (OEB) oversees the operation of the system and approves mergers and acquisitions. The OEB must approve the acquisition of generating facilities by distributors or transmitters, and the acquisition of transmission or distribution assets by the generators. However, the legislation grandfathered the current distributors' ownership of generating assets.<sup>26</sup> The OEB also requires that private utilities have a license to generate, transmit, distribute, or sell electricity in the Ontario market.<sup>27</sup> The OEB must also review and approve the fees to be charged to market participants for the administration of the electricity markets in Ontario.<sup>28</sup>

Through its subsidiaries, OHSC owns and operates Ontario's high voltage transmission system transporting electricity to large industrial customers and municipal utilities. OHSC also owns and operates low voltage distribution facilities serving smaller municipal utilities and nearly one million retail customers in the province. OHSC has signed letters of intent with about 20 municipalities to acquire their electric utilities and is negotiating with others.<sup>29</sup> In March 2000, the OEB approved the first acquisition of a municipal utility by the Ontario Hydro Networks Company (OHNC), a wholly-owned subsidiary of OHSC.<sup>30</sup>

While OHSC retains its distribution and transmission businesses, OEB requires that separate accounts be maintained so that the two functions can be regulated effectively. The legislation calls for the separation of such businesses only where necessary to prevent cross-subsidization of regulated and competitive business units.<sup>31</sup>

## Retail Supply

Ontario's restructuring legislation also mandated the separation or unbundling of electricity distribution services from retail supply services. The municipal electric utilities and rural distribution services of the former Ontario Hydro were required to separate their distribution and energy supply businesses. The resulting Local

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<sup>25</sup> Ontario Ministry of Energy, Science and Technology, "Electricity Restructuring and Bill 35, the Energy Competition Act, 1998," p. 4.

<sup>26</sup> *Ibid.*, p. 6.

<sup>27</sup> *Ibid.*, p. 10.

<sup>28</sup> Ontario Energy Board, "Electricity and Gas Rates," found at Internet address [http://www.oeb.gov.on.ca/english/establishing\\_electricity\\_and\\_gas\\_rates.htm](http://www.oeb.gov.on.ca/english/establishing_electricity_and_gas_rates.htm), retrieved July 14, 2000.

<sup>29</sup> Ontario Hydro Services Company Inc., *1999 Annual Report*, 1999.

<sup>30</sup> Canadian Electricity Association, "Ontario Energy Board Approves Ontario Hydro Networks Company's Purchase of Artemesia Utility," press release, found at [http://www.canelect.ca/connections\\_online/this\\_week/canada/OHSC1.htm](http://www.canelect.ca/connections_online/this_week/canada/OHSC1.htm), retrieved, Apr. 27, 2000, p. 1.

<sup>31</sup> Ontario Ministry of Energy, Science and Technology, "Electricity Restructuring and Bill 35, the Energy Competition Act, 1998," p. 6.

Distribution Companies (LDCs) remain monopolies and their distribution rates are regulated by the OEB.

In the new market environment,<sup>32</sup> the wholesale price of electricity will cease to be fixed annually. Although the prices for transmission and distribution will be regulated, the spot market energy price will change hourly as the IMO calculates the price based on supply and demand factors. As customers will be able to respond to these price signals, suppliers will have opportunities to offer a variety of pricing and service packages.<sup>33</sup> Such suppliers include distributors, wholesale sellers, wholesale consumers, and retailers.<sup>34</sup>

## ***Remaining Impediments to Competition***

The Canadian market continues to be dominated by major provincial utilities which have excess generating capacity. The dominance of relatively low-cost hydropower may make it difficult for those who wish to participate in power generation. Only Alberta has truly opened its generation market to competition. Most of the other provinces have yet to develop a wholesale supply market, let alone a retail supply market, and power trading remains in its infancy.

One potential issue that may arise in relations between the United States and Canada concerns the issue of reciprocity. Federal Energy Regulatory Commission (FERC) orders 888 and 888-A require all transmission service providers that also wish to sell power at unregulated rates in the U.S. wholesale market to post a pro forma open-access transmission tariff with FERC. By posting an open-access tariff, they are essentially unbundling the transmission charge from the cost of electric power, such that all users of the transmission grid pay the same rate. Even the transmission grid owner must charge itself this same rate if it transmits its own power. Essentially, this means that transmission owners must offer each other reciprocal access to their facilities in order to participate in the wholesale market. The same rules apply to Canadian firms that wish to participate in the U.S. wholesale market, which means that provincial governments must restructure their electricity markets to provide the same level of transmission access.<sup>35</sup> Canadian market participants have thus far agreed to this reciprocity provision on a voluntary basis. However, this could become a significant issue for Canadian producers if U.S. deregulation proceeds faster than Canadian deregulation.<sup>36</sup>

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<sup>32</sup> Independent Electricity Market Operator, "Introducing Ontario's Competitive Electricity Market," found at Internet address [http://www.iemo.com/imoweb/mkt\\_trans/background/background.asp](http://www.iemo.com/imoweb/mkt_trans/background/background.asp), retrieved Apr. 28, 2000, p. 2.

<sup>33</sup> *Ibid.*, p. 1.

<sup>34</sup> *Ibid.*, pp. 1-2.

<sup>35</sup> Commission for Environmental Cooperation (CEC), *Assessing Environmental Effects of the North American Free Trade Agreement (NAFTA), An Analytical Framework (Phase II) and Issue Studies*, (Montreal, Canada, 1999), p. 291.

<sup>36</sup> CEC, *Assessing Environmental Effects of the North American Free Trade Agreement (NAFTA), An Analytical Framework (Phase II) and Issue Studies*, p. 290.



# CHAPTER 5

## JAPAN

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*Regional power companies retain virtual monopolies, though Japan makes provisions for niche competitors. Large industrial and commercial customers are granted consumer choice. Market power of regional firms leaves grid access problematic.*

### Nature and Extent of Regulatory Reform

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Japan has undertaken regulatory reform of its electric power sector with the objective of bringing its electricity rates, currently the highest among all OECD countries, in line with international levels by 2001.<sup>1</sup> Japan's electric power industry remains dominated by 10 privately-owned, vertically integrated power companies that perform generation, transmission, distribution, and retail supply functions.<sup>2</sup> Japan has introduced limited competition into the generation and retail supply segments of its electric power market.<sup>3</sup> A 1995 amendment<sup>4</sup> to the Electric Utility Industry Law (EUIL)<sup>5</sup> opened Japan's generation and wholesale supply<sup>6</sup> segments to independent power producers (IPPs) by permitting IPPs to construct thermal power plants and supply power to vertically integrated power companies (table 5-1). Further, the 1995 amendment created a new category of electric power provider, "the special electric utility," which supplies electricity to customers not served by the vertically

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<sup>1</sup> Organization for Economic Cooperation and Development (OECD), *Regulatory Reform in Japan*, (OECD: Paris, France, 1999), p. 290.

<sup>2</sup> The 10 electric utilities are located in the following areas (listed from north to south): Hokkaido, Tohoku, Tokyo, Chubu, Hokuriku, Kansai, Chugoku, Shikoku, Kyushu, and Okinawa. The Okinawa Electric Power Company shares no transmission links with the other nine utilities, and has not been included in most industry reforms. Japan Electric Power Information Center, Inc. (JEPIC), *Electric Power Industry in Japan, 1999/2000*, (Tokyo 1999), p. 46.

<sup>3</sup> "Overview of the Interim Report on the Subcommittee of Basic Policy Directions: Electricity Utility Industry Council," Dec. 24, 1998, found at Internet address <http://www.miti.go.jp/report-e/gNR1101e.html>, retrieved Jan. 7, 2000.

<sup>4</sup> Law No. 75, passed on April 21, 1995.

<sup>5</sup> Law No. 170, passed on July 11, 1964.

<sup>6</sup> The term "wholesale supply" refers to the supply of electric power by IPPs to one of Japan's general electric utilities.

**Table 5-1  
Principal reforms to Japan's electric power sector following 1995 and 1999 amendments to  
Electric Utility Industry Law (EUIL) businesses**

1995 Amendment	1999 Amendment
<p>Permitted IPPs to bid for short-term thermal power projects (lead time of seven years) commissioned by electric utilities. Utilities determine the amount of capacity to be auctioned and the ceiling prices for bids.</p>	<p>Permits firms to construct new power plants without approval from MITI. (Firms must submit "after-the-fact" notification of construction plans, and power plants must meet environmental, technical, and safety standards.)</p>
<p>Permitted special electricity suppliers to supply power to customers who do not receive power from one of the 10 general electric utilities.</p>	<p>Permits large-scale customers (those with demand of 2 MWh/year or higher and at the level of 20,000 volts or more) to choose their own power supplier, and provides third-party access to utilities' transmission networks. MITI will require utilities to publish transmission rates and terms of access to transmission lines.</p>
	<p>Requires utilities to place all new thermal capacity up for tender. Permits utility companies to bid for wholesale supply to other utilities located outside their service area.</p>
	<p>Establishes a "forward-looking" cost methodology for utilities, allowing them to incorporate anticipated cost efficiencies from improved technology or administrative procedures in the calculation of transmission rates. MITI will develop and implement rules on which costs utilities are permitted to include.</p>
	<p>Removes an antimonopoly exemption on the electricity industry. Allows MITI and the Japan Fair Trade Commission (JFTC) to establish competition policy guidelines for the retail power business.</p>
	<p>Proposes the establishment of separate accounting systems for the generation and transmission (including ancillary services) activities of the electric utilities, which would require utilities to charge their own generation units the same transmission prices as they would third-party users.</p>

Source: *Electric Power Industry in Japan, 1999/2000*, Japan Electric Power Information Center, Inc., Tokyo, 1999, p. 18; "Japan Moves Toward Deregulation of Retail Sales of Electric Power," *East Asian Executive Reports*, Nov. 15, 1997; "Summary of Reports," prepared by the Joint Subcommittee of Basic Policy Committee and Rate System Committee Electricity Utility Industry Council, Dec. 2, 1999, p. 2; and U.S. Trade Representative, *2000 National Trade Estimate on Foreign Trade Barriers*, p. 195.

integrated firms.<sup>7</sup> A 1999 amendment<sup>8</sup> partially liberalized the retail supply segment, permitting large-scale consumers (those with demand of more than 2 megawatts hours per year and at the level of 20 kilovolts or higher) to choose their own electricity supplier.<sup>9</sup> Suppliers to these large consumers are called “special scale electric utilities,” and appear to include firms with generation capacity, including IPPs, as well as marketers who will purchase capacity in the wholesale market as this market develops. The 1999 amendment further promotes competition by permitting the vertically integrated power companies to supply power to other vertically integrated power companies outside of their service region.<sup>10</sup> Vertical restructuring has been modest, with the large utilities receiving direction to establish separate accounting systems for their generation and transmission operations.<sup>11</sup>

Following the 1999 amendment to the Electric Utility Industry Law, Japan introduced additional regulatory measures to support electric power sector reform. These measures required MITI to develop administrative rules regarding transmission rates and third-party access to transmission networks, remove an exemption for the electric utility industry under Japan’s Antimonopoly Law, and work with the Japan Fair Trade Commission (JFTC) to create competition policy guidelines.<sup>12</sup>

Japan’s electric power sector is regulated by the Agency of Natural Resources and Energy (ANRE) and its parent organization, the Ministry of International Trade and Industry (MITI).<sup>13</sup> The most recent reforms to the Electric Utility Industry Law assign MITI the following regulatory responsibilities:

- developing, implementing and enforcing administrative rules pertaining to utilities’ calculation of transmission charges, and open and fair access to transmission networks in accordance with the Electric Utility Industry Law;

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<sup>7</sup> Article 5, section 6 of Law No. 75, which amends the Electric Utility Industry Law, states that the Ministry of International Trade and Industry (MITI) will grant permission for the operation of a special electric utility “in the case [...] that the commencement of such business activity is not likely to impair the interests of electricity consumers in the service area of [a] general electric utility supply business.” Special electric utilities do not supply power to the general public. Agency of Natural Resources and Energy, MITI, *The Electric Utilities Industry Law*, and JEPIC, Dec. 1995, p. 4.

<sup>8</sup> The amendment to the Electric Utility Industry Law was passed on May 14, 1999, and became effective on March 21, 2000.

<sup>9</sup> Partial liberalization of retail power was recommended by the Basic Policy Committee, established by the Electric Utility Industry Council in July 1997. “Japan Moves Toward Deregulation of Retail Sales of Electric Power,” *East Asian Executive Reports*, Nov. 15, 1997.

<sup>10</sup> “Japan Moves Toward Deregulation of Retail Sales of Electric Power,” and Peter Evans, Ph.D. candidate, Massachusetts Institute of Technology (MIT), telephone interview by USITC staff, Mar. 20, 2000.

<sup>11</sup> U.S. Trade Representative (USTR), *2000 National Trade Estimate on Foreign Trade Barriers*, p. 195, and OECD, *Regulatory Reform in Japan*, p. 88.

<sup>12</sup> Ibid.

<sup>13</sup> “Overview of the Ministry of International Trade and Industry (MITI),” found at Internet address <http://www.miti.go.jp/>, retrieved Mar. 6, 2000.

- monitoring utilities' transmission rates with respect to third-party users and issuing change orders in the event that such rates do not conform to MITI rules;<sup>14</sup>
- administering environmental, technical, and safety standards for power generating facilities;
- formulating competition policy guidelines jointly with the Japan Fair Trade Commission; and
- settling disputes (in conjunction with the JFTC).<sup>15</sup>

Subsequent to January 2001, MITI will reportedly separate its policymaking and regulatory activities pertaining to the electric power sector between two newly-established divisions: the Policy Planning Division, which will be in charge of all policymaking agenda, and the Electricity Marketing Division, which will be in charge of industry regulation under the Electric Utility Industry Law. The latter division will work with the JFTC in overseeing deregulation of the electric power market.<sup>16</sup>

## Current Market Conditions

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### *Generation*

Prior to the 1995 amendment to the Electric Utility Industry Law, Japan's generation segment comprised 10 vertically-integrated electric power companies and wholesale electricity suppliers,<sup>17</sup> including the Electric Power Development Corporation

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<sup>14</sup> The utilities are required to make information regarding how they calculate transmission rates for third-party users available to MITI (although not to the public). If a third-party user complains to MITI that a particular utility's transmission rates are unfair, MITI may issue a change order requiring the utility to revise its transmission charges. Japanese Government Officials, interviews by USITC staff, Tokyo, Japan, June 7, 2000.

<sup>15</sup> Generally, MITI has jurisdiction over disputes that concern the Electric Utility Industry Law, while the JFTC has jurisdiction over cases that involve the Antimonopoly Law. However, because the dispute resolution process is much shorter for MITI than for the JFTC (one month for MITI versus several months for the JFTC), disputants are often advised to settle their disputes through MITI. Japanese Government Officials, interviews by USITC staff, Tokyo, Japan, June 6 and 9, 2000.

<sup>16</sup> Japanese Government Officials, interviews by USITC staff, Tokyo, Japan, June 7, 2000.

<sup>17</sup> Wholesale electric power companies in Japan are prohibited from selling electricity on a retail basis to consumers. *International Comparisons of Electricity Regulation*, (Cambridge: Cambridge University Press, 1996), ed. Richard J. Gilbert and Edward P. Kahn, p. 239.

(EPDC),<sup>18</sup> the Japan Atomic Power Company (JAPC),<sup>19</sup> municipal and joint venture power companies, and self-generators<sup>20</sup> (table 5-2). The 1995 amendment provided for market entry among IPPs and special electric utilities,<sup>21</sup> and the 1999 amendment developed the special scale electric utility, which supply large scale consumers through transmission lines owned and operated by the large electric utilities.<sup>22</sup>

Under the Electric Utility Industry Law, MITI grants approval to new entrants in the electric power services sector based on whether they plan to enter the general, wholesale, special, or special scale electric utility supply business.<sup>23</sup> Where IPPs desire to function as wholesale suppliers<sup>24</sup> to the vertically integrated firms, the latter are responsible for conducting tenders and determining ceiling prices for bids.<sup>25</sup> The 1999 revision to the EUIL allows IPPs to serve as special scale electric utilities, supplying power to large-scale commercial and industrial consumers. There are 8,300 large-scale consumers in Japan that account for nearly 28 percent of all electricity

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<sup>18</sup> The Electric Power Development Corporation generates both thermal and hydroelectric power. Two-thirds of EPDC are owned by the national government, with the remaining third owned by nine regional utilities in Japan. In July 1997, the Japanese Cabinet approved the privatization of the EPDC, which is to be completed through the sale of the government's stake in the company by 2003. OECD, *Regulatory Reform in Japan*, pp. 286-287; and industry representatives, interview by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>19</sup> The Japan Atomic Power Company generates nuclear power, and was established by nine regional utilities (excluding Okinawa), EPDC, and other nuclear firms. OECD, *Regulatory Reform in Japan*, pp. 286-287.

<sup>20</sup> Local governments own and operate the 34 municipal electric utilities, which generate hydroelectric power. The 20 joint venture generating companies, which produce primarily thermal power, were established by the regional utilities and large-scale industrial consumers. JEPIC, *Electric Power Industry in Japan, 1999/2000*, p. 48.

<sup>21</sup> MITI, Agency of Natural Resources and Energy (ANRE), *The Electric Utilities Industry Law*, Agency of Natural Resources and Energy, MITI, and JEPIC, p. 4.

<sup>22</sup> U.S. Department of Commerce (USDOC), International Trade Administration (ITA), "Revision of Electricity Law," *International Market Insight (IMI)*, June 16, 1999, found at Internet address <http://www.csjapan.doc.gov/imi9906/electricity.html>, retrieved Feb. 15, 2000.

<sup>23</sup> MITI, ANRE, *The Electric Utilities Industry Law*, and JEPIC, Dec. 1995, p. 3.

<sup>24</sup> The Electric Utility Industry Law distinguishes between an entity that operates as "wholesale supplier" and a "wholesale electric utility." Whereas a wholesale supplier need only submit "after-the-fact" notification of its intention to supply electricity to a general electric utility, a wholesale electric utility must receive permission to establish by MITI. MITI, ANRE, *The Electric Utilities Industry Law*, Dec. 1995, pp. 1-3, and 14; and industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>25</sup> Utilities determine ceiling prices for bids using avoided costs; i.e., an estimation of the costs to a utility of building a power plant of similar size to one constructed by an IPP. "Japan Moves Toward Deregulation of Retail Sales of Electric Power," *East Asian Executive Reports*, Nov. 15, 1997, and industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

**Table 5-2  
Market participants in Japan's electric power sector following 1995 and 1999 reforms**

	Pre-1995	1995-1999	From March 2000
Generation	10 electric utilities; wholesale suppliers (EPDC, JAPC, 34 municipal utilities, and 20 joint venture companies); and self-generators <sup>1</sup>	10 electric utilities; wholesale suppliers (EPDC, JAPC, 34 municipal utilities, and 20 joint venture companies); self-generators; and independent power producers (IPPs) <sup>1</sup>	10 electric utilities; wholesale suppliers (EPDC, JAPC, 34 municipal utilities, and 20 joint venture companies); self-generators; and independent power producers (IPPs) <sup>2</sup>
Transmission and distribution	10 electric utilities	10 electric utilities ( <i>third-party access granted to wholesale suppliers</i> )	10 electric utilities ( <i>third-party access granted to wholesale and retail suppliers</i> )
Trading and supply	<u>Wholesale</u> : EPDC, JAPC, 34 municipal utilities, and 20 joint venture companies  <u>Retail</u> : 10 electric utilities	<u>Wholesale</u> : EPDC, JAPC, 34 municipal utilities, 20 joint venture companies; and independent power producers (IPPs) <sup>1</sup>  <u>Retail</u> : 10 electric utilities; and special electric utilities <sup>5</sup>	<u>Wholesale</u> : EPDC, JAPC, 34 municipal utilities, 20 joint venture companies; independent power producers (IPPs); <sup>3</sup> self-generators; <sup>4</sup> and electric utilities  <u>Retail</u> : 10 electric utilities; special electric utilities; IPPs supplying large-scale industrial and commercial consumers; and power traders <sup>6</sup>

<sup>1</sup> Self-generators are industrial firms that generate electricity for their own use.

<sup>2</sup> Independent power producers bidding for short-term capacity (maximum of seven years).

<sup>3</sup> Independent power producers bidding for long term capacity (over 10 years).

<sup>4</sup> Self-generators will be permitted to sell excess capacity to retail suppliers, including the 10 general electric utilities.

<sup>5</sup> Special electric utilities are permitted to provide electricity to customers in circumscribed geographic locations.

<sup>6</sup> Large-scale industrial and commercial consumers have electricity demand of 2 MW or higher.

Source: Compiled by the Commission.

consumption.<sup>26</sup> Although IPPs do not need to receive prior government approval to function as special scale electric utilities, they must register with MITI.<sup>27</sup>

## ***Transmission and Distribution***

Amendments to Japan's Electric Utility Industry Law do not affect the regulated monopoly structure of the transmission and distribution segments. However, due to the partial deregulation of the retail supply segment, utilities are required to provide third-party access to their transmission networks.<sup>28</sup> Utilities determine transmission prices, as well as the terms and conditions under which third-party access is provided, in accordance with MITI guidelines.<sup>29</sup>

Under this system, utilities are permitted to establish transmission rates based on an estimation of the future costs of providing such service. In estimating transmission costs, utilities are directed to incorporate cost reductions due to anticipated efficiency gains.<sup>30</sup> Under the "activity-based costing (ABC) method" of accounting, MITI specifies the categories of costs that utilities should use in determining transmission rates and the time period within which such costs should be projected.<sup>31</sup>

## ***Retail Supply***

The vertically integrated power firms remain the dominant retail suppliers in Japan. However, in the aftermath of the 1995 and 1999 amendments to the EUIL, they will eventually compete with special scale electric utilities and power traders.

Since the 1995 reforms, Japan appears to have experienced both a reduction in electricity rates and an increase in consumer surplus, or savings incurred by

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<sup>26</sup> Federation of Electric Power Companies (FEPC), briefing note, No. 123, Feb. 20, 1999. Figures reported by FEPC actually include customers with demand of 22,000 volts or higher.

<sup>27</sup> Participants in the special scale electric utility business are not permitted to use their own transmission lines to supply power. U.S. Department of State, "Revision of Electricity Law," *IMI*, June 16, 1999, found at <http://www.csjapan.doc.gov/imi9906/electricity.html>, retrieved Feb. 15, 2000, and "Reform of the Electricity Supply System in Japan," FEPC, Apr. 2000, p. 12.

<sup>28</sup> Following the 1995 amendment to the EUIL, IPPs were allowed access to the electric utilities' transmission lines for the purposes of wholesale supply only.

<sup>29</sup> USDOC, ITA, "Revision of Electricity Law," *IMI*, June 16, 1999, found at Internet address <http://www.csjapan.doc.gov/imi9906/electricity.html>, retrieved Feb. 15, 2000.

<sup>30</sup> USTR, "Comments on the United States Government on the Draft Report on Electricity Transmission by the Electric Utility Industry Council, Joint Subcommittee on Basic Policy Directions and Electricity Charges, the Revised Electric Utility Industry Law Draft Implementing Ordinances and the Joint JFTC-MITI Draft Guidelines for Fair Electricity Transactions," Nov. 19, 1999.

<sup>31</sup> Generally, the ABC accounting method specifies that utilities should calculate transmission rates based on the costs associated with ancillary, transmission, 'receiving' transformation, supply, and customer services. MITI, ANRE, "The New Framework of the Electric Power Industry," Public Utilities Department, Mar. 2000.

consumers. Electricity rates in 1996 were nearly 6.3 percent lower than the 1989 base rate. Subsequently, in 1998, the average rate paid by residential customers decreased by 4.5 percent over the previous year, while that paid by commercial and industrial customers declined by 5.1 percent.<sup>32</sup> According to a Japanese government study, the consumer surplus in the electric power market increased by roughly three times between 1995 and 1996, and by two-thirds between 1997 and 1998.<sup>33</sup>

## ***Remaining Impediments to Competition***

Deregulation of Japan's electric power sector is currently in its initial stages, and MITI has yet to dismantle a number of market entry barriers. Industry representatives indicate that impediments to market entry into Japan's electric power sector include:

- limited availability of and access to inputs for power generation, including fuel, land, and generating assets;
- lack of access to excess generation capacity;
- transmission access issues, including pricing for transmission service that may render retail supply by new market entrants uncompetitive;
- limited potential access to the power pool operated by the vertically integrated electric utilities in Japan;
- lack of unbundling of the vertically integrated electric utilities;
- lack of an independent regulator;
- lack of an independent system operator;
- environmental requirements (especially at the prefectural and municipal levels) that delay power plant development and result in high construction costs; and
- local certification requirements for power generating equipment that are based on safety rather than on performance standards, and that differ from international norms.

*Limited availability of and access to inputs for power generation:* Industry sources have indicated that participation in the retail power supply market is hampered by limited access to land, fuel, and generating assets. First, the high cost and lack of availability of land in Japan has meant that companies that plan to build new power generating facilities must either own land already or be able to partner with local firms that own land in Japan. Second, because fuel supplies (in this case, liquified natural gas (LNG), the primary fuel used for thermal power generation in Japan) are largely controlled by the vertically integrated electric utilities, IPPs must negotiate with the utilities to purchase LNG. Finally, industry representatives have noted that the incumbent utilities do not appear inclined to sell any of their generating assets, thus requiring that IPPs build their own generating facilities.<sup>34</sup> New power plant

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<sup>32</sup> On average, electricity rates across all classes of customers in 1998 decreased by nearly 4.67 percent compared to 1997. *Electric Power Industry in Japan, 1999/2000*, p. 18.

<sup>33</sup> U.S. Department of State telegram, "Japanese Government Report Shows Regulatory Reform Benefits," message reference No. 00734, prepared by U.S. Embassy, Tokyo, Jan. 28, 2000.

<sup>34</sup> In addition, although the Electric Power Development Corporation (EPDC) is slated to be privatized in 2003, some fear that the two-thirds stake owned by the government will be

(continued...)

construction in Japan physically takes at least one year, but the need to acquire environmental permits may extend the process to three years.<sup>35</sup>

*Lack of access to excess capacity:* Representatives interested in acting as power traders have indicated that participation in the market is difficult due to lack of access to excess generating capacity. Incumbent utilities do not appear willing to sell their excess capacity to new competitors, and IPPs engaged in wholesale supply have been locked into long-term contracts with the utilities, which preclude them from selling excess power to new entrants.<sup>36</sup> Lack of access to excess generating capacity may limit the number of potential competitors in the retail power market.

*Transmission access issues:* The vertically integrated electric utilities own and operate the only transmission networks in Japan, so rules governing third-party access terms and transmission rates are critical to fostering competition in the retail supply business. Industry sources have identified several problems pertaining to transmission access that hamper new entrants in the power market. First, high wheeling rates and back-up supply charges<sup>37</sup> render it economically infeasible for new entrants to compete with the vertically integrated utilities in serving large industrial consumers. Second, third-party users of the large utilities' transmission networks are required to establish one-year wheeling contracts with the utilities. According to such contracts, new entrants must pay the vertically integrated utilities a basic service fee, calculated on a monthly basis, even if there are months during the year when they do not use transmission service.<sup>38</sup> In some cases, the large utilities may also charge a penalty fee to the new entrant for early termination of its wheeling service contract. Third, industry sources suggest that the vertically integrated utilities do not provide clear information on how they calculate transmission rates; this is of particular concern in cases where new entrants have claimed that the transmission rates imposed by the utilities are unduly high.<sup>39</sup> Finally, it has been noted that many of the utilities have developed similar terms and conditions with regard to third-party access to

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<sup>34</sup> (...continued)

sold to the utilities. The EPDC reportedly accounts for roughly 6 to 7 percent of all generating capacity in Japan. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>35</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>36</sup> One Japanese steel company, for example, noted that it had established a 15-year supply contract with a utility prior to the introduction of 1999 reforms to the Electric Utility Industry Law, which prevents it from selling its excess generated capacity to new entrants. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 5, 2000.

<sup>37</sup> Third parties do not have to pay the utilities a back-up supply charge if they are able to generate their own back-up power, although this is impractical for most new entrants. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 9, 2000.

<sup>38</sup> Although, under accounting separation, the utilities must charge themselves the same fees that they charge new users of their transmission networks, these fees do not represent an out-of-pocket expense for the utilities. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 5-8, 2000.

<sup>39</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 5-8, 2000.

transmission lines, leading some industry representatives to consider the possibility of collusion on the part of the utilities.<sup>40</sup>

*Limited access to utilities' power pool:* At present, third parties are not granted access to the existing power pool operated by the utilities.<sup>41</sup> Representatives from the electric utility industry in Japan have indicated that third parties participating in the pool will likely be restricted to entities with their own generating assets. In addition, industry sources have suggested that there will be a limited window for power trading by third parties, with priority given to emergency transactions between the utilities and to other public service obligations.<sup>42</sup> At the same time, however, MITI will develop guidelines with the JFTC that would make it a violation of the Antimonopoly Law for utilities to deny new entrants access to the pool or to set conditions for such access that serve as de facto barriers.<sup>43</sup>

*Lack of unbundling of nine regional utilities:* Japan's electric utilities remain vertically integrated with respect to generation, transmission, distribution, and supply operations. Industry representatives have indicated that in order for Japan to create a competitive electric power market, utilities must either unbundle or divest their generation and transmission assets. Functional unbundling would help ensure that utilities do not favor their own generators or that they do not provide more favorable terms of access to their transmission lines to internal suppliers. Functional unbundling would also prevent utilities from cross-subsidizing, or using profits obtained in the regulated segment of the market to subsidize services provided in the unregulated segment.<sup>44</sup> MITI currently plans to require utilities to create separate accounts for their generation, transmission, and other business units, rather than to unbundle or divest their assets.<sup>45</sup> At the same time, MITI has pledged to consider more progressive measures to achieve structural deregulation of the electric power sector in 2003, though there is no guarantee that this will include functional unbundling.<sup>46</sup>

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<sup>40</sup> Presentation to the Government of Japan by U.S. industry representatives, Jan. 27, 2000.

<sup>41</sup> The utilities now use the pool for both emergency and economic trades. The utilities reportedly completed 780 million kilowatt hours of economic transactions in 1999. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 8, 2000.

<sup>42</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 8, 2000.

<sup>43</sup> Japanese Government Officials, interviews by USITC staff, Tokyo, Japan, June 7, 2000.

<sup>44</sup> U.S. Department of State telegram, "Second U.S.-Japan Energy Deregulation Working Group Meeting," message reference No. 052177, prepared by U.S. Embassy, Tokyo, Mar. 23, 1999.

<sup>45</sup> MITI has indicated that, because the utilities are privately owned, it has no legal authority to require them to divest their generation and transmission assets. OECD, *Regulatory Reform in Japan*, p. 88.

<sup>46</sup> U.S. Department of State telegram, "Second U.S.-Japan Energy Deregulation Working Group Meeting," message reference No. 052177, prepared by U.S. Embassy, Tokyo, Mar. 23, 1999.

*Lack of an independent regulator:* As noted earlier, there exists no independent regulatory authority in the electric power sector. In addition to policymaking, MITI performs all regulatory functions, including those pertaining to transmission networks, dispute settlement, and competition policy (in conjunction with the Japan Fair Trade Commission).<sup>47</sup> Although MITI will separate its policymaking and regulatory functions between two newly-created divisions, its position as industry regulator reportedly remains less than ideal.<sup>48</sup> Historically, MITI has worked closely with the electric utilities, and shares partial ownership of the Electric Power Development Corporation (EPDC), one of Japan's two major wholesale utilities.<sup>49</sup> Industry representatives have emphasized the need for an unbiased, independent regulator to oversee transactions in the electric power market.<sup>50</sup>

*Lack of an independent system operator:* Despite partial deregulation of retail supply, Japan's electric power market still lacks an independent system operator (ISO). The vertically integrated utilities' power pool is managed by a central office, which is staffed by personnel from the utilities.<sup>51</sup> As such, the potential exists for large utilities to discriminate against new entrants and in favor of their own generation and supply units when providing access to transmission networks.<sup>52</sup> Currently, there appear to be no plans by MITI to develop an independent system operator.

*Environmental requirements:* Firms seeking to build new power plants in Japan must undergo three layers of environmental approval: at the national, prefectural, and municipal levels. Reportedly, the approval process may cause power plant development to be delayed for three years or more, and result in high construction costs. Industry sources note that requirements imposed by prefectural and municipal authorities in Japan may be especially stringent. For example, in 1999 a Japanese subsidiary of a U.S. petroleum firm was forced to withdraw from its power plant project in Kawasaki City due to the high costs of meeting the city's environmental standards.<sup>53</sup>

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<sup>47</sup> Japanese Government Officials, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>48</sup> Written information presented to the Government of Japan by U.S. industry representatives, June 17, 1999, and industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>49</sup> *International Comparisons of Electricity Regulation*, pp. 238-239.

<sup>50</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 5-8, 2000.

<sup>51</sup> There are reportedly two different entities that coordinate utilities' usage of the power pool. First, each utility manages its participation in the pool through its own "central dispatch center", which is located in the geographic area served by the utility. Second, a "central dispatch coordination command center," staffed by utility employees, coordinates power exchange among the nine regional utilities. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 6 and 9, 2000.

<sup>52</sup> USTR, "Comments of the United States Government on the Draft Report on Electricity Transmission by the Electric Utility Industry Council Joint Subcommittee on Basic Policy Directions and Electricity Charges," June 18, 1999.

<sup>53</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 5-8, 2000.

*Japanese certification requirements for power generating equipment:* Industry representatives have indicated that equipment certification in Japan may also be a cumbersome process. Equipment manufacturers must deal with three different agencies to have their equipment certified, including Japan's Environmental Protection Agency, MITI, and the Ministry of Construction. Although certification standards for domestic- and foreign-manufactured equipment are the same, U.S. industry representatives suggest that Japanese manufacturers are advantaged by the fact that they can have inspections performed in their domestic factories, which is less costly for them than it is for foreign manufacturers, whose equipment is inspected upon import. In addition, U.S. industry representatives have noted that certification requirements in Japan are based on safety rather than on performance standards, which is not the case in many other countries.<sup>54</sup>

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<sup>54</sup> U.S. representatives state that equipment safety standards in the United States are sufficiently stringent, and that such equipment should be accepted for use in the Japanese market. Industry representatives, interviews by USITC staff, Tokyo, Japan, June 8, 2000.

# CHAPTER 6

## NEW ZEALAND

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*New Zealand has implemented wide-ranging market reform, entailing privatization and restructuring, and has granted 100-percent consumer choice. Market entry has not been problematic to date, but recent government statements may discourage further entry.*

### Nature and Extent of Regulatory Reform

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The Government of New Zealand commenced electricity market reform in 1987, when the generation and transmission assets of the Electricity Division of the Ministry of Energy were reorganized into the Electricity Corporation of New Zealand (ECNZ). More recently, in April 1998, New Zealand passed the Electricity Industry Reform Act of 1998 (EIR) with the objectives of (1) granting residential consumers a choice of power suppliers and reducing electricity prices; (2) reducing electricity prices for business and industry; (3) guarding against further privatization; and (4) improving the environment. New Zealand has undertaken limited privatization in the generation and retail supply segments of the electricity industry. The government has separated competitive lines of business, including generation and retail supply, from monopolistic lines, including transmission and distribution, and introduced competition into the generation segment by separating ECNZ into three state-owned generators.

New Zealand has designated no regulator, but the Market Surveillance Committee acts to ensure that the market is self regulating by supervising business conduct and exercising powers of investigation, suspension, and termination. Nondiscriminatory system access is guaranteed, and the system operator, Transpower, is independent of the dominant utility. All consumers won the right to choose their suppliers in April 1999, and power is available from the wholesale market or from generators through bilateral contracts.

### Current Market Conditions

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#### *Generation*

On April 1, 1999, the generation assets of ECNZ were separated into three distinct state-owned companies: Meridian Energy, Genesis Energy, and Mighty River Power.

They currently account for 27 percent, 19 percent, and 12 percent of total generation capacity, respectively.<sup>1</sup> Contact Energy, initially state-owned but eventually privatized, accounts for a further 28 percent of national generation capacity.<sup>2</sup> The remaining generation capacity is accounted for by private sector firms Pacific Hydro Limited, TransAlta New Zealand, and Trustpower.<sup>3</sup>

Shares of Contact Energy<sup>4</sup> were made publicly available on November 30, 1998.<sup>5</sup> Edison Mission, a subsidiary of the U.S. parent firm Edison International, purchased a 42-percent “cornerstone” stake in Contact Energy through an auction process, with the remaining 60 percent of shares purchased by the public. Contact Energy officially became a private sector company on April 1, 1999. As a result of the sale of Contact Energy, the private sector accounts for approximately 40 percent of total generation capacity in New Zealand.<sup>6</sup>

## ***Transmission and Distribution***

The national transmission grid remains wholly-owned by Transpower, a state-owned monopoly.<sup>7</sup> System access is guaranteed and transmission rates are published. Transpower determines appropriate standards for electricity quality on the national grid. Following reforms instituted by the government in 1997, Transpower was joined in this effort by industry representatives in the Grid Security Project. Thus, grid users are ultimately responsible to themselves and their fellow users in implementing quality standards and ensuring the security of service.

Following passage of the EIR, which mandates that transmission and distribution businesses are to be owned apart from retail and generation businesses,<sup>8</sup> most electricity companies decided to retain their distribution businesses and ownership of low voltage distribution lines, and divest themselves of their retail supply businesses.<sup>9</sup> There are approximately 30 electric power distribution companies in New Zealand, some of which are publicly listed companies. Many others have become locally-owned trusts following a corporatization process that occurred in the early 1990s.

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<sup>1</sup> The Marketplace Co. Ltd., “Power Companies: Power Company Ownership Changes,” found at Internet address <http://www.m-co.co.nz/C1changes.htm>, retrieved Mar. 21, 2000.

<sup>2</sup> Ibid.

<sup>3</sup> “Electricity links to New Zealand and the World,” found at Internet address <http://www.mang.canterbury.ac.nz/people/mike//energylinks/energylinks.htm>, retrieved July 3, 2000.

<sup>4</sup> International Energy Agency, *Energy Policies for IEA Countries: New Zealand 1997 Review*, OECD/IEA, 1997, p. 68.

<sup>5</sup> New Zealand Ministry of Economic Development, “Description of the New Zealand Electricity Industry Structure by 2000,” found at Internet address <http://www.moc.govt.nz/ers/electric/sector/sector-02.html>, retrieved Mar. 7, 2000.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

## ***Retail Supply***

Three state-owned enterprises derived from ECNZ have each entered the retail market, as have TrustPower, TransAlta New Zealand, and Contact Energy.<sup>10</sup> Currently, there are 10 major retailers competing in various regions of New Zealand and all consumers may choose their supplier. Aside from the three firms named above, they are First Electric, Mercury Electric, Meridian Energy, Genesis Energy, Empower, WEL, and Todd Energy. Only Meridian Energy competes nationwide.<sup>11</sup>

Electricity prices are determined by matching bids for supply and demand through COMIT, an electronic commodity market trading system that now underpins the New Zealand Electricity Market. COMIT produces a spot market price that is quoted 48 times per day on half-hour intervals. There is also a market for forward contracts to be traded should buyers and sellers wish to hedge. It functions like a typical commodity futures market.<sup>12</sup>

Since 1998, electricity prices for small and residential consumers have increased, while prices for large and industrial consumers have decreased. Average prices paid for electricity are also higher in the northern portions of the North Island than in the southern portion of the island, or on the South Island as a whole. This price differential is attributed to cost differences resulting from the concentration of generation capacity on the South Island, away from the metropolitan areas on the North Island.<sup>13</sup>

## ***Remaining Impediments to Competition***

New Zealand maintains a foreign investment approval process. Through this process, New Zealand's Overseas Investment Corporation (OIC) must approve investments by an "overseas person" for the following:

- the acquisition or control of 25 percent or more of the shares or voting power in a company where either the consideration of transfer or the value of the assets of the company exceeds \$NZ10 million;
- the establishment of new business in New Zealand where the total expenditure in setting up the business exceeds \$NZ10 million;
- the acquisition of the assets of the business where the total consideration paid or payable for the assets exceed \$NZ10 million; and

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<sup>10</sup> Ibid.

<sup>11</sup> Ibid. E-mail communication with a representative of the New Zealand Ministry of Economic Development confirmed that Meridian Energy is the only nationwide retailer.

<sup>12</sup> Grid Security Project, "GSP Background," found at Internet address <http://www.gsp.co.nz/background.html>, retrieved May 31, 2000.

<sup>13</sup> Ibid.

- the issue or allotment of shares where the 25 percent threshold has already been exceeded or will be exceeded as a result of the issue and where the total consideration paid or payable exceeds \$NZ10 million.<sup>14</sup>

Furthermore, OIC approval is required, regardless of the dollar value of the investment, for the acquisition of rural land. Approval is also required under the Land Settlement Promotion and Land Acquisition Act for the purchase of some classes of land.<sup>15</sup>

While New Zealand's approval process has generally not presented a significant barrier to market access, foreign investment has become more problematic recently. One recent example is action by the New Zealand Government to block all foreign bidders for a fifty-percent stake in a fishing company. Furthermore, the New Zealand Finance Minister has recently advised the OIC that it should no longer presume in favor of applications but instead adopt a more "neutral" stance. Additionally, the Deputy Prime Minister has been calling for more stringent criteria for foreign investment.<sup>16</sup>

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<sup>14</sup> GATS, *New Zealand: Schedule of Specific Commitments*, GATS/SC/62, Apr. 15, 1994.

<sup>15</sup> *Ibid.*

<sup>16</sup> U.S. Embassy, E-mail response to questions by USITC staff, Wellington, New Zealand, June 2, 2000.

## PART III

# EUROPEAN UNION

*In 1996, the European Union passed the Community Directive on Electricity Restructuring. The Directive requires member states to open their markets to competition in generation and retail supply. The goals of the Directive are increased efficiency, resulting in lower prices for consumers; improved service standards; reduction of reserve capacity; and an increase in the security of supply. Implementation of the Directive has created new opportunities for European and non-European firms to participate in the European power industry.*



# CHAPTER 7

## OVERVIEW OF THE EUROPEAN UNION ELECTRICITY DIRECTIVE

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### Nature and Extent of EU Regulatory Reform

The current Single European Market is the result of a renewed drive to form a common market, sparked by the 1985 Single European Act (SEA).<sup>1</sup> The single market program did not immediately address energy, however. In 1988, a European Commission Working Paper listed all of the obstacles to creating an internal energy market, and single market proponents began to see the energy sector as a fundamental component of the Single European Market.<sup>2</sup> That year, the single market program was expanded to include the creation of an Internal Energy Market (IEM) as one of its goals.<sup>3</sup> The Community's heads of state mandated the European Commission's Directorate General for Energy and Transport (at the time known as DG XVII) to oversee the development of the IEM,<sup>4</sup> and instituted structural changes to enable the Commission to legislate in the electricity sector. However, this mandate did not extend to the development of a common energy policy for other purposes, for instance, to ensure security of supply or promote energy efficiency.

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<sup>1</sup> The SEA introduced the concept of a Single European Market to the then European Communities. It contained the seeds of a number of pan-European projects, including European political cooperation and a single currency, and led to the transformation from the European Community to the European Union (EU) in 1992. The SEA mandated a number of internal decision-making changes, allowing the European Community to pursue a single market with less interference from individual member states.

<sup>2</sup> The European Commission, *Special White Paper on Energy Policy*, (COM 88 174.1988).

<sup>3</sup> *The List of Obstacles to be Overcome to Complete the Single Energy Market: An Initial Commission Analysis*; Supplement to *EEC Energy Policy and the Single Market of 1993*, (Prometheus, Brussels: 1998/9).

<sup>4</sup> Although the European Commission's Directorate General for Energy and Transport was charged with creating the IEM, the European Court of Justice has ruled that the Directorate General for Competition also has competence in this area. Throughout the 1990s, this Directorate General also began to play a larger role in energy legislation, increasingly defining permissible monopolies as only those absolutely necessary for the provision of a public good that the market is unable to provide competitively. This has been interpreted to justify the dismantling of gas and electricity monopolies, for import, export, and transportation. The Directorate General for Competition requested that member states abolish such monopolies, or explain why they were necessary, and in 1994, it took reluctant states to the European Court of Justice over this issue. *A European Market For Electricity?*, Centre for Economic Policy Research, (London: 1999), p. 50.

These issues are addressed by a separate Common Energy Policy (CEP), which, has been developed along side the IEM and entails different interests and powers.<sup>5</sup>

In 1989, the Directorate General for Energy and Transport introduced a package of IEM proposals for improved transparency of electricity and gas prices, less restrictive rules on movement of gas and electricity, and plans to monitor large investments in the energy sector.<sup>6</sup> The proposal for unrestricted movement of electricity was adopted without great resistance, but further developments in the sector did not occur until 1995.

In 1995, two EU Commission studies placed electricity deregulation at the heart of the Single Market project. The Commission's December 1995 White Paper on Energy identified industrial competitiveness as one of the main objectives in the evolving IEM.<sup>7</sup> That year, the Second Ciampi Report on Competitiveness concluded that the absence of energy liberalization in the European Union was beginning to have a negative effect on the overall European Union economy.<sup>8</sup> Consensus was building for sweeping reforms in the energy sector. European Union energy ministers debated proposals for reform in June 1995, but could not agree on modifications to the model governing access to transmission facilities. Spain, during its presidency of the EU in the second half of 1995, took the lead in promoting a compromise text for an electricity restructuring directive, and produced a complete draft text, which allowed for a choice among two network access models. Agreement on the text was then delayed in order to decide the pace of liberalization, until Italy, during its presidency in the first half of 1996, pushed for minimum levels of consumer choice of between 20 and 40 percent. On June 20, 1996, the energy ministers of the EU member states finally agreed to the text of the EU 1996 Directive on Electricity Restructuring at a meeting of the Energy Council. The member states voted on December 19, 1996, for the resultant Community Directive on Electricity Restructuring.<sup>9</sup>

Other electricity proposals have followed this Directive, indicating possible future energy legislation. In January 1997, the European Commission proposed a common system for the taxation of energy products. In February 1998, the EU Council of

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<sup>5</sup> The European Council adopted a Resolution on Energy Efficiency in the European Community in December 1998, setting forward a work program for 1998-2002 to promote security, competitiveness, and environmental goals under the CEP. Official Journal C 394, 17.12.1998.

<sup>6</sup> The European Commission, *Transparency of Consumer Energy Prices*, COM (89) 123; *Draft Directive on Electricity Transportation*, COM (89) 336; and *Draft Directive on Natural Gas Transportation*, COM (89) 334, Brussels.

<sup>7</sup> The European Commission, *White Paper: An Energy Policy for the European Union*, COM (95) 683, Brussels.

<sup>8</sup> *Enhancing European Competitiveness*, Competitiveness Advisory Group (Ciampi Group), Second Report to the President of the Commission and the Prime Ministers and the Heads of State, Dec. 1995.

<sup>9</sup> Further historical information about the development of electricity restructuring in the EU is provided by Svein S. Andersen in *EU Energy Policy: Interest Interaction and Supranational Authority*, ARENA Working Papers No. WP 00/5, (University of Oslo: 2000).

Ministers adopted a unanimous common position for the gas market. In May 1999, the Council of Ministers requested that the Commission begin creating a framework for the use of renewable resources in the internal energy market. However, the area of most prolific legislative activity since 1996 has been energy efficiency in consumer products; a series of EU Directives has forced a range of consumer appliances such as washing machines to comply with higher levels of energy efficiency.

European decision-making on electricity reform is facilitated by a consensual approach to problem-solving, involving regular meetings of energy industry actors and regulators, in a process known as the Florence Forum. In the Florence “process” actors in the electricity sector, including TSOs, national regulators and electricity associations meets regularly to discuss regulatory practices. Each participant has one voice in the Florence discussions, and the forum is expected to come up with a common position. In this way, anomalous regulatory issues can be discussed and modified, and the industry is able to move towards consensus without significant new legislation.<sup>10</sup>

## The Directive

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The 1996 Directive on Electricity Restructuring addresses a range of issues, including rules for liberalization, unbundling, access to transmission and distribution networks, licensing new capacity, transmission and system operation, and distribution. Each of these provisions, which must be implemented by each member state, is discussed below.<sup>11</sup>

### *Liberalization*

In the context of the European Union’s 1996 Directive on Electricity Restructuring, liberalization entails establishing common rules for the generation, transmission, and distribution of electricity.<sup>12</sup> The Directive calls for nondiscriminatory access to networks for all existing suppliers and new entrants, and imposes an impartial licensing procedure for all new generation plants. In addition, the Directive requires member states to introduce choice in electricity supply in three steps. In the first

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<sup>10</sup> Representative of the European Commission, interview by USITC staff, Brussels, Belgium, June 19, 2000.

<sup>11</sup> Much of the following information about the Directive is informed by explanatory literature from the European Commission itself, including the “*Second Report to the Council and the European Parliament on Harmonisation Requirements, Directive 96/92/EC, Concerning Common Rules for the Internal Market in Electricity*”; The European Commission, “Guide to the Electricity Directive” DG-XVII, found at Internet address <http://europa.eu.int/en/comm/dg17/elec/memor.htm>, retrieved Jan. 24, 2000; and The European Commission, *Opening Up to Choice: the Single Electricity Market*, Brussels: 1999.

<sup>12</sup> Directive 96/92/EC, adopted by the Council of Ministers, December 19, 1996. Official Journal No. L 027, 30/01/1997, p. 0020.

step, completed by February 19, 1999, 26 percent of customers had to be free to choose their electricity suppliers. By February 19, 2000, the Directive states that 28 percent of customers must be free to choose their suppliers, and by February 19, 2003, the Directive's final deadline, 33 percent of customers must be free to choose their electricity supplier. Thus far, the pace of liberalization has been uneven. Three countries obtained derogations from the Directive's timetable: Belgium (one year), Greece (two years), and Ireland (one year). Other countries, such as Finland, Germany, Spain, Sweden, and the UK, have considerably exceeded the minimum liberalization called for by 1999.

Member states are able to set the eligibility criteria for liberalization in their market. These criteria must be made public by the end of January each year. However, the Directive mandates that very large final consumers of over 100 GWh, and distributors responsible for the volume of electricity consumed by other final eligible customers, must have been included in the definition of eligible customers in the first tranche of liberalization, in 1999.

The Directive calls for this liberalization, and any disputes arising from it, to be regulated jointly by EU member states and institutions, and the European Union itself. The Directive calls for member states to establish dispute settlement authorities, independent of electricity companies, to settle disputes relating to negotiations and contracts, including those pertaining to system access. The Directive also expresses concern that none of the incumbent companies abuse a dominant position.

## *Unbundling*

As described in Chapter 2, unbundling entails the separation of functions that had previously been provided by a simple, vertically-integrated utility. The aim of unbundling in the 1996 Directive on Electricity Restructuring is to avoid discrimination, cross-subsidization, and distortion of competition. The Directive approaches unbundling by calling for disaggregated accounting, and banning cross-subsidization for each of the functions of the industry: generation, transmission, distribution, and supply. To achieve this, the EU encourages, but does not mandate, the separation of transmission system operators from other aspects of electricity generation and procurement. In practical terms, this means the breaking-up of vertically integrated electricity companies. Most states have chosen this approach. However, two of the largest markets in Europe, France and Germany, maintain their vertically integrated utilities and instead impose regulatory constraints to control potential anticompetitive behavior.<sup>13</sup>

These constraints include the requirement that vertically integrated electricity firms keep separate, published accounts for their generation, transmission, and distribution activities. Member states or any other competent authority must have right of access

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<sup>13</sup> For a discussion of the individual member states see Henry Edwardes-Evans, Lucy Plaskett, and Sally Bogle in "Electricity in Europe: Into the Single Market," vol. 1, *Financial Times Energy*, (London: 1997).

to these unbundled accounts. The Directive requires member states to ensure that safeguards are put in place to prevent the release of confidential information. Sometimes called the “Chinese Walls” requirement, the Directive requires that electricity companies that have both generation and transmission assets maintain discrete management boards.

## ***Access to the Transmission and Distribution Networks***

The 1996 Directive on Electricity Restructuring enables member states to choose among three methods for gaining access to transmission and distribution facilities: negotiated third party access (TPA), regulated TPA, and single buyer. In the negotiated TPA model, terms of access are negotiated on an individual basis between the transmission service operator and suppliers. In regulated TPA, transmission prices are fixed by relevant state authorities (and published), and all producers and consumers receive the same rate. In the single buyer model, the service operator is responsible for the centralized buying of power. Most member states have chosen to liberalize according to the regulated TPA model; only Germany has chosen a wholly negotiated TPA model.<sup>14</sup>

## ***Licensing New Generating Capacity***

In authorizing new electricity generation, member states can choose between two different procedures: tendering or authorization (or a mix thereof). Whatever procedure is chosen, the Directive mandates that it must be applied objectively, transparently, and with non-discriminatory criteria.

In the tendering procedure, member states set up an inventory of the need for future generating capacity based on estimations carried out by the transmission system operator or any other competent authority designated by the state. The specifications must be published in the Official Journal of the European Communities at least six months before the closing date for tenders.

In the authorization system, member states approve the development of new generation capacity on a case-by-case basis. The criteria for granting authorization must be objective and non-discriminatory. These criteria must also be made public, and may relate to: safety and security of the electricity system; protection of the environment; land use; use of public ground; energy efficiency; the nature of primary sources; characteristics particular to the applicant such as technical, economic, financial capabilities; and other public service obligations. Lack of demand is not considered to be a valid reason for license refusal. If authorization is refused, the authorizing agency must make its reasoning public, and companies refused a license

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<sup>14</sup> Romesh Vaitilingam, ed., *A European Market for Electricity?*, (London: Centre for Economic Policy Research, 1999), pp. 82-83.

can appeal to the European Commission. Most member states have chosen to apply the authorization procedure to new generation projects.<sup>15</sup>

## ***Transmission and System Operation***

Transmission is defined by the European Union as the transport of electricity on high-voltage interconnected systems. Member states must require the owners of electricity transmission systems to designate a transmission system operator (TSO) that is charged with guaranteeing security of supply. The TSO will then be responsible for operating the system, ensuring maintenance, developing new transmission capacity, and inter-connecting with other systems. The TSO must dispatch electric power on the basis of objective, published criteria that are applied in a non-discriminatory manner. The dispatch criteria must take into account the precedence of electricity from available generating installations, interconnector transfers, and the technical constraints of the system. For environmental reasons, a member state may, however, require the TSO to assign greater dispatch priority to electricity produced from renewable resources, and from combined heat and power facilities. This allows member states to ensure the sale of environment-friendly electricity, even in cases where the costs of this electricity exceed the costs of other production methods. The Directive also permits priority in dispatching electricity produced from indigenous fuels. Up to 15 percent of the overall primary energy necessary to produce the electricity consumed in the member state can be favored in this way.

## ***Distribution***

The EU defines distribution as the transport of electricity on medium-voltage and low-voltage interconnected systems. As in the case for transmission, a system operator must be designated to be responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and its interconnections with other systems. The distribution system operator is responsible for maintaining a secure, reliable, and efficient electricity distribution system in its area with due regard to the environment. Member states may also require distribution companies to supply customers located in its service area. States may impose public service obligations on companies within their service areas.

## ***Exemptions***

Exemptions to some of the Directive's obligations may be obtained by member states in order to achieve certain public service objectives. The Directive leaves the definition of these objectives up to each member state, within certain guidelines. Exemptions taken for the general economic interest must be clearly defined, transparent, non-discriminatory, verifiable, and disclosed by the member states.

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<sup>15</sup> For a discussion of the individual member states see Edwardes-Evans, Plaskett, and Bogle, *Electricity in Europe: Into the Single Market* for a discussion of the individual member states.

Public service objectives must fall into one of the following categories: security of electricity supply, regularity, quality and price of supplies, and environmental protection. Examples of the implementation of public service objectives include requiring that a distribution provider supply all customers in its area at an equal price, or requiring customers to purchase a certain percentage of electricity from renewable resources. Recognizing that exemptions may be used to favor domestic electricity producers at the expense of producers in other member-states,<sup>16</sup> the Commission reserves the right to declare such exemptions incompatible with EU law.

The 1996 Directive also allows members to take an exemption on the basis of reciprocity, such that some temporary measures may be imposed to aid domestic markets in states that are liberalizing more quickly. These measures may only be used during the transitional period of 1997-2006 to avoid imbalance in the opening of electricity markets. Most member states have included this clause in their legislation.<sup>17</sup> Instituting this clause allows states to refuse access to electricity suppliers from other member states because of the customer being eligible only in one of the two systems. The state applying this reciprocity mechanism must have a higher-than-minimum level of market opening, and the state to which it is applied must have a lower-than-minimum level of market opening.<sup>18</sup>

A national system operator may also refuse access when there is a shortage of transmission capacity. The Directive contains no provision that forces system operators to construct new capacity, even where there is a shortage. In all cases of refusal, however, national system operators are required to explain their decisions in relation to the guideline.

Member states can also obtain exemptions that allow the state to compensate electricity companies for extra costs associated with new competition. For example, established firms may be burdened by stranded costs, or financial obligations resulting from uneconomic investments made in accordance with past social or environmental responsibilities. In other cases, incumbent electricity companies can face higher negotiated costs for a limited time, which new companies, concluding new agreements only post-1996, might not face. In still other cases, incumbent electricity companies can face serious, long-term losses of competitiveness by opening their infrastructure to new competitors. In these and similar situations, member states can assist companies

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<sup>16</sup> The Community's position on this matter is put forward in many EU documents. See, for instance, The European Commission, *Opening Up to Choice: the Single Electricity Market*, Luxembourg: 1999.

<sup>17</sup> By October 1999, ten member states had invoked a reciprocity clause: Austria, Belgium, Denmark, Germany, Greece, Ireland, the Netherlands, Portugal, Spain, and Sweden. See *A European Market for Electricity?: Monitoring European Deregulation 2*, Centre for Economic Policy Research, London: 1999.

<sup>18</sup> This raises questions about the Reciprocity Clause's compatibility with the Treaty of Rome, which broadly prohibits unequal treatment. The Commission deals with this question by stressing the transitional nature of this clause, as well as its role in a "progressive pattern" of overall market liberalization. See The European Commission, *Guide to the Electricity Directive*, Directive of Energy and Transport, found at Internet address <http://europa.eu.int/en/comm/dg17/elec/memor.htm>, retrieved Feb. 9, 2000.

in a number of ways. These include direct financial support and competitive constraints, or policies favoring electricity providers using certain fuels. As of January 1, 1999, the European Commission had received twelve notifications of transitional regimes in liberalizing markets.

# CHAPTER 8

## FRANCE

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*France has taken the steps necessary to comply with the EU directive, but has done little else to reform its market. EdF remains a virtual monopoly, accounting for 90 percent of power generation and all transmission and distribution service provision. Consumer choice is set at minimum permissible levels.*

### Nature and Extent of Regulatory Reform

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France enacted relatively modest electricity reform legislation in February 2000. Electricité de France (EdF), a 100-percent state-owned utility, retains a virtual monopoly over generation, transmission, and distribution. France committed to the minimum amount of consumer choice allowable under the EU Directive on Electricity Restructuring; 28 percent of consumers will be permitted to exercise choice over their supplier in 2000, and 33 percent will be able to do so in 2003.

The legislation creates the Commission for the Regulation of Electricity (CRE), a new electricity regulatory body, which will apply and interpret regulations on access to and use of the grid, implement rules on unbundling, and settle disputes between operators and users. In France, unbundling principally entails the maintenance of separate accounts for production, transmission, and distribution activities.<sup>1</sup>

### Current Market Conditions

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#### *Generation*

EdF is one of the few remaining monopoly electricity suppliers in Europe. The French legislation does little to open the market to competition,<sup>2</sup> effectively

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<sup>1</sup> U.S. Department of State telegram, "France's Controlled Deregulation of Electricity," message reference No. 004401, prepared by U.S. Embassy, Paris, Feb. 25, 1999.

<sup>2</sup> U.S. Department of State telegram, "French Electricity Deregulation Lagging; Industry Hurt," message reference No. 16259, prepared by U.S. Embassy, Paris, Oct. 22, 1999.

protecting EdF's current market dominance.<sup>3</sup> The law does not provide for the creation of a trading market, but producers may resell electricity in proportion to their share of total production. This favors EdF, which is by far the largest producer.<sup>4</sup> EdF has more than 100 GW of generating capacity in France,<sup>5</sup> with nuclear facilities accounting for 81 percent of generation, hydroelectric facilities for 15 percent, and fossil fuel-burning facilities for 4 percent.<sup>6</sup> Although EdF remains the sole public provider of electricity services, about 10 percent of total production is attributed to auto producers and water distributors that operate low power-generating units.<sup>7</sup> For the development of new generation capacity, France opted to institute an authorization system supplemented by a tendering procedure. The multi-annual program sets new capacity objectives in terms of primary energy source and, when appropriate, by production technique and geographic zone. The tendering procedure is instituted by the Ministry for Energy and administered by the CRE. The Ministry for Energy issues operating authorizations.<sup>8</sup>

## ***Transmission and Distribution***

EdF owns and operates the entire transmission and distribution system in France, with the exception of 150 small distribution firms representing about 5 percent of French distribution sales.<sup>9</sup> There is little or no private participation in this segment. EdF's distribution of electricity is principally divided into 104 public utility distribution centers, which function under concession from the municipalities that they serve.<sup>10</sup>

EdF will house the transmission system operator (TSO), which will determine which generators will be dispatched in order to supply consumers.<sup>11</sup> The director of the TSO will be nominated by the Ministry of Industry, and cannot be replaced without the Minister's consent. Management of the TSO will be separated from the rest of

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<sup>3</sup> U.S. Department of State telegram, "France's Controlled Deregulation of Electricity," message reference No. 004401, prepared by U.S. Embassy, Paris, Feb. 25, 1999.

<sup>4</sup> U.S. Department of State telegram, "Electricity, Gas: Liberalization, Consolidation and Challenges," message reference No. 16259, U.S. Embassy, Paris, Feb. 23, 2000.

<sup>5</sup> Public Utilities Fortnightly, *A Continent United? Some Thoughts on Prospects for a Single Energy Market in Europe*, Jan. 15, 2000.

<sup>6</sup> Penwell Publishing Co., *International Electric Power Encyclopedia*, (Tulsa, OK: PennWell Publishing, 1999), p. 98.

<sup>7</sup> Romesh Vaitilingam, ed., *A European Market for Electricity? Monitoring European Deregulation 2*, (London: Centre for Economic Policy Research, 1999), p. 182.

<sup>8</sup> The European Commission, *Implementation by the Member States: France*, found at Internet address <http://europa.eu.int/en/comm/dg17/elec/implgrid.htm>, retrieved Mar. 9, 2000.

<sup>9</sup> Vaitilingam, *A European Market for Electricity? Monitoring European Deregulation 2*, p. 182.

<sup>10</sup> Ibid.

<sup>11</sup> International Energy Agency, *Energy Policies of IEA Countries: France, 1996 Review*, (France: OECD, 1996), p. 72.

EdF.<sup>12</sup> Consistent with accounting separation, the TSO division will have a budget that is separate from the rest of EdF. In order to further insulate the TSO from the rest of EdF, the government is reportedly drafting regulations that will restrict the movement of personnel between the TSO and the rest of EdF.<sup>13</sup>

The French Government chose to implement regulated third party access (RTPA). Under this system, the Ministry of Energy determines transmission and distribution prices and payments for meeting public service obligations after receiving a public recommendation from the regulator.<sup>14</sup>

## ***Retail Supply***

The first phase of liberalization will permit consumer choice for companies with annual electricity consumption exceeding 40 GWh. This action affects roughly 400 companies. The threshold will be lowered to 9 Gwh per year, or approximately 33 percent of the market, by 2003. Competitive retail suppliers will still be required to use EdF's distribution network to reach their customers.<sup>15</sup> Consumers eligible to choose their power supplier sign contracts of at least three years. Existing contracts with EdF can be terminated by either party, but clients of EdF will have to pay an indemnity for canceling contracts entered into before the law was passed.<sup>16</sup>

## ***Remaining Impediments to Competition***

France's legislation reveals the presence of effective impediments to market access. These impediments may reflect the French Government's view of the EU Directive's purpose. French officials reportedly view the directive as means to harmonize technical differences and standardize cross-border transmission pricing mechanisms, and not necessarily as a means to further liberalization.<sup>17</sup>

The most significant impediment appears to be the continued existence of EdF as a state-owned, vertically integrated entity. Industry analysts believe that despite accounting separation, EdF will continue to operate as a vertically integrated firm and make it difficult, as a practical matter, for new market entrants to gain access to transmission capacity.<sup>18</sup> In addition, some market participants feel that EdF's recent

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<sup>12</sup> Representative of the French Ministry of the Economy, interview by USITC staff, Paris, France, June 16, 2000.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> U.S. Department of State telegram, "France's Controlled Deregulation of Electricity," message reference No. 004401, prepared by U.S. Embassy, Paris, Feb. 25, 1999.

<sup>16</sup> The requirement of five-year contracts originally included in the draft law was decreased to three-year contracts in the legislation passed in February 2000. U.S. Department of State telegram, "Electricity, Gas: Liberalization, Consolidation and Challenges," message reference No. 16259, U.S. Embassy, Paris, Feb. 23, 2000.

<sup>17</sup> Representative of the French Ministry of the Economy, interview by USITC staff, Paris, France, June 16, 2000.

<sup>18</sup> Ibid.

investment activities have enabled EdF to extend its market power into the area of cross-border transactions.<sup>19</sup>

The French Government has no plans to privatize EdF, nor will ownership of assets be substantially restructured.<sup>20</sup> However, in the event that the French Government privatizes assets in the electric power sector, potential market access impediments remain. France has reserved the right under the General Agreement on Trade in Services to limit foreign participation in privatized companies.<sup>21</sup>

France's implementation of the EU Directive is distinct from the approach taken by most other EU members. Most of the distinct features of French law are allowable under the Directive, though some have been criticized as inadequate by the EU Commission. In addition, certain elements of the law may impinge on market access in France. For example, France has chosen to adopt the minimum level of market opening allowed by the Directive, with only 33 percent of the market open to customer choice by 2003. In addition, all companies participating in the electric power industry must provide the same level of salary and benefits as provided by EdF, which could discourage market entry and limit price competition. French transposition of the Directive also includes a requirement that all electricity sales should take place within a three-year "contractual framework" between parties. The government argues that this clause promotes market stability.<sup>22</sup> The EU Commission, which objects to the clause, argues that it restricts short-term trading activities, and is inconsistent with the Directive.<sup>23</sup>

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<sup>19</sup> Industry representative, interview by USITC staff, Brussels, Belgium, June 20, 2000.

<sup>20</sup> Representative of the French Ministry of the Economy, interview by USITC staff, Paris, France, June 16, 2000.

<sup>21</sup> GATS, *European Communities and Their Member States: Schedule of Specific Commitments*, GATS/SC/31, Apr. 15, 1994.

<sup>22</sup> Ibid.

<sup>23</sup> Representative of the European Commission, interview by USITC staff, Brussels, Belgium, June 19, 2000.

# CHAPTER 9

## GERMANY

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*German reform provides 100-percent consumer choice, but does little to alter industry structure and ownership. Vertically integrated firms remain dominant in the generation and transmission segments.*

### Nature and Extent of Regulatory Reform

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Germany commenced reform of its electricity market in 1998 with the enactment of the Energy Deregulation Law. Reform was intended to reduce electricity prices for households and small enterprises, remove political influence over the operation of municipal enterprises, and terminate electricity consumers' subsidization of public transportation, theaters, and community swimming pools. German reform, however, neither restructured the electricity sector nor altered ownership.<sup>1</sup> The largest electricity utilities remain vertically integrated, although reform resulted in the accounting separation of generation and distribution, and the accounting and management separation of transmission.

All German consumers obtained the right to choose electricity suppliers in April 1998, far exceeding the mandatory thresholds found in the EU Directive. The Ministry of Economics remains the primary regulatory authority in the energy sector. In addition, federal and state competition authorities are responsible for enforcing competition law and resolving disputes over areas such as network access and abuse of market power.<sup>2</sup>

### Current Market Conditions

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#### *Generation*

The German electricity sector has a decentralized, three-tiered structure. The first tier comprises six regional monopolies, or Energieversorgungsunternehmen (EVUs),

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<sup>1</sup> After German reunification in 1990, Bayernwerk, Preussen Elektra, RWE Energie AG, and the EHB consortium (Energiebeteiligungsholding) began the process of privatizing East German electricity companies.

<sup>2</sup> The European Commission, "Energy: Implementation by Member State: Germany," found at Internet address <http://europa.eu.int/en/comm/dg17/elec/implgrid.htm>, retrieved Feb. 10, 2000.

that produce the majority of electric power. The second tier comprises approximately 70 regional electricity companies that deal primarily in electricity distribution. Finally, the third tier consists of about 900 municipal utility companies, which are responsible for distribution in cities and municipalities. The EVUs generate 81 percent of the public supply of electricity, while regional utilities generate roughly 9 percent, and the municipal utilities generate the remaining 10 percent. In addition, about 200 industrial firms operate power plants for their own use and channel excess power into the system.<sup>3</sup>

The EVUs are largely defined by geographic regions, typically located within a German State. Ownership is distributed among the states, banks, insurance companies, and other financial intermediaries. The EVUs hold shares in the majority of the 70 regional suppliers. The municipal distributors are primarily held by local communities, who operate all communal utilities, i.e., public transportation, gas, water, sewage, waste disposal, and electricity.<sup>4</sup>

The EVUs include Energie Baden-Wuerttemberg (EnBW), Berliner Kraft- und Licht AG (BEWAG), EVS (Schwaben), Hamburgische Electricitaets-Werke AG (HEW), RWE-VEW, and VEBA-VIAG.<sup>5</sup> The entire East German energy industry is operated by the umbrella organization, Vereinigte Energiewerke AG (VEAG).<sup>6</sup> VEAG has undertaken measures to build and modernize power plants and energy distribution networks in the east.<sup>7</sup>

As a result of regulatory reform, the German generation segment is consolidating. The EVUs are seeking mergers to achieve greater economies of scale and to improve or maintain market share. Two recent mergers include RWE/VEW and VEBA/VIAG.<sup>8</sup> Pending approval from the federal cartel office, these six companies could be reduced to four. Restructuring on the municipal level is also proceeding.<sup>9</sup> Foreign competitors are among those looking for opportunities in Germany, although

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<sup>3</sup> Henry Edwardes-Evans, Lucy Plaskett, and Sally Bogle, "Electricity in Europe: Into a Single Market," vol. 1, *Financial Times Energy*, (London: 1997), pp. 139-143.

<sup>4</sup> *A European Market for Electricity? Monitoring European Deregulation 2*, (London: Centre for Economic Policy Research, 1999), pp. 147-149.

<sup>5</sup> VEBA and VIAG are the majority owners of Preussen Elektra and Bayernwerk, respectively. The new company is called E.ON.

<sup>6</sup> The European Commission, "Energy: Implementation by Member State: Germany."

<sup>7</sup> U.S. Department of Commerce (USDOC), International Trade Administration (ITA), "Liberalization of the German Energy Market," *Industry Sector Analysis (ISA) - June 2000*, prepared by Foreign Commercial Service, Leipzig, sent via E-mail, June 14, 2000.

<sup>8</sup> The European Commission has approved the VEBA/VIAG merger and the RWE/VEW mergers, subject to several conditions. VEBA, VIAG, RWE, and VEW are required to divest their stakes in most eastern German companies, including VEAG. VEBA/VIAG must also sell interests in Bewag and RWE. VEBA/VIAG will receive RWE/VEW's holdings in Gelsenwasser, Ruhrgas, and Gasag in exchange for the stake in RWE, eliminating links between the two entities. In addition, the two merged entities agree to purchase electricity from VEAG for seven years. RWE/VEW has reached an agreement in principle with the German Federal Cartel Office.

<sup>9</sup> U.S. Department of State telegram, "A Brave New World in German Electricity Markets," message reference No. 01820, U.S. Embassy, Berlin, Nov. 17, 1999.

they have expressed concern that the EVUs continue to own a dominant share of both electricity generation and transmission capacity, which limits market access.<sup>10</sup>

In October 1998, the German Government declared that nuclear power was no longer “socially acceptable or economically justified,” effectively conveying that the government was committed to phasing out nuclear power generation, which currently accounts for 25 percent of Germany’s generating capacity. The phase-out will occur over the next 32 years.<sup>11</sup> Siemens has criticized the plan because it does not believe the government can meet its Kyoto obligations and eliminate nuclear power at the same time. Germany must reduce its CO<sub>2</sub> emissions by 21 percent by 2010. Industry representatives project that the elimination of relatively cheap nuclear power will increase electricity costs.<sup>12</sup>

## ***Transmission and Distribution***

Each EVU controls its own individual, interconnected high-voltage grid. The EVUs are responsible for the operation of the national and international interconnected systems, pooling reserves in order to participate in the load frequency control required by the Union for the Coordination of the Production and Transmission of Electricity (UCPTE), the regional interconnection system in Western Europe. Electricity is either supplied to customers directly or sold to distribution companies.<sup>13</sup>

Germany adopted negotiated third party access (NTPA) as its system access regime in 1998. Under this regime, terms of access to the grid are negotiated on an individual basis between the transmission service operator and suppliers. Network access can be refused based on lack of network capacity, and when third party access would impede sales of electricity generated from renewable sources or combined heat and power (CHP).<sup>14</sup> There is no nationwide coordinated dispatch because there is no national pool or national grid company, although there is a coordinating association, Deutsche Verbundgesellschaft, comprised of the 6 large EVUs.<sup>15</sup>

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<sup>10</sup> Uta Harnischfeger and Deborah Hargeaves, “German Power Market Face More Competition,” *Financial Times*, found at Internet address <http://news.ft.com/>, retrieved May 8, 2000.

<sup>11</sup> Ralph Atkins, “Germany’s Greens Back N-Power Deal,” *Financial Times*, June 24, 2000, found at Internet address <http://www.ft.com/>, retrieved July 18, 2000.

<sup>12</sup> Matthew Jones, “Siemens Attacks Berlin,” *Financial Times*, July 6, 2000, found at Internet address <http://www.ft.com/>, retrieved July 18, 2000.

<sup>13</sup> Edwardes-Evans, Plaskett, and Bogle, *Electricity in Europe: Into a Single Market*, pp. 139-143.

<sup>14</sup> The European Commission, “Energy: Implementation by Member State: Germany.”

<sup>15</sup> Ibid.

## *Retail Supply*

As noted, Germany's reforms opened the electricity market to all consumers and eliminated area concessions for supply companies, thereby allowing consumers to choose their supplier, and suppliers to compete nation-wide.<sup>16</sup> Many suppliers have established marketing subsidiaries such as Yello Strom, a subsidiary of Energie Baden-Wuerttemberg, and Electra Direkt, a subsidiary of VEBA-VIAG. In addition, nontraditional suppliers, such as the Quelle catalog company, are also marketing electricity to consumers, capitalizing on their well-known brand name.<sup>17</sup> Although retail suppliers are confident that consumers will ultimately switch to low-cost suppliers, mass switching has not occurred to date.<sup>18</sup>

Germany's regulatory reform will spur spot market trading of electric power on the Frankfurt-based European Energy Exchange (EEX). Shareholders in the EEX include Germany energy suppliers (51 percent) and Eurex (49 percent), a partnership between the Frankfurt Stock Exchange and the Zurich Stock Exchange. The new system will enable customers to trade electricity 24 hours ahead of physical delivery. Individual hours of electricity will be auctioned and trading will take place for both peak and base load electricity.<sup>19</sup>

While the German Ministry of Economics selected Frankfurt am Main as the location of the EEX over Leipzig, Leipzig has decided to continue with its plans to open a separate energy trading site. The Leipzig Power Exchange (LPX) began electricity spot trading in May 2000, with plans to enter the futures trading business six to nine months later. Shareholders in the LPX include the Scandinavian Energy Exchange - Nord Pool, with a 35-percent stake; the State Bank of Saxony, with a 35-percent stake; and the State of Saxony and the City of Leipzig, sharing the remaining 30 percent. Within the next two years, an estimated 25 percent of German energy sales will be made via the German power exchanges.<sup>20</sup>

Before liberalization, electricity prices in Germany were among the highest in Europe. Since reform was initiated, wholesale electricity prices have reportedly

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<sup>16</sup> Branko Terzic, Berthold Wurm, and Yorck Dietrich, "Germany: Taking the Lead in Electricity and Gas," *Public Utilities Fortnightly*, Jan. 15, 2000, p. 26; and U.S. Department of State telegram, "A Brave New World in Germany Electricity Markets," message reference No. 001820, prepared by U.S. Embassy, Berlin, Nov. 17, 1999.

<sup>17</sup> Terzic, Wurm, and Dietrich, "Germany: Taking the Lead in Electricity and Gas," pp. 26-27.

<sup>18</sup> U.S. Department of State telegram, "A Brave New World in Germany Electricity Markets," message reference No. 001820, prepared by U.S. Embassy, Berlin, Nov. 17, 1999.

<sup>19</sup> Andrew Taylor, "Internet spot trading to launch," *Financial Times*, found at Internet address <http://www.ft.com>, retrieved Mar. 10, 2000.

<sup>20</sup> USDOC, ITA, "Germany - Power Exchange Starts Business in May 2000," *International Marketing Insight - IMI20000320*, found at Internet address <http://www.stat-usa.gov>, retrieved June 8, 2000.

fallen by approximately 40 percent,<sup>21</sup> and transmission costs are now comparable to those in the United Kingdom and Scandinavia.<sup>22</sup> At the retail level, a notable price decline has benefitted consumers, particularly large users such as chemical companies. From July 1998 to January 1999, electricity prices for industrial customers fell by between 8 percent and 18 percent.<sup>23</sup>

## ***Remaining Impediments to Competition***

Despite reform, industry representatives indicate that the German market holds a number of challenges for new entrants. The principal challenge is rooted in the continued vertical integration of the EVUs.<sup>24</sup> As indicated, the 6 EVUs own 81 percent of generation, 100 percent of transmission, and 34 percent of distribution capacity.<sup>25</sup> Further, the recent mergers that have occurred reportedly have resulted in less intense competition in the market. Traders are particularly concerned about the potential for more mergers because they reduce the number of available counter parties, which in turn diminishes market liquidity and transparency.<sup>26</sup>

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<sup>21</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," Feb. 2000, p. 5.

<sup>22</sup> Harnischfeger and Hargeaves, "German Power Market Face More Competition.

<sup>23</sup> Michael Roberts, "EU electricity directive faces some resistance," *Chemical Week*, found at Internet address <http://proquest.umi.com>, retrieved Mar. 9, 2000.

<sup>24</sup> Industry representative, interview by USITC staff, Brussels, Belgium, June 20, 2000.

<sup>25</sup> Industry representative, interview by USITC staff, Utrecht, The Netherlands, June 22, 2000.

<sup>26</sup> Industry representative, interview by USITC staff, Brussels, Belgium, June 20, 2000.



# CHAPTER 10

## ITALY

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*Italy is undertaking considerable reform that entails privatization, restructuring, and 40-percent consumer choice by 2002. Industry representatives report few market impediments, but support greater transparency and regulatory streamlining.*

### Nature and Extent of Regulatory Reform

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Law No. 481 of November 1995 established guidelines for electricity market liberalization, and created the Electricity and Gas Authority.<sup>1</sup> This Authority is an independent regulator responsible for protecting customer interests; developing transparent pricing regimes; assuring universal service, quality, competition, and efficiency; providing advice regarding energy supply to the Italian Government and Parliament; and developing guidelines for the unbundling of energy firms' operations.<sup>2</sup> The Bersani Decree, which came into effect in April 1999, was designed to implement the EU Electricity Directive.<sup>3</sup> This decree initiated several electricity sector reforms, including the break-up of Ente Nazionale per l'Energia Elettrica S.p.A. (Enel), Italy's state-owned dominant utility; the privatization of certain facilities; the termination of sales and import monopolies held by Enel; and the development of a single buyer access regime.<sup>4</sup> The Bersani Decree stipulates that any electricity provider, including Enel, supplying more than 300,000 customers must separate their transmission, distribution, and retail supply functions into distinct subsidiaries.<sup>5</sup> Enel separated its generation, transmission, distribution, and retail supply functions into separate firms

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<sup>1</sup> Frederick Fucci and Francesco Fucci, "Bersani Decree Opens Italian Energy Market," *International Financial Law Review*, Sept. 1999, found at Internet address <http://proquest.umi.com/>, retrieved Jan. 27, 2000.

<sup>2</sup> The European Commission, "Implementation By the Member States: Italy," found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved Jan. 27, 2000.

<sup>3</sup> Susan Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," Feb. 1, 2000, Standard & Poor's, *EU Electricity Directive Sparks Market Reforms Across Europe*, (London: Standard & Poor's, Feb. 2000), p. 21.

<sup>4</sup> In the single buyer model, the service operator is responsible for the centralized buying of power. Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>5</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," pp. 21-22.

inside 6 months of the Bersani Decree's entry into force.<sup>6</sup> Further, in October 1999, the Italian government privatized 35 percent of Enel through an initial public offering on the New York and Milan stock exchanges. However, to preserve the government's controlling interest in the utility, no single investor was permitted to acquire a stake greater than 1 percent.<sup>7</sup> In addition, the Bersani Decree accords 40 percent of Italian consumers choice over their supplier by 2002.

## Current Market Conditions

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### *Generation*

In 1999, Enel remained the dominant provider of electricity generation in Italy. Enel owns 85 percent of Italy's electricity generating capacity.<sup>8</sup> In addition to Enel, approximately 600 independent generators supply the Italian electricity market, principally through hydroelectric plants.<sup>9</sup> Italy will not permit any single entity to import or generate more than 50 percent of the country's electricity after January 1, 2003. In order to comply with this regulation, Enel must sell at least 15,000 MW of its electricity generation capacity. Enel reportedly will sell this capacity as three separate firms with capacities of 7,008 MW, 5,438 MW, and 2,611 MW.<sup>10</sup> Beginning in 2002, Italy also will require firms that import or generate electricity in excess of 100 GWh per year<sup>11</sup> to generate a certain amount of electricity using renewable fuels.<sup>12</sup>

U.S. firms are beginning to participate in the Italian generation segment. For example, Enron has formed a joint venture with Enel for the purpose of introducing combined-cycle gas turbine (CCGT) technology into existing plants.<sup>13</sup> In addition, U.S. firm

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<sup>6</sup> The European Commission, "State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000," found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved June 26, 2000; and Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>7</sup> "Enel Begins Trading on the New York and Milan Stock Exchanges," *Business Wire*, Nov. 2, 1999, found at Internet address <http://today.newscast.com/>, retrieved Mar. 16, 2000; and "Northern Notes: Economic News from Northern Italy," *State Department Wires*, Dec. 20, 1999, found at Internet address <http://today.newscast.com/>, retrieved Mar. 16, 2000.

<sup>8</sup> Energy Information Administration (EIA), *Italy*, Sept. 1999, found at Internet address <http://www.eia.doe.gov/>, retrieved Jan. 27, 2000.

<sup>9</sup> International Energy Agency (IEA), *Italy 1999 Review*, (Paris: OECD, 1999), p. 90.

<sup>10</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>11</sup> Exported electricity, electricity produced for self-consumption, and electricity produced through cogeneration are not included in this 100GWh threshold.

<sup>12</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 22; and the European Commission, "State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000," found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved June 26, 2000.

<sup>13</sup> "Business: Jolted," *The Economist*, Mar. 14, 1998, found at Internet address <http://proquest.umi.com/>, retrieved Jan. 27, 2000.

Public Service Enterprise Group recently acquired 70 percent of Italian firm Prisma 2000, a power plant developer. Prisma plans to construct 550 MW of generation capacity in Italy.<sup>14</sup> The Bersani Decree is facilitating participation of this type by promising reform of the permit process. At present, the permit process for the construction of new generation capacity in Italy is extremely complicated due to a large number of regulations at various government levels.<sup>15</sup>

## *Transmission and Distribution*

Enel remains the majority owner of Italy's transmission network,<sup>16</sup> but control of the network has been ceded to the system operator, Gestore della Rete di Trasmissione Nazionale S.p.A.<sup>17</sup> The System operator is required to accommodate as reasonable any party that requests connection to the network. However, priority is given to energy generated using domestic energy sources, renewable sources, and combined heat and power (CHP) plants.<sup>18</sup> Should the operator deny access to the grid, it must clearly state its reasons for doing so.<sup>19</sup> The system operator establishes transmission fees based on energy losses, depreciation, and the cost of associated services.<sup>20</sup>

The Bersani Decree stipulates that the system operator also must establish a single buyer within six months of the Decree's effective date.<sup>21</sup> The single buyer will purchase bulk power on behalf of captive customers. Until the pool market begins operations, the single buyer will carry out<sup>22</sup> such purchases through bilateral contracts with electricity suppliers.<sup>23</sup> Distribution companies will be able to purchase shares in the single buyer, but the system operator must retain majority ownership and no single distribution company will be permitted to hold more than 10 percent of the single buyer.<sup>24</sup>

In 1997, approximately 14 percent of Italy's electricity demand was met through cross-border imports. France and Switzerland, which respectively accounted for

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<sup>14</sup> "N.J. Utility Acquires 70% Stake in Italian Power Plant Builder," *The Record*, Mar. 16, 2000, found at Internet address <http://today.newscast.com/>, retrieved Mar. 22, 2000.

<sup>15</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>16</sup> Enel is the sole owner of Italy's 380 kV transmission grid, and owns 81.5 percent of Italy's 220 kV transmission grid. IEA, *Italy 1999 Review*, p. 87.

<sup>17</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 21; and the European Commission, "State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000."

<sup>18</sup> The European Commission, "Implementation By the Member States: Italy."

<sup>19</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>20</sup> IEA, *Italy 1999 Review*, p. 100.

<sup>21</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," pp. 21-22; and Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>22</sup> The Single Buyer will assume these responsibilities on a date to be determined by the Ministry of Industry. Frederick Fucci, "Reforming the Italian Electric Sector," *Energy Notes*, Summer 1999, found at Internet address <http://www.thelenreid.com/>, retrieved Mar. 16, 2000.

<sup>23</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," pp. 21-22.

<sup>24</sup> *Ibid.*, and Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

imports of 17.3 TWh and 20 TWh in 1997, were Italy's most significant foreign electricity suppliers. Enel conducted all of Italy's cross-border electricity trade until February 1999, when the Bersani Decree ended Enel's import concession<sup>25</sup> and permitted private entities to participate in cross-border electricity trade. Under the Bersani Decree, the transmission system operator is responsible for identifying extant cross-border connections and determining the level of use and availability of such capacity. If the demand for cross-border transmission is greater than capacity, the Electricity and Gas Authority may establish import conditions.<sup>26</sup> The Electricity and Gas Authority allocated ceilings for the use of cross-border transmission capacity during 2000. These ceilings may limit Enel's share of cross-border capacity to as little as 50 percent.<sup>27</sup> In addition, the Electricity and Gas Authority is responsible for instituting procedures under which the transmission system operator can deny access to imported electricity, if eligible customers in the country of origin do not enjoy import privileges similar to those granted to eligible customers in Italy.<sup>28</sup>

Currently, Enel owns 93 percent of Italy's electricity distribution network,<sup>29</sup> while 165 separate municipal utilities own the remaining 7 percent of the network. ACEA-Rome, AEM-Milan, and AEM-Turin are three of the largest municipal companies. Other large cities with municipal companies include Bolzano, Brescia, Cremona, Modena, Parma, San Remo, Seregno, Sondrio, Trieste, Vercelli, Verona, and Voghera.<sup>30</sup> By March 31, 2001, providers of electricity distribution services must acquire a 30-year operating license. Although several major Italian electricity markets obtain distribution services from two companies-- Enel and a local company-- only one distributor in each municipality will receive a license. Thus, this new regulation likely will reduce Enel's share of the Italian electricity distribution market.<sup>31</sup> The distance between consumers and suppliers determines the level of distribution fees.<sup>32</sup>

## ***Retail Supply***

The Bersani Decree immediately permitted customers that consumed at least 30 GWh of electricity per year and consortiums that consumed at least 30 GWh as a whole and 2 GWh per member to purchase electricity from any wholesaler, distributor, or generator. Beginning January 1, 2000, customers that consumed at least 20 GWh of electricity annually and consortiums that consumed at least 20 GWh as a whole and 1 GWh per member were able to choose their own electricity supplier. Such consumers account for approximately 35 percent of the Italian electricity market. On January 1, 2002, the threshold for individual customers and consortia will drop to 9 GWh, though the eligibility of the latter will continue to require the consumption of at least 1 GWh by individual members. In addition, eligibility will be extended to multi-site customers

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<sup>25</sup> IEA, *Italy 1999 Review*, p. 88; and EIA, *Italy*.

<sup>26</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>27</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 21.

<sup>28</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>29</sup> EIA, *Italy*.

<sup>30</sup> IEA, *Italy 1999 Review*, p. 87.

<sup>31</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 21.

<sup>32</sup> IEA, *Italy 1999 Review*, p. 100.

that consume a total of at least 40 GWh and a minimum of 1 GWh per site. As a result, approximately 40 percent of consumers in the Italian electricity market will be able to choose their suppliers by 2002.<sup>33</sup> This guideline may be altered if less than 40 percent of electricity consumers qualify as eligible customers by January 2002.<sup>34</sup> In addition, Italy's regulatory authority may accelerate market liberalization after 2002 by extending eligibility to a larger number of consumers.<sup>35</sup>

Eligible customers will purchase power by entering into bilateral contracts with electricity suppliers or through participation in the national pool, to be established on January 1, 2001.<sup>36</sup> According to the Bersani Decree, the system operator must establish a market operator, a fully state-owned entity to govern the pool.<sup>37</sup> The market operator will manage the pool market,<sup>38</sup> balance supply and demand for electric power, and establish a merit order<sup>39</sup> that determines which generators will dispatch electricity.<sup>40</sup> Customers that purchase electricity through bilateral contracts will pay an additional fee to cover extra costs.<sup>41</sup>

All captive customers, which largely comprise small businesses and residences,<sup>42</sup> will pay a uniform price for electricity.<sup>43</sup> A consumer that has become eligible to participate in the liberalized electricity market can request to be treated as a captive consumer for a maximum of four years.<sup>44</sup>

Since the initiation of reform, Italian electricity prices have declined by 2 percent overall, and by 6 percent when fuel costs are not included. Analysts expect that Italy's reforms likely will rationalize some subsidies and bring distributors' revenues closer to the cost of service provision.<sup>45</sup>

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<sup>33</sup> Fucci, "Reforming the Italian Electric Sector," and the European Commission, "Implementation By the Member States: Italy."

<sup>34</sup> IEA, *Italy 1999 Review*, p. 90.

<sup>35</sup> Fucci, "Reforming the Italian Electric Sector."

<sup>36</sup> The European Commission, "Implementation By the Member States: Italy."

<sup>37</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>38</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 21.

<sup>39</sup> *Ibid.*, p. 21. The merit order will be based on bid prices submitted by generators to the electricity pool.

<sup>40</sup> IEA, *Italy 1999 Review*, pp. 107-108.

<sup>41</sup> The European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*.

<sup>42</sup> Fucci, "Reforming the Italian Electric Sector."

<sup>43</sup> Fucci and Fucci, "Bersani Decree Opens Italian Energy Market."

<sup>44</sup> IEA, *Italy 1999 Review*, p. 90.

<sup>45</sup> Witt, "Italy: Enel Will Remain Dominant Despite Market Overhaul," p. 23.

## ***Remaining Impediments to Competition***

In general, foreign firms face few restrictions in Italy. Italy permits 100-percent foreign ownership of Italian firms and foreign investment in privatized firms. In addition, foreign investors receive national treatment in most cases. However, the Italian Government reserves the right to block mergers involving foreign firms in order to protect the Italian economy, or if Italian firms do not receive reciprocal treatment in a foreign firm's home country.<sup>46</sup>

It is also reported that the regulatory process for establishing a new plant is not transparent.<sup>47</sup> The need to acquire multiple permits and approvals at various government levels and the close scrutiny given to foreign investment reportedly discourage investment in industrial projects. Although Italy's parliament is currently developing legislation that would increase transparency in the public works sector, present government procedures likely will continue to pose disincentives for new investment in Italy.<sup>48</sup>

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<sup>46</sup> U.S. Department of Commerce (USDOC), *Country Commercial Guide Italy, Fiscal Year 1999*, June 1998, found at Internet address <http://wwwstat-usa.gov/>, retrieved May 19, 2000.

<sup>47</sup> Industry representatives, interview by USITC staff, London, United Kingdom, June 14, 2000.

<sup>48</sup> USDOC, *Country Commercial Guide Italy, Fiscal Year 1999*.

# CHAPTER 11

## THE NETHERLANDS

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*Dutch market reform features privatization and the dismantling of a cartel in the generation segment. Complete consumer choice is scheduled for 2004. Industry representatives support greater transparency and streamlining of the privatization process.*

### Nature and Extent of Regulatory Reform

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The Electricity Act of 1998 implements the EU Electricity Directive in Dutch law and replaces the Electricity Act of 1989. The 1989 Act separated generators from distributors, and merged four large generating companies into a temporary cartel.<sup>1</sup> N.V. SEP, the Dutch Electricity Generating Board, is the coordinating body that manages the cartel's production and transmission functions.<sup>2</sup> The Netherlands further requires the separation of transmission and distribution on an accounting basis.

Major objectives of the 1998 Act are to deregulate the distribution segment and phase-in complete consumer choice by 2004, putting the Netherlands well ahead of the timetable established by the EU directive with respect to consumer choice. The government also hopes to privatize distribution firms within the next 3 to 5 years, despite concerns raised by the Dutch Parliament regarding consumer welfare.<sup>3</sup> The 1998 Act dismantled the cartel arrangement and transferred grid operations to TenneT, the Netherlands' independent system operator, which may also be partially privatized in the future.<sup>4</sup>

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<sup>1</sup> E. Andrin, O. Kitsou, J.-P. Leotard, and M. Smets, "The Deregulation of the Power Industry in the European Union," Massachusetts Institute of Technology, Energy and Economic Development Technology and Policy Program, found at Internet address <http://cogen.mit.edu/tpp126/EUROPE2.html/>, retrieved Feb. 24, 2000.

<sup>2</sup> International Energy Agency, "The Netherlands - 1996 Review," *Energy Policies of IEA Countries*, (Paris: OECD/IEA, 1996), p.58; and Organisation for Economic Co-operation and Development (OECD), *Regulatory Reform in the Netherlands*, (Paris: OECD, 1999), p. 62.

<sup>3</sup> Representatives of the Ministry of Economic Affairs; and industry representatives, interviews by USITC staff, Arnhem, the Netherlands, and The Hague, the Netherlands, June 23, 2000.

<sup>4</sup> U.S. Department of State telegram, "USITC Investigation, Electric Power Services: The Netherlands," message reference No. 000876, prepared by U.S. Embassy, The Hague, Mar. 21, 2000.

The electricity sector is regulated by DTe, a part of the Netherlands Competition Authority (NMa) under the Ministry of Economic Affairs.<sup>5</sup> According to the 1998 Act, DTe guarantees transparent grid access conditions and transmission pricing. It regulates third-party access to the electricity network, and ensures free and non-discriminatory access to the grid. DTe also determines rate structures in consultation with TenneT, the system operator, and grid users.<sup>6</sup> Suppliers and consumers may trade electricity through bilateral contracts or through the Netherlands' developing electricity pool.

## **Current Market Conditions**

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### ***Generation***

Electric power in the Netherlands is still largely generated by four companies, UNA, EPZ, EZH, and EPON, which account for 64 percent of all generated capacity. These four generators together form and own SEP, a public limited company.<sup>7</sup> Three of these four firms now have foreign ownership. UNA is owned by Reliant Energy of the United States, EZH is owned by PreussenElektra of Germany, and EPON is owned by Electrabel of Belgium and ING, a Dutch banking concern.<sup>8</sup> The cartel sells electricity at marginal cost and distribution companies are paid a fixed annual price. The cartel arrangement is set to expire at the end of 2000.<sup>9</sup> Regional independent power producers (IPPs) account for 5,280 MW, or 30 percent, of the total electricity generated in the Netherlands.<sup>10</sup>

### ***Transmission and Distribution***

The Dutch transmission grid consists of two high voltage - 380 kV and 220 kV - grids. A new independent system operator, TenneT, was created to manage the transmission grid and high-voltage interconnectors. The owners of SEP have a combined 49.9-percent interest in TenneT, the rest being controlled by municipal and provincial

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<sup>5</sup> Dutch Electricity Regulatory Service, "Price Cap Regulation in the Electricity Sector, Information and Consultation Document," unauthorized translation, July 1999, found at Internet address <http://www.dte.nl/>, retrieved May 18, 2000.

<sup>6</sup> Representatives of DTe, interview by USITC staff, The Hague, the Netherlands, June 22, 2000.

<sup>7</sup> U.S. Department of Commerce (USDOC), International Trade Administration (ITA), "Netherlands - Foreign Competition in Electricity," *Industry Sector Analyses (ISA), Market Research Reports*, Oct. 7, 1998, found at Internet address <http://www.stat-usa.gov>, retrieved Mar. 15, 2000.

<sup>8</sup> The European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*, found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved June 26, 2000.

<sup>9</sup> Representatives of DTe, interview with USITC staff, The Hague, the Netherlands, June 22, 2000.

<sup>10</sup> Ibid.

governments. It is envisioned that TenneT will be partially privatized in 2001, with the central government holding majority ownership for a period of up to three years to protect captive consumers.<sup>11</sup> Revenues from the sale of TenneT will be used to alleviate stranded costs. TenneT may also assess a transit fee to help pay these costs.<sup>12</sup>

Some 20 companies owned by municipal and provincial authorities distribute and supply electricity to consumers.<sup>13</sup> The distribution grids consist of two low voltage - 150 kV and 110 kV - networks.<sup>14</sup> There has been significant consolidation in the distribution sector in recent years. The 23 distribution companies operating in 1997 have been reduced to 12, with 3 major players, Eneco, Nuon, and Essent.<sup>15</sup> Until 2002, Ministry approval is required for the privatization of distribution companies.<sup>16</sup>

## ***Retail Supply***

The nature of competition in the retail supply segments will change as consumer choice is phased in. The first class of consumers, those using more than 10 GWh annually, have been free to choose their retail suppliers since January 1999. This class of consumers comprises the 350 largest, primarily industrial, users in the Netherlands. The intermediate class of consumers will be free to choose their suppliers by January 2002. The Dutch electricity market is expected to be fully liberalized by January 2003, when small consumers will be allowed to select their suppliers.<sup>17</sup> The intermediate group of consumers can choose to receive electricity from a licensee supplier for a fixed price for ten years, while small consumers can remain captive indefinitely.<sup>18</sup> Generators and non-captive consumers are free to directly negotiate and conclude contracts.<sup>19</sup> Supply and compensation arrangements between the

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<sup>11</sup> Industry representative, interview with USTIC staff, Arnhem, the Netherlands, June 23, 2000.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> "TenneT: Transmission System Operator," found at Internet address <http://www.tennet.org/html/nl/ni3/home.htm>, retrieved Mar. 13, 2000.

<sup>15</sup> The European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*.

<sup>16</sup> Representatives of DTe, interview by USITC staff, The Hague, the Netherlands, June 22, 2000.

<sup>17</sup> U.S. Department of State telegram, "USITC Investigation, Electric Power Services: The Netherlands," message reference No. 000876, prepared by U.S. Embassy, The Hague, the Netherlands, Mar. 21, 2000.

<sup>18</sup> DTe, "Current Lines Toward an Electricity Market: The Framework for a New Electricity Act in the Netherlands," found at Internet address <http://www.dte.nl/>, retrieved May 17, 2000.

<sup>19</sup> Dutch Electricity Regulatory Service, "Price cap regulation in the electricity sector, information and consultation document," unauthorized translation, July 1999, found at Internet address <http://www.dte.nl/>, retrieved May 18, 2000.

four main generators, distributors and captive consumers will continue according until 2001.<sup>20</sup>

The Amsterdam Power Exchange (APX), which started operation on May 15, 1999, is a daily spot market where electricity is traded a day ahead with hourly pricing. APX participants must be involved in the energy industry, but shareholders in APX do not share this requirement. Shareholders are limited to a 10 percent stake. The Ministry of Economics supports the APX but has no formal role.<sup>21</sup> Foreign producers, consumers, traders, and suppliers are allowed to buy and sell, but a reciprocity clause is applied to consumers of less than 20 GWh per year. Currently, the Netherlands' four generators are not permitted to sell their electricity on the APX; they must continue selling electricity through SEP.<sup>22</sup> However, generators will eventually be free to trade on the exchange.<sup>23</sup>

APX is presently suffering a general lack of liquidity. There are 3500 MW of capacity available in the Netherlands. Of that amount, 300 MW are used to keep the grid operating and 2300 MW is allocated to SEP, leaving only 900 MW available for APX participants. However, there will be an auction of interconnection capacity in 2001, and the proceeds will be reinvested. In addition, TenneT has proposed an auction for transmission capacity.<sup>24</sup>

DTe is anticipating a substantial reduction in prices over the next few years.<sup>25</sup> According to industry representatives, prices for the 650 consumers accorded choice over suppliers in 1999 have already declined. In addition, regulated prices in 2000 are 2 percent lower than in 1999.<sup>26</sup>

## ***Remaining Impediments to Competition***

While the Netherlands has set the stage for considerable liberalization in its electricity market, industry representatives note a number of difficulties they face at present. As

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<sup>20</sup> Standard & Poor's, "Infrastructure Finance: EU Electricity Directive Sparks Market Reforms Across Europe," Feb. 2000, p. 24; and DTe, "Advice Regarding the Allocation of Obligations of the Electricity Production Sector," found at Internet address <http://www.dte.nl/>, retrieved May 17, 2000.

<sup>21</sup> Industry representative, interview by USTIC staff, Amsterdam, the Netherlands, June 23, 2000.

<sup>22</sup> Ibid.

<sup>23</sup> Industry representative, interview by USTIC staff, Utrecht, the Netherlands, June 23, 2000.

<sup>24</sup> Representatives of DTe, interview by USITC staff, The Hague, the Netherlands, June 22, 2000.

<sup>25</sup> DTe, "DTe announces method for regulating electricity sector," Netherlands Electricity Regulatory Service, press release 00001, The Hague, Mar. 1, 2000; found at Internet address <http://www.dte.nl> retrieved Mar. 28, 2000.

<sup>26</sup> Representatives of DTe, interview by USITC staff, The Hague, the Netherlands, June 22, 2000.

noted, the privatization of an electricity distributor requires ministerial authorization.<sup>27</sup> In addition, industry representatives report government intervention in contractual negotiations. It is also apparent that different business styles have reportedly caused problems, with foreign participants indicating that more transparency is needed in certain areas, such as the distribution price setting formula.<sup>28</sup>

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<sup>27</sup> Romesh Vaitilingam ed., "A European Market for Electricity?," Center for Economic Policy Research, (London:1999), p. 63.

<sup>28</sup> Industry representative, interview by USITC staff, Utrecht, the Netherlands, June 22, 2000.



# CHAPTER 12

## SPAIN

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*Spain has privatized Endesa, the country's dominant electricity utility, and undertaken limited restructuring. Industry representatives support greater regulatory transparency and less frequent revision of policies and procedures pertaining to market entry.*

### Nature and Extent of Regulatory Reform

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The 1994 *Ley de Ordenacion del Sector Electrico Nacional* (LOSEN) was Spain's first attempt at electric power sector reform. Although it was never implemented,<sup>1</sup> portions of the 1994 law have become part of Spain's current reform program.<sup>2</sup> The *Ley del Sistema Electrico* (hereafter, the Electricity Law),<sup>3</sup> which was issued on November 27, 1997, and implemented on January 1, 1998, effectively initiated Spain's reform program as required under the EU Electricity Directive.<sup>4</sup> Among other reforms, the Electricity Law established the *Comisión Nacional del Sistema Eléctrico* (CNSE), Spain's independent regulatory authority. In 1999, the CNSE and Spain's gas regulator merged, forming the *Comisión Nacional de la Energía* (CNE). The CNE's responsibilities include the settlement of network access disputes and the provision of various supervisory, advisory, and control services. The CNE also is responsible for proposing pricing regimes. However, the Ministry of Industry, the entity with which the CNE shares regulatory authority, must approve such proposals.<sup>5</sup> The Electricity Law also stipulates that entities involved in transmission, distribution, or system management (regulated activities) are prohibited from generating or marketing electricity (unregulated activities).<sup>6</sup> Unregulated and regulated services may be provided by legally distinct firms within the same parent company, as long as these

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<sup>1</sup> Pierre Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," ed. Romesh Vaitilingam, *A European Market for Electricity?*, (London: Centre for Economic Policy Research, Oct. 1999), p. 164.

<sup>2</sup> Henry Edwardes-Evans, Lucy Plaskett, and Sally Bogle, *Electricity in Europe: Into the Single Market*, vol. 2 (London: Financial Times Energy, 1997), p. 117.

<sup>3</sup> Electricity Act 54/1997.

<sup>4</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 164; and the European Commission, *Implementation By the Member States: Spain*, found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved Jan. 27, 2000.

<sup>5</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>6</sup> Ibid.

firms do not share information.<sup>7</sup> Although the legal separation of these functions is not required until year-end 2000, firms that carry out both regulated and unregulated functions must immediately separate the accounts of, and establish management partitions between, those entities involved in these separate activities.<sup>8</sup> Newly established firms must separate regulated and unregulated functions completely upon establishment.<sup>9</sup>

Privatization in the Spanish electricity market has occurred gradually, beginning prior to regulatory reform. The Spanish Government privatized Endesa, the dominant electricity generation firm, through four separate public offerings. Specifically, shares accounting for 13 percent, 20 percent, 26 percent, and 41 percent of the firm were sold in May 1988, June 1994, October 1997, and June 1998, respectively.<sup>10</sup> In addition, Red Electrica de España (REE), the dominant provider of transmission services in Spain, was partially privatized under the Electricity Law, with the state continuing to hold a 25-percent share.<sup>11</sup>

## Current Market Conditions

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### *Generation*

Endesa is Spain's largest electric power generator, producing 47 percent of Spain's electricity. Other firms that generate substantial shares of Spain's electricity currently include Hidrocanabrico, Iberdrola, and Union Fenosa.<sup>12</sup> Each of these companies, including the recently-privatized Endesa, are privately-owned and have agreed not to merge with or acquire one another.<sup>13</sup> However, no horizontal restructuring has occurred in the Spanish generation segment, which remains highly concentrated.<sup>14</sup>

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<sup>7</sup> The European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*, found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved June 26, 2000.

<sup>8</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>9</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 166.

<sup>10</sup> Michael Peterson, "Endesa Electrifies Investors," *Euromoney*, Feb. 1999, found at Internet address <http://proquest.umi.com/>, retrieved May 25, 2000.

<sup>11</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," pp. 164 and 166.

<sup>12</sup> Energy Information Administration (EIA), *Spain*, Dec. 1999, found at Internet address <http://www.eia.doe.gov/>, retrieved Jan. 27, 2000; and Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 165.

<sup>13</sup> EIA, *Spain*, and the European Commission, *Implementation By the Member States: Spain*.

<sup>14</sup> Industry representative, interview by USITC staff, London, United Kingdom, June 12, 2000.

For the most part, generation firms with capacity greater than 50 MW must sell electricity through bilateral contracts with consumers or by submitting bids to the market operator.<sup>15</sup> Firms with capacity less than 50 MW, auto producers that use cogeneration or similar technologies, and generators using renewable energy sources are not required to participate in the electricity market. In addition, distributors are required to purchase such producers' surplus electricity at a regulated price.<sup>16</sup> Generators that produce less than 15 percent of the country's electricity through the use of indigenous coal may receive priority dispatching, but to date, the government has not invoked this provision.<sup>17</sup>

Under Spain's 1997 electricity law, the construction of new electricity generation plants is permitted subject to authorization, and foreign participation is unrestricted.<sup>18</sup> To date, foreign firms have preferred to enter the Spanish electricity market through joint ventures with local firms, although some foreign entities have entered the market independently.<sup>19</sup> U.S. firm Edison International presently operates a 400 MW generation facility in Varagoza,<sup>20</sup> while British firms BP Amoco, National Power, and Eastern have gained market entry by forming joint ventures with Spanish firms.<sup>21</sup> Other U.S. firms that are building generation capacity in Spain include Enron, AES, and Entergy.<sup>22</sup>

## ***Transmission and Distribution***

REE owns the vast majority of Spain's transmission network, connecting 98 percent of Spain's generation capacity. As noted, REE was 75-percent privatized under the 1997 Electricity Law. Single entities are limited to a 10-percent stake in REE, and no more than 40 percent of REE's shares can be held by other participants in the Spanish electricity market. Other firms that own transmission substations and lines in Spain include Endesa, Hidrocanabrico, Iberdrola, and Union Fenosa.<sup>23</sup>

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<sup>15</sup> *Compañía Operadora del Mercado Español de Electricidad, SA* is Spain's market operator.

<sup>16</sup> The European Commission, *Implementation By the Member States: Spain*; and *Compañía Operadora del Mercado Español de Electricidad*, "Electricity Market Rules," Feb. 1999, p. 50, found at Internet address <http://www.omel.es/>, retrieved Aug. 11, 2000.

<sup>17</sup> The European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*.

<sup>18</sup> Ana Nogales, "Spain: New Competitive Pressures for Electric Utilities," Feb. 4, 2000, in Standard & Poor's, *EU Electricity Directive Sparks Market Reforms Across Europe*, (London: Standard & Poor's, Feb. 2000), p. 29; U.S. Embassy representative, E-mail response to questions by USITC staff, June 15, 2000; and the European Commission, *State of Implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*.

<sup>19</sup> Industry representative, interview by USITC staff, London, United Kingdom, June 12, 2000.

<sup>20</sup> U.S. Embassy representative, telephone interview by USITC staff, Apr. 4, 2000.

<sup>21</sup> EIA, *Spain*.

<sup>22</sup> U.S. Embassy representative, telephone interview by USITC staff, Apr. 4, 2000.

<sup>23</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 166.

REE serves as both system operator and transmission manager,<sup>24</sup> and its independence is maintained through the 10-percent ownership limit mentioned above.<sup>25</sup> REE is required to connect any entity that requests access to the network. Network access can only be refused due to inadequate capacity, such that a particular connection would compromise the quality and security of transmission. The National Energy Commission (CNE) is responsible for handling disputes regarding network access.<sup>26</sup>

The 1997 Electricity Law stipulates that the Spanish electric power distribution market will continue to comprise local monopolies.<sup>27</sup> All of Spain's approximately 120 distribution firms have been or will be privatized.<sup>28</sup> The government consults with relevant local firms in order to determine when new investment in the distribution system is needed, and these local monopolies are responsible for making such investments. Because new investment has been concentrated in Spain's transmission and generation segments in recent years, the distribution network has become relatively less reliable, accounting for the vast majority of breakdowns.<sup>29</sup>

Fees charged for electricity transmission and distribution are regulated flat rates based on network use and voltage levels. All system operation costs, as defined in Spanish law, are reflected in these fees. The government must approve these fees, which are understood to be the maximum permissible price for electricity transmission and distribution.<sup>30</sup>

## ***Retail Supply***

With regard to consumer choice, Spain has liberalized its electricity market much faster than required under the EU Electricity Directive, which stipulates that 33 percent of a member country's market must be open to competition by 2003.<sup>31</sup> When the Spanish Electricity Law was enacted in January 1998, entities that consumed at least 15 GWh of electricity per year were eligible to choose their own electricity supplier. This threshold dropped to 5 GWh on January 1, 1999, enabling nearly 2,000 customers, or 33 percent of the total market, to choose their own supplier.<sup>32</sup> On October 1, 1999, Spain reduced the threshold yet again, extending consumer choice to approximately 9,000 industrial customers, or 47 percent of the total market. Reportedly, 55 percent of the Spanish market, including all industrial consumers,

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<sup>24</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>25</sup> Nogales, "Spain: New Competitive Pressures for Electric Utilities," p. 29.

<sup>26</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>27</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 166.

<sup>28</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>29</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 167.

<sup>30</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>31</sup> EIA, *Spain*.

<sup>32</sup> The European Commission, *Implementation By the Member States: Spain*.

were eligible to choose their own electricity supplier by July 1, 2000.<sup>33</sup> All customers reportedly will be granted eligibility in 2003.<sup>34</sup>

Eligible customers can purchase electricity through bilateral contracts with generators or retail suppliers, or from the electricity pool.<sup>35</sup> Spain's electricity pool consists of three separate markets: the daily market, which began operations on January 1, 1998; the intraday market, which began operations on April 1, 1998; and the markets for complementary services, which began operations on January 1, 1998. In the daily market, entities on both the supply and demand sides of the power market submit bids for the sale and purchase of the following day's hourly electricity production. A private firm, *Compañía Operadora del Mercado Español de Electricidad, SA*, operates the daily market. Customers and producers that plan to buy or generate an amount of electricity different than that bought or sold in the daily market can submit bids in the intraday market. This market, which currently holds five sessions per day and ultimately plans to hold as many as 24 daily sessions, is operated by the market operator. In markets for complementary services, electricity producers submit bids for the sale of reserve power supply. Spain has not yet established a futures market for the sale and purchase of electricity.<sup>36</sup>

Ineligible customers are charged a uniform price established by the Ministry of Industry.<sup>37</sup> This price is based on an estimated average wholesale price of electricity, auxiliary service costs, and recognized transmission, distribution, and "system" costs. Eligible customers are also permitted to purchase electricity at these regulated rates.<sup>38</sup> Since 1997, prices charged to ineligible customers have declined by 11 percent, while prices charged to eligible customers have decreased by 20 percent.<sup>39</sup>

## ***Remaining Impediments to Competition***

While Spain has made great progress toward developing a competitive power market, a number of impediments appear to remain. Reportedly, Spain's electricity market system lacks transparency, as it is unclear which versions of the rules governing the system are valid, and firms that wish to enter the market have difficulty obtaining information concerning relevant policies and procedures.<sup>40</sup> Frequent changes to

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<sup>33</sup> Nogales, "Spain: New Competitive Pressures for Electric Utilities," p. 29.

<sup>34</sup> David White, "Spain to Boost Competition," *Financial Times*, June 24, 2000, found at Internet address <http://news.ft.com/>, retrieved Aug. 10, 2000.

<sup>35</sup> The European Commission, *Implementation By the Member States: Spain*.

<sup>36</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," pp. 168-169.

<sup>37</sup> *Ibid.*, pp. 169-170; and Nogales, "Spain: New Competitive Pressures for Electric Utilities," p. 30.

<sup>38</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," p. 170.

<sup>39</sup> Nogales, "Spain: New Competitive Pressures for Electric Utilities," pp. 30-31.

<sup>40</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," pp. 171, 174, 177-180.

regulations have contributed to lack of transparency.<sup>41</sup> Other impediments to market access include:

- Significant market power retained by incumbent generation firms reportedly places new entrants at a disadvantage,<sup>42</sup>
- Spain's program for the recovery of stranded costs allegedly discourages competition and subsidizes industry incumbents,<sup>43</sup>
- Government consultations with industry incumbents regarding electric power market regulations serve as a barrier to potential market entrants, as outside parties are rarely included in such discussions and such consultations increase the influence of incumbent firms;<sup>44</sup> and
- Obtaining access to the transmission grid reportedly is more difficult in Spain than in some other European countries.<sup>45</sup>

These impediments reportedly have limited market entry and the growth of competition in the Spanish electric power market.<sup>46</sup>

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<sup>41</sup> Industry representative, interview by USITC staff, Arnhem, the Netherlands, June 23, 2000.

<sup>42</sup> Industry representative, interview by USITC staff, Brussels, Belgium, June 20, 2000.

<sup>43</sup> Industry representative, interview by USITC staff, London, United Kingdom, June 12, 2000.

<sup>44</sup> Régibeau, "Regulatory Reform in the Spanish Electricity Industry: Same as It Ever Was?," pp. 171, 174, and 177-180.

<sup>45</sup> Steven Kean, Executive Vice-President and Chief of Staff, Enron, testimony before the U.S. International Trade Commission, June 6, 2000.

<sup>46</sup> *Ibid.*, pp. 171, 174, and 177-180.

# CHAPTER 13

## UNITED KINGDOM

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*The United Kingdom has undertaken ambitious regulatory reform, entailing privatization and restructuring. England, Wales and Scotland allow 100-percent consumer choice. Criticism of the complex initial pricing formula has spurred the development of a new pricing procedure. Remaining impediments to competition include a shortage of transmission capacity and nontransparent regulation of generators.*

### Nature and Extent of Regulatory Reform

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Regulatory reforms in the United Kingdom vary by region.<sup>1</sup> England and Wales have fully integrated their power systems to form the largest market. Scotland maintains a level of independence from the England/Wales market, but still operates under the same regulatory regime. Northern Ireland operates under its own regulatory framework and is not physically connected to the other systems. This discussion will focus on regulatory reforms in the England/Wales market, which is the largest and most competitive.

The 1989 Electricity Act (the Act) effectively laid the foundation for a switch from state-owned electricity monopolies to private ownership and competition throughout the United Kingdom.<sup>2</sup> The Act provided for functional restructuring of the industry, with power generation and retail marketing designated as competitive segments, while transmission and distribution services remained monopolies.<sup>3</sup> Accounting separation must be maintained between competitive and monopoly activities in all four regions. In England and Wales, ownership separation is required for transmission services. The generation and retail supply segments of the industry were gradually deregulated, while the transmission and distribution segments remained regulated with open access guaranteed. A new regulatory authority, the Office of Energy Regulation (OFFER), introduced a new form of price cap regulation for transmission and distribution activities.

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<sup>1</sup> Romesh Vaitilingam, ed., *A European Market for Electricity? Monitoring European Deregulation 2*, (London: Centre for Economic Policy Research, 1999), pp. 89-91.

<sup>2</sup> United Kingdom Electricity Association, "The UK Electricity System," found at Internet address <http://www.electricity.org.uk/>, retrieved Mar. 8, 2000.

<sup>3</sup> James A. Ferrier, ed., *International Electric Power Encyclopedia*, (Tulsa: PennWell Publishing, 1999), p. 90.

In early 1999, OFFER was combined with the Office of Gas Supply to form the Office of Gas and Electricity Markets (OFGEM). OFGEM has the following responsibilities:

- granting of transmission, generation, or supply licenses;
- enforcing the conditions of the licenses and certain provisions of the Electricity Act;
- considering changes that may be required to licenses issued under the Act;
- investigating complaints about licensees;
- resolving disputes between customers and public electricity suppliers;
- overseeing the development of competition and the activities of licensees and referring anti-competitive practices to the Competition Commission;
- setting standards of performance for aspects of customer service and the promotion of efficient use of electricity;
- establishing and maintaining arrangements for the representation of customers;
- fixing and publishing maximum charges for reselling electricity;
- publishing information and advice for the benefit of customers;
- determining connection and use of system agreements under which suppliers have access to the distribution systems and to the national grid; and
- reviewing developments concerning the electricity supply industry.<sup>4</sup>

The Act also created the Electricity Pool, a centralized market for electric power in England and Wales.<sup>5</sup> All generation over 50 MW must be dispatched through the Pool, which acts as a clearinghouse between generators and wholesale consumers of electricity (primarily the regional electricity distributors).<sup>6</sup> The Pool manages a competitive bidding process among generators and establishes which generators will be dispatched to meet forecast demand. Consumers can elect to buy from the pool at a price that varies with market conditions or enter into fixed price contracts with regional distributors, thereby reducing their risk. The regional distributors would then buy electricity from the pool on behalf of those consumers.<sup>7</sup>

The Electricity Pool has elicited criticism in recent years, primarily due to lack of transparency in the extremely complex price setting process. Some analysts have alleged that generators have been able to manipulate prices at the expense of the customers.<sup>8</sup> In response, the Government proposed a new electricity trading

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<sup>4</sup> The Office of Gas and Electricity Markets, "The Office of Gas Supply," found at Internet address <http://www.ofgas.gov.uk/>, retrieved May 9, 2000.

<sup>5</sup> Ferrier, ed., *International Electric Power Encyclopedia*, p. 219.

<sup>6</sup> *The Deregulation of the Power Industry in the European Union*, Energy and Economic Development Technology and Policy Program, found at Internet address <http://cogen.mit.edu/tpp126/EUROPE2.html/>, retrieved Feb. 23, 2000.

<sup>7</sup> David Brown, *Electric Deregulation Lessons Learned From Overseas*, National Utility Service, Inc., Feb. 2000.

<sup>8</sup> *The Government's Review of Energy Sources for Power Generation: A Consultation Document*, Office of Gas and Electricity Markets, Feb. 2000, found at Internet address <http://www.ofgas.gov.uk/>, retrieved May 9, 2000.

arrangement (NETA), which is scheduled to be introduced by the end of 2000.<sup>9</sup> Proposals for NETA envision a series of markets working up to and at the time of dispatch (i.e., in “real time”). It is expected that a variety of forward and futures markets will develop in which most participants will buy or sell for any half-hour period to meet most of their requirements.

One such market is the UK Power Exchange (UKPX), which started on-line trading of electricity contracts on June 5, 2000. UKPX allows firms to trade electricity futures contracts up to 18 months in advance. A spot market is expected to be launched in November 2000.<sup>10</sup> Approximately 20 to 25 percent of British electricity sales, valued at \$9.4 billion, are expected to be channeled through new online exchanges, which are designed to facilitate more competitive electricity trading arrangements by publishing both bid and offer prices.<sup>11</sup> The primary goal is to provide a more transparent market, thereby increasing opportunities for lower prices and better service.<sup>12</sup>

## **Current Market Conditions**

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### ***Generation***

In England and Wales, the market reform process broke up the Central Electricity Generating Board (CEGB), into three generating companies: PowerGen, National Power, and Nuclear Electric. PowerGen and National Power were privatized, although no single shareholder was permitted to acquire more than a 15 percent stake and the government retains a golden share, which conveys veto power over decisions by directors.<sup>13</sup> New entry into the generation segment is unrestricted, to encourage the development of competition, and regional distribution companies are allowed to acquire generation assets as long as generation facilities do not account for more than 15 percent of their individual electricity sales. This has led to considerable investment by regional distributors in independent power producers, especially those with combined cycle gas turbine facilities.<sup>14</sup> Before deregulation of the generation market, there were seven major power producers in the United Kingdom. There are now more than 30 generators. The combined market share of the two largest producers, National Power and PowerGen, fell from 74 percent in 1991 to 39 percent in 2000.<sup>15</sup> The industry regulator recently forced these two generation firms to divest even more

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<sup>9</sup> Ibid.

<sup>10</sup> Arif Mohamed, “UK Electricity Trades Online,” *IT Week*, found at Internet address <http://www.zdnet.co.uk/>, retrieved Aug. 8, 2000.

<sup>11</sup> Under the current arrangements, only generators are allowed to offer prices in the national electricity pool.

<sup>12</sup> Andrew Taylor, “UK to Start Electricity Futures Trading,” *Financial Times*, found at Internet address <http://news.ft.com/>, retrieved Apr. 13, 2000.

<sup>13</sup> Ferrier, ed., *International Electric Power Encyclopedia*, p. 221.

<sup>14</sup> Ibid.

<sup>15</sup> “Electricity Industry Review 4,” Electricity Association, Jan. 2000.

facilities because of alleged market abuse.<sup>16</sup> Today, half of the generation capacity in the United Kingdom has been constructed since deregulation commenced in 1989.<sup>17</sup>

The Scottish generation market continues to be served predominantly by two privatized, but vertically integrated utilities, Scottish Hydro and Scottish Power, which serve northern and southern regions, respectively. The Northern Ireland market is served by three privatized generation companies.

## ***Transmission and Distribution***

In England and Wales, transmission services are provided by the National Grid Corporation. National Grid, which was privatized in 1995 through a public offering on the stock exchange, is responsible for meeting consumer demand at the lowest cost and ensuring that power flows on the transmission system remained within technical limits.<sup>18</sup> Distribution services are provided by the now privatized 12 regional distribution companies. Distribution prices are controlled by OFGEM using the CPI-X form of regulation. This establishes a price ceiling, and allows the ceiling to increase at the rate of consumer price inflation (CPI) minus the value X, which is intended to promote and reflect efficiency gains.<sup>19</sup> The distributors are then free to set prices subject to this price ceiling.<sup>20</sup>

In 1995, concern about vertical reintegration prompted the government to block takeover bids of two regional distribution companies initiated by PowerGen and National Power. The government also prevented the acquisition of National Power by Southern Company of the United States on the grounds that Southern already owned one of the regional distribution companies, South Western Electricity (SWE). In addition, OFGEM required National Grid to sell two hydroelectric generation facilities, subsequently acquired by Mission Energy of the United States, and forced the regional distribution companies to sell their interests in National Grid.<sup>21</sup>

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<sup>16</sup> Representative of the United Kingdom Department of Trade and Industry (DTI), interview with USITC staff, London, June 13, 2000.

<sup>17</sup> Industry representative, interview with USITC staff, Slough, United Kingdom, June 12, 2000.

<sup>18</sup> "National Grid - Background," found at Internet address <http://www.nationalgrid.com/uk/>, retrieved Aug. 8, 2000; Brown, *Electric Deregulation Lessons Learned From Overseas*; and Yorkshire Electricity, "The UK electricity industry," found at Internet address <http://www.yeg.co.uk/>, retrieved Apr. 21, 2000.

<sup>19</sup> *The Deregulation of the Power Industry in the European Union*, Energy and Economic Development Technology and Policy Program; and Ferrier, ed., *International Electric Power Encyclopedia*, p. 221.

<sup>20</sup> Brown, *Electric Deregulation Lessons Learned From Overseas*.

<sup>21</sup> Ferrier, ed., *International Electric Power Encyclopedia*, p. 220.

Transmission and distribution services continue to be provided by Scottish Power and Scottish Hydro in their respective regions in Scotland, and by Northern Ireland Electricity (NIE) in Northern Ireland, although accounting separation is required.

## ***Retail Supply***

Since May 1999, all industrial, commercial, and domestic consumers have been able to select their electricity supplier in England, Wales, and Scotland.<sup>22</sup> Two types of supply licenses are available: Public Electricity Supply licenses (PES) and second-tier supply licenses.<sup>23</sup> Only regional distributors hold PES licenses, which allow for supply to a designated area. Second-tier licenses, on the other hand, may be issued to anyone wishing to enter the supply market, including regional distributors wishing to supply customers outside their designated area.<sup>24</sup> Since competition in supply will reportedly take time to become fully effective, the Director General set retail supply price restraints for 1998-99 and 1999-2000 to protect smaller customers.

In Northern Ireland, consumers whose annual consumption exceeds 2.5 Gwh, or about 30 percent of the market are eligible to choose their supplier. However, only four retail suppliers have received a license and few consumers have switched from NIE.<sup>25</sup>

Since the privatization and regulatory reform process began, electricity prices in England and Wales, once among the highest in the Europe, now are among the lowest.<sup>26</sup> Overall, residential customers have saved about \$3 billion since electricity reform began, with electricity prices falling approximately 30 percent over the last decade.<sup>27</sup> Large industrial users have also benefitted from a 33-percent decline in

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<sup>22</sup> Office of Electricity Regulation, "Structure of the Industry," found at Internet address <http://www.ofgas.gov.uk/>, retrieved Apr. 24, 2000.

<sup>23</sup> A second tier supplier is defined as any company supplying electricity which is not a public electricity supplier (PES) supplying its own area. Office of Electricity Regulation, "Structure of the Industry."

<sup>24</sup> David M. Newbery and Richard Green, "Regulation, Public Ownership and Privatisation of the English Electricity Industry," *International Comparisons of Electricity Regulation*, ed. Richard J. Gilbert and Edward P. Kahm, (Cambridge: Cambridge University Press, 1996), p. 59.

<sup>25</sup> Vaitilingam, ed., *A European Market for Electricity? Monitoring European Deregulation 2*.

<sup>26</sup> Ibid.

<sup>27</sup> Andrew Taylor, "Competition Saves UK Energy Consumers £2 Billion," *Financial Times*, found at Internet address <http://news.ft.com/>, retrieved May 25, 2000; and Electricity Association, "Prices Latest," found at Internet address <http://www.electricity.org.uk/>, retrieved Aug. 8, 2000.

prices over the same period.<sup>28</sup> The NETA is expected to lead to a further 10-percent decline in electricity prices.<sup>29</sup>

## ***Remaining Impediments to Competition***

One of the largest impediments to entry into the generation market is the lack of transmission capacity in England and Wales, which requires that new generation plants be built near customers in densely populated areas. This may deter some potential producers from entering the market as siting such plants can be difficult.<sup>30</sup> The regulator is attempting to remedy this situation by allowing National Grid Company, the system operator, to charge higher use-of-system charges to those producers generating in areas furthest from customer demand in order to encourage producers to build plants in those areas where they are most needed.<sup>31</sup>

A second issue of concern to generators in the British market is the recent introduction of a “good behavior clause” by OFGEM to the licenses of generators it deems to have market power.<sup>32</sup> Under this clause, the regulator would have the power to take away the license of a generator found to be raising prices through market abuse.<sup>33</sup> OFGEM outlines examples of market abuse as capacity withholding,<sup>34</sup> bidding strategies,<sup>35</sup> manipulation of the complex rules governing the system, and abuse of the generator’s contractual position.<sup>36</sup> The test for market abuse is whether or not a licensee has substantial market power, and whether or not an abuse has occurred.<sup>37</sup> Generators complain that OFGEM is going beyond its powers with the inclusion of this clause and that the criteria for inclusion are not well-defined. Six generators accepted the modification to their licenses. However, British Energy and AES, the latter an American firm, rejected the clause on the grounds that it will create ambiguities in the

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<sup>28</sup> Electricity Association, “Prices Latest.”

<sup>29</sup> Paul Lund, “UK: Full Competition, But Inertia Prevents Customer Movement,” *EU Electricity Directive Sparks Market Reforms Across Europe*, (London: Standard & Poor’s, Feb. 2000), p. 34.

<sup>30</sup> Industry representative, interview with USITC staff, London, United Kingdom, June 12, 2000.

<sup>31</sup> Electricity Association, *Electricity Industry Review 4*, Jan. 2000.

<sup>32</sup> Industry representatives, interview with USITC staff, London, United Kingdom, June 14, 2000.

<sup>33</sup> Matthew Jones, “New UK Power Trading Arrangements May Be Delayed,” *Financial Times*, found at Internet address <http://news.ft.com/>, retrieved June 27, 2000.

<sup>34</sup> By withholding capacity, a generator could possibly increase the market price for its remaining plant.

<sup>35</sup> Generators with a large amount of temporary market power could exploit that power to significantly increase wholesale electricity prices.

<sup>36</sup> Generators could raise spot or forward prices (by increasing their bid prices or withholding capacity) after taking a long position in the futures market.

<sup>37</sup> “Introduction of the market abuse condition onto the licenses of certain generators,” Ofgem’s second submission to the Competition Commission, found at Internet address <http://www.ofgem.gov.uk>, retrieved July 5, 2000.

market and inhibit innovation.<sup>38</sup> The matter is currently before the UK Competition Commission.<sup>39</sup>

Other market impediments include the current moratorium on the construction of new gas plants and prohibition on the construction of new coal plants.<sup>40</sup> The gas plant moratorium is expected to be lifted when the new trading arrangements (NETA) are implemented. The implementation date has been repeatedly pushed back, however, and many now worry if NETA will be implemented before the end of the year.<sup>41</sup>

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<sup>38</sup> Jones, “New UK Power Trading Arrangements May Be Delayed.”

<sup>39</sup> “Introduction of the market abuse condition onto the licenses of certain generators.”

<sup>40</sup> Industry representative, interview with USITC staff, Slough, United Kingdom, June 12, 2000.

<sup>41</sup> Jones, “New UK Power Trading Arrangements May Be Delayed.”



# CHAPTER 14

## NORD POOL MEMBERS

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*One hundred eighty firms participate in Nord Pool, an electric power exchange spanning Denmark, Finland, Sweden, and Norway. Members ensure nondiscriminatory access to national grids and permit unregulated power transactions. Intense competition, public ownership of certain electricity assets, and the slow pace of reform limit market entry.*

Denmark, Finland, and Sweden are addressed together here due to their joint participation in Nord Pool, a regional electric power exchange. Nord Pool, which evolved from Norway's domestic power exchange, is now jointly owned by Svenska Kraftnatt, the Swedish system operator, and Statnett, the Norwegian system operator. Nord Pool essentially consists of a spot exchange, Elspot, and a futures and options exchange, Eltermin. In Elspot, contracts are traded on a daily basis for next day delivery. Purchase and sale bids are placed for every hour, from which Nord Pool calculates prices. After a system price is established, spot contracts are determined, and participants are notified of their prices and trades. Settlements are made on a weekly basis.<sup>1</sup> In Eltermin, market participants can hedge against price risk for up to three years by entering into either future or forward contracts. Futures contracts are traded in increments of single weeks from 4 to 7 weeks in advance, blocks of 4 weeks between 5 and 52 weeks in advance, and as seasons of blocks from 1 to 3 years in advance.<sup>2</sup>

There are approximately 180 participants in the Nord Pool, including generators, distributors, industrial firms, brokers, and traders from each of the Nordic countries.<sup>3</sup> In order to participate, however, each country must provide nondiscriminatory access to its transmission and distribution facilities and permit unregulated bulk power transactions. The following sections discuss the regulatory reform process undertaken by Denmark, Finland, and Sweden in order to meet these requirements and then briefly describe current market conditions in each country.

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<sup>1</sup> Nord Pool, The Nordic Power Exchange, "The Elspot Market, The Spot Market," found at Internet address [http://193.69.80.130/menu1/m1\\_3.htm/](http://193.69.80.130/menu1/m1_3.htm/), retrieved May 4, 2000; and Romesh Vaitilingam, ed., *A European Market for Electricity: Monitoring European Deregulation 2*, (London: Centre for Economic Policy Research, Oct. 1999), pp. 121-122.

<sup>2</sup> Vaitilingam, ed., *A European Market for Electricity: Monitoring European Deregulation 2*.

<sup>3</sup> Nord Pool, "Organization and Products - Owners," found at Internet address [http://193.69.80.130/menu1/m1\\_12.htm/](http://193.69.80.130/menu1/m1_12.htm/), retrieved May 4, 2000.

# Denmark

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## *Nature and Extent of Regulatory Reform*

The Danish Electricity Supply Act entered into force on January 1, 1998, implementing the main elements of the EU Directive.<sup>4</sup> The Act permitted limited opening of the electricity market, providing non-discriminatory network access and allowing customers that consume more than 100 GWh per year to choose their own supplier.<sup>5</sup> The Act provides for the unbundling of generation, transmission, distribution, and system operation into separate companies, but does not require separate ownership.<sup>6</sup> As a result of Denmark's restructuring efforts, major generators were consolidated into two regional groupings, Elsam and Elkraft in the western and eastern regions, respectively; separate transmission grid companies were formed for each region; a system of negotiated third-party access to the transmission grid was implemented; and distribution companies were split into retail supply and network companies. Transmission charges are regulated based on a break-even principle, meaning that no profit or loss is allowed. In other words, a profit in one year must be returned to consumers in the form of a price reduction in the next and vice versa. Transmission rates are published and follow the postage stamp principle, meaning that transmission service users pay one fee at the access point which covers delivery across the entire grid, irrespective of distance.<sup>7</sup> The transmission system operators are responsible for planning, engineering, constructing, and maintaining the high voltage network, and for system balance.<sup>8</sup> They are also tasked with integrating and developing renewable energy, ensuring that the costs of environmental requirements are borne equally by all consumers,<sup>9</sup> and giving dispatch priority to electricity produced from renewable resources and local combined heat and power (CHP) stations.<sup>10</sup>

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<sup>4</sup> The European Commission, "Implementation by Member States 2000: Denmark," *The Single Market for Electricity*, found at Internet address <http://europa.eu.int>, retrieved Sept. 18, 2000.

<sup>5</sup> U. S. Department of Commerce (USDOC), International Trade Administration (ITA), "Denmark - Power Distribution System," Stat-USA, found at Internet address <http://www.stat-usa.gov/>, retrieved Feb. 3, 2000.

<sup>6</sup> U.S. Department of State telegram, "International Energy Agency Standing Group on Long-Term Cooperation Reviews Member Electricity Sector Regulatory Reform and Considers Work Program for 2000," message reference No. 0018376, prepared by U.S. Embassy, Paris, Dec. 17, 1999.

<sup>7</sup> The European Commission, "Implementation by Member States: Denmark," *The Single Market for Electricity*, found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved Mar. 3, 2000.

<sup>8</sup> "The Backbone of the System," found at Internet address <http://www.eltra.dk/>, retrieved Mar. 23, 2000.

<sup>9</sup> "The Market Must Be Opened and Work," found at Internet address <http://www.eltra.dk/>, retrieved Mar. 23, 2000.

<sup>10</sup> International Energy Agency (IEA), *Energy Policies of IEA Countries: Denmark 1998 Review*, (Paris: OECD/IEA, 1998, pp. 11-12.

The Danish Energy Agency, one of four agencies under the Ministry of Environment and Energy, is responsible for energy policy formulation and implementation.<sup>11</sup> Specifically, the agency is responsible for power planning through the Electricity Supply Act, promoting the technological development and utilization of renewable energy through the Development Program for Renewable Energy, energy conservation, appliance labeling and subsidy schemes, and administering the Electricity Saving Fund used to subsidize conversion to electrical heating. Regulatory oversight of the electric power industry is the responsibility of the Energy Supervisory Board, an independent agency.<sup>12</sup>

## ***Current Market Conditions***

### **Generation**

Generation companies in Denmark are generally semi-privately owned, and often established as corporations where local municipalities hold the majority of shares. Elsam and Elkraft, the system operators, control the majority of generation, accounting for 18 primary power plants that produce 90 percent of Denmark's power.<sup>13</sup> Like Sweden and Finland, new construction of generation facilities is subject only to authorization, but a tendering process may apply in specific cases. However, since construction of new nuclear or coal-fired plants will not be authorized,<sup>14</sup> new facilities must use natural gas as a fuel, which is supplied by government-owned corporations.<sup>15</sup>

### **Transmission and Distribution**

Denmark's transmission operations are carried out by two regional monopolies, Eltra and Elkraft. Eltra began as a partnership between 64 consumer-owned distribution companies, which in turn own the 6 generation companies in western Denmark. Although the Electricity Supply Act only requires accounting and management separation among generation, transmission, and distribution, the Elsam region went a step further and separated the three functions into three independent corporate entities. The generation utilities in western Denmark thus decided to transfer the transmission functions to Eltra, making Eltra the transmission operator.

As a result of the Electricity Supply Act, distribution companies have been split into supply and network companies. Cross-ownership of companies in other market segments is permitted, but accounting separation must be maintained. Half of the electricity distribution companies are owned by the municipalities and the other half are organized as cooperatives owned by consumers. Inside the distribution segment,

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<sup>11</sup> *Ibid.*, pp. 25-28.

<sup>12</sup> The European Commission, "Implementation by Member States: Denmark."

<sup>13</sup> USDOC, ITA, "Denmark-Power Distribution System - IMI970930."

<sup>14</sup> The European Commission, "Implementation by Member States: Denmark."

<sup>15</sup> USDOC, ITA, "Denmark: Mergers and Acquisitions in Power Sector," Stat-USA, found at Internet address <http://www.stat-usa.gov/>, retrieved Feb. 3, 2000.

there is room for sector consolidation, but this reportedly could be hampered by the national government's policy of reducing subsidies to cities that sell their electricity holdings.<sup>16</sup>

NESA is the largest distribution company in Denmark and the only one established as a corporation, with majority-municipal ownership. NESA is aggressively acquiring small distributors in an effort to maintain its dominance in the Danish market and to become a national distributor. NESA will face competition from neighboring countries, as their suppliers gain access to the Danish market.<sup>17</sup>

## **Retail Supply**

An amendment to the Danish Electricity Supply Act opened the market to consumers on a phased basis. As of January 1, 1998, consumers with annual consumption greater than 100 GWh were permitted to choose their retail supplier from among any of those eligible to participate in Nord Pool. On April 1, 2000, consumer choice was extended to those with annual consumption greater than 10 GWh, and by 2003, the market will be opened for all consumers. However, since taxes represent 80 percent of household electricity prices, it is unlikely households will realize large price reductions.<sup>18</sup>

# **Finland**

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## ***Nature and Extent of Regulatory Reform***

Electric power sector liberalization began in 1995 with the adoption of the Electricity Market Act. The Act entered into force in June 1995 and introduced competition in the electric power sector by allowing users with a power requirement exceeding 500 KW to choose their supplier. This threshold was eliminated on January 1, 1997, enabling all consumers to buy electricity on the market - through the pool or bilateral contracts. In December 1996, the two grids were merged to form the Finnish Power Grid Ltd., but operations did not begin until September 1997. The Act was amended on March 24, 1998, to create Fingrid, a new transmission system operator. Fingrid is responsible for balancing production and consumption, and uses a load curve profiling method for small consumers, which relieved small consumers of the burden of investing in metering equipment to gain access to the market.<sup>19</sup>

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<sup>16</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," Feb. 2000, p. 11.

<sup>17</sup> USDOC, ITA, "Denmark: Mergers and Acquisitions in Power Sector."

<sup>18</sup> Ibid.

<sup>19</sup> The European Commission, "Implementation by Member States: Finland," *The Single Market for Electricity*, found at Internet address <http://europa.eu.int/en/comm/dg17/elehome.htm/>, retrieved Mar. 3, 2000.

Finland's Electricity Market Authority was created under the Electricity Market Act and is subordinate to the Ministry of Trade and Industry. The Electricity Market Authority monitors the implementation of the Act and issues licenses for network operation; monitors general obligations and pricing principles of network operation to assess if they are equitable and non-discriminatory; issues licenses for construction of national high voltage lines; and monitors the electricity retailer's obligation to deliver electricity.<sup>20</sup> The Electricity Market Authority is charged with promoting efficient competition in electricity trade and has the authority to intervene if terms and prices of network services restrict competition. The Electricity Market Authority publishes prices for electricity and distribution, and provides information on competitive tendering and its potential benefits.<sup>21</sup>

## ***Current Market Conditions***

### **Generation**

Finland has approximately 400 power plants that may be divided into four major categories: Fortum Heat and Power (majority-owned by the government), Pohjolan Group (PVO), self-generators in energy intensive industries, and municipal generators.<sup>22</sup> Fortum and PVO are the largest generators, providing 40 percent and 30 percent of Finland's generation capacity, respectively.<sup>23</sup> The government plans to privatize up to 49 percent of Fortum. Finland, like Sweden, requires authorization prior to the construction of new generating capacity. Applications reportedly are examined for compliance with environmental and land use statutes.

### **Transmission and Distribution**

Finland's network operations, including transmission and distribution, continue to function as monopolies.<sup>24</sup> Network service providers must be licensed by the Electricity Market Authority. Network operators must maintain and develop the network, connect users, and transmit or distribute electricity. Network operators are also responsible for the quality of electricity provided to consumers and for the condition of the network.<sup>25</sup>

The transmission system is owned and operated by Fingrid. Fingrid has mixed ownership by Fortum, PVO, the Finnish Government, and institutional investors.

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<sup>20</sup> The European Commission, "Implementation by Member States: Finland."

<sup>21</sup> "At Your Service," found at Internet address <http://www.sahkomarkkinakeskus.fi/>, retrieved Apr. 13, 2000.

<sup>22</sup> The European Commission, "Implementation by Member States: Finland."

<sup>23</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," p. 13.

<sup>24</sup> "Network Services," found at Internet address <http://www.energia.fi/>, retrieved Apr. 13, 2000.

<sup>25</sup> Electricity Market Authority, "Transmission and distribution," found at Internet address <http://sahkomarkkinakeskus.fi/>, retrieved Apr. 13, 2000.

Fingrid is a national grid company, responsible for the technical operation of the Finnish power system and for selling grid services on equal and non-discriminatory terms.<sup>26</sup> Transmission services are priced using the postage stamp principle.<sup>27</sup> Grid service fees comprise a marketplace fee, a use of grid fee, a loss fee, and a system service fee.<sup>28</sup> Network service prices must be publically available and are supervised by the Electricity Market Authority.<sup>29</sup>

Distribution is also supervised by the Electricity Market Authority, with similar pricing and performance requirements. Currently, there are 10 regional network operators, and 60 distribution network operators that also control regional networks. A network license grants an exclusive area of responsibility in which the network operator has the right to construct distribution networks.<sup>30</sup> Distribution networks are owned and operated by regional and local distributors, two-thirds of which are municipally-owned firms.<sup>31</sup>

## **Retail Supply**

As noted above, consumer choice was extended to all consumers on January 1, 1997. The Act was further amended on March 24, 1998, to charge Fingrid with responsibility for providing balancing services and to introduce use of the load profile method for small consumers. The use of the load profiling method eliminates the need for metering equipment. The load profile method entered into force on September 1, 1998, for household consumers and November 1, 1998, for small industrial consumers.<sup>32</sup> While only approximately five percent of Finnish consumers have switched suppliers, the ability to switch has contributed to price cutting. Since 1997, electric power prices have declined by 20 percent, with wholesale prices less than 1.5 cents per KWh and retail prices between 2 and 3 cents per KWh.<sup>33</sup>

## **Sweden**

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### ***Nature and Extent of Regulatory Reform***

The Swedish electric power industry was governed by the Electricity Act of 1902 until the early 1990s. Under this Act, state-owned Vattenfall was the primary generator, as

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<sup>26</sup> Ibid.

<sup>27</sup> "Network Services."

<sup>28</sup> Fingrid, "Grid Service," found at Internet address <http://www.fingrid.fi/>, retrieved Apr. 13, 2000.

<sup>29</sup> "Transmission and Distribution," found at Internet address <http://www.sahkomarkkinakeskus.fi/>, retrieved Apr. 13, 2000.

<sup>30</sup> Ibid.

<sup>31</sup> The European Commission, "Implementation by Member States: Finland"

<sup>32</sup> Ibid.

<sup>33</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," p. 13

well as the owner and operator of the grid. Sweden began its reform process in 1991, when the state transferred transmission activities from Vattenfall to a newly created state-owned transmission utility, Svenska Kraftnatt. Svenska Kraftnatt became operational on January 1, 1992, and is responsible for the national transmission grid and foreign interconnections.<sup>34</sup> Vattenfall was reorganized into a generating company that could compete with other generation firms.<sup>35</sup> Sweden's next step was to create a new Electricity Act that would allow for competition in generation and retail supply. The Swedish Electricity Act came into force on January 1, 1996, making all Swedish end users eligible to choose their electric power supplier.<sup>36</sup> Statens Energimyndighet (Swedish National Energy Administration or STEM), an independent government body, regulates transmission and distribution providers to ensure their impartiality and efficiency, coordinates the restructuring of the energy industry, and promotes the use of renewable energy sources.<sup>37</sup> Sweden requires the legal separation of transmission and distribution activities from generation and supply activities. However, ownership separation is not required, so transmission and distribution companies can own generation and retail supply companies and vice versa.<sup>38</sup> Third party access to the networks is regulated, with terms of access, prices, and quality determined by the Network Authority and STEM.<sup>39</sup> The Swedish Electricity Act also includes regulations for electricity installations, trade in electricity, and safety.<sup>40</sup> In order to implement the EU Directive on a national level, the Electricity Act needed to be modified only slightly, to include a provision to publish transmission tariffs.<sup>41</sup>

## ***Current Market Conditions***

### **Generation**

There are over 300 generation firms in Sweden. However, the market is fairly concentrated with the top 3 generators producing 85 percent of Sweden's power. Generation is open to competition, but given the state of concentration in the market, smaller firms may find it difficult to compete. Sweden requires authorization for the construction of new generating capacity, in accordance with the EU Electricity

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<sup>34</sup> Vaitilingam, ed., *A European Market for Electricity: Monitoring European Deregulation 2*, p. 137.

<sup>35</sup> USDOC, ITA, "Sweden - Energy Market Deregulation/Regionalization - ISA971101," Stat-USA, found at Internet address <http://www.stat-usa.gov>, retrieved Feb. 3, 2000.

<sup>36</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," p. 32.

<sup>37</sup> USDOC, ITA, "Sweden - Energy Market Deregulation/Regionalization - ISA971101."

<sup>38</sup> Vaitilingam, ed., *A European Market for Electricity: Monitoring European Deregulation 2*, p. 140.

<sup>39</sup> *Ibid.*, p. 137.

<sup>40</sup> "Swedish Electricity Act," found at Internet address <http://www.stem.se>, retrieved July 24, 2000.

<sup>41</sup> "Swedish Electricity Act."

Directive. However, Sweden's Electricity Act does not outline the authorization process.<sup>42</sup>

Since generation has been open to competition, there have been a number of foreign acquisitions of Swedish generation firms. For example, Germany's Preussen Electra and Norway's Statkraft have acquired shares in Sydkraft, the second largest electricity producer. In addition, Electricité de France and Preussen Electra have acquired shares in Granenge; and Fortum, the Finnish power company, has acquired shares in Birka.<sup>43</sup> Enron Nordic Energy has recently entered the generation market through a wind power venture.<sup>44</sup>

## Transmission and Distribution

Sweden's transmission grid consists of three levels. The main grid covers the entire country, comprising 220 KV and 400 KV networks, and is owned and operated by Svenska Kraftnatt, a state agency. Svenska Kraftnatt is also responsible for the integration, operation, reliability, and safety of the national power system. The regional grid, owned by the eight largest generators, connects their power plants with the main grid. The local grid is collectively owned by 250 local distributors, most of whom in turn are owned by municipalities. The interconnections between Sweden and its neighboring countries are owned by the state and operated by Svenska Kraftnatt.<sup>45</sup>

Access to all levels of the transmission grid is based on regulated third party access. Svenska Kraftnatt is obligated to connect all users unless there is a lack of capacity. Like Finland, transmission services are priced according to the postage stamp principle. Consumers pay connection fees to the local network owner, who in turn pays a fee to be connected to the regional grids, whose owners in turn pay a fee to be connect to the national grid. Network tariffs include all costs for operating and handling the grid, including the price for accessing other parts of the network.<sup>46</sup> The tariff for connection to the national grid contains three main elements: a once-for-all connection fee, which is used only if the cost of connection is high; an annual latitude dependent capacity fee, which varies depending on the latitude of the connection; and a use fee, which reflects transmission losses.<sup>47</sup> Tariffs must be published,<sup>48</sup> and the Electricity Network Authority determines if transmission prices reflect efficient use of

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<sup>42</sup> The European Commission, The Single Market for Electricity, "Implementation by Member States: Sweden," found at Internet address <http://europa.eu.int/en/comm/dg17/elehome.htm/>, retrieved Mar. 3, 2000.

<sup>43</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," p. 33.

<sup>44</sup> Embassy representative, E-mail response to USITC staff questions, Apr. 13, 2000.

<sup>45</sup> The European Commission, "Implementation by Member States: Sweden;" and Vaitilingam, *A European Market for Electricity: Monitoring European Deregulation 2*, p. 137.

<sup>46</sup> The European Commission, "Implementation by Member States: Sweden."

<sup>47</sup> Vaitilingam, *A European Market for Electricity: Monitoring European Deregulation 2*, pp. 138-139.

<sup>48</sup> The European Commission, "Implementation by Member States: Sweden."

the three grids.<sup>49</sup> Under the Electricity Act, the state can grant line and area concessions to monopoly distribution service providers. Concession holders must supply electricity within their area at reasonable prices, which are assessed by the Electricity Network Authority.<sup>50</sup>

## **Retail Supply**

All consumers, including households, are permitted to choose their electricity retail supplier. Until November 1, 1999, small consumers needed to purchase a special meter to measure their hourly electricity consumption in order to switch suppliers, which posed a deterrent to switching. However, Sweden began using a load profile method similar to that used by Finland on November 1, 1999. This eliminated the need to install metering equipment and, hence, allowed consumers to change suppliers at no cost.<sup>51</sup> While less than five percent of Swedish consumers have switched suppliers, the ability to switch has contributed to price cutting. Since 1996, electricity prices have declined by 20 percent,<sup>52</sup> with wholesale prices less than 1.5 cents per KWh and retail prices between 1.5 and 2.5 cents per KWh.<sup>53</sup>

## **Remaining Impediments to Competition in the Nord Pool Region**

While the markets of Nord Pool members are open to private and foreign participation, certain market characteristics may pose impediments to new entrants from outside the region. For example, the prevalence of municipal-owned distribution companies and the absence of significant privatization efforts may limit opportunities for acquisitions by foreign firms. Furthermore, intense competition already exists among generation and supply companies in the contiguous Nordic countries, such that new entrants may have difficulty competing in terms of cost or performance.<sup>54</sup> In Denmark, the

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<sup>49</sup> USDOC, ITA, "Sweden - Energy Market Deregulation/Regionalization - ISA971101."

<sup>50</sup> The European Commission, "Implementation by Member States: Sweden."

<sup>51</sup> Ibid.

<sup>52</sup> However, since nuclear power will be phased out by the year 2010, the cost of developing new power plants to replace the retired nuclear plants will likely be passed on to future consumers in the form of price increases. The European Commission, "Implementation by Member States - Sweden."

<sup>53</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reforms Across Europe," p. 32

<sup>54</sup> Industry representative, telephone interview by USITC staff, July 26, 2000.

relatively slow pace of reforms combined with small market size, questions over ownership regulations, and the duopolistic structure of the transmission system may limit its attraction for foreign firms.<sup>55</sup>

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<sup>55</sup> USDOC, “Electrical Power Industry: A Profile and Status of the Liberalization Process,” provided by U.S. Embassy staff, July 5, 2000; industry representative, telephone interview by USITC staff, July 26, 2000; and USDOC, “Electrical Power Industry: A Profile and Status of the Liberalization Process,” provided by U.S. Embassy staff, July 5, 2000.

# CHAPTER 15

## OTHER EUROPEAN UNION MEMBER STATES

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*Austria and Portugal embark on electricity reform while Belgium, Greece, and Ireland use derogations provided by European Commission to prepare for reform. The small size of these markets may limit opportunities for foreign participation.*

### Introduction

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The remaining six member states include some of the smallest electricity markets in Europe. Liberalization has proceeded slowly in some of these markets. Belgium, Greece, and Ireland successfully asserted that, due to technical factors, they would not be able to meet the timetable of the Directive. Consequently, Belgium and Ireland each received a one-year derogation from the Directive's implementation schedule, while Greece received a two-year derogation. Once the Directive is implemented, competition may not develop in some of these markets due to their small size or geographic characteristics. For example, the Republic of Ireland has a relatively small market with net annual consumption of 18.4 TWh, or roughly 6 percent of the size of the British market. Such a market offers relatively few opportunities to develop or acquire electric power facilities. The country also has no interconnections to the other regions of the United Kingdom, limiting market access through cross-border channels. As a result of such factors, these countries are addressed as a group. The major characteristics of each market are summarized briefly through the following discussion of market conditions.

### Austria

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Austria implemented the electricity Directive with a federal electricity law which entered into force on February 19, 1999. The legislation requires accounting and management separation of generation, transmission, and distribution activities, and guarantees open access to transmission and distribution facilities. Sub-federal legislation and Ministerial regulations address power market issues such as

transmission pricing principles and stranded cost compensation. The Ministry of Economic Affairs has regulatory authority over the sector.<sup>1</sup>

Verbundgesellschaft (VbG), the national power generator, is a holding company for nine federal electricity producers and operates the national transmission grid. It also has ultimate responsibility for ensuring security of supply, but coordination of power section investment is decentralized. VbG is 51-percent state-owned and 49-percent privately-owned.<sup>2</sup> The electricity generated by VbG and its subsidiaries accounts for 84 percent of the electricity supply in Austria.<sup>3</sup> The remaining 16 percent of generation capacity is provided by the federal railway system and smaller privately-owned power plants. VbG has a legal monopoly on electricity imports and exports, and must review and approve contracts between other utilities and foreign entities.<sup>4</sup> Retail supply of electrical energy is provided principally by the nine large electric companies. Under the new legislation, consumers of more than 40 GWh per year, or 28 percent of the market, may choose their retail supplier.

## Belgium

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As noted, Belgium was granted a one-year derogation from the Electricity Directive. Legislation to implement the Directive was passed in April 1999. The law introduced consumer choice for large buyers; mandated accounting separation of production, transmission, and distribution activities; and created a new regulatory body, the Commission for Electricity and Gas Regulation (CREG), to resolve disputes and approve transmission and distribution tariffs. The Commission for Electricity and Gas Control (CEEG), the current regulatory body, will continue to determine tariffs for retail consumers who are not yet eligible to choose their power supplier.<sup>5</sup>

The Ministry of Economic Affairs is developing a program to open the electricity grid, currently owned by Electrabel and/or local municipalities, to outside electricity

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<sup>1</sup> Romesh Vaitilingam ed., "A European Market for Electricity?," Center for Economic Policy Research, (London), Oct. 1999.

<sup>2</sup> A.M. Klom, "Electricity Deregulation in the European Union," European Commission, DG XVII, Sept. 15, 1997, found at <http://europa.eu.int/en/comm/dg17/27klom.htm>, retrieved Feb. 1, 2000.

<sup>3</sup> U.S. Department of Commerce (USDOC), International Trade Administration (ITA), "Austria - Upgrading/refurbishing Power Gen. Fac.," *Industry Sector Analyses (ISA), Market Research Reports*, Mar. 1, 1997, found at <http://www.stat-usa.gov>, retrieved Mar. 15, 2000.

<sup>4</sup> International Energy Agency, "Energy Policies of IEA Countries: Austria -- 1998 Review," Nov. 1998, found at <http://www.iea.org/pubs/reviews/files/austria/07-aus.htm>, retrieved Mar. 22, 2000.

<sup>5</sup> Representatives of the CCEG, interview by USITC staff, Brussels, Belgium, June 20, 2000.

suppliers.<sup>6</sup> One or more companies will be created to manage the national grid as an independent company under guidelines to be established and controlled by the Ministry of Energy.<sup>7</sup>

At present, Belgium's electric power sector is dominated by Electrabel, a private vertically-integrated power company. Electrabel produces 88 percent of Belgium's electricity, owns 91 percent of the transmission grid, and controls 80 percent of distribution.<sup>8</sup> The Société Coopérative de Production d'Électricité (SPE), a cooperative association of 16 companies, generates approximately 8 percent of total electricity consumption in Belgium and owns the remainder of the transmission grid.<sup>9</sup> Under the new legislation, consumers of more than 100 GWh per year, or 33 percent of the market, may choose their retail supplier.

## Greece

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Greece received a two-year derogation from the timetable of the EU Directive. Once reforms are implemented on February 19, 2001, they reportedly will entail some privatization of Public Power Corporation (PPC), the dominant government-owned monopoly, that presently produces 99 percent of Greece's electric power, and controls the transmission grid. Greece's new legislation provides for the accounting separation of generation, transmission, and distribution activities, and guaranteed access to transmission and distribution facilities. Reportedly, transmission services will be provided by an independent, state-owned firm, and PPC likely will retain its distribution network. Greece plans to establish an independent Electricity Regulatory Authority to oversee the industry and regulate prices in the transmission and distribution segments. Consumers of more than 100 GWh per year will be eligible to choose their retail supplier. However, reform may not result in increased competition in this market due to its geographic characteristics, lack of natural resources, government-subsidized pricing, and likely continued state control of PPC.<sup>10</sup>

Greece and five other countries -- Albania, Bosnia-Herzegovina, Bulgaria, Macedonia, and Romania -- are establishing a regional electricity transmission grid and power trading market, scheduled to be operational by 2006.

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<sup>6</sup> USDOC, ITA, "Belgium - Energy Profile 1999," *ISA, Market Research Reports*, July 16, 1999, found at <http://www.stat-usa.gov>, retrieved Mar. 15, 2000.

<sup>7</sup> The Economist Intelligence Unit Limited, "Journal: Country Profiles, Belgium, Economic infrastructure: Energy provision," database Sept. 23, 1998.

<sup>8</sup> Standard & Poor's, "EU Electricity Directive Sparks Market Reform Across Europe," Feb. 2000, p. 9.

<sup>9</sup> *Ibid.*

<sup>10</sup> Ana Nogales, "Greece: Power Company's Monopoly Position Will Remain Unchanged," Feb. 9, 2000, in Standard & Poor's, *EU Electricity Directive Sparks Market Reforms Across Europe*, p. 19.

## Ireland

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As noted, Ireland received a one-year derogation from the timetable of the Directive. Ireland enacted the Electricity Regulation Act in July 1999, which established the Commission for Electricity Regulation (CER) as the independent regulator. Ireland is currently preparing a "Statutory Instrument" that provides new regulatory policies to implement the Act. Ireland's electric power market is presently dominated by the Electricity Supply Board (ESB), a government-owned vertically integrated company that operates 24 power stations as well as the transmission and distribution grids. The Statutory Instrument will create a state-owned transmission system operator (TSO), whose assets will be held by ESB as the licensed Transmission Asset Owner. The TSO's management will be separate from ESB. Account unbundling will be used to separate ESB's regulated activities from its competitive activities, i.e., generation and retail supply. The Statutory Instrument will also establish and license a distribution system operator. Under the Electricity Regulation Act, new generation is subject to authorization by the CER, which also provides licenses required for participation in the generation and retail supply segments. Consumers whose annual consumption exceeds 4 GWh, or approximately 28 percent of the market, are free to choose their retail supplier.

This share will increase to 40 percent of all consumers in 2002, with full consumer choice guaranteed by 2005.<sup>11</sup>

## Luxembourg

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Luxembourg, the smallest market in the European Union, imports 95 percent of its electricity from Germany and Belgium,<sup>12</sup> and the remainder is produced by private industry for its own use.<sup>13</sup> The country is working to reduce its reliance on other countries for its energy requirements, and is actively developing alternative sources. The Belgian supplier Electrabel is developing an ambitious energy production project near Esch-sur-Alzette. Due to go online in June 2001, the plant will be capable of supplying some 40 percent of the total electricity requirements of Luxembourg when operating at full capacity.<sup>14</sup>

Cegedel and Sotel dominate Luxembourg's electricity market, supplying 65 percent of Luxembourg's electricity to approximately 128,000 consumers. Cegedel, which is partially owned by the government (41 percent), supplies the public grid with

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<sup>11</sup> The European Commission, *State of implementation of the EU Electricity Directive 96/92/EC, Country by Country Overview, State of Play by the End of May 2000*, found at Internet address <http://europa.eu.int/en/comm/dg17/elechome.htm>, retrieved Jan. 27, 2000.

<sup>12</sup> Klom, "Electricity Deregulation in the European Union."

<sup>13</sup> Ibid.

<sup>14</sup> USDOC, ITA, "International Market Insights (IMI), Luxembourg - Alternative Energy Sources," *ISA, Market Research Reports*, Nov. 11, 1999, found at <http://www.stat-usa.gov>, retrieved Mar. 15, 2000.

electricity imported mainly from the German grid (RWE). Sotel, a steel industry cooperative, provides about 35 percent of Luxembourg's electricity supply for the steel industry and railroads. Alongside these two major distributors, there are two municipal distribution companies, and a few other small-scale distributors supplied by Cegedel.<sup>15</sup>

The Institute of Telecommunications and Electricity, an independent body, has regulatory authority over the electricity sector. The Institute sets prices and processes applications for transmission and distribution services. The Ministry of Energy is responsible for licensing public electricity suppliers and power stations.<sup>16</sup>

Luxembourg's legislation implementing the EU Electricity Directive, permits consumers of more than 100 Gwh per year to choose their power supplier. This threshold includes only six consumers, but 39 percent of additional consumption.<sup>17</sup>

## Portugal

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Electricidade de Portugal (EdP) is Portugal's largest electricity provider accounting for 72 percent of generation. The Portuguese Government has reduced its stake in EdP, but still retains a controlling share. EdP provides generation, transmission, and distribution services. In August 1994, EdP was unbundled vertically and a new holding company, Grupo EdP, was formed. Operation and strategy coordination is the responsibility of the group holding company, while the members of the group consist of a generation company, a grid company, four regional distribution companies, and ten additional companies. The entities that comprise Grupo EdP are separated on a legal and accounting basis. Rede Eléctrica Nacional (REN), which is part of Grupo EdP, is the sole provider of transmission services, and serves as the system operator.

The Entidade Reguladora do Sector Eléctrico (ERSE) is Portugal's independent regulatory authority. ERSE is financially independent and neither the executive branch nor parliament may issue directives to ERSE. The Council of Ministers appoints ERSE's director and two counselors.

The national electricity system is composed of two parts: the public system, which supplies electricity to captive customers, and the independent system. In the public system, construction of generation plants is subject to an international tendering process. This process is based on the need for new capacity, which is determined by the government. In the independent system, any applicant that secures authorization can construct power generation capacity. As of February 15, 1999, consumers of at least 20 GWh annually were free to choose their supplier. Consumers of more than

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<sup>15</sup> MOCI, *Un Secteur Energetique Oriente Vers Le Marche Europeen*, July 2, 1998, Wavo Database, retrieved Mar. 23, 2000.

<sup>16</sup> Romesh Vaitilingam ed., "A European Market for Electricity?"

<sup>17</sup> Ibid.

9 GWh annually may choose their supplier as well if they pay a fixed fee. The 20 GWh threshold includes 89 industrial consumers that comprise approximately 25 percent of the Portuguese market. In 2001, this threshold will drop to 9 GWh.

## PART IV

# SOUTH AMERICA

*Electricity markets in South America examined in this report include Argentina, Brazil, Chile, and Venezuela. Of these four countries, Chile and Argentina have achieved the most progress in terms of regulatory reform. Chile pioneered electricity market reform in the region by beginning the process of restructuring in the 1970s, creating a regulatory framework during 1982-85, and privatizing most companies during 1986-90. Argentina followed Chile's market reform, enacting major legislation in 1992 to restructure the industry and privatize most federally-owned electric power enterprises.*

*In Brazil, privatization began before regulatory and market structures were created and operational, making for an uncertain but hopeful investment climate. Privatization is currently underway, beginning with state-owned distribution companies, while the government continues to develop restructuring policies and procedures. In Venezuela, new electricity legislation was published in 1999, but significant reform has yet to take place.*



# CHAPTER 16

## ARGENTINA

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*Argentina has privatized large portions of its electricity assets, separated transmission functions from other segments of the industry, and established a large number of competing generation facilities. Consumer choice is presently limited to large industrial customers. Remaining impediments to competition appear to include a shortage of transmission capacity, a seasonal pricing mechanism that impedes the development of a spot market and instances of vertical and horizontal reintegration.*

### Nature and Extent of Regulatory Reform

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Argentina pursued regulatory reform of the electric power sector in an effort to reduce costs and improve service. Poor maintenance and inadequate investment turned an industry with nearly 30 percent excess capacity in the 1970s to one characterized by increasing shortages of power in the 1990s.<sup>1</sup> Circumstances worsened during periods of relatively little rainfall, exposing Argentina's reliance on hydroelectric power generation. Electricity was expensive and illegal hookups and unpaid electricity bills were common. The average cost of new capacity was about \$6,000/KW during 1970-90, considerably above the prevailing international costs of \$1,500-\$1,800/KW.<sup>2</sup> The lack of investment, poor management, poor service, and annual financial losses estimated at \$2 billion stimulated the push for regulatory reform.<sup>3</sup>

Prior to regulatory reform, Argentina had a government monopoly on generation, transmission, and distribution services.<sup>4</sup> At the federal level, four government-owned entities dominated the electric power sector: Servicios Electricos del Gran Buenos Aires (Segba), Agua y Energia Electrica (Ayee), Hidroelectrica Norpatagonica, S.A. (Hidronor), and Comision Nacional de Energia Atomica (Conea).<sup>5</sup> In addition, binational agencies control the large Yacyreta hydroelectric plant, jointly owned by Argentina and Paraguay, and Salto Grande hydroelectric plant, jointly owned by Argentina and Uruguay. Nineteen provincial utilities and several electricity

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<sup>1</sup> U.S. Department of Energy (USDOE), Energy Information Administration (EIA), "Electricity Reform Abroad and U.S. Investment," 1997, found at Internet address <http://www.eia.doe.gov/emeu/pgem/electric>, retrieved Mar. 10, 2000.

<sup>2</sup> PennWell Publishing Co., *International Electric Power Encyclopedia* (Tulsa, OK: PennWell Publishing, 1999), p. 56.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> USDOE, EIA, "Electricity Reform Abroad and U.S. Investment."

cooperatives completed Argentina's electricity profile by providing distribution and supply services.

The 1989 Law of State Reform established the legal basis for regulatory reform in Argentina.<sup>6</sup> This legislation, implemented in 1991, directed the Executive Office to reorganize and privatize public enterprises, including those providing electric power services. The Electricity Regulation Act of 1992 subsequently provided for the privatization of virtually all federally-owned electric power enterprises. Through the privatization process, the power sector was to be restructured vertically and horizontally to permit competition to develop. The objectives delineated in the Act guided both the overall design of the regulatory framework and decisions to be made by the regulators. In so doing, the Act established the basis for an independent regulatory entity and other institutional authorities, the administration of the wholesale power market, pricing in the spot market, and tariff-setting in segments that remained regulated.

The Act provided for continuing control of market power by requiring complete separation of transmission from generation, distribution, and retail supply activities.<sup>7</sup> Generation companies are not allowed to hold transmission assets with the exception of internal expansion projects. Generation companies that hold distribution assets must own less than 10 percent of the national generation capacity. Accordingly, the largest private generation company -- the Piedra del Aguila Hydroelectric project -- has less than 8 percent of the total national market. In addition, no firm with more than a 50-percent stake in one electricity company may have a stake in any other company in the market.<sup>8</sup> Transmission and distribution activities continue to function as regulated monopolies operating through concessions that are awarded through a competitive bidding process. Competitive generators and retail suppliers are guaranteed access to all transmission and distribution facilities on open and nondiscriminatory terms.

ENRE is the federal regulator of Argentina's electric power industry. ENRE mediates disputes and enforces federal laws, regulations, and terms of concessions.<sup>9</sup> ENRE also establishes service standards that distribution companies must meet and sets the maximum price that transmission and distribution companies may charge for services (price-cap regulation). ENRE oversees the operator of the wholesale electricity market, CAMMESA, and the generation companies. Three wholesale price structures for electricity exist in Argentina: contractual, spot, and seasonal. Contractual unregulated prices are established between generators and distribution companies, and between generation companies and large users.<sup>10</sup> Most contracts have a duration of

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<sup>6</sup> Inter-American Development Bank (IADB), "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries," Sept. 1999, found at Internet address [http://www.iadb.org/sds/utility.cfm/215/ENGLISH/pub\\_1239](http://www.iadb.org/sds/utility.cfm/215/ENGLISH/pub_1239), retrieved Mar. 31, 2000.

<sup>7</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>8</sup> "Argentina orders Endesa to cut stake in Electricity sector," *Wall Street Journal*, Aug. 15, 2000, p. A21.

<sup>9</sup> USDOE, EIA, "Electricity Reform Abroad and U.S. Investment."

<sup>10</sup> *Ibid.*

one year. Spot prices are determined hourly in the wholesale market and include additional charges for the provision of reserve requirements and transmission losses, which increase with system load. Only generators and large consumers participate in the spot market. Seasonal prices are established by CAMMESA, the wholesale market administrative body, for a period of six months, subject to revision every three months. Seasonal prices are available to distribution companies and are designed to stabilize prices for retail consumers. CAMMESA uses the costs and availability declared by participants in the wholesale power market to perform a centralized load dispatch and to estimate hourly spot prices. CAMMESA dispatches power to the national electricity grid and ensures that the power system maintains adequate reserve capacity.<sup>11</sup> CAMMESA sends the lowest-cost power first until current demand has been satisfied, and determines whether expansion and modification of the system is required.

## **Current Market Conditions**

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### *Generation*

Through Argentina's Federal privatization program, conventional electricity (thermal and hydroelectric) facilities were sold individually, essentially making each privatized generation facility an independent power producer.<sup>12</sup> The thermal generation facilities were sold outright, while concessions averaging 30 years were awarded for the hydroelectric plants. As a result, 6 thermal power generation enterprises were created following the restructuring of Segba (in Greater Buenos Aires), 22 thermal power and 4 hydroelectric generation entities came from restructuring Ayee, and 5 hydroelectric generation enterprises resulted from Hidronor's restructuring.<sup>13</sup> The federally-owned nuclear power generation utility has not been privatized, and the federal government retains control over its interests in the Yacyreta and Salto Grande binational hydroelectric projects with Uruguay and Paraguay, respectively.

The majority of Argentina's privatized generation capacity was purchased by foreign companies.<sup>14</sup> Because foreign firms generally showed little interest in smaller facilities, these tended to be acquired by domestic firms more interested in meeting local electricity needs rather than in selling to the national wholesale market. Most

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<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

of the foreign companies investing in Argentina's electricity generation industry are from the United States and Chile.<sup>15</sup>

## *Transmission and Distribution*

The transmission function in Argentina has been subdivided into two systems:<sup>16</sup> (1) The national interconnected high-voltage transmission system (STEEAT), which transports electricity between regions, operating at 500 kV; and (2) the regional systems (STEEDT), which connect generators, distributors, and large users within each individual region, operating at 132 through 220 kV.<sup>17</sup> STEEAT is managed by Compañía Nacional de Transporte Energética en Alta Tensión (Transener), a private firm that received the monopoly concession in 1993 following competitive bidding. Transener is responsible for the integrity and maintenance of the system. Transener serves 14 of Argentina's 24 provinces, carrying approximately 90 percent of Argentina's transmitted power.<sup>18</sup> Six regional companies comprise STEEDT, consisting of Transnoa, Transnea, Transpa, Transcomahue, Distro Cuyo, and Transener, which owns a regional transmission company in addition to serving as the high voltage concessionaire. Separate from the STEEDT, provincial transmission companies and independent transmission companies operate under technical licenses provided by Transener, with which they make their assets available in the wholesale electricity market (MEM) in exchange for a fee. Among the six transmission companies, more than half have been at least partially privatized -- Distro Cuyo, Transnea, Transener, and Transpa.<sup>19</sup>

Through privatization, three distribution companies were formed from the breakup of Segba (EDENOR, EDESUR, and EDELAP), which represent 44 percent of the power distribution market in Argentina.<sup>20</sup> Including the companies divested from several regional utilities (Entre Rios, San Luis, Cordoba, Mendoza, Formosa, Santiago del Estero, Tucuman, Rio Negro, Catamarca, Misiones, Jujuy, and Santafe), private participation in the distribution market has increased to approximately 60 percent. The remaining distribution companies continue to be held by provincial governments, but this ownership structure is likely to change as the new regulatory framework extends into additional regions. Foreign firms participating in the distribution market

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<sup>15</sup> U.S. firms include AES, Amoco, CMS Energy, Cinergy, Consumers Energy Co., Dominion Resources, Inc., Duke Power, El Paso Electric, Entergy, Houston Industries, Kansas City Power & Light/Western Resources, LG&E Energy Corp., Louis Dreyfus Argener, S.A., Merrill International, Ltd., New World Power, Northeast Utilities, PSI Energy, and Southern Company. The major Chilean firms include National Electricity Co. of Chile, Endesa, and Enersis.

<sup>16</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>17</sup> Ibid.

<sup>18</sup> USDOE, EIA, "Electricity Reform Abroad and U.S. Investment."

<sup>19</sup> Ibid. Major foreign participants in Argentine electricity transmission firms include British firm National Grid, France's Electricite de France, and U.S. firms Duke Power and Entergy.

<sup>20</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

include mainly Chilean and U.S. firms, although Spanish and French firms have also invested significantly.<sup>21</sup>

## ***Retail Supply***

Under current law, only large industrial consumers may choose their electric power supplier. As of mid-1999, approximately 1,500 consumers had elected to purchase electric power directly from generators. Small commercial and residential consumers remain captive to their regional retail supplier, who in many cases is also the incumbent distribution service firm.

Since 1992, when electricity reforms began, Argentina has experienced a significant reduction in electricity prices, with wholesale prices decreasing by more than 50 percent nationwide.<sup>22</sup> Moreover, customer service, system reliability, and productivity have improved.

## ***Remaining Impediments to Competition***

Industry representatives have expressed concern that seasonal prices may distort competition in Argentina's electricity market.<sup>23</sup> As noted above, distribution companies have the option of purchasing power at the seasonal price in addition to contracting with generators. Whereas distributors can pass the seasonal price through to their customers, they can not pass through contract prices to consumers when those prices are above the spot price. So, because of seasonal prices, there is little incentive to enter into contracts. The seasonal price also impedes the development of the spot market, as distributors do not have the option to purchase power through the spot market. Some U.S. companies participating in the Argentine electricity market believe that the seasonal price should be eliminated,<sup>24</sup> arguing that buyers and sellers should be allowed complete freedom to enter into contracts and engage in the spot market.

Industry representatives are also concerned that underinvestment in transmission capacity may adversely affect competition.<sup>25</sup> Transener has little incentive to invest in transmission expansion, and major capacity expansion depends on the formation of user coalitions. Reaching agreement within such coalitions may be difficult, however,

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<sup>21</sup> U.S. firms participating in this segment principally include AES, but also include Cinergy, Citicorp Capital Investors, CMS Energy, Community Energy Alternatives, Entergy, GPU, Houston Industries, PSE&G, and PSI Energy. Foreign investors include Bouygues and Electricite de France (France), and Repsol-YPF and Endesa (Spain). Bouygues, Electricite de France, and Repsol-YPF own stakes in EDENOR. Endesa holds stakes in both EDENOR and EDESUR, but has been ordered to sell its take in one the two companies as its 65-percent ownership of EDESUR prescribes ownership of any other firm in the electricity market. USDOE, EIA, "Electricity Reform Abroad and U.S. Investment;" and "Argentina orders Endesa to cut stake in Electricity sector," p. A21.

<sup>22</sup> USDOE, EIA, "Electricity Reform Abroad and U.S. Investment."

<sup>23</sup> Industry representatives, interviews by USITC staff, Buenos Aires, Argentina, June 20-24, 2000.

<sup>24</sup> Ibid.

<sup>25</sup> Ibid.

as all transmission users may not benefit equally from capacity expansion projects. Additionally, as a result of poor transmission over long distances, the Argentine Government requires generators that are close to a market to always be available, although a more efficient generator located further away may be able to supply electricity at a lower cost. Transmission expansion would remedy the need for this practice and ensure that competitive factors determine which generators are dispatched.

Some concerns have also been raised regarding the reintegration of the markets in both horizontal and vertical terms. When Endesa Spain acquired Endesa Chile, it also acquired a number of assets held by Endesa Chile in Argentina, thereby increasing its market position significantly.<sup>26</sup> Additionally, the merging of two natural gas companies that also own electricity generation assets has raised concerns over whether the newly-created firm could leverage its market power in the gas sector to the disadvantage of other electric power competitors.

Finally, the Government's continued participation in CAMMESA is seen by some private participants as increasing the risk of politically motivated actions.<sup>27</sup> Industry representatives have also expressed concern that CAMMESA may potentially alter the competitive landscape by dipping into the SALEX fund, which is intended to support emergency expansion of the system, to offset potential increases in electricity prices.<sup>28</sup>

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<sup>26</sup> USDOE, EIA, "Argentina," found at Internet address <http://www.eia.doe.gov/emeu/cabs/argentina/html/>, retrieved Apr. 5, 2000.

<sup>27</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>28</sup> Industry representatives, interviews by USITC staff, Buenos Aires, Argentina, June 20-24, 2000.

# CHAPTER 17

## BRAZIL

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*The Brazilian electricity industry is presently undergoing privatization and restructuring. Consumer choice is limited to large consumers. Government interference in private sector contracts, regulated power pricing below break-even prices, and the dilution of the regulatory authority's effectiveness are among the remaining impediments to competition.*

### Nature and Extent of Regulatory Reform

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Prior to 1995, the Brazilian electrical system was characterized by over 99-percent government ownership, no competition among generators, and no choice of electricity supply among retailers or final consumers. Four regional generation and transmission companies of the federal government's holding company Eletrobras -- Eletrosul, Furnas, Chesf, and Eletronorte -- accounted for approximately 54 percent of generation, 32 percent of transmission, and 6 percent of distribution capacity.<sup>1</sup> Utilities owned by Brazil's states accounted for the remaining system capacity.

During the 1980s, the federal government systematically reduced prices on electricity in an effort to control inflation.<sup>2</sup> Low prices and low-rated international credit reportedly led to significantly reduced public financing for investment in electricity. The threat of electricity shortages associated with inadequate capacity investment stimulated reform of the sector and its regulatory framework. Guidelines for Brazil's restructuring process were established in two laws passed by Congress in 1995. The new legal framework allowed the onset of privatization and began to create a system in which market forces could dictate the prices paid to generators and motivate the development of new units.

Privatization is currently underway. With the exception of the binational hydroelectric plant Itaipu,<sup>3</sup> nuclear generation facilities, and the national transmission grid, most federally- and state-owned generation and distribution facilities will be sold to the private sector. During 1995-98, Brazil auctioned off more than \$21 billion of electricity assets, including the December 1998 sale of GERASUL, the first divestiture

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<sup>1</sup> Augusto F. Mendonca and Carol Dahl, "The Brazilian Electrical System Reform," *Energy Policy*, No. 27, 1999.

<sup>2</sup> Mendonca and Dahl, "The Brazilian Electrical System Reform."

<sup>3</sup> The Governments of Brazil and Paraguay each own 50-percent of Itaipu.

of a federally-owned generation company.<sup>4</sup> By the end of 1998, about 60 percent of distribution was controlled by the private sector, but nearly 93 percent of Brazil's electricity generation remained in the hands of the state and federal governments.

Horizontal restructuring is being gradually accomplished by breaking up large utilities into smaller companies which are subsequently sold to private investors. Vertical restructuring is provided for through Brazil's regulatory reforms, which require the unbundling of generation, transmission, and distribution activities into separate corporate entities during a 10-year transition period. Cross-ownership restrictions will prevent transmission companies from holding ownership interests in generation or retail supply activities.

A wholesale energy market (MAE) has been established to replace the system of regulated generation prices and rolling supply contracts.<sup>5</sup> Eligible market participants include generators with installed capacity above 50 MW, retail suppliers with annual sales exceeding 250 GWh, and consumers with loads greater than 10 MW. Over time, smaller consumers will be able to participate in the market. Each generation company will provide the system operator, ONS, with all the technical characteristics of its plants in order for ONS to determine the optimal dispatch of the system.

Federal regulatory authority rests with ANEEL, an autonomous government agency created in December 1996.<sup>6</sup> ANEEL is headed by a board of directors, who are appointed by the executive branch and approved by the legislative branch. Directors serve non-concurrent, fixed-period terms and may be removed only under limited circumstances.<sup>7</sup> ANEEL was created to implement the regulatory process and mediate disputes between the government, service providers, and consumers.<sup>8</sup> The legislation that created ANEEL also promoted competition and established rules for preventing market concentration. Accordingly, ANEEL has been directly involved in the implementation of the new restructuring model, although the Brazilian Government's Ministry of Mines and Energy sets certain policies and determines the criteria for expanding system capacity.<sup>9</sup> ANEEL is in charge of price regulation and competitive behavior, technical regulation and standards, and also awards and oversees

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<sup>4</sup> U.S. Department of Energy (USDOE), Energy Information Administration (EIA), "Brazil," July 1999, found at Internet address <http://www.eia.doe.gov/emeu/cabs/brazil.html>, retrieved Apr. 20, 2000.

<sup>5</sup> Inter-American Development Bank, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries," Sept. 1999.

<sup>6</sup> Jose Claudio Linhares Pires, "Capacity, Efficiency and Contemporary Regulatory Approaches in the Brazilian Energy Sector: The Experiences of ANEEL and ANP," paper presented, Centre for Brazilian Studies, (Oxford University, Dec. 1999), found at Internet address <http://www.bndes.gov.br>, retrieved May 3, 2000.

<sup>7</sup> Pires, "Capacity, Efficiency and Contemporary Regulatory Approaches in the Brazilian Energy Sector: The Experiences of ANEEL and ANP."

<sup>8</sup> Jose Claudio Linhares Pires, "The Reform Process Within the Brazilian Electricity Sector," paper, undated, found at <http://www.bndes.gov.br>, retrieved Mar. 3, 2000.

<sup>9</sup> Inter-American Development Bank (IADB), "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

concessions. Reportedly, ANEEL will begin to implement full price regulations for transmission and distribution services in 2000,<sup>10</sup> and will determine the criteria for passing through distribution costs to consumers.<sup>11</sup> A federal government planning agency (CCPE) is currently being developed to govern expansion of the transmission system and develop a strategic plan for new power plants.<sup>12</sup>

## Current Market Conditions

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### *Generation*

Slightly more than half of the power generated in Brazil reportedly comes from subsidiaries of Eletrobras and the binational hydroelectric plant Itaipu.<sup>13</sup> Eletrobras' subsidiary Eletronorte operates in the north, Chesf in the northeast, and Furnas in the southeast. In the south, Eletrosul, another Eletrobras subsidiary, was split into two companies. One of these, GERASUL, retained Electrosul's generation assets and was privatized in 1998. Privatization of other generators owned by the federal government was delayed.<sup>14</sup> The major portion of the remaining generation is produced by companies controlled by state and municipal governments. The largest are CESP (Sao Paulo) with 10 GW of installed capacity in 1997, CEMIG (Minas Gerais) with 5 GW, and COPEL (Parana) with 3.4 GW. These three companies and CELG (Goia) accounted for more than 90 percent of the installed generation capacity of firms owned by Brazilian states.<sup>15</sup>

Endesa (Spain) bought Cachoeira Dourada in 1997, Tractebel (Belgium) bought GERASUL in 1998, and U.S. firms Duke Energy International and AES Corporation bought Paranapanema and Tiete (each formerly part of CESP), respectively, in 1999.<sup>16</sup> As of April 2000, AES owned a controlling 43.7- percent interest in Tiete, a hydroelectric generation company in the State of Sao Paulo.<sup>17</sup> Moreover, Enron (U.S.) is constructing a 480 MW, combined-cycle natural gas power plant in Cuiaba,

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<sup>10</sup> Industry representative, conference presentation, "Brazil Energy 2000," Miami, FL, Mar. 23, 2000.

<sup>11</sup> ANEEL, "Explanatory Note on the Valor Normativo (Reference Prices)," Oct. 26, 1999, found at Internet address [http://www.aneel.gov.br/ouvidoria/sp\\_ouvid.htm](http://www.aneel.gov.br/ouvidoria/sp_ouvid.htm), retrieved June 7, 2000.

<sup>12</sup> Adison de Oliveira, "The New Brazilian Electricity Market: Coordination or Competition?" paper (Institute of the Americas - Critical Issues, Nov. 1999).

<sup>13</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>14</sup> de Oliveira, "The New Brazilian Electricity Market: Coordination or Competition?"

<sup>15</sup> Mendonca and Dahl, "The Brazilian Electrical System Reform."

<sup>16</sup> Ibid.

<sup>17</sup> AES Corporation, "The AES Corporation Announces Plan to Tender For All Outstanding Shares of Tiete," press release, Apr. 28, 2000, found at Internet address <http://www.aesc.com>, retrieved May 3, 2000.

Brazil. The plant, 68-percent owned by Enron, will connect with the Bolivia-to-Brazil natural gas pipeline to provide power to Brazil.<sup>18</sup>

Private investment in generation capacity has been smaller than anticipated. ANEEL sold 4 concessions with a cumulative installed capacity of 1.6 GW in 1998, below the agency's reported goal of 3.6 GW from 19 concessions. Private investment in generation was reportedly discouraged by factors including generation prices below break-even costs, difficulties in obtaining appropriate financing, and the absence of exchange rate indexing in power purchase agreements, which potentially transfers all devaluation risk to generation system developers.<sup>19</sup>

## *Transmission and Distribution*

The main transmission lines continue to operate as a regulated monopoly. The lines are currently the property of Eletrobras' subsidiaries and state-owned companies such as CESP, CEMIG, and COPEL, which are expected to retain ownership of these transmission assets indefinitely.<sup>20</sup> The ongoing restructuring of Eletrobras will likely entail the creation of new transmission companies that initially will remain under the ownership of Eletrobras.

Eletropaulo, once the largest distribution company in Brazil, was split into two distribution companies, one transmission company, and one generation company in 1998. Subsequently, its two distribution companies, Metropolitana and Bandeirante, were privatized. Two large distribution companies owned by Brazilian states, COPEL and CEMIG, have yet to be privatized.<sup>21</sup>

Metropolitana is currently the largest distribution company in Brazil, with nearly 14 percent of the market, followed by Bandeirante and Light (Rio de Janeiro), with 9 percent each, and CPFL (Sao Paulo State), with 7 percent.<sup>22</sup> Foreign participants in distribution include U.S. firms AES, Alliant Energy, CMS, Enron, and PSEG, as well as EDF (France), EDP (Portugal), Endesa and Iberdrola (Spain), and Chilectra and Enersis (Chile).<sup>23</sup> U.S. firm Reliant Energy also currently participates in Brazil,

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<sup>18</sup> Enron Corporation, "Enron International - Our Presence in Brazil," found at [http://www.ei.enron.com/presence/projects/brazil\\_main.html](http://www.ei.enron.com/presence/projects/brazil_main.html), retrieved May 3, 2000.

<sup>19</sup> ANEEL official, conference presentation, "Brazil Energy 2000," Miami, FL, Mar. 23, 2000.

<sup>20</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>21</sup> de Oliveira, "The New Brazilian Electricity Market: Coordination or Competition?"

<sup>22</sup> Pires, "The Reform Process Within the Brazilian Electricity Sector."

<sup>23</sup> Industry representative, conference presentation, "Brazil Energy 2000," Miami, FL, Mar. 23, 2000, and U.S. corporations press releases.

but is contemplating the sale of its Latin American assets to focus on investments elsewhere.<sup>24</sup>

## ***Retail Supply***

Retail supply activities may be provided by authorized generators, distributors, and independent retailers.<sup>25</sup> Distributors are permitted to provide both distribution and retail supply services, but must maintain separate accounts for each activity. Distribution fees must be broken out separately, such that all retail suppliers are charged the same rate within a specific region. Initially, only large consumers (with load greater than 10 MW) may choose their retail supplier. This threshold will gradually be reduced to expand consumer choice.

## ***Remaining Impediments to Competition***

Although the privatization and restructuring process is well underway, private investors continue to encounter uncertainty when trying to enter Brazil's electricity market.<sup>26</sup> For example, on September 27, 1999, the Minas Gerais state judiciary body ruled illegal a contract with U.S. investors to purchase 33 percent of the state electricity company, CEMIG. The state's governor contended that, although previous legal challenges have upheld the validity of the contract, the purchase would give foreigners strategic control of the company, potentially harming the "interests of the Minas people."<sup>27</sup> The foreign investors have expressed concern about the seeming failure of the Brazilian system to honor a legal contract.<sup>28</sup> Additionally, private investors in generation are concerned by such factors as regulated generation prices being below minimum break-even costs, financing, and the absence of exchange rate indexing in purchase power agreements.

Altogether, ANEEL's responsibilities are larger than those of most comparable regulatory agencies, as it must award concessions, regulate, arbitrate, and set some of the sector policies. There is concern that such a broad scope of activities could dilute the effectiveness of ANEEL's regulatory authority.<sup>29</sup> Moreover, concerns have been raised that ANEEL may face difficulties in establishing the authority to impose its rulings in order to resolve certain conflicts. Although the agency is authorized to provide arbitration procedures, it has not been established that its authority under the

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<sup>24</sup> Reliant Energy, Form 10-K, Dec. 31, 2000, and "Reliant Energy to Review Latin American Investments," press release, Dec. 10, 1999.

<sup>25</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>26</sup> Industry representative, interview by USITC staff, Buenos Aires, Argentina, June 22, 2000.

<sup>27</sup> U.S. Department of State telegram, "Lawsuit sends chilling message to Minas energy investors," message reference No. 001234, prepared by U.S. Embassy, Rio de Janeiro, Sep. 30, 1999.

<sup>28</sup> U.S. Department of State telegram, "State of Play: CEMIG," message reference No. 001285, prepared by U.S. Embassy, Rio de Janeiro, Oct. 9, 1999.

<sup>29</sup> Pires, "The Reform Process Within the Brazilian Electricity Sector."

Law of Arbitration (Law 9307/96) applies to contracts of an administrative nature as compared with those of a commercial nature. Should possible rulings on administrative issues need to be submitted for judicial review of their legality, the agency's decisions may not have their intended timely effect.

# CHAPTER 18

## CHILE

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*Chile was among the first nations to reform its electricity market. By 1990, Chile's electricity industry was largely in private hands and generation, transmission, and distribution services were partially unbundled. Consumer choice is limited to large industrial customers. Remaining impediments to competition include a pricing mechanism that may distort prices, the retention of significant market power by the incumbent utility, and the lack of a clearly independent regulatory agency.*

### Nature and Extent of Regulatory Reform

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Prior to reform, Chile's electric power sector was regulated under the 1931 electricity law, as amended in 1959. Under this law, Chile's market structure consisted of two government-owned electric companies, Endesa and Chilectra, that acted as public monopolies. During 1959-79, prices were regulated by the Tariff Commission, based on a rate of return method. During the 1960s, Endesa and Chilectra seldom reached the maximum allowable rate of return which adversely affected investments in new technologies to improve efficiency and system performance. The sector's financial situation further deteriorated when the Tariff Commission did not adjust prices amidst hyperinflation during 1970-73. Various attempts were made to improve this financial situation during the 1970s, culminating in the creation of CNE (National Energy Commission), a new regulatory body, in 1979.<sup>1</sup>

The current regulatory regime has been in force since 1980, but was formalized as law in 1982. The 1982 law (DFL No. 1) opens the sector to private ownership and sets rules for sector structure, operations, markets, and pricing. It establishes quality and safety guidelines, and provides for open entry and competition in the generation sector, but requires concessions or permits for most transmission and distribution activities, which are regulated as monopolies. Additionally, the law provides for open access to transmission and distribution grids, establishes a coordinating unit for load dispatch, and deregulates prices for large consumers. Complementary legislation (DFL No. 6) passed in 1982 provided for the coordination of market operation by defining the criteria under which the interconnected system operates. This legislation charges the

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<sup>1</sup> Pablo T. Spiller and Luis Viana Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay, and Chile," ed. Richard J. Gilbert and Edward P. Kahn, *International Comparisons of Electricity Regulation*, (NY: Cambridge University Press, 1996), pp. 112-117.

Center for Economic Load Dispatch (CDEC) with setting operating rules for transmission according to minimal cost and other guidelines established by the CNE.<sup>2</sup>

Full-scale privatization began in 1986, and was largely completed by 1990, at which time only two generation companies remained publicly held. There were three mechanisms of privatization. First, the smallest companies were sold through public auctions. Second, shares of the largest companies were sold in large blocks on the stock market. Third, remaining shares of the largest companies were sold in small packages. Through this process, the privately held share of the largest national energy company, Endesa, increased from 30 percent in 1986 to 72 percent in 1989. Institutional investors, including pension funds, eventually held 25 percent of the stock. Employees of the utilities received between 5 and 10 percent of the stock.<sup>3</sup>

Chile's electricity law does not prohibit enterprises from undertaking more than one area of commercial activity, although separate accounts for each activity are required. Vertically integrated incumbents were partly unbundled during the 1980s. Endesa's distribution activities were spun-off in numerous, geographically-based business units, and Chilectra's generation and distribution activities were vertically and horizontally spun-off into several independent business entities. The most notable exception to the sector's unbundling was the retention by Endesa of the ownership and operation of the high voltage transmission assets of the Central Interconnected System (SIC). The main utility in the Great Northern Interconnected System (SING), Edelnor, has also remained vertically integrated, although provisions for its privatization include a plan to separate the utility's transmission from its generating and distribution activities.<sup>4</sup>

The CNE, the Ministry of Economy, and the Superintendence of Electricity and Fuels (SEC), a subdivision of the Ministry of Economy, are the main regulatory bodies. The CNE, managed by a board of directors composed of seven ministers, performs the basic policy formulation along with the regulatory and price-setting functions for the sector. The SEC oversees the technical, operating, and financial performance of sector enterprises according to legal and regulatory mandates and established standards. The Ministry of Economy authorizes concessions for new transmission and distribution capacity in addition to approving and publishing prices.<sup>5</sup>

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<sup>2</sup> Inter-American Development Bank (IADB), "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries," Sept. 1999.

<sup>3</sup> Antonio Estache and Martin Rodriguez-Pardina, "Light and lightning at the end of the public tunnel: The reform of the electricity sector in the Southern Cone," draft paper, May 1998, pp. 3-4.

<sup>4</sup> IADB, "Profiles of Power Sector Reforms."

<sup>5</sup> Ibid.

# Current Market Conditions

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## *Generation*

In the generation segment of Chile's electricity market, 11 private generators represent about 90 percent of the national installed generating capacity. Ten private generators supply the SIC. Endesa and its subsidiary Pehenche own approximately 2.6 GW, or over 60 percent, of the SIC's installed capacity and supply 65 percent of the system's total generation. The second largest generator, Gener, holds close to 24 percent of the market, with 1.6 GW of installed capacity. Gener's affiliate, Guacolda S.A., is building another 300 MW of capacity. Colbun-Machicura, Chile's third largest generator, owns two hydro facilities, with a combined installed capacity of 560 MW. Smaller private generators in the SIC include the Guardia Vieja, Pullinque, and Pilmaiquen plants. Edelnor, a privately-owned, vertically integrated utility with 277 MW of installed capacity, together with Codelco, a copper mining company, own and operate the northern interconnected system (SING).<sup>6</sup>

## *Transmission and Distribution*

The national transmission company, Transelec, was created as an affiliate of Endesa to own and operate the SIC's transmission assets in March 1993. The spin-off aimed to provide greater transparency and assuage concerns about the potential for Endesa to favor the dispatch of its own electricity. Transelec's shareholders were initially the same as Endesa's, but have changed over time and developed separate investor interests. Edelnor, through its subsidiary Sitranor, owns and operates the SING's transmission system.<sup>7</sup>

Within the distribution segment, there are a total of 23 utilities. Enersis is the holding company for the largest distribution company, Chilectra, which serves the Santiago metropolitan area, or approximately 40 percent of the total retail market. Chilectra and Chilquinta are the largest of the 17 investor-owned distribution companies that operate in the SIC. Edelnor and two smaller companies provide distribution service for the SING. In general, small private vertically integrated companies provide distribution services in the smaller isolated systems, and there are three small municipal utilities and a few electric cooperatives supplying retail electricity service in remote areas.<sup>8</sup>

## *Retail Supply*

Retail prices vary depending on the type of consumer. Large industrial consumers (with loads greater than 2 MW) and distribution companies negotiate prices directly with generation companies. Small consumers must purchase power from a regional

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<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

distribution and retail supply company at a price determined by the CNE every 6 months on the basis of demand, capacity, and cost forecasts. These forecasts take into account water supply for hydroelectric energy, current and expected demand, and an evaluation of the value added in the transmission and distribution phases.<sup>9</sup>

Since beginning regulatory reform of the electric power sector, Chile's unregulated power prices have declined and become closely correlated with long-run marginal costs.<sup>10</sup> In addition, the overall performance of the sector has improved greatly. Coverage rates have reached 97 percent, and over 70 percent of the required investment has been accomplished by private operators. Consumption has grown at an average annual rate of 8 percent during 1986-97. Energy losses are about a third of historical levels. Labor productivity, in terms of clients per employee, has doubled. Similarly, power output generated per worker increased from less than 5 GW to almost 8 GW. However, rate reductions at the wholesale and large consumer level have not translated into parallel rate reductions in the regulated retail market. In 1997, prices to the (unregulated) industrial sector were 56 percent of those to the residential sector.<sup>11</sup> This means that distribution and retail supply companies with captive residential and small commercial customers benefit from a large spread between the unregulated price they pay to purchase electricity and the regulated price they charge consumers. As a result, the regulated distribution companies have been earning nearly twice the 15 percent rate of return on equity received by generating companies.<sup>12</sup>

## ***Remaining Impediments to Competition***

Four major potential impediments to market access have been identified. These include problems with CNE's pricing model, excessive market power held by Endesa, the questioned independence of CDEC, and the lack of a well developed contract market. With respect to pricing, Chile's regulatory regime for electricity has been under tremendous pressure over the last 2 years, precipitated by a severe drought that led to power shortages. According to one analyst, the problems are largely attributed to the way that prices are determined.<sup>13</sup> Unlike the cases of the United Kingdom or Argentina, where plants submit competitive bids, the CDEC system requires all generators to bid actual marginal costs of generation in setting the spot price. This formula may lead to price distortions. For example, hydroelectric plants must submit a variable cost of 0 in times of low demand and plentiful rainfall, and gas-fired plants are not permitted to include the cost of fuel transportation in the calculation of their costs. A second aspect of the pricing problem is that the CNE model may overestimate the country's water reservoir levels, thus underestimating the marginal costs for hydroelectric plants. Moreover, the CNE model uses a 6-percent reserve

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<sup>9</sup> Spiller and Martorell, "How should it be done? Electricity regulation in Argentina, Brazil, Uruguay, and Chile," p. 113.

<sup>10</sup> Ibid., p. 109.

<sup>11</sup> Energy Information Administration, "Chile," found at Internet address <http://www.eia.doe.gov>, July 1999, retrieved Mar. 3, 2000.

<sup>12</sup> Estache and Rodriguez-Pardina, "Light and lightning at the end of the public tunnel: The reform of the electricity sector in the Southern Cone." Estache and Rodriguez-Pardina, pp. 5 and 11-12.

<sup>13</sup> Industry representative, interview by USITC staff, Santiago, Chile, June 27, 2000.

margin, though 15 percent would reportedly be considered more appropriate, and would allow for a higher marginal cost.<sup>14</sup> Additionally, the fuel prices assumed in the model may be unrealistically low, leading to reduced variable cost estimates for natural gas-fired plants. The net effect of these pricing policies has been reduced profitability for generators, which in turn discourages new entrants.

Concerning market power, industry representatives have complained about the “oligopolistic-like” nature of the electricity market.<sup>15</sup> As noted, there are no legal restrictions on vertical cross-ownership or horizontal concentration of market power. Endesa controls a large portion, possibly up to 60 percent, of the market in generation, has a majority share of Transelec, the dominant transmission provider, and has significant indirect holdings, reportedly up to 40 percent, in Chilectra, the largest distribution company in Chile. Moreover, Endesa owns the water rights for the most attractive future hydroelectric generation projects. By postponing the development of these projects, Endesa may obtain significant rents on its existing capacity. Reportedly, only 13 percent of total non-consuming water rights that have been appropriated are being used.<sup>16</sup> Disputes concerning transmission prices and Endesa’s strong presence in both the transmission and generation segments are frequent.<sup>17</sup> However, the concerns about Endesa’s market power have diminished in the last year for two main reasons. The first is that Endesa has decided to sell its interests in Transelec. The second is the addition of two new natural gas pipelines as well as a transmission line in Northern Chile from Argentina, which may erode Endesa’s market share.<sup>18</sup>

Regarding CDEC, the method for determining transmission charges is reportedly inequitable and inefficient, and incentives to invest in new transmission capacity are inadequate.<sup>19</sup> Finally, the poor development of a contract market is principally a result of the large size of the regulated market, the imposition of seasonal prices, and low spot prices.<sup>20</sup> Chilean officials are evaluating various options for addressing these issues, including possible changes to the CDEC system and reductions in the lower limit on the size of wholesale market participants below the present 2MW limit. They also have discussed connecting the SING with the SIC transmission grids and moving toward an energy exchange or a commodities market in the long run, which would allow for trading of energy and financially-derived energy products, such as futures.<sup>21</sup>

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<sup>14</sup> Ibid.

<sup>15</sup> Industry representatives, interview by USITC staff, Santiago, Chile, June 26-30, 2000.

<sup>16</sup> Estache and Rodriguez-Pardina, “Light and lightning at the end of the public tunnel: The reform of the electricity sector in the Southern Cone,” pp. 12-13.

<sup>17</sup> Ibid.

<sup>18</sup> Industry representatives, interview by USITC staff, Santiago, Chile, June 26-30, 2000.

<sup>19</sup> Basanes, Saavedra, and Soto, “Post-privatization Renegotiation, and Disputes in Chile,” report for IADB, (Washington, D.C., Sept. 1999).

<sup>20</sup> Industry representatives, interview by USITC staff, Santiago, Chile, June 26-30, 2000.

<sup>21</sup> Basanes, Saavedra, and Soto, “Post-privatization Renegotiation, and Disputes in Chile.”



# CHAPTER 19

## VENEZUELA

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*Venezuela's reform entails privatization and restructuring, but has little or no immediate effect on consumer choice. Venezuelan reform is in its infancy, so several significant impediments to competition remain. The principal regulatory agency's responsibilities are presently unclear, as is the market's pricing mechanism.*

### Nature and Extent of Regulatory Reform

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Rapid growth of electricity demand combined with inadequate investment in the power sector in recent years have resulted in frequent power shortages. With investment needs estimated at \$6 billion over the next five years, the Venezuelan government is pursuing a program of privatization and regulatory reform in an effort to attract private capital to the power sector.<sup>1</sup>

The initial guidelines for electric power reform were established in 1996 by Presidential Decree 1558. The decree defines a subsidiary role for the state, opens the generation segment to competition, mandates vertical unbundling, provides free access to the transmission and distribution grids, and establishes prices based on cost of service for different customer groups.<sup>2</sup> The 1999 Electricity law formalizes and further develops many features of the 1996 Presidential Decree.<sup>3</sup> Under the terms of the law, electric utilities will split into separate generation, transmission, and distribution units, all of which will be open to private investment, although hydroelectric plants will remain under state control. No single company may participate in more than one segment of the market. The national transmission network, formed in 1968, will become a separate state-run enterprise, which will link power generators with local distribution firms. The law specifies that the institutions required to regulate and operate the sector will be in place within two years of its enactment.<sup>4</sup> A major short term goal included in the legislation is the creation of a

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<sup>1</sup> U.S. Department of Energy, Energy Information Administration, "Venezuela," Jan. 2000, found at Internet address <http://www.eia.doe.gov/emeu/cabs/brazil.html>, retrieved Apr. 20, 2000.

<sup>2</sup> Inter-American Development Bank (IADB), "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries," Sept. 1999.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

spot market for electricity sales.<sup>5</sup> The grid company would request offers of supply from generators on an hourly basis at various prices, and select the least expensive power on a nationwide “pooling” basis.<sup>6</sup>

Privatization of Venezuela’s electric power sector has been proceeding gradually. Since 1990, the Venezuelan Investment Fund (FIV) has transferred seven out of twelve government-owned electric power utilities to the private sector.<sup>7</sup> In 1997, Venezuela took steps to privatize and reorganize its remaining state-owned electric companies, beginning with a public auction for the state of Nueva Esparta’s electric system. The offering was intended to commence a series of privatizations, which was to include CADAPE, Venezuela’s second largest government-owned utility, and CADAPE’s regional subsidiaries. In anticipation of the privatization, CADAPE reorganized its business units into four regional distribution facilities, ELEORIENTE, ELEOCCIDENTE, ELECENTRO, and CADELA; a separate transmission unit; and various hydro and thermal generating units. However, the privatization process was delayed in 1998, largely as a result of the uncertain political climate following presidential elections that year.<sup>8</sup>

Venezuela’s privatization program began anew in 1999 with the auction of SENECA, the distribution facility serving Margarita Island, through which the U.S. firm CMS acquired the majority share. The privatization process was further advanced on May 10, 2000, when the privatization agency announced that it had re-opened registration for companies interested in buying a majority share in the ENELVEN utility, the electrical system serving the petroleum-producing state of Zulia. Additional privatizations are scheduled by year end 2000.

The Ministry of Industry, Energy, and Mines has overall responsibility for developing policy for the electric power industry. Under the new legislation, a new institution, the National Energy Commission (CNEE), will be responsible for overseeing all electric sector activities.<sup>9</sup>

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<sup>5</sup> U.S. Department of State telegram, “Venezuela’s New Electricity Law,” message reference No. 003440, prepared by U.S. Embassy, Caracas, Oct. 19, 1999.

<sup>6</sup> Ibid.

<sup>7</sup> USDOC, ITA, *Venezuela Country Commercial Guide - FY 2000*, found at Internet address <http://stat-usa.gov>, retrieved Mar. 9, 2000.

<sup>8</sup> U.S. Department of State telegram, “Venezuela to Sell-Off Majority Stake in State Electric System,” message reference No. 001481, prepared by U.S. Embassy, Caracas, May 16, 2000.

<sup>9</sup> U.S. Department of State telegram, “Venezuela’s New Electricity Law,” message reference No. 003440, prepared by U.S. Embassy, Caracas, Oct. 19, 1999.

# Current Market Conditions

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## *Generation*

Presently, Venezuela's power generation capacity is dominated by the National Inter-linked System (SNI).<sup>10</sup> The SNI consists of four companies,<sup>11</sup> of which Electrificación de Caroni (EDELCA) is the largest.<sup>12</sup> The company, which is responsible for 70 percent of the country's electricity generation, has capacity in excess of 12 GW, with an additional 4.8 GW under construction. CADAFE has installed capacity of 4.2 GW. Other generators include ENELBAR (151 MW), ENELVEN-ENELCO (1.37 GW), SEMDA (536 MW), and SENECA (170 MW). Of these, only SENECA has been privatized thus far through an auction won by CMS of the United States.

## *Transmission and Distribution*

Structural changes called for by the new electricity law have yet to be implemented. These include the creation of a single company that would own and operate the majority of the nationwide inter-connected transmission system and guarantee open access to its facilities.<sup>13</sup> At present, most transmission capacity is still owned by EDELCA and CADAFE, the dominant generators.

The new electricity law states that transmission pricing will be based on the cost of investment, operation, and maintenance of the facilities and other costs required to develop the activity and to obtain a just return. At present, industrial and commercial prices reflect a 15 percent to 20 percent surcharge to subsidize residential customers. The new law will allow the government to provide subsidies to very low-income residential consumers or specific sectors. These subsidies will be financed by government, other residential consumers, or large electricity generators. The contributions of other residential customers will have a cap of 20 percent of the cost of service and will be reduced by 5 percent every two years.<sup>14</sup>

Under the new law, distribution activities will be unbundled from transmission and generation activities. However, at present, CADAFE and EDELCA continue to be the largest distributors, accounting for two thirds of the market. State-owned ENELVAN-ENELCO and ENELBAR account for 13 percent and 4 percent of the

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<sup>10</sup> Ibid.

<sup>11</sup> Electrificación de Caroni (EDELCA), CADAFE, Electricidad de Caracas (ELECAR), and Empresa de Energía de Venezuela (Enelven).

<sup>12</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

distribution market, respectively, and privately-owned firms hold approximately 17 percent market share.<sup>15</sup>

## ***Retail Supply***

Under the new legislation, retail supply services will continue to be provided by regional distribution companies operating under concessions. Concessions will run 30 years and feature options for an additional 20 years. However, large consumers (with loads exceeding 5 MW) will be able to purchase power directly from generators.<sup>16</sup>

## ***Remaining Impediments to Competition***

The main impediment to market access in Venezuela appears to be a result of the fact that regulatory reform remains in the very early stages of implementation. The Ministry of Industry, Energy, and Mines has yet to draft regulations governing the CNEE, or even to staff and set up the institution. Additionally, existing distribution companies must restructure their organizations within the next three years, which may delay the ongoing privatization process.<sup>17</sup>

Industry representatives have indicated that, although Venezuela's new electricity law provides for market access, the uncertain political climate and uncertain price structure make it difficult to do business in the country.<sup>18</sup> Additionally, incumbent electricity providers resistant to competition may make market entry by foreign firms difficult. For example, a government-owned incumbent utility recently filed an injunction to prevent a U.S. electricity provider from selling electricity to industrial customers within its region. A cease and desist order was issued, and the U.S. provider is presently unable to provide services. These facts suggest that, although a competitive regulatory framework exists, additional work may be required to develop a fully competitive market in Venezuela.<sup>19</sup>

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<sup>15</sup> U.S. firms participating in the distribution market include AES, which launched a successful takeover bid for privately held Electricidad de Caracas (EDC), the utility company that serves Venezuela's capital, in April 2000. AES paid more than \$1 billion for 49 percent of EDC's shares, adding to the 1.1 percent it already owned. U.S. Department of State telegram, "AES Launches Takeover Bid for Privately-Held EDC," message reference No. 001275, prepared by U.S. Embassy, Caracas, Apr. 28, 2000.

<sup>16</sup> Ibid.

<sup>17</sup> IADB, "Profiles of Power Sector Reforms in Selected Latin American and Caribbean Countries."

<sup>18</sup> Industry representative, interview by USITC staff, Santiago, Chile, June 2000.

<sup>19</sup> Industry representative, correspondence with USITC staff, Washington, DC, July 2000.

**PART V**  
**SUMMARY AND CONCLUSION**



# CHAPTER 20

## NATURE OF MARKET REFORMS IN THE SUBJECT COUNTRIES

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Each of the countries under examination in this study has initiated policy reforms intended to introduce competition into the electric power market. However, the degree of market liberalization engendered by such reforms varies greatly from country to country. In general, the policies adopted by these countries may be divided into the following major elements:

1. Privatization
2. Vertical separation or unbundling
3. Horizontal separation or reducing industry concentration
4. Ensuring system access or access to common infrastructure
5. Establishing independent and transparent regulatory authority

Each of these elements is discussed briefly below, and table 20-1 presents a summary of the policy choices adopted by each of the subject countries.

### Privatization

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Electricity sector privatization has occurred, or is planned, in most of the subject countries. Both Chile and the United Kingdom have privatized virtually all state-owned electricity sector assets, but in many countries, the state has sold only a portion of its assets. The extent of these partial privatizations differs significantly. Countries that have not privatized, or do not plan to privatize, remaining state-owned electricity assets include Denmark, France, and Sweden. Privatization is not an important issue in Belgium or Japan, as most electricity assets in these countries traditionally have been privately owned.

### Vertical Separation

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All of the subject countries have separated their electric power generation, transmission, distribution, and retail supply segments to some degree. In some countries, vertical restructuring has entailed separation on an accounting or management basis, while in other markets, complete ownership separation has been required. Vertical restructuring methods employed by these countries also differ with regard to which market segments are subject to separation. Some countries require the complete disaggregation of all four market segments, but most countries only require the separation of competitive market segments from those with monopoly power.

**Table 20-1**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Argentina	All federally-owned power generation utilities have been privatized, except for the nuclear generation entity and the binational hydroelectric projects. About 70 percent of the provinces have implemented 23 privatization programs, initially in distribution. Of the six transmission companies, four have been at least partially privatized.	Argentina requires complete ownership separation of transmission activities from generation, distribution, and supply activities. Generation companies that own more than 10 percent of national generation capacity are barred from owning distribution facilities.	Horizontal restructuring was brought about through the privatization program. Present rules barring generation companies with more than 10 percent of national capacity from owning distribution facilities presents a disincentive to amassing more than 10 percent of the generation market.	System access is guaranteed, and the system operator is independent from the dominant utility. Maximum transmission and distribution prices (price caps) are set by the regulator.	ENRE, an independent agency of the federal government, is managed by five directors appointed by the Secretary of Energy. ENRE has authority over transmission companies and national distribution companies, but it does not regulate provincial distribution companies.
Australia	In Victoria and South Australia extensive privatization has occurred. In other states, little or no privatization has occurred.	The states of Victoria and South Australia require ownership separation of transmission and distribution activities from supply and generation activities.	In states where reforms have taken place, the privatization process separated generation and supply activities into at least 5 competing companies in each state.	System access is guaranteed, and the system operator is independent from the dominant utility. Prices are set by independent regulatory authorities in each state.	On the federal level, NEMMCO acts as independent system operator, NECA controls amendments to the electricity code, and ACCC handles competition policy. Each state also has a separate regulatory agency to handle non-eligible customers and state-based issues.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Brazil	The privatization program, stalled in 1999, is expected to accelerate in the second half of 2000. Distribution is 60 percent privatized. With the exception of binational hydroelectric companies and the nuclear plants, generation assets are being slowly privatized. Transmission is expected to remain government-owned in the near term.	After a 10-year transition period, Brazil will require complete ownership separation of transmission activities from generation and retail supply activities. However, separate but affiliated corporate entities can engage in such activities.	Through privatization, large distribution companies have been split up and sold to various investors. A similar process is expected to restructure the generation segment in the near future.	System access is guaranteed, and the system operator is independent from the dominant utility. The system operator sets charges for network use based on incremental use at different locations.	Brazil's regulator, ANEEL, is an autonomous agency of the federal government.
Canada	Most major utilities continue to be Crown corporations owned by the provinces or territories. Alberta and Ontario are the exception, with significant private ownership.	In Ontario, generation has been separated from transmission and distribution; distribution and retail supply are undergoing accounting separation. In Alberta, all segments are undergoing separation.	Ontario has required the dominant generator to reduce its share of the market. Alberta has required the three dominant, privately-owned generators to auction the rights to their capacity to other retail marketers. These firms are permitted to continue owning and operating their facilities, however.	In both Alberta and Ontario, system access is guaranteed and the system operators are independent from the dominant utilities. In Alberta, the transmission operator sets prices, while in Ontario, transmission fees must be approved by the Ontario Energy Board.	Each province or territory has regulatory oversight of the industry. In Alberta, the Energy and Utilities Board, created in 1995, is an independent regulator. The Ontario Energy Board serves a similar function in Ontario.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Chile	Chile has privatized virtually all electricity assets.	There are no legal barriers to vertical cross-ownership, however there is strong pressure to introduce such a measure. Endesa has voluntarily decided to sell its ownership stake in the main transmission company, Transelec.	Chile does not limit horizontal holdings.	System access is guaranteed, but the system operator is not yet independent from the dominant utility.	The independence of local regulatory authorities has been questioned and their structure may be changed in the near future. On the federal level, the National Energy Commission (CNE) determines regulatory policy and is the leading authority in terms of tariff rates and general policy issues, while the Superintendence of Electricity and Fuels (SEC) is the enforcement body for the energy sector.
Japan	One of Japan's two main wholesale power suppliers, the Electric Power Development Corporation (EPDC), has two-thirds' government ownership, but is slated to be privatized in 2003. The rest of Japan's electricity assets, including large, vertically-integrated utilities, traditionally have been privately-owned.	Japan requires vertically integrated utilities to maintain separate accounts for their generation and transmission units.	Japan's 10 privately-held, vertically-integrated electric utilities still retain virtual monopolies over the geographic regions that they serve. However, the vertically integrated utilities are competing, or will soon compete, with independent power producers and new types of retailers.	System access is guaranteed, but the system operator is not independent from the dominant utility. Each utility sets transmission prices according to government guidelines.	The Ministry of International Trade and Industry (MITI) is responsible for formulating policy, establishing laws, and adjudicating disputes (in conjunction with the Japan Fair Trade Commission).

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
New Zealand	One generation firm, which accounts for approximately 28 percent of New Zealand's generation capacity, has been privatized. Other private firms provide an additional 14 percent of national generation capacity, with the remaining 58 percent still provided by government-owned entities. Some of New Zealand's approximately 30 distribution companies are privately owned, while many others are locally-owned trusts.	New Zealand requires the separation of transmission and distribution interests from generation and retail supply by either public sale or establishment of a separate trust. Generation firms may enter the retail supply sector.	The state-owned generator, ECNZ, has been broken into three separate and competing state-owned enterprises. Together, these enterprises account for 58 percent of New Zealand's generation capacity.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission prices must be disclosed in order to discourage anti-competitive behavior.	New Zealand does not have an independent electricity regulator. However, the Market Surveillance Committee acts to ensure that the market is self-regulated effectively.
Venezuela	The privatization process was initiated in 1999. Two utilities have already been sold to U.S. companies. The privatization process may be delayed, however, until the industry restructures to meet the requirements of the new electricity law.	Under future electricity sector reforms, Venezuela will require the complete ownership separation of existing generation, transmission, and distribution activities.	Venezuela will not require horizontal restructuring.	Under future electricity sector reforms, system access will be guaranteed and the system operator will be independent from the dominant utility. Transmission prices will be based on the cost of the activity plus just retribution.	Electricity sector reforms will replace the present regulatory authority with the National Energy Commission (CNEE), which will be fiscally independent.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
European Union	Privatization is not mandated by the EU Directive; the 15 member states have different ownership structures, and the level of private ownership varies widely.	The EU's 1996 Directive on Electricity Restructuring bans cross-subsidization, but each member state may choose how best to achieve this objective. Some states require full ownership separation, while others require only accounting and/or management separation.	The EU Directive does not address horizontal restructuring. This is to be determined by the relevant competition authority in each member state.	EU member states must guarantee system access and establish an independent system operator. The EU Directive did not establish guidelines regarding transmission prices.	The EU requires member states to establish independent electricity regulators.
Austria	Some utilities have been partially privatized, including 49 percent of Verbundgesellschaft (VbG), the dominant generation and transmission provider.	Austria requires the separation of generation, transmission, and distribution activities on an accounting and management basis, but VbG already has unbundled its generation and transmission activities on a legal basis.	Austria has not required horizontal restructuring and VbG continues to generate 84 percent of the nation's electricity.	System access is guaranteed, but the system operator is not independent from the dominant utility. The method for calculating Austria's "postage stamp" transmission prices, which are differentiated by voltage levels, is defined by regulation.	The Ministry of Economic Affairs regulates the electricity sector.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Belgium	Belgium's electricity assets traditionally have been privately-owned.	Belgium requires complete disaggregation on an accounting basis. The network operator may not hold any interest in producers, distributors, or intermediaries.	Belgium has not required horizontal restructuring. Electrabel produces 88 percent of the nation's electricity, owns 91 percent of the transmission grid, and controls 80 percent of distribution services.	System access is guaranteed, but the system operator is not independent from the dominant utility. The Price Control Committee establishes transmission prices.	The Commission for Electricity and Gas Regulation (CREG), an independent agency, advises the Minister of Energy on authorization of new generation capacity and oversees the transmission system operator on tariffs, cross-subsidies, public service obligations, accounts of electricity companies, and grid development.
Denmark	Generation companies are often established as corporations where local municipalities hold the majority of shares. Two firms, Elsam and Elkraft, produce 90 percent of Denmark's power. Distribution companies tend to be owned by municipalities. Privatization is not widespread, and in fact is deterred because municipalities that sell their electric power utilities would experience a reduction in national financial assistance.	Denmark requires the separation of generation, transmission, and distribution activities on a legal basis.	Denmark has not required horizontal restructuring.	System access is guaranteed, and the system operator is independent from the dominant utility. The regulator sets prices which must cover costs, including a return on investment.	The Energy Agency, a government body, is in charge of granting supply licenses, and planning applications for generation, transmission, and supply. The Energy Supervisory Board, an independent body, is in charge of price controls.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Finland	There are plans to privatize up to 49 percent of Fortum, but the Finnish Government will likely retain its 12 percent stake in Fingrid.	The 1995 Electricity Market Act required the separation of generation, transmission, distribution, and supply activities on an accounting basis.	The Finnish Competition Authority has the right to block mergers that result in one company having more than 25 percent market share in the distribution or the retail supply segment.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission prices are based on usage, locality, and time of day, and transmission customers are charged at the point of connection.	The Electricity Market Authority (EMA) is an independent body, but is subordinate to the Finnish Ministry of Trade and Industry.
France	There are no plans to privatize EdF, the state-owned monopoly.	France requires the separation of generation, transmission, and distribution activities on an accounting basis.	There are no plans for horizontal restructuring.	System access is guaranteed, but the system operator is not independent from the dominant utility. Transmission prices are set, and are not subject to negotiation.	The independent regulator (CRE) interprets regulations on access to and use of the transmission grid, implementation of unbundling, and dispute settlement.
Germany	Reform did not alter the ownership structure of EVUs, Germany's largest utilities, which are jointly owned by states and private institutions. The former East German electricity companies were privatized.	Germany requires the vertical disaggregation of transmission activities on an accounting and management basis, and distribution activities on only an accounting basis.	Germany's vertically-integrated electric utilities retain market dominance over the geographic regions that they serve. There is currently no movement towards horizontal restructuring among these utilities.	System access is guaranteed, but the system operator is not independent from the dominant utility. System access is negotiated on a case-by-case basis.	There is no single independent regulatory agency operating in Germany. The Ministry of Economics is the general authority with regard to the German energy law. The competition authorities are responsible for dispute settlement concerning network access and competition issues. The individual state (Laender) authorities are responsible for authorizing new generation capacity.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Greece	Regulatory reform likely will entail the partial privatization of the Public Power Corp. (PPC), which controls electricity generation, transmission, and distribution in Greece. However, the government likely will retain control of the PPC.	Greek law requires the separation of electricity generation, transmission, distribution, and other activities on an accounting basis.	Greece has not required horizontal restructuring.	Following electricity reforms, system access will be guaranteed, and the system operator will be independent from the dominant utility. Transmission fees will be regulated and published.	Greece is planning to establish an independent Electricity Regulatory Authority.
Ireland	The Electricity Supply Board (ESB), a state-owned statutory corporation, will likely remain under state ownership. Future privatization of ESB has been proposed.	Following electricity sector reforms, Ireland will require the separation of all electricity segments on an accounting basis. The transmission system operator will be separated from ESB on a management basis.	Ireland has not required horizontal restructuring.	System access is guaranteed, and the system operator eventually will be independent from the dominant utility. Transmission prices are set, and are not subject negotiation.	The Commission for Electricity Regulation (CER) is the independent regulatory authority established by the Electricity Act.
Italy	In October 1999, the Italian government privatized 35 percent of Enel.	Any electricity provider that has more than 300,000 customers must separate its transmission, distribution, and supply activities into distinct subsidiaries. Enel was required to separate its generation, transmission, distribution, and supply activities within six months of April 1, 1999.	As of January 2003, Italy will not permit any single entity to generate or import more than 50 percent of the country's electricity. By March 31, 2001, Italy will consolidate the distribution segment by granting an operating license to only one distributor in each municipality, likely reducing Enel's dominance.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission prices are set by the regulator, and are based on energy losses, depreciation, and the cost of associated services.	The Electricity and Gas Authority is Italy's independent regulator.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Luxembourg	Luxembourg has already privatized 59 percent of Cegedel, the distribution provider. Other distribution assets are owned by Sotel, a private industry cooperative, and various municipalities. Further privatization is not anticipated.	Luxembourg has not required the separation of transmission and distribution activities due to the small size of the system. Almost no electricity is generated in Luxembourg.	Luxembourg has not required horizontal restructuring.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission prices are set by the Ministry of Energy, and likely will be based on voltage levels.	The Institute of Telecommunications and Electricity, an independent body, has regulatory authority over the electricity sector.
Netherlands	SEP, the primary generator and transmitter, already has some private participation. Distribution companies are presently owned by municipal and provincial authorities. Until 2002, approval by the Ministry of Economics is required to sell shares to persons outside the circle of present owners.	The Netherlands requires the separation of transmission and distribution activities on an accounting basis.	The Netherlands has not required horizontal restructuring.	System access is guaranteed, and the system operator is independent from the dominant generation utilities. Transmission prices are set by the regulator.	The electricity sector is regulated by DTe, a part of the Netherlands Competition Authority (NMa) under the Ministry of Economic Affairs. The Energy Ministry appoints, and can give binding direction to, the DTe director.
Portugal	The Portuguese Government has reduced its stake in Electricidade de Portugal (EdP), though it retains a controlling interest. In the future, EdP may be fully privatized.	Portugal requires utilities to separate their activities on an accounting and a legal basis.	Portugal has not required horizontal restructuring.	System access is guaranteed, but the system operator is not independent from the dominant utility. The regulator sets and publishes transmission prices.	The Entidade Reguladora do Sector Eléctrico (ERSE) is Portugal's independent regulatory authority. ERSE is financially independent and neither the executive branch of government nor parliament may issue directives to ERSE. The Council of Ministers appoints ERSE's director and two counselors.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
Spain	The Spanish government completely privatized Endesa, an electricity generation firm, through four separate public offerings. In addition, Spain partially privatized Red Electrica de España (REE), the dominant provider of transmission services. The government continues to hold a 25-percent share in REE.	Firms involved in transmission, distribution, or system management activities are prohibited from generating or marketing electricity. Although the complete unbundling of these functions is not required until year-end 2000, established firms that carry out both regulated and unregulated functions must immediately separate the accounts of, and establish partitions between, entities involved in those separate activities. New firms must separate these activities completely upon establishment.	No horizontal restructuring has occurred and the industry remains highly concentrated with one firm, Endesa, producing 47 percent of all electricity. However, in 1996, Spain's dominant generation firms - Endesa, Iberdrola, Union Fenosa, and Hidrocantabrico - voluntarily agreed not to consolidate further.	System access is guaranteed, and the system operator is independent from the dominant generation utilities. Transmission prices are proposed by the Comisión Nacional de la Energia (CNE) and approved by the Ministry of Industry.	The Comisión Nacional de la Energia (CNE) and the Ministry of Industry share regulatory authority. The CNE's responsibilities include the settlement of network access disputes and the provision of various supervisory, advisory, and control services. The CNE also is responsible for proposing pricing regimes. However, the Ministry of Industry must approve pricing regime proposals.
Sweden	State-owned assets are not expected to be privatized, but Sweden already has a significant level of private ownership in the generation segment. Distribution service providers are generally owned by municipalities.	Sweden requires the legal separation of transmission and distribution activities from generation and retail supply activities.	Sweden has not required horizontal restructuring, although the top three generators produce 85 percent of the electric power, and one accounts for 50 percent.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission customers are charged at the point of connection, and prices are based on usage, locality, and time of day.	STEM, an independent government body, is the principal regulatory authority.

**Table 20-1--Continued**  
**Summary of market reforms**

<b>Country</b>	<b>Extent of Privatization</b>	<b>Status of Vertical Restructuring</b>	<b>Status of Horizontal Restructuring</b>	<b>System Access Regime</b>	<b>Regulatory Authority and Independence</b>
United Kingdom	In England, Wales, and Northern Ireland, all electricity assets have been privatized. With the exception of nuclear assets, all electricity assets in Scotland also have been privatized.	England and Wales require the separation of competitive retail supply activities from monopolistic distribution activities through a system of accounting separation. The grid operator is prohibited from owning generation or retail supply functions. Scotland and Northern Ireland require the separation of all electricity activities on an accounting basis.	The regulator monitors the generation segment for potential market abuse. Divestiture of some facilities was required of the two largest generators in England and Wales due to concerns regarding market power.	System access is guaranteed, and the system operator is independent from the dominant utility. Transmission prices are regulated.	The Office of Gas and Electricity Markets (OFGEM) is the independent regulatory authority.

Source: Compiled by the Commission.

monopoly power. For example, a single entity may not provide both electricity distribution and retail supply in New Zealand, and Japanese utilities must separate the accounts of generation and transmission units.

## **Horizontal Separation**

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Some countries have introduced competition into certain electricity segments by breaking up incumbent firms, or by establishing a maximum permissible market share for participants in a certain segment. Most frequently, such horizontal restructuring has taken place in the generation segment, but a few countries have restructured their markets for electricity distribution and/or retail supply. However, over half of the subject countries have not, or do not plan to, horizontally restructure their electric power markets. In most of those countries in which horizontal restructuring has not occurred, a single firm or a small number of firms continue to dominate individual market segments.

## **System Access**

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In all of the subject countries, the transmission and distribution segments remain under monopolies with regulated prices. All of the subject countries guarantee nondiscriminatory third-party access (such as by generators, traders, and retailers) to the electricity transmission and distribution networks, or plan to guarantee such access once electric power sector reforms have been fully implemented. In addition, most countries have designated a system operator that is independent from the incumbent utility. The subject countries' system access regimes differ with regard to the regulation and calculation of transmission prices. The most common methods used to regulate prices include price caps, non-negotiable rates, and government approval of prices. Factors that affect prices include the volume of system use, time of day, location, access fees, or a combination of these factors.

## **Regulatory Authority**

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Most of the subject countries have established, or are planning to establish, a single industry regulator. Many of these regulators are organized as independent government agencies, but the degree of independence exercised by these regulators differs among countries. Some of the factors that affect regulatory independence in the subject countries include the degree of administrative and/or financial autonomy granted to regulators, the extent to which regulatory decisions are subject to the approval of another government entity, and the manner in which members of regulatory authorities are chosen and dismissed. Approximately one-third of the subject countries have not established a single industry regulator. In most of these countries, numerous agencies at both the federal and sub-federal levels, some of which are organized as independent agencies, share regulatory authority.

# New Competitive Opportunities Created by Reforms

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The market reforms implemented by the subject countries have essentially entailed a shift from an old, rigid industry framework characterized by few choices and captive customers to one with an array of choices and participants (see figure 20-1). This has in turn created new opportunities for private sector participation in all four of the major segments of the electric power industry (generation, transmission, distribution, and retail supply) and effectively created a fifth segment: electric power trading. In the generation segment, new opportunities for foreign participation principally entail investment to construct or acquire facilities. In the transmission and distribution segments, the monopoly structure has been preserved, so new opportunities are limited to private investment in the monopoly service provider. In some markets where an independent system operator (ISO) has been established, foreign equity participation in the ISO may also be possible. At the retail supply level, the introduction of consumer choice may create a new marketing and customer relations function, which involves metering, billing, and the provision of additional services like electricity management and advisory services.<sup>1</sup> The retail supply functions can be provided by the generation firms themselves, by subsidiaries of incumbent distribution providers or by newly-formed marketing intermediaries, such as companies that market “green” power by aggregating environmentally conscious consumers and producers that use renewable resources like wind power. Finally, electric power trading is a new business activity made possible by regulatory reform. Whereas regulators set prices under the old regime, in a deregulated environment prices are discovered through the interaction of traders, producers, and consumers. Power traders serve as intermediaries by matching electric power producers with consumers, or aggregations of consumers. Traders also mitigate risk for both parties by underwriting various financial contracts, such as futures and options.

Private firms generally may participate in either competitive activities (generation, retail supply, and trading) or in monopoly activities (transmission and distribution). Separation between monopoly activities and competitive activities is viewed as necessary to prevent cross-subsidization. Firms engaged in competitive activities can usually intermingle their operations with other competitive segments, such that a generator may also be a trader and a retailer.

As a result of the wide variety of electric power sector reforms undertaken by the subject countries, new entrants face varying levels of opportunity in each of these markets. Market competition is influenced by a number of factors, including the level and extent of consumer choice, the extent of competition in the generation segment, and the extent to which a wholesale trading market has developed. Each of these factors is discussed briefly below, and table 20-2 summarizes the position of each of the subject countries relative to these elements.

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<sup>1</sup> In cases where retail competition has yet to be introduced, the incumbent distribution service provider may continue to provide both distribution and retail supply services.



**Table 20-2**  
**Summary of competitive market factors**

<b>Country</b>	<b>Level and Extent of Consumer Choice</b>	<b>Extent of Competition in Generation</b>	<b>Development of a Trading Market</b>
Argentina	Current law allows consumers of more than 50 KWh per year to choose their supplier. As of mid-1999, about 1,500 large industrial customers bought directly from generators.	Considerable competition exists, except in certain remote locations. Largest generator holds less than 10 percent market share.	Argentina's trading market comprises consumers and suppliers from the entire country. Electricity can be bought and sold through the electricity pool, or through an informal bilateral contract market.
Australia	In the states participating in the National Electricity Market, all consumers may choose, or will be able to choose, their supplier by January 2003.	In two states, vertically integrated monopolies continue to exist. Only one firm generates electricity in Tasmania. In each of the four other states, there are at least five competing generation companies.	Australia has a mandatory power pool in which all producers, retail suppliers, and eligible consumers from four provinces and the ACT participate.
Brazil	Currently, only retail suppliers with annual sales exceeding 250 GWh and consumers with loads greater than 10 MW will be able to choose their power provider. Over time, choice will be extended to smaller consumers.	Competition is limited as privatization of generation facilities has been slow and many firms are locked into contracts that will remain in effect until 2002. Currently, Eletrobras accounts for 50 percent of Brazil's generation capacity.	A energy market (MAE) is expected to begin operations by late 2000. Eligible market participants include generators with installed capacity above 50 MW, retail suppliers with annual sales exceeding 250 GWh, and consumers with loads greater than 10 MW. Over time, smaller consumers will be able to participate directly in the market.
Canada	Alberta currently extends consumer choice to industrial customers, and plans to extend choice to household consumers in 2001. Ontario has delayed consumer choice indefinitely. Other provinces have yet to implement reform to permit consumer choice.	In Alberta, three previously regulated utilities generate 90 percent of the province's electricity from capacity that remains regulated. However, an auction currently being held will complete the deregulation of generation capacity and bring new competitors into the market. In Ontario, OPG owns 85 percent of the province's generation capacity, but will relinquish some of this capacity after market opening.	Alberta has established a power pool, through which electricity can be bought and sold. Ontario plans to launch a similar market in late 2000. Other provinces have yet to implement reform or develop trading.

**Table 20-2--Continued**  
**Summary of competitive market factors**

<b>Country</b>	<b>Level and Extent of Consumer Choice</b>	<b>Extent of Competition in Generation</b>	<b>Development of a Trading Market</b>
Chile	Customers with a load greater than 2 MW are free choose their own supplier. The regional distribution companies continue to provide electricity to smaller consumers.	Competition is somewhat limited due to Endesa's 60-percent share of the Chilean generation market.	Chile has two separate transmission systems which are not connected. As a result, Chile has two separate trading markets in which electricity can be traded through an informal bilateral contract market or through a regional pool.
Japan	Large-scale commercial and industrial customers that receive power at the level of 20 kV or more and that consume more than 2 MW per year may choose their own supplier.	Competition is limited, as generation in each region is dominated by a single power company. Independent power producers (IPPs) are permitted to supply power on a wholesale basis to the electric utilities and on a retail basis to large-scale commercial and industrial consumers.	Japan has a power pool used by nine electricity retailers to conduct power trading. Electricity can be traded through an informal bilateral contract market or through the electricity pool.
New Zealand	All consumers may choose their own supplier.	Four major generation firms account for approximately 86 percent of total output. Three of these are competing state-owned enterprises.	All market participants can trade electric power through an informal bilateral contract market or through COMIT, an electronic trading system. Electric power futures and also be traded through COMIT.
Venezuela	Presently, no consumers are able to choose their own electricity supplier. When customer choice is initiated, consumers with a load greater than 5 MW will be able to choose their own supplier.	Presently there is no market competition in Venezuela. Six state-owned power companies hold 80 percent of Venezuela's generation capacity. The new law would open generation to competition.	Following the successful implementation of electricity sector reforms, producers, retail suppliers, and eligible consumers will be able to trade electricity through an informal bilateral contract market or through a centralized power pool.
European Union	Liberalization began Feb. 19, 1999, by which time 26 percent of consumers in each EU member state - and all consumers of over 100 GWh per year - were to have choice of suppliers.  By February 19, 2003, approximately 33 percent of consumers in each member state are to have choice of suppliers.	Generators in any member may compete to provide electric power to eligible customers in any other EU member. Development of new generation capacity must be open to new market entrants on a non-discriminatory basis through either an authorization or a tendering process.	Trading markets have developed within the EU. However, the EU itself mandates only transparency in pricing.

**Table 20-2--Continued**  
**Summary of competitive market factors**

Country	Level and Extent of Consumer Choice	Extent of Competition in Generation	Development of a Trading Market
Austria	Consumers of at least 40 GWh per year (28 percent of the market) can choose their supplier.	Competition is limited, as regional generators controlled by Verbund, majority-owned by the state, account for 84 percent of electric power production. Development of new generation capacity is subject to authorization.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market. In addition, Verbund participates in the wholesale market in Leipzig.
Belgium	Consumers of at least 100 GWh per year (33 percent of the market) can choose their supplier.	Generation is dominated by Electrabel, which produces 88 percent of Belgium's electricity. Development of new generation capacity is subject to authorization by the federal government.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market. In addition, Electrabel participates in the Amsterdam Power exchange.
Denmark	As of April 1, 2000, consumers of at least 10 GWh are eligible to choose their supplier. By 2003, all consumers will be eligible to choose their supplier.	Generators owned by Elsam and Elkraft produce about 90 percent of Denmark's power. Development of new generation facilities is open subject to authorization, but new nuclear or coal-fired plants are prohibited. Thus, new plants tend to use natural gas supplied by government-owned firms.	Western Denmark is a member of Nord Pool with Finland, Norway, and Sweden. Nord Pool is a voluntary pool that contains a spot and futures market. Electricity can also be traded through an informal bilateral contract market.
Finland	All consumers may choose their supplier.	Two firms, Fortum Heat and Power and Pohjolan Group, produce 70 percent of Finland's electric power. Municipalities and self generators provide the remaining 30 percent. Generation is open to competition and construction of new facilities is permitted subject to authorization based on environmental and land use rules.	Finland is a member of Nord Pool with Western Denmark, Norway, and Sweden. Nord Pool is a voluntary pool that contains a spot and futures market. Electricity can also be traded through an informal bilateral contract market.
France	France has complied with the minimum standards in the EU directive. Thus, 28 percent of the market is considered eligible at present.	EdF, a state-owned firm, produces 90 percent of the electricity generated in France.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market.

**Table 20-2--Continued**  
**Summary of competitive market factors**

<b>Country</b>	<b>Level and Extent of Consumer Choice</b>	<b>Extent of Competition in Generation</b>	<b>Development of a Trading Market</b>
Germany	German legislation provided for immediate 100-percent market opening. There is no eligibility threshold. All final consumers, distributors, and other agents are <i>de jure</i> eligible customers.	The development of competition has been limited, as 6 regional generators account for 81 percent of power generation. Construction of new generation capacity is subject to an authorization procedure.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market or through Germany's electricity pools.
Greece	Currently, no consumers are able to choose their own electricity supplier. Customers that consume more than 100 GWh per year and other customers (not yet determined) will be able to choose their own supplier on February 19, 2001. This opening will satisfy the minimum requirements of the EU Electricity Directive.	Currently, PPC is the state-owned monopoly provider of generation services in Greece, producing 99 percent of Greece's electricity. Autoproduction, independent power production, and co-generation are permitted if gas or renewable fuel sources are used and if various other conditions are met. In the future, permission to build new generation capacity will be granted under an authorization system.	Greece has yet to develop a trading market, but is working with Albania, Bosnia-Herzegovina, Bulgaria, Macedonia, and Romania to establish a regional transmission grid and power trading market.
Ireland	Customers that consume at least 4 GWh per year at any single premises are entitled to choose their own supplier. This represents 28 percent of the market. Ireland plans to increase consumer choice to 40 percent by 2002, with full consumer choice in about five years.	The state-owned Electricity Supply Board (ESB) generates almost all of Ireland's electricity. An authorization procedure will be used for the construction of new generation capacity.	Ireland has yet to develop a power trading market.
Italy	Individual customers and consortia that consume at least 20 GWh per year, or approximately 35 percent of Italian electricity consumers, currently are eligible to choose their own electricity supplier. By 2002, customers and consortia that consume at least 9 GWh per year, or approximately 40 percent of consumers, will be able to choose their electricity supplier.	In 1999, Enel remained the dominant provider of electricity generation in Italy, owning 85 percent of Italy's generation capacity. However, as of January 2003, Italy will not permit any single entity to generate or import more than 50 percent of the country's electricity. Enel must sell at least 15 GW of its generation capacity in order to comply with this regulation.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market. In addition, a national pool market will be established on January 1, 2001.

**Table 20-2--Continued**  
**Summary of competitive market factors**

<b>Country</b>	<b>Level and Extent of Consumer Choice</b>	<b>Extent of Competition in Generation</b>	<b>Development of a Trading Market</b>
Luxembourg	Consumers of at least 100 GWh per year (6 consumers or 39 percent of the market) can choose their supplier.	Luxembourg imports practically all of its electric power from Electrabel (Belgium) and RWE (Germany). Development of new generation capacity is subject to authorization.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market
Netherlands	Consumers of at least 10 GWh annually can choose their supplier.	The electricity generation market is open to competition. Four conglomerates produce 64 percent of the Netherlands' electricity.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market or through the electricity pool.
Portugal	Currently, consumers of more than 20 GWh per year (89 industrial consumers and 25 percent of the market) are eligible to choose their own electricity supplier. In 2001, this threshold will drop to 9 GWh per year, allowing 189 industrial consumers to choose their own supplier.	Generation capacity remains concentrated, with EdP accounting for 72 percent of production.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market. Portugal is expected to establish a centralized pool market by the end of 2000.
Spain	Fifty-five percent of the Spanish market, including all industrial customers, were eligible to choose their own electricity supplier by July 1, 2000. All customers will be granted eligibility by January 1, 2003.	The Spanish electricity market is dominated by four firms: Endesa, Iberdrola, Union Fenosa, and Hidrocantabrico. Each of these companies is privately-owned.	Producers, retail suppliers, and eligible consumers can trade electricity through an informal bilateral contract market or through the centralized electricity pool.
Sweden	All consumers may choose their retail supplier.	Generation is open to competition, but the market is concentrated. The top three firms produce 85 percent of Sweden's power. Construction of new generation capacity is subject to an authorization procedure.	Sweden is a member of Nord Pool with Finland, Norway, and Western Denmark. Nord Pool is a voluntary pool that contains a spot and futures market. Electricity can also be traded through an informal bilateral contract market.

**Table 20-2--Continued**  
**Summary of competitive market factors**

<b>Country</b>	<b>Level and Extent of Consumer Choice</b>	<b>Extent of Competition in Generation</b>	<b>Development of a Trading Market</b>
United Kingdom	All consumers may choose their suppliers in England, Wales, and Scotland. In Northern Ireland, consumers of at least 2.5 GWh, accounting for 30 percent of consumers, are allowed to choose their supplier.	Generation is open to competition, and half of the generation capacity in the UK has been introduced since 1989. In Scotland, the generation market continues to be dominated by Scottish Power and Scottish Hydro. In Northern Ireland, the small size of the market and the lack of connection to Scotland or England/Wales deters new generators from entering the market.	In England and Wales, most producers and suppliers must trade through the mandatory spot market or pool. Pending legislation likely will transform the mandatory pool into a voluntary pool and permit trading of bilateral contracts. Scottish generators also participate in the England/Wales Pool. In Northern Ireland, Northern Ireland Electric serves as a single buyer, purchasing all electric power from competing generators and selling to retail suppliers at a uniform price.

Source: Compiled by the Commission.

## **Level and Extent of Consumer Choice**

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New Zealand, Finland, Germany, Sweden, and the United Kingdom<sup>2</sup> permit all consumers to choose their electricity supplier, and Australia, Denmark, Ireland, and Spain plan to extend choice to all consumers in the near future. The degree of consumer choice in other subject countries typically is based on consumption thresholds which range from 50 KWh per year in Argentina to 100 GWh per year in Belgium and Luxembourg. Customers who meet these minimum energy-use thresholds may choose their electricity supplier. Currently, Brazil, Greece, and Venezuela do not permit any electricity consumers to choose their supplier, but each of these countries plans to extend consumer choice to a portion of electricity customers in the near future.

## **Extent of Competition in Generation**

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In most of the subject countries, the extent of competition in generation remains small. For example, in one-third of the subject countries, a single firm continues to account for more than 50 percent of national electricity production.<sup>3</sup> In several other countries, electricity markets are not intensely competitive because a small number of entities dominate the market, or because industry incumbents exercise regional market power. Market opening has not succeeded in attracting new entrants in many subject countries due to the market power of industry incumbents, which places potential competitors at a disadvantage, and due to the small size of some of these markets, which reduces incentives to invest in new capacity.

## **Electric Power Trading**

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The level of opportunity facing new market entrants is also influenced by the size of the trading market for electricity, and by the trading options available to customers and suppliers. In most subject countries, trading markets do not extend beyond national borders. The only regional market operating in the subject countries is Nord Pool, which comprises market participants from Denmark, Finland, and Sweden, as well as Norway. Over two-thirds of the subject countries permit, or will soon permit, eligible consumers and suppliers to buy and sell electricity through bilateral contracts or an electricity pool. In addition, a majority of subject countries have a spot market for electricity, and five of these countries have established, or will establish, an electricity futures market. Thus, although trading markets in many of the subject

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<sup>2</sup> All consumers in England, Scotland, and Wales may choose suppliers. In Northern Ireland, only consumers of at least 2.5 GWh may choose their suppliers.

<sup>3</sup> Most of these eight countries do not plan to require horizontal restructuring in the generation segment. However, Italy will not permit any entity to produce or supply more than 50 percent of the country's electricity after January 2003. This will force its dominant producer, Enel, to sell some of its generation capacity. In addition, Brazil plans to split up government-owned generation companies in the privatization process.

countries remain limited in size, most subject countries grant certain market participants some degree of choice regarding how electricity is bought and sold.

## **Remaining Impediments to Competition**

A common theme in regulatory reform programs is the importance of fostering favorable conditions for the development of competition. The subject countries have made considerable progress toward this objective by crafting a range of policies to address issues like ease of establishment or market entry, interconnection, regulatory practices, market power, wholesale market development, and treatment of foreign firms.

To a large extent, these policy measures have been effective. However, problems persist, principally in creating equivalent competitive opportunities for all market participants. In many countries, there are a small number of incumbent generating firms, and these firms control the market to such an extent that new entrants find it difficult to compete. In Germany, recent industry consolidation may have exacerbated this problem.<sup>4</sup> In Japan, the situation is compounded by the difficulty of building new power plants due to limited access to natural gas supplies and strict environmental regulations.<sup>5</sup> Seven of the countries in this study<sup>6</sup> have generation markets that are dominated by a small number of large firms. Even in countries with less sectoral concentration, unique aspects of the electric power industry make the risk of abusive market power a persistent problem. For example, transmission constraints or characteristics of available generation facilities may enable a single firm to influence the market price.

Providing for equal access to transmission and distribution systems also presents a major problem. In all of the subject countries, the transmission and distribution segments of the industry have remained monopolies. A few of the transmission and distribution companies have been privatized, but most remain state-owned. In at least three cases,<sup>7</sup> vertically integrated, incumbent utility firms also act as system operators. The issue for new entrants, then, has been more one of gaining equal access to the transmission and distribution grids, than of competing in the segment itself. Several country studies in this report<sup>8</sup> have highlighted two types of problems with access to the transmission grid: unreasonably high access charges and discriminatory scheduling of load dispatch, particularly at peak load times. Either of these problems can seriously impact the ability of new entrants to compete with incumbent utilities.

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<sup>4</sup> Industry representative, interview by USITC staff, Brussels, Belgium, June 20, 2000.

<sup>5</sup> Industry representatives, interviews by USITC staff, Tokyo, Japan, June 6, 2000.

<sup>6</sup> Chile, Finland, France, Germany, Japan, Spain, and Sweden.

<sup>7</sup> France, Germany, and Japan

<sup>8</sup> Chile, Japan, France, Italy, and Spain

Countries have tried to develop appropriate, competitive safeguards to ensure that new entrants have the opportunity to compete in their markets. Such safeguards include policies to prevent firms from engaging in cross subsidization, using information obtained from competitors with anti-competitive results, or withholding timely information regarding commercially relevant facilities such as transmission and distribution networks. Additional safeguards are designed to ensure that all market participants receive non-discriminatory access to transmission and distribution networks in a timely fashion and at rates that are reasonable and transparent. However, as one industry representative pointed out concerning the liberalization process in general, “There are any number of diversions, foot dragging tactics, detours, exceptions and other ways of mitigating open and liberalized access policies which make liberalization in fact non-existent or at least severely limited.”<sup>9</sup> These difficulties can be compounded in the absence of a strong regulatory authority completely separate from, and not accountable to, any provider of electricity services or any government bodies responsible for making policy concerning the electricity sector. In several of the countries studied,<sup>10</sup> observers have voiced concerns that close ties between the regulator and incumbent utilities tend to favor the incumbents. In Germany and Japan, the regulatory agencies are not independent from other policy-making agencies.

A significant problem for new entrants in generation markets is access to natural gas supplies. As noted in Chapter 2, natural gas has become a preferred fuel choice for electric power plants in recent years, so lack of access to gas supplies can be a serious impediment to entry into the generation market. Like the electricity market, the natural gas market in many countries traditionally has been controlled by a monopoly supplier, which may or may not also be in the process of reform. In at least five of the countries in this study,<sup>11</sup> new entrant generation firms have had difficulty securing access to natural gas supplies, or have been unable to do so at competitive prices. This type of interaction between the electricity and the gas markets suggests that regulatory reform programs may need to encompass the broader energy sector, rather than the electricity or gas segments alone.

Foreign firms interested in participating in the electric power sector may also be subject to various economy-wide measures that could impede market access. Such measures could include limitations on foreign investment, investment approval or screening procedures, nationality requirements for directors, or restrictions on the purchase of real estate. Among the subject countries, investment measures tend to be general safeguard policies that do not specifically target any particular industry and, thus far, they have not been reported as a significant impediment to the activities of foreign firms. Appendix C presents a listing of general measures maintained by the subject countries that may affect market access conditions in the electric power sector.

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<sup>9</sup> Steven Kean, Enron International, testimony before the Commission, June 6, 2000.

<sup>10</sup> Argentina, Germany, Japan, Spain, and the United Kingdom

<sup>11</sup> Argentina, Denmark, France, Japan, and Spain.

# CHAPTER 21

## INTERNATIONAL TRADE

### IMPLICATIONS

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Regulatory reform programs are more a matter of domestic rather than international policy. However, in the case of the electric power industry, there appear to be some international implications. For example, this report documents how regulatory reform has resulted in new opportunities for firms to compete to build, own, and operate generation, transmission, and distribution facilities, as well as to establish power trading and marketing enterprises around the world. These opportunities often result in international trade, both on a cross-border basis and through foreign-based commercial establishments. Thus regulatory reform programs have the potential to influence international trade flows, and international trade and investment practices may similarly have bearing on regulatory reform.

Regulatory reform of the electric power sector has also created a greater need for international cooperation among governments, particularly concerning the development of a competitive market for trading electric power and related financial instruments.<sup>1</sup> In a competitive market for electric power, prices are determined through the interaction of producers, consumers, and various trading and marketing intermediaries. The lowest prices are likely to be achieved when consumers have the broadest possible array of choices among electric power suppliers and financial intermediaries. In larger markets where there are more participants, there likely will be more choices available, leading to more intense competition and lower consumer prices. This in turn creates an incentive to expand market size beyond the boundaries of a particular country, as evidenced by the European Union's single market initiative, NordPool, and regional interconnection efforts underway in South and Central America. Such initiatives require the negotiation of rules governing international trade in electric power and related physical and financial contracts.

Another aspect of international coordination concerns fairness issues that may arise when reforms are implemented unevenly. For example, by virtue of its government support and the relatively slow pace of reform in its home country, Electricité de France has considerably greater opportunities to market power to consumers in Germany, Italy, Spain, and the United Kingdom, than do competing European firms in France.<sup>2</sup> To some extent, the EU Electricity Directive anticipated problems with the uneven pace of implementation by including a provision that permits countries that have exceeded certain liberalization targets to refuse market access to firms from countries that have failed to achieve those targets. In response, many European governments included provisions in their implementing legislation to allow them to

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<sup>1</sup> Industry representatives, interview by USITC staff, Houston, Texas, Apr. 13, 2000.

<sup>2</sup> Industry representatives, interview by USITC staff, London, United Kingdom, June 12, 2000; and Brussels, Belgium, June 20, 2000.

foreclose market access from firms headquartered in countries that do not offer comparable market access conditions.<sup>3</sup> However, the Directive does not contain a mechanism for determining the actual level of compliance, and therefore has little practical effect. It therefore remains possible for slow-reforming countries to meet the letter but not the spirit of the reform program.<sup>4</sup>

A final international aspect of regulatory reform involves the importance of foreign investment. Despite technological advances that have decreased minimum efficient scale, the electric power industry remains relatively capital intensive. The establishment or acquisition of generation and distribution facilities requires significant investment capital, at times amounting to billions of dollars per investment. The total investment required to meet estimated worldwide electricity demand through 2020 is estimated at \$3.3 trillion (1990 dollars), most of which will need to be derived from the private sector.<sup>5</sup> However, in many countries there are relatively few private firms with the necessary investment capital and technical expertise to make such investments. These countries must turn to foreign investors. But countries with uncertain economic, political, and regulatory environments pose a risk and may therefore have difficulty attracting investment. For such countries, coordinating regulatory policy internationally may foster domestic stability that in turn could create a more favorable investment climate.

The foregoing discussion illustrates that governments may have an incentive to coordinate policies concerning the electric power industry. Such coordination could support growth in international trade in services, facilitate regional initiatives to

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<sup>3</sup> Countries that have invoked the Directive's reciprocity clause include Austria, Belgium, Denmark, Germany, Greece, Ireland, Netherlands, Portugal, Spain, Sweden, and Norway. Romesh Vaitilingam, ed., *A European Market for Electricity: Monitoring European Deregulation 2*, Centre for Economic Policy Research, (London) Oct. 1999, pp. 82-84.

<sup>4</sup> One industry representative called for the development of a mechanism that would establish "clear percentage milestones for the market share served by competitive providers ... to reflect how much of the market is served by competitors rather than incumbents in order to determine whether policies on paper are leading to choice in fact." The governments of the United Kingdom and the Netherlands appear to share this view, as they jointly commissioned a study from Oxford Economic Research Associates (OXERA) to develop a set of indicators for monitoring the development of competition in the gas and electricity markets across Europe. These governments believe that such a monitoring tool could be used to identify areas where competition is less effective and further policy consideration may be needed. However, quantitative market-share objectives have a complicated history in international relations, as noted by representatives of the National Electrical Manufacturers Association (NEMA). NEMA suggests that, while some governments may have an incentive to negotiate quantitative targets, a better result may be achieved by allowing market-opening commitments to take a variety of forms. Steven Kean, Enron International, testimony before the Commission, June 6, 2000; OXERA, "Energy Liberalization Indicators in Europe," preliminary report, June 5/6, 2000, p. 3; and John Meakem, National Electrical Manufacturer's Association (NEMA), post-hearing letter to the Chairman, July 18, 2000.

<sup>5</sup> International Energy Agency, *Electricity Reform: Power Generation Costs and Investment*, (Paris, France, 1999.) p. 84, as cited in post-hearing statement by Donna J. Bobbish, Vinson & Elkins L.L.P., June 29, 2000.

achieve market efficiencies, provide a means of ensuring equitable access to competitive opportunities, and encourage direct investment from abroad. While policy coordination of this nature is already taking place on a regional basis, multilateral coordination may offer an additional means of pursuing these objectives. U.S. industry representatives support this view, arguing that multilateral negotiations presently taking place within the World Trade Organization are an appropriate vehicle to foster competition and international trade in energy services and thereby contribute significantly to economic and social development.<sup>6</sup>

## **WTO Negotiations on Trade in Services**

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Multilateral negotiations presently underway in the World Trade Organization are intended to widen and deepen the scope of the General Agreement on Trade in Services (GATS), an agreement signed by all 136 members of the WTO which entered into effect on January 1, 1995. In broad terms, the GATS provides a set of principles or rules designed to remove impediments to trade and investment in services along with a binding dispute settlement process. These principles apply to the provision of services both on a cross-border basis and through the establishment of a commercial presence. Depending upon how the electric power industry is defined,<sup>7</sup> the GATS may have bearing on the provision of generation, transmission, distribution, retail supply, and trading services provided from one country to another or provided by a locally-established enterprise that is owned or controlled by a foreign firm.

There are many similarities between the common regulatory objectives being pursued by the subject countries and the trade principles contained in the GATS. Competition is the key element of reform, as market forces drive firms to pursue gains in efficiency and service quality. But introducing competition into a previously monopolistic industry can be difficult, as incumbent service providers retain many advantages. For this reason, regulatory reforms tend to be oriented toward encouraging the entry of new competitors by ensuring effective market access and equivalent competitive opportunities. GATS principles are similarly oriented toward enhancing competitive

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<sup>6</sup> Rachel Thompson, "Integrating Energy Services into the World Trading System," Washington, DC, Apr. 10, 2000, p. 1.

<sup>7</sup> The scope of the industry definition adopted under the GATS has yet to be determined. The central question concerns whether electric power generation constitutes a service or a manufacturing process. On the one hand, electric power is an intangible force that must be produced as it is consumed. These are characteristics of a service. Alternatively, a power plant "materially transforms" energy stored in various fuel sources into electrical energy. Such material transformation is characteristic of a manufacturing process. Should WTO members choose to define generation as a manufacturing process, then foreign firms that seek to own or acquire power generation facilities will have no rights or privileges under the GATS. In the United States, generation activities represent 74 percent of the cost of providing electricity and 55 percent of investment in facilities. For the purpose of this study, as requested by USTR, power generation is considered to be a service. Industry and government representatives, interviews by USITC staff, Washington, DC, June 2000; and Energy Information Administration, *Financial Statistics of Major Investor-owned Utilities 1996*, DOE/EIA-0437(96/1), Dec. 1997.

opportunities by eliminating barriers to market access and policies that unnecessarily discriminate against selected service providers. Specific GATS provisions that appear to be particularly relevant in this context include those addressing market access, nondiscrimination, transparency, domestic regulation, and monopolies (table 21-1).

Table 21-2 provides a closer look at a more detailed list of policy objectives among the regulatory reform programs, and their compatibility with GATS principles. For example, market reform objectives concerning equal treatment of bidders participating in privatization programs appear to be compatible with GATS market access and nondiscrimination principles. Similarly, reform objectives in connection with privatization programs, interconnection policies, and general rule-making procedures appear to be compatible with the GATS transparency principle; and reform objectives of preventing cross-subsidization and the misuse of information advantages appear to be compatible with GATS rules on monopolies and exclusive suppliers. It appears that additional reform objectives that pertain to elements unique to the electricity industry could be addressed under Article XVIII. WTO members employed Article XVIII during negotiations on basic telecommunications when it became clear that the general principles of market access and national treatment did not fully address important aspects, like interconnection issues, necessary for new market entrants to have effective market access. Reform objectives listed under “Other” in table 21-2 were selected because they may not be fully captured by the general GATS principles. Examples of these objectives include ensuring that market concentration does not limit competition and thereby impede market access, and various specific objectives concerning interconnection, stranded costs, and universal service requirements, among others.

The compatibility of regulatory reform objectives with GATS principles suggests that the GATS could serve as a tool to support regulatory reform efforts by providing a venue for pursuing international coordination and by affording a means of resolving international disputes. By supporting regulatory reform, the GATS could further support continued growth in international trade and investment in services.

## **Conclusion**

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The findings in this report document a clear trend toward regulatory reform of the electric power sector. The countries examined here appear to be leading this trend, and the policy reforms undertaken bear a striking similarity to each other in terms of objectives and approaches. The list of countries pursuing regulatory reform appears to be growing quickly, to include much of Latin America, Asian nations such as the Philippines, Korea, and India, and several Eastern European countries. Early results indicate that significant rate reductions, particularly at the wholesale and large consumer level, can accompany regulatory reform.

While regulatory reform must take place within individual countries, international coordination of regulatory policies concerning the electric power industry could support growth in international trade in services, facilitate regional initiatives to achieve market efficiencies, provide a means of ensuring equitable access to competitive opportunities, and encourage direct investment from abroad. The General

Agreement on Trade in Services may offer a vehicle for pursuing such policy coordination, as the objectives of regulatory reform are generally compatible with the principles contained in the agreement.

**Table 21-1**  
**Selected GATS Provisions**

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<b>Market Access</b>	<p>The GATS market access principle, contained in Article XVI, establishes the objective of progressively eliminating a set of six specific types of limitations to market access. These are:</p> <ul style="list-style-type: none"><li>a) limitations on the number of service suppliers whether in the form of numerical quotas, monopolies, exclusive service suppliers or the requirements of an economic needs test;</li><li>b) limitations on the total value of service transactions or assets in the form of numerical quotas or the requirement of an economic needs test;</li><li>c) limitations on the total number of service operations or on the total quantity of service output expressed in terms of designated numerical units in the form of quotas or the requirement of an economic needs test;</li><li>d) limitations on the total number of natural persons that may be employed in a particular service sector or that a service supplier may employ and who are necessary for, and directly related to, the supply of a specific service in the form of numerical quotas or the requirement of an economic needs test;</li><li>e) measures which restrict or require specific types of legal entity or joint venture through which a service supplier may supply a service; and</li><li>f) limitations on the participation of foreign capital in terms of maximum percentage limit on foreign share-holding or the total value of individual or aggregate foreign investment.</li></ul>
<b>Nondiscrimination</b>	<p>The GATS principles concerning nondiscrimination are contained in Articles II and XVII. Article II provides for most-favored-nation treatment (MFN), through which WTO members commit to accord to services and service suppliers of any other member treatment no less favorable than that accorded to like services and service suppliers of any other country. Members must adhere to MFN principles except in those areas in which they have listed exemptions. Article XVII provides for national treatment, which is described as treatment no less favorable than that accorded to domestic services and service suppliers. National treatment applies to the extent a member has committed to it on its schedule of specific commitments.</p>
<b>Transparency</b>	<p>GATS transparency obligations are contained in Article III, which requires:</p> <ul style="list-style-type: none"><li>▶ Prompt publication of relevant measures of general application</li><li>▶ Notification to the WTO of significant changes in laws, regulations, or administrative guidelines with significant bearing on services trade</li><li>▶ Establishment of enquiry points for use by other WTO members</li><li>▶ Prompt responses to information requests from other WTO members</li></ul>
<b>Domestic Regulation</b>	<p>GATS domestic regulation obligations, as contained in Article VI, require WTO members to:</p> <ul style="list-style-type: none"><li>▶ Avoid using regulatory powers in such a way as to create services trade barriers</li><li>▶ Ensure that measures of general application are administered in a reasonable, objective, and impartial manner</li><li>▶ For sectors in which specific commitments are undertaken regarding market access or national treatment, ensure that licensing and qualification requirements or technical standards (1) are based on objective and transparent criteria, (2) are not more burdensome than necessary, and (3) in the case of licensing procedures, are not in themselves a restriction on the supply of the service.</li></ul>

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**Table 21-1--Continued**  
**Selected GATS Provisions**

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**Monopolies and  
Exclusive Suppliers**

Article VIII of the GATS asserts that WTO members should ensure that, in cases where a monopoly supplier competes in supplying a service outside the scope of its monopoly rights, such a supplier does not abuse its monopoly position in a manner that limits market access or national treatment.

**Additional  
Commitments**

Under Article XVIII, the GATS also provides for the negotiation of additional commitments to address measures affecting trade in services that are not covered by the market access and national treatment provisions. Negotiation of such commitments strengthened the WTO Agreement on Basic Telecommunications by ensuring that market access commitments would not be undercut by anticompetitive practices. These additional commitments required signatories to:

- ▶ prevent cross-subsidization and misuse of bid information,
  - ▶ implement interconnection rules that favor competition,
  - ▶ maintain non-discrimination and transparency in the implementation of universal service obligations,
  - ▶ implement policies to ensure the transparency or public availability of licensing criteria,
  - ▶ maintain the independence of regulators from any market competitors,
  - ▶ ensure non-discrimination in the allocation of scarce resources such as band width.
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Source: World Trade Organization, *General Agreement on Trade in Services*.

**Table 21-2  
Comparison of market reform objectives with GATS principles**

Market Reform Objectives	Market Access	National treatment	MFN Treatment	Transparency	Domestic Regulation	Monopolies and exclusive suppliers	Other
<b>Privatization</b>							
Ensure that:							
All potential bidders may participate on equal terms	X	X	X				
All necessary information is publicly available				X			
The privatization process is unbiased					X		
<b>Restructuring of Management Control</b>							
Ensure that:							
Entry and exit for all competitive sectors is not impeded by regulatory or market barriers	X	X					
Cross-subsidization does not take place						X	
No firms have an information advantage					X	X	
Market concentration does not limit competition							X
<b>Regulatory reform</b>							
Ensure that:							
Access and interconnection to existing energy facilities and networks is open, based on objective criteria (including technical standards and specifications), and not unduly burdensome to obtain					X		X
Interconnection to the transmission grid is provided in a timely fashion, on terms, conditions (including technical standards and specifications) and cost-oriented rates that are transparent, reasonable, having regard to economic feasibility, and sufficiently unbundled so that the supplier need not pay for network components or facilities that it does not require to provide service					X		X
Transmission constraints do not distort competition by limiting access to power produced in other domestic regions							X
International cross-border transmission may take place where economically feasible		X	X				X

**Table 21-2--Continued**  
**Comparison of market reform objectives with GATS principles**

Market Reform Objectives	Market Access	National treatment	MFN Treatment	Transparency	Domestic Regulation	Monopolies and exclusive suppliers	Other
<b>Regulatory reform--Continued</b>							
Procedures applicable for interconnection to the transmission grid as well as interconnection agreements themselves are publicly available				X	X		
Timely recourse is available to a body that will resolve disputes regarding the terms, conditions, and rates of interconnection							X
Allocation and use of rights of way (e.g., land on which to build transmission and distribution lines) is carried out in an objective, timely, transparent, and non-discriminatory manner				X			X
Rule-making and implementation are conducted in a transparent manner				X			
Regulatory authorities are independent and objective					X		X
Provisions are in place for providing information on the reasons for denial of licenses				X			X
Terms and conditions of licensing and licensing criteria are publicly available				X	X		X
Authorization, licensing, or permitting procedures are not unnecessarily lengthy, burdensome, or subject to arbitrary criteria					X		
Stranded cost provisions are administered in a transparent, nondiscriminatory, and competitively neutral manner				X			X
Competition is not adversely impacted by government subsidies, such as those that encourage coal production, nuclear power, renewable energy or combined cycle technology					X		X
Electricity and fuel taxes that vary within the region or relative to neighboring regions do not disadvantage individual firms		X	X		X		X
Universal service requirements are administered in a transparent, non-discriminatory and competitively neutral manner, and in a manner no more burdensome than necessary for the kind of universal service required by the government		X	X	X	X		X

**Table 21-2--Continued**  
**Comparison of market reform objectives with GATS principles**

Market Reform Objectives	Market Access	National treatment	MFN Treatment	Transparency	Domestic Regulation	Monopolies and exclusive suppliers	Other
<b>Regulatory reform--Continued</b>							
Environmental policies are administered in a transparent, non-discriminatory and competitively neutral manner, and in a manner no more burdensome than necessary		X	X	X	X		X
Interrelationship with other industries, such as natural gas supply, does not distort or impede competition							X
<b>Additional international objectives</b>							
Ensure that competitive opportunities are not foreclosed by:							
Foreign investment approval, screening, or registration procedures, such as case-by-case approval or economic needs tests	X	X	X				
Foreign equity ownership limitations	X	X	X				
Limitations on cross-border trading in electric power brokerage and related services	X	X	X				
Reciprocity provisions		X	X				
Limitations on foreign acquisition of existing businesses	X	X	X				
Limitations on the scope of foreign business to specified activities that are narrower than local firms	X	X	X				
Discriminatory personnel requirements imposed on foreign firms (such as a certain percentage of domestic employees, the CEO must be a national or citizen, or a percentage of the board must be residents)	X	X	X				
Limitations on long-term leasing or ownership of land by foreigners for commercial development		X	X				X
Special requirements on the legal form of establishment for foreign companies (such as joint-ventures)	X	X	X				

Source: Compiled by the Commission.

# **Appendix A**

## **Request Letter**



EXECUTIVE OFFICE OF THE PRESIDENT  
THE UNITED STATES TRADE REPRESENTATIVE  
WASHINGTON, D.C. 20508

NOV 22 1999

DOCKET

The Honorable Lynn M. Bragg  
Chairman  
U.S. International Trade Commission  
500 E Street, SW  
Washington, DC 20436

2102

Office of the  
Secretary  
U.S. Trade Commission

Dear Chairman Bragg:

As you are aware, Article XIX of the General Agreement on Trade in Services (GATS) requires that members of the World Trade Organization enter into successive rounds of negotiations with a view to achieving a progressively higher level of liberalization. Specifically, these negotiations are intended to reduce or eliminate the adverse effects on trade in services of measures that limit effective market access. Such negotiations are scheduled to resume in January 2000.

One sector in which the liberalization could have a large beneficial impact on the global economy is the energy sector, principally including the electricity and natural gas industries. The global market for electricity, for instance, is twice as large as the global market for telecommunication services. Like the telecommunication services industry, the electricity industry is in many countries evolving from a monopolistic industry of large vertically integrated firms into a competitive industry with increasing numbers and types of participants, especially independent power producers that will compete with former electricity monopolies to sell electricity into the energy market and independent system operators that will control the terms and conditions of access to national power grids. Simultaneously, multiple new regulatory regimes, broadly intended to balance the efficient operation of the electricity industry with consumer welfare, are being devised and implemented. Consequently, regulatory measures that significantly influence U.S. firms' market access and competitive position are changing in significant ways.

In this regard, a series of concise reports on energy markets is of interest to my office. I believe that a careful examination of these markets is a task that is most appropriately performed by the U.S. International Trade Commission, which has demonstrated expertise in services and the GATS in several investigations requested by this office in recent years. To initiate this series of reports, I request, pursuant to authority delegated by the President under section 332(g) of the Tariff Act of 1930, that the U.S. International Trade Commission conduct an investigation that (1) discusses the nature and extent of market reform, privatization, and liberalization undertaken in foreign electricity markets; (2) examines current and evolving conditions of market access, investment, and regulation; and (3) and provides, if possible, a listing of common regulatory practices insofar as these exist. I urge the Commission to define the electricity industry in the broadest terms, including core areas such as generation, transmission, and distribution; and construction, engineering, consulting, and marketing services as they pertain to the provision of electricity. The Commission's report should examine electricity markets in Argentina, Chile, Brazil, Venezuela, Canada, the European Union, Australia, New Zealand, and Japan, where significant market reform, privatization, and liberalization has occurred or is ongoing.

The Honorable Lynn M. Bragg  
Page Two

The Commission is requested to deliver this report no later than twelve months from receipt of this letter. This office intends to make the Commission's report available to the general public in its entirety. Therefore, the report should not contain any confidential business or national security classified information

Upon completion of this initial report, it is the intent of this office to make similar requests of the Commission with respect to other energy markets, including the natural gas market.

The Commission's assistance in this matter is greatly appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read "Charlene Barshefsky", written in a cursive style.

Charlene Barshefsky

**Appendix B**  
***Federal Register* Notice**



subheading 2925.20.90 of the Harmonized Tariff Schedule of the United States, that have been found by the Department of Commerce to be sold in the United States at less than fair value (LTFV).<sup>2</sup> The Commission made a negative determination concerning critical circumstances.

### Background

The Commission instituted this investigation effective February 12, 1999, following receipt of a petition filed with the Commission and the Department of Commerce by Pfanstiehl Laboratories, Inc., Waukegan, IL. The final phase of the investigation was scheduled by the Commission following notification of a preliminary determination by the Department of Commerce that imports of creatine monohydrate from China were being sold at LTFV within the meaning of section 733(b) of the Act (19 U.S.C. § 1673b(b)). Notice of the scheduling of the Commission's investigation and of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the **Federal Register** of August 19, 1999 (64 FR 45275). The hearing was held in Washington, DC, on December 16, 1999, and all persons who requested the opportunity were permitted to appear in person or by counsel.

The Commission transmitted its determination in this investigation to the Secretary of Commerce on January 28, 2000. The views of the Commission are contained in USITC Publication 3272 (January, 2000), entitled *Creatine Monohydrate from China* (Investigation No. 731-TA-814 (Final)).

By order of the Commission.

Issued: January 28, 2000.

**Donna R. Koehnke,**

*Secretary.*

[FR Doc. 00-2331 Filed 2-2-00; 8:45 am]

BILLING CODE 7020-01-P

## INTERNATIONAL TRADE COMMISSION

[Investigation 332-411]

### Electric Power Services: Recent Reforms in Selected Foreign Markets

**AGENCY:** United States International Trade Commission.

**ACTION:** Institution of investigation and scheduling of public hearing.

**EFFECTIVE DATE:** January 24, 2000.

**SUMMARY:** Following receipt of a request on November 23, 1999, from the United States Trade Representative (USTR), the Commission instituted investigation No. 332-411, *Electric Power Services: Recent Reforms in Selected Foreign Markets*, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)).

### FOR FURTHER INFORMATION CONTACT:

Information specific to this investigation may be obtained from Mr. Christopher Melly, Project Leader (202-205-3461), Mr. Michael Nunes, Deputy Project Leader (202-205-3462), or Mr. Richard Brown, Chief, Services and Investment Division (202-205-3438), Office of Industries, U.S. International Trade Commission, Washington, DC, 20436. For information on the legal aspects of this investigation, contact William Gearhart of the Office of the General Counsel (202-205-3091). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202) 205-1810.

### Background

In her letter dated November 22, 1999, the USTR requested that the Commission, pursuant to section 332(g) of the Tariff Act of 1930, conduct an investigation of the electric power services markets in countries where significant market reform, privatization, and liberalization has occurred or is ongoing. The foreign markets to be examined are: Argentina, Australia, Brazil, Canada, Chile, the European Union, Japan, New Zealand, and Venezuela. As requested, in its report, the Commission will (1) discuss the nature and extent of market reform, privatization, and liberalization undertaken in foreign electricity markets; (2) examine current and evolving conditions of market access, investment, and regulation; and (3) provide, if possible, a listing of common regulatory practices insofar as these exist. For the purpose of this study, electric power services are broadly defined to include core areas such as generation, transmission, and distribution, as well as construction, engineering, consulting, and marketing services as they pertain to the provision of electricity.

The USTR asked that the Commission furnish its report by November 22, 2000, and that the Commission make the report available to the public in its entirety.

### Public Hearing

A public hearing in connection with the investigation will be held at the U.S.

International Trade Commission Building, 500 E Street SW, Washington, DC, beginning at 9:30 a.m. on June 6, 2000. All persons shall have the right to appear, by counsel or in person, to present information and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street SW, Washington, DC 20436, no later than 5:15 p.m., May 23, 2000. Any prehearing briefs (original and 14 copies) should be filed not later than 5:15 p.m., May 25, 2000; the deadline for filing post-hearing briefs or statements is 5:15 p.m., June 29, 2000. In the event that, as of the close of business on May 23, 2000, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or non-participant may call the Secretary of the Commission (202-205-1806) after May 23, 2000, to determine whether the hearing will be held.

### Written Submissions

In lieu of or in addition to participating in the hearing, interested parties are invited to submit written statements (original and 14 copies) concerning the matters to be addressed by the Commission in its report on this investigation. Commercial or financial information that a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of section § 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available in the Office of the Secretary of the Commission for inspection by interested parties. To be assured of consideration by the Commission, written statements relating to the Commission's report should be submitted to the Commission at the earliest practical date and should be received no later than the close of business on June 29, 2000. All submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW, Washington, DC 20436. The Commission's rules do not authorize filing submissions with the Secretary by facsimile or electronic means.

Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the

<sup>2</sup> Commissioner Deanna Tanner Okun did not participate in this investigation.

Secretary at 202-205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>).

#### List of Subjects

WTO, GATS, market access, electric power.

Issued: January 24, 2000.

By order of the Commission.

**Donna R. Koehnke,**  
Secretary.

[FR Doc. 00-2324 Filed 2-2-00; 8:45 am]

BILLING CODE 7020-02-P

## INTERNATIONAL TRADE COMMISSION

[Inv. No. 337-TA-419]

### Certain Excimer Laser Systems for Vision Correction Surgery and Components Thereof and Methods for Performing Such Surgery; Notice of Decision To Extend the Deadline for Determining Whether To Review an Initial Determination Finding No Violation of Section 337 of the Tariff Act of 1930

**AGENCY:** U.S. International Trade Commission.

**ACTION:** Notice.

**SUMMARY:** Notice is hereby given that the U.S. International Trade Commission has determined to extend by three (3) business days, or until February 2, 2000, the deadline for determining whether to review an initial determination (ID) finding no violation of section 337 of the Tariff Act of 1930, as amended in the above-captioned investigation.

**FOR FURTHER INFORMATION CONTACT:** Timothy P. Monaghan, Esq., Office of the General Counsel, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone 202-205-3152. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>). Hearing-impaired persons are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202-205-1810.

**SUPPLEMENTARY INFORMATION:** This investigation was instituted on March 1, 1999, based on a complaint by VISX, Inc. ("VISX"), 64 FR 10016-17. The respondents named in the investigation are Nidek Co., Ltd., Nidek Inc., and Nidek Technologies, Inc. Complainant alleges importation and sale of certain excimer laser systems for vision correction surgery that infringe claims

of U.S. Letters Patent Nos. 4,718,418 and 5,711,762 ("the '762 patent"). An evidentiary hearing was held from August 18, 1999 to August 27, 1999.

On December 6, 1999, the presiding administrative law judge ("ALJ") issued her final ID finding that complainant VISX failed to establish the required domestic industry, that there was no infringement of any claim at issue, and that the '762 patent was invalid and unenforceable.

The authority for the Commission's determination is contained in section 337 of the Tariff Act of 1930, as amended (19 U.S.C. 1337), and in section 210.42(h)(2) of the Commission's Rules of Practice and Procedure (19 CFR 210.42(h)(2)).

Copies of the public version of the ALJ's ID and all other nonconfidential documents filed in connection with this investigation are or will be available for inspection during official business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary, U.S. International Trade Commission, 500 E Street, S.W., Washington, D.C. 20436, telephone 202-205-2000.

By order of the Commission.

Dated: Issued: January 28, 2000.

**Donna R. Koehnke,**  
Secretary.

[FR Doc. 00-2330 Filed 2-2-00; 8:45 am]

BILLING CODE 7020-02-P

## INTERNATIONAL TRADE COMMISSION

[Investigation No. 731-TA-718 (Review)]

### Glycine From China

**AGENCY:** United States International Trade Commission.

**ACTION:** Institution of a five-year review concerning the antidumping duty order on glycine from China.

**SUMMARY:** The Commission hereby gives notice that it has instituted a review pursuant to section 751(c) of the Tariff Act of 1930 (19 U.S.C. 1675(c)) (the Act) to determine whether revocation of the antidumping duty order on glycine from China would be likely to lead to continuation or recurrence of material injury. Pursuant to section 751(c)(2) of the Act, interested parties are requested to respond to this notice by submitting the information specified below to the Commission;<sup>1</sup> to be assured of

<sup>1</sup>No response to this request for information is required if a currently valid Office of Management and Budget (OMB) number is not displayed; the OMB number is 3117-0016/USITC No. 00-5-052, expiration date July 31, 2002. Public reporting burden for the request is estimated to average 7

consideration, the deadline for responses is March 22, 2000. Comments on the adequacy of responses may be filed with the Commission by April 17, 2000.

For further information concerning the conduct of this review and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A, D, E, and F (19 CFR part 207). The Rules may also be found on the Commission's World Wide Web site at <http://www.usitc.gov/rules.htm>.

**EFFECTIVE DATE:** February 3, 2000.

#### FOR FURTHER INFORMATION CONTACT:

Mary Messer (202-205-3193) or Vera Libeau (202-205-3176), Office of Investigations, U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202-205-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000. General information concerning the Commission may also be obtained by accessing its internet server (<http://www.usitc.gov>).

#### SUPPLEMENTARY INFORMATION:

#### Background

On March 29, 1995, the Department of Commerce issued an antidumping duty order on imports of glycine from China (60 FR 16116). The Commission is conducting a review to determine whether revocation of the order would be likely to lead to continuation or recurrence of material injury to the domestic industry within a reasonably foreseeable time. It will assess the adequacy of interested party responses to this notice of institution to determine whether to conduct a full review or an expedited review. The Commission's determination in any expedited review will be based on the facts available, which may include information provided in response to this notice.

#### Definitions

The following definitions apply to this review:

(1) *Subject Merchandise* is the class or kind of merchandise that is within the scope of the five-year review, as defined by the Department of Commerce.

hours per response. Please send comments regarding the accuracy of this burden estimate to the Office of Investigations, U.S. International Trade Commission, 500 E Street, SW, Washington, DC 20436.

**Appendix C**  
**Economy-wide Measures That May**  
**Impede Market Access**



Country	Description of limitation
Argentina	<ul style="list-style-type: none"> <li>Acquisition of land within 150 km of borders and 50 km from coastal areas may be limited.</li> </ul>
Australia	<ul style="list-style-type: none"> <li>Foreign investment is permitted subject to notification and examination under Australia's foreign investment policy guidelines and the Foreign Acquisitions and Takeovers Act 1975. Proposals are approved unless national interest considerations arise.</li> </ul>
Brazil	<ul style="list-style-type: none"> <li>All foreign capital invested in Brazil must be registered with the Central Bank of Brazil to be eligible for remittances. The Central Bank establishes procedures related to remittances and transfer of funds abroad.</li> <li>Foreign service suppliers must incorporate in Brazil with the appropriate Entities' Public Registry (EPR).</li> </ul>
Canada	<ul style="list-style-type: none"> <li>Approval is needed to obtain control of a Canadian firm with assets exceeding the limit set each January. The 1994 limit of \$C153 million is adjusted annually for changes in nominal Gross Domestic Product. Approval is dependent upon the expected effect of the investment on economic activity, productivity, efficiency, technological development, and product innovation and variety; the degree and significance of Canadian participation; compatibility of the investment with economic and cultural policies; and the expected contribution to Canada's worldwide competitiveness.</li> <li>Establishment or acquisition of firms related to Canada's culture are subject to approval. Included are the production and sale of film or video recordings, audio or video music recordings, radio communication, television, cable broadcasting, and the publication, distribution, or sale of print media.</li> <li>Foreign ownership may be limited, and nationality requirements for senior management may be specified for service firms being privatized. Foreign supply may be limited in areas such as social security, public health, and welfare.</li> <li>Over 50 percent of directors of federally incorporated firms must be Canadian citizens or residents. Aboriginal persons may be given preferential treatment in the acquisition, establishment, or operation of any commercial enterprise.</li> <li>Alberta: At least 50 percent of firm's directors must be legal Canadian residents. An Alberta resident attorney must file documents for non-Alberta firms. Alberta Opportunity Fund gives preference to Canadian-owned firms. Service firms within Alberta or Canada may be given preference when competitive in large-scale energy projects needing industrial development, forest management, oil sands, power plant or gas plant and coal development permits. Foreign purchases of Crown land and non-urban real estate may be limited.</li> <li>British Columbia: Over 50 percent of firm's directors must be Canadian residents, and one director must be a British Columbia resident. Only Canadian citizens or permanent residents are eligible for grants of Crown land.</li> <li>Manitoba: Over 50 percent of directors must be Canadian residents. Non-residents are subject to restrictions when purchasing more than 10 acres of farm land, and to a tax on transfers of farm land.</li> <li>Newfoundland and Labrador: Over 50 percent of directors must be Canadian residents. Co-operatives must have at least five Canadian residents. Non-resident firms must use local attorneys.</li> <li>Ontario: Over 50 percent of corporate and co-operative directors, and of a quorum must be Canadian residents. Small business development corporation investments are not available to foreign firms.</li> <li>Prince Edward Island: Out-of-Province residents need approval to acquire over 5 acres of land, or over 165 feet of shore frontage. Only Provincial residents can receive property tax rebates on non-commercial property.</li> <li>Quebec: Provincial residents receive preference in purchasing or leasing public land. Additional taxes are levied on land transfers to non-residents.</li> <li>Saskatchewan: Over 50 percent of firm's directors must be Canadian residents, and at least one director must be resident of Province of incorporation. Foreign entities limited to purchases of 10 acres of Crown land.</li> </ul>

<b>Country</b>	<b>Description of limitation</b>
Chile	<ul style="list-style-type: none"> <li>• Authorization to deliver services through a commercial presence may take into account the contribution of the commercial presence to Chile's integration into the world market, and the effects of commercial presence on: <ul style="list-style-type: none"> <li>a) economic activity, including the effect on employment, on the use of parts, components and services produced in Chile and on exports of services;</li> <li>b) productivity, industrial efficiency, technological development and product innovation in Chile;</li> <li>c) competition in the sector and other sectors, on consumer protection, on the smooth functions, integrity and stability of the market, and on the national interest.</li> </ul> </li> <li>• Acquisition of land within 10 km of the frontier and 5 km from the coast and Arica province may be restricted.</li> </ul>
European Union (EU)	<ul style="list-style-type: none"> <li>• Subsidiaries of third-country companies must have their registered office, central administration, or principal place of business in the European Union. Others may be granted treatment equivalent to that accorded in the other EU member state, unless prohibited by law. Less favorable treatment may be given to subsidiaries with only their registered offices in the European Union, unless the company shows an effective and continuous link with one of the EU member states.</li> </ul>
<i>Austria</i>	<ul style="list-style-type: none"> <li>• Treatment accorded to subsidiaries of third-country companies, legally formed and established in one European Economic Area (EEA) member state, may not be accorded to branches and agencies of that company in other EEA member states. EEA members include members of both the European Union and the European Free Trade Area.</li> <li>• Branches of foreign joint stock companies and limited liability companies must have approval from the appropriate Federal authority. Approval is subject to the discretion of that authority.</li> <li>• Foreign acquisitions of real estate must have approval from regional authorities.</li> </ul>
<i>Denmark</i>	<ul style="list-style-type: none"> <li>• Limitations exist on purchase of real estate and agricultural land by foreign entities.</li> </ul>
<i>Finland</i>	<ul style="list-style-type: none"> <li>• Authorities can deny foreign acquisition of over one-third of the voting rights in major Finnish companies if an important national interest is jeopardized.</li> <li>• With few exceptions, at least 50 percent of the board of directors or all managing directors of limited liability companies must be Finnish citizens and residents.</li> <li>• Foreign firms need a trade permit to establish a branch.</li> <li>• Foreign firms need permission to found a limited liability company.</li> <li>• Aland authorities must give permission for non-citizens of the Aland Islands to acquire and hold property.</li> </ul>
<i>France</i>	<ul style="list-style-type: none"> <li>• Foreign equity participation in newly privatized companies may be limited.</li> <li>• If foreign investment exceeds one-third of total investment, or exceeds 20 percent of equity in publicly traded French companies, the following regulations apply: Investments of less than FFr 50 million in French companies with total annual sales of less than FFr 500 million are allowed 15 days after notification and verification. Investments exceeding this limit are subject to approval by the Ministry of Economic Affairs within 1 month of notification.</li> <li>• If managing director is not holder of permanent residence permit, specific authorization is needed to establish certain commercial, industrial, or artisanal activities.</li> </ul>
<i>Germany</i>	<ul style="list-style-type: none"> <li>• Foreign purchases of real estate in Berlin, Schleswig-Holstein, and Saarland may be subject to authorization.</li> </ul>
<i>Greece</i>	<ul style="list-style-type: none"> <li>• Permission from the Ministry of Defense is required to acquire land near borders.</li> </ul>
<i>Ireland</i>	<ul style="list-style-type: none"> <li>• The Land Commission must give prior written consent for acquisitions of land outside cities or towns. Certificate from Minister for Enterprise and Employment may waive requirement when land is for industrial use.</li> </ul>
<i>Italy</i>	<ul style="list-style-type: none"> <li>• Exclusive rights to newly privatized companies may be granted or maintained, and voting rights may be restricted.</li> </ul>
<i>Portugal</i>	<ul style="list-style-type: none"> <li>• Authorization is required for non-EU originating investments exceeding 20 percent of capital, or if investment results in the control or strengthening of decision-making power in the enterprise.</li> <li>• The amount of foreign participation in newly privatized companies is determined by the government on a case-by-case basis.</li> </ul>
<i>Spain</i>	<ul style="list-style-type: none"> <li>• Foreign governments and foreign public entities need prior authorization to invest.</li> </ul>

Country	Description of limitation
<i>Sweden</i>	<ul style="list-style-type: none"> <li>• One founding member of a joint stock company must be a Swedish resident or a Swedish legal entity. Partners must also be Swedish residents or Swedish legal entities. The managing director and at least 50 percent of the board must be Swedish residents. Exemptions to these regulations are sometimes granted.</li> </ul>
New Zealand	<ul style="list-style-type: none"> <li>• Maori persons or organizations may receive more favorable treatment in relation to the acquisition, establishment or operation of any commercial or industrial undertaking.</li> <li>• Under the Overseas Investment Regulations 1985, issued under the Overseas Investment Act 1973, Overseas Investment Commission approval is required for the following investments by overseas persons: <ul style="list-style-type: none"> <li>▸ Acquisition or control of 25 percent or more of the shares or voting power in a business where either the consideration of transfer or the value of assets of the company exceeds \$NZ10 million;</li> <li>▸ the establishment of new business in New Zealand where the total expenditure in setting up the business exceeds \$NZ10 million;</li> <li>▸ the acquisition of the assets of a business where the total consideration paid or payable for the assets exceeds \$NZ10 million;</li> <li>▸ the issue or allotment of shares where the 25-percent threshold has already been exceeded or will be exceeded as a result of the issue and where the total consideration paid or payable exceeds \$NZ10 million.</li> </ul> </li> <li>• Overseas Investment Commission consent is required, regardless of the dollar value of the investment, for acquisition of rural land. Approval is also required under the Land Settlement Promotion and Land Acquisition Act for the purchase of some classes of land.</li> </ul>

Source: Compiled by the Commission from the General Agreement on Trade in Services, Schedules of Specific Commitments.

