

# **Private Power Production in Mexico: A Country Study**

Alejandra Núñez-Luna

Working Paper #47

August 17, 2005

The Program on Energy and Sustainable Development at Stanford University is an interdisciplinary research program focused on the economic and environmental consequences of global energy consumption. Its studies examine the development of global natural gas markets, reform of electric power markets, international climate policy, and how the availability of modern energy services, such as electricity, can affect the process of economic growth in the world's poorest regions.

The Program, established in September 2001, includes a global network of scholars—based at centers of excellence on five continents—in law, political science, economics and engineering. It is based at the Center for Environmental Science and Policy, at the Stanford Institute for International Studies.

**Program on Energy and Sustainable Development**  
At the Center for Environmental Science and Policy  
Encina Hall East, Room 415  
Stanford University  
Stanford, CA 94305-6055

<http://pesd.stanford.edu>

## About The Experience of Independent Power Projects in Developing Countries Study

Private investment in electricity generation (so called "independent power producers" or IPPs) in developing countries grew dramatically during the 1990s, only to decline equally dramatically in the wake of the Asian financial crisis and other troubles in the late 1990s. The Program on Energy and Sustainable Development at Stanford University is undertaking a detailed review of the IPP experience in developing countries. The study has sought to identify the principal factors that explain the wide variation in outcomes for IPP investors and hosts. It also aims to identify lessons for the next wave in private investment in electricity generation.

PESD's work has focused directly on the experiences with IPPs in 10 developing and reforming countries (Argentina, Brazil, China, India, Malaysia, Mexico, the Philippines, Poland, Thailand and Turkey). PESD has also helped to establish a complementary study at the Management Program in Infrastructure Reform & Regulation at the University of Cape Town ("IRR"), which is employing the same methodology in a detailed study of IPPs in three African countries (Egypt, Kenya and Tanzania).

### About the Author

**Alejandra Núñez-Luna** is a Juridical Science (S.J.D.) doctoral candidate at Harvard and a former research fellow at the Program of Energy and Sustainable Development in Stanford. She is currently doing research on the relationship between water rights and social conflict around river basins in Mexico. Her work also focuses on the political and distributional aspects of privatization of electricity and water in Latin American countries.

Alejandra holds a Master of Laws (LL.M) from Harvard Law School and a Bachelor of Laws (LL.B.) from the Instituto Tecnológico Autónomo de México.

### Disclaimer

This paper was written by a researcher (or researchers) who participated in the PESD study *The Experience of Independent Power Investment in Developing Countries*. Where feasible, this paper has been reviewed prior to release. However, the research and the views expressed within are those of the individual researcher(s), and do not necessarily represent the views of Stanford University.

## List of Acronyms

<b>IPP</b>	Independent Power Producers
<b>SEN</b>	<i>Sistema Eléctrico Nacional</i> (National Electrical System)
<b>CFE</b>	<i>Comisión Federal de Electricidad</i> (Federal Electricity Commission)
<b>SOE</b>	State-Owned Enterprise
<b>IBRD</b>	International Bank for Reconstruction and Development/World Bank
<b>PEMEX</b>	<i>Petróleos Mexicanos</i>
<b>PRI</b>	<i>Partido Revolucionario Institucional</i> (Institutional Revolutionary Party)
<b>PRD</b>	<i>Partido de la Revolución Democrática</i> (Democratic Revolution Party)
<b>LSPEE/ IPP Law</b>	<i>Ley del Servicio Público de Energía Eléctrica</i> (Electricity Utilities Act)
<b>SENER/ Ministry of Energy</b>	<i>Secretaría de Energía</i> (Ministry of Energy)
<b>CRE</b>	<i>Comisión Reguladora de Energía</i> (Energy Regulatory Commission)
<b>LFC</b>	<i>Compañía de Luz y Fuerza del Centro</i> (Light)
<b>PPA</b>	Power Purchase Agreement
<b>PGPB</b>	<i>PEMEX Gas y Petroquímica Básica</i> (PEMEX Gas and Basic Petrochemicals)
<b>PIDIREGAS</b>	<i>Proyectos de Inversión Directa en Infraestructura con Registro Diferido en el Gasto</i> (Long-term Infrastructure Projects with Deferred Impact in Recording of Expenditure)
<b>POISE</b>	<i>Programa de Obra e Inversiones del Sector Eléctrico</i> (Work Program and Investments of the Electricity Sector)
<b>PF</b>	Public Funding
<b>BLT</b>	Build-Lease-Transfer
<b>PAN</b>	<i>Partido Acción Nacional</i> (National Action Party)
<b>COMEGO</b>	<i>Compañía Mexicana de Gerencia y Operación</i> (Mexican Management and Operations Company)
<b>EDFI</b>	Electricité de France International
<b>EDF</b>	Electricité de France

## Tables and Figures

- Fig. 1. Electric Power Generation, 1950-1975 (in millions of KWh)
- Fig. 2. Energy Industry Structure
- Fig. 3. Installed Capacity by Entity
- Fig. 4. Electricity Consumption by Sector
- Fig. 5. Evolution of Private Participation Schemes in Mexico
- Fig. 6. Electricity Generation and Consumption, 1990-2001 (in billion KWhr)
- Fig. 7. Mexico's Macroeconomic Indicators, 1990-2002
- Fig. 8. Financing Schemes for the Power Generation Sector in Mexico
- Fig. 9. Administrative Authorizations Granted by CRE, 1994-2004
- Fig. 10. Amount of Public v. PIDIREGAS-supported Investment in Power Projects, 1997-2001 (in million dollars)
- Fig. 11. Installed Capacity by Fuel, 1990-2001 (in thousands MW)
- Fig. 12. Natural Gas Production and Consumption, 1990-2001 (in tcf)
- Fig. 13. The Universe of Independent Power Producers
- Fig. 14. Generations of IPP Projects



# Private Power Production in Mexico: A Country Study

*Alejandra Núñez Luna*

## I. INTRODUCTION

This study is part of a broader research project aimed at investigating the factors affecting the success or failure of independent power production projects in developing countries<sup>1</sup>. Exploring the Mexican experience in independent power production is relevant for several reasons, all of which ultimately converge in the State's ownership of energy assets as a historically relevant characteristic of the Mexican economy. Specifically in the context of IPPs, in the face of old constitutional constraints that have made -and continue to make- restructuring difficult, during the last decade Mexico has enacted creative regulatory frameworks in an effort to attract foreign investment while avoiding constitutional limitations. Through such mechanisms, particularly statutory norms providing for pseudo-independent power production and a special financing arrangement designed to reduce payment and currency risks to investors, the country has enabled an attractive piece-meal approach to reform both through statutory legislation and the contractual experience in the context of IPP projects. However, the analysis of the stakes involved suggests that further flexibility is required as these frameworks might be reaching exhaustion.

This paper is a broad introduction to the issues that may have a relationship with the performance of IPP projects in Mexico. It aims to provide a foundation for a comprehensive analysis of such factors in the context of individual case-studies, to be developed at a latter stage of this research project.

The paper is structured in three parts. The first part provides a history of the power system context in Mexico in brief detail, in order to contextualize the current structure of the electricity sector and the challenges faced by the restructuring process in the country. This section also provides a description of the reforms undertaken by the government to liberalize the electricity sector, in particular those that enabled independent power production, as well as an assessment of the role of IPPs in the Mexican electricity sector in light of the government's efforts at liberalizing the industry during the last decade. Finally, the administrative procedure regulating IPPs in Mexico is outlined in an attempt to shed light at the peculiar character of these projects in the country; *i.e.* private "independent" power projects that remain controlled by the State in several important aspects.

The second part of this paper introduces the current Mexican investment climate, from a broad background on macroeconomic fundamentals and private forms of financing electricity infrastructure in general, to the description of each of the specific

---

<sup>1</sup> Cf. Victor, et al., *The Experience with Independent Power Projects in Developing Countries: Introduction and Case Study Methods*, PESD WORKING PAPER (PESD, 2004), available at <http://pesd.stanford.edu/publications/workingpapers.html>. I am grateful to Erik Woodhouse for his insightful comments on the draft version of this paper, as well as his editing suggestions.

issues that might affect investment outcomes in IPP projects in the country, namely debt capital sourcing; fuel supply issues; natural gas as a state policy; and the much politicized character of the attempts at energy reform during the two last presidential administrations, believed to be one of the main drivers of success or eventual failure of independent power production in the country. Throughout this section, the adequacy of the electricity state-owned enterprise to meet power demand is discussed, and arguments advanced in favor and against such reforms are outlined.

The third and final part of this study presents a situation analysis of independent power production projects built and operated in the country since the passage of enabling statutory law in 1992, including an explanation of the methodology utilized in the compilation of this dataset. The section continues with a brief description of specific private power production projects –including but not restricted to IPPs- with an aim at providing a broader understanding of the “success” of the IPP program to date. Finally, the study suggests three IPP projects for in-depth analysis in individual case-studies, providing the relevant background in light of the factors that might affect outcomes in these projects as outlined in the research protocol.

## II. THE MEXICAN POWER SYSTEM CONTEXT

### A. Historical Background.<sup>2</sup>

The following section consists of a brief account of the Mexican power system from an historical perspective, since the beginning of the electricity industry until the 1990s, and with special focus on the relationships between the government and the private sector from the birth of the industry to its nationalization in 1960. This examination is important because, as it will be discussed further, many factors arising from such relationships continue to strongly influence the feasibility of energy liberalization in the country, which in turn might affect market attractiveness for independent power producers. This section illustrates, in particular, the inability of the state to provide for certain technologies critical to modern power generation in specific periods of history, the squeeze of investors at times where such technologies and forms of financing had become more widespread<sup>3</sup>, the strong correlation between politics and the creation and consolidation of the electrical system, and a recurrent conflict about electricity rates.

---

<sup>2</sup> This section was drawn from the following sources: Miguel S. Wionczek, *Electric Power: The Uneasy Partnership*, in Raymond Vernon (ed.), *PUBLIC POLICY AND PRIVATE ENTERPRISE IN MEXICO* (Harvard, 1964); José A. Gómez Ibañez, *REGULATING INFRASTRUCTURE: MONOPOLY, CONTRACTS AND DISCRETION* (Harvard, 2003); idem, *The Future of Private Infrastructure: Lessons from the Nationalization of Electric Utilities in Latin America, 1943-1979*, Discussion Paper, Taubman Center for State and Local Government, John F. Kennedy School of Government, Harvard University, January 1999; Ernesto Galarza, *LA INDUSTRIA ELÉCTRICA EN MÉXICO* (FCE, 1941) [sections 1 to 4]; Víctor Rodríguez-Padilla and Rosío Vargas, *Energy Reform in Mexico: A New Development Model or Modernization of Statism?*, *ENERGY POLICY* 24(3):265-274 (1996) [section 5].

<sup>3</sup> Raymond Vernon, *SOVEREIGNTY AT BAY: THE MULTINATIONAL SPREAD OF U.S. ENTERPRISES* (Basic Books, 1971).

After the 1980s, the discussion focuses on the shift in energy policy from the period of import-substitution industrialization to the implementation of the neoliberal paradigm in Mexico in the 1990s, as a general introduction to the history of electricity reforms enacted by subsequent administrations in the mid-1990s and to the analysis of the factors influencing outcomes in independent power production (“IPP”) projects, discussed in further detail in section II of this paper.

1. *Origins of the Electricity Industry and Foreign Investment, 1897-1917.*

Mexico’s entire electricity sector was run by private firms at the turn of the twentieth century. Starting in 1897, the year when the first power plant was built, electricity infrastructure for self-supply was built and operated by British, Canadian and American companies. Through favorable concessions and tax benefits, major foreign conglomerates were given a stake in the country’s water resources in exchange for the construction of hydroelectric infrastructure, an important component of then-President Porfirio Díaz’s modernization program. During the first decade of the century, British resources accounted for 85% of the total amount of investment in electric power generation and distribution<sup>4</sup>. This is explained by the fact that the private sector was leading the technological developments during the industrial revolution, while the government had limited domestic financial resources and entrepreneurial skills for such kind of investments<sup>5</sup>.

In 1884 the government had issued a decree providing tax exemptions to hydroelectric companies and enabled the State to expropriate lands for the construction of power plants. For more than a decade, hundreds of concessions were granted to national companies, which in turn transferred them to foreign investors. The industry was then developed by five major American, British and Canadian companies, mainly to bring power to export-driven manufacturing and mining companies, and secondarily for public lightning in urban areas. By the advent of the Revolution in 1910, foreign companies controlled the most profitable, indefinite concessions for hydroelectric power generation and were free to set rates and to negotiate contracts with private consumers. These companies –in particular the Canadian-owned *Mexican Light and Power Company* and the *American and Foreign Power Company*- would be the industry’s backbone for the next forty years<sup>6</sup>.

There is controversy about the profitability of these companies in this period. While some sources claim that the foreign corporations greatly profited from their investments, others state that they were less profitable than in other countries. If one compares electric utility profits with those of mining and oil it does seem as though the electricity business was not as profitable; however, it was of less scale and much less risky. These companies, who saw the country as a window of opportunity, were not at all limited by government regulation that, if existent, was never enforced<sup>7</sup>.

---

<sup>4</sup> Wionczek, *supra* note 2 at 21-23.

<sup>5</sup> Gómez-Ibañez, *supra* note 2 at 1-2; Ernesto Galarza, *supra* note 2 at 74.

<sup>6</sup> Wionczek, *supra* note 2 at 22.

<sup>7</sup> *Id.* at 26-27.

After 1910, however, the country outlook became less favorable for investors. Rapidly increasing demand made the private companies unable to provide electricity to two new actors: small industrial consumers and municipalities. The first conflicts between the electric utilities and municipalities took place at the time of renewal of contracts, where the latter disputed high rates for urban supply. Mexican politicians were aware of the political appeal of these arguments. Small industrialists also took advantage of these complaints by advancing, for the first time, an argument couched in nationalistic rhetoric of “the exploitation of the Mexican consumer by a foreign-owned monopoly”. These early clashes did not affect the financial position of the industry thanks to investors’ protection from the federal government until the Mexican Revolution of 1910<sup>8</sup>.

## 2. *From Revolution to Regulation, 1917-1935.*

At first, the Mexican Revolution brought substantial financial losses to the electric utilities. Municipalities, already with a low paying record under the Díaz regime, completely stopped paying their bills. Other consumers could at best pay in devalued bank notes. This caused the utilities to suspend payments of dividends on their bonds. Fortunately for them, this situation did not last long. When the Revolution ended and General Alvaro Obregón took power in 1921, all major companies initiated ambitious expansion programs, as it was projected that demand would increase with the country’s recovery. Even after the enactment of the “social” Constitution<sup>9</sup> in 1917, and the rise of the *Partido Nacional Revolucionario*<sup>10</sup>, the *laissez-faire* conditions of the previous regime continued in the electricity sector. Soon it became clear that these utilities were indispensable for the modernization and expansion of the economy, and that domestic companies were too weak to invest in and operate enterprises of such magnitude. As a result, the framework for regulations between the state and the private utilities remained unchanged after the Revolution<sup>11</sup>.

The private utilities took advantage of this situation, and during the 1920s, the electricity industry grew faster than any other sector in the economy. Total installed electric power capacity almost tripled and total generation more than doubled as compared with the previous two decades. About one fourth of the population became

---

<sup>8</sup> *Id.* at 28-29.

<sup>9</sup> After the Mexican Revolution, a new constitution was enacted in 1917. The Constitution incorporated the liberal legal tradition of the nineteenth century but also incorporated “social” elements, such as the State’s property of lands and waters. Cf. Sergio López-Ayllón and Héctor Fix-Fierro, “Faraway, So Close!”, *The Rule of Law and Legal Change in Mexico, 1970-2000*, in Lawrence Friedman and Rogelio Pérez Perdomo, *LEGAL CULTURE IN THE AGE OF GLOBALIZATION, LATIN AMERICA AND LATIN EUROPE* (Stanford, 2003). As discussed below, further interventionist reforms in the 1930s would also give the State complete control over the energy industry.

<sup>10</sup> The *Partido Revolucionario Institucional* (Institutional Revolutionary Party), the state party which held power from its creation since the Mexican Revolution until its defeat in 2000, had two antecedents – *Partido Nacional Revolucionario* (created in 1929) and *Partido de la Revolución Mexicana* (created in 1938)- which mark different actors as the party’s main support base, *i. e.*, peasants, workers and unions. A comprehensive account of the party and its role in the Mexican state can be found at José Ramón Cossío Díaz, *CAMBIO SOCIAL Y CAMBIO JURÍDICO* (ITAM, 2001).

<sup>11</sup> Wionczek, *supra* note 2 at 35-37.

consumers of electricity, with 60% being dispatched to industries, and the remaining 40% to public lighting, agriculture and household consumption. Because of the country's mountainous geography, remote rural areas were less profitable for investors, who then focused on large urban areas. Soon, difference of service between urban and rural settlements created social tensions that translated into the first signs of the government's dissatisfaction with foreign utilities. The government responded with a first attempt to regulate the industry, creating the *Comisión Nacional de Fuerza Motriz* (National Power Commission) in 1922 as an advisory body to the Ministries of Agriculture and Industry on matters of hydroelectric energy conservation, electricity rate regulation, and conflict resolution among consumers and utilities<sup>12</sup>.

Although its real role was very limited, during the government of Plutarco Elías Calles the Commission encouraged the creation of the *Código Nacional Eléctrico* (National Electric Code), the first body of legislation for the electricity industry in 1926, enacted with the purpose of improving relations between the government and the private sector which, according to the Commission, were characterized by unsophisticated management of the electricity sector by all levels of government, an inability by the utilities to comprehend the industry's "public interest" character, and poor service quality and high tariffs<sup>13</sup>.

The Code provided for federal jurisdiction over the entire power industry, and that electricity constituted a *public service*. Rates would now be subject to regulation and power projects would be awarded via concessions by the federal government. Politically, this was the government's response to numerous complaints advanced by the new class of small textile industrialists –now well organized and substantially larger- who had complained about exorbitant rates for more than two decades<sup>14</sup>, arguing that the price of power greatly increased production costs. Although energy cost contributed very little to the cost structure of the textile industry, both domestic politics and nationalist sentiment were powerful incentives for the government to publicize the issue. Nevertheless, these expressions of dissatisfaction and the new legislation did not seriously affect the business outlook of the industry, which continued to grow. Moreover, the structure of the industry changed radically with the arrival of a large volume of capital brought by the *American & Foreign Power Company*, which undertook a comprehensive expansion plan, investing \$70 million in the construction of three of the five large electric systems then operating in Mexico and the purchase of thermoelectric plants in seven medium-sized industrial centers. This would be the largest financial operation in the history of Mexican public utilities until its nationalization in 1960. *American* became the owner of all generation

---

<sup>12</sup> *Id.* at 38.

<sup>13</sup> *Id.* at 41.

<sup>14</sup> Despite the secrecy surrounding company's records, the disparity between prices paid by large and small consumers had become widely known; the ratio between prices on electric power sold in block to large mining and industrial consumers and those charged to small industrial plants and domestic consumers ranged from 1-to-15 to 1-to-25. In the 1950s it was about 1-to-5. The textile industry organized the first large consumer association and threatened not to pay electricity rates until the companies reduced the rates. While the cost of power played a minor role in the total production costs of an industry such as textiles, politics played a big role in the squeeze of private utilities. *Id.* at 45.

and transmission facilities in Mexico outside the capital and continued expanding through 1935, the year when self-financing of vertical utilities ended forever<sup>15</sup>.

The Great Depression had a negative impact on the Mexican electric power industry. Mining and manufacturing output sharply declined, and so did the demand for power. Thus, revenue from the sale of electricity to middle and small consumers became strategically important for the utilities and high rates were maintained, increasing consumers' complaints about the rates. At this stage, however, the government did not intervene to mediate the conflict between utilities and consumers, nor did it provide the regulatory agency with the budget and personnel required to enforce the Electric Code. It was not until the end of 1932, when protests became serious, that the government decided to intervene in the electricity industry. The annual State of the Union delivered by President Abelardo Rodríguez in 1932 referred to the problem of high rates. The Ministry of Energy and Commerce then invited the utilities to submit their rates for revision, and this was the first time in the history of the Mexican electricity industry that rates for medium and small consumers were substantially cut, an event which would set a precedent for further subsidization of rates for certain sectors<sup>16</sup>.

This event triggered further –and decisive- government intervention in the industry. The government's plan for the period 1934-39 provided that electricity would be supplied at a price low enough to enable the development of agricultural and industrial enterprises. In 1933 the government ordered the creation of a national system (today the *Sistema Eléctrico Nacional*, SEN or National Electrical System) of electric power generation, transmission and distribution, comprised by state enterprises and consumer cooperatives. Further, electricity generation was taxed, previous exemptions on taxes on profits were rescinded, the Constitution was amended to extend federal authority to every aspect of the electricity industry and, a proposal for the creation of the *Comisión Federal de Electricidad* (CFE or Federal Electricity Commission) was introduced. CFE's mission would be to design the planning programs for the SEN and to undertake the generation, transmission and distribution of electricity. That same year, President Rodríguez introduced a bill in Congress proposing the creation of *Petróleos Mexicanos* (PEMEX), the oil state-owned enterprise (“SOE”) that today retains a constitutionally mandated monopoly over the oil industry<sup>17</sup>.

### 3. *Interventionism and Stagnation, 1935-1945.*

From 1935 to the end of the Second World War, Mexico's electricity industry went through a state of semi-stagnation. From 1936 to 1945 less than 100,000 KW were added to the country's total installed capacity of 610,000 KW. Of the new capacity, only 30,000 KW were added by private utilities, and the rest came from power plants built by CFE. As a result, by the end of the war Mexico faced power shortages and was unable to meet demand. The nationalization of the oil industry by President Lázaro Cárdenas in 1938 further strained the relationships between foreign investors and the government to

---

<sup>15</sup> *Id.* at 46-47.

<sup>16</sup> *Id.* at 48-53.

<sup>17</sup> *Id.* at 54-58.

the point that it was unthinkable that private investors would be encouraged to contribute to alleviating the electricity demand crisis. After investors' negotiations with the government to avoid nationalization of the electricity industry, Cárdenas promoted a federal electricity law (*Ley de la Industria Eléctrica* or Electricity Industry Act)<sup>18</sup>. The statute was submitted to the electricity unions –an important part of the political support base of the *Partido Revolucionario Institucional* (PRI or Institutional Revolutionary Party)- and the CFE was formally created by presidential decree in 1937, although with an insignificant initial budget of 50,000 pesos<sup>19</sup>.

There is evidence that executives of *American and Foreign Power Company* also met with the President to negotiate the statute before its passage. The law did not prevent private participation in the industry, but limited it greatly. A system of concessions subject to CFE's approval was created; from now on, construction projects would be proposed according to CFE's own demand estimates; rate structures would be fixed for specified periods of time, and a uniform accounting system would be introduced<sup>20</sup>.

Upon passage of the statute, *Mexlight* requested rate increases to the government which were granted in 1939 but were soon suspended in 1940. From this moment on it would become clear that rates would be set according to political, rather than economic criteria, as is the case today. Relations between the government and private utilities were damaged almost beyond repair. At the same time, CFE's operations were growing. The SOE took over the electrification of rural areas lacking infrastructure and built the largest hydroelectric power plant in central Mexico. At this point infrastructure expansion to cope with deferred and expected demand was left completely in the hands of CFE, and financed with public savings and external debt from the United States. By the end of World War II, damaged relations with the private sector, an increasingly interventionist state and a lack of budget led to serious blackouts throughout the country, in spite of the overloading of power plants and transmission lines built by CFE<sup>21</sup>.

#### 4. *Nationalization and Expansion of the SEN, 1945-1975.*

From 1945 to the 1960s, foreign investment was increasingly contracted and replaced by public funding. During this period the government's attitudes towards private investors were mixed. Politics and administrative discretionality, rather than costs, continued to pervade the setting of tariffs. To compensate for inadequate rates, the private companies were given unrestricted access to CFE-generated electricity at favorable prices and advantageous concessions at the time of contract renegotiations<sup>22</sup>. The government persuaded unions to restrain their demands as well, and supported the corporations in obtaining foreign loans. However, a new group of smaller industrialists grouped in the *Cámara Nacional de la Industria de la Transformación* (National Industry Chamber)

---

<sup>18</sup> It is interesting to note that the lack of regulatory experience in this period led the government to enact a statute which was substantially a copy of the legislation regulating electricity in the United States.

<sup>19</sup> Wionczek, *supra* note 2 at 63.

<sup>20</sup> *Id.* at 65-67.

<sup>21</sup> *Id.*

<sup>22</sup> It is said that the low prices of power under which the corporations purchased electricity from CFE were the main reason why CFE had no profits during the 1950s. *Id.* at 76.

undertook important publicity campaigns attacking the private companies, exerting pressure for low prices and a program for electricity expansion led by the state and financed domestically in its entirety.

The Mexican electricity utilities were vertically integrated and electricity coverage was expanded, with capacity increasing from 700,000 KW to 3 million KW. The result of this state-sponsored expansion program in both urban and rural areas further diminished the role for foreign utilities. Between 1945 and 1960 the CFE added 1,000,000 KW of new capacity while *Mexlight* and *American & Foreign Power* had added half that amount<sup>23</sup>. While in 1945 the two large foreign corporations had accounted for 60% of the total electricity generation power in the country and the CFE had contributed 5%, in 1960 the CFE controlled 40% of the total generating capacity while the companies generated 33% of the total. Further, in 1960, the Mexican Constitution was amended to empower the State to exclusively provide electricity “as a public service”, precluding the private sector from providing electricity or acquiring concessions for exploitation of this sector. This reduction of the private sector’s role in generation can be traced to several factors, but is inseparable from the government’s growing ability to build and operate infrastructure providing reliable electricity, which had been beyond its reach in the beginnings of the industry. Similarly, by now the government had somewhat improved its ability to raise revenues through taxes and external debt financed by international financial institutions, which in turn forced the government into adopting more austere fiscal and monetary policies<sup>24</sup>.

FIGURE 1: ELECTRIC POWER GENERATION, 1950-1975 (IN MILLIONS OF KWH)

YEAR	PRIVATE UTILITY	SELF-SUPPLY	CFE	TOTAL
1950	3,050	874	500	4,424
1960	200	2,139	8,389	10,790
1975	0	4,106	39,400	43,506

Source: Joseph W. Mullen, *Energy in Latin America: The Historical Record 65* (CEPAL, 1978)

Since the government was not willing to renegotiate tariffs, private utilities concentrated in purchasing as much CFE-generated power as possible and, at their own initiative<sup>25</sup>, started preparations to sell their assets to the Mexican Government. In 1960, under the administration of President Adolfo López Mateos, the two largest corporations were nationalized –or “mexicanized”, as the President labeled this process- peacefully and upon mutually agreed conditions, under which the government bought these companies at a book value of \$400 million. The process played in the government’s

<sup>23</sup> It is very important to highlight that, despite the fact that private utilities’ share of electricity generation was greatly diminished, they were still the largest buyers of the electricity produced by CFE, with 50%-75% of the power output being sold by CFE to the private companies in the first place, then distributed to other classes of consumers. *Id.*

<sup>24</sup> Cf. Gómez-Ibañez, *supra* note 2.

<sup>25</sup> Wionzcek notes that the foreign companies’ deliberate initiative to sell their assets to the government was not only due to their inability to make profits from their investments in Mexico, but also as part of the strategy to exit the utility business in Latin America as a whole.

advantage, as the International Bank for Reconstruction and Development (“IBRD”) had conditioned new loans for power expansion on the revision of tariffs<sup>26</sup>.

At that time, the electricity sector was dominated by large infrastructure projects which took advantage of economies of scale and further contributed to CFE’s monopolistic position in the industry<sup>27</sup>. CFE took charge of the SEN to connect all the regional areas, achieving electrification in all parts of the country. With the nationalization of the industry, the government established a single system of tariffs and large subsidies which held tariffs constant from 1960 to 1973, and which led CFE to fail to cover costs once more. Finally, a single national electrical trade union was established. By 1975, the corporations had been completely replaced by CFE<sup>28</sup>.

##### 5. *Statist Modernization, 1980s-1990s: Towards a Shift in Energy Policy.*

The period going from 1982 to the late 1990s was characterized by increasing macroeconomic instability and an external debt crisis that led to the instrumentation of structural adjustment policies. These policies, together with the historical dependence on oil and highly subsidized electricity tariffs, greatly reduced the availability of public investment in the electricity sector and made the service provision inefficient. CFE’s policy of expansive spending, electrification of remote areas, and investment to meet an electricity demand that outstripped the pace of economic growth would soon be exhausted.

During the economic crisis, the rise of neoliberalism brought a group of technocrats to take charge of the *Partido Revolucionario Institucional* (PRI or Institutional Revolutionary Party). The PRI had represented the old corporatist regime and for four decades sustained power by favoring unions and later elites in exchange for political support masked by a populist discourse. The PRI had granted these political organizations seats in Congress, employment in the SOEs, and a variety of contracts. In the early 1980s, the state had over 1150 parastatal companies and SOEs where it employed over 20% of the active labor force in the country. Now the technocrats, led by Presidents Miguel de la Madrid, Carlos Salinas and Ernesto Zedillo, represented a new ideology that advocated for a smaller and more efficient state, and for a market-driven economy, privatizing and deregulating several industries.

By 1988, the PRI no longer faced strong political divisiveness within the party. Due to disagreement about the economic policies enacted by De la Madrid, the majority of the leftist *priistas* exited the party and formed their own, the *Partido de la Revolución Democrática* (PRD or Democratic Revolution Party)<sup>29</sup>. This gave President Carlos Salinas a free hand to undertake privatization reforms, since workers, peasants and middle-class government employees that benefited most from the SOE scheme were no

---

<sup>26</sup> Wionczek, *supra* note 2 at 91-93.

<sup>27</sup> Cf. Gómez-Ibañez, *supra* note 2.

<sup>28</sup> *Supra* at fig. 1.

<sup>29</sup> Cf. World Bank, *BUREAUCRATS IN BUSINESS: THE ECONOMICS AND POLITICS OF GOVERNMENT OWNERSHIP* (Oxford, 1995).

longer supporting the PRI. Salinas had no strong political obstacle to privatize key industries like the national airline or the telephone company. However, the program was generally unsuccessful because the revenues were not reinvested in development programs, but were largely used to finance budget deficits.

During Salinas's presidency, the energy industry played key roles that paved the way towards the transition to reforms enacted in the subsequent administration. In strategic terms, it became a field of negotiation (of NAFTA in particular) with the US, Mexico's largest trading partner and the world's largest energy consumer. In economic terms, it became an important source of tax revenues and foreign exchange required to alleviate the public debt<sup>30</sup>. The decision not to openly liberalize the industry also meant, in political terms, continuity with the nationalistic discourse that has pervaded Mexican politics since nationalization of the oil industry in 1938.

During the Salinas administration, three main ideas which had been disregarded in the past became the main drivers of energy policies: the principle of economic benefit maximization and achievement of costs, environmental protection<sup>31</sup>, and security of supply. This last factor proved very important in energy policy design, initially to justify mass purchases abroad to make up for insufficient production<sup>32</sup>, and more recently to highlight the importance of natural gas as the main state-supported fuel for electricity generation.

In light of efficiency concerns, organizational and economic changes were enacted in the electricity state-owned enterprises (SOEs) looking towards their behavior as corporate entities, which translated into the CFE and particularly PEMEX going through an important restructuring process. Thus, functions inside the companies were separated in order to facilitate the evaluation of results in operative processes. Institutional policies and practices were revised, personnel were reduced and finances reorganized. Subsidies, which had played a vital role in the companies' industrial and social policies, were gradually eliminated<sup>33</sup>. These changes strengthened the companies' position to face the administration's new objectives. However, the SOEs did not become

---

<sup>30</sup> Rodríguez-Padilla and Vargas, *supra*, note 2 at 266. The total amount that PEMEX paid for taxes and rights have since become a constant source of revenues for the government, which in turn allocates part of the national budget to PEMEX every year.

<sup>31</sup> *Id.* In principle, environmental protection at this time was inspired by the international trend rather than by will to deal with the acute pollution problems the country faced, given the costs. It was not until the signature of NAFTA's side Agreement on Environmental Cooperation that the environment became a policy priority in terms of budget allocations. Accordingly, PEMEX enacted programs of fuel conversion of diesel into gas and CFE introduced environmental impact assessments as part of project evaluations.

<sup>32</sup> Between 1988 and 1992, natural gas imports increased from 1000 bd (equivalent in fuel oil) to 36900 bd. Rodríguez-Padilla and Vargas, *supra*, note 2, fn 3 at 266.

<sup>33</sup> Gradual phase-out of subsidies was a notable achievement to increase the SOEs' income and thus its self-financing capacity, as well as to comply with the country's commitments under GATT and NAFTA and with the recommendations of international financial institutions. On one side, this meant that the SOEs stopped receiving strong sums of money; *e. g.* subsidies to liquid gas, which accounted for \$238 million USD in 1993, had disappeared by 1995. This also meant that CFE stopped receiving 650 million pesos per year. However, some sectors, in particular domestic and agriculture, continue to be heavily subsidized or cross-subsidized, as they have been since the 1930s. *Id.* at 267.

autonomous, as they were never granted decision-making power and continued to depend on the Executive through the *Secretaría de Energía, Minas e Industria Paraestatal* (Ministry of Energy) in so far as appointments, investment decisions, production levels and labor policies was concerned. Positions inside the companies were utilized for political and personal benefit, and material resources were used to support political campaigns. Moreover, both PEMEX and CFE continued –and continue- to be under governmental budgetary and fiscal control.

Given the populist environment and the nationalist legal framework that greatly limited the possibilities for investment in the sector, President Salinas also started a trend of circumventing the Constitution rather than promoting its amendment through clear and transparent rules<sup>34</sup>. For example, PEMEX was restructured into four independent divisions looking towards welcoming private investment in certain subsectors. Since the Constitution reserves the production of petrochemicals to PEMEX, through statutory law two categories were created; *i.e.* “basic” and “secondary” petrochemicals<sup>35</sup>. Foreign investment was welcome in secondary petrochemicals only, but the number of basic petrochemicals was reduced from fifty substances to eight, thus opening the doors to private investment by circumventing, but without violating the Constitution. As will be explained below, a similar strategy was subsequently used to liberalize the electricity industry with the passage of amendments to the *Ley del Servicio Público de Energía Eléctrica* (LSPEE, Electricity Act or IPP law) in order to enable private investment in independent power production, as well as to open the natural gas sector to private capital (*infra*).

As for foreign investors in general, Mexico’s membership in the OECD, APEC and the WTO implied commitments from the country to enact more competitive policies towards investment and trade. In 1991, exchange controls were abolished as well as restrictions on the repatriation of profits and dividends. Moreover, significant legal changes were enacted in order to attract capital. Specifically, a new *Foreign Investment Act* was passed in 1993, repealing previous statutory law which had restricted foreign participation in 170 economic activities. Amendments to the law were introduced in 1996 to simplify administrative procedures for investors. However, some activities continue to be completely exempted or maintain percentage stakes or authorization restrictions for investors. In particular, as will be explained below, under the Constitution, in principle, control over electricity continues to be reserved to the Mexican government.

---

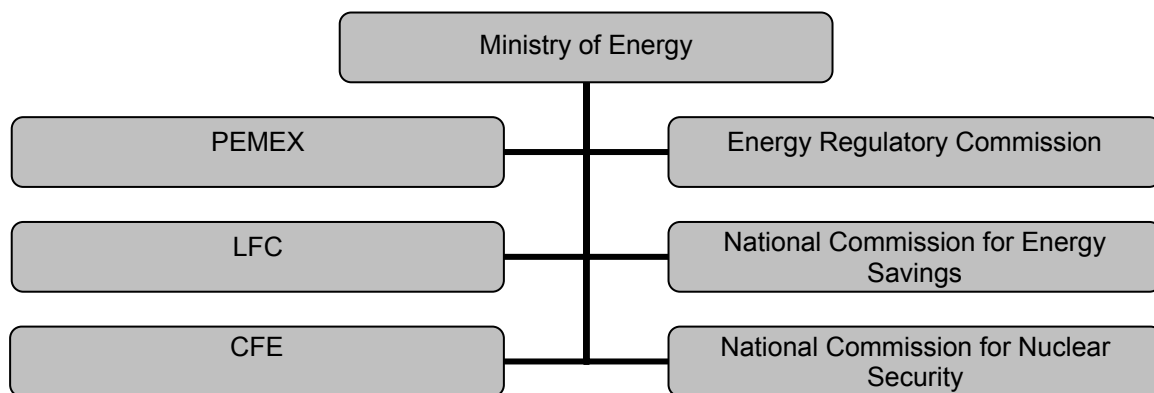
<sup>34</sup> Amending the Constitution is a complicated process as it requires majority from both the Federal Congress and the state legislatures; in the context of the energy sector this is compounded by the fact that the energy industry has been considered “strategic” since its nationalization.

<sup>35</sup> Rodríguez-Padilla and Vargas, *id.* at 270.

## B. The Mexican Electricity Sector Today: Industry Structure.

Since the nationalization of the industry in 1960, the Mexican Constitution strongly limits private participation in the energy sector<sup>36</sup>. By constitutional mandate, the government has control of transmission, distribution, and generation when aimed at “public service”. There are two key state-owned enterprises (“SOE”) which have a monopoly over the energy industry as a whole: *Petróleos Mexicanos* (PEMEX), the state’s oil enterprise<sup>37</sup>, and *Comisión Federal de Electricidad* (CFE), the electricity company which controls generation, transmission and distribution of power. The *Secretaría de Energía* (Ministry of Energy) is responsible for planning and formulating energy policy, as well as for approving exploration activities related to natural resources, and the *Comisión Reguladora de Energía* (CRE or Energy Regulatory Commission) is responsible for the regulation and oversight of private power generation and gas distribution. At the federal level, beyond the electricity industry, the Ministry of the Treasury (*Secretaría de Hacienda*) approves –in practice, sets- the electricity tariffs proposed by CFE (retail distribution).

FIGURE 2: ENERGY INDUSTRY STRUCTURE



At the federal level the *Secretaría del Medio Ambiente, Recursos Naturales y Pesca* (SEMARNAP or Environment, Natural Resources and Fisheries Secretariat) articulates natural resource management policy, issues Mexican *Normas Oficiales Mexicanas* (NOMs or Official Norms) and sets environmental standards. The states retain authority over environmental issues in the context of infrastructure projects; *i.e.* land-use licensing, construction permits and regulation of waste disposal.

<sup>36</sup> Art. 27 of the Constitution expressly states that “only the state can generate, transmit, transform, distribute and supply electricity when aimed at public service... in this area no concession will be granted to private entities.”

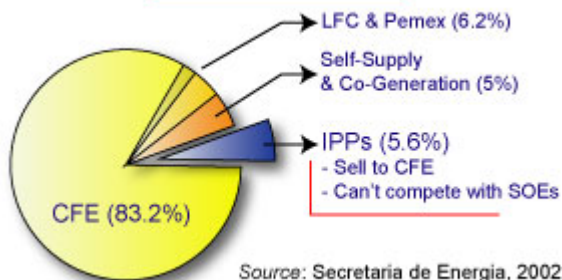
<sup>37</sup> Although not directly involved in the electricity industry, PEMEX plays an important role in so far as it provides for oil fuel and natural gas for several power projects.

## 1. *Electricity Industry Structure.*

A statutory amendment in 1992 opened the door to private participation in generation “not for public service”. Private generators are allowed, but must sell their production through long-term power purchase agreements to CFE, unless energy produced is used for export or self-supply. Private companies cannot compete with the SOEs.

CFE generates more than 4/5 of the total electricity produced in the country (43,534 MW of installed capacity as of 2002)<sup>38</sup>. The LFC, which serves parts of Mexico City, Morelos, Hidalgo and Puebla, generates 2% and PEMEX 4% (for self-supply). CFE and LFC also control the transmission grid, and together distribute electricity to 25 million users. That leaves 10.5% of total electricity generation to the private sector, of which 5% comes from co-generation and self-supply, and 5.6% from IPPs.

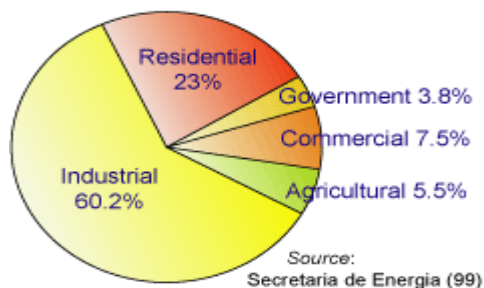
**Fig. 3. Installed Capacity by Generator Type**



## 2. *Electricity Consumption by Sector.*

As shown in the chart to the right, the industrial sector consumes the largest share of electricity in the country (60%). This is an important issue to look at, given that one of the reasons argued in favor of liberalization and eventual privatization of the electricity sector is the high amount of subsidies received by the agriculture and domestic sectors, which together comprise less than 30% of the total electricity consumption in the country.

**Fig. 4. Electricity Consumption by Sector**



## C. Private Sector Participation: Legal Reforms to Re-Open the Electricity Industry.

Until 1986, all infrastructure electricity investments were done entirely by the government. Up to 1990, private participation was only allowed in oil-fueled electricity self-generation (in sugar mills) and renewables (small hydroelectric plants and wind energy, among others)<sup>39</sup>. In the late 1980s the government began to explore options to open the electricity generation sector to private investors, initially through BLT contracts for both brownfield and greenfield projects. *Carbón II* and *Rosarito*, the first coal-fueled projects (cancelled) which provided for private participation in the same manner as IPPs

<sup>38</sup> Miguel G. Breceda-Lapeyre, *Private Investment in Mexico's Electricity Sector*, North American Commission for Environmental Cooperation, Environment, Economy and Trade Program, Mexico, November 2002.

<sup>39</sup> Rodríguez-Padilla and Vargas, *supra*, note 2, at 268.

do today failed, arguably due to the lack of a proper regulatory environment<sup>40</sup>. It was not until the early to mid-1990s that legal reforms to liberalize the electricity sector were pursued, with some being successful and others having failed.

Given constitutional constraints which grant the State –through CFE and LFC– control over generation, transmission and distribution of electricity when aimed at public service, the growing need for investment to modernize the electricity sector triggered “creative” statutory amendments to the IPP law (LSPEE) in 1992 to authorize private participation in certain sectors of the industry that “do not constitute public service”, which ultimately means that private projects cannot sell electricity directly to end-users. On that basis, the private sector today can participate in the following subsectors: self-generation, co-generation, independent production and import-export of electricity. Through amendments to the *Ley Orgánica de la Administración Pública Federal* in 1994, the authority of the Ministry of Energy was also redefined to expressly include the promotion of private participation in electricity generation. Also, in 1995, changes to the *Ley Orgánica de la Comisión Reguladora de Energía* (Organic Law of the CRE) granted the agency greater operative autonomy and technical capacity<sup>41</sup>. Further, article 27 of the Constitution was modified in its provisions over natural gas, and a *Reglamento de Gas Natural* (Regulations on Natural Gas) was passed to allow for private participation in storage, transport and distribution of this fuel.

FIGURE 5: EVOLUTION OF PRIVATE PARTICIPATION SCHEMES IN MEXICO

YEAR	PROJECT NAME	MODE OF PRIVATE PARTICIPATION
1988	Central Valladolid	First turnkey contract (CFE)
1989	Tuxpan III, Tuxpan IV	First BLT, financed by private investors and government (NAFIN)
1990	Rosarito, Carbón II	First intended IPP project (pre-IPP law) – cancelled
1992	Samalayuca	First BLT
1994	Mérida III	First IPP after the 1995 LSPEE
1996	Rosarito, Monterrey, Chihuahua, Prieto	Bidding of the first 4 projects under PIDIREGAS scheme
2000	Termoeléctrica del Golfo	Financial closing of the first large self-supply project (500 MW)

PROTEGO, “El Rol de la Banca y de la Iniciativa Privada en el Desarrollo de Proyectos de Energía en México”, III Congreso Nacional AMEE, 25 de mayo 2000, available at <http://serpiente.dgsca.unam.mx/pue/congresoAMEE/rolbanca.ppt#5> .

<sup>40</sup> PROTEGO, “El Rol de la Banca y de la Iniciativa Privada en el Desarrollo de Proyectos de Energía en México”, III Congreso Nacional AMEE, 25 de mayo 2000, available at <http://serpiente.dgsca.unam.mx/pue/congresoAMEE/rolbanca.ppt#5> (last accessed on April, 2004).

<sup>41</sup> For a broader context in regulatory reforms to promote economic competition, cf. Organization of Economic Cooperation and Development, *The Role of Competition Policy in Regulatory Reform* (OECD, 1999).

## D. Independent Power Producers in the Mexican Electricity Sector.

### 1. *IPPs Intended as a Step in Electricity Markets Restructuring.*

Under the *Ley del Servicio Público de Energía Eléctrica* (LSPEE) “independent power production” refers to the production of electricity by a power plant –privately financed, built, owned and operated- with installed capacity higher than 30MW, exclusively for its sale to the CFE or for export. “Independent Production” status is granted through the mechanism of administrative authorizations (“*permisos*”), following a bidding procedure arranged by CFE for the award of a power purchase agreement (“PPA”).

Because some private power projects have utilized other means under the law besides “independent power production”, for purposes of this study it is important to note that under the “self-supply” category power producers can generate electricity for their own use and that of their partners, and that under the “export” scheme any type of electricity generator can aim part of its capacity for sale abroad, which in practice has been mostly to the United States.

The mixed success of legal reforms since the 1900s has, in part, determined the role that IPPs have played in the electric power system<sup>42</sup>. In February of 1999, President Ernesto Zedillo unsuccessfully submitted to Congress a bill aimed at amending the Constitution to open the electricity sector to private investment, as well as statutory law aimed at unbundling the industry and introducing competition in all its sectors. Those reforms would have involved the creation of an independent system and market operators, and would have formed the basis for a conversion to a merchant power system. These attempts to restructure the electricity industry failed due to popular opposition and protests by electricity unions<sup>43</sup>.

The current administration also views IPP reform as an important step in restructuring the industry. In August 2002, President Fox –whose reform efforts are widely supported by the Ministry of Energy and the CRE- submitted another creatively-designed bill to Congress, which attempts to overcome the constitutional restrictions on private participation by proposing to introduce the notion of “qualified user”, typically a large power consumer that will have the choice not to be provided electricity “for public service” as provided in the Mexican Constitution<sup>44</sup>. If successful, private investors will be able to generate, transmit and distribute electricity to these qualified users<sup>45</sup>. The basic

---

<sup>42</sup> For a description of broader deregulation reforms in the Zedillo’s administration *cf.* Organization for Economic Cooperation and Development, *Regulatory Reform in Mexico, Government Capacity to Assure High Quality Regulation* (OECD, 1999).

<sup>43</sup> World Markets Research Centre, *Country Report*, Mexico, 20 February 2004 at 8-9.

<sup>44</sup> Presidencia de la República, *Oficio por el que se remite Iniciativa de Decreto por el que se Reforman, Adicionan y Derogan diversas disposiciones de la Ley del Servicio Publico de Energía Eléctrica*, 15 de agosto 2002, available at <http://www.energia.gob.mx/work/secciones/1457/imagenes/oficioconelqueremiteiniciativadedecretoporelquesereforman.doc>

<sup>45</sup> Breceda, *supra* note 38 at 3.

aim is to create a parallel market focused on large consumers that will allow for private participation in all unbundled sectors of the industry, promoting investment flows and alleviating the burden on public finances.

Fox's reform has found stiff opposition in Congress, and approval is not certain, particularly as political parties are preparing their campaign platforms for the presidential elections in 2006<sup>46</sup>. Moreover, in 2001 the President promoted regulatory reforms aimed at authorizing independent power producers to increase the amount of excess electricity that they sold to CFE, above that which was provided in the terms of the power purchase agreement. The legislature (not in regular session, but through the *Comisión Permanente*) sued the President before the Supreme Court, which held that the President had violated the Constitution by exceeding its powers to regulate statutory law<sup>47</sup>. This incident illustrates the difficulties involved in establishing a viable consensus for reform, and the political constraints on utilizing the IPP experience as a transition instrument for further reform in Mexico.

## 2. *IPPs's De Facto Role in Alleviating Power Demand.*

Given the relative successes and failures of liberalization reforms in the electricity industry and the manner in which IPP projects have developed, in practice the role of IPPs in the system has been that of alleviating demand, which has steadily increased in the last ten years. Up to 2003 demand grew at a rate of 4.9% per year, and after 2003 it climbed to 6-7% annually for the decade.

According to official forecasts from the Ministry of Energy, demand is expected to grow at a rate of 5.6% between 2003 and 2012, mostly in the Northeast, Baja California and the Yucatan Peninsula, and mainly due to industrial development. It is now widely accepted –even by CFE- that IPPs and further reforms are greatly needed to cope with such growth. SOEs are widely considered financially and technologically unable to meet demand, particularly after decades of inadequate rate levels and failures in investment strategies. Legal and financial constraints in major infrastructure projects like natural gas pipelines, transmission lines and power plants prevent electricity generating capacity from keeping up with consumption, which has increased 60% in the past decade<sup>48</sup>.

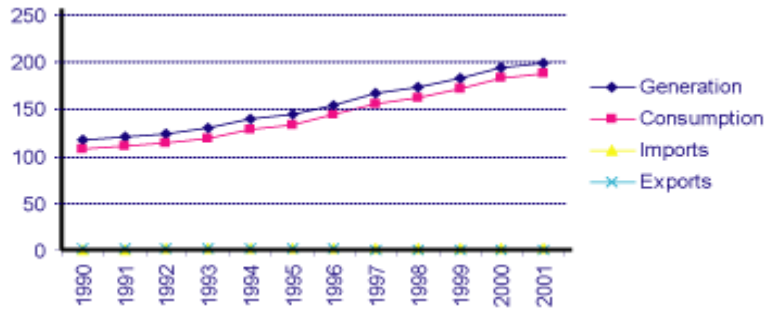
---

<sup>46</sup> Cf. Economist Intelligence Unit, Mexico: Country Outlook (March 2004).

<sup>47</sup> Cf. José Ramón Cossío and Josefina Cortés, *La inconstitucionalidad del Reglamento de Energía Eléctrica (y las inconsistencias de la sentencia que la declara)*, Boletín de Justicia Constitucional, Univ. Carlos III (Madrid, 2003), available at <http://www.uc3m.es/uc3m/inst/MGP/JCI/revista-00citas.htm>

<sup>48</sup> Energy Information Administration, *Mexico: Country Analysis Brief*, March 2004, available at <http://www.eia.doe.gov/emeu/cabs/mexico.html#elec>; World Markets Research Centre, *supra* note 43.

FIGURE 6: ELECTRICITY GENERATION AND CONSUMPTION (BILLION KWH)



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>Generation</b>	116.6	120.5	123.8	129.4	139.7	144.9	154.5	166.2	172.3	182.5	193.9	198.6
<b>Consumption</b>	107.1	110.5	114.1	119.2	128.9	133.7	143.7	156	161.3	170.8	182.4	186.7
<b>Imports</b>	0.6	0.6	1	0.9	1.1	1.2	1.3	1.5	1.1	1.1	2.2	2.1
<b>Exports</b>	2	2.1	2	2	2	2.3	1.3	0	0	0	0.1	0.1

Source: US Energy Information Administration

### 3. Administrative Rules for Independent Power Producers.

As mentioned above, IPPs can generate +30 MW of electricity, but under the statute they are obliged to sell it to CFE. Power projects are initially determined by CFE –which determines the amount of installed capacity needed, the type of plant and technology as well as the duration of the contract- and then offered for bidding, pursuant to the Ministry of Energy’s approval and through their inclusion in CFE’s plans and programs (*Programa de Obra e Inversiones del Sector Eléctrico* or POISE, which stands for “Work Program and Investments of the Electricity Sector”). The contract is awarded through competitive bidding on the basis of the lowest average generation price. The CFE also facilitates the signature of fuel contracts –in some cases with PEMEX- and purchases the construction site to provide to the developer for construction<sup>49</sup>.

Once the contract has been awarded, an administrative authorization must be obtained from the regulator, CRE. Because permits for IPPs are only granted to Mexican citizens or corporations organized under Mexican law and domiciled in Mexico, foreign corporations must set up subsidiaries or Mexican joint ventures for the purpose of building and operating power plants, in most cases the subsidiary being incorporated solely for the IPP project. Once authorization has been granted, investments are entitled to national treatment and protection against expropriation.

<sup>49</sup> Information on this procedure was inferred both from the dataset in IPPs (*infra*), as well as from descriptions of parts of the procedure in environmental impact assessments.

## II. THE INVESTMENT CONTEXT

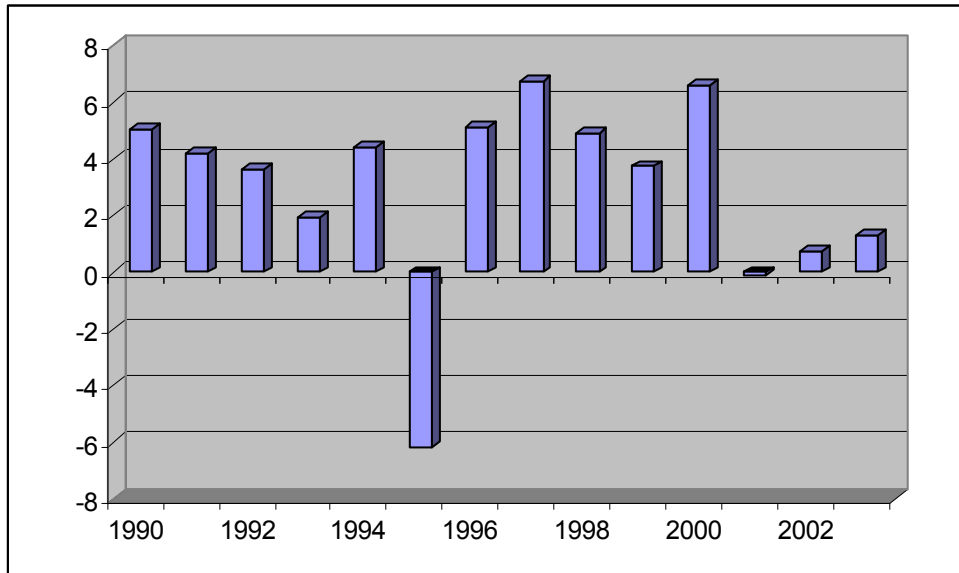
### A. Background.

During the last ten years, political, financial and legal reforms have driven an explosion of capital investment in the power sector. Although demand is expected to increase steadily during the next decade and the government has been successful in providing investors with an attractive business climate to the extent allowed under a nationalist legal framework, there are significant issues arising from the current power context which have the potential to further accelerate or hinder investment in the sector. After a brief introduction to the investment context in Mexico, such issues will be discussed as they relate specifically to IPPs.

### B. The Macroeconomic Context.

Mexico's membership in NAFTA since 1994 has substantially contributed to the country's growth in the last decade, with the GDP at a rate of 4%-5% per year between 1994 and 1999. In the last couple of years growth has strengthened due to rise in demand of Mexican exports from the US and the weaker dollar<sup>50</sup>. Currently, the energy sector accounts for 3% of Mexico's GNP, and oil export for 8% of its total exports.

FIGURE 7: MEXICO'S ANNUAL GDP GROWTH, 1990-2003



After the financial crisis and the peso devaluation in December 1994, a group of international lenders led by the United States provided over \$40 billion in international assistance to stabilize the economy<sup>51</sup>. Despite this recovery, the peso crisis introduced high levels of inflation, which persisted until 2003 (from 35% in 1995 to 5% in 2002). Fiscal discipline also helped raise the country's standing with the international financial

<sup>50</sup> Economist Intelligence Unit, *supra*, note 46.

<sup>51</sup> Energy Information Administration, *supra*, note 48.

community, and several rating agencies have recently upgraded Mexico's long-term foreign denominated debt from BB+ to investment grade BBB. On the down side, however, Mexico still has not addressed meaningful tax reform –a pillar of the administration economic policy together with the energy reform, crucial in so far as PIDIREGAS is concerned (*infra*)- because the President's party does not have a majority in Congress.<sup>52</sup>

### C. Private Forms of Financing in the Mexican Energy Sector.

As noted above, during the Salinas's administration comprehensive reforms were enacted in order to attract private investment in the country, ranging from membership in international organizations like OECD and WTO and trade agreements like NAFTA, to the removal of exchange controls and the amendment of domestic foreign investment laws. The *Foreign Investment Act* was amended to remove restrictions on entry to most economic activities and administrative procedures to start a business were greatly simplified<sup>53</sup>. However, the statute, pursuant to the constitutional text, *in principle*, continues to reserve the electricity sector to the state.

It is important to note that, in spite of constitutional and statutory obstacles which provide that “only the State can exploit” the industry, Congress has enabled private investors to participate not only in generation, but also in transmission of electricity, and more broadly, in distribution of natural gas and exploration of “non-associated” gas fields<sup>54</sup>. In the southeast and northeast of the country, the transmission grids are so stretched that new generation cannot be installed without bolstering the grid. Because of this, the CFE has contracted out with a consortium of ABB, Spain's *Isolux*, and Mexico's *Techint*, projects to install 466 miles of new transmission lines over a period of several years<sup>55</sup>.

Moreover, Mexico lacks the pipeline infrastructure to transport its abundant gas reserves over long distances to the major consuming areas in the north and the northeast. Given constitutional constraints in the natural gas sector, private investors got involved in developing infrastructure in “proven” gas reserves, but are not allowed to explore other basins. European companies are currently the most active investors in the sector, particularly Spain's *Gas Natural* and Belgium's *Tractebel*, as well as *Sempra* in the United States<sup>56</sup>. In order to promote private participation in the sector while avoiding constitutional challenges, PEMEX is using “multiple service contracts” (MSCs)<sup>57</sup> under

---

<sup>52</sup> *Id.*

<sup>53</sup> In general, authorization from the National Commission for Foreign Investments in the Ministry of Foreign Affairs is required in order to start a corporation. Applications for non-restricted business take 15 days to be granted while restricted businesses take 45 days. World Markets Research Centre, *supra* note 43 at 12.

<sup>54</sup> As for oil, legislation was amended in 1980 to allow private investment in secondary petrochemicals, with PEMEX retaining control over upstream activities.

<sup>55</sup> Energy Information Administration, *supra*, note 48.

<sup>56</sup> *Id.*

<sup>57</sup> MSCs are based on article 6 of the Oil Law which grants PEMEX the “right to hire contractors to improve operational efficiency, provided they do not receive an interest in production”.

which it is contracting with private investors for the building of pipelines and gas transportation in “non-associated” gas fields, particularly in the Burgos basin in the northeast.

Besides private participation in the industry through BLT and IPP schemes, there is a third scheme for supplementing the overall financing needs of CFE called “Public Funding” (widely used by CFE today), under which several works are being built by private developers<sup>58</sup>. However, it is only under the IPP and self-supply schemes that investors own and operate the built infrastructure (and thus the other forms of financing are not discussed in detail in this paper).

FIGURE 8: FINANCING SCHEMES FOR THE POWER GENERATION SECTOR IN MEXICO

SCHEME	DESCRIPTION
Build-Lease-Transfer (BLT)	<ul style="list-style-type: none"> <li>❖ Consists on the design, financing and commissioning of a power plant by private investors through a bidding procedure. Once in operation, the plant is leased to CFE for a period of 25 years after which it acquires the ownership of the plant. During the lease period, CFE is responsible for operation and maintenance of the plant.</li> <li>❖ Financed privately.</li> </ul>
Independent Power Producer (IPP) (BOO)	<ul style="list-style-type: none"> <li>❖ The developer designs, finances, builds and operates the plant and sells the output to CFE at the price determined in the PPA, which is awarded through a bidding process. Administrative authorization from CRE is required to start construction. Once in operation the plant is owned by the private entity.</li> <li>❖ Financed through PIDIREGAS scheme.</li> </ul>
Public Funding (PF)	<ul style="list-style-type: none"> <li>❖ The project developer (which can be a private entity) carries out all the necessary investments and when the facilities are ready, CFE must liquidate the amount invested in the project, for which CFE obtains long-term financing.</li> <li>❖ Financed through PIDIREGAS scheme.</li> </ul>

Source: Breceda, *supra* note 38 at 4.

#### D. The Experience of Investors in IPP Projects.

Despite stiff opposition from certain groups, it is generally accepted that Mexico’s SEN needs substantial capital injection to prevent a future supply crisis. The 2001-2006 National Energy Plan calls for \$34 billion –approximately \$5 billion a year- in electricity infrastructure investments. According to official projections, Mexico must expand its national installed capacity from its current 40,000 MW to 60,000 MW by the year 2012. Over half of this amount has been offered in IPP projects and is already in operation or under construction<sup>59</sup>. Foreign corporations like Spain’s *Unión Fenosa* and *Iberdrola*, U.S.-based *Sempra*, Japan’s *Mitsubishi*, Canada’s *Transalta*, and *InterGen* have been commissioned and currently operate large power plants throughout the country. To date, all IPP projects have been successful in basic terms, in light of the fact that:

- All IPP plants are currently in operation,

<sup>58</sup> Breceda, *supra* note 38 at 4.

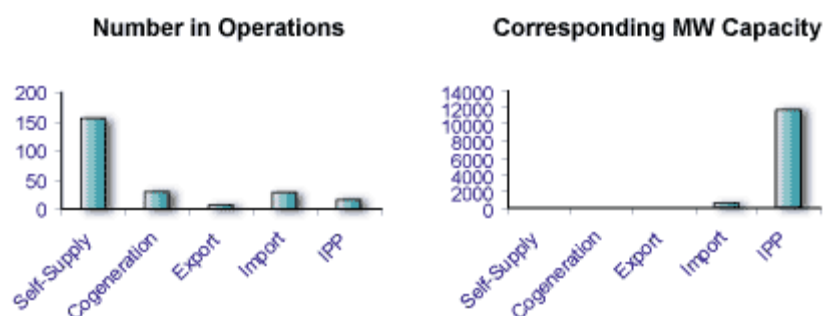
<sup>59</sup> Energy Information Administration, *supra*, note 48.

- No administrative authorization has been revoked, and
- There has been no default on payments to developers by CFE<sup>60</sup>

Private investors must meet all the requirements set by CFE in the bidding procedure in order to be awarded a PPA for the construction and operation of an IPP project. In particular, the main bidding criterion is the lowest cost for delivered electricity. In this sense, it is difficult for private firms to achieve viable rates of return. Companies which are subsidized by their governments, such as *Electricité de France*, might have an advantage over purely private companies, as not only are they willing to accept lower rates of return, but they can further reduce their financial costs thanks to cheap government loans<sup>61</sup>.

The highly competitive nature of the CFE bidding process may also encourage the various hybrid facilities that are emerging in Mexico, selling energy both to the grid and to captive industrial users or into U.S. markets. Because income from pure grid sales to CFE is so constrained, winning bids usually must arrange for additional income streams.

FIGURE 9: ADMINISTRATIVE AUTHORIZATIONS GRANTED BY CRE, 1994-2004



	Self-Supply	Co-Gen	Export	Import	IPP
<b>Under construction</b>	20	3	1	0	3
<b>In operation</b>	154	29	4	27	15
<b>Inactive</b>	1	2	1	0	0
<b>Starting works</b>	0	0	0	0	2
<b>Total Capacity (MW)</b>	4.6	2	2	184	11,478
<b>Generation (GWH/yr)</b>	24.5	12.6	15.5	487	79,260

Source: *Comisión Reguladora de Energía*

Despite these factors influencing investment decisions, an improved macroeconomic situation and further legal reforms to grant autonomy to CRE brought cheers to investors. In 1997 *AES Corporation* won the first IPP project PPA for the construction and operation of the 500 MW *Mérida III* plant, the first in the country after the passage of the IPP law. From that date until July 2003, the government has granted twenty authorizations for independent power production projects, for a total capacity of

<sup>60</sup> Cf. Miguel G. Breceda-Lapeyre, *Private Investment in Mexico's Electricity Sector (Technology and Energy Selection)*, North American Commission for Environmental Cooperation, Environment, Economy and Trade Program, Mexico, November 2002.

<sup>61</sup> *Id.*

11,500 MW. Fifteen of such projects are currently in operation, three are currently under construction and two are yet to begin work. In particular, the Spanish *Iberdrola* has more than 2000 MW of installed capacity in the most industrial-intensive cities, and has now passed LFC as the second largest-generator in the country.

E. Factors Affecting Outcomes in IPP Projects.

While IPP projects have so far been “successful” and capital investment and generation capacity in this subsector continues to increase, there are certain issues that have the potential to greatly affect the role of IPPs in the country and determine the success or failure both from the standpoint of investors and Mexican institutions; *i. e.* (i) debt capital sourcing; (ii) fuel supply issues; (iii) natural gas as state policy; and (iv) the politics of the energy sector legal reform<sup>62</sup>.

1. *Debt Capital Sourcing*

As highlighted above, the Mexican government wants to expand its national installed capacity by 28,000 MW by the year 2010 in order to satisfy the growing demand for power<sup>63</sup>, for which a \$5 billion annual investment (\$50 billion in total) in the sector will be required. The new power projects include 64 projects, of which 43 (17,698 MW) would be combined-cycle plants, financed under the IPP and PF schemes. CFE’s plan is to secure private investment to fund 70% of the needed investment amounts<sup>64</sup>. The government mechanism for financing both PF and IPP projects is discussed below.

(a) **PIDIREGAS**

In December 1995, the government enacted a financing arrangement called *Proyectos de Inversión Directa en Infraestructura con Registro Diferido en el Gasto* (PIDIREGAS, an acronym for “Long-term Productive Infrastructure Projects with Deferred Impact in the Recording of Expenditure”) as a response to the reduction in public revenues and loss of access to international financing brought about by the economic crisis of December 1994. Prior to the implementation of PIDIREGAS, construction of infrastructure projects was dependent on annual budget allocations. A series of legal amendments to the budget laws enabled PIDIREGAS as a mechanism to attract private investment by offering long-term, multi-year financing of “strategic” –oil, electricity and transportation- projects without subjecting them to budgetary cuts or delays due to the economic crisis<sup>65</sup>.

---

<sup>62</sup> Barry M. Machlin, *At the Crossroads?*, Challenges still exist in Latin America’s strongest power market, Global Power Report 2002, available at <http://www.mbpprojectfinance.com/news/crossroads.pdf> (last accessed October 2004).

<sup>63</sup> Juliette Kerr, *Mexico: Energy Reform, 2002, The Politics of Change*, World Markets Research Centre (2002)

<sup>64</sup> Barry M. Machlin, *supra* note 62.

<sup>65</sup> IPD Latin America, *PIDIREGAS: Viability or Crisis*, Third Annual Energy Law Seminar, AMDE-ITAM, October 10, 2002, at 2-4.

The main feature of the PIDIREGAS mechanism, applicable to both IPPs, BLTs and PF projects (*supra*), is the deferral of liability through account recording procedures. Under the law, in any given year, only the expenses accrued during the current and the next year is recorded as a liability by the state-owned enterprise providing the public service; i. e; CFE or PEMEX. The remaining portion of debt is treated as a contingent liability<sup>66</sup>.

Specifically to IPPs, these are BOO projects; i. e. built, entirely financed, owned and operated by the private sector. Once the project is completed, the investor retains full ownership of the project and CFE is contractually bound to purchase the energy output as provided for in the PPA. Under the PIDIREGAS mechanism, the purchase of electricity is recorded in the federal budget as a current cost, and the obligations for subsequent years are treated as contingent liabilities<sup>67</sup>.

While PIDIREGAS is an important means for the government to raise capital for badly needed investment in the electricity industry, it also creates liabilities for the government<sup>68</sup>. One of the main concerns is that this mechanism might be used mainly to bypass spending controls, and to move public investment off budget and debt off the government balance sheet, while the government still bears most of the risk involved and faces potentially large fiscal costs<sup>69</sup>.

PIDIREGAS financing also translates into a reduction in the amount of funds from the federal budget that otherwise would be available to other programs. Also, given that capacity payments to IPP projects are made in US dollars, and CFE revenue is fixed in Mexican pesos, CFE is exposed to exchange rate risk.

### **(b) Other Forms of Debt Financing**

Up to now, all of the IPP projects tendered have been underwritten by multilateral institutions and export credit agencies. However, IFIs, ECAs and commercial banks are reluctant to lend more in order to limit their exposure to the sector. Yet, capital needs are such that PIDIREGAS is becoming the largest share of the government's debt in the annual budget. Analysts point at the 2002 decision by international credit rating agency Standard & Poor's to upgrade Mexico's sovereign to investment grade as a signal to offer new funding sources, in particular bonds, which would not only bring about new capital but would also give more flexibility to international financial institutions and export-credit agencies in supporting the deals<sup>70</sup>.

The possibility of capital markets financing has been bolstered by the experience of recent IPP projects like *Monterrey III*, which have been self-financed by sponsors

---

<sup>66</sup> Morgan Stanley Equity Research Latin America, *Electric Utilities, Power to Converge*, Report Jan 27, 2003, at 27. Thanks to Erik Woodhouse for this reference.

<sup>67</sup> *Id.*

<sup>68</sup> IPD Latin America, *supra* note 65 at 15.

<sup>69</sup> At the end of the first quarter of 2002, CFE has recorded over 2 billion dollars in contingent liabilities (including both IPP and BLT projects). Morgan Stanley, *id.*

<sup>70</sup> Barry M. Machlin, *supra* note 62 at 2.

through the construction period entirely on balance sheet. Practitioners note that, while this is an expensive strategy, it is advantageous for sponsors which can support IPPs all through the start of commercial operations, since they find themselves with an asset with little or no construction risk. These projects could in turn be refinanced through bonds in the capital markets.<sup>71</sup>

## 2. *Fuel Supply Issues*

An important factor in the development of IPP projects has been the shift of fuel supply responsibility from CFE to PEMEX, the oil SOE (specifically through *PEMEX Gas y Petroquímica Básica*, one of its four subsidiaries, created during the Salinas's administration), as part of a separate contract between the latter and the IPP. In the first IPP projects CFE assumed the fuel supply risks associated with the output produced in its entirety. In *Mérida III*, the first IPP project after the passage of the IPP law, CFE typically contracted to buy 100% of the output, and fuel risk was passed-through. In latter projects like *Monterrey III*, *Bajío* and *Rosarito IV*, where the PPA provided for an excess capacity component, CFE absorbed the risk on the output, and a separate fuel supply agreement was negotiated with PEMEX (PGPB)<sup>72</sup>.

The transfer of fuel supply risks to an entity different from CFE is not yet exempt of problems, though. Practitioners note that “third generation” IPP deals (*infra*) have failed to coordinate the terms of fuel supply with the PPAs, exposing these projects and their sponsors and lenders to important risks. Often, PPA bids are based on assumptions about fuel supply costs, as the bid and PPA negotiation process precede the fuel supply negotiations. After a bid is submitted and the PPA awarded, sponsors may find that the fuel supply arrangements contain elements that expose the project to risks that must be addressed to permit a successful financing. In some cases, these issues have slowed the deal process and forced renegotiation of the financial structure of the contracts<sup>73</sup>.

## 3. *Natural Gas as a State Policy*

Mexican electricity generation is heavily based on fossil fuels. Thermal (oil, coal and natural gas) have historically accounted for approximately 80% of the total generating capacity.

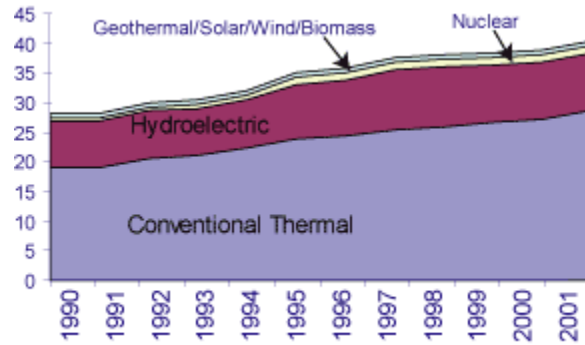
---

<sup>71</sup> *Id.*

<sup>72</sup> *Id.* at 4; IPP dataset (*infra*).

<sup>73</sup> *Id.*

FIGURE 11: INSTALLED GENERATION CAPACITY BY FUEL (THOUSANDS MW)



Fuel	1990	1992	1994	1996	1998	2000	2001
Conventional Thermal	19.1	20.68	22.43	24.46	26.02	27.23	28.65
Hydroelectric	7.76	7.99	8.17	9.33	10.03	9.63	9.63
Nuclear	0.68	0.68	0.68	1.31	1.31	1.37	1.37
Geothermal/Solar/Wind/Biomass	0.7	0.72	0.74	0.76	0.75	0.77	0.87
<b>Total Capacity</b>	<b>28.23</b>	<b>30.07</b>	<b>32.01</b>	<b>35.85</b>	<b>38.11</b>	<b>39</b>	<b>40.52</b>

Source: DOE/EIA

Today, oil-fired power plants still account for almost 50% of Mexican electricity generation, compared to 11% gas-fired and 10% coal-fired plants. However, the government is encouraging brownfield private investments to convert the majority of these plants into natural gas. Official estimates for the year 2012 forecast the share of natural gas generation as 63% of the total power production in the country, while the use of fuel oil is expected to decrease by 25%<sup>74</sup>. This is an important opportunity for private investors because the CFE in general cannot afford the cost of gas-fired electricity generation, which has to be imported due to lack of gas infrastructure, as oil had constituted the state's preferred fuel for decades.

There are historical reasons for the government's preference for oil as main fuel for electricity generation<sup>75</sup>. In a country with abundant oil reserves like Mexico, oil-fired power plants have been the most affordable option. Particularly during the period of import-substitution industrialization, policies were pursued to make the sector self-sufficient and therefore imports of fuels and technology were disfavored. As for coal, the majority of the country's coal reserves, located in Coahuila, are of low quality due to their high ash content and have thus been a more expensive option than oil for purposes of electricity production<sup>76</sup>.

While the country has important gas reserves, to date it lacks the necessary pipeline infrastructure to transport it over long distances, particularly because demand is

<sup>74</sup> Heavy reliance on natural gas opens questions about security of supply, price volatility and availability of associated technologies. For a detailed discussion, cf. Jorge M. Huacuz, *The road to green power in Mexico-reflections on the prospects for the large-scale and sustainable implementation of renewable energy*, ENERGY POLICY (mimeo).

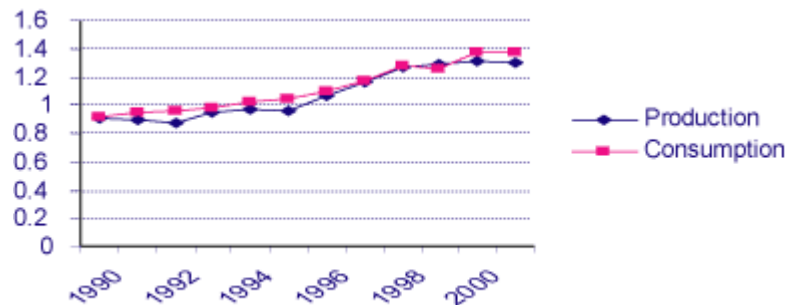
<sup>75</sup> Cf. Carreón Rodríguez et al., *The Mexican Electricity Sector: Economic, Legal and Political Issues*, PESD WORKING PAPER #23 (PESD, 2004), available at <http://pesd.stanford.edu/publications/20311>

<sup>76</sup> Energy Information Administration, *supra*, note 48.

concentrated in the industrial cities of the north, while gas is produced mostly in the southeast of the country. Besides, underinvestment by PEMEX has led to a decline in production, making the country a net importer of gas from the United States. Constitutional legal obstacles limit private investors' participation to non-associated natural gas production through the award of multiple service contracts<sup>77</sup>.

Current natural gas demand in Mexico is about 4.3 billion cubic feet per day (Bcfd) and is expected to grow over the decade to 9 Bcfd, at a rate of 7-8% over the 2002-2011 period, largely as a result of the privatization of gas distribution and, most importantly, of the growing use of gas in electricity generation, in particular in IPP projects. In 2001, the electricity sector accounted for 29% of natural gas consumption, and it increased to 36% by 2003<sup>78</sup>.

FIGURE 12: NATURAL GAS PRODUCTION AND CONSUMPTION, 1990-2001 (IN TCF)



	1990	1992	1994	1996	1998	2000	2001
<b>Production</b>	0.903	0.879	0.975	1.064	1.266	1.314	1.302
<b>Consumption</b>	0.918	0.959	1.026	1.103	1.284	1.38	1.372

In response to the increasing dependence on the United States in terms of natural gas exports, the administration's energy plans have declared natural gas as the preferred fuel for electricity generation and domestic use. Today Mexico has more than 4000 MW of combined cycle generating capacity, nearly all of which uses natural gas as main fuel. This policy emphasis on natural gas has shaped the IPP experience, as every project has used natural gas-fueled combined-cycle technology. The largest gas-fired power project in the country is *Iberdrola's* four unit *Monterrey III* plant, with more than 1000 MW of installed capacity. The CFE also operates *Samalayuca II*, a plant with capacity greater than 750 MW, which was built by a consortium of US and Mexican companies (*GE Power Systems, GE Capital Services, El Paso Energy Corporation* and *Grupo ICA*) under the BLT scheme. This project utilizes natural gas via pipelines coming from the United States.

#### F. The Politics of the Energy Reform.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.*

As IPP deals have been organized with an increasing degree of sophistication, pressure has been put on CFE and on CRE to reconcile the needs of the market with current regulatory frameworks. To that end, in 2002 President Fox –widely supported by the Ministry of Energy and the regulator- submitted a bill (*supra*) to amend the Constitution and statutory law of the electricity sector.

There are three factors that have made these reforms impossible to date. First, constitutional obstacles that prevent private entities from participating in most subsectors in the energy industry; second, frustrating events like the California crisis in 2001, and third, Mexico’s negative experiences with the privatization of the banking, transportation and telecommunication sectors<sup>79</sup>. Moreover, the failure of Zedillo’s 1995 proposal to restructure the industry (*supra*) is an example of the obstacles Fox is likely to face, particularly since his party, the conservative right-wing *Partido Acción Nacional* (PAN) does not have a majority in Congress and there is also further divisiveness inside the party as the next presidential candidacy approaches.

Success of the electricity reform will find an obstacle in tariffs, too. Residential users pay only 39% of their real electricity consumption, and agricultural users only 26%. The government pays for one-third of the electricity bills in the country, but for decades have not paid for its own electricity consumption and it is a common occurrence that the SOE employees got light in their homes for free. Moreover, notwithstanding reforms to give the Ministry of Energy authority over the Mexican electricity sector and the creation of the CRE as the independent regulator, the Ministry of the Treasury sets the tariffs (proposed by CFE) “for public purposes”, which respond to macroeconomic needs and have not been compatible with the needs of a self-sustaining power sector. Agriculture and residential users are highly subsidized since the 1930s, and it is estimated that reforms could increase electricity rates by 85%<sup>80</sup>.

#### 1. *Opposition to Reforms.*

Many opponents of legal reform in Mexico contest the government’s claims on the basis that official forecasts for power demand expansion are inflated and that public debt levels are still quite manageable. Opponents to private investment claim that the Fox’s administration has exaggerated electricity demand projections and overestimated the amount of investment needed to cope with demand, particularly in light of the low GDP growth registered during the past few years<sup>81</sup>. As for tariffs, people familiar with the matter say that estimate implies subsidies that are more than double their true size<sup>82</sup>.

Another of the arguments advanced to oppose reforms since the mid-1990s is that the restructuring process is aimed at formalizing trade in energy –electricity and gas- with

---

<sup>79</sup> In general, privatization of these industries brought along competition; however, these services were heavily subsidized for decades and therefore, substantial price increases created popular opposition to privatization.

<sup>80</sup> Luis Cueto Preciado, *Negotiations and Legislative Strategies for Allowing Private Investment in Mexico’s Electric Sector*, The Monterey Institute for International Studies, May 2002.

<sup>81</sup> World Markets Research Centre, *supra* note 43 at 29.

<sup>82</sup> Luis Cueto Preciado, *supra* note 82.

the United States rather than to cope with domestic demand<sup>83</sup>. The policies and statutory reforms introduced in the Salinas's administration were in part aimed at addressing the political pressure during the NAFTA negotiations, particularly in light of the more flexible environmental legislation existing in Mexico as compared to that of the United States. The IPP law enabled the construction of power plants in the north of the country for export purposes, a strategy preferred by many developers precisely due to the less stringent environmental regulations in Mexico<sup>84</sup>.

### (a) Popular Opposition

“Privatization” is a controversial word in Mexico. Popular opinion has been persuaded by unions that Fox's reform is a step towards privatization of the industry. After hinting that PEMEX might be sold out to the private sector during his electoral campaign, popular opposition forced Fox to officially state that he would not seek to privatize the energy sector<sup>85</sup>; but only to “allow private investment and foster competition” without compromising the Mexican patrimony. Since the nationalization of the oil and electricity industries, energy as a whole has been a symbol of national sovereignty and a matter of Mexican pride among the population<sup>86</sup>. Besides, the lack of success with the privatization of the telephone industry among the population at large has precluded support for further privatization reforms in other industries, particularly as the conventional knowledge is that tariffs for electricity consumption will substantially increase if privatization takes effect.

### (b) The Right and the Left in the Federal Congress

In Congress, both the right and the left opposed Zedillo's reforms in 1997, and today the left oppose Fox's reforms. Back in 1997 the left-wing parties PRD and the radical PT (*Partido del Trabajo*) stuck to their position that the state should run the economy and not surrender to the market, because that would allow private corporations, especially foreign ones, to take control of the “competition process” and enrich themselves by exploiting the sovereign patrimony of all Mexicans. The left wing argued that this was the program imposed by the World Bank, the IMF and the United States, a

---

<sup>83</sup> Cf. NACLA, *Privatization and Its Discontents*, Report on the Americas, Volume XXXCI, No. 3, Jan/Feb 2003.

<sup>84</sup> However, the number of administrative authorizations granted by CRE and the electricity generated for export purposes is marginal when compared to the share that IPPs are generating for domestic use, which hints that export to the US is not the government's primary strategy for restructuring the industry, at least not in the short term. *Cf. supra* at fig. 9.

<sup>85</sup> Secretaría de Energía, *Prospectiva del Sector Eléctrico*, 2002-2001.

<sup>86</sup> Similarly, there is strong political opposition with regards to private investment in natural gas exploration. In 2001 the Senate questioned PEMEX on the legality of multiple service contracts, claiming that they were an attempt to introduce “concessions”, which are forbidden by the Constitution. PEMEX defended its position by arguing that the contracts cover exploration of “proven” reserves only, and therefore are allowed by the statute that authorizes PEMEX to celebrate services contracts with other entities. While political opposition continues and lawmakers have threatened to start a constitutional controversy before the Supreme Court, PEMEX has been awarding multiple service contracts to foreign companies like *Repsol-YPF*, *Petrobras*, and *Lewis Energy Group*. World Markets Research Centre, *supra* note 43.

“conspiracy to steal the strategic and patrimonial assets of the Mexican people and to deliver them to agents of international capital.”<sup>87</sup> The disastrous Mexican privatizations of telecommunications and finance, which have created monopolies or foreign oligopolies and increased bills, provided left-leaning critics with good examples to oppose more privatizations<sup>88</sup>.

On the other hand, when the PRI introduced its own restructuring bill (Zedillo’s) in 1997, the right-wing PAN argued that there was no need to privatize existing infrastructure and divest the SOEs. The only thing needed was to introduce ‘private participation’ in the construction of new existing infrastructure. The PAN’s position was that transmission and distribution should remain in the state’s hands, and that private competition should only be introduced in the power generation sector<sup>89</sup>. However, PAN today has a platform for reform that, although marginally different in detail, pursues the same goals (in the long-term, privatization) as the PRI bill six years earlier. At that moment, the PAN declined support to the PRI because the presidential race was strongly favoring Fox, leading the PAN to reserve its own bill until after a favorable result in the presidential elections. A similar subordination of energy policy to political strategy is repeating itself today; consensus (between PAN and PRI) will be difficult to achieve as political parties prepare for the next elections.

#### **(c) Unions.**

Unions have constituted an important constituency for the PRI for decades, and while these groups were weakened during the Salinas administration, they continued to maintain a privileged position in the government until the PRI’s defeat in 2000. The electricity unions SUTERM and SME were crucially responsible for the failure to approve Zedillo’s privatization proposal, when they formed the “National Front of Resistance” to the privatization of the electricity industry, collected millions of signatures against the bill and demonstrated on the streets, ultimately preventing its approval in Congress<sup>90</sup>.

During the Fox Administration, relations between unions –particularly the oil union- and the government have changed in nature. In particular, union members are no longer protected from criminal investigation for corruption, including recent charges against the oil union for the illegal transfer of funds to support the PRI’s presidential candidate last election. However, the electricity unions continue to openly voice their opposition to reform, and their potential impact, while difficult to predict with confidence, should not be underestimated.

#### **(d) The Political and Economic Power of the Incumbent**

---

<sup>87</sup> Cámara de Diputados, *Diario de Debates*, Nov. 16, 1999 at [www.cddhcu.gob.mx/servddd](http://www.cddhcu.gob.mx/servddd); NACLA, *supra* note 85.

<sup>88</sup> *Id.*

<sup>89</sup> Luis Cueto, *supra* note 82 at 2(7).

<sup>90</sup> *Cf.* NACLA, *supra* note 85.

Notwithstanding arguments advanced by the opposition, the available data on private financing of infrastructure (both through PF and IPP schemes) show that CFE's dominance within the electricity sector is beginning to wane as it confronts its inability to cope with growing demand. At the same time, IPPs are starting to secure a significant market share. In particular, the Spanish *Iberdrola* will soon have 4000 MW of installed capacity in the most industrial intensive cities, and has now passed LFC as the second largest-generator in the country.

### III. THE UNIVERSE OF MEXICAN INDEPENDENT POWER PRODUCERS

#### A. Overview of the IPP Sector in Mexico.

Official federal sources and records were consulted to compile this universe of independent power producers. This required reviewing all CFE bidding documents and administrative authorizations for IPP projects granted by the CRE between 1994 and 2004. This data was further refined by referring to the World Bank Private Participation in Infrastructure Database, "project abstracts" in the databases of international financial institutions (particularly IFC and IADB), environmental impact assessments (when available in the World Bank, IFC and IADB's databases), and project descriptions in company websites. When differences in data were found among these sources, a decision was made to rely on information in company's publications. The dataset is presented below.

FIGURE 13: THE UNIVERSE OF INDEPENDENT POWER PRODUCERS

Project Name	Mexican Company	Parent Consortium	Fin. close	MW	Invest. amount millions	Fuel	Fuel Supplier	Type of Plant	Status/ Date
Mérida III	AES Mérida III	AES (US), Nichimen (JP), Hermes (MX)	1998	531.5	260	Nat'l gas/diesel	CFE	Combined cycle	Operation 02/28/00
Hermosillo	Fuerza y Energía de Hermosillo	Unión Fenosa Desarrollo y Acción Exterior, S. A.	1999	252.7	160	Nat'l gas/diesel	El Paso (Sempra)	Combined cycle	Operation 10/01/01
Río Bravo (aka Anáhuac)	Central Río Bravo	E.D.F. Internacional,	2000	568.6	234.5	Nat'l gas/diesel	CFE	Combined cycle	Operation 01/18/02
Saltillo	Central Saltillo	E.D.F. Internacional	2000	247.5	160	Nat'l gas/diesel	CFE	Combined cycle	Operation 11/18/01
Bajío (aka El Sauz)	Energía Azteca	InterGen Aztec Energy VIII,	2000	597	230	Nat'l gas/diesel	CFE	Combined cycle	Operation 11/15/01
Monterrey III	Iberdrola Energía Monterrey	Iberdrola Energía,	2000	570	609.9	Nat'l gas	PGPB	Combined cycle	Operation 03/27/02
Campeche	Transalta Campeche	Transalta Energy Corp.	2000	275	200	Nat'l gas	PGPB/Mayakán	Combined cycle	Operation 05/28/03
Altamira II	Electricidad Águila de Altamira,	Mitsubishi Co.	2002	565.30	300	Nat'l gas	PGPB	Combined cycle	Operation 05/01/02
Naco-Nogales	Fuerza y Energía de Naco-Nogales	Unión Fenosa Acción y Desarrollo Exterior,	2002	339.3	136	Nat'l gas	El Paso	Combined cycle	Operation 08/31/03
Rosarito IV	Energía Azteca X	Intergen Aztec Energy X	2002	597.25	n/a	Nat'l gas	Sempra	Combined cycle	Operation 07/20/03
Tuxpan III-IV	Fuerza y Energía de Tuxpan	Unión Fenosa Desarrollo y Acción Exterior	2003	1120	250	Nat'l gas	PGPB	Combined cycle	Operation 05/23/03
Altamira III-IV	Iberdrola Energía Altamira,	Iberdrola Energía	2003	1153.7	570	Nat'l gas	PGPB	Combined cycle	Operation 10/01/03
Chihuahua III	Transalta Chihuahua	Transalta Energy Corp.	2003	317.9	202	Nat'l gas	Enron/CFE	Combined cycle	Operation 08/15/03

This chart includes all IPP projects in operation. There are three more IPPs which have been approved by the CRE and are currently under construction (*Río Bravo III*, *Río*

*Bravo IV* -both located in Tamaulipas, with capacity of around 540 MW and awarded to *Electricité de France*) and *La Laguna II* (517.8 MW, awarded to *Iberdrola*). There are other 5 IPP projects currently undergoing bidding procedures (*Mexicali II*, *Tuxpan V*, *Altamira V*, *Valladolid III*, *Tamazunchale I*).

Several patterns can be inferred from this chart and official documents related to each of these projects. First, as for the type of contract, all IPP projects are BOO contracts. Second, they all use natural gas as main fuel and utilize combined-cycle technology. Third, with respect to ownership structures, all IPP projects are foreign, entirely or in majority stakes. Fourth, because Mexican investment laws allow such projects be done only by Mexican corporations, foreign companies establish Mexican corporations, limited liability companies and joint ventures (“special purpose companies”) for the sole purposes of executing the individual IPP projects. Fifth, immediately apparent variation among projects is only found in the fuel supply contracts, which will be explained in greater detail below.

This section outlines a few IPP projects representative of the issues discussed earlier, including the two failed projects which were abandoned before the passage of the IPP law. IPP Projects can be classified into 3 phases, whose characteristics are defined by the Ministry of Energy as follows:

FIGURE 14: GENERATIONS OF IPP PROJECTS

GENERATION	CHARACTERISTICS	IPP PROJECTS
<b>1<sup>st</sup> Generation</b>	<ul style="list-style-type: none"> <li>❖ No possibility of early termination of the contract.</li> <li>❖ CFE assumes fuel supply risks in 100%.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Mérida III</li> </ul>
<b>2<sup>nd</sup> Generation</b>	<ul style="list-style-type: none"> <li>❖ Contract provides the possibility of early termination.</li> <li>❖ PPA includes the choice for the power producer to buy the fuel from CFE or from another provider.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Hermosillo</li> <li>❖ Río Bravo</li> <li>❖ Saltillo</li> <li>❖ El Sauz</li> </ul>
<b>3<sup>rd</sup> Generation</b>	<ul style="list-style-type: none"> <li>❖ Revised exit clause.</li> <li>❖ Contract provides the possibility of incorporating additional capacity to the contract amount, including self-supply or third-party sales.</li> <li>❖ Fuel supply contracts negotiated separately, in general with PEMEX (PGPB).</li> </ul>	<ul style="list-style-type: none"> <li>❖ Monterrey III</li> <li>❖ Bajío</li> <li>❖ Rosarito IV</li> </ul>

Although not proposed for case-study selection for not complying with the criteria outlined in the research protocol<sup>91</sup>, the following is a brief description of *Carbón II* and *Rosarito*, the two IPP projects cancelled before the passage of the IPP law. *Samalayuca*, the largest BLT project—managed by CFE—has also been included, as well as *Río Bravo IV* and *Altamira V*, two post-IPP law BOO projects for which construction has been completed but which have not yet started operations, as they present interesting comparisons with the projects selected for individual study.

<sup>91</sup> Victor et al., *supra* note 1.

B. Miscellaneous Power Projects.

1. *Failed Projects (pre-1992 IPP Law).*

<b>CARBON II</b>	
<b>Location</b>	State of Coahuila
<b>IPP Scheme</b>	Build-Lease-Transfer (would-be greenfield project)
<b>Investors</b>	Mission Energy, an independent power affiliate of Southern California Edison and CFE, with joint-venture partner Grupo Acerero del Norte
<b>Capacity</b>	1400 MW
<b>Fuel</b>	coal
<b>Status</b>	cancelled
<b>Remarks</b>	This project would have been the first privately-owned electricity plant in Mexico. The project, located only 18 miles from the US border, faced criticism because discharges flowing across the border into Texas would not meet US environmental standards. When construction had already begun, Mission Energy announced its pull-out from Carbón II, and the project went in limbo. Arguably, the reason for termination was pressure from US environmentalists to install scrubbers (required by US, but not Mexican, environmental laws) <sup>92</sup> .

<b>ROSARITO</b>	
<b>Location</b>	State of Coahuila
<b>IPP Scheme</b>	Build-Lease-Transfer (would-be brownfield project)
<b>Investors</b>	Tri-National Power (Community Energy Associates, Nova Corporation of Alberta and Pan Alberta Gas, Ltd., Grupo de Planeación y Proyectos de México)
<b>Capacity</b>	600 MW
<b>Fuel</b>	Coal
<b>Status</b>	Cancelled
<b>Remarks</b>	The aim of the BLT was to re-power the plant and eventually increase capacity to 2,200 MW. Six of the current power plant's oldest coal-fired units would be replaced with gas-fired turbines rather than building a new plant. The contract between Tri-National and CFE was terminated. Arguably, the reason for

<sup>92</sup> *SOCAL ED Affiliate Mission Acquires 49% of 1400 MW Coal Plant in Mexico*, ELECTRIC UTILITY WEEK, April 27, 1992, INTERNATIONAL POWER at 15; *Mission buys into 1400 MW Coal Plant in Mexico, Private Power needs Swell*, INDEPENDENT POWER REPORT, April 24, 1992 at 1.

	termination of the contract was that the newly enacted IPP law –which provided for bidding- was more advantageous than the negotiated approach used with Tri-National two years before <sup>93</sup> .
--	--

2. *Successful BLT Projects in Operation.*

<b>SAMALAYUCA II</b>	
<b>Location</b>	State of Chihuahua
<b>IPP Scheme</b>	Build-Lease-Transfer
<b>Investors</b>	US-based General Electric (40%); Mexico’s Empresas Ingenieros Civiles (10%); El Paso Energy (30%) and International Generating Company of Boston (a joint venture between Bechtel and PG&E Enterprises, 20%)
<b>Investment Amount</b>	\$647 million (\$440 million in non-recourse loans from 4 commercial banks; \$75 million in construction loans and 10-yr term financing).
<b>Multilateral Guarantees</b>	Inter-American Development Bank; political risk insurance provided by US Ex-Im Bank
<b>Capacity</b>	717 MW
<b>Fuel</b>	natural gas (pioneer plant)
<b>Technology</b>	combined-cycle
<b>Fuel Supplier</b>	El Paso Energy (via a pipeline from Texas)
<b>Status</b>	operational since 1998
<b>Remarks</b>	CFE is operating this project via a 20-year lease-to-own arrangement. This is the largest privately-built, state-operated project to date.

4. *Closed IPP (BOO) Deals, Beginning of Operations Expected.*

<b>RIO BRAVO IV</b>	
<b>Location</b>	State of Tamaulipas
<b>IPP Scheme</b>	Independent Power Production (BOO contract)
<b>Investors</b>	Electricité de France, through EDFI, S. A. (100%)
<b>Investment Amount</b>	\$292 million USD

<sup>93</sup> *Mission’s 1400 MW Mexican Project Imperiled by Environmental Concerns*, INDEPENDENT POWER REPORT, August 27, 1993, INTERNATIONAL POWER at 14.

<b>Multilateral Guarantees</b>	International Finance Corporation, through A loan of \$50 million (for IFC's own account) and a B loan of \$168 million (for the account of participants)
<b>Capacity</b>	568 MW
<b>Fuel</b>	Natural gas
<b>Technology</b>	Combined-cycle
<b>Fuel Supplier</b>	Private (Tennessee Gas Pipeline and Gasoducto del Río)
<b>Status</b>	Commercial operation expected in April 2005
<b>Remarks</b>	<p><i>Bidding price:</i> EDFI was awarded the contract on the basis of the most competitive bid, at 2.9328 cents per kwh.</p> <p><i>Gas supplier:</i> The contract includes the choice for the power producers to buy the fuel directly from CFE or from another provider. Until 2021, the gas will be supplied by Cinergy Marketing and Trading, which will be providing gas from the US via two pipelines, a 16 km-pipeline owned by Tennessee Gas Pipeline and a 52 km-pipeline owned by Gasoducto del Río, a Mexican subsidiary of EDFI.</p>

<b>ALTAMIRA V</b>	
<b>Location</b>	State of Tamaulipas
<b>IPP Scheme</b>	Independent Power Production (BOO contract)
<b>Investors</b>	Iberdrola Energía (100%)
<b>Investment Amount</b>	\$ 550 million USD
<b>Multilateral Guarantees</b>	n/a
<b>Capacity</b>	1150 MW
<b>Fuel</b>	Natural gas
<b>Technology</b>	Combined-cycle
<b>Fuel Supplier</b>	CFE
<b>Status</b>	Commercial operation expected in 2006
<b>Remarks</b>	<p><i>Size:</i> Altamira V is the largest IPP project awarded to date. This new plant, together with Monterrey III, will raise Iberdrola's generating capacity to 3814 MW, turning it into the largest private generator in the country after CFE.</p>

	<p><i>Power Sales:</i> Like all third generation IPPs, the contract provides for the possibility of incorporating capacity additional to the one planned by CFE and set in the contract, depending on the needs of the power producer, including co-generation (for self-supply) and even the possibility of contracting the latter with third parties.</p> <p><i>Supply Arrangements:</i> The CFE will supply the gas under a dollarized contract.</p>
--	---

C. Operating IPP Projects.

This section presents more detailed description of three cases that, pursuant to the criteria set forth in the research protocol are being proposed for closer examination. Selection for in-depth study was based upon variation in the “generation of IPP law” highlighted above (*supra*), and for variation in fuel suppliers. Additionally, the selection considered variation in terms of the role of investors in the project; *i. e.* the status of the sponsor in the home country, the existence of an “in-house” operator vs. subcontractor for operation and maintenance, as well as the multilateral financial institution supporting the project.

1. *First Generation of IPPs.*

MERIDA III	
<b>Location</b>	State of Yucatán
<b>IPP Scheme</b>	Independent Power Production (BOO contract)
<b>Investors</b>	AES (55%; operator); Nichimen Corp. (25%); Grupo Hermes (20%)
<b>Investment Amount</b>	\$ 231 million USD
<b>Multilateral Guarantees</b>	International Finance Corporation (\$30 million A loan + \$74 million B loan)
<b>Capacity</b>	495 MW
<b>Fuel</b>	Natural gas
<b>Technology</b>	Combined-cycle
<b>Fuel Supplier</b>	CFE
<b>Status</b>	Operational since 02/28/00

*Mérida III* is a 484 MW combined-cycle, gas-fired power generation facility located in Parque Industrial Felipe Carrillo Puerto, southwest of the city of Mérida, in the state of Yucatán. *Mérida III* was the first IPP project completed in an emerging market

economy after a macroeconomic crisis, as electricity sector reforms and the rapid recovery of the Mexican economy by 1995 attracted foreign energy companies. *Mérida III* was awarded to *AES Mérida III*, among a pool of 19 bidders<sup>94</sup>, with an offer to generate power at a price of less than 3 cents/kwh, below the subsidized SOE power tariff of 4-5-6 cents/kWh at the time<sup>95</sup>.

The project consists of two Westinghouse 501 F gas-fired turbines, two heat recovery steam generators and a single steam turbine. The leading sponsor (and operator) of the project is *AES Corporation*, one of the largest independent power producers in the world. The other sponsors are *Nichimen Corporation* of Japan, one of the world's leading trading companies, and Mexico's *Grupo Hermes, S.A. de C.V.*, a Monterrey-based industrial group which services the energy, automotive and service sectors. *AES* and *Nichimen* (but not *Grupo Hermes*, which hints at its role as a local partner only) established *AES Mérida III, S. de R.L.* to operate the plant after CFE awarded the PPA in February 1997. The project was built by Westinghouse under a turnkey contract and started operations in June 2000<sup>96</sup>.

The PPA (BOO contract) provided for the sale of the entirety of output to CFE for 25 years. The fuel supplier is CFE, which purchases the gas from privately owned and operated *Mayakán* Pipeline. *Mayakán* is a 690 km, \$266 million pipeline going from Tabasco to Mérida. The pipeline is owned by *Energía Mayakán* (a consortium of *Gaz de France* –which acquired *TransCanada's* 67.5% stake in 2000); *InterGen* (a joint venture between *Shell* and *Bechtel*) and Mexico's *Gutsa Construcciones*. The project sells 270 cubic feet per day to CFE who in turn facilitates the fuel to the *Mérida III*.

*Mérida III* was the first IPP project awarded after the passage of the 1992 IPP law, and the first true BOO contract signed ever since the nationalization of the industry in 1960. It also set the blueprint for international financial institutions's direction in the industry. Since *Mérida III*, all projects have complied with either IFC or IBRD policies, potentially establishing an avenue for IFIs to exert an influence on the regulatory reform/privatization of the sector<sup>97</sup>.

---

<sup>94</sup> Bidders waited three years for the *Mérida III* project to be awarded from the time the first international tender was published in May 1994. The bidding process was postponed several times in October 1995, April 1996, July 1996, and October 1996. Technical bids were finally submitted on November 1996.

<sup>95</sup> Jonathan Doh and Erik Holt, *A Tale of Two International Projects in Emerging Markets: Enron in Dabhol, India and AES in Merida, Mexico*, Dept. of Management, College of Commerce and Finance, Villanova University (2003).

<sup>96</sup> For purposes of this country study, this project lacks a detailed background description of the sponsor's role in the domestic market as AES, which is the main player (operator) of the plant, has no more presence in Mexico other than through *Mérida III*. AES is one of the largest independent power producers in the world (mostly through PPAs); however, except for a few projects in Argentina and Brazil, its business is not focused on the Latin American region. AES, *The AES Investor Fact Book*, September 2003.

<sup>97</sup> IFC, Summary of Project Information, *Mérida III*, available at <http://ifcfn101.worldbank.org/IFCExt/spiwebsite1.nsf/2bc34f011b50ff6e85256a550073ff1c/f49db5c83ffad7988525688e00784057?OpenDocument>

*Mérida III* is the only project considered “unsuccessful” to a certain extent, and this is for reasons of timing. During 1995, adverse economic conditions postponed construction due to the shortage of turbines in the market.

2. *Second Generation of IPPs.*

<b>RIO BRAVO II (aka Central Anáhuac, S. A.)<sup>98</sup></b>	
<b>Location</b>	State of Tamaulipas
<b>IPP Scheme</b>	Independent Power Production (BOO contract)
<b>Investors</b>	Electricité de France, through EDFI, S. A. (100%)
<b>Investment Amount</b>	\$ 34.5 million USD
<b>Multilateral Guarantees</b>	International Finance Corporation, with IFC’s investment comprising \$50 million in "A" Loan, \$110 million in "B" Loan and \$5 million in "C" Loan.
<b>Capacity</b>	495 MW
<b>Fuel</b>	Natural gas
<b>Technology</b>	Combined-cycle
<b>Fuel Supplier</b>	CFE
<b>Status</b>	Operational since 01/18/2002

The *Río Bravo II* (aka *Central Anáhuac*) project is located near the municipality of Valle Hermoso, in the state of Tamaulipas, approximately 23 kms from the Mexico-U.S. border. It was developed in 1999 by EDFI. The plant is adjacent to two other *Electricité de France* (EDF) projects, *Río Bravo III* and *Río Bravo IV*, all developed by EDFI.

The *Río Bravo II* project consists of the construction and operation of a natural gas-fired combined cycle power plant of 495 MW (layout 2-2-1). The project includes two Westinghouse 501 F combustion turbine generators each rated at 180 MW, a recovery steam generator and a 160 MW steam turbine generator. The proposed technology (501F Westinghouse gas turbines) is considered an advanced technology with high thermal efficiency of about 55%. The plant uses natural gas as main fuel and diesel as alternative. Operation and maintenance of the plant is done by *Compañía Mexicana de Gerencia y Operación* (COMEGO), a 100%-EDF owned subsidiary with 177 employees (including those onsite) which manages and operates all EDFI plants.

<sup>98</sup> International Finance Corporation, *Summary of Project Information: Río Bravo [II]*, available at <http://ifcln101.worldbank.org/IFCExt/spiwebsite1.nsf/2bc34f011b50ff6e85256a550073ff1c/daa60f3bf8705b9b8525688e00786291?OpenDocument>

*Río Bravo II* is selling all its output to CFE under a 27-year PPA based on an annual plant load factor of 80%. The fuel is provided by CFE, as initially arranged in the contract. This project has been influenced by recent regulatory reforms to liberalize the natural gas industry. Because the PPA provided the choice for the power producer to buy the fuel from CFE or from another provider, once the pipeline *Gasoducto del Río* is completed, it will supply the fuel to this plant as well as other EDF projects and a PEMEX-owned plant in the area (*supra*).

The project sponsor is *Electricité de France International, S.A.* (EDFI), a wholly owned subsidiary of EDF with operations outside of France in electricity generation, transmission and distribution. The special purpose company, *Central Anáhuac, S.A.*, is 100% owned by EDFI. The project had a cost of \$234 million, with IFC's investment comprising \$50 million in "A" Loan, \$110 million in "B" Loan and \$5 million in "C" Loan.

After the passage of the 1992 IPP law, EDF positioned itself as the leading player in the independent power production sector in Mexico. EDFI owns and operates five combined-cycle plants in the country: *Río Bravo II*, *Río Bravo III*, *Río Bravo IV*, *Saltillo* (100%) and *Altamira II* (a joint venture between EDF -51%- and *Mitsubishi* -49%), totaling an installed capacity of 2230 MW, or \$1280 million investments. The *Saltillo*, *Río Bravo II* and *III*, and *Altamira III* plants were put into operation over the period going from December 2001 to April 2004, while *Río Bravo IV* is expected to start operations in April 2005. EDFI is financing, building and operating a 56 km-pipeline (410,000 MM btu/day) connected to the border with the United States, to supply its three *Río Bravo* (*II*, *III* and *IV*) plants, as well as PEMEX-owned *Río Bravo I* plant<sup>99</sup>.

EDFI's total business in Latin America in 2003 was 2 billion, about 4% of its total business<sup>100</sup>. Although the company has been profitable in Mexico (*Central Anáhuac* had a \$159.34 million turnover in 2003), Mexican IPPs account for a small share in its business activity in the region as a whole. Because of losses with *Light*, its Brazilian distributor, in 2003 the company decided to focus its operations in Europe<sup>101</sup>.

The status of the parent company in its home country might be an interesting issue to explore in its relation to outcomes in IPP projects. As a company heavily subsidized by its government, EDF might have an advantage over purely private companies in so far as it is able to accept lower rates of return because of availability of government financing<sup>102</sup>. As of today, EDF is owned 100% by the French government, and it benefits from a special legal status called *Etablissement Public a Caractère Industriel et*

---

<sup>99</sup> EDF, *Les implantations du Groupe EDF au Mexique*, available at [http://www.edf.fr/index.php4?coe\\_i\\_id=1#](http://www.edf.fr/index.php4?coe_i_id=1#)

<sup>100</sup> Groupe EDF, *Organisation et chiffres clés 2003; Rapport annuel 2003*, both available at [http://www.edf.fr/index.php4?coe\\_i\\_id=233](http://www.edf.fr/index.php4?coe_i_id=233)

<sup>101</sup> David Hall, *Electricity in Latin America 2004*, Public Services International Research Unit, University of Greenwich, July 2004 available at <http://www.psuru.org/reports/2004-07-E-Latam.pdf>

<sup>102</sup> In particular, *cf.* information on the *Río Bravo IV* project, which was awarded by CFE to EDFI on the basis of EDFI's offer of the lowest bid, at 2.9328 cents/kwh.

*Commercial* (EPIC), which grants bondholders an ultimate implicit recourse to the French government. However, in July 2004 the French Parliament passed a law<sup>103</sup> which authorizes the restructuring of EDF into a limited liability company, with the aim of making the company more competitive and to adapt it to a European directive of June 2003, and which will ultimately take place by the end of year 2004. Notwithstanding this change, the government will maintain a 70% stake in the company and 15% will be reserved to employees<sup>104</sup>. Analysts note that the maintenance of this majority stake and EDF's role in the French energy sector will assure that the government will continue to support the company and will prevent it from falling below investment grade level<sup>105</sup>.

### 3. *Third Generation of IPPs.*

<b>MONTERREY III</b>	
<b>Location</b>	State of Nuevo León.
<b>IPP Scheme</b>	Independent Power Production (BOO contract).
<b>Investors</b>	Iberdrola (100%).
<b>Investment Amount</b>	\$ 609.9 million USD (\$152.5 million equity + \$75 million A loan + \$382.4 million B loan) <sup>106</sup>
<b>Multilateral Guarantees</b>	InterAmerican Development Bank; through an A loan of \$75 million and a B loan of \$382 million
<b>Capacity</b>	1000 MW, comprised of a combined-cycle power plant (570MW IPP / 620MW self-supply), and a 35 MW steam cogeneration facility.
<b>Fuel</b>	Natural gas.
<b>Technology</b>	Combined-cycle.
<b>Fuel Supplier</b>	PGPB ( <i>PEMEX Gas y Petroquímica Básica</i> ).
<b>Status</b>	Operational since 03/27/02

*Monterrey III* is the largest power project in operation to date. It consists of a 1,140 MW combined cycle power plant in the town of Pesquería, State of Nuevo León. It is located next to two state-owned power plants, *Monterrey II* and *Huinalá*. *Monterrey III*

<sup>103</sup> *Projet de loi relatif au service public de l'électricité et du gaz et aux entreprises électriques et gazières*, available at [http://www.legifrance.gouv.fr/html/actualite/actualite\\_legislative/pl\\_edf\\_gaz.htm](http://www.legifrance.gouv.fr/html/actualite/actualite_legislative/pl_edf_gaz.htm)

<sup>104</sup> EDF, *Le changement de statut juridique d'EDF est voté*, available at [http://www.edf.com/index.php4?coe\\_i\\_id=33189](http://www.edf.com/index.php4?coe_i_id=33189)

<sup>105</sup> EDF, Annual Report (2002)

<sup>106</sup> IADB, *Private Infrastructure, Support from the Inter-American Development Bank Group, 1990-2003*, Sustainable Development Department, January 2004, available at [http://www.iadb.org/sds/doc/IFM-Private\\_Infrastructure-Report-2004.pdf](http://www.iadb.org/sds/doc/IFM-Private_Infrastructure-Report-2004.pdf)

is entirely owned by *Iberdrola Energía Monterrey*<sup>107</sup>, *S. A. de C. V.*, a special purpose company established by *Iberdrola* for purposes of this project. Under a 12-year operation and maintenance contract, France's *Alstom* is providing *Iberdrola* with operation support for the four turbines<sup>108</sup>. The Inter-American Development Bank supported this project through an A/B loan, and has declared this plant to be the most important ever approved by the bank<sup>109</sup>.

The plant is fueled by natural gas, and uses combined cycle technology, consisting of four ABB single shaft sets combined-cycle units, each comprising one GT24 gas turbine, one steam turbine, one heat recovery, one generator and complementary equipment<sup>110</sup>. The commissioning of the two units that supply electricity to the CFE took place in a record period of fifteen months.

*Monterrey III* was developed in two phases, with additional capacity being installed under different schemes authorized by the IPP law. In its initial phase, *Iberdrola Energía Monterrey, S. A.* requested CRE authorization to install 570 MW capacity (under the IPP scheme), with the output to be sold to CFE under a 25-year PPA. Because the bidding documents and the PPA provide for the possibility of incorporating additional capacity to that set in the contract, as well as the possibility of self-supply or contract with third parties, *Iberdrola* legally developed an additional 570 MW (under the self-supply and cogeneration categories) from which output is sold to the local industry in Monterrey via PPAs<sup>111</sup>. This PPA provision means not only that the project is selling more than 50% of its capacity to private parties (the *Alfa-Pegi Group* for 388 MW, the cement producer APASCO for 51 MW, and the brewer FEMSA Group for 37 MW, among others), but also that *Iberdrola* has designed a business strategy to potentially sell part of its output in a not-yet created competitive market, were Fox's reform bill to be approved by Congress.

### **Sponsor and Parent Company:**

*Iberdrola*, a purely private company, is *en route* to become a major stakeholder in the Mexican power generation industry. Like *Río Bravo II*, this project is also influenced by regulatory reforms to liberalize the gas sector, and to a much greater extent, since part of *Iberdrola's* business strategy is to become a major player in the country's gas sector<sup>112</sup>. The company, the second-largest Spanish utility, currently has 1,157 MW of

---

<sup>107</sup> Iberdrola won by offering 2.38 per kwh in bidding. InfoCRE, Julio-Agosto 1999 Año 2, No. 4 available at <http://www.cre.gob.mx/publica/infoCRE/infocre070899.pdf>

<sup>108</sup> This is ALSTOM's second O&M contract for this type of power plant technology in Mexico (and ninth for combined cycle trains in general). The first one was for the Hermosillo IPP project, which was signed in March 2002. Alstom Press Release, 11 March 2003, available at <http://www.service.power.alstom.com/NewsAndEvents/news/0def6884111c2b3c011556bbe16f6f69.html>

<sup>109</sup> Banque Interaméricaine de Développement, *Rapport Annuel 2000*, available at <http://www.iadb.org/EXR/ar99/french.pdf>

<sup>110</sup> IADB, Monterrey III, Project Abstract.

<sup>111</sup> Interamerican Development Bank, Monterrey III Power Project: Environmental and Social Impact Report, June 2000, available at [http://www.iadb.org/pri/projDocs/ME0229\\_R\\_E.pdf](http://www.iadb.org/pri/projDocs/ME0229_R_E.pdf)

<sup>112</sup> There is a difference in EDF and Iberdrola's business strategies. With respect to gas liberalization, whereas EDF has built a pipeline primarily to supply its own power plants, Iberdrola has acquired a major

installed capacity in Mexico (from *Monterrey III* IPP and the 120 MW *Enertek* and 37 MW FEMSA cogeneration plants). When two other projects awarded become operational (*Altamira V* and *La Laguna II*), Iberdrola will have close to 4000 MW of installed generating capacity, and plans to have 5000 MW on line by 2006. *Iberdrola* also owns a 13% stake in Gas Natural Mexico, the country's major gas distributor, holding permits to distribute natural gas in six states, and controls 42.6% of the shares in *Metrogas*, the gas distributor for Mexico City<sup>113</sup>.

*Monterrey III* contributes more than 1,000 MW of private generation to the Mexican grid (more than 10% of the estimated needs through 2006), making *Monterrey III* a critical project for purposes of coping with increasing electricity demand, particularly in Monterrey, one of the most industrialized cities in the country<sup>114</sup>. The project also utilizes the most efficient and environmentally-friendly technology in the country, which is important given its location in Monterrey, an environmentally-critical area. Finally, *Monterrey III* is selling electricity at tariffs which are lower than the system's current average cost of generation and the system's long term marginal cost<sup>115</sup>.

Not only is the project efficient, but it is bringing good returns to *Iberdrola*. The company is incurring minimal risks, because both the PPA with CFE and the fuel contracts with PGPB –as all of *Iberdrola*'s projects in the country- have pass-through clauses<sup>116</sup> and are dollarized, which means that fluctuations in the Mexican peso against the dollar do not effect *Iberdrola*'s accounts<sup>117</sup>. As for total operations, *Iberdrola*'s gross operating profit grew from 39 million euros in 2001 to 98 million in 2002 (mostly from domestic business). However, company reports note that *Iberdrola*'s sales in Mexico increased by 64% thanks to the *Monterrey* project. These successes have led *Iberdrola* to plan an investment in Mexican power generation of 3 billion from 2001-2006.

---

stake in the natural gas distributor in Mexico City as well as in other states. As for market expansion, Iberdrola has been commissioned several projects in Mexico and South America, with a stated intention of becoming a major player in Mexico. On the other hand, recent negative experiences in Brazil have led EDF to reduce its presence in the region and focus on European markets instead.

<sup>113</sup> Iberdrola, Annual Report (2002)

<sup>114</sup> IADB, *supra*, note 108.

<sup>115</sup> IADB, *supra*, note 108.

<sup>116</sup> BNP Paribas, *The EU Power Sector*, Investment Grade Credit Research, 6 February 2004.

<sup>117</sup> Iberdrola, Annual Report (2001)