RENEWABLE GENERATION IN ARGENTINA: PAST FAILURES AND A PLAN FOR FUTURE SUCCESS

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I. INTRODUCTION

Because many countries around the world have realized the importance of generating energy from environmentally friendly sources, there is a worldwide tendency towards the development of renewable electricity.[1] The Argentinean Republic is no exception and it has strong reasons for not being so. Argentina has almost no electricity reserve capacity left, its reserves of oil and natural gas are slumping, and its environment is in jeopardy.[2] Internationally, oil prices prove to have a high ceiling, and the Kyoto Protocol imposes certain commitments on Argentina with regard to renewable energy generation.[3] Fortunately, with a diverse geography and climate, Argentina

1. Energy Info. Admin., How Much Renewable Energy Do We Use?, http://tonto.eia.doe.gov/energy_in_brief/print_pages/renewable_energy.pdf (last visited Mar. 1, 2008).

2. *See* ENERGY INFO. ADMIN., COUNTRY ANALYSIS BRIEFS: ARGENTINA 1 (2008), *available at* http://www.eia.doe.gov/emeu/cabs/Argentina/pdf.pdf (noting that Argentina's "imbalance between rising domestic energy demand and falling energy production has created problems . . . . "); Gerardo Jiminez, *Argentina's Natural Gas Shortage*, ENERGY TRIB., Apr. 22, 2008, http://www.energytribune.com/articles.cfm?aid=872 ("Oil production has peaked, natural gas reserves are not being replaced, natural gas is not attractive to foreign investors, and major electricity shortages are looming . . . . ").

3. *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 1, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol]. Argentina ratified the Kyoto Protocol on September 28, 2001. Argentina ratified the Kyoto Protocol on September 28, 2001. United Nations Framework Convention on Climate Change, Argentina: Ratification Status, http://maindb.unfccc.int/public/country.pl?country=AR (last visited Mar. 1, 2009).

has the best conditions with which to build up a renewable energy generation industry.[4] Indeed, its renewable potential is outstanding. For instance, in one year, the Patagonian winds over Argentina have the potential to produce up to 500,000 megawatts.[5] Furthermore, Argentina still has the capability to generate 130,000 gigawatts of electricity per year from hydrological sources[6] and also has almost four million Tons of Oil-Equivalent ("TOE") from unexploited biomass.[7] As will be explained, Argentina has taken the adequate steps to achieve a successful generation sector. Even so, this South American country has developed a strong fossil fuel and large hydro-generation sector but has failed in promoting renewable generation.[8] As will be explained in this Article, with reasonable changes to its legislation, Argentina will be able to overcome that failure.

Argentina's generation sector grew dramatically with the enactment of Law 24,065 (the "Electricity Law") at the end of 1991.[9] Among other major changes introduced by the law were the transfer of state-owned companies to private parties and the application of market forces to the electricity sector.[10] By making these changes, Argentina implemented a cutting-edge model,[11] becoming one of the first countries worldwide to permit

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4. *See* VICTOR BRAVO ET AL., RETS I FINAL REPORT ON RENEWABLE ENERGY TECHNOLOGIES IN ARGENTINA 2, 26–30 (2005), *available at* http://www.gnesd.org/Downloadables/RETs/FB%20RETs%20final%20version.pdf.

5. SECRETARÍA DE ENERGÍA DE LA NACIÓN, DESCRIPCIÓN, DESARROLLO Y PERSPECTIVAS DE LAS ENERGÍAS RENOVABLES EN LA ARGENTINA Y EN EL MUNDO 28 (2004), http://energia3.mecon.gov.ar/contenidos/archivos/Reorganizacion/renovables/DescripcionDesarrolloyPerspectivas.pdf [hereinafter DESCRIPCIÓN, DESARROLLO Y PERSPECTIVAS].

6. GUSTAVO DEVOTO, HYDROELECTRIC POWER AND DEVELOPMENT IN ARGENTINA, *available at* http://www.un.org/esa/sustdev/sdissues/energy/op/hydro_devoto.pdf.

7. *See* BRAVO ET AL., *supra* note 4, at 28.

8. *See generally* WORLD RES. INST., ENERGY AND RESOURCES: ARGENTINA (2003), *available at* http://earthtrends.wri.org/pdf_library/country_profiles/ene_cou_032.pdf [hereinafter ENERGY AND RESOURCES].

9. Law No. 24065, Jan. 3, 1992, [27306] B.O. 30.

10. *See id.* arts. 3, 35.

11. *See* ENERGY INFO. ADMIN., ELECTRICITY REFORM ABROAD AND U.S. INVESTMENT 3 (1997), http://www.eia.doe.gov/emeu/pgem/electric/061697.pdf [hereinafter ELECTRICITY REFORM] ("Reforms undertaking in these three countries [Argentina,

private participation in the generation, transmission, and distribution sectors of the industry.[12] The electricity regulatory model ensured non-concentration through the implementation of transparent rules and regulations.[13] It also provided transparency and legal certainty to the privatization process itself and to the subsequent investments made in the electricity sector.[14] This unique situation attracted local and foreign investments totaling US$12.5 billion.[15]

By 1998, almost 95% of the primary energy produced in Argentina came from fossil fuels.[16] During that year, in an attempt to increase the production of energy from renewable sources, the Argentinean National Congress enacted Law 25,019,[17] by means of which both wind and solar energy were to receive special treatment intended to boost those types of energy generation. As will be explained later, the regime created by Law 25,019 was intended to be similar to the one successfully implemented by Germany during the 1990s.[18] However, neither wind nor solar energy generation in Argentina has grown significantly.[19]

Unfortunately, the conditions that had promoted the Argentinean electricity industry's strong growth during the 1990s had changed by the end of 2001.[20] Due to a constant public deficit, Argentina's public debt had increased dramatically by the end of the 1990s.[21] This situation, together

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Australia, and the United Kingdom] are especially important because they have in many ways become models for reforms carried out elsewhere").

12. *See id.* at 70–73.

13. *See id.* at 65.

14. *See id.* at 65, 77–79.

15. *See id.* (discussing how Argentina's privatization process attracted foreign and local investments).

16. *See, e.g.*, ENERGY AND RESOURCES, *supra* note 8, at 1 (showing that from 1991–1999, fossil fuels accounted for almost all energy consumed in Argentina).

17. Law No. 25019, Oct. 19, 1998, [29008] B.O. 1.

18. *See infra* notes 323, 387.

19. *Cf. supra* note 16 and accompanying text.

20. *See supra* notes 9–10 and accompanying text.

21. *See* International Monetary Fund, Memorandum of Economic Policies, http://www.imf.org/external/np/loi/2000/arg/01/index.htm (last visited Mar. 1, 2009) [hereinafter Economic Policies Memo] (describing Argentina's economic situation by the year 2000).

with a deteriorating balance of payments, made it necessary for Argentina to restructure its public debt.[22] Though there were many different ways of doing so, at the end of 2001, the Argentinean government took a hard road under the brief administration of President Adolfo Rodriguez Saa. Firstly, in December 2001, the government forbade depositors from making withdrawals exceeding US$250 per week from their bank accounts and prohibited foreigner investors from repatriating their investments.[23] Secondly, it decided to suspend all payments on its foreign debt.[24] Moreover, the National Congress went one step further and, after ten years of pegging the Argentinean peso to the U.S. dollar,[25] authorized the Executive Branch to abandon that foreign exchange policy in January 2002.[26] Less than a month after this enactment, the peso was maxi-devaluated,[27] and a quasi-flotation regime[28] was implemented with a peso that, today, is worth approximately US$0.32.[29] The fourth step the government took was to require that all contracts originally agreed to be paid off in U.S. dollars were converted to pesos; however, the conversion rates applied to the contracts varied depending on the characteristics of each agreement.[30] Finally, during 2004, the Executive Branch enacted Decree 1735/2004[31] by means of which Argentina exchanged outstanding debt for new bonds worth 25% of the original ones.[32] Those measures, among others, triggered a

22. *See id.*

23. Decree No. 1570/2001, Dec. 1, 2001, [29787] B.O. 1, art. 2.

24. *See* Res. No. 73/2002, Apr. 25, 2002, [29888] B.O. 13.

25. Law No. 23928, Mar. 27, 1991, [27104] B.O. 1, art. 2.

26. *See* Law No. 25561, Jan. 6, 2002, [29810] B.O. 1 art. 2.

27. *See* Res. No. 73/2002, art. 1.

28. *See* Decree No. 260/2002, Feb. 8, 2002, [29834] B.O. 1 art. 2.

29. Central Bank of Argentina, Currency Rates, http://www.bcra.gov.ar/index_i.htm (last visited Mar. 1, 2009).

30. *See* Decree No. 214/2002, Feb. 3, 2002, [29830] B.O.; *see also* Decree No. 320/2002, Feb. 15, 2002, [29839] B.O. 1.

31. Decree No. 1735/2004, Dec. 9, 2004, [30543] B.O. 1.

32. Ministerio de Economía y Finanzas Públicas, Cuenta de Inversión 2005: Compatibilización Contable Presupuestaria, http://www.mecon.gov.ar/hacienda/cgn/cuenta/2005/tomoi/07compatibilizacion.htm#a (last visited Mar. 1, 2009).

global financial panic that would affect not only Argentina but all emerging market economies.[33]

This crisis affected the entire Argentinean economy and, within it, the energy industry.[34] As a consequence of that crisis, the electricity industry saw the "pesification" of their tariffs but not of their international contracts subject to foreign legislation.[35] Furthermore, in order to avoid entering into a new inflation escalade, like the one experienced during the 1980s, the government froze the electricity tariffs.[36] Indeed, had the Argentinean government let the electricity tariffs float, they would have immediately increased in almost the same proportion as the increase of the U.S. dollar against the peso, due to the fact that the investments in the sector were highly leveraged with foreign debt.[37] According to the Argentinean government, that situation would have created a domino effect because the industry in general would have made a passthrough of the increased electricity tariffs paid to power suppliers with the prices of their final products or services, leading the economy to a new inflation period.[38] The freeze on tariffs remained unchanged until 2004.[39] In 2004, the Energy Secretariat authorized a raise on the tariffs of "large users" (basically, industrial and commercial users).[40]

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33. *Argentina Default Impact Limited*, BBC NEWS, Dec. 23 2001, http://news.bbc.co.uk/1/hi/business/1726265.stm (last visited Feb. 11, 2009).

34. *Id.*

35. *See* Law No. 25561, Jan. 6, 2002, [25561] B.O. 1 art. 8. The conversion of a U.S. dollar obligation to a peso obligation is known as "pesification." Martín D. Manzano, Presentation at International Bar Association Annual Conference: Political Risk in Argentina (Sept. 16, 2003).

36. Res. No. 38/2002, Apr. 9, 2002, [29874] B.O. 4.

37. Fernando Krakowiak, *Los que Pescan con la Inflación*, PÁGINA 12, July 30, 2007, *available at* http://www.pagina12.com.ar/diario/economia/2-88906-2007-07-30.html.

38. *Id.*

39. *See* Res. No. 93/2004, Jan. 26, 2004, [30340] B.O. 13; *see also* Res. No. 842/2004, Aug. 25, 2004, [30471] B.O. 12.

40. Res. No. 93/2004; Res. No. 842/2004.

Under the previous one-sided changes, the normal supply of energy was threatened and future private investment in this sector was restrained. Conversely, other users (mostly homeowners) would benefit from unchanged tariffs effective on February 1, 2008.[41]

Since 2002, the Argentinean economy and industry have started to grow steadily again.[42] Along with this growth, demand for electricity has increased at an average pace of 7.34% per year.[43] However, almost no investment in the electricity sector was made.[44] Furthermore, generators started to satisfy the new demand with electricity generated from reserved capacity.[45] In 2006, the sector had almost no reserves left—power plants had reached their generation limits.[46] Given this situation, and due to the fact that the whole region is currently

41. *See* Res. No. 805/2007, July 23 2007, [31204] B.O. 18 (showing that increased tariff rates have not yet been determined); Res. No. 433/2007, May 7, 2007, [31168] B.O. 27; Res. No. 434/2007, Apr.. 27, 2007, [31145] B.O. 12.

42. *See*, *e.g.*, PRICE WATERHOUSE COOPERS, HIGHLIGHTS OF ARGENTINA: A WRAP-UP OF 2006 AND A FORECAST FOR 2007 (2007), *available at* http://www.pwc.com/ar/spa/pdf/highlights_ar_2006-2007.pdf; Carlos Fernández, Ministro, Ministerio de Economía y Producción, Discurso: Día de la Exportación [Speech: Export Day] (Aug. 20, 2008), *available at* http://www.mecon.gov.ar/basehome/discursos/2008/08/20-08-08.pdf (explaining that during the last five years, Argentina's economy has expanded at an annual rate of 8.7%).

43. *See* Instituto Nacional de Estadística y Censos, Facturación de Energia Eléctrica, Por Tipo De Usuario Final: Total Del País: Años 2001–2005, http://www.indec.gov.ar/nuevaweb/cuadros/14/z051008.xls (last visited Mar. 1, 2009) (excel spreadsheet showing electricity invoiced per megawatt hour (MWh) increased by approximately 5% each year from 2003–2005); SECRETARÍA DE ENERGÍA, BALANCE ENERGETICO NACIONAL 25 (2007), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/Reorganizacion/informacion_del_mercado/publicaciones/energia_en_gral/balances_energeticos2006/BEN_AVANCE_2006.pdf.

44. EDENOR, Argentine Electricity Sector: Background, http://www.iredenor.com/argentine_electricity_sector/background (last visited Mar. 1, 2009) ("At the end of 2001 and beginning of 2002, Argentina experienced the worst political, economic and social crisis of the last 50 years which also severely affected the electricity sector. This situation caused many Argentine electricity generators, transmission companies and distributors to defer making further investments in their networks.").

45. *See* Antonio Rossi, *Energía: Dos Años Para Vivir Con La Capacidad Al Límite*, CLARÍN, Sept. 3, 2006, *available at* http://www.clarin.com/suplementos/economico/2006/09/03/n-00311.htm.

46. *Id.*

facing electricity shortages,[47] the Argentinean government started to look for alternatives to increase the installed capacity.[48] The first alternative was implemented in September 2006, when the Energy Secretariat launched a new program called Energía Plus. This program required all large users (above 300 kW)[49] to contract to buy the difference between their current demand and their demand in 2005 from new generation capacity.[50] However, the new program did not achieve its goal, because installed capacity did not increase as expected. Consequently, the government started thinking about new options that reached extremes such as changing the lamps of all public buildings to low-consumption lamps.[51] Within this context and for other reasons explained in Part II, the National Congress enacted Law 26,190 at the beginning of 2006.[52] Law 26,190 was intended to have a broader scope, because it referred not only to wind and solar energy but also to certain types of hydro, biogas and other gases, biomass, geothermal, tidal power, and renewable sources in general.[53]

More than two years have passed since the enactment of Law 26,190, and ten years have passed since the enactment of Law 25,019, but little investment has been made in the industry of renewable generation, despite Argentina's massive potential in natural resources.[54] The questions that arise are: what went wrong and is there a way to improve the current legislation?

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47. *See id.*; *see also, e.g.*, Josefina Giglio, *Se Debió Importar Energía Desde Brasil*, LA NACIÓN, Jan. 9, 2008, *available at* http://www.lanacion.com.ar/nota.asp?nota_id=977468&high=Brasil.

48. Res. No. 1281/2006, Sept. 4, 2006, [30983] B.O. 5.

49. A watt (W) is equal to one joule of energy per second; a kilowatt (kW) is equal to 10^3 W; a megawatt (MW) is equal to 10^6 W; a gigawatt (GW) is equal to 10^9 W; and a terawatt (TW) is equal to 10^{12} W. Energy Information Administration, Electric Conversions, Unit-of-Measure Equivalents, http://www.eia.doe.gov/cneaf/electricity/page/prim2/charts.html (last visited Feb. 11, 2009).

50. Res. No. 1281/2006, art. 3.

51. *Instan al Cambio de Lámparas de Bajo Consumo en Edificios Públicos*, LA NACIÓN, Jan. 7, 2008, *available at* http://www.lanacion.com.ar/archivo/Nota.asp?nota_id=976946.

52. Law No. 26190, Dec. 27, 2006, [31064] B.O. 1.

53. *Id.* art. 4(a) (defining renewable energy sources as non-fossil energy sources).

54. *See infra* Part VI.A.

The purpose of this Article is to analyze the systems implemented by Laws 25,019 and 26,190, to understand why none of them worked as intended, and to propose changes that would help renewable generation to develop. Part II explains why Argentina must develop renewable energy. Part III describes the privatization process of the electricity sector that took place in Argentina at the beginning of the 1990s. Part IV reviews the two attempts to develop wind and solar energy generation. In Part V, the new "green generation" law is analyzed and compared with those models applied in the United Kingdom and Germany, which are base models in Europe. This comparison will highlight the differences that may have caused the failure of the Argentinean attempts to create a renewable energy industry and will suggest changes that may help to reverse the situation. Part V will also attempt to point out issues that may have barred Argentina from achieving sustainable development of renewable generation, and Part VI discusses amendments that may help to avert such failure.

II. REASONS FOR ARGENTINA TO DEVELOP RENEWABLE ENERGY

Whether Argentina should develop a renewable industry is arguable, particularly since renewable generation is still more expensive than conventional generation.[55] This Article is based on the premise that Argentina has decided to move forward in the promotion of the renewable industry, and that decision is consistent with the country's necessities with regard to increasing its installed capacity.

Argentina has many reasons that support its decision. The first is that almost half of Argentina's electricity comes from hydro sources.[56] These services are in jeopardy due to changes in

55. UNITED NATIONS DEP'T OF ECON. & SOC. AFFAIRS, WORLD ENERGY ASSESSMENT: OVERVIEW 2004 UPDATE 50, tbl. 7 (2004) *available at* http://www.undp.org/energy/weaover2004.htm; *cf.* Energy Information Administration, Average Cost of Coal Delivered for Electricity Generation by State, http://www.eia.doe.gov/cneaf/electricity/epm/table4_10_a.html (last visited Mar. 1, 2009) (indicating that the average cost of coal delivered for U.S. electricity generation is approximately 5.2 cents/kwh after conversion).

56. *See infra* Part IV.D.

climate conditions. As explained by the Argentinean government in its Second National Communication to the United Nations Framework Convention on Climate Change:

> Argentina is potentially vulnerable to Climatic Change . . . . In addition [to agricultural and land damages], the country relies on hydro-power for an important share of its electricity generation. Accordingly, various studies were carried out to characterize the impacts of current climate variability and of the climate changes that may take place in a time horizon of 10 to 40 years . . . . The temperature of the Andean zone of Patagonia had an increase in more than one degree, with the consequent receding of almost all the Andean glaciers. There was a centennial downward trend in the streamflows of the rivers that originate in the Andes Mountains in the provinces of San Juan, Mendoza, Río Negro and Neuquén, which was likely caused by a reduction of winter snowfall over that mountain range. In the case of the two last provinces, where an important part of the country's hydropower is generated, this trend has already caused generation losses of up to 40% . . . . The downward trend of snowfall in the Andes Mountains is projected to persist. Thus, the hydropower generation in the provinces of Mendoza, Río Negro and Neuquén is expected to continue being negatively affected. [57]

The Argentinean Government has stated that "the only key to stop the massive and brutal destruction of the [Argentinean] ecosystem is a change in the energy policies; making strong bets in unlimited and harmless energetic resources."[58]

The second reason is that, beyond the devastating consequences that climate change is producing, it has been officially recognized that Argentina needs to achieve energy independence by diversifying its energy matrix and increasing

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57. COMITÉ DE CONDUCCIÓN, SECRETARÍA DE AMBIENTE Y DESARROLLO SUSTENTABLE, SEGUNDA COMUNICACIÓN NACIONAL DE LA REPÚBLICA ARGENTINA A LA CONVENCIÓN MARCO DE LAS NACIONES UNIDAS SOBRE CAMBIO CLIMÁTICO 33–34 (2007), *available at* http://maindb.unfccc.int/library/view_pdf.pl?url=http://unfccc.int/resource/docs/natc/argnc2s.pdf [hereinafter SEGUNDA COMUNICACIÓN].

58. DESCRIPCIÓN, DESARROLLO Y PERSPECTIVAS, *supra* note 5, at 6 (author's translation).

the use of renewable energy.[59] This is because Argentina needs to reduce its energy exposure to erratic oil and natural gas prices and decreased domestic reserves of natural gas.[60]

The third reason is that Argentina has to comply with international commitments. On September 28, 2001, the Argentinean government ratified the Kyoto Protocol.[61] By means of that ratification, Argentina committed itself to increasing the generation of renewable energy by 8% of the total generated energy.[62] This commitment was expressly ratified by article 2 of Law 26,190.[63]

For the reasons discussed above, the Energy Secretariat is focused on the structure of policies and strategies to promote renewable energy with the intention of achieving environmental, industrial, and economic benefits.[64]

This Article assumes the Argentinean government's goals and reasons for developing a renewable energy industry are valid and does not discuss whether Argentina should or should not promote renewable energy. Rather, this Article will explain why the Argentinean renewable industry has stagnated.

III. THE STRENGTHENING OF THE GENERATION SECTOR IN ARGENTINA

A. The End of a State-Owned-Company Model

During the 1980s, the Argentinean government managed the economy, as well as basic services like water, power, natural gas, and sewage.[65] Those utilities companies were poorly

59. La Cámara Nacional de Diputados, Proyecto de Resolución No. 3072-D-2007, June 25, 2007, *available at* http://www1.hcdn.gov.ar/proyxml/expediente.asp?fundamentos=si&numexp=3072-D-2007.

60. *Id.*

61. *See* Kyoto Protocol, *supra* note 3.

62. Law No. 26190, Dec. 27, 2006, [31064] B.O. 1, art. 2.

63. *Id.*

64. DESCRIPCIÓN, DESARROLLO Y PERSPECTIVAS, *supra* note 5, at 5–6.

65. *See* MYRNA ALEXANDER & CARLOS CORTI, THE WORLD BANK, CFS DISCUSSION PAPER SERIES NO. 103, ARGENTINA'S PRIVATIZATION PROGRAM 1,3 (1993) *available at* http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1993/08/01/000009265_3961005052451/Rendered/PDF/multi0page.pdf.

managed and were not equipped to supply the most essential and vital services needed.[66]

Due to the government's large role in the economy, and in an effort to keep it moving despite its inefficiency, the national deficit increased massively, constantly weakening the Argentinean currency.[67] The currency weakness triggered a hyper-inflation cycle. In 1989, the Argentinean GDP dropped by more than 10% and the annual rate of inflation was around 3,000%.[68] This led the country into a crisis of huge magnitude.[69] The strong, government-controlled economy model proved to be a failure in Argentina.

In 1989, the Executive Branch described this situation straightforwardly when introducing to the Congress the bill that would eventually become the Law of State Reform:

> We are facing a country that not only needs resources, but has also accumulated a domestic debt of unusual dimensions and a foreign debt that restrains our growth. This goes along with a deep economic recession that substantially increases unemployment and underemployment and leads large sectors of the population into poverty and makes it difficult to increase fiscal revenues. The poorly-managed public companies are severely affected in their economic and financial capabilities, they show accumulated and growing deficits and provide inefficient services that alienate the one that should be considered the true beneficiary of such services: the user. The government cannot introduce new technology into public utilities or

66. *See id.* at 2.

67. Walter T. Molano, *Argentina: The Political Economy of Stabilization and Structural Reform*, *in* THE POLITICAL ECONOMY OF INTERNATIONAL FINANCIAL CRISIS 213, 214 (Shale Horowitz & Uk Heo eds., 2001).

68. Argentina's National Institute of Statistics and Census (INDEC) reports that consumer prices increased 4923.6% between December 1988 and December 1989. Instituto Nacional de Estadística y Censos, Dirección de Indices de Precios de Consumo, http://www.indec.gov.ar/nuevaweb/cuadros/10/ipc-var-dde1943.xls (last visited Mar. 1, 2009) (excel spreadsheet showing inflation rate).

69. Christine Gorman, *The Fall and Fall of Argentina*, TIME, June 12, 1989, at 47 ("After years of tottering on the brink of economic crisis, Argentina started sliding into chaos last week. In food riots that erupted in Rosario, Córdoba, Buenos Aires and other major cities, more than 2,000 people were arrested and at least 15 killed.").

> increase the offer of services to new users who do not have access to essential services. Thus, the government is failing to comply with one of its most important objectives, namely, to secure the general welfare. The government does not have the resources with which to strengthen the essential basic infrastructure (roads, ports, airports, etc.) necessary to implement the productive revolution we aim at and, thus, to activate the economy in order to create new productive employment opportunities and maintain the existing infrastructure, which, as a result of the lack of efficient conservation, shows symptoms of premature deterioration. This is why the privatization process and the participation of private capital in public services, which starts with this bill, should not give rise to ideological debates. On the contrary, all of us should accept the importance of this national emergency and implement the measures to overcome it . . . . [70]

As the above quotation summarizes, the privatization of state-owned companies was seen as a solution to the problems that Argentina faced. This idea was shared internationally. Along this line, the United States Department of Energy wrote:

> privatization directly addressed the problem of rising debt by divesting inefficiently-operated assets and companies. In addition, it was expected that the new owners of privatized assets would improve the assets, thereby upgrading Argentina's infrastructure. Further, privatization indirectly addressed the country's economic problems by providing Argentina's treasury with a financial cushion while the fiscal reforms worked through the economy. Privatizations also were a solution for a number of other problems (such as the absence of competition to spur the reduction of production costs) that tend to drain the national treasury, and that often are attributed to publicly-operated companies as opposed to similar privately-operated companies.[71]

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70. Federal Senate, 22 *Diary of Entered Issues* 1678–1679 (1989) (Author's translation).

71. ELECTRICITY REFORM, *supra* note 11, at 63.

The fiscal reforms, which would eventually be seen as "impressive in both speed and coverage,"[72] would materialize through a massive privatization process that started in 1989 and lasted throughout the 1990s.[73] The privatization process began with a bill that identified the state-owned companies that would be privatized and specified the conditions under which the privatization should be done.[74]

Along with the privatization process, and in an effort to end an inflation cycle that started decades before and impeded Argentina's chances of promoting investment, Law 23,928 pegged the peso to the U.S. dollar at a rate of 1:1.[75]

The privatization process and the stabilization of the local currency resulted in investments.[76] The new policy ensured "rapid growth of investment, structural reforms, and, for most of the period, a favorable international environment."[77] In this confident environment, foreign investors bought shares in the newly privatized companies and began to invest in them heavily.[78] As a consequence, in the early 1990s, Argentina reduced its debt and associated interest payments significantly.[79]

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72. World Bank, 1997 Abstracts of Current Studies: Private Sector Development and Private Sector Management, http://www.worldbank.org/html/dec/Publications/Abstracts97/09psd/psd4.html (last visited Mar. 1, 2009) (discussing two reports analyzing Argentina's privatization program).

73. *See* ALEXANDER & CORTI, *supra* note 65, at 3 ("Upon assuming responsibility in July 1989, the government of President Menem concluded that privatization had to be one of the main features its economic stabilization and reform program.").

74. Law No. 23696, Aug. 18, 1989, [26702] B.O. 2, arts. 1, 31–33. The law lists state-owned companies to be privatized, including those in the telecommunications industry. *Id.* It establishes the transfer of companies to the provinces. *Id.* It also creates subsidies for 1) cooperatives, 2) user- and employee-owned stock programs (though the program for subsidies of user-owned stock was never implemented), and 3) former producers of products or services in these industries. *See id.*

75. Law No. 23928, Mar. 27, 1991, [27104] B.O. 1; Decree No. 529/1991, Mar. 27, 1991, [27104] B.O. 1. This regime was known as the "convertibility regime." Economic Policies Memo, *supra* note 21.

76. Molano, *supra* note 67, at 219.

77. Economic Policies Memo, *supra* note 21.

78. Molano, *supra* note 67, at 219.

79. Argentina's balance of payments is available from Argentina's National Institute of Statistics and Census. *See generally* Instituto Nacional de Estadística y Censos, http://www.indec.mecon.ar/default.htm (last Feb. 11, 2009).

Electricity companies were included in this privatization process.[80] In 1992, Argentina restructured and privatized its electricity sector utilizing the experience of the United Kingdom.[81] To assess the change to the electricity sector, the model existing before 1992 will be briefly described.

B. The Pre-1992 Electricity Model, Law 15,336

1. General Description

Before 1992, the electricity sector was regulated by Law 15,336 and, like all other public utilities, was controlled by state-owned companies.[82] During this period of state ownership, the electricity sector suffered from significant underinvestment that led it to an unreliable and critical situation.[83] Late in 1988, the severity of that crisis was reflected in the headlines of all newspapers.[84] Beyond the deterioration of the system, the situation got worse when Argentina suffered an extreme drought that lasted from July 1988 until August 1989.[85]

The electricity transmission and distribution sectors were in no better condition. Both were controlled by the government (distribution companies were, in some cases, controlled by provincial governments).[86] These sectors also suffered from lack of investment.[87]

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80. Law No. 24065, Jan. 3 1992, [27306] B.O. 30.

81. Stephen C. Littlechild & Carlos J. Skerk, *Regulation of Transmission Expansion in Argentina Part I: State Ownership, Reform and the Fourth Line* 5 (Cambridge-MIT Inst., Working Paper No. 61, 2004) (listing similarities such as "separation of generation, transmission and distribution, creation of a [electricity] Pool, retail competition for larger customers, and introduction of sector regulation.").

82. Law No. 15336, Sept. 20, 1960 [19340] B.O.

83. Daniel Gustavo Montamat, *Los Vaivenes Energéticos Y Las Frustraciones Económicas*, PETROTECNIA, Feb. 2005, at 23–24.

84. *Id.*

85. Marta Renée Borda, *Las Sequías Históricas*, AGROBARROW, Sept. 2003, at 20, *available at* http://www.inta.gov.ar/barrow/info/documentos/agrobarrow28/Revista%208.pdf.

86. *See* Richard A. Kessler, *Argentina Cuts Electric Power, Debates Industry Reform Bills*, WASH. POST, Aug. 2, 1989, at F3.

87. *Id.*

This situation led to extended and periodic scheduled and unscheduled blackouts.[88] These factors combined to bring about urgent changes in the electricity sector.

2. The Proposed Changes

The changes proposed were established by Decree 634/1991.[89] Those proposals ranged from creating a free market favoring competition[90] to decentralizing the decision-making process in the power market regarding investments and prices.[91] The proposals were the opposite of the scheme in existence at the time. Indeed, the privatization process would be used to introduce competition into a typically monopolistic sector. By 1992, the idea was to create a wholesale market with free market prices, split the industry both vertically and horizontally, and allow certain users to enter into private contracts to buy and sell electricity.[92]

C. The New Model: Law 24,065

1. The Creation of the Wholesale Electricity Market

The model that was planned for the new private electricity sector was achieved by the enactment of Law 24,065 (the "Electricity Law") and supplementary regulations that created an electricity regulatory framework (together with the Electricity Law, the "Electricity Regulatory Framework").[93] The main objectives of the Electricity Regulatory Framework included encouraging market competition;[94] promoting the

88. *Id.*

89. *See* CARLOS MANUEL BASTOS & MANUEL ANGEL ABDALA, REFORM OF THE ELECTRIC POWER SECTOR IN ARGENTINA 315 (1996) (giving a detailed description of the privatization process).

90. *See* Decree No. 634/1991, Apr. 12, 1991, [27117] B.O. 3, pmbl., art. 7.

91. *See id.* pmbl.

92. *See* Law No. 24065, Jan. 3, 1992, [27306] B.O. 30, art. 2 (instituting a new electricity system that emphasizes competition and private investment).

93. The supplementary regulations include Decree Number 1398 and Resolution Number 61. Decree No. 1398/1992, Aug. 6, 1992, [27448] B.O. 30; Res. No. 61/1992, Apr. 29, 1992, [27387] B.O.

94. Law No. 24065, art. 2(b).

operation and reliability of the system, as well as free and equal access to it;[95] promoting private investments in generation, transmission, and distribution; [96] and setting adequate, fair, and reasonable tariffs.[97]

As in the United Kingdom, the Argentinean government led the electricity restructuring process.[98] It started with Servicios Eléctricos del Gran Buenos Aires, the largest state-owned electricity company, which was broken into six generation and three distribution companies.[99] Agua y Energía Eléctrica, the second largest company would have the same fate.[100] The privatization of the spun-off companies began in early 1993.[101] Finally, the national network of extra-high-voltage electric power transmission was assigned to Transener S.A. ("Transener").[102]

Through this process, more than 80% of the generation, 100% of the transmission, and 60% of the distribution sector were privatized.[103] By 2001, Argentina had gone from twenty-three to forty-four generation companies, from seven to sixty-two privately-owned transmission companies,[104] and from twenty-six to sixty-one distribution companies; most of which were privately owned and operated.[105] Only a nuclear-powered generating company and two hydroelectric plants (co-owned

95. *Id.* art. 2(c).

96. *Id.* arts. 2(b), (f).

97. *Id.* arts. 2(d), (e).

98. ELECTRICITY REFORM, *supra* note 11, at 21.

99. *See* CTR. FOR ENERGY ECON., RESULTS OF ELECTRICITY SECTOR RESTRUCTURING IN ARGENTINA 3 (2002), *available at* http://www.beg.utexas.edu/energyecon/new-era/case_studies/Results_of_Electricity_Sector_Restructuring_in_Argentina.pdf [hereinafter ELECTRICITY SECTOR RESTRUCTURING].

100. BASTOS & ABDALA, *supra* note 89, at 28.

101. *See* ELECTRICITY REFORM, *supra* note 11, at 63, 66, 68.

102. *See* Res. No. 9/1994, Jan. 10, 1994, [27814] B.O. 1 (creating Transener, S.A.).

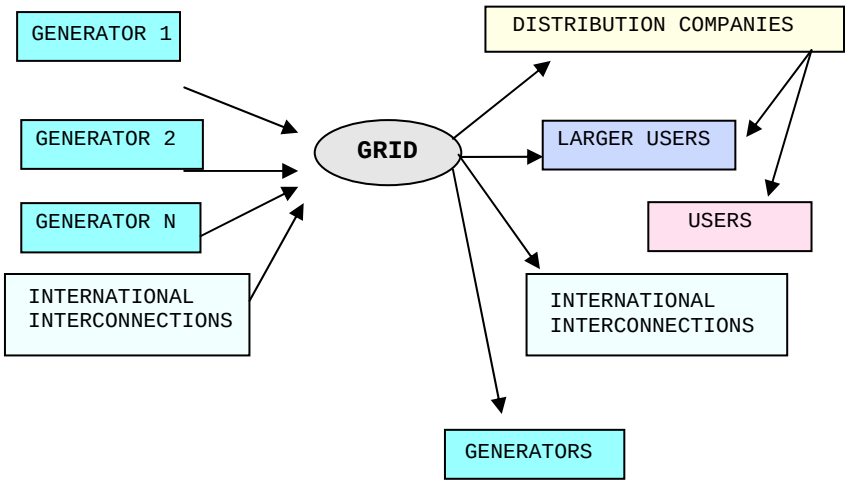
103. Ministerio de Economía Finanzas Públicas, Marco Legal del Sector Eléctrico, http://mepriv.mecon.gov.ar/Sector_Electrico/marco.htm (last visited Mar. 1, 2009).

104. Even though the main grid is managed by Transener, many transmission companies were incorporated to connect the generation plants to the grid.

105. MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, INFORME DEL SECTOR ELECTRICO: AÑO 2006 18 (2006), *available at* http://energia3.mecon.gov.ar/contenidos/verpagina.php?idpagina=2599 (follow link to Part 1 of the report).

with foreign investors) in the generation sector and some provincially-owned distribution companies remained under state control.

Based upon the United Kingdom's model, the Argentinean government created a national electricity pool known as the Wholesale Electricity Market ("WEM"), which began operating in 1992.[106] The WEM has both a supply side, which is integrated by local and foreign generators, and a demand side, which is composed of distribution companies, large users, and foreign consumers. Basically, the WEM has the following structure:



Finally, there is also a smaller grid in Argentina called the Patagonian grid that covers parts of the southern provinces of Chubut, Rio Negro, and Santa Cruz, and was connected to the national grid in 2006.[107]

106. ELECTRICITY REFORM, *supra* note 11, at viii.

107. Both the WEM and the Patagonian grid can be seen in the map included on page __. [NOTE TO AUTHOR – WILL FINALIZE PG NUMBER W/MAP]

2. The Main Public Actors

The main public actors in the new national model are the Energy Secretariat, the National Regulatory Entity ("ENRE"), Compañía Administradora del Mercado Mayorista Eléctrico S.A. ("CAMMESA"),[108] and Organismo Encargado del Despacho ("OED").[109]

The Energy Secretariat has the overall responsibility for the electricity industry. Its main role is to establish the policies applicable to the sector and to decide sector disputes.[110]

The ENRE is a national regulatory agency that regulates the industry, particularly transmission and distribution. Furthermore, the ENRE sets the price for transmission and distribution services,[111] mediates disputes between electricity companies, enforces the Electricity Regulatory Framework,[112] and establishes service standards for distribution companies.[113]

CAMMESA coordinates and schedules supply and demand of electricity.[114] This is not an easy task because the new model requires a constant dispatch. Also, CAMMESA sets a uniform price for electricity and acts as the agent of generation, transmission, and distribution companies with regard to certain activities related to the WEM.[115]

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108. *See* Decree No. 1192/1992, July 10, 1992, [27433] B.O. 30 (creating CAMMESA). It is important to point out that CAMMESA's Board of Directors consists of representatives of the WEM agents and the National Government. *See* Uriel F. O'Farrell & Mariano Palacios, *Argentina*, *in* GETTING THE DEAL THROUGH—ELECTRICITY REGULATION 2006 9, 13 (2006).

109. Res. No. 415/2004, Apr. 28, 2004, [30390] B.O. 19, arts. 5, 6.

110. Inter-American Development Bank, The Power Sector In: Argentina, http://www.iadb.org/sds/doc/1846eng.pdf (last visited Mar. 1, 2009).

111. Law No. 24065, Jan. 3, 1992, [27306] B.O. 30, art. 56(d).

112. *Id.* art. 56(a), (l).

113. *Id.* arts. 56(b).

114. Arturo González, *Deregulation Impacts Control and Communications Systems*, TRANSMISSION & DISTRIBUTION WORLD, Oct. 1, 2004, *available at* http://tdworld.com/distribution_management_systems/power_deregulation_impacts_control/.

115. *See id.*; *see also* MARIO VIGNOLO, THE NEW ELECTRICITY SUPPLY INDUSTRY IN ARGENTINA AND CHILE 4–5 (2000), *available at* http://iie.fing.edu.uy/investigacion/grupos/syspot/Argch_reg.pdf.

The OED manages the Fondo de Estabilización, or Stabilization Fund.[116] By law, the OED also manages the transactions among the agents of the WEM under rules of technical safety and the minimization of total variable production cost, defined according to the cost of fuel used and the generation equipment performance.[117] These last duties, however, have been entrusted to CAMMESA.[118]

3. Generation Sector

The Electricity Regulatory Framework defined generation as an activity of "general interest"[119] and, of the three electricity industry segments, it became a competitive activity with open access to the national grid and unregulated prices.[120] In 1991, generation was initially in the hands of four major companies with a combined market share of 77.3%, the largest company (SEGBA) having a market share of 23.3%. By 2002, there were forty-three generating companies in the WEM,[121] and the share of the four largest private companies was 40.5%.[122] The energy market was liberalized for large users. Large users are free to contract directly with generators and can participate directly in the generation market.[123] As a result of this liberalization, the number of participants in the WEM grew to 2,528 in December

116. Law No. 24065; Res. No. 61/1992, Apr. 29, 1992, [27387] B.O., annex 1, pt. 5.7.

117. Res. No. 712/2004, July 12, 2004, [30442] B.O. 4, arts. 1, 2.

118. *See* MARTÍN RODRÍGUEZ PARDINA, INST. OF THE AMS. PROGRAM ON EFFECTIVE INSTS. FOR EFFICIENT MARKETS, GOVERNANCE MECHANISMS FOR ELECTRICITY MARKETS IN LATIN AMERICA: A PENDING TASK 7–8 (2001) (discussing the functions of CAMMESA).

119. The WEM covers most of the country (and 93% of electricity demand). Southern Argentina has its own non-interconnected market (the MEMSP), which supplies 4.4% of total electricity demand; the remainder of the power demand is supplied by small isolated systems. *See* Ministerio de Planificación Federal, Inversión Pública y Servicios, Mercados Eléctricos, http://energia.mecon.gov.ar/energ_anuario/zip/doc2/d2p29.pdf.

120. Law No. 24065, art. 2.

121. MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, INFORME DEL SECTOR ELECTRICO: AÑO 2002 15 (2006), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/publicaciones/Informe%202002.pdf [hereinafter INFORME DEL SECTOR ELECTRICO 2002].

122. In theory, however, no generator in Argentina is allowed to control more than 10% of the system's generation capacity. ELECTRICITY REFORM, *supra* note 11, at viii.

123. Law No. 24065, art. 6.

2002.[124] That number included 43 generating companies, 66 distribution companies, and 2,370 large users.[125] By this time, national installed capacity was 25.5 GW.[126]

The Regulatory Framework created two supply markets within the WEM:[127] (1) the "spot market", in which energy is supplied on an hourly basis with uniform prices established by CAMMESA that reflect the short term marginal cost in the system's load center; and (2) the "term market,"[128] in which energy is supplied through power purchase agreements between sellers (power generators) and buyers (other generators, distribution companies, users, and marketers) who freely agree on prices and other conditions.[129] Both markets have their own prices. Therefore, as is explained below,[130] the Electricity Regulatory Framework created two kinds of wholesale electricity prices in the Argentinean electricity industry, namely: the spot price,[131] which could be affected by a seasonal price,[132] and contractual prices.

124. INFORME DEL SECTOR ELECTRICO 2002, *supra* note 121.

125. *Id.*

126. *Id.* at 25.

127. Res. No. 61/1992, Apr. 29, 1992, [27387] B.O., art. 9.

128. Res. No. 426/2004, Apr. 30, 2004, [30393] B.O. 11, art. 1 (explaining that term market contracts must have a minimum term of two semesters).

129. Daniel A. Yarano & Christina Brusven, *Basic Elements of a Power Purchase Agreement*, WINDUSTRY, Dec.. 15, 2006, http://windustry.advantagelabs.com/sites/windustry.org/files/PowerPurchaseAgreement.pdf. Contracts do not necessarily entail physical delivery, since dispatch is established on the basis of ascending cost of production. EUROPEAN COMM'N, DG COMPETITION REPORT ON ENERGY SECTOR INQUIRY 121 (2007), *available at* http://ec.europa.eu/competition/sectors/energy/inquiry/full_report_part2.pdf.

130. *See infra* Part III.C.v.

131. The spot can be found daily on the CAMMESA website: http://www.cammesa.com.ar.

132. Law No. 24065, Jan. 3, 1992, [27306] B.O. 30, art. 70.

4. Transmission and Distribution Sectors

On the other hand, transportation and distribution activities, although privatized, remained state-regulated monopolies affected by strong government controls, including tariffs and quality standards.[133] This is because transportation and distribution have been defined by the ENRE as sectors in which the government has a natural monopoly, and thus, they are closely regulated.[134] To become a transportation or distribution company, a concession by the Executive Branch is required.[135] As a consequence of the natural characteristics of the activities, these companies may charge no more than regulated prices for their services.[136] Concessionaires are not allowed to sell or buy electricity[137] and are required to give third parties open access to their transmission network.[138] Futhermore, users are not allowed to choose between retailers.[139]

The transmission network physically links buyers and sellers and has two parts: a high voltage (500 kilowatt) transmission system and six medium-voltage (220 kilowatt) regional transmission systems.[140]

The following map illustrates the current high-tension voltage and trunk lines:

133. Compañía Administradora del Mercado Mayorista Eléctrico S.A., MEM, http://portalweb.cammesa.com/pages/institucional/ (last visited Mar. 1, 2009) [hereinafter CAMMESA MEM]. The United Kingdom adopted a form of price-cap regulation that was emulated by Argentina. *See* Law No. 24065, art. 42. By means of this restriction, the government establishes a price ceiling. FRED BOSSELMAN ET AL., ENERGY, ECONOMICS AND THE ENVIRONMENT: CASES AND MATERIALS 707 (1st ed. 2000).

134. Law No. 24065, art. 1.

135. For instance, the concession agreement between the government and Transener contained a term of ninety-five years. Contrato de Concesión de Transener S.A., art. 3, *available at* http://www.uniren.gov.ar/audiencias_publicas/cc_transener.pdf.

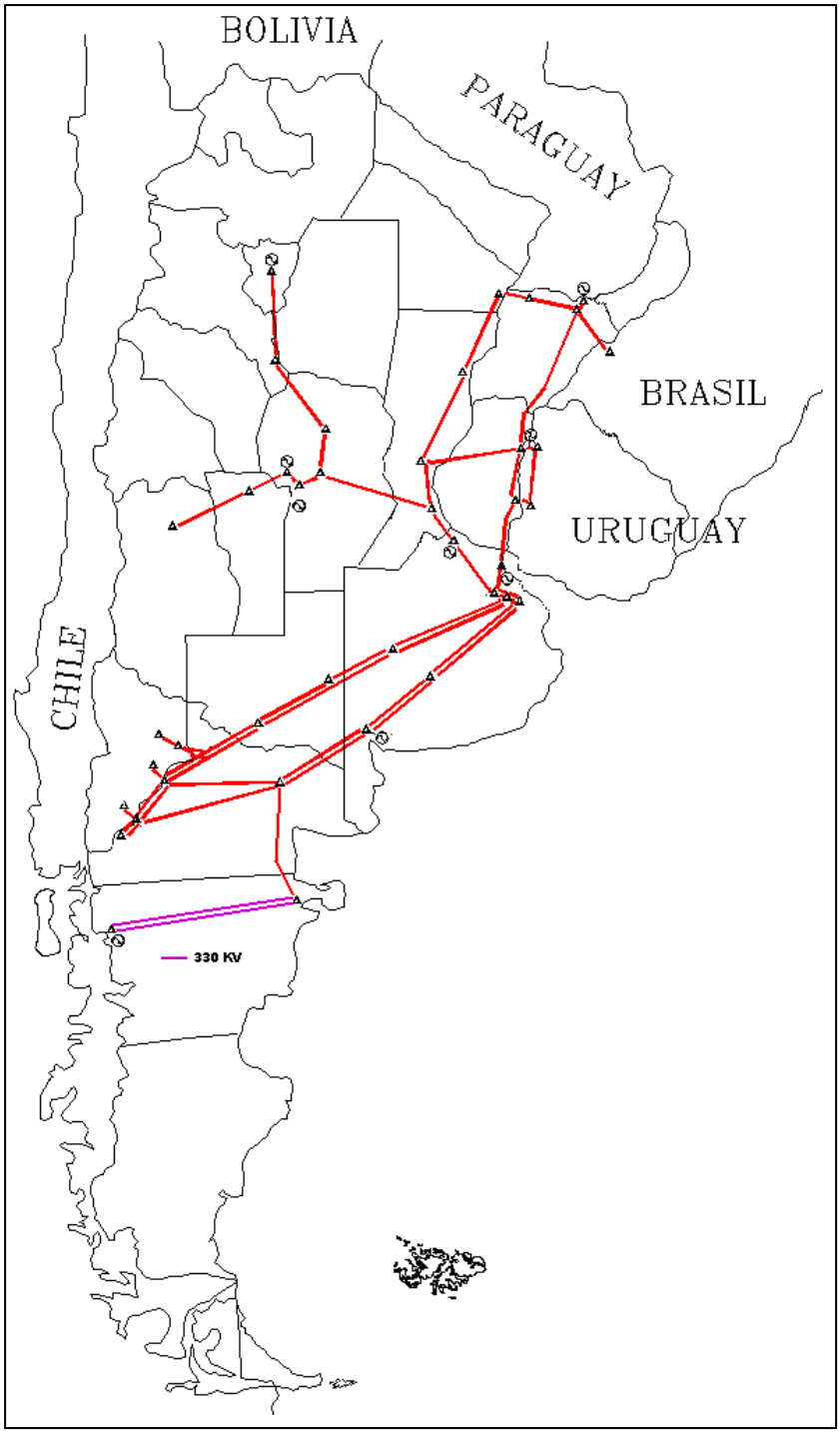
136. Law No. 24065, art. 42.

137. *Id.* art. 30.

138. *Id.* art. 22.

139. *Id.* arts. 3, 50.

140. ELECTRICITY REFORM, *supra* note 11, at 73.


BOLIVIA
PARAGUAY
BRASIL
URUGUAY
CHILE
330 KV

5. Interaction Between Supply and Demand

a. The Spot Market

The interaction between supply and demand for electricity in the spot market is subject to economic dispatch, whereby the required load demand is allocated on a merit order based on the system's marginal cost. The lowest-cost unit is dispatched first, followed by the next lowest-cost unit.[141] This process continues until the demand for electricity is satisfied.

According to the provisions of the Electricity Regulatory Framework, a uniform price for electricity would be established from time to time by CAMMESA.[142] CAMMESA would prepare, on the basis of biannual demand projections, a list of generators arranged in ascending order of variable production costs, as submitted, until the supply was adequate to meet the estimated demand. The price paid to each power generator was a standard price calculated for all generators and was determined on the basis of the generator with the highest cost of generation that was actually dispatched.[143] In addition, generators would receive a price for the capacity they made available to the grid.[144] Therefore, the income of the generation sector basically came from two sources: income from the sale of electricity (which essentially covered variable costs) and compensation for the capacity made available to the grid (allocated to cover fixed costs, including investment costs in U.S. dollars).

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141. Operations planning and pricing are based on the application of two computer programs originally developed by Électricité de France, OSCAR and MARGO. MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, MERCADO ELECTRICO MAYORISTA 5 (2001), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/Reorganizacion/contenidos_didacticos/MercadoElectricoMayorista.pdf.

142. *See* Ministerio de Planificación Federal, Inversión Pública y Servicios, Sistema Tarifario, http://energia3.mecon.gov.ar/contenidos/verpagina.php?idpagina=342 (last visited Mar. 1, 2009) (describing the pricing procedure).

143. Law No. 24065, Jan. 3, 1992, [27306] B.O. 30, art. 36.

144. Res. No. 137/1992, Nov. 30, 1992, [27556] B.O. 10, annex 20, pt. 2.4.2.1.

In order to protect consumers, distributors may purchase electricity in the WEM at a seasonal price determined by CAMMESA.[145] Every six months (subject to a quarterly review), CAMMESA determines the seasonal electricity prices payable by distributors for their purchases of energy in the WEM.[146] To determine the seasonal price, CAMMESA uses a seasonable database and models that take into account energy supplies provided by generators based on their expected availability, committed imports of electricity, and the availability declared by generators.[147]

Under normal conditions, the seasonal price for electricity matches the expected mean spot price. There are cases, however, when the price for electricity paid by distributors differs from the price paid to generators. This may happen, for example, due to exceptionally low or high levels of water or an unforeseen low or high demand for electricity. If the prices on the spot market are lower than the seasonal price, funds are deposited in the Fondo de Estabilización Estacional, managed by the OED.[148] Conversely, if prices on the Spot Market exceed the seasonal price, the fund covers payments to generators.[149] In case of a deficit in the Fondo de Estabilización Estacional, the Electricity Regulatory Framework states that the Energy Secretariat will either finance the deficit of the Fondo de Estabilización Estacional,[150] and adjust the seasonal price collected by the distributors to cover the spot price payable to the generators for their energy sales,[151] or directly approve an increase in the seasonal price to reflect the actual cost of electricity.[152] As can

145. Compañía Administradora del Mercado Mayorista Eléctrico S.A., Distribuidores, http://portalweb.cammesa.com/pages/institucional (last visited Mar. 1, 2009).

146. *Id.*

147. *See* CAMMESA MEM, *supra* note 133.

148. *Id.*

149. *See id.*

150. This occurred in the case of the loan granted to this fund by Decree 1181/2003. Decree No. 1181/2003, Dec. 3, 2003, [30292] B.O. 5.

151. *See* Law No. 24065, Jan. 3, 1992, [27306] B.O. 30, art. 36.

152. *Id.* art. 37.

be concluded, the Fondo de Estabilización Estacional does not affect the market competition existing between generators because generators are paid according to the costs of generation.

b. The Term Market

As was mentioned, in addition to the spot market, there is a term market in which generators and certain buyers (i.e., distributors, large users, and marketers) freely agree upon the terms and conditions of their power purchase agreements.[153] Since 2004, those contracts must have a minimum term of one year.[154]

6. The Performance of the Argentinean Electricity Sector from 1992 Until 2002

The privatization of the electricity sector in the 1990s was a success.[155] In fact, it was said that "by common consent, electricity was the most successful of Mr. Menem's privatizations. By 2001, Argentina had become the most efficient energy producer in Latin America, having moved from being an importer in the 1980s to exporting oil, gas and electricity" by the mid-1990s.[156]

a. Investment

The view that the privatization of the electricity market had been successful was reflected in investment levels. Indeed,

> the privatization process was flawless and allowed the sector to maintain a growing productive process. Investors and operators from Argentina, Chile, Europe and the USA participated on an equal opportunity basis, without favoritism. The process was absolutely transparent, a fact which has been acknowledged by successful and unsuccessful bidders in each tender

153. Res. No. 426/2004, Apr. 30, 2004, [30393] B.O. 11, art. 1.

154. *Id.*

155. *See The Laws of Economics Bite Back; Argentina's Energy Shortage*, ECONOMIST, Apr. 24, 2004, at 35 (quoting Fernando Ponasso, the president of the association of electricity distributors).

156. *Id.*

> process, as well as by Government enforcing agencies . . . . The excellent outcome of the reform process becomes apparent when it is considered that the wholesale electricity price dropped by 51% in the 1992–2001 period, while the retail price to end users decreased by 24% . . . . The model implemented in Argentina is acknowledged as one of the most successful worldwide.[157]

Furthermore, between the beginning of 1992 and the end of 2002, the installed capacity in the WEM expanded from 13,267 MW to 25,497 MW, and the reserve margin was 46% at its peak in 2002 (peak demand divided by available capacity).[158] The number of units delivered increased from 45,800 GWh to 76,636 GWh.[159] Transmission lines in the main WEM system expanded from 16,958 Km to 21,521 Km between 1992 and 2002 and to 24,602 Km by 2006. [160] In distribution, the total number of electricity users served increased from 4.982 million in 1992 to 9.858 in 2002.[161]

b. Prices

Electricity prices in Argentina are among the lowest in Latin America and are extremely low by global standards.[162] Between 1992 and 2001, wholesale prices fell by over 55% in nominal terms and by 63% in inflation-discounted terms.[163] In May 2002,

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157. *El Riesgo Energético*, CLARÍN, Aug. 24, 2003, *available at* http://www.clarin.com/suplementos/economico/2003/08/24/n-02401.htm (author's translation).

158. *See* INFORME DEL SECTOR ELECTRICO 2002, *supra* note 121, at 25.

159. *Id.* at 29.

160. *See* MINISTERIO DE ECONOMÍA Y FINANZAS PÚBLICAS, RESUMEN EJECUTIVO DE LA INFORMACIÓN PRESENTADA POR EDENOR S.A. (2002), http://www.mecon.gov.ar/crc/docs/info_recibida/energia/distribucion_energia_electrica/edelap_resumenejecutivo.pdf [hereinafter EDENOR S.A.].

161. *See id.*

162. Alexei Barrionuevo, *Energy Crunch Threatens South American Nations*, N.Y. TIMES, Oct. 13, 2007, at A7.

163. CÁMARA ARGENTINA DE INVERSORES EN EL SECTOR ELÉCTRICO, ELECTRICITY IN ARGENTINA: A GREAT ACHIEVEMENT FACING SERIOUS PROBLEMS 12 (2002) [hereinafter ELECTRICITY IN ARGENTINA].

residential tariffs were just US$0.025 per kilowatt for a residential consumer compared with US$0.08 per kilowatt in the United States.[164]

c. Financial Performance

The low price of electricity and high rates of investment in the sector prior to 2002 were accompanied by strong financial performance by the companies involved.[165] The average post-tax rate of return on equity was 4.6% in 2000.[166] In transmission, Transener's post-tax rate of return on equity was 6.8% in 2000.[167] Among the distribution companies, rates of return on equity were rather higher; Edenor S.A. and Edesur S.A. earned post-tax rate of returns on equity of 10.9% and 9.5% in 2000.[168]

164. *Compare* ENTE NACIONAL REGULADOR DE LA ELECTRICIDAD, INFORME ANUAL 2001 20 (2001) (graphing Argentine tariff prices), *with* TATSUYA YAMADA, ELECTRIC POWER GROUP, INTERNATIONAL COMPARISON OF ELECTRIC SERVICE TARIFFS 5 (2002), *available at* http://eneken.ieej.or.jp/en/data/pdf/149.pdf (graphing a comparison of U.S. tariff prices against those of other European and Asian nations).

165. *See* ELECTRICITY IN ARGENTINA, *supra* note 163, at 5.

166. *See id.*

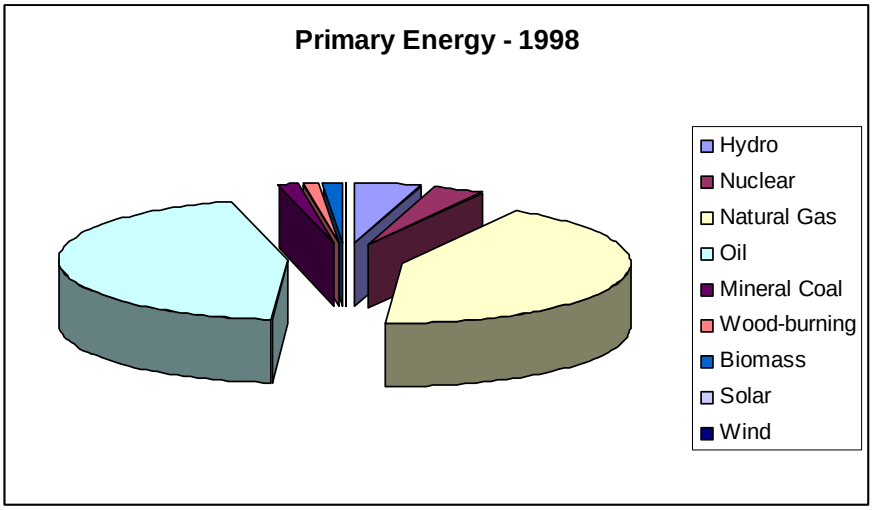
167. *See* Press Release, Transener S.A., Transener S.A. Reports Fiscal Year 2001 Results (Mar. 6, 2002), *available at* http://www.transener.com.ar/menu_eng/finanzas/eng_12-01.pdf.

168. *See* EDENOR S.A., *supra* note 160.

IV. ATTEMPTS TO BOOST RENEWABLE GENERATION

A. First Attempt

By 1998, most energy in Argentina was generated by fossil fuels.[169] In fact, the National Electricity Balance (Balance Energético Nacional),[170] prepared by the Energy Secretariat, shows that, in 1998, only 4,143 kTOE of the 78,915 kTOE produced (5.25%) was produced by renewable energy (including large hydro power plants), with 3 kTOE coming from wind sources[171] and 2.859 kTOE from hydro sources.[172] In 1998, the energy generated throughout Argentina came from the following sources:[173]



169. *See* SECRETARÍA DE ENERGÍA, BALANCE ENERGETICO NACIONAL 30 (2007), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/Reorganizacion/informacion_del_mercado/publicaciones/energia_en_gral/balances_energeticos2006/BEN_AVANCE_2006.pdf.

170. *Id.*

171. *Id.* at 34.

172. *Id.* at 24.

173. *Id.* at 21.

Given the aforementioned situation, in the mid 1990s, international non-governmental organizations like Greenpeace and national cooperatives[174] that did not have access to the grid started to work for the enactment of a law that would allow the creation of a renewable generation industry.[175] Furthermore, renewable energy was the subject of analysis in different local universities like Universidad de Buenos Aires and Universidad Nacional de La Plata. In other words, the issue started to be discussed between different social groups. As a consequence of this social requirement, the Argentinean government took the first step towards the creation of a renewable generation industry by enacting Law 25,019[176] (and its regulatory decree 1597/1999).[177] That law came five years after the original text was drafted by the Congress in 1993.[178] However, when the Congress approved the text of Law 25,019 in 1998, the executive branch did not support it and exercised its veto power.[179] The veto was overridden by the Congress.[180] The main objectives of that law were basically to promote clean, renewable wind and solar energies, to reduce fossil fuel dependency, to create sustainable development, to create employment, and to promote investment.

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174. *See* ELECTRICITY SECTOR RESTRUCTURING, *supra* note 99, at 2 (noting that, like in the United States, cooperatives in Argentina are business-owned and democratically controlled by their members (the people who use the co-op's services or buy its goods), not by outside investors).

175. *See, e.g.*, Soledad Aguilar, *Environmental Non-Government Organizations in Argentina*, 11 REV. EUR. COMMUNITY & INT'L ENVTL. L. 225, 227–28 (2002) (discussing Greenpeace's involvement in pushing for a law allowing creation of renewable wind power).

176. Law No. 25019, Oct. 19, 1998, [29008] B.O. 1.

177. Decree No. 1597/1999, Dec. 9, 1999, [29295] B.O. 2.

178. The project was originally drafted in 1993. Proyecto de Ley No. 3049-D-93, Oct. 13, 1993, Declarar de Interés Nacional la Generación y Producción de Energía Eólica en la Patagonia, Trámite Parlamentario 101. It was not enacted in 1993, but was resubmitted for consideration in 1995. Proyecto de Ley No. 1823-D-95, June 15, 1995, Declarar de Interés Nacional la Generación y Producción de Energía Eólica en la Patagonia (Reproducción del Expediente 3049-D-93), Trámite Parlamentario 55.

179. ALVARO MENDEZ, ARGENTINA: THE MARKET FOR WIND POWER EQUIPMENT, *available at* http://www.ic.gc.ca/scdt/bizmap/interface2.nsf/vDownload/IMI_8403/$file/X_6530439.DOC.

180. *Id.*

In order to achieve these results, Law 25,019 declared wind and solar generation to be of national interest,[181] introduced a mechanism that established an additional payment over the spot price per kilowatt generated from wind resources,[182] established a preference dispatch mechanism for wind-generated energy,[183] and granted certain tax exemptions and tax stability for a period of fifteen years from the law's promulgation.[184] Beyond the previously mentioned benefits, wind and solar energy investments made to build wind or solar power plants were authorized to defer the payment of the value added tax for the term of fifteen years, after which time the tax could be paid in fifteen yearly installments from the enactment of the law.[185] Unfortunately, the rationale behind the law was not made explicit in any part of the law nor in any public file related to its legislative history.

By 2001, three years after the enactment of Law 25,019, little investment had been made in the renewable generation sector.[186] If there had been any expectations for any development in that sector, they became a fantasy after the economic crisis that hit Argentina in December 2001.[187]

181. Law No. 25019, art. 1.

182. *Id.* art. 5.

183. *Id.* art. 6.

184. *Id.* art. 7.

185. *Id.* art. 3.

186. *A Pesar de Ser Ilegal, Greenpeace Entrega Energía Solar a la Red Pública Nacional*, GREENPEACE ARGENTINA, Apr. 19, 2001, http://www.greenpeace.org/argentina/enerG-a-e-lica/greenpeace-solar/a-pesar-de-ser-ilegal-greenpe (explaining that there have been small projects to feed the WEM such as the solar power plant built in 2001 by Greenpeace in Buenos Aires).

187. University of California Santa Cruz, UC Atlas of Global Inequality, Argentina Economic Crisis of 2001, http://ucatlas.ucsc.edu/sap/Argentina_crisis.php (last visited Mar. 1, 2009).

B. 2001 Crisis and Its Aftermaths

In 2001, ten years had passed since Argentina had refinanced its public debt, yet it already needed to restructure its debt again.[188] After ten years of having the peso pegged to the U.S. dollar, Argentina started to experience deflation.[189] That economic effect slowed down the entire Argentinean economy, which entered into a recession.[190] In order to avoid that recession, the government kept making public investments and started to print money.[191] These two factors increased the public deficit in an impressive way.[192] Due to that increase of the fiscal deficit, the macro economy was so deteriorated that in early 2002, the Argentinean government enacted Law 25,561 in an effort to reverse the situation.[193] This law substantially changed the rules and regulations under which investments—including those in the electrical sector—were decided, and materially and adversely affected the financial requirements of the companies' business continuities.[194]

First, Congress decided to suspend all payments on Argentina's foreign debt.[195] Furthermore, the deterioration of the Argentinean balance of payments put pressure on the parity

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188. Ramon Moreno, *Learning from Argentina's Crisis*, FED. RES. BANK OF SAN FRANCISCO ECON. LETTER, Oct. 18, 2002, at 3, *available at* http://www.frbsf.org/publications/economics/letter/2002/el2002-31.pdf.

189. *See id.* at 2.

190. *See* Peter Katel, *Argentina's Crisis Explained*, TIME, Dec. 20, 2001, *available at* http://www.time.com/world/article/0,8599,189393,00.html (explaining that the peso's tie to the U.S. dollar and Brazil's consequential devaluation of its *real* both led to a decrease in Argentina's foreign investment and exports, thereby causing economic uncertainty and a recession).

191. *See id.*

192. Moreno, *supra* note 188, at 2.

193. *See generally* Ruy Varela, President, SIGLA S.A., Presentation at 2008 Institute of Electrical and Electronics Engineers Power & Energy Society General Meeting: Hydro Developments and Generation Options in Argentina (July 22, 2008), *available at* http://www.ieee.org/organizations/pes/meetings/gm2008/slides/pesgm2008p-000631.pdf.

194. ELECTRICITY IN ARGENTINA, *supra* note 163, at 5.

195. *See* Harold Trinkunas & Jack Boureston, *Financial and Political Crisis in Argentina: Walking a Wobbly Tightrope*, STRATEGIC INSIGHTS, Mar. 2002, *available at* http://www.ccc.nps.navy.mil/si/mar02/latinAmerica.asp.

between the U.S. dollar and the peso.[196] A maxi-devaluation of an overvalued peso was needed. By means of that devaluation, the peso was unpegged from the U.S. dollar and started to float, under the constant interference of the Argentine Central Bank, within certain ratios established by the government.[197] This meant a fall of the peso to up to four pesos per U.S. dollar.[198] All contracts originally agreed to be paid off in U.S. dollars were converted to pesos at different conversion ratios depending on the type, amount, and parties to the agreement.[199] Furthermore, the foreign exchange market was closed[200] and electricity tariffs were frozen.[201]

The consequences of such measures were clear. The development of the electrical utility is based on investments made in very specific assets with long maturing cycles (major assets which depreciate over a long time, most of which are imported or subject to international reference pricing).[202] Those

196. *See id.*

197. *See id.*

198. Kurt Schuler & Steve H. Hanke, *Argentina: Look to Ecuador*, CATO.ORG, Apr. 1, 2002, http://www.cato.org/pub_display.php?pub_id=6606.

199. Sabyasachi Mitra, *Redollarization to Worsen the Argentine Crisis*, INT'L DEV. ECON. ASSOCS., Apr. 8, 2003, http://www.networkideas.org/news/apr2003/news08_Argentine_Crisis.htm. The general rule was that obligations in foreign currencies were converted into Argentinean pesos (ARS$) at a rate of ARS$1 per US$1, but bank deposits were converted at a rate of ARS$1.4 per US$1. *Id.* If the values of the good or service resulting from the pesification were higher or lower than the market value thereof at the date of payment, any of the parties could request an equitable readjustment of the price. *Id.* Obligations denominated in foreign currency and not subject to Argentine law were not pesified. *See id.*

200. *See* Decree No. 260/2002, Feb. 8, 2002, [29834] B.O. 1 (explaining that the foreign exchange market was created in February 2002); Decree No. 616/2005, June, 10, 2005, [30672] B.O. 1 (imposing a 30% mandatory deposit applicable to funds received from abroad by all local companies, regardless of their corporate type).

201. *See* Decree No. 260/2002 (confirming CAMMESA's decisions in this sense). Thereafter, pursuant to several Resolutions of the Energy Secretariat, all values previously expressed or calculated in U.S. dollars pursuant to the Electricity Regulatory Framework were converted into pesos at the exchange rate of 1:1. *See, e.g.*, Res. No. 2/2002, Mar. 14, 2002 [29860] B.O. 3; Res. No. 8/2002, Apr. 5, 2002 [29873] B.O. 9; Res. 126/2002, Oct. 11, 2002 [30006] B.O. 23.

202. International Reference Pricing (sometimes referred to simply as IRP) compares the prices for the same product in different countries; the reference price for that product is determined by an arbitrary statistical calculation (i.e., average of all, average of lowest three countries, etc.). *See generally* Oded Lowengart & Shlomo

cycles require long-term stability in the operating rules, so as to promote investments with a guaranteed return.[203] Therefore, a change in the investing or market rules would inhibit any investments. Secondly, tariffs were frozen and, thus, prices in the Spot Market are no longer fixed according to the cost of the last unit dispatched.[204]

Consequently, generators are not paid a price that reflects the electric system's economic costs. Generators of electricity from renewable sources saw their "premium prices" converted to pesos and paid over a pesified and frozen Spot Market tariff while their debt was or would be in U.S. dollars.[205] Likewise, due to the pesification of payments in U.S. dollars, all generators have been forced to receive capacity payments that are well under their generation costs and substantially reduced in U.S. dollar amount.[206]

Mizrahi, *Applying International Reference Price: Market Structure, Information Seeking and Consumer Welfare*, 17 INT'L MARKETING REV. 525 (describing international reference pricing and some of the factors involved in determining the IRP).

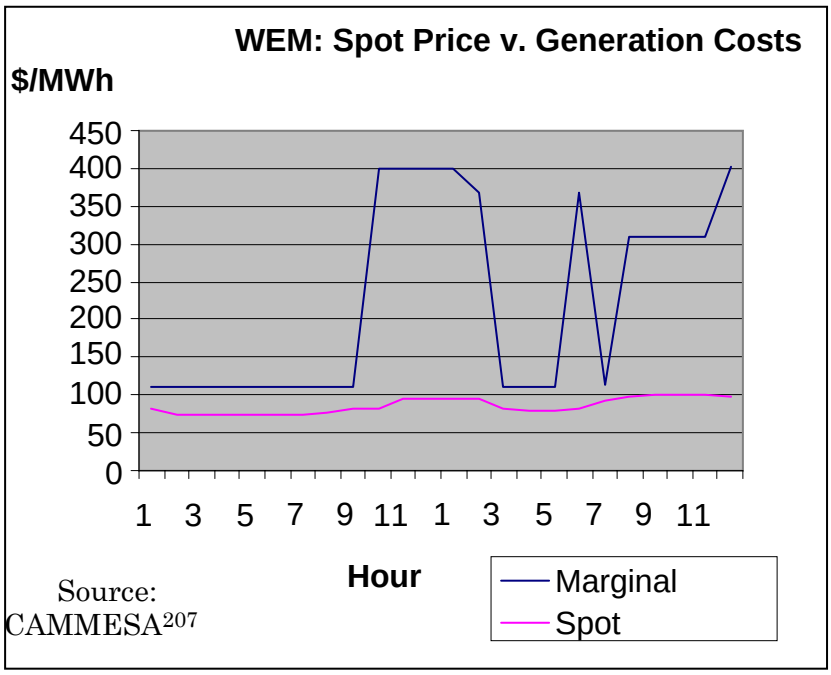
203. ELECTRICITY IN ARGENTINA, *supra* note 163, at 5.

204. *See* Alejandra Nuñez-Luna & Erik J. Woodhouse, *The IPP Investment Experience in Argentina* 16 (Program on Energy & Sustainable Dev., Working Paper No. 44, 2005), *available at* http://iis-db.stanford.edu/pubs/20954/Argentina.pdf.

205. *See* Decree No. 214/2002, Feb. 3, 2002, [29830] B.O., art. 3; Res. No. 38/2002, Apr. 9, 2002, [29874] B.O. 4 (freezing tariffs).

206. *See, e.g.*, El Paso Energy Int'l Co. v. Argentine Republic, ICSID (W. Bank) Case No. ARB/03/15 (Apr. 27, 2006) ¶ 26 (describing the effects of pesification on individual generators CAPEX and Costanera).

These and other measures led to an important disparity between investment costs and returns for generators. The following chart compares the difference between the spot price and generation costs on March 29, 2008 (which is similar for every day of the year):



Source: CAMMESA[207]

This difference between the spot price paid to generators and their marginal costs of generation was considered to be a credit of generators against CAMMESA.[208] Instead of receiving their credits back in cash, generators were invited to partially offset their credits by constructing two new power plants.[209]

207. Daily generation costs and spot prices are *available at* http://portalweb.cammesa.com/pages/dataoperations.aspx.

208. *See* Res. No. 406/2003, Sept. 8, 2003, [30230] B.O. 12, arts. 1, 2; *see also* Julian Dowling, *Govt. Gives Generators to Oct. 13 to Accept New Fund*, BUS. NEWS AM., Sept. 20, 2004, http://www.bnamericas.com/news/electricpower/Govt,_gives_generators_to_Oct,13_to_accept_new_fund.

209. *See* Res. No. 1193/2005, Oct. 7, 2005, [30759] B.O. 5, art. 1. The rest of the financing was provided by non-residential users of the WEM through a compulsory fund named "Cargo Transitorio para la Conformación del FONINVEMEM." Res. No. 1866/2005, Nov. 29, 2005, [30798] B.O. 9, art. 1; *see Argentina's New 800-MW Gas*

Indeed, in order to replenish the fund, the Energy Secretariat created an investment fund called "Fondo para las Inversiones Necesarias que permitan incrementar la oferta de energía eléctrica en el Mercado Eléctrico Mayorista" (Fund for Investments Required to Increase the Electric Power Supply in the Wholesale Electricity Market).[210] This fund encouraged WEM creditors to participate as investors in the construction of two new power plants in Argentina.[211] Even though the invitation was not compulsory, non-participating agents would only receive payment on any such credits as of the date on which the new generators provided sufficient funds.[212]

All these measures did little to attract investors. As the Argentinean Chamber of Investors in the Electrical Sector said:

> The possibility of new investments [from the private sector] appears to be remote due, among other things, to the fact that the industry has not only suffered the effects of the recent exchange, monetary and price repression measures mentioned above, but also a change in the regulatory provisions that encouraged the landing of so many new investors ready to compete in Argentina.[213]

Specifically, four main effects of these circumstances are currently impacting the sector. The first one is that the economic measures and rules implemented resulted in a "loss of the companies' working capital which ended up affecting their ability to meet service quality goals, since the maintenance of equipment and networks [was] impaired by the lack of resources."[214] "Such a lack will become more perceptible when

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Projects to be Lead-Managed by TOTAL, ENDESA, GLOBAL POWER REP., Jan. 19, 2006, at 9, *available at* 2006 WLNR 1841961 (noting that Foninvemem represents "the difference between tariff revenues collected from distributors and generators' actual production costs").

210. Res. No. 712/2004, July 12, 2004 [30442] B.O. 4, art. 1.

211. *See* Res. No. 1193/2005, art. 1.

212. *See* Res. No. 826/2004, Aug. 6, 2004, [30461] B.O. 11.

213. ELECTRICITY IN ARGENTINA, *supra* note 163, at 11.

214. *Id.* at 6. These measures and rules included the mentioned pesification and freeze of tariffs. *See supra* notes 205–06 and accompanying text. It also included the strong restrictions affecting the foreign exchange market, which included restrictions to access foreign exchange to pay for imports, and the emission of quasi-monies by the

imported materials or spare parts are needed, due to the foreign origin of the equipment and the impossibility of replacing them . . . despite the preventive maintenance carried out."[215] The second one is that pesified and frozen tariffs, as well as pesification of outstanding contracts, left most companies suffering from heavy financial losses, because most loans borrowed from foreign creditors had to be repaid in U.S. dollars.[216] All this affected the generating sector as a whole.[217] The third effect, and certainly of greater consequence, is that the investment process has stopped. "[M]ost investors in this sector today are feeling the consequences of a default in the repayment of their investments."[218] The following chart illustrates the stagnation of investment in the electricity sector:[219]

federal government as well as the government of several provinces. *See* OFFICE OF THE U.S. TRADE REPRESENTATIVE, 2004 NATIONAL TRADE ESTIMATE REPORT ON FOREIGN TRADE BARRIERS 7 (2004) (noting Argentina's implementation of capital and exchange controls); Augusto de la Torre, et al., Argentina's Financial Crisis: Floating Money, Sinking Banking 15–16 (2002) (draft), *available at* http://www.econ.umn.edu/~tkehoe/classes/Schmukler.pdf (discussing Argentina's financial crises, including the issuance of quasi-monies and pesificication).

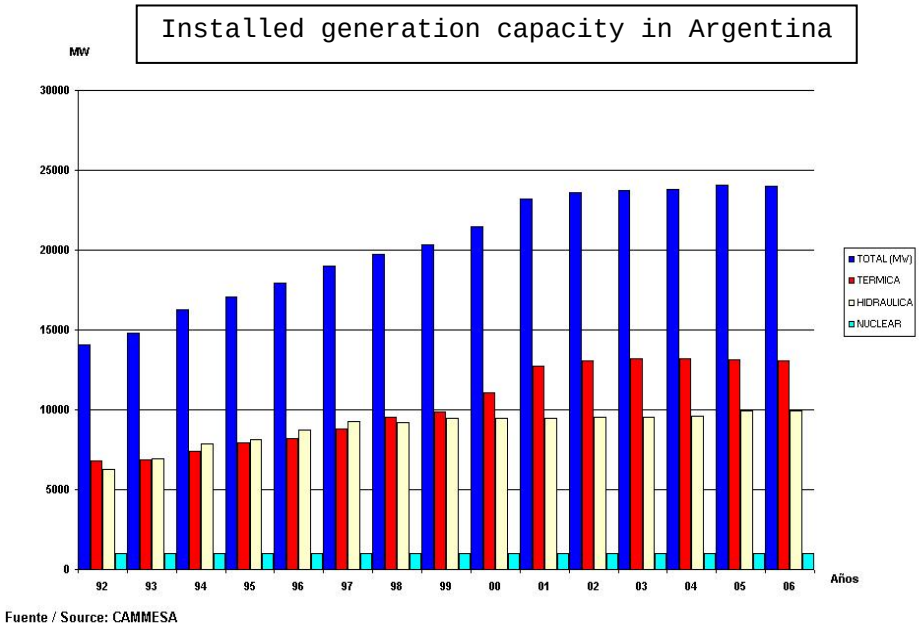
215. ELECTRICITY IN ARGENTINA, *supra* note 163, at 6.

216. *See id.* at 20. A resolution of the Ministry of Economy froze tariffs in 2002. Res. No. 38/2002, Apr. 9, 2002, [29874] B.O. 4, arts. 1, 2.

217. *See generally* ELECTRICITY IN ARGENTINA, *supra* note 163, at 5 (explaining the sector's need for reasonable rates of return).

218. *Id.* at 6.

219. Compañía Administradora del Mercado Mayorista Eléctrico, Potencia Efectiva Bruta Instalada, http://www.cammesa.com/archcount.nsf/LinkCounter?OpenAgent&X=Estadisticas*Pot.*instalada*MEM/MEMSP&L=/estadistica.nsf/WEstadistica/8CED253C0DB730F303256B7B004E7D95/$File/potencia.xls (excel spreadsheet from Argentina's wholesale electricity administrator).

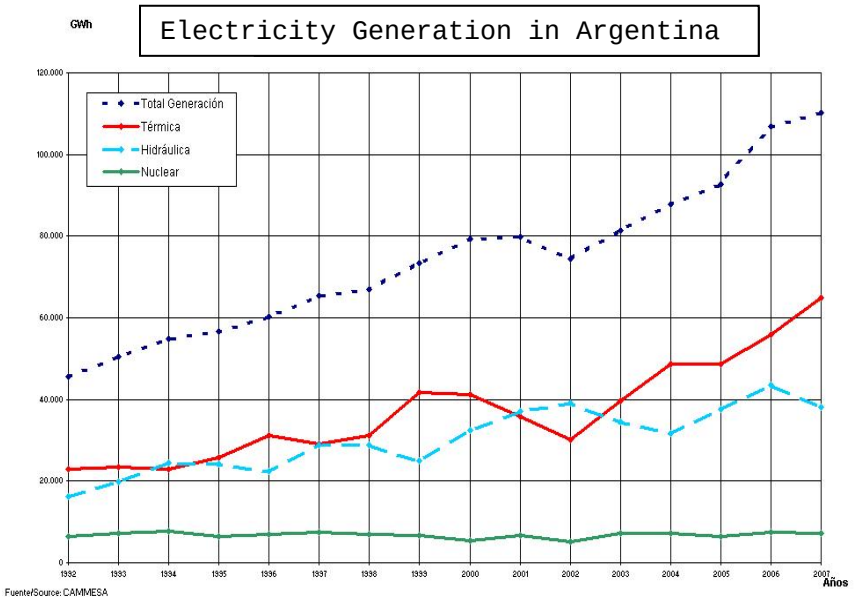


Finally, and with regard to renewable generation, the premiums granted to renewable generators have never been updated.[220] Even though there have been different attempts to amend it, they have always stayed as they were originally established in 1998. [221]

220. *See* Law No. 25019, Oct. 19, 1998, [29008] B.O. 1, art. 5.

221. In 2002, the national deputy introduced a bill to amend Law Number 25,019, updating the premium granted to renewable generators. Proyecto de Ley No. 6277-D-2002, Jan. 10, 2002, Modificaciones a la Ley 25019, de Regimen Nacional de Energia Eolica y Solar, Trámite Parlamentario 147. Similar amendments to 25,019 were proposed in 2004. Proyecto de Ley No. 4995-D-2004, Aug. 13, 2004, Modificación del Articulo 5 de la Ley 25019, Regimen de Energia Eolica y Solar, Sobre Actualizacion del Valor Estacional del KWH, Trámite Parlamentario 113; Proyecto de Ley No. 6412-D-2004, Sept. 30, 2004, Regimen Nacional de la Energia Eolica y Solar, Ley 25019, Modficaciones Sobre Instalacion de Centrales Y/O Equipos Eolicas o Solares, Trámite Parlamentario 147.

But things get worse. On the one hand, the electricity generation industry has stagnated for four years in a row; on the other hand, demand for electricity has kept growing year after year. The following chart shows that constant growth:



Until recently, the increase in electricity demand has been satisfied with reserve capacity.[222] However, Argentina has no more spare reserve capacity.[223] The government has taken different measures to try to overcome the electricity crisis. In 2006, through the enactment of Resolution 1281 of the Energy Secretariat, ratified by Resolution 1784 of the Planification Ministry, the government launched a program known as

222. *See Argentina: Caught Short*, ECONOMIST, June 16, 2007, at 47.

223. *See id.* The energy shortage was highlighted in then-current newspaper articles and was characterized as palpable by the Energy Secretariat. *See, e.g.*, *Government Asks Steelmakers to Consume Less Electricity*, BUS. NEWS AMS., May 30, 2008; *Vamos Hacia un Colapso Energético Inevitable*, ÁMBITO FINANCIERO, Sept. 8, 2006, *available at* http://www.ambito.com/diario/noticia.asp?id=294936; *Insisten en Que el Pais Esta al Borde de Una Crisis Energética*, LA PRENSA, Sept. 13, 2006; Francisco Olivera, *Preocupan a Energía y las Leyes Laborales*, LA NACIÓN (Buenos Aires), Sept. 15, 2006, *available at* http://www.lanacion.com.ar/nota.asp?nota_id=840607.

Energía Plus.[224] The objective of this program is to increase the generation capacity.[225] Through it, all large users are required to buy the difference between their current demand of electricity and their demand in 2005 from capacity installed since 2005.[226] Those contracts are freely agreed to between the parties and are not subject to the set of regulations concerning tariffs implemented after 2001.[227] Therefore, currently, there are two markets in Argentina: the WEM (with its Spot Market and Term Market) and the Energía Plus market.[228] The Energía Plus program may be seen as a good plan to the extent that new electricity is needed and, thus, new generation would easily find buyers.[229] However, there have been very few private investors interested in the program, and these investors only plant to develop 1,200 MW of new capacity.[230]

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224. Res. No. 1281/2006, Sept. 4, 2006, [30983] B.O. 5, art. 2; Res. No. 1784/2006, Nov. 7, 2006, [31032] B.O. 14, art. 1.

225. Res. No. 1281/2006, app. I.

226. *Id.* arts. 1, 3.

227. *See Argentina Assures Power Only to Small Users, Putting Supplies for Industrial Users in Doubt*, GLOBAL POWER REPORT, Sept. 14, 2006, at 13, *available at* 2006 WLAR 16804206.

228. *See* Res. No. 1281/2006, art. 2 (establishing the Energía Plus as separate from and not interconnected to the WEM).

229. *Ministries Launch Energía Plus Industrial Energy Program*, BUS. NEWS AMS., Aug. 28, 2006, http://www.bnamericas.com/news/electricpower/Ministries_launch_Energia_Plus_industrial_energy_program.

230. *La Falta de Inversión en Generación, el Gran Desafió que Enfrenta el Sector Eléctrico*, EL CRONISTA, Sept. 27, 2007, *available at* http://www.electroindustria.com/noticia.asp?inf_id=6059. Most likely, the failure of the program is due to the fact that large costs for power plant construction generally require financing through project finance. In this type of highly-leveraged financing, creditors are not willing to take commercial risk. *See id.* Therefore, an investor must prove to lenders that under a reasonable set of assumptions, demand will be sufficient to absorb the planned output of the project at a price that will cover the full cost of production to service its debt and provide an adequate equity return. Otherwise, the investor will not obtain the required financing. Although the aggregate demand of new demand of electricity is important, the new demand per user is not that important. Therefore, potential investors face difficulties in getting power purchase agreements reliable and profitable enough to satisfy potential lenders for projects other than small power plants. Indeed, even though the energy generated by those projects is more expensive than the one generated by a large-scale classic power plant, their construction costs are much lower and, therefore, they can be built by the same industry requiring the electricity (either through centralized-financing or project-financing structures).

As the electricity crisis continued to grow, in January 2008 the Executive Branch ordered the change of all the lamps of public buildings to low consumption lamps.[231] Until now, that measure did not have an important effect on the electricity market. Furthermore, in January 2008, Argentina needed to import electricity from Brazil, even though Brazil is also facing an electricity generation shortage.[232] Therefore, although there have been different attempts from the Executive Branch to hide this crisis affecting the electricity sector,[233] today it has become undeniable.[234] In fact, the Argentinean National Congress has two projects of law drafted by the Lower House recognizing this situation and declaring the emergency of the sector for a period of two years.[235] Indeed, within the last five years, the demand for electricity increased by 37% while installed capacity only grew 3.5%.[236]

C. Second Attempt

1. Investments in the Renewable Generation Sector

By 2000, the Argentinean government had realized that it needed to start working harder in the development of renewable energy. As was explained, Argentina carried out studies showing the devastating consequences that climate change will produce

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231. *See, e.g.*, Res. No. 8/2008, Jan. 11, 2008, [31323] B.O. 7, art. 1.

232. *See* Josefina Giglio, *Se Debió Importar Energía Desde Brasil*, LA NACIÓN (Buenos Aires), Jan. 9, 2008, *available at* http://www.lanacion.com.ar/nota.asp?nota_id=977468.

233. Leonardo Mindez, *Cristina Negó la Crisis Energética e Insistió Con Sumar a Venezuela*, CLARÍN, Feb. 27, 2008, *available at* http://www.clarin.com/diario/2008/02/27/elpais/p-00301.htm; *La Presidenta Garantizó la Energía y Desestimó una Crisis*, INFOBAE.COM, Feb. 26, 2008, http://www.infobae.com/contenidos/366173-100897-0-Cristina-Kirchner-garantizo-energia-y-desestimo-una-crisis.

234. *See, e.g.*, Larry B. Pascal, *Summary of Oil and Gas Developments in South America*, 13 LAW & BUS. REV. AM. 521, 534–35 (2007).

235. Proyecto de Ley 2616-D-2007, May 31, 2007, Emergencia Energética, Trámite Parlamentario 61; Proyecto de Ley No. 3211-D-2007, June 28, 2007, Régimen Nactional de Fomento del Uso de Fuentes Renovables de Energia Destinada a la Producción de Energia Electrica, Trámite Parlamentario 79.

236. Mario Brodersohn, *Desafios Claves del Nuevo Gobierno*, 80 PROYECTO ENERGÉTICO 12, 15 (2007).

on its geography and economy.[237] Even today, the consequences of climate change on Argentina's geography have created generation difficulties for large scale hydro-generation.[238] Water is becoming a scarce resource.[239] Furthermore, the Argentinean government also started to worry about its need to reduce its exposure to international oil and natural gas prices as well as to the reduction in its domestic reserves of natural gas by diversifying its energy matrix and increasing the use of renewable energy.[240] As a result, in 2006, Argentina committed itself to increasing the renewable generation in the country up to 8% by 2017.[241] Those are sufficient reasons for Argentina to start thinking about developing renewable technology for generating electricity.[242] By developing renewable generation, Argentina will contribute to price stability, improve its system reliability, and promote competition within the different generation technologies.[243] It contributes to price stability

237. *See supra* Part II.

238. *See* SEGUNDA COMUNICACIÓN, *supra* note 57, at 34.

239. For instance, El Chocon reservoir is reaching its lowest levels. *See Descartan que el Chocón Deje de Producir Electricidad*, LA NACIÓN (Buenos Aires), Feb. 21, 2008, *available at* http://www.lanacion.com.ar/economia/nota.asp?nota_id=989323; Osvaldo Ortiz, *El Chocón se está Quedando sin Agua para Generar Electricidad*, CLARÍN, Feb. 21, 2008, *available at* http://www.clarin.com/diario/2008/02/21/elpais/p-01401.htm.

240. *See* Alieto A. Guadagni, *Gas y Política*, 80 PROYECTO ENERGÉTICO 6, 7 (2007). Thanks to investor-unfriendly policies, natural gas production has been stagnant since 2004 and reserves have fallen more than 40% since 2002. *Id.* For instance, on February 14, 2008, Bolivia announced that it would not be able to deliver all the natural gas required by Argentina. Alfredo Sainz, *Bolivia Advierte que Faltará Gas para la Argentina este Invierno*, LA NACIÓN (Buenos Aires), Feb. 14, 2008, *available at* http://www.lanacion.com.ar/nota.asp?nota_id=987305. Argentinean natural gas insufficiency will not be new. As winter approached in 2007, the Argentinean government announced that it would restrict natural gas exports in order to preserve the supply for internal consumption, both domestic and industrial, in compliance with the Argentinean Hydrocarbons Law. *See* Claudia Riquelme, *Argentina Corta Completamente los Envíos de Gas Natural a Chile*, EUROPA PRESS, May 29, 2007, http://www.eleconomista.es/empresas-finanzas/noticias/219949/05/07/Economia-Energia-Argentina-corta-completamente-los-envios-de-gas-natural-a-Chile.html; *see also* Law No. 17319, June 23, 1967, [21220] B.O. 1, art. 6.

241. Law 26190, Dec. 6, 2006, [31064] B.O. 1, art. 2.

242. *See supra* Part II.

243. NANCY RADER & SCOTT HEMPLING, THE RENEWABLES PORTFOLIO STANDARD 4 (2001), *available at* http://www.naruc.affiniscape.com/associations/1773/files/rps.pdf.

because it reduces the effects of variable-cost fuels.[244] It improves system reliability because it expands the generation sources. Therefore, a failure in one of them (i.e., due to a natural gas shortage or seasons lacking rain or wind) will not affect the other generation sources. A single event would have much less of an effect on the entire system. Finally, although it is currently subsidized, renewable electricity generation still promotes competition among different fuels.[245] Among others, these reasons pushed the Argentinean government to try to develop the infrastructure of the power generation in Argentina, with renewable generation as a milestone.[246]

2. Enactment of Law 26,190

Enacted in 2006, Law 26,190 was intended to attract investment in all kinds of renewable generation of electricity in Argentina.[247] While Law 25,019 focuses on wind and solar energy,[248] Law 26,190 is much broader, reaching all kinds of renewable energy[249] (as long as it is used to supply public services and, in the case of hydroelectric power plants, does not exceed a capacity limit of 30 MWh[250]).[251] This is an important difference from Law 25,019, because any new technology producing energy from renewable sources can be included within the frame of Law 26,190.

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244. *Id.*

245. *Id.* at 34.

246. *See, e.g.*, MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, PLAN ESTRATEGICO NACIONAL DE ENERGIA EOLICA 1, *available at* http://www.minplan.gov.ar/minplan/documentos/vientos_patagonia.pdf; MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, ARGENTINA 2016: POLÍTICA Y ESTRATEGIA NACIONAL DE DESARROLLO Y ORDENAMIENTO TERRITORIAL 4–5, *available at* http://www.planif-territorial.gov.ar/paginas/programas/documentos/argentina_web_2016h_a332b9.pdf.

247. Law 26190, Dec. 27, 2006, [31064] B.O. 1, art. 3.

248. Law 25019, Oct. 19, 1998, [29008] B.O. 1, art. 1.

249. Law 26190, art. 4(a) (defined as "non-fossil energy sources").

250. *Id.* art. 4(b).

251. *See id.* art. 1.

Another important difference is that Law 26,190 establishes an eight percent minimum of renewable energy to be supplied to the system by 2016.[252] This minimum matches Argentina's international commitment under the Kyoto Protocol.[253]

Law 26,190 also creates an investment regime.[254] This regime lasts for ten years from the enactment and gives certain benefits.[255] The first benefit gives investors the option, under certain circumstances, to use the value added tax paid when buying, building, or importing fixed assets as tax credit to pay other taxes or claim its reimbursement.[256] The second benefit authorizes a calculation of the amortization of assets on special terms.[257] The third and last benefit exempts the investor from the application of the minimum deemed income tax that would apply to the assets used to generate energy from renewable sources to feed the grid.[258]

Regarding price policy, Law 26,190 establishes premiums over market prices for the energy produced from renewable sources for a fifteen-year term from the enactment of the law.[259] Those premiums were set as follows: ARS$0.015/kWh for wind

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252. DENNIS TIRPAK, UNITED NATIONS DEV. PROGRAM, NATIONAL POLICIES AND THEIR LINKAGES TO NEGOTIATIONS OVER A FUTURE INTERNATIONAL CLIMATE CHANGE AGREEMENT 40 (2008), *available at* http://www.undp.org/climatechange/docs/UNDP_NationalPolicy.pdf.

253. *Compare* Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 3, Dec. 10, 1997, 37 I.L.M. 22 (providing an emission reduction commitment of 2–10% in the commitment period 2008 to 2012), *and* Law No. 25438, July 13, 2001, [29692] B.O. 1 (providing an emission reduction commitment of 5% of the 1990 level by the commitment period 2008 to 2012), *with* Law No. 26190 (requiring that 8% of the use of electric power in the country should come from renewable resources by December 2016).

254. Law No. 26190, art. 7.

255. *Id.*

256. *Id.* art. 9.

257. *Id.*

258. This tax is levied on the value of the assets located within Argentina and abroad belonging to, among others, companies domiciled in Argentina as well as permanent establishments of non-residents in Argentina. Law No. 25063, Dec. 24, 1998, [29053] B.O. 1, art. 6. The assessment of the value of the assets is made at the closing of each fiscal period at the rate of 1%. *Id.*

259. Law No. 26190, art. 14.

energy; ARS$0.9/kWh for solar energy; ARS$0.015/kWh for geothermal, biomass, different gases, and tide energy; and ARS$0.015/kWh for hydro-energy generated by plants up to 30MW.[260]

Premiums would be paid through a fiduciary fund named "Fondo Fiduciario de Energías Renovables," managed by the Argentinean Electricity Energy Council.[261] Currently, there is no experience with regard to this fund because it is not functioning yet. Nevertheless, such a fund would be funded through a charge to be included in the tariffs paid by users of the WEM (distribution companies and large users).[262] Once received, those funds would be paid directly to generators of renewable energy.[263] As long as the Fondo Fiduciario de Energías Renovables works as intended, generators of renewable energy would get their premiums paid, as established by law.[264] However, previous experiences in Argentina show that similar funds have been used for other purposes than those for which they have been created and, thus, create a risk for the payment of premiums.[265]

260. *Id.*

261. *Id.*

262. *See id.* art. 14 (listing the tariffs charged per type of renewable energy consumed that will make up the trust fund).

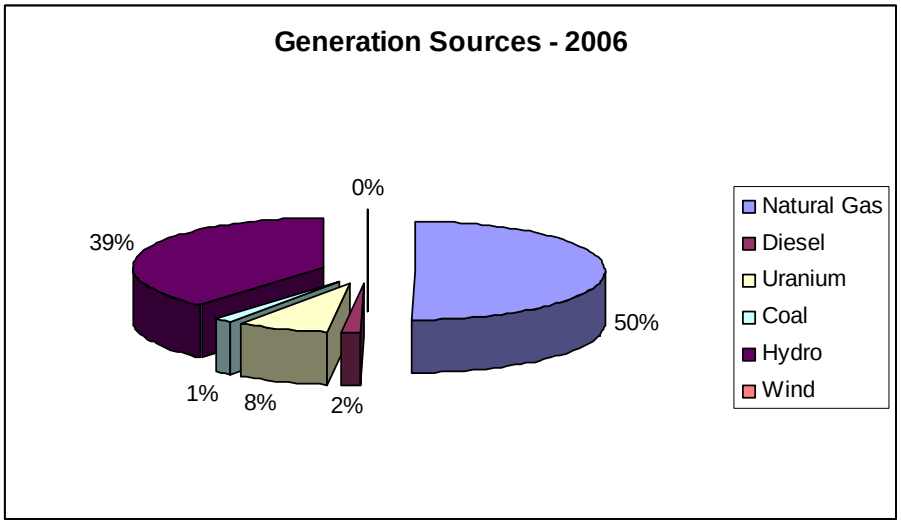
263. *Id.* art. 8 (describing how proceeds from the fund will be paid to renewable energy generators based on the type of renewable generated).

264. Law No. 26190, arts. 1, 2, 8, 14.

265. For instance, this occurred in the case of the Seasonal Stabilization Fund, used in 2001 to finance the effects of the frozen tariffs. Enersis S.A., Annual Report (Form 20-F), at 50 (June 10, 2005).

D. The Results Obtained so Far

Ten years have passed since the enactment of Law 25,019, and little private investment has been made. The following graphic prepared by the Energy Secretariat shows the structure of the installed capacity of electricity generation in Argentina by 2006 and is clear with regard to the lack of investment in renewable generation:[266]



266. MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, INFORME DEL SECTOR ELECTRICO: AÑO 2006 34 (2006), *available at* http://energia3.mecon.gov.ar/contenidos/verpagina.php?idpagina=2599 (follow link to Part 2 of the report) [hereinafter INFORME DEL SECTOR ELECTRICO 2006 PART 2].

This is reflected in the installed capacity per source reported by the Energy Secretariat for the years 1998,[267] 2001,[268] and 2006:[269]

	Solar	Wind	Geothermic	Small Hydro
1998	25 kW	13,252 kW	0 kW	974,000 kW
2001	26 kW	24,829 kW	600 kW	974,000 kW
2006	26 kW	27,629 kW	600 kW	974,000 kW

This means that the aggregate energy produced from renewable sources in Argentina—excluding large hydro power plants—went from 3.8% of the total production in 1998 to 5% in 2006.[270] That development is insignificant when compared to those experienced by other countries such as the United Kingdom and Germany. For instance, as will be shown in Part V below, ten years after the first fee-in-tariff regulation was launched in 1990, Germany saw its renewable generation grow from 18.3TWh to 38.8TWh.[271] As a consequence, renewable generation went from 2.9% to 6.6% of the total electricity generation.[272] For the same period, the United Kingdom went from a production of 5.8 TWh in 1990 to 10.4TWh in 2000.[273] Furthermore, all the investment in renewable generation currently analyzed by the Energy Secretariat was prepared under the Energía Plus program.[274]

267. MINISTERIO DE PLANIFICACIÓN FEDERAL, INVERSIÓN PÚBLICA Y SERVICIOS, INFORME DEL SECTOR ELECTRICO: AÑO 2001 24 (2002), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/publicaciones/Informe%20del%20Sector%20Electrico%202001.pdf.

268. INFORME DEL SECTOR ELECTRICO 2006 PART 2, *supra* note 266, at 23.

269. *Id.*

270. SECRETARIA DE ENERGIA, ARGENTINA ENERGY BALANCE REPORT 21 (2007), *available at* http://energia3.mecon.gov.ar/contenidos/archivos/Reorganizacion/informacion_del_mercado/publicaciones/energia_en_gral/balances_energeticos2006/BEN_AVANCE_2006.pdf.

271. *See infra* Part V.B.

272. INT'L ENERGY AGENCY, RENEWABLE ENERGY: MARKET & POLICY TRENDS IN IEA COUNTRIES 299 (2004), *available at* http://www.iea.org/textbase/nppdf/free/2004/renewable1.pdf.

273. *Id.* at 4.

274. For instance, one of the most important projects currently analyzed, Ingentis, was presented by Emgasud in the province of Chubut. *See* Ana Tronfi, *Construirán un*

In order to understand why Argentina failed in its efforts to create a renewable generation industry while the United Kingdom and Germany succeeded, some basic information regarding the electricity industry and regulation of those countries must be given.

V. THE EXPERIENCES OF THE UNITED KINGDOM AND GERMANY

The reason why the United Kingdom and Germany cases will be analyzed is due to the great development Europe has experienced in generation of renewable energy. Such development is based on two main policies. The first one was implemented by the United Kingdom. The second one was created in Germany.

A. Experience of the United Kingdom

In the United Kingdom, renewable electricity represents just 4.4% of total production[275] but the government expects it to grow over the coming years through policies such as the Renewables Obligation.[276] The systems created by means of these policies are generally known as "green certificates" systems.[277]

The Renewables Obligation was introduced in England and Wales[278] and, in a different form, in Scotland,[279] in April 2002,

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Polo de Gas y Energía Eólica, LA NACIÓN, Apr. 30, 2007, *available at* http://www.lanacion.com.ar/nota.asp?nota_id=904625.

275. EUROPEAN COMM'N, DIRECTORATE-GEN. FOR ENERGY & TRANSP., EU ENERGY IN FIGURES 2007/2008 2 (2008), *available at* http://ec.europa.eu/dgs/energy_transport/figures/pocketbook/doc/2007/2007_energy_ext_renewables_gross_electricity_generation_en.pdf [hereinafter EU ENERGY IN FIGURES].

276. Similar renewable energy policies can be found in countries like Sweden, Italy, Belgium, Romania, and Poland. *See Communication from the Commission: The Support of Electricity from Renewable Energy Sources*, at 22–23, COM (2005) 627 final (Dec. 7, 2005), *available at* http://ec.europa.eu/energy/res/biomass_action_plan/doc/2005_12_07_comm_biomass_electricity_en.pdf [hereinafter *Communication from the Commission*].

277. *Id.* at 4.

278. The Renewables Obligation Order, 2006, S.I. 2006/1004, pt. 2 (Eng. & Wales).

279. *Cf.* The Renewables Obligation Order (Scotland), 2006 S.S.I. 2006/173, pt. 2.

and in Northern Ireland[280] in April 2005.[281] It is the government's main mechanism for supporting generation of renewable electricity. The Renewables Obligation requires designated electricity suppliers to obtain a certain percentage of the electricity they supply from renewable sources.[282] For instance, in 2008 suppliers had the obligation to buy 7.9% of the electricity they supplied from renewable sources while in 2015 that percentage will rise to 15.4%.[283] That requirement is satisfied by suppliers proving to the Gas and Electricity Markets Authority (i) that they have supplied to users such amount of electricity generated from eligible renewable sources, (ii) that another electricity supplier has done so or, (iii) that, between them, they collectively have done so.[284]

Suppliers meet their obligations by presenting their Renewables Obligation Certificates ("ROCs") to the authority.[285] In the event that a supplier does not have sufficient certificates

280. *Cf.* Renewables Obligation Order (Northern Ireland), 2006 S.R. 2006/56, pt. 2.

281. Before this new policy was launched, renewable generation was supported by the Non-Fossil Fuel Obligation, implemented in 1990. The Electricity (Non-Fossil Fuel Sources) (England and Wales) (No. 2) Order, 1990, S.I. 1990/1859 (Eng. & Wales). The Non-Fossil Fuel Obligation program was financed by the Fossil Fuel Levy, a levy that used to be paid by suppliers of electricity from non-renewable energy sources in the United Kingdom. *Id.* This levy was replaced by the Climate Change Levy mentioned later. *See* Francis N. Botchway, *The Role of the State in the Context of Good Governance and Electricity Management: Comparative Antecedents and Current Trends*, 21 U. PA. J. INT'L ECON. L. 781, 822 n.283 (2000); Christina K. Harper, *Climate Change and Tax Policy*, 30 B.C. INT'L & COMP. L. REV. 411, 440 (2007) (stating that the Climate Change Levy went into force on April 1, 2001). Under the Non-Fossil Fuel Obligation program, electricity suppliers were required to make the necessary arrangements to secure that, for each period established by the Statutory Instrument, the aggregate amount of non-fossil fuel generating capacity available to such supplier from relevant non-fossil fuel generating stations would not be less than that specified in the Statutory Instrument in relation to such supplier for that period. S.I. 1990/1859, art. 3.

282. Namely, solar energy (including photovoltaics), hydro, wave power, tidal energy, geothermal energy, biofuels (including energy crops), and onshore and offshore winds, with the limitations established in Sections 5, 6, 7, and 8 of the England and Wales Renewables Obligation Order. S.I. 2006/1004, arts. 5–8.

283. Department of Business Enterprise & Regulatory Reform, What is the Renewables Obligation?, http://www.berr.gov.uk/whatwedo/energy/sources/renewables/policy/renewables-obligation/what-is-renewables-obligation/page15633.html (last visited Mar. 1, 2009) [hereinafter What Is the Renewables Obligation?].

284. S.I. 2006/1004, art. 3, ¶ 1.

285. *Id.* art. 3 ¶ 3.

to cover its obligation, it must make a buyout payment to the relevant authority.[286] The payment referred to is a fixed price per MWh for which the supplier does not produce ROCs.[287] As the Renewable Obligation Order states, "ROCs shall be issued to the operator of the generating station by which the relevant electricity was generated in a particular month."[288] The cost of the ROC is finally passed to the final consumer of the electricity through the electricity tariff. [289]

To promote competitiveness between the renewable generation industry and the fossil fuel industry, the United Kingdom complemented the ROC program with other incentives, such as an exemption granted to renewable electricity generators from the Climate Change Tax Levy,[290] and the launch of programs through the New Opportunities Fund and the Department of Trade and Industry that fund different projects related to renewable generation.[291]

Since its introduction in 2002, the Renewables Obligation has succeeded in stimulating growth in renewable electricity generation.[292] The United Kingdom Department for Business Enterprise and Regulatory Reform contends that renewable electricity generation has more than doubled since 2002.[293]

286. *Id.* art. 11 ¶ 1.

287. *Id.* art. 11 ¶ 2–3.

288. *Id.* art. 15 ¶ 2.

289. *See* British Wind Energy Association, The Renewables Obligation, http://www.bwea.com/business/roc.html (last visited Mar. 1, 2009).

290. The Climate Change Levy taxes consumption by non-domestic users in an effort to promote increased energy efficiency and reduce carbon emissions. *See* Christina K. Harper, *Climate Change and Tax Policy*, 30 B.C. INT'L & COMP. L. REV. 411, 440 (2007). This levy was implemented by the Finance Act. Finance Act 2000, 2000, ch. 17, § 30.

291. A description of these programs can be found in the report "Renewable Energy," prepared by the United Kingdom National Audit Office. COMPTROLLER & AUDITOR GEN., NAT'L AUDIT OFFICE, DEPARTMENT OF TRADE AND INDUSTRY: RENEWABLE ENERGY 9–10 (2005), http://www.nao.org.uk/publications/0405/renewable_energy.aspx.

292. *See* What Is the Renewables Obligation?, *supra* note 283.

293. *Id.*

Nevertheless, as different studies have shown,[294] if the United Kingdom keeps its system as it currently is, it will probably not achieve its target for 2015.[295]

For that reason, in May 2007, the British government published a consultation regarding a possible reform to the Renewables Obligation to become effective on April 1, 2009.[296] Instead of simply increasing the penalties to electricity suppliers for not buying electricity generated from renewable sources, the intention is, among other things, to "band the [Renewable Obligation] to provide differentiated levels of support for different technologies"; and "introduce a mechanism intended to maintain [ROC's] prices in a situation of ROC oversupply." [297]

This will be done because "the government believes that banding the ROC will provide the flexibility necessary to increase deployment of renewable electricity generation in the years following 2009" by allowing different technologies and

294. *See*, *e.g.*, RENEWABLE ENERGY FOUND., RESPONSE OF THE RENEWABLE ENERGY FOUNDATION TO THE 2006 ENERGY REVIEW: OUR ENERGY CHALLENGE (2006), *available at* http://www.berr.gov.uk/files/file30869.pdf. This study concludes that:

> in the light of the above analysis we are deeply concerned that current policy is not correctly configured to deliver a diverse and balanced portfolio of renewable electricity generation. We have concluded that the Renewables Obligation is in large part the cause of these deficiencies, with unsatisfactory consequences in the rest of the energy sector. In our view the single most important action that the government could take in relation to renewables is to revise the Obligation to reduce rewards for near-market technologies. We emphasise that the benefits of a revision to the Obligation would be felt both within and without the renewable energy sector.

Id. at 48.

295. *Id.* This was also pointed out by the Commission of the European Communities. *Commission Green Paper Follow-Up Action: Report on Progress in Renewable Electricity*, at 8, COM (2006) 849 final (Jan. 10, 2007), *available at* http://www.feed-in-cooperation.org/images/files/com_2006_progress_report_renewable_electricity_en.pdf.

296. DEP'T OF TRADE & INDUS., RENEWABLE ENERGY: REFORM OF THE RENEWABLES OBLIGATION ii (2007), *available at* http://www.berr.gov.uk/files/file39497.pdf.

297. *Id.* at 9; *cf.* Renewable Energy Electricity Act, 2000, c. 4 (Austl.) (establishing a system of penalties for electricity retailers who do not purchase a set amount of energy produced from renewable sources).

scales to compete under a profitable basis.[298] Basically, under the proposed new system, each certificate would have a value depending on the amount, origin, and type of energy sold.

B. Experience of Germany

Although support for renewable energy in Germany started in the 1970s with the federal government's program for energy research and other supports that came in time, Germany experienced an important expansion in renewable energy starting in 2000.[299] Such growth was due, in part, because of the boost given to the renewable energy sector by the enactment of the "Renewable Energy Act" ("EEG").[300] The EEG requires grid operators to purchase, with priority, available electricity generated from renewable sources.[301] The EEG was intended to contribute towards doubling the share of renewable energy in the market from 5% to 10% by 2010.[302] By 2006, however, as a

298. *Id.* at 3, 23.

299. Volkmar Lauber & Lutz Mez, *Three Decades of Renewable Electricity Policies in Germany*, 15 ENERGY & ENV'T 1, 4, 10 (2004).

300. FED. MINISTRY FOR THE ENV'T, NATURE CONSERVATION & NUCLEAR SAFETY, EEG—THE RENEWABLE ENERGY SOURCES ACT 4 (2007), *available at* http://www.invest-in-germany.com/uploads/media/EEG_Brochure_01.pdf. This growth will increase in 2009 when new homes in Germany will be required to install renewable energy heating systems, such as solar panels, under a new law called the Renewable Energies Heating Law. Jane Burgermeister, *Germany to Require Renewables for New Homes in 2009*, RENEWABLEENERGYWORLD.COM, Dec. 10, 2007, http://www.renewableenergyworld.com/rea/news/story?id=50746.

301. Gesetz für den Vorrang Erneuerbarer Energien [Erneuerbare-Energien-Gesetz] [Renewable Energy Sources Act], Mar. 29, 2000, BGBI. I at 305, § 3, last amended by Gesetz, July 21, 2004, BGBI. I at 1918 (F.R.G.). Similar systems to the one being analyzed have been adopted by eighteen countries in the European Union. Wilson Rickerson & Robert C. Grace, *White Paper on the Debate over Fixed Price Incentives for Renewable Electricity in Europe and the United States: Fallout and Future Directions* (Feb. 2007), *available at* http://www.boell.org/docs/Rickerson_Grace_FINAL.pdf. Croatia also has a similar energy policy. Austrian Energy Agency, Supply: Energy Sources, http://www.energyagency.at/enercee/hr/supplybycarrier.htm (last visited Mar. 1, 2009).

302. *The New German Renewable Energy Law*, RENEW ON LINE, July–Aug. 2000, http://eeru.open.ac.uk/natta/renewonline/rol27/10.html.

consequence of the enactment of the EEG, renewable energy represented almost 12% of the total gross electricity consumption in Germany.[303]

The special characteristic of the EEG that boosted the generation of renewable energy is that the payment for this kind of energy is made through minimum fixed tariffs.[304] Those tariffs are calculated by taking into account the separate cost of a given technology, a twenty-year maturity term, and specific internal rates of return.[305] Furthermore, tariffs differ depending on the natural source and power plant that generates the electricity, and they decrease every year.[306] Therefore, "a generator beginning production in 2007 will receive a lower payment stream than a generator beginning production in 2005."[307] As the referred "minimum fixed tariffs" are higher than the tariff paid for electricity from traditional sources, the difference between those two tariffs is apportioned to consumers.[308]

This policy was meant to create a competitive market for this kind of power generation, which still has relatively high costs.[309] As explained by Michaele Hustedt, a member of the German Parliament,

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303. Federal Ministry of Economics and Technology, Renewable Energies in Germany—A Success Story, http://www.german-renewable-energy.com/Renewables/Navigation/Englisch/root.html (last visited Mar. 1, 2009).

304. Rickerson & Grace, *supra* note 301, at 6–7. Prices are "differentiated by conversion technology, system size, installation type, and/or resource availability." *Id.* at 7.

305. Volker Oschmann, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Presentation at German Federal Institute for Geosciences and Natural Resources: The German Renewable Energy Act, Objectives, Design, Achievements (June 2, 2004), *available at* http://www.bgr.de/veransta/renewables_2004/presentations_DGP/Block2MarketDevelopment_pdf/1_Oschmann.pdf.

306. *Id.*

307. Rickerson & Grace, *supra* note 301, at 6–7.

308. *See* FED. MINISTRY FOR THE ENV'T, NATURE CONSERVATION AND NUCLEAR SAFETY, RENEWABLE ENERGY SOURCES ACT (EEG) PROGRESS REPORT 2007 9 (2007), *available at* http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/erfahrungsbericht_eeg_2007_zf_en.pdf (noting that these cost differences create a resultant surcharge for renewable-generated electricity and that the EEG was responsible for a portion of electricity price increases for households between 2002 and 2006).

309. Oschmann, *supra* note 305, at 3, 6.

> by setting specific tariffs for each renewable energy technology based on its real cost, the new law recognises the contribution of renewable energy to reducing greenhouse gas emissions and saving depletable fossil fuel reserves. Its aim is to initiate a self-sustaining market for renewables by compensating for the distortions in the conventional electricity market, and simultaneously creating the critical mass by a massive market introduction programme that does not lead to any additional burden for the taxpayer. Under this framework, renewables are to be made competitive with conventional energies, in the medium and long-term.[310]

This policy was first launched in 1990 under a system that linked the price paid to renewable generators to the spot price of electricity.[311] However, "[t]he drop in the tariffs paid by consumers has led to a similar decrease in the renewable energy feed-in tariffs (REFITs)."[312] That resulted in a flaw in the system, because it created a risk to the returns on a project. As has been explained by Federal Environment Minister Jürgen Trittin, the "lack of planning and investment security" generated by a system that granted a premium over the market price of electricity forced an improvement of the regulations.[313] The solution to this problem came by guaranteeing compensatory payments down to the last pfennig per kWh, thus creating a reassuring climate for new investments.[314] Hustedt explains that,

> [a]lthough we are strongly supporting a gradual decrease in tariffs for renewable energies to take into

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310. *The New German Renewable Energy Law*, *supra* note 302.

311. *See* CHRIS GRAECEN & DETLEF LOY, THAIL. ENERGY POLICY RESEARCH PROJECT, FEED-IN TARIFFS: INTERNATIONAL EXPERIENCES AND RECOMMENDATIONS FOR IMPLEMENTATION IN THAILAND 8 (2006), *available at* http://www.palangthai.org/docs/FeedinTariffs2Apr06.doc*;* Catherine Mitchell et al., *Effectiveness Through Risk Reduction: A Comparison of the Renewable Obligation in England and Wales and the Feed-in System in Germany*, 34 Energy Policy 297, 298 (2006).

312. *The New German Renewable Energy Law*, *supra* note 302.

313. Gesetz für den Vorrang Erneuerbarer Energien [Erneuerbare-Energien-Gesetz] [Renewable Energy Sources Act], Mar. 29, 2000, BGBI. I at 305, § 3, last amended by Gesetz, July 21, 2004, BGBI. I at 1918 (F.R.G.).

314. *Id.*

> account technological innovations, we feared that the sudden fall in electricity prices started to threaten further investments in renewables. The new situation worried financial institutions in particular, but also wind turbine manufacturers, owners and potential developers. Actually, the situation had started to endanger the viability of both existing and proposed projects[315]

In order to reverse this situation, the German government abandoned the previous system "where the REFITs [were] linked to the average electricity tariff [in lieu of] a more clearly fixed price based on actual generation cost of the various renewable energy technologies."[316] The new REFITs policy seems to be more effective than the previous scheme to the extent that it does not allow generators to increase their variable costs.[317]

The efficiency of the German model is reflected in the increase in renewable energy production that the new law has brought. The following chart shows such increase over recent years, and the percentage of national energy supply contributed by each in 2006:[318]

Fuel Type	2004	2005	2006	2006
Hydro	21.7 TWh	20.8 TWh	21.6 TWh	3.50%
Wind	25.5 TWh	27.2 TWh	30.5 TWh	5.00%
Biomass	8.4 TWh	11.2 TWh	15.5 TWh	2.50%
Landfill biogas	2.1 TWh	3.0 TWh	3.6 TWh	0.60%
Photovoltaic	06 TWh	1.3 TWh	2.0 TWh	0.30%
TOTAL	58.3 TWh	63.5 TWh	73.2 TWh	11.90%

315. *The New German Renewable Energy Law*, *supra* note 302.

316. *Id.*

317. *Id.*

318. National Master Encyclopedia, Renewable Energy in Germany, http://nationmaster.com/encyclopedia/Renewable-energy-in-Germany (last visited Mar. 1, 2009).

The effectiveness of the feed-in tariff is also reflected in the prices paid for renewable electricity. For instance, tariffs for wind energy fell approximately 20% between 1990 and 2004, ending up at 7.5 C/kWh.[319]

Along with the REFITs, an important tool that helped Germany's renewable development was the implementation of soft loan schemes and guarantees through a program named "Program to Promote Renewable Energies," which was operated by the KfW Bankengruppe (formerly Deutsche Ausgleichsbank).[320] These loans can be granted to self-employed professionals, small and medium-sized private commercial enterprises, and other public sector applicants. The credit terms of these soft loans range from ten to twenty-year maturity terms with interest rates up to 2% below market rates.[321] Furthermore, almost all federal states and municipalities launched different local programs to support renewable generation.[322]

The solid growth of renewables in Germany led Federal Environment Minister Sigmar Gabriel to point out that the target for increasing the use of renewable energies proposed by Germany for 2010 was met by mid-2007.[323] Thus, he said that Germany should raise the bar for the 2020 target so as to have it at 45% by 2030.[324]

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319. Lucy Butler & Karsten Neuhoff, *Comparison of Feed in Tariff, Quota and Auction Mechanisms to Support Wind Power Development* 8–9 (Cambridge-MIT Inst., Working Paper No. 70, 2004).

320. *See* JEROME M. WEINGART & ROBERT F. LEE, WIDE-SPREAD IMPLEMENTATION OF RENEWABLE ENERGY PROJECTS IN APEC MEMBER ECONOMIES: ROAD MAPS FOR SUCCESS 76–77 (2000), *available at* http://www.apec.org/apec/publications.html (follow "Search for APEC Publications" hyperlink; then search for "implementation renewable energy" for the period "prior to 2002"); KfW Bankengruppe, Our History—60 Years of KfW, http://www.kfw.de/EN_Home/KfW_Bankengruppe/Our_history_-_60_years_of_KfW.jsp (last visited Mar. 1, 2009).

321. *See* KfW Fördenbank, Renewable Energies Programme, http://www.kfw-foerderbank.de/EN_Home/Umweltschutz/RenewableE.jsp (last visited Feb. 11, 2009); WEINGART & LEE, *supra* note 320, at 76–77.

322. *See* Renewable Energies Programme, *supra* note 321.

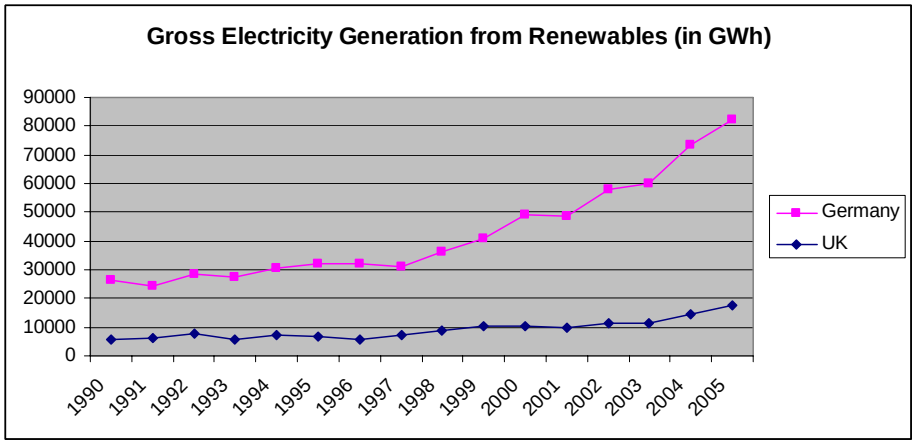
323. Press Release, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Gabriel: An Outstanding Success Story (July 5, 2007), *available at* http://www.bmu.de/english/current_press_releases/pm/pdf/39678.pdf.

324. *Id.*

C. *Comparison of the experiences of the United Kingdom and Germany*

To summarize what has been said in the last two subsections, there are two main renewable energy policies in Europe: the Renewables Obligation and REFITs. The Renewables Obligation seeks to create price competition between renewable electricity generators to meet defined targets at the least cost and typically defines the maximum cost through a market priced instrument. In turn, REFITs involve renewable generators being paid fixed prices set by the government. Each generator is given a contract to supply electricity for which they receive a payment of guaranteed amounts over a long-term period.

The following chart shows the evolution of the renewable generation in the United Kingdom and Germany since the launch of the new policies:[325]



It may be argued that those results are a consequence of a different renewable potential. However, the United Kingdom has better wind resources than Germany.[326] Project planning may also be seen as a leveraging issue when analyzing the difference in development between those countries, but in both

325. EU ENERGY IN FIGURES, *supra* note 275, at 4.

326. Butler & Neuhoff, *supra* note 319, at 5.

countries planning terms are close to two years.[327] Finally, access to financing can also be a barrier.[328] Once again, both in the United Kingdom and Germany, what makes the difference is the characteristics of the generator.[329] Indeed, if the generator is located in places of low wind speeds or in places that are difficult to connect to the grid, it will face binding financial barriers in both countries.[330]

Nevertheless, it seems that feed-in tariff systems are more effective than those like the one implemented by the United Kingdom. Research conducted by Mitchell, Bauknecht, and Connor shows that the feed-in system implemented by Germany is more effective than the one in the United Kingdom because it more effectively reduces risk for renewable generators.[331] The authors state that:

> Although feed-in systems may still not be as efficient in the short term, they do provide long-term stability, incentives and resources for innovation leading to efficiency improvements in the long term (dynamic efficiency . . . . The German EEG represents an attempt to provide security, while also trying to incentivise price reduction.[332]

The importance of risk reduction in the role of policy efficiency in Europe was also pointed out by the Commission of the European Communities.[333] This communication states that "green certificates [like the ROC] may pose a higher risk for investors and long-term, currently high cost technologies are not easily developed under such schemes."[334]

With regard to price, Butler and Neuhoff's study reveals that the difference in the price paid for wind energy in the United Kingdom and in Germany is not as great as is suggested when the difference in wind resource is considered. The authors

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327. *Id.* at 19.

328. *Id.* at 23.

329. *See id.*

330. *Id.*

331. Mitchell et al., *supra* note 311, at 297–98.

332. *Id.* at 298, 305.

333. *Communication from the Commission*, *supra* note 276, at 16.

334. *Id.* at 5.

of the study show that the price paid per megawatt in the United Kingdom was "roughly" equal to the price paid in Germany.[335] As the study conducted by Mitchell, Bauknecht, and Connor shows, the higher regulatory and market risks seemed to raise the prices in the United Kingdom.[336] German prices could even fall lower in the future because fair competition seems to be stronger among turbine producers and constructors under the German feed-in system.[337]

These conclusions seem to be recognized by the United Kingdom. Indeed, the Stern Review reads as follows:

> Both sets of instruments [ROCs and feed-in tariff] have proved effective but existing experience favours price-based support mechanisms. Comparisons between deployment support through tradable quotas and feed-in tariff price support suggest that feed-in mechanisms achieve larger deployment at lower costs. Central to this is the assurance of long-term price guarantees. The German scheme . . . . provides legally guaranteed revenue streams for up to twenty years if the technology remains functional. Whilst recognising the importance of planning regimes for both PV and wind, the levels of deployment are much greater in the German scheme and the prices are lower than comparable tradable support mechanisms (though greater deployment increases the total cost in terms of the premium paid by consumers). Contrary to criticisms of the feed-in tariff, analysis suggests that competition is greater than in the UK Renewable Obligation Certificate scheme. These benefits are logical as the technologies are already prone to considerable price uncertainties and the price uncertainty of tradable deployment support mechanisms amplifies this

335. Butler & Neuhoff, *supra* note 319, at 16. The authors assert that in both the United Kingdom and Germany, land use regulations restrictions are important constraints on development. *Id.* at 18–20.

336. Mitchell et al., *supra* note 311, at 302–05.

337. *See* Butler & Neuhoff, *supra* note 319, at 26–31 (explaining that Germany's feed-in system encourages market participants to adopt a long-term perspective, thereby creating more competition in the turbine production and construction sectors, which may have a stronger impact on the final price of wind energy because these sectors constitute the majority of the costs of wind projects).

> uncertainty. Uncertainty discourages investment and increases the cost of capital as the risks associated with the uncertain rewards require greater rewards.[338]

To sum up, research shows that the German feed-in system is more effective than the British ROC and it has been responsible for most of the additions in renewable capacity.[339]

VI. RENEWABLE GENERATION IN ARGENTINA: WHAT WENT WRONG?

A. Introduction

Argentina is a country with tremendous renewable resources.[340] For instance, wind is significant in both quality and coverage.[341] The Patagonian region is especially favorable for this source.[342] In 2000, the Patagonian winds had the potential to produce up to 500,000 megawatts.[343] With that

338. NICHOLAS STERN, STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE, PART IV: POLICY RESPONSE FOR MITIGATION 366 (2006), *available at* http://www.hm-treasury.gov.uk/d/Chapter_16_Accelerating_Technological_Innovation.pdf. Lord Nicholas Stern, then head of the Government Economic Service and former World Bank Chief Economist, led the Stern Review, which published its findings October 30, 2006. Office of Climate Change, Stern Team, http://www.occ.gov.uk/activities/stern.htm (last vistedvisited Mar. 1, 2009). It was intended to provide to the United Kingdom Prime Minister and Chancellor an assessment about: (i) "the economics of moving to a low-carbon" economy; (ii) "the potential of different approaches for adaptation to changes in the climate;" and (iii) "lessons for the [United Kingdom] in the context of its existing climate change goals." NICHOLAS STERN, STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE, PREFACE AND ACKNOWLEDGEMENTS i (2006), *available at* http://www.hm-treasury.gov.uk/d/Preface_and_Acknowledgements.pdf.

339. Butler & Neuhoff, *supra* note 319, at 6–7.

340. GLOBAL NETWORK ON ENERGY FOR SUSTAINABLE DEV., POVERTY REDUCTION: CAN RENEWABLE ENERGY MAKE A REAL CONTRIBUTION? 36, *available at* http://www.gnesd.org/Downloadables/PovertyReductionSPM.pdf.

341. *Id.* at 37.

342. AMY ELLSWORTH, ENERGY INT'L CORP., CDM CARBON PRICING IN THE RENEWABLE ENERGY SECTOR: A MARKET PERSPECTIVE 8 (2000), http://www.upme.gov.co/siame/documentos/documentacion/mdl/03_VF_Bibliografia/Industria/cdm%20carbon%20pricing%20in%20the%20renewable%20energy.pdf.

343. DESCRIPCIÓN, DESARROLLO Y PERSPECTIVAS *supra* note 5, at 28.

power, windmills of a hydrogen plant could produce electricity to feed an electrolyser and produce enough energy to supply the whole world at the current levels of demand.[344]

Concerning hydro energy, the ENRE has said that "the gross theoretical hydro potential of Argentina has been estimated at 169,000 GWh/year while the technically feasible potential is 130,000 GWh/year. Only 25% of this technically feasible potential has been developed at present."[345] Indeed, the average annual generation of all hydro plants in operation is 32,000 GWh/year (counting only half of the output of the bi-national plants).[346] However, the 25% of developed potential accounts for 45% of national electricity production in an average year, including pumped-storage generation.[347]

Argentina also has biomass potential. According to a study carried out by Shafik Asal and Remi Marcus in 2005, "[o]ut of the 6[.]6 available million TOE, Argentina already produces energy from around 2[.]9 million TOE using firewood, bagasse and agro-industrial waste; this means that 3[.]7 million TOE of available energy resources from biomass are not utilized today."[348] Nevertheless, by 2005 there was no plant in Argentina that was generating electricity using biomass as a fuel for the purpose of selling the electricity on the market.[349]

Regarding photovoltaic systems, even though they have been developed in isolated areas as a consequence of the implementation of a program named Energía Renovable en Mercados Rurales Dispersos (PERMER), their quantitative importance in the national electricity supply is very marginal, accounting for only 2% of the generation and photovoltaic systems.[350]
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344. *See id.*

345. DEVOTO, *supra* note 6.

346. *Id.*

347. *Id.*

348. SHAFIK ASAL & RÉMI MARCUS, UNIVERSITE PARIS DAUPHINE, BIOMASS ENERGY POTENTIAL IN ARGENTINA 44 (2005) *available at* http://www.eco2initiative.com/index_fichiers/Argentina_Biomass_2005.PDF.

349. *Id.*

350. *Id.*

Finally, geothermal energy has not been developed for use in electricity generation in Argentina.[351] As a result of geothermal reconnaissance studies covering approximately 300,000 square kilometers, only 4 areas exhibited favorable conditions to build high enthalpy geothermal power generation plants.[352] Those spots are Tuzgle (Province of Jujuy), Valle del Cura (Province of San Juan), Domuyo and Copahue (both in the Province of Neuquén).[353] Of these four areas, Copahue already has a 670 kW cycle pilot plant; feasibility studies for the other three areas are encouraging.[354]

Despite the potential and spare capacity of Argentina's renewable sources, little investment has been made in the sector. As was mentioned, two laws were enacted to change this situation,[355] although neither of them has achieved the expected result. The following two subsections will try to address the reasons for Argentina's failure in promoting a renewable generation industry.

B. Law 25,019: Its Flaws

Law 25,019 was not enacted with the strength required for a law intending to introduce changes as important as those proposed through it. Congress delayed five years before passing the law, which was originally drafted in 1993, and, after being approved by both chambers of the Congress, was vetoed by the executive branch (this veto was eventually overridden by the Congress).[356] This history shows that there was little commitment from the Argentinean government to create a

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351. U.S. Department of State, U.S., Partners Promote Geothermal Energy in Developing Nations, http://www.america.gov/st/env-english/2008/February/20080206161409lcnirellep0.5360224.html (last visited Mar. 1, 2009).

352. Gerald W. Huttrer, *The Status of World Geothermal Power Production 1990–1994*, 25 GEOTHERMICS 165, 165 (1996).

353. *Id.*

354. *Id.*

355. *See* TIRPAK, *supra* note 252, at 40 (standing for the proposition that Law 26,190 expanded upon Law 25,019 to include newer renewable resources and also updated the subsidy values).

356. *See, e.g.*, Larry B. Pascal, *Summary of Oil and Gas Developments in South America*, 13 LAW & BUS. REV. AM. 521, 534–35 (2007).

renewable industry. Notwithstanding the foregoing, Law 25,019 presents regulatory, investment, technical, and infrastructure barriers to promoting a robust renewable industry.[357]

1. Regulatory Barriers

As has been mentioned, Law 25,019 was drafted in 1993 but not enacted until 1998.[358] Even though other countries like Germany and the United Kingdom had experienced improvements in renewables policy between 1993 and 1998,[359] none of that experience was taken into consideration by the Argentinean congressmen. Therefore, Law 25,019 overlooked priceless lessons from other countries and, in fact, contained some policy defects already addressed by other countries by the time of the law's enactment.[360] Furthermore, Law 25,019's regulatory decree, Decree 1597/1999, was issued more than one year later.[361] This delay indicated a lack of commitment on the part of the government to enact Law 25,019. Even worse, though both the law and its regulatory decree were enacted, the issuance of the required administrative rules was not completed until mid-2001.[362] At that time, an investor would finally have

357. COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE, RENEWABLE ENERGY SOURCES IN LATIN AMERICA AND THE CARIBBEAN 3 (2004), *available at* http://www.eclac.org/publicaciones/xml/1/14981/Lcl2132i_s.pdf.

358. *See supra* note 356 and accompanying text.

359. *See, e.g.*, Gesetz sur Neuregelung des Energiewirtschatsrechts [Energy Act], Apr. 28, 1998, BGBI. I at 730 (F.R.G.); The Electricity (Non-Fossil Fuel Sources) (England and Wales) (No. 4) Order, 1997, S.I. 1997/248 (Eng. & Wales).

360. For instance, England and Wales passed the Renewable Obligation Order in 2002, replacing the Non-Fossil Fuel Obligation premium payments for renewables-generated electricity with tradable Renewables Obligation Certificates (ROCs). The Renewables Obligation Order, 2006, S.I. 2006/1004, pt. 2 (Eng. & Wales); ADRIAN SMITH & JIM WATSON, TYNDALL CTR. FOR CLIMATE CHANGE RESEARCH, THE RENEWABLES OBLIGATION: CAN IT DELIVER? (2002), *available at* http://www.tyndall.ac.uk/publications/briefing_notes/note04.pdf; What Is the Renewables Obligation?, *supra* note 283. Germany's tariff system, similar to the one implemented by Law 25,019, became financially unfeasible. *See supra* notes 205–06 and accompanying text.

361. *Compare* Law No. 25019, Oct. 19, 1998, [29008] B.O. 1., *with* Decree No. 1597/1999, Dec. 9, 1999, [29295] B.O. 2.

362. In 2001, the Energy Secretariat issued Resolution 113/2001, establishing the requirements for applying for the tax benefits granted by Law 25,019. *See* Res. No. 113/2001, Feb. 2, 2001, [29583] B.O. 2.

had the needed information to analyze the feasibility of an investment in renewable energy. Due to the fact that by the end of 2001 the Argentine economy entered into a major crisis, the regulation of Law 25,019 was, by all means, untimely implemented.

2. Investment Barriers

Another important barrier that affects Law 25,019 is the weakness of the fundamental economics of any investment project under that law. An example of that weakness is the project pursued by Sociedad Cooperativa Popular Limitada de Comodoro Rivadavia ("SCPLCR") in 2000.[363] SCPLCR is a local cooperative in Comodoro Rivadavia, Argentina which purchases electricity from the Patagonian grid and distributes it to its members.[364] The increase in electricity demand required the cooperative to find a way to increase its electricity capacity.[365] One way to satisfy that increase in demand was to build and own a wind generation power plant.[366] Two main barriers were found in the foresaid project. The first is the one discussed in this subsection, namely, an investment barrier. Indeed,

> a financial analysis of the project, which was conducted prior to the project implementation, reveals the project is not feasible because the project IRR (internal rate of return) during its repayment period is 6.10% without revenue of CER (certified emission reduction), which is lower than the interest rate of 7.5%; however, assuming CER is sold at 5 US$ [price that was much higher than the existing in 2000], project IRR improves up to 7.63%, which is higher than interest rate of 7.5%. Therefore, the project has an investment barrier.[367]

It could be argued that currently, the CER prices would make profitable an investment such as the one analyzed by

363. *See* ANTONIO MORAN, WIND POWER PLANT PROJECT IN PATAGONIA REGION, ARGENTINA 1 (2005), *available at* http://www.dnv.com/focus/climate_change/upload/pdd_antonio%20moran_2005-05-16.pdf.

364. *See id.*

365. *Id.*

366. *Id.*

367. *Id.* at 4.

SCPLCR. Two factors, however, would also destroy the fundamental economics of such a project. The first is that the premiums paid to renewable generators are paid over the spot price of electricity.[368] That base price, as has been explained in Part VI is, nowadays, well below the real cost of generation.[369] Therefore, the final price paid to renewable generators for their electricity would be lower than those considered in 2000 by SCPLCR.[370] The second factor is that, ten years after its enactment, most of the benefits granted under Law 25,019 begin to expire, also changing the fundamental economics of the investment. Therefore, the current system does not provide an adequate frame within which to make a profitable investment in renewable generation.

Another barrier not mentioned in the previous analysis is that the price offered by the law is not a fixed tariff, but rather a premium over the market price of electricity. Indeed, although a premium system is normally classified as a feed-in system, there is a big difference: the final price paid to generators in systems like the one implemented by Law 25,019 fluctuates with the normal electricity spot market.[371] That means that projects do not have a guaranteed return, making them riskier and, thus, more expensive. This was the previously explained experience of Germany with its *Stromeinspeisungsgesetz*.[372] Germany's experience was overlooked by the Argentinean National Congress. This issue will be further discussed when analyzing the flaws of Law 26,190.[373]

368. *See* Law No. 25019, Oct. 19, 1998, [29008] B.O. 1, art. 15 (offering premiums per kilowatt hour generated from wind power, which may be less than market prices determined by CAMMESA); Law No. 26190, Dec. 27, 2006, [31064] B.O. 1, art. 14 (offering premiums per kilowatt hour generated from other renewable resources, including solar, biomass, and hydroelectric, which may be less than market prices determined by CAMMESA).

369. *See* Law No. 25019, art. 15; Law No. 26190, art. 14.

370. *See* Law No. 25019; Law No. 26190; *see also* MORAN, *supra* note 363, at 4.

371. *See* Law No. 25019, art. 15 (providing that the final price per kilowatt hour for renewable power generated is determined by adding the premium offered under article 15 and the variable market price).

372. Rickerson & Grace, *supra* note 301, at 6.

373. *See supra* Part VI.C.

3. Technical Barriers

The third barrier, also identified in the SCPLCR, was a technical barrier. This technical limitation was a consequence of Argentina's lack of technical capacity to develop such projects. In this sense it has been said that:

> The manufacturing technology of a wind power generator is not developed in Argentina and all of the wind power generators of SCPLCR have been imported from developing countries, Denmark and Spain. SCPLCR has not provided education or capacity building for operation staff with the assistance of the plant suppliers in the stage of operation, management and maintenance. Therefore, they form a technological barrier to implement the project.[374]

4. Infrastructure Barrier

Another barrier for renewable generation in the Patagonian area where many wind projects would have taken place was the lack of connectivity between the WEM and the Patagonian grid.[375] Considering the fact that most renewable generation would probably be obtained from the Patagonian area, not having the Patagonian grid connection to the WEM was a significant limitation. This was taken into consideration by those considering investment in renewable energy in Argentina.[376] Investors would have had to wait until 2006 to see

374. MORAN, s*upra* note 363, at 5. The report demonstrates that the methodologies employed in the project were the simplified modalities and procedures for small-scale CDM project activities for "I.D. Renewable Electricity Generation for a Grid." *Id.*

375. *See* INTERAM. DEV. BANK, SECOND GENERATION ISSUES IN THE REFORM OF PUBLIC SERVICES 6 (1999), *available at* http://www.iadb.org/sds/doc/1941eng.pdf (explaining that the WEM and the Patagonian system are not connected).

376. *See* Gabriela Origlia, *Argentina Incorporates Wind Energy into its National Grid*, GREEN MOMENTUM, Oct. 13, 2008, http://www.greenmomentum.com/wb3/wb/gm/gm_content?id_content=173; Edwin F. Feo, Partner, Milbank, Tweed, Hadley & McCoy LLP, Presentation to the U.S. Export-Import Bank at the Environmental Technologies and Renewable Energy Conference: International Investment Opportunities for U.S. Companies (Oct. 16, 2007) (transcript *available at* http://www.milbank.com/NR/rdonlyres/5761D7BB-A014-4B78-BB5B-A27580A59C48/0/US_EXIM_Speech_Feo.pdf) (recommending that investors consider the available power grid and energy infrastructure before investing in energy production).

the connection of the Patagonian grid with the WEM through the interconnection line between Choele Choel and Puerto Madryn.[377] In other words, although Law 25,019 intended to create a wind and solar electricity generation industry, the required connection between the generation plants and the grid did not exist and was not even considered. It was one year after the enactment of Law 25,019 when the Argentinean government finally authorized the construction of the transmission line to interconnect the WEM to the Patagonian grid.[378]

It could be argued that private developers could have built the line. However, considering the line extension would be 350 kilometers at extra-high voltage and that transmission fees are low, the project would have been financially unviable for any private investor. Therefore, even assuming that the investment barriers did not exist or could have been overcome, this material deficiency would have prevented any project from developing.

C. Law 26,190: Its Flaws

Although Law 26,190 was enacted almost eight years after its predecessor, the legislature did not learn from the lessons of the European countries or analyze the reasons for Law 25,019's failure. In this subsection, the different barriers that prevent the development of a renewable industry will be identified.

1. Regulatory Barriers

Law 26,190 suffers from the same flaw as Law 25,019: although more than two years have passed since its enactment, the required complementary legislation, including its regulatory decree, has not been implemented. In fact, the Argentinean Ministry of Economy has not issued nor been informed about any law, decree, or regulation that would complement Law

377. *See* Secretaría de Infraestructura, Planeamiento y Servicios Públicos, Interconectado-Choele Choel-Puerto Madryn, http://www.chubut.gov.ar/infraestructura/archives/015873.php?id=-1 (last visited Mar. 1, 2009). The 500 kV line is still under construction and is intended to extend to El Calafate. *Id.*

378. *Compare* Res. No. 400/99, July 21, 1999, [29196] B.O. 4 *with* Law No. 25019, Oct. 19, 1998, [29008] B.O. 1 (approving the Patagonian and WEM grid interconnection one year after passage of the Wind and Solar Energy Law).

26,190.[379] Much of the implementation of Law 26,190 will depend on the effectiveness of that complementary legislation. Such legislation is of the essence for any investor to prepare the fundamental economics of the project. Furthermore, the more those regulations are delayed, the less effective they are, because investors would see such a delay as a lack of commitment from the Argentinean government, thus increasing the project's risk and its cost.[380]

2. Investment Barrier

Both Laws 25,019 and 26,190 fail to provide an adequate return. Returns are the main engine for developing projects in a capitalistic economy.[381] Generally, if a project has a minimum pre-established return, it will be accepted.[382] If not, it will be dismissed.[383]

379. *See* Law No. 26190, Dec. 27, 2006, [31064] B.O. 1.

380. *See* Rudiger Dornbusch, Notes on "A Primer on Emerging Market Crises", Jan. 2001, *available at* http://www.sinc.sunysb.edu/Class/eco360/DornbuschEmerMkt.doc (arguing that when governments are slow to react, this suggests a lack of commitment to the cause and warns investors that the government will not stick to its promises).

381. *See generally* Eric D. Chason, *Outlawing Pension-Funding Shortfalls*, 26 VA. TAX REV. 519, 546 (2007).

382. *See* JOHN D. FINNERTY, PROJECT FINANCING: ASSET-BASED FINANCIAL ENGINEERING 72 (2d ed. 2007) (stating that a critical issue concerning economic viability is whether there is an acceptable rate of return to investors).

383. *See id.*

The following chart contains the cost of generating electricity as well as the prices paid in Argentina and Germany for electricity produced from both wind and solar sources.[384]

Wind power		
	Return in 2006 (c€/kWh)[385]	Cost in 2006 (c€/kWh)
Germany	8.4	3.5–8.5
Argentina	0.032 + spot price (approx. 1.8) [386]	3–4.5

Solar power		
	Return in 2006 (c€/kWh)	Cost in 2006 (c€/kWh)
Germany	43.4	35–45
Argentina	20 + spot price (approx. 1.8)	22–63

Clearly, prices paid in Argentina for renewable-generated electricity from these resources are much lower than those established in Germany.[387]

Finally, the fact that the price paid to renewable generators is not a fixed price makes the investment more expensive because, as Germany learned, the project's cash flow is more uncertain. Even more, today the price for renewable electricity is tied to the cost of production of other technologies. Consequently, renewable generators are not paid according to

384. *See id.*

385. The price of the Euro was established through a cross rate between the exchange rate of the $/US$ and of the $/€ as reported by the Argentinean Central Bank on February 1, 2008 *at* http://www.bcra.gov.ar (click on 'Estadísticas e Indicadores,' 'Cambiarias,' 'Cotizaciones,' 'Cotizaciones por fecha,' and then select desired date and click on 'ver' button).

386. Spot Prices for 2006 are *available at* ENRE, http://www.enre.gov.ar/web/web.nsf/Files/2001RME%20ENRE%202001.pdf/$FILE/2001RME%20ENRE%202001.pdf (click on "Tarifas" and then click on "2006").

387. *See* FINNERTY, *supra* note 382.

their own costs but rather according to the costs of other generators, which is beneficial today with oil prices over US$100 per barrel, but which would not be with cheap fuels.

Another important deficiency in the Argentinean price policy is that it does not make any distinction between the sizes and locations of power plants that generate electricity. In Germany, the fee paid varies—depending on the renewable source—according to the location.[388] Also, the fee changes according to the capacity of the renewable generation plant.[389] The reason for having those distinctions is to grant a fair return to those investing in different sources and regions of the country and, as a consequence, to promote competition between generators in a similar situation.[390] Argentina's regulation lacks this distinction and, therefore, even if it adjusts the premium paid for electricity generated from renewable resources, it will probably not see nationwide development of a diversified renewable industry. This policy is necessary to develop less efficient energies; on the other hand, private investments would be made only in the most efficient units (which may be politically difficult because these profits largely stem from public support).[391] From the text of Law 26,190, it can be concluded that the categories implanted in Germany to ensure a diversified renewable industry have not been included.

Regarding the risk-related costs, it is assumed that they are contemplated in the costs of production reported by the Energy Secretariat. However, it should be mentioned that Law 26,190 does not include any reference to the rationale behind the premiums to be paid for renewable electricity, nor is there any reference in Congress's debate minutes containing the

388. FED. MINISTRY FOR THE ENV'T, NATURE CONSERVATION AND NUCLEAR SAFETY, EEG–THE RENEWABLE ENERGY SOURCES ACT (2007), *available at* http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/eeg_brochure_engl.pdf.

389. *Id.*

390. *See id.*

391. *Cf.* EUROPEAN ENV'T AGENCY, CSI: RENEWABLE ELECTRICITY (2008), *available at* http://themes.eea.europa.eu/IMS/IMS/ISpecs/ISpecification20041007132211/IAssessment1196270748290/view_content ("There are significant differences in the share of renewable between the EU-27 Member States. These reflect differences in the availability of natural resources in each country and the policies chosen to support the development of renewable energy.").

enactment of this law. Furthermore, in neither the Argentinean Congress's library nor in the relevant Congressional Study Commissions is there a complementary study addressing these issues.

3. Technical Barrier

Argentina invests little on renewable energy research and almost none on education.[392] This is an important deficiency that must be remedied by the Argentinean government in order to make any development in renewable generation possible. For instance, between 1991 and 2001, Germany spent €41.9 million, starting with €1.5 per year in 1991 and finishing with €6.2 million in 2001, on education for the deployment of renewable energy technologies.[393] The reason for such educational investment is that Germany recognizes a milestone for the development of the industry.

Germany has spent €334.4 million between 1991 and 2001 in research and development. As has been pointed out in SCPLCR's 2000 project, the consequence of not investing enough in research and development is that local manufacturers cannot improve either the production processes or the quality control and modernization of equipment and machinery.[394] Thus, because operating and maintenance of projects cannot be done efficiently by local companies, they must be imported. Furthermore, a lack of knowledge in the subject matter bars policymakers from being able to create efficient regulations that would help the sector to develop. Finally, not investing in education also prevents the industry from growing, to the point that people remain unaware of the reasons, characteristics, and consequences of renewable generation. Therefore, education at school, consumer, technical, and policymaker levels is essential

392. Interview with Mr. Pablo Carulla, Mr. Juana Ajuria Guerra de Arizaga, and Ms. Veronica Seifer, Dirección Nacional de Promoción de la Subsecretaría de Energía Eléctrica, in Buenos Aires, Arg. (Feb. 20, 2008).

393. Jon Strand, *Energy Efficiency and Renewable Energy Supply for the G-7 Countries, With Emphasis on Germany* 28 (Int'l Monetary Fund, Working Paper No. 07/299, 2007), *available at* http://ssrn.com/abstract=1087178.

394. ASAL & MARCUS, *supra* note 348, at 83.

for developing a cutting-edge technology like renewable generation. This is also a key aspect in achieving a more efficient and cheaper renewable energy generation.

4. Infrastructure Barrier

Like Law 25,019, Law 26,190 does not amend the legislation applicable to the construction of interconnection lines connecting the power plants to the grid.[395] Currently, the expansion of the transmission system depends on the market, and it is the user's responsibility (generators and demand) to decide whether a project is necessary and to finance it. Every project is subject to the approval of the ENRE, which evaluates it using economic efficiency criteria.[396] Current law allows two ways of financing the construction of new lines: private contracts among interested parties and public bids.[397] The first way is easier because the interested parties finance the construction of the line and the transmission facilities and operate them under the same price paid to Transener.[398] This mechanism was used only for small projects[399] due to the fact that the returns on those projects are very low because of the transmission tariffs.

The second process is used for larger projects and is much more difficult than the previous one. The reason is that it has more steps and delays. It basically works as follows: the interested parties submit an application to the ENRE explaining the project and the reasons why the project is needed. Then the ENRE analyzes it.[400] Afterwards, CAMMESA identifies the potential beneficiaries of such a line (those persons that will wind up paying for the project).[401] If 30% of the beneficiaries are against the project, the project will be rejected.[402] If the ENRE

395. *See* Law No. 26190, Dec. 27, 2006, [31064] B.O. 1.

396. Manuel Angel Abdala & Andres Chambouleyron, *Transmission Investment in Competitive Power Systems*, PUB. POL'Y FOR THE PRIVATE SECTOR, Sept. 1, 1999, at 1, *available at* http://rru.worldbank.org/documents/publicpolicyjournal/192abdal.pdf.

397. *See id.*

398. *Id.*

399. *See id.*

400. *Id.*

401. *Id.*

402. *Id.*

approves the project and the beneficiaries do not oppose it, the ENRE tenders the project in a public bid.[403] Given its complexities, the rules governing the extension of transmission lines have been characterized as "deficient" or "unsuccessful."[404]

The fact that policymakers in Argentina do not take into consideration the characteristics of the transmission regulations bars potential projects from connecting to the grid. Therefore, if the intention is to develop a renewable industry in Argentina, the legislature should necessarily consider how to modify the actual legislation regulating expansion of the transmission system.

5. Tax Barrier

Although the relevant regulatory decree has still not been enacted, it should be pointed out that Law 26,190 has a short amortization period that does not match the requirements of the industry.[405] Firstly, these are projects that need long amortization periods—usually of ten years—due to the fact that, because of their costs and complexities, they are typically highly leveraged[406] and their return does not allow them to pay off the debt in the short-term. Thus, the tax incentives created by Law 26,190 for a ten year period of time from its enactment[407] will probably be seen as short (today, there are only nine remaining years). Secondly, although taxes are an extremely relevant aspect of this kind of project, Law 26,190 does not grant any tax stability during the time of amortization of the project.[408] The lack of such guarantee is a flaw that, if not amended, will prevent investment.

403. *Id.*

404. Littlechild & Skerk, *supra* note 81, at 5.

405. Law No. 26190, Dec. 27, 2006, [31064] B.O. 1, art. 7.

406. JOHN D. FINNERTY, PROJECT FINANCING: ASSET-BASED FINANCIAL ENGINEERING 38 (2d ed. 2007).

407. Law No. 26190, Dec. 27, 2006, [31064] B.O. 1, art. 7.

408. *See id.*

VII. REQUIRED AMENDMENTS TO PROMOTE INVESTMENT IN RENEWABLE GENERATION

It can be concluded that Argentina needs to change its policy on prices settings; its transmission system rules; its policy on investment in research, development and education; the consistency, stability, and adequacy of its regulations; its policy on tax incentive; and its renewable energy education efforts.

A. Policy on Price Setting

Today, the organization of the renewable electricity market in Argentina does not support any investment because it is impossible for a project to reach adequate internal rates of return.[409] Therefore, Argentina should move away from a system where the prices paid to renewable generators are linked to the out-of-date spot electricity tariff and towards a more clearly fixed price system based on actual generation cost of the different renewable energy technologies. Indeed, there seems to be a consensus with regard to the fact that feed-in tariff systems are the most efficient way to promote development of renewable generation because they reduce risk regarding the projects' cash flows. As has been explained, those prices should not differ materially from those resulting from adding the premium granted by Law 26,190 to the spot price that would exist if Argentina had a free-market price setting.[410]

Second, generators should be paid a fixed tariff calculated with a viable internal rate of return, taking into account the characteristics of the investment and Argentina's risk. Furthermore, the fixed price should be granted for the amortization term of this kind of project (at least ten years).

Finally, it is recommended that Law 26,190's regulatory decree include a categorization between different projects according to their specific characteristics, if it is intended to include all different sources of renewable energy in the Argentinean electricity matrix.

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409. *See supra* notes 305–06 and accompanying text.

410. *See supra* Part VI.C.

B. Transmission System Rules

The rules related to expansion of the transmission system should be amended in order to eliminate current barriers that delay or prevent the system from being expanded. In this sense, it should be analyzed whether it would be more convenient to include the price of the transmission lines within the price offered to renewable generators, amend the current legislation regarding the procedures to build new transmission lines, or both.

C. Policy on Investment in Research, Development and Education

It is imperative for Argentina to create different programs within the framework of Laws 25,019 and 26,190 to improve the education, research, and development in the industry of renewable generation. As with other industries, the electricity industry requires technical skills. Therefore, as long as the local market does not provide such technical knowledge, it will have to be imported. In order to acquire such knowledge, two different types of training should be provided: training personnel with regard to existing facilities and training regulatory officials and personnel working for public energy companies "for the ultimate independent conduct" of the industry.[411] The intention should not be to develop a breakthrough technology, which may have been intended in countries like Germany; rather, goals should be realistic. One goal should be to educate consumers on the characteristics, effects, and costs of renewable generation. Another goal should be to encourage professionals of different fields to become qualified in different areas of expertise so as to continue developing the industry and planning adequate policies.

411. Jacqueline Lang Weaver, "Sustainable Development: Environmental and Socio-economic Issues in Petroleum Development," p. 2, not published.

D. Consistency, Stability, and Adequacy of Regulations

This paper shows that there are two different laws regulating the renewable generation in an overlapping form. Both Law 25,019 and Law 26,190 are effective, even though they have certain contradictory aspects that the policymakers probably should have tried to avoid. For example, although under Law 25,019, wind energy is granted fiscal stability for a term of fifteen years after its enactment,[412] electricity generated from other sources lacks that important benefit. As the legislature mentions no reason for that difference, it must be concluded that it is a consequence of having two different laws regulating the same area.

Lack of coordination makes long-term projects like those involving the construction of a power plant riskier and, thus, more expensive.[413] Therefore, in order to attract investors into the renewable generation industry, Argentina needs to build a consistent, stable, and adequate legislative framework.

E. Tax Incentive Policy

Tax incentives should be extended for a period of time of ten years from the time the project is launched—and not from enactment of the law—in order to match the amortization period of projects of this kind. Further, tax stability should be also granted for the same period of time in order to reduce the project risk. Tax stability could be obtained through an agreement between the Argentinean government and the investor.

F. Miscellaneous

Notwithstanding the aforementioned amendments, there are other factors that have not been discussed in this paper but that may also help the promotion of the renewable industry in Argentina. All of them need a further analysis and discussion. Three of these factors include the Clean Development Mechanism, the Fondo Fiduciaro de Energias Renovables, and arbitration awards.

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412. Law No. 25019, Oct. 19, 1998, [29008] B.O. 1, art. 7.

413. ASAL & MARCUS, *supra* note 348, at 83.

1. Approach to the Clean Development Mechanism

The Clean Development Mechanism ("CDM") is an arrangement under the Kyoto Protocol through which developed countries are permitted to invest in projects to reduce emissions of developing countries as an alternative to more expensive emission reduction programs in their own countries.[414] In return, the developed countries receive certified emission reductions ("CERs").[415] CERs can be used by the countries included in Annex I to the Kyoto Protocol[416] to help them meet their emission targets by investing in other countries like Argentina. This program has not been applied extensively, though it could be a great opportunity for Argentina.[417]

2. Policy on the Management of the Fondo Fiduciario de Energías Renovables

The fiduciary fund named "Fondo Fiduciario de Energías Renovables" should not be managed by the Argentinean government but, rather, by private parties. Previous experiences in Argentina with similar funds create uncertainty with regard to the efficiency in the management of that fund. As a consequence of that uncertainty, the risk of the project as a whole increases and, therefore, the internal rate of return is reduced, thereby making investments less attractive.

3. Arbitration Awards

In order to transmit commitment and confidence to potential investors, the Argentinean government should comply with all the arbitration awards in due time. Furthermore, it should issue

414. *The Kyoto Protocol's Clean Development Mechanism*, IN BRIEF (Library of Parliament, Ottawa, Can.), Jan. 23, 2006, at 1, *available at*, http://www.parl.gc.ca/information/library/PRBpubs/prb0558-e.pdf.

415. *Id.*

416. U.N. Framework Convention on Climate Change [UNFCCC], Subsidiary Body for Implementation, *Status Report on the Review of Third National Communications*, p. 2, U.N. Doc FCCC/SBI/2005/INF.9 (Nov. 14, 2005).

417. In fact, on January 23, 2008, Banco Santander granted the first loan in Argentina secured with these "green bonds." *See Primer Préstamo en la Argentina Garantizado con "Bonos Verdes"*, ASTERISCOS.TV, Jan. 23, 2008, http://www.asteriscos.tv/noticia-11279.html.

a fresh commitment to comply with any future award. That conduct will automatically reduce political risk and attract investors willing to invest in a market with transparent rules.

VIII. CONCLUSION

Argentina has huge amounts of renewable energy waiting to be exploited. Furthermore, it must use those resources to produce the electricity that it requires in order to meet the increasing demand for electricity as well as its international commitments under the Kyoto Protocol. Although the Argentinean Congress enacted two laws to create the renewable generation industry, neither law seems to be efficient enough to achieve such a result.[418] Therefore, those rules have to be reviewed and amended or complemented as necessary. To do so, Argentina should analyze the experience of other countries that have already been in this situation and adapt those experiences to its own domestic situation. That modification has to be done in conjunction with the participation of all sectors involved, starting with engineers and continuing with environmentalists, policymakers, consumer associations, and potential investors. In the meantime, Argentina will probably see just a minimal increase in its installed renewable generation capacity.

418. *See* Law No. 25019, Oct. 19, 1998, [29008] B.O. 1; *see also* Law No. 26190, Dec. 27, 2006, [31064] B.O. 1.