

NEW REGULATION FOR THE POWER GENERATION AND GAS INDUSTRIES IN MEXICO: THE POSSIBILITIES FOR FOREIGN INVESTORS

*Alejandro López-Velarde**

Synopsis: The natural gas and electricity industries represent two of the most important industries in the Mexican economy. These economic sectors were finally opened for private participation either national or foreign. The energy reform initiated with the modifications of the Mexican Constitution in December 2013, and continued with the laws of the congress that implemented the new constitutional mandate in August 2014. Since 1994, Mexico has become one of the largest producers of electricity through natural gas in the world. However, Mexico needs to address various challenges in both the natural gas and the electricity industries, due to lack of infrastructure. In the natural gas industry, such challenges exist in the exploration, production, transportation, distribution and storage of natural gas. In the electricity industry, the challenges are satisfying the national demand for electricity generation, and delivering electricity in a reliable, safe, efficient, and sustainable way through the national electricity system to the industry and households. This article will review the modifications made to the legal regime in both industries, analyzing the activities that individuals and corporations could not perform in the past, and the activities that the energy reform opened for the participation of the private sector. It will also address the difficulties found in the energy reform after more than 4 years of its implementation.

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* Attorney and Counselor-at-law, admitted in Mexico in 1991; J.D., National Autonomous University of Mexico; LL.M. University of Houston Law Center, 1993. Mr. Alejandro López-Velarde was in-house counsel for the Pemex Houston Legal Department in 1992. He is a Professor of Law on Energy at the National Autonomous University of Mexico. He is partner of the law firm López Velarde, Wilson, Abogados, S.C. where he acts as Director of the Energy Practice Group of the Mexico City office. Telephone number: (5255) 52928931. Email: alopezv@lvwhb.com

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I. INTRODUCTION

Traditionally, energy sectors, especially the hydrocarbon and electricity industries, have been considered a symbol of Mexican sovereignty. In these industries, not only foreign participation was forbidden, but participation by private Mexican companies was also forbidden. It was the historical belief that the Mexican government should solely develop these sectors, because they have been the pillars of the Mexican economy.

On November 8, 1995, the first modifications to the natural gas industry were made with the promulgation of the Natural Gas Regulation (Gas Regulation) by Ernesto Zedillo's administration.¹ The Gas Regulation provides the guidelines for the private sector participation in the distribution, transportation, and storage of natural gas.² Pursuant to the Gas Regulation, private and foreign investors who wished to participate in this industry needed to obtain a permit granted by the Regulatory Energy Commission (CRE).³

During the administration of President Enrique Peña Nieto from 2012 to 2018, particularly "at the end of the year 2013 and middle of the year 2014, several laws were modified, supplemented, incorporated, or abrogated with the purpose of allowing private investment (national or foreign) in the energy sector. These

1. Reglamento de Gas Natural [Gas Regulation], Diario Oficial de la Federación [DOF], Nov. 8, 1995 (Mex.).

2. *Id.*

3. *Id.* at art. 14.

included: (1) changes to Articles 25, 27 and 28 of the Constitution;⁴ (2) the promulgation of a new oil and gas law named the “Hydrocarbon Law;”⁵ (3) the Hydrocarbons Revenue Law;⁶ and (4) the Electricity Industry Law,⁷ (together referred to as the “2014 Energy Reform”) among other legal ordinances. These various modifications and reforms effectively opened almost all sectors of the natural gas and electricity industries to the participation of the private and social sector.⁸ The objective of the government’s plan for power sector reform is to open the hydrocarbons and electricity industries to private participation in order to secure reliable, cost-efficient, and quality energy sources.⁹ Nevertheless, the Mexican government must improve the implementation of the new regime in both sectors.

Globally, one fifth of electric power generation depends on natural gas.¹⁰ In fact, the United States of America is the country that produces the most electricity from this source of generation, followed by Russia, and Japan.¹¹ In Mexico, beginning with the administration of President Ernesto Zedillo from 1994 to 2000 until the current administration, the demand for electric power has increased exponentially based on natural gas combined cycles power plants, as well as its storage, transportation, and distribution. Consequently, the demand can be expected to continue to increase in the upcoming years.¹²

II. HISTORICAL BACKGROUND

A. *The Natural Gas Industry*

In 1995, during the administration of President Ernesto Zedillo, the modifications and reforms to Article 27 of the Mexican Constitution in the Petroleum

4. Decreto por el que se Reforman y Adicionan Diversas Disposiciones de la Constitución Política de los Estados Unidos Mexicanos, en Materia de Energía [Decree Amending and Supplementing Various Provisions of the Political Constitution of the United Mexican States on Energy Matters], *as amended*, Diario Oficial de la Federación [DOF], Dec. 20, 2013 (Mex.) [hereinafter 2013 Constitutional Modification].

5. The Hydrocarbons Law abrogates the Regulatory Law to Article 27 of the Mexican Constitution in the Petroleum Sector and the Gas Regulation, and amended the Foreign Investment Law, the Mining Law, and the Public and Private Association. LeyLaw. Ley Hidrocarburos [Hydrocarbon Law], art. 3, transitory 2, Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

6. Ley de Ingresos sobre Hidrocarburos [Hydrocarbon Revenue Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

7. Ley de la Industria Eléctrica [Electricity Industry Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

8. The social sector in Mexico represents the agricultural sector and the labor unions.

9. Alejandro Chanona Robles, *Tracking the Progress of Mexico’s Power Sector Reform*, THE WILSON CENTER (Apr. 2016), https://www.wilsoncenter.org/sites/default/files/tracking_progress_of_mexico_power_sector_reform.pdf.

10. THE SHIFT PROJECT DATA PORTAL, BREAKDOWN OF ELECTRICITY GENERATION BY ENERGY SOURCE, <http://www.tsp-data-portal.org/Breakdown-of-Electricity-Generation-by-Energy-Source#tspQvChart> (last visited Mar. 14, 2019).

11. Programa de Desarrollo del Sistema Eléctrico Nacional 2018 2032, [PRODESEN] [Development Program of the National Electric System 2018 2032], Secretaría de Energía [Ministry of Energy], p. 27, (Mex.).

12. *Outlook for Natural Gas in Mexico: The Electricity Sector Will Drive the Market*, FTI CONSULTING (Jan. 2017), <https://www.fticonsulting.com/~/media/Files/us-files/insights/white-papers/natural-gas-mexico-energy.pdf>.

Sector (the “Old Petroleum Law”) were enacted.¹³ The Old Petroleum Law was then modified for the first time, along with the adoption of the Gas Regulation, to allow for private participation in the transportation, distribution, and storage of natural gas in Mexico.¹⁴

The principal justifications behind the modifications and reforms to the Old Petroleum Law included (i) “lack of financial resources that can be dedicated to the modernization of the natural gas industry”; (ii) “lack of an adequate distribution infrastructure”; (iii) “uncertainty in the supply of natural gas to petrochemical and thermoelectrical plants, as well as other consumers that might require this fuel for industrial purposes”; (iv) “the need to meet domestic demand and thereby limit the need to import natural gas from [the] U.S. border states”; and (v) “development of the natural gas industry in order to allow Mexico to export natural gas.”¹⁵

However, the above-mentioned modifications were not enough, since the participation of the private sector still had restrictions such as (i) capacity on Petroleos Mexicanos (Pemex) transportation pipelines were not for sale; (ii) the Mexican government maintained control over domestic natural gas through its exploration and exploitation; (iii) first-hand sale of national product were in the hands of Pemex; and (iv) international trade was controlled by the executive branch granting importation permits only to Pemex’s subsidiaries.¹⁶

B. *The Power Industry*

Due to the urgent need to use the electric power generated by the private sector to meet Mexico’s demand, that was then in a full stage of development, the power industry was opened to private investment from 1879 to 1939.¹⁷ Thus, Mexico hosted multiple private companies that developed the electric sector, distributing the necessary energy to public or private users.¹⁸ The companies only met local needs so their size and generation capacities were small. In that context, the growth of the power sector became a necessity for Mexico.

During the 1930’s, user surveys began to emerge, as well as the formation of consumer organizations protesting the service, rates, and fluid shortages. The private companies did not carry out projects of investment, expansion, conservation, and improvement of the facilities, which resulted in the shortage of services in a growing country with huge demands for electricity.

13. Ley Reglamentaria del Artículo 27 Constitucional en el Ramo del Petróleo [Regulatory Law to Article 27 of the Mexican Constitution in the Petroleum Sector], *Diario Oficial de la Federación* [DOF], Nov. 29, 1958, amended May 22, 1995 (Mex.) [hereinafter Old Petroleum Law].

14. For a better understanding of the modifications made to the natural gas sector through the *years see Alejandro López-Velarde*, *Algunas Consideraciones En Relación A Las Nuevas Posibilidades De Inversión Extranjera En La Industria Petrolera Mexicana* [Some Considerations on the Foreign Investment Possibilities in the Mexican Oil and Gas Industry] Mexican Law Library, Commercial Codes, Vol. 4, 1997 Pocket Part, 14-21.

15. *Id.* at 12.

16. Congressional Research Service, *Mexico’s Oil and Gas Sector: Background, Reform Efforts, and Implications for the United States* (Sept. 25, 2015), <https://fas.org/sgp/crs/row/R43313.pdf>.

17. Victor Carreon and Armando Jimenez, *The Mexican Electricity Sector: Economic, Legal and Political Issues*, <https://fsi-live.s3.us-west-1.amazonaws.com/s3fs-public/evnts/media/Mexico.pdf>.

18. Private companies such as Mexican Light and Power Co., the American and Foreign Power, and the Compañía Eléctrica de Chapala became private generators of electricity in the central zone of the country.

The predominance of private companies gave rise to a series of problems linked to the shortage of electricity, which made it imperative to (i) regulate private companies, thereby motivating the Mexican government to decide to create the *Commission Federal Electricity* - known by its Spanish acronym as “CFE” (Federal Electricity Commission) in the year of 1937;¹⁹ and (ii) proceed to the nationalization of the industry in 1960, during the six-year term of President Adolfo López Mateos.²⁰

The possibility of private participation was not contemplated again until February 1999, when President Zedillo sent the bill that contained the modifications and reforms of Articles 25, 27, and 28 of the Mexican Constitution, which established the basis of the electric sector in Mexico.²¹

The principal justifications behind the modifications and reforms to the power sector included (i) lack of financial resources that can be dedicated to the modernization of the power generation industry; (ii) lack of an adequate transmission and distribution infrastructure; (iii) the need to meet domestic demand by the generation plants and thereby limit the need to import electricity; and (iv) the promotion of efficiency and competitiveness in the industry through plants that can offer the best terms for security, stability, and price.²²

III. GENERAL LEGAL FRAMEWORK APPLICABLE TO THE NATURAL GAS AND POWER LEGAL SYSTEMS

To understand the natural gas and power industries, a variety of legal ordinances should be reviewed.

19. CFE was created by decree on August 24, 1937 during the administration of President Lázaro Cárdenas. Ley que crea la Comisión Federal de Electricidad [Law that creates the Federal Electricity Commission], Diario Oficial de la Federación [DOF], August 24, 1937 (Mex.).

20. The (i) lack of due regulation of the electricity sector; (ii) the impossibility of complying with the national demand; (iii) the growth of consumer organizations; (iv) the decision of the largest national electric monopoly existing at that time named the American and Foreign Power Co. to sell its assets, gave, among other things, reason for the State to nationalize the power sector.

21. Duncan Wood & Jeremy Martin, *Mexico's New Energy Model of Paradigm Shifts and Political Conflict: The History of Mexico's Second Energy Revolution*, THE WILSON CENTER (May 2018), https://www.wilsoncenter.org/sites/default/files/of_paradigm_shifts_and_political_conflict_the_history_of_mexicos_second_energy_revolution.pdf.

22. In general, the statement of purpose of the Bill sent to the Mexican Congress established *inter alia* regarding (i) the generation sector that the Mexican government has announced that at least 13 GW of additional generation capacity will be required during the following years in order to meet the national demand; (ii) transmission sector the challenge is to modernize the network and to increase its reliability and security, and the quality of service, since a shortage of public resources has limited levels of investment in recent years. The result has been congestion in the national interconnected system, which prevents full use of generation capacity, increases the cost of producing electricity and reduces the system's efficiency and reliability; (iii) distribution sector needs investment. Indicator of quality and reliability of service especially investment requirements of electricity sector during the coming years will place an unprecedented burden on the budget and the financing capacity of the public sector. To go without these investments would put at risk the supply of electricity in the conditions required by a competitive economy, and would also undermine the ability of the national economy to create jobs. *Id.*

A. *Natural Gas Industry*

The most important of the applicable laws to this sector are the following: (1) the Mexican Constitution;²³ (2) the Hydrocarbons Law;²⁴ (3) the Petroleos Mexicanos Law (Pemex Law);²⁵ (4) the Hydrocarbons Revenue Law;²⁶ (5) the Foreign Investment Law (FIL);²⁷ (6) the Law on the National Security Industrial Agency and the Environmental Protection in the Hydrocarbon Sector;²⁸ (7) the Regulatory Bodies in Energy Matters Law;²⁹ (8) the Law of the Mexican Petroleum Fund for Stabilization and Development;³⁰ (9) the Law on Public-Private Partnerships;³¹ (10) Federal Budget and Fiscal Responsibility Law;³² and (11) the General Law of Public Debt,³³ among others.

B. *Electricity Industry*

Generally, companies and individuals operating within the electricity sector must comply with the following regulations: (1) Constitution;³⁴ (2) Electricity Industry Law³⁵ and its Regulation;³⁶ (3) Energy Transition Law;³⁷ (4) Geothermal

23. 2013 Constitutional Modification *supra* note 4, Arts. 25, 27-28.

24. Hydrocarbon Law, *supra* note 5.

25. The Pemex Law abrogates its predecessor law published on November 28, 2008, and it also derogates the Federal Law of Paraestatal Entities [Ley Federal de las Entidades Paraestatales]; the Law of Acquisitions, Leasings, and Services of the Public Sector [Ley de Adquisiciones Arrendamientos y Servicios del Sector Público]; the Public Works and Related Services Law [Ley de Obras Públicas y Servicios Relacionados con las Mismas]; and any and all legal and administrative provisions contrary to this law. Ley de Petroleos Mexicanos [Petroleos Mexicanos Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

26. Hydrocarbon Revenue Law, *supra* note 6, transitories 3-5.

27. Ley de Inversión Extranjera [Foreign Investment Law], *as amended*, art. 5(I)-(II), Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

28. *See generally* Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos [Law on the National Industrial Security Agency and Environmental Protection in the Hydrocarbon Sector], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

29. *See generally* Ley de los Órganos Reguladores Coordinados en Materia Energética [Regulatory Bodies in Energy Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

30. *See generally* Ley del Fondo Mexicano del Petróleo para la Estabilización y el Desarrollo [Law of the Mexican Petroleum Fund for Stabilization and Development], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

31. *See generally* Ley de Asociaciones Público Privadas [Law on Public-Private Partnerships], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

32. *See generally* Ley Federal de Presupuesto y Responsabilidad Hacendaria [Federal Budget and Fiscal Responsibility Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

33. *See generally* Ley General de Deuda Pública [General Law of Public Debt], *as amended*, Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

34. 2013 Constitutional Modification, *supra* note 4.

35. *See generally* Ley de la Industria Eléctrica [Electricity Industry Law], Diario Oficial de la Federación [DOF], August 11, 2014 (Mex.).

36. *See generally* Reglamento de la Ley de la Industria Eléctrica [Regulation of the Electricity Industry Law], Diario Oficial de la Federación [DOF], Oct. 31, 2014 (Mex.).

37. *See generally* Ley de Transición Energética [Energy Transition Law], Diario Oficial de la Federación [DOF], Dec. 24, 2015 (Mex.).

Energy Law³⁸ and its Regulation;³⁹ (5) Promotion and Development of Bioenergetics Law;⁴⁰ (6) General Law on Climate Change;⁴¹ (7) Law of the Federal Electricity Commission (CFE Law)⁴² and its Regulations;⁴³ (8) Regulatory Energy Commission Law;⁴⁴ (9) Law of the Coordinated Regulatory Bodies in Energy Matters;⁴⁵ (10) Amparo Law;⁴⁶ (11) Federal Law of Administrative Procedure (LFPA);⁴⁷ (12) General provisions regarding acquisitions, leases, services contracting and execution of works of the CFE and its Subsidiaries (the “Procurement Provisions”);⁴⁸ and (13) General Administrative Ordinances published by the Executive Branch, among others.

In accordance with the previous regulations, the activities of the natural gas and electricity industries are of (1) public utility; (2) federal jurisdiction; and (3) commerce with the purpose of putting Pemex and CFE on equal footing under the *jure-gestionis* with companies and individuals in the private and social sectors, guaranteeing legal security while establishing the application of the same legal provisions for public, private, and social companies.

IV. REGULATORY BODIES IN THE NATURAL GAS AND ELECTRICITY SECTORS

In order to ensure the success of the 2014 Energy Reform in the natural gas and power industries, several modifications to the governmental structures were made, creating new public entities and granting new powers to already existing public entities in charge of administrating specific aspects of the energy sector.

38. See generally Ley de Energía Geotérmica [Geothermal Energy Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

39. See generally Reglamento de la Ley de Energía Geotérmica [Regulation of the Geothermal Energy Law], Diario Oficial de la Federación [DOF], Oct. 31, 2014 (Mex.).

40. See generally Ley de Promoción y Desarrollo de los Bioenergéticos [Promotion and Development of Bioenergetics Law], Diario Oficial de la Federación [DOF], Feb. 1, 2008 (Mex.).

41. See generally Ley General de Cambio Climático [General Law on Climate Change], Diario Oficial de la Federación [DOF], June 6, 2012 (Mex.).

42. See generally Ley de la Comisión Federal de Electricidad [CFE Law] [Law of the Federal Electricity Commission], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

43. See generally Reglamento de la Ley de la Comisión Federal de Electricidad [Regulation of Law of the Federal Electricity Commission], Diario Oficial de la Federación [DOF], Oct. 31, 2014 (Mex.).

44. See generally Ley de la Comisión Reguladora de Energía [Regulatory Energy Commission Law], Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

45. Law of the Coordinated Regulatory Bodies in Energy Matters, *supra* note 25.

46. Ley de Amparo Reglamentaria de los artículos 103 y 107 de la Constitución Política de los Estados Unidos Mexicanos [Amparo Law] [Law of Amparo, Regulatory of Articles 103 and 107 of the Political Constitution of the United Mexican States], Diario Oficial de la Federación [DOF], Apr. 2, 2013 (Mex.).

47. See generally Ley Federal de Procedimiento Administrativo [LFPA] [Federal Law of Administrative Procedure], Diario Oficial de la Federación [DOF], Aug. 4, 1994 (Mex.).

48. See generally Disposiciones generales en materia de adquisiciones, arrendamientos, contratación de servicios y ejecución de obras de la Comisión Federal de Electricidad y sus empresas productivas subsidiarias [General provisions regarding acquisitions, leases, contracting of services and execution of works of the Federal Electricity Commission and its subsidiary production companies] Diario Oficial de la Federación [DOF], Apr. 27, 2016 (Mex.).

A. *Ministry of Energy (SENER)*

The Ministry of Energy - known by its Spanish acronym as SENER - has broad and discretionary powers in both the natural gas and power industries.

In the natural gas sector, SENER is responsible for issuing five-year expansion plans and for optimizing the natural gas plan for the pipeline and storage infrastructure. It must take into consideration the proposal made by the managers of the “*integrated systems*”⁴⁹ prior to obtaining technical assistance from the CRE.⁵⁰

With the technical assistance of the CNH (as described below), SENER will award Pemex, or any other Productive State Entity, allotments (*asignaciones*) for exploration and extraction of natural gas established in Article 27, paragraph 7 of the Constitution.⁵¹ Then, Pemex or any Productive State Entity will be able to request that SENER assign the allotments to the private sector [] and the private sector will be able to participate in the development of such allotments through a bidding process with CNH for the granting of the administrative contracts.⁵² Further, SENER has the possibility to determine the applicable contract for upstream activities (i.e. services, utility, participation, license, or some combination of these contracts) and to assign the allotments to the private sector.⁵³

In the midstream and downstream sectors, SENER grants permits for the processing of natural gas, the export and import of hydrocarbons, and petroleum.⁵⁴

On the other hand, in the electricity sector, SENER is in charge of strategic planning concerning new power generation and oversees projects to ensure the proper generation, transmission, distribution, supply, and commercialization of electric power.⁵⁵ SENER establishes and executes the policy, regulation, and surveillance of the electricity industry.⁵⁶ SENER and CRE’s main purposes are to: (1) guarantee the efficiency, quality, reliability, continuity, and security of the National Electric Grid (*Sistema Eléctrico Nacional*—known by its Spanish acronym as SEN); (2) ensure that the activities of the electrical industry are carried out under criteria of sustainability; (3) promote investment and competition, where feasible; (4) promote the efficient expansion of the electricity industry, while respecting the human rights of communities; (5) encourage the diversification of the electricity generation matrix, as well as national energy security; (6) support the electric suppliers; and (7) protect the interests of the end users, among others.⁵⁷

49. Pipeline transport and storage systems for natural gas, petroleum, and petrochemicals that are interconnected may form integrated systems in order to expand coverage or provide systemic benefits in terms of improvements in safety conditions, continuity, quality, and efficiency in the rendering of services. *See* Hydrocarbon Law, *supra* note 4, at art. 60.

50. *Id.*

51. *Id.* arts. 6-7.

52. *Id.* art. 12.

53. *Id.* For a better understanding of SENER’s faculties in the oil and gas industry *see* Alejandro- López Velarde, *The Application of the Antitrust Law Under the New Rules of the Oil and Gas Industry in Mexico*, 38 ENERGY L. J. 95, 100 (2017).

54. Hydrocarbon Law, *supra* note 4, at art. 48(I).

55. *Id.* at art. 49.

56. *Id.*

57. Electricity Industry Law, *supra* note 7, at art. 6.

B. National Hydrocarbons Commission (CNH)

The National Hydrocarbon Commission (*Comisión Nacional de Hidrocarburos* – known by its Spanish acronym as CNH) is the entity that regulates the upstream activities and participates in the granting of administrative contracts carrying out the public tender.⁵⁸ It is also the technical administration of allotments and contracts, and the regulation of exploration and extraction of [natural gas].⁵⁹ Further, the CNH authorizes the alliances and partnerships between Pemex and the private sector through a bidding process before executing a contract between the partnership or alliance and Pemex.⁶⁰

C. Regulatory Energy Commission (CRE)

CRE has been granted faculties and powers as regulator of the natural gas (with the exception of upstream activities) and power industries. In the natural gas industry, CRE regulates the mid and downstream sectors through a permit regime.⁶¹ CRE may grant and revoke permits in the transport, distribution, storage, compression, liquefaction, decompression, regasification, marketing, and sale to the public of natural gas.⁶² Further, it is authorized to: (1) approve the creation of integrated systems; (2) determine the incorporation of new infrastructure;⁶³ and (3) issue provisions related with the activities above-mentioned, including the terms and conditions applicable to services, remuneration, among others.⁶⁴

In the power industry, CRE is empowered to conduct operations including, but not limited to: (1) grant the permissions to generators and suppliers, as well as registrations to traders and qualified end users and decide on its modification, revocation, assignment, extension or termination; (2) determine the methodologies of calculation, criteria, and bases to establish and update the considerations applicable to the exempt generators and users of basic supply with controllable demand when they sell their production or demand reduction to a basic services supplier; (3) establish and modify the general conditions for the public service of transmitting and distributing electric power, as well as the general conditions for the rendering of the electric supply; (4) issue and apply the tariff regulation to which the transmission, distribution, operation of the basic services suppliers, the operation of CENACE and the related services not included in the Wholesale Electricity Market, as well as the final rates of the basic supply; and (5) apply economic sanctions for violation of the Electricity Industry Law.⁶⁵

58. See generally 2013 Constitutional Modification, *supra* note 4, at transitories 6, 10. CNH is not involved in the power industry.

59. *Id.* at transitory 10(b).

60. *Id.* at transitory 6; see also Hydrocarbon Law, *supra* note 5, at arts. 13-15.

61. See generally Hydrocarbon Law, *supra* note 5.

62. Hydrocarbon Law, *supra* note 5, at art. 48(II).

63. *Id.* at art. 61.

64. Further, CRE also applies principles of asymmetric regulation to limit the dominant power of Pemex as to the first-hand sales of oil, petroleum or petrochemicals until a greater participation of other economic agents in the markets is achieved. *Id.* at art. 82(I), transitory 13.

65. Electricity Industry Law, *supra* note 7, at art. 12.

D. The National Natural Gas Control Centre (CENEGAS)

Based on the fact that Pemex and its subsidiaries cannot be a competitor, a judge, and manage the natural gas pipeline system all at the same time, pursuant to the 2014 Energy Reform, the government incorporated the National Natural Gas Control Centre (*Centro Nacional de Control del Gas Natural* - known by its Spanish acronym CENEGAS).⁶⁶ CENEGAS is responsible for the management of the national transportation pipeline and storage systems.⁶⁷ CENAGAS shall secure the supply of natural gas in the whole Mexican Republic, as well as publish and manage the public tenders related to infrastructure projects dealing with the national transportation and storage of natural gas.⁶⁸

E. National Center for Energy Control (CENACE)

Under the 2014 Energy Reform, the *Centro Nacional de Control de Energía* (CENACE) was separated from CFE.⁶⁹ CENACE is in charge of the SEN and it is the chief operator of the Wholesale Electricity Market.⁷⁰ In addition, CENACE is directly responsible for open access to the SEN and ensuring access to all power generators, suppliers, and end users, among other activities.⁷¹

Generators, traders, and qualified end users will be able to conduct, at minimum, the following transactions of sale in the new Wholesale Electricity Market:

- i. Electric power;
- ii. Related Services that are included in the Wholesale Electricity Market;
- iii. Power or any other product that guarantees the sufficiency of resources to satisfy the electricity demand;
- iv. The above products, via import or export;
- v. Financial transmission rights; and
- vi. Clean Energy Certificates.⁷²

V. PETROLEOS Mexicanos (Pemex) and Federal Electricity Commission (CFE) as Productive State Entities.

In Mexico, Pemex and CFE⁷³ have been in charge of the development of the hydrocarbon and power industries, respectively, in a *de-jure* monopolistic fashion

66. See Hydrocarbons Law, *supra* note 5, at art. 66.

67. *Id.* at arts. 66-69.

68. See generally 2013 Constitutional Modifications, *supra* note 4, at transitory 16; see also Hydrocarbons Law, *supra* note 5, at art. 66.

69. See Hydrocarbon Law, *supra* note 5, at art. 66.

70. *Id.*

71. See Electricity Industry Law, *supra* note 7, at art. 3 (XXVII).

72. *Id.* at art. 96.

73. Until the year 2009, the Central Light and Power Company (*Compañía de Luz y Fuerza del Centro*) a public company such as CFE used to provide the public service of electricity together with CFE. However, it was disincorporated during the Administration of President Felipe Calderon due to lack of efficient services and Union problems.

for more than 50 years.⁷⁴ Before the 2014 Energy Reform, both public companies were considered decentralized public entities of the federal Mexican government. This legal status required both companies to follow and observe the terms and conditions established in the Public Acquisitions, Leases and Service Law; and the Public Works and Related Services Law (the “Procurement Laws”) for engaging the private sector in the development of both industries.⁷⁵ Now, Pemex and CFE are considered Productive State Entities with the possibility of incorporating Productive Subsidiary Entities and affiliate companies as requested by their Board of Directors.⁷⁶ Private investment participation in both companies is clearly forbidden since Pemex and CFE are owned by the Mexican federal government.⁷⁷

As Productive State Entities, Pemex and CFE are both granted an independent legal status, created for the purpose of managing and developing industrial and commercial activities for all of the activities related to the Mexican hydrocarbon and power industries. This generates economic value and increases the profits of the Nation in accordance with the terms of the Pemex Law, the CFE Law, the Hydrocarbons Law, and the Electricity Industry Law.⁷⁸

For the purpose of securing the participation of the private and social sectors in both industries, SENER has the power to implement “sanctions against Pemex and [CFE] to instruct, by itself or on a proposal from CRE [], to carry out the necessary actions to ensure that Pemex’s [and CFE’s] activities and operations do not hinder competition nor the efficient development of the markets.”⁷⁹

Today, CFE, as a Productive State Entity of the federal Mexican government, participates in the generation, transmission, distribution, storage and commercialization of electric power, being the only entity in Mexico to have carried out the activities of transmission and distribution in an exclusive manner.⁸⁰ Therefore, the SEN is regulated by CENACE. However, the SEN is operated by CFE since this state company keeps the physical control of the SEN. Therefore, CENACE (as regulator) and CFE (as operator) establish the guidelines and proceedings for the interconnection and connection of the generators or end users to the SEN with the purpose of ensuring security, reliability, efficiency, sustainability so that the SEN can be operated in such a way as to support any critical contingency.⁸¹

74. Pemex is no longer the public company granting upstream natural gas contracts. Now, the private sector can participate in the exploration and extraction of natural gas through administrative contracts granted by the CNH. *See generally* Hydrocarbon Law, *supra* note 5.

75. Hydrocarbon Law, *supra* note 5, at art. 32.

76. *Id.*

77. Pemex Law, *supra* note 25, at art. 2; CFE, *supra* note 42, at Art. 2.

78. Pemex Law, *supra* note 25, at arts. 4-5; CFE, *supra* note 42, at arts. 1-2. For a better understanding of Pemex legal status and powers before the 2014 Energy Reform, *see* Alejandro López-Velarde, *The New Foreign Participation Rules in Each Sector of the Mexican Oil and Gas Industry: Are the Modifications Enough for Foreign Capitals?*, 3 J. WORLD ENERGY L. & BUS. 71, 74-76 (2010).

79. Pemex Law, *supra* note 25, at arts. 80 (III), 81 (IX); CFE, *supra* note 42, at art. 10.

80. *See* CFE Law, *supra* note 42, at art. 5; Electricity Industry Law *supra* note 7, at art. 2.

81. Electricity Industry Law *supra* note 7, at art. 4 (II).

The 2014 Energy Reform also calls for structural changes in CFE, which is broken up into business units.⁸² These new units oversee the power quality, reliability, and cost, and are forced to compete with each other, as well as with the private sector and energy sellers, thereby breaking up the government's monopoly in this sector.⁸³

VI. NEW FOREIGN INVESTMENT PARTICIPATION IN EACH LEVEL OF THE NATURAL GAS AND ELECTRICITY INDUSTRIES

A. *The Constitutional Restrictions for Both Industries*

The Constitution, as Mexico's paramount law, is the most important legal ordinance addressing the natural gas and power industries.

In the natural gas sector, the Mexican Nation keeps ownership of and has direct dominion over the subsoil, as well as the exclusive right of exploitation and development of natural gas.⁸⁴ The Constitution still prohibits the private ownership of natural gas, and reserves ownership of all solid, liquid, and gaseous hydrocarbons to the State.⁸⁵ The ownership of such natural resources is a Constitutional right that is inalienable and imprescriptible.⁸⁶ The 2014 Energy Reform opens up the possibility to consider the hydrocarbons as part of the production of the private sector in their financial statements when the hydrocarbons are extracted from the wellhead. This is only possible if the company has complied with royalty payments and all terms and conditions of the contract signed with the Mexican government.⁸⁷

In addition, Article 28 of the Constitution includes a list of so-called *strategic areas*, which includes the exploration and extraction of natural gas among those considered to be strategic activities.⁸⁸ That is to say, "the Mexican State will carry out these activities through allotments granted to Pemex" or other Productive State Entities, or through the execution of exploration and extraction contracts with the private sector through the bidding proceedings with the CNH.⁸⁹

Regarding the power industry, after the reform carried out on December 20, 2013, the Mexican Constitution reaffirmed that the State exercises exclusively the (1) planning and control of the SEN; (2) public service of transmission and distribution of electrical energy; and (3) nuclear energy industry.⁹⁰ In fact, the above-

82. *Id.* at art. 2.

83. The Constitution dictated that CFE shall be divided in several companies with the purpose to avoid monopolistic practices by CFE thereby creating several subsidiaries devoted to generation; transmission; distribution; and commercialization. 2013 Constitutional Modification, *supra* note 4, at art. 25.

84. *Id.* at art. 27.

85. *Id.*

86. *Id.*

87. *Id.*

88. 2013 Constitutional Modification, *supra* note 4, at art. 28.

89. 2013 Constitutional Modification, *supra* note 4, at arts. 27-28; Hydrocarbon Law, *supra* note 5, at art. 2.

90. 2013 Constitutional Modification, *supra* note 4, at art. 27.

mentioned activities are considered strategic areas for the Mexican government.⁹¹ Therefore, the Mexican State maintains its ownership, notwithstanding that it may enter into contracts with the private sector under the terms of the Electricity Industry Law.⁹² As such, the private sector is able to participate in the transmission, distribution, and nuclear energy sectors through a public tender process to be published by the CFE.⁹³

B. *The Natural Gas Industry*

Before the 2014 Energy Reform, the Mexican legal system regulated the products of the gas industry (*e.g.*, natural gas, shale gas, liquefied petroleum gas, associated gas) in different ways, establishing restrictions and legal barriers to the free market participation for the private sector (national or foreign).⁹⁴

The Old Petroleum Law broadened the activities reserved to the Mexican State for the natural gas industry.⁹⁵ However, the first modifications and reforms to the Old Petroleum Law in 1995 allowed domestic and foreign private participation in the transportation, distribution, and storage of natural gas.⁹⁶ Nevertheless, the modifications were not enough since the following activities were reserved to the State: (1) exploration and production; (2) transportation pipeline system was not for sale and kept in the hands of Pemex; and (3) the first-hand sale of domestic natural gas.⁹⁷

Based on the 1995 short modifications, which only opened up the participation of the private sector in transportation, distribution and storage of natural gas, the 2014 Energy Reform allows the private sector to do the following:

- i. In the upstream sector, it is possible to participate in upstream activities of natural gas through contracts granted by CNH as explained in Section IV.B. above.⁹⁸
- ii. Transportation and distribution represents one of the biggest problems in the oil and gas industry since the country lacks the ability to transport and distribute natural gas throughout the Mexican Republic due to lack of infrastructure. Currently, the private sector is able to participate in activities such as transportation and distribution through a permit to be granted by CRE.⁹⁹ In fact, foreign capital will be able to participate on

91. 2013 Constitutional Modification, *supra* note 4, at art. 25; Electricity Industry Law, *supra* note 7, at art. 2.

92. 2013 Constitutional Modification, *supra* note 4, at art. 2.

93. *Id.* at arts. 27-28; Electricity Industry Law, *supra* note 7, at art. 2.

94. For a better understanding as to how the 2014 Energy Reform regulates the gas industry including the Liquefied Petroleum Gas; the Associated Natural Gas; and the Shale Gas see Alejandro López Velarde & Philip D. Vasquez, *Historic Break with the Past: The New Foreign Investment Possibilities in the Mexican Oil and Gas Industry*, 55 NAT. RES. J., 153, 174-178 (2015).

95. All the phases of the natural gas industry were exclusively reserved to the Mexican government which developed this industry through Pemex. Gas Regulation, *supra* note 2, at arts. 1-3.

96. *Id.*

97. *Id.*

98. See *supra* Section IV(B); see generally 2013 Constitutional Modification, *supra* note 4, at transitories 6, 10.

99. Hydrocarbon Law, *supra* note 4, at art. 48(II).

- a 100% basis through shipping companies engaged in the operation of vessels that provide services for the exploration and extraction of oil and other hydrocarbons such as natural gas.¹⁰⁰
- iii. The Storage industry is also allowed to participate in the private sector with permits granted by the CRE. Such permits are granted for specific locations and defined capacity. The application must include the project location as well as the capacity of the project.¹⁰¹
 - iv. Activities such as “compression, liquefaction, decompression, regasification, and sale to the public” were also opened to private participation through a permit to be granted with the CRE.¹⁰²
 - v. Prices for the first-hand sale of natural gas produced by Pemex are set by the CRE.¹⁰³ However, once the market has developed and several competitors are in place, such competitors may request the Federal Competition Commission (FCC) to establish prices initially in accordance with the competitiveness of the market place.¹⁰⁴ In establishing prices, the CRE and the FCC have to take into account costs, opportunities and conditions of gas competitiveness in the international market.¹⁰⁵
 - vi. Regarding international trade in the past, the import and export of natural gas required prior authorization from the Mexican government, which often denied to the private sector.¹⁰⁶ Currently, permits are granted by SENER.¹⁰⁷

C. The Power Industry

As in the case of the natural gas sector, the electricity industry was opened up for private participation in each of its sectors with the exception of (1) planning and control of the SEN; (2) public service of transmission and distribution of electrical energy; and (3) the nuclear energy industry.¹⁰⁸

In general terms, the electricity industry includes the generation, transmission, distribution, and commercialization of electric power, planning and control of the SEN, and the operation of the Wholesale Electricity Market (also known as

100. *Id.* at Art. 48(II).

101. *Id.* at Art. 4(XI).

102. *Id.* at Art. 2(III), 48-49.

103. First hand sale prices are understood as the first sale of national hydrocarbons made by Pemex. Before the Natural Gas Regulation back in 1995 and the 2014 Energy Reform, the prices for natural gas were proposed by Pemex and approved by SENER. *Id.* at 110.

104. Hydrocarbon Law, *supra* note 4, at art. 82(II)(b).

105. *Id.*

106. *Id.* at art. 48(I).

107. *Id.*

108. 2013 Constitutional Modification, *supra* note 4, art. 27. The amended version of Article 27 paragraph 6 now reads as follows: “In the cases to which this article refers . . . the Nation shall be exclusively in charge of energy transmission by way of the National Transmission Grid, as well as the operation, control, and maintenance of the National Transmission Grid. In these matters there will be no concessions to individuals and the Nation will take full advantage of the goods and natural resources required to accomplish these objectives.” Electricity Industry Law, *supra* note 7, at art. 2.

the Spot Electricity Market).¹⁰⁹ As previously mentioned, the Wholesale Electricity Market is operated by CENACE, through which the market participants (generators, traders, supplier, and qualified user), may carry out the transactions mentioned in Section IV. E. above.¹¹⁰

In the above-mentioned activities, the private sector can participate as follows:

- i. Generation of power- The power generation was opened to the private and social sectors through a permit to be granted by the CRE as long as the generation reaches the amount of .500 MW, and an interconnection agreement is obtained with CENACE.¹¹¹ If the generation is below .500MW, no permit needs to be obtained from the CRE, but a connection agreement with CFE needs to be obtained by the exempt generator.¹¹²
- ii. Transmission and distribution- Based on the consideration that the transmission and distribution sectors are exclusively reserved to the Mexican State, the same are regulated by CENACE and operated by CFE Transmission and CFE Distribution.¹¹³ Consequently, the private and social sectors will be able to participate through bidding proceedings whereby a public work, acquisition and services contract can be granted to the supplier who offers the best available conditions with respect to price, quality, financing, opportunity, and any other pertinent circumstances in a public tender or through the exceptions established to the public tender such as to invitation to at least 3 suppliers or direct award.¹¹⁴
- iii. Commercialization- This new activity for the private sector encompasses one or more of the following activities: (1) providing the electric supply to the end users; (2) representing the exempt generators in the Wholesale Electricity Market; (3) carrying out the transactions referred to in article 96 of the Electricity Industry Law in the Wholesale Electricity Market; (4) executing electric coverage contracts with the purpose of carrying out sales transactions related to electric power, power or related services, and transmission financial rights with the generators, suppliers, and qualified users participating in the Wholesale Electricity Market; (5) acquiring transmission and distribution services from CFE Transmission and CFE Distribution; (6) acquiring and disposing of related services not included in the electricity market, with the intermediation of CENACE; and (7) anything else that the CRE deems necessary (together referred as the “Energy Services”).¹¹⁵

109. Electricity Industry Law, *supra* note 7, at art. 2.

110. *Id.* at Art. 3 (XXVII).

111. Generator is understood as the holder of one or more permits to generate electricity in power plants, or holder of a Market Participant contract that represents in the Wholesale Electricity Market those power plants or, with the authorization of the CRE, to the electric power plants located abroad. *Id.* at art. 3 (XXIV).

112. *Id.* at art. 17.

113. Ley de la Comisión Federal de Electricidad [CFE Law] [Law of the Federal Electricity Commission], Art. 5, Diario Oficial de la Federación [DOF], Aug. 11, 2014 (Mex.).

114. 2013 Constitutional Modification, *supra* note 4, at art. 134.

115. Electricity Industry Law, *supra* note 7, at art. 45.

The above-mentioned Commercialization can be carried out by the private and social sectors through the following suppliers and traders:

- (a) A Basic Services Supplier who need to obtain a permit from CRE and an agreement as a “Market Participant” of the Wholesale Electricity Market from CENACE. This supplier must provide energy services to each end user who has not applied as a qualified end user with CRE and has requested its services.¹¹⁶
- (b) A Qualified Services Supplier who needs to obtain a permit from CRE and an agreement as a Market Participant of the Wholesale Electricity Market from CENACE. This supplier provides Energy Services to Qualified End Users.¹¹⁷
- (c) A Last Resource Supplier who needs to obtain a permit from CRE and an agreement as a “Market Participant” of the Wholesale Electricity Market from CENACE. This supplier shall offer the last resort supply to all qualified end users that require it and whose Cargo Centers (or metering devices) are located in the areas where they operate.¹¹⁸
- (d) A Non-supplier marketer who needs to obtain a registration with CRE and an agreement as “Market Participant” of the Wholesale Electricity Market from CENACE. This trader does not provide electric supply, but it can provide the rest of the Energy Services.¹¹⁹
- iv. An End User who can be an individual or an entity that acquires power for its own consumption or for consumption either within its facilities, the electric supply in its Cargo Centers, as a “Market Participant,” or through a Supplier.¹²⁰
- v. Qualified End Users who can be an individual or an entity that has registered with CRE to acquire the Electric Supply as a “Market Participant”, or through a Qualified Service Supplier with the purpose of purchasing power in the Wholesale Electricity Market at cheaper prices.¹²¹
- vi. Regarding international trade, CRE authorizes the importation of electric power from power plants connected exclusively to the SEN.¹²²

D. The Expropriation Process

Mexico, as part of the United Nations, applies the Resolution 1803 (XVII) approved by the General Assembly on December 14, 1962, entitled, “Permanent Sovereignty over Natural Resources”,¹²³ which dictates *inter alia* that:

116. *Id.* at art. 3 (XLVI).

117. *Id.* at art. 3 (XLVII).

118. *Id.* at art. 3 (XLVIII).

119. *Id.* at art. 3 (IX), (LVII).

120. Electricity Industry Law, *supra* note 7, at art. 45.

121. *Id.* at art. 3 (LV).

122. *Id.* at art. 12 (XXVIII).

123. United Nations Gen. Assembly, 1803 (XVII) Permanent Sovereignty Over Natural Resources 15 (Dec. 14, 1962), [https://undocs.org/en/A/RES/1803\(XVII\)](https://undocs.org/en/A/RES/1803(XVII)).

- i. “The right of peoples and Nations to permanent sovereignty over their natural wealth and resources must be exercised in the interest of their national development and of the well-being of the people of the State concerned.”¹²⁴
- ii. “The exploration, development, and disposition of natural resources, as well as the import of the foreign capital required for these purposes to should be in conformity with the rules and conditions which the peoples and nations freely consider to be necessary or desirable with regard to authorization, restriction, or prohibition such activities.”¹²⁵
- iii. “In cases where the authorization is granted, the foreign capital imported and the earnings on that capital shall be governed by the terms thereof, by the national legislation in force, and by international law. The profits derived must be shared in the proportions freely agreed upon, in each case, between the investors and the recipient State that receives the investment, due care being taken to ensure that there is no impairment, for any reason, of that State’s sovereignty over its natural wealth and resources.”¹²⁶
- iv. “Nationalization, expropriation, or requisitioning shall be based on grounds or reasons of public utility, security, or national interest, which are recognized as overriding purely individual or private interests, both domestic and foreign. In such cases, the owner shall be paid appropriate compensation, in accordance with the rules in force in the State taking such measures in the exercise of its sovereignty and in accordance with international law. In any case where the question of compensation gives rise to a controversy, the national jurisdiction of the State taking such measures shall be exhausted. However, upon agreement by sovereign States and other parties concerned, settlement of the dispute should be made through arbitration or international adjudication.”¹²⁷
- v. “Violation of the rights of peoples and nations to sovereignty over their natural wealth and resources is contrary to the spirit and principles of the Charter of the United Nations and hinders the development of international cooperation and the maintenance of peace.”¹²⁸

Based on the foregoing, Mexico grants protection to foreign investors in the energy sector through its Paramount and Expropriation Law;¹²⁹ international treaties such as the United States–Mexico–Canada Agreement (USMCA);¹³⁰ the

124. *Id.*

125. *Id.*

126. *Id.*

127. *Id.*

128. United Nations Gen. Assembly, 1803 (XVII), *supra* note 123, at 16.

129. EXPROPRIATION LAW (Jan. 27, 2012), <http://www.diputados.gob.mx/LeyesBiblio/pdf/35.pdf>.

130. Office of the U.S. Trade Representative, Agreement between the United States of America, the United Mexican States, and Canada Text (Nov. 30, 2018), <https://ustr.gov/trade-agreements/free-trade-agreements/united-states-mexico-canada-agreement>.

Agreement on Trade-Related Matters between Mexico and the European Community,¹³¹ and bilateral investment treaties to national and foreign concerns that wish to participate in this sector as follows:

A. “The Constitution dictates that congressional law will ‘encourage and protect economic activity performed by the private sector and provide conditions for the development of the private sector’ with the purpose of contributing to national economic development and promoting competitiveness.”¹³²

B. Derived from its strategic nature, upstream activities in the natural gas sector and the power industry are considered to be of “social interest and public order, which take precedence over any other use affecting the surface or subsurface” to those lands.¹³³

C. “Expropriations may only be made for public purposes” through payment of compensation.¹³⁴

D. Sectors such as refining, petrochemical, transportation, distribution, and storage of oil and gas and any economic activity which are carried out through a permit granted by SENER or the CRE and are considered public utilities.¹³⁵

E. In Mexico, the expropriation will proceed after a declaration of public utility, temporary occupation, or limitation of ownership will be made by decree of the Federal Executive that will be published in the Federal Registry (D.O.).¹³⁶

The Expropriation Law establishes the events of public utility regulating the execution procedures. Thus, it considers among other things the defense, conservation, development, or use of natural elements susceptible to exploitation, as well as the construction of infrastructure and provision of public services, which require real estate and its improvements derived from concessions, permits, contracts, or any legal act concluded in terms of the applicable legal provisions.¹³⁷ Further, it is necessary that the Mexican government issue the declaration of public utility, as follows:

- i. The cause of public utility will be accredited based on the corresponding technical opinions.¹³⁸
- ii. The declaration of public utility shall be published in the Public Registry (D.O.) and, where appropriate, in a newspaper of the locality in question, and will be notified personally to the owners of the assets and rights that would be affected.¹³⁹

131. Economic Partnership, Political Coordination and Cooperation Agreement between the European Community and its Members States, of the one part, and the United Mexican States, of the other part (Oct. 28, 2000), http://www.sice.oas.org/trade/mex_eu/english/Global_e.pdf.

132. See 2013 Constitutional Modifications, *supra* note 4, at art. 2.

133. See Hydrocarbon Law, *supra* note 5; see also Electricity Industry Law, *supra* note 7.

134. See 2013 Constitutional Modifications, *supra* note 4, at art. 3.

135. See Hydrocarbon Law, *supra* note 5.

136. Alberto m. Vazquez, *Mining – Mexico*, 5 THE MINING L. REV. 116 (2016), available at <https://thelaw-reviews.co.uk/edition/the-mining-law-review-edition-5/1140356/mining-mexico>.

137. EXPROPRIATION LAW, *supra* note 129, at 2.

138. *Id.*

139. *Id.*

- iii. Interested parties will have a period of fifteen working days from the notification or the second publication in the DO to state what is right for them and present the evidence they deem pertinent.¹⁴⁰
- iv. The Federal Executive must decree the expropriation, within thirty business days following the issuance of the resolution.¹⁴¹ After the deadline without issuing the respective decree, the declaration of public utility will be without effect.¹⁴²
- v. The price set as compensation for the property expropriated, will be equivalent to the commercial value that is set without being able to be lower, in the case of real estate, to the fiscal value that appears in the Catastral offices.¹⁴³

VII. THE CONSUMPTION NEEDS OF NATURAL GAS BY THE ELECTRICITY INDUSTRY

As previously mentioned, the demand for electric power has increased exponentially based on the use of natural gas combined cycles power plants in Mexico. In addition to the liberalization of the natural gas and power industries to the private and social sectors, among other measures imports shall be increased through the private sector regardless of whether Pemex and CFE do the same. Today in Mexico, the capacity of completed pipelines is a length of 4,217 Km, with investments of USD \$2,224 million dollars, and a capacity in (mmpcd) of 15,489.¹⁴⁴

On the other hand, the gas pipelines under construction will have a length of 4,399 km, with an estimated investment of USD \$9,617 million dollars, and a capacity of 12,193 (mmpcd).¹⁴⁵

In addition, there are also gas pipelines in projects with a length of 1,031 Km, with an approximate investment of USD \$919 million dollars, whose capacity in (mmpcd) is to be determined.¹⁴⁶

140. *Id.*

141. *Id.*

142. EXPROPRIATION LAW, *supra* note 129, at 2.

143. *Id.* at 5.

144. The pipeline routes included are: Tarahumara Pipeline (San Isidro – El Encino), NET Mexico (Agua Dulce – Camargo), Sierrita Gas Pipeline (Tucson – Sásabe), Zacatecas (Aguascalientes – Calera), Tamazunchale – El Sauz, Los Ramones Fase I (Camargo – Ramones), Sásabe – Puerto Libertad (Northwest Project) Ampliación Mayakán (Nuevo Pemex), Gasoducto Morelos (Nativitas – Huexca), Puerto Libertad – Guaymas (Northwest Project), Los Ramones Fase II (North section), Los Ramones Fase II (South section), Trans-Pecos Pipeline (Waha-Presidio), Comanche Trail Pipeline (Waha-San Elizario), San Isidro-Samalayuca, El Oro-Mazatlán (Northwest Project), Ojinaga-El Encino, Guaymas-El Oro (Northwest Project). PRODESEN, *supra* note 11, at 193.

145. The gas pipelines under construction include: El Encino – Topolobampo (Northwest), El Encino – La Laguna, Nueva Era, Tuxpan – Tula, La Laguna – Aguascalientes, Tula – Villa de Reyes, Villa de Reyes – Aguascalientes – Guadalajara, Samalayuca – Sásabe, Nueces-Brownsville, Sur de Texas – Tuxpan (Marino). *Id.* at 194.

146. Gas pipelines in construction project include: Mérida – Cancún, Jáltipan - Salina Cruz, Lázaro Cárdenas – Acapulco, Salina Cruz – Tapachula. *Id.*

In Mexico, the distribution of the national demand for natural gas is mainly established in the Northeast, Northwest, and South-Southeast regions, representing 72.6% in 2016, according to the latest official data.¹⁴⁷ This is approximately 60% of the total demand for natural gas in the country that corresponds to the electricity sector.¹⁴⁸

On the other hand, due to the reduction in production of natural gas by Pemex, as well as the low prices in the USA,¹⁴⁹ Mexico increased its imports to an average of 17.5% in the 2016 period compared to 2015.¹⁵⁰

Based on the above-mentioned facts, Mexico has been ranked within the first ten countries with the largest generation of electricity from natural gas.¹⁵¹ In fact, the necessity of natural gas will be increasing in Mexico for the coming years. The infrastructure is not in line with its demand. The Mexican government will need to increase its use of energy as quickly as possible in order to meet the growing demand in an environment where technologies and the use of energy are also changing rapidly.

VIII. THE IMPLEMENTATION OF BOTH SECTORS BY THE MEXICAN GOVERNMENT

Undoubtedly, going from a public monopoly regime to a mixed regime where the private sector participates with the government in almost all phases of (i) the natural gas industry through Pemex and its subsidiary companies, and exclusively in its exploration and extraction, and (ii) the electricity industry through the CFE and its subsidiaries, and exclusively in the transmission, distribution and generation of nuclear energy, has been an enormous task on the part of the government; not only because it had to modify the Constitution, but also, because it had to publish the new laws applicable to each sector.

In addition to the economic uncertainty for the change of administration in Mexico since December 1, 2018, with the new President Andres Manuel Lopez Obrador, the collapse of the prices in the oil and gas industry, and the global economic uncertainty, the following implementation problems are among those that have been identified in Mexico:

147. The Northeast, Northwest and South-Southeast regions required a natural gas demand of 2,499.5, 608.1 and 2,422.8 million cubic feet per day (mmpcd), respectively, in 2016. *Id.* at 27.

148. At the end of the year 2016, the electricity sector participated with 50.9%. That is to say, 3,878.5 million cubic feet per day of natural gas (mmpcd) of natural gas demand in Mexico. *Id.* at 26.

149. In 2016, national fuel production decreased by 9.2% respect to 2015 and the average price of natural gas Henry Hub averaged around 3 dollars per million BTU in the U.S.A. during 2017. PRODESEN, *supra* note 11, at 26.

150. Peter de Montmollin, *Mexico Natural Gas Imports Continued Double-Digit Growth in April*, NAT. GAS INTEL. (July 12, 2018), <https://www.naturalgasintel.com/articles/115030-mexico-natural-gas-imports-continued-double-digit-growth-in-april>.

151. THE SHIFT PROJECT DATA PORTAL, COUNTRIES WITH HIGHEST INSTALLED POWER CAPACITY, http://www.tsp-data-portal.org/TOP-20_Capacity?slect=T2EC_Unit%2C%22%22GW%22%22&select=T2EC_Year%2C%22%222014%22%22%23tspQvChart%22%22 (last visited Mar. 1, 2019).

A. *The Natural Gas Industry*

In general terms, the

(a) rising expenses;

(b) regulatory complexity whereby the granting of permits to the private sector takes from three months to a year;

(c) social impact and environmental studies which put several projects in the hand of the Mexican Courts by indigenous communities and environmental associations;¹⁵²

(d) always present expropriation proceedings in favor of the countries;

(e) deep crisis in the area of security not only in the pipeline system, but also to companies and individuals;

(f) regulations against harmful emissions and the boom of clean energies. The goals of reducing harmful emissions are becoming increasingly relevant. Companies will have to develop new plans to address the fight against climate change both within their organizations and in close collaboration with governments;

(g) the collapse of oil prices, which has been as low as \$27.00 USD per barrel.¹⁵³ In this context, production companies that had committed to large-scale projects had to deal with unsustainable production costs;

(h) impact of the increasingly high costs, which could significantly reduce profit margins;

(i) negative influence of regulatory complexity on the realization of multilateral projects. By expanding to more and more distant places, companies must submit to diverse regulations;

(j) lack of talent;

(k) weakness of small and medium producers, which accelerates the realization of mergers and acquisitions;

(l) smaller number of accessible markets due to the increasing nationalization of resources - currently state companies control 75% of the hydrocarbon reserves tested worldwide;¹⁵⁴

(m) progressive difficulties in exploiting oil and natural gas stocks. A significant portion of the remaining fossil fuels require more complex forms of extraction with because of high levels of contaminants or because they are in locations that are difficult to reach.

As can be seen, some of the problems mentioned above that the 2014 Energy Reform has faced are of an international nature (e.g., collapse of the prices of the

152. Sergio Chapa, *TransCanada Halts Work on Two Pipeline Projects in Central Mexico*, THE HOUSTON CHRONICLE (Nov. 20, 2018), <https://www.chron.com/business/article/TransCanada-cancels-500-million-pipeline-in-13405207.php>.

153. REUTERS, US OIL FALLS ON UNEXPECTEDLY LARGE INVENTORY BUILD (last updated Jan. 20, 2016), <https://www.cnbc.com/2016/01/19/oil-prices-fall-further-on-glut-worries-us-crude-slumps-below-28.html>.

154. WORLD BANK, NATIONAL OIL COMPANIES AND VALUE CREATION xi (last visited Mar. 1, 2019), <https://siteresources.worldbank.org/INTOGMC/Resources/9780821388310.pdf>.

oil and gas industry). The Mexican authorities realize that it is necessary to implement changes to various legal ordinances, including, but not limited to, those pertaining to the following purposes:

- (i) shorten the times for the granting of permits;
- (ii) personal attention to investors and not only through the electronic notification system implemented by the CRE;
- (iii) social and environmental impacts must be granted with shorten times as the permits granted by the CRE. Consequently, SEMARNAT and SENER must have better communication with the CRE;
- (iv) granting not only legal security to investors through the provisions of the applicable legal ordinances, but also reduction in the insecurity indexes to individuals, corporations, and their electrical and natural gas facilities.

B. The Power Industry

In general terms,

- (a) the regulatory complexity of granting permits to the private sector takes from 3 months to a year;
- (b) a long way to go for obtaining a contract from CENACE with the purpose of participating in the Spot Electricity Market known as the Wholesale Electricity Market taking at least 86 working days counted from the day of admission of the application;
- (c) social impact and environmental studies;
- (d) unfinished tariff regulation has shaken the private sector companies having tariff increases of up to 95% in their electricity bills during the year 2018 due to the lack of a regulation that establishes the terms and conditions that govern the tariff formula;¹⁵⁵
- (e) uncertainty of the rates charged by the CFE for the transmission and distribution of electricity and its discretion for their application;
- (f) regulatory framework is unfamiliar to the new participants in this sector (e.g., generators, traders, end users, importers, and exporters);
- (g) ignorance in the application of the Grid Code for all companies that generate electricity or consume it from the SEN, including to carry out costly studies on energy efficiency and safety;
- (h) little knowledge on the part of generators and large consumers of the obligations to generate and consume clean energy as of 2018 (5% of its production or consumption);¹⁵⁶
- (i) unfinished rules applicable to the Wholesale Electricity Market;
- (j) lack of sufficient Verification Units and Inspection Units to review new investment projects leading to the delay in their approval by the CRE; among others.

155. MEX. NEWS DAILY, ELECTRICITY TARIFFS HAVE SOARED AS MUCH AS 500% DUE TO NEW PRICING FORMULA (Nov. 19, 2018), <https://mexiconewsdaily.com/news/electricity-tariffs-have-soared-as-much-as-500>.

156. MEX. COUNTRY COMMERCIAL GUIDE, MEXICO – Q. RENEWABLE ENERGY (Oct. 12, 2018), <https://www.export.gov/article?id=Mexico-Renewable-Energy>.

As in the case of the natural gas industry, it is necessary in the electrical industry:

(i) to reduce the time for the granting of permits, registrations, authorizations and specialized studies that must be carried out by the CRE, the CENACE or the CFE;

(ii) to finish publishing the rules applicable to the Wholesale Electricity Market;

(iii) to reduce the time for the granting of the participant contract in the Wholesale Electricity Market by CENACE to the electric market participants (e.g., generators, marketers and qualified users), which is at least 86 working days;

(iv) the environmental and social impact studies must be granted at times similar to those granted by the CRE for the electric generation permit;

(v) to publish the provisions that establish all the components that make up the electricity tariff without leaving discretion to the authority to raise it for political reasons. Specifically, the rates applicable to transmission and distribution of power which are exclusively carried out by the government, and that individuals, when connecting to the SEN, need to evaluate them in their projects;

(vi) to make publicity campaigns by the authority of the new electric regulation, including the Grid Code so that both generators and consumers connected in medium and high voltage know of the new requirements that must be met in order to have a reliable, sustainable and efficient SEN providing a better electrical service to all end users;

(vii) a massive explanation of the obligations of generators and qualified users regarding their production and annual consumption of clean energies and their legal consequences of not complying with them;

(viii) to increase the CRE staff at the national level of the officials that can serve to any petitioner in the electricity sector; and

(ix) to approve more Inspection Units for the verification of the facilities of the private sector from the point of connection of their plants to the SEN, among others.

IX. CONCLUSION

Mexico has opened the natural gas and electricity industries to private participation of national or foreign nature in order to gather capital, technology, experience in both sectors, meet the national demand, and have the necessary infrastructure. With this, it ends two of the largest *de-jure* monopolies in the world that the Mexican government held through Pemex in the natural gas industry and CFE in the electrical industry. For such effects, the federal government withdrew the authority that Pemex had in the natural gas industry creating the CENAGAS within the CRE and transferred the CENACE to the CRE to also take away the authority of the CFE.

The challenges are enormous due to the lack of infrastructure in terms of exploration, production, transportation, storage, and the import and export of natural gas. While in the electrical industry, the challenges are linked to generation, transmission, distribution, marketing, and foreign trade of electricity. Likewise, the

Wholesale Electricity Market is a spot market that is still subject to testing by the electric market participants (*e.g.*, generators, marketers, qualified users).

In accordance with the implementation problems identified in Section VIII above, the Mexican government must implement them as soon as possible through general ordinances published by the executive branch, and even amendments to the Electricity Industry Law and the Hydrocarbons Law by the Congress with the purpose of having a system that contemplates the above mentioned problems and a granting of contracts and permits in a quick and efficient manner.