

MEXICO: Analysis of the proposed modification to the Electricity Industry Law (LIE)

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**GLOBAL ENERGY MARKETS
CONSULTANTS**



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FOREWORD

In late January 2021, President Andrés Manuel Lopez Obrador (AMLO) sent to the Chamber of Deputies, as a preferred initiative, the “Initiative of Draft Decree” by which various provisions of the Electricity Industry Law are amended and added. The initiative was approved by the Deputies and Senators Chambers, and published on March 9th, 2021..

This document presents an analysis of the proposal to modify the Electricity Industry Law of Mexico (LIE) and its possible effects on the operation of the wholesale electricity market, energy prices, end user tariffs, compliance with clean generation goals, supply security of demand and other relevant aspects.

The opinions expressed herein are subject to the generally accepted uncertainties associated with the interpretation of engineering and commercial data and do not reflect the totality of circumstances, scenarios and information that could potentially affect decisions made by the report’s recipients and/or actual results. The opinions and statements contained in this report are made in good faith and in the belief that such opinions and statements are representative of prevailing circumstances.

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MODIFICATION PROPOSAL TO THE LIE

The main changes proposed to the LIE are the following:

1. It modifies the definitions of Legacy Power Plant, Electricity Coverage Contract and Legacy Contract for Basic Supply. It also adds a new definition: Electricity Coverage Contract with Physical Delivery Commitment. (article 3)
2. It eliminates the statement that the generation and commercialization of electricity are services provided in a free competition regime. (article 4)
3. It modifies the dispatch criterion to first guarantee the dispatch of the Electricity Coverage Contracts with Physical Delivery Commitment and, secondly the dispatch of clean energies. (article 4)
4. It grants the SENER the faculty to grant permits "considering the planning criteria of the National Electric System established by the Energy Secretariat". (article 12)
5. It commands the CENACE to instruct transporters and distributors on the use of the networks, giving priority to the dispatch of Legacy Power Plants and External Legacy Power Plants with a physical delivery commitment. (Article 26)
6. It eliminates the obligation of Basic Service Providers to acquire energy and associated products exclusively through auctions. (article 53)
7. It forces CENACE to consider Electricity Coverage Contracts with Physical Delivery Commitment for the assignment and dispatch of the power plants (articles 101 and 108).
8. It grants CELs to all CFE clean generation regardless of the commissioning date of its plants. (article 126)
9. It grants the CRE the power to revoke self-supply permits which still remain in force (with their respective modifications), granted or processed under the Electric Power Public Service Law. In that case, the permit holders may process a new generation permit, in accordance with the modified LIE. (Third Transitory)
10. It establishes that the Electric Power Generation Capacity Commitment Contracts and Electric Power Trading Contracts signed with independent power producers under the Electric Power Public Service Law (LSPEE), must be reviewed to ensure compliance with the established "Profitability to the Federal Government" requirement. (Fourth Transitory).

POSSIBLE EFFECTS ON THE OPERATION OF THE ELECTRICITY MARKET

CHANGES IN THE GENERATION DISPATCH ORDER

Proposal

The proposed change to the LIE modifies the dispatch order of the generation units, establishing a dispatch by type of generator instead of a dispatch of minimum cost.

By the proposal, the following order is established for generation dispatch:

- Hydroelectric plants
- CFE's thermal power plants;
- Combined cycles property of independent producers with contracts with CFE,
- Clean energy plants (wind, solar);
- Other thermal power plants

Expected effects

1. Higher operating cost

The proposed change in order of dispatch will increase the operating costs of the electricity market since CFE's thermal power plants with low efficiency and high operating costs will have a greater dispatch (out of merit dispatch).

Correspondingly, high-efficiency thermal power plants with low operating costs will see their dispatch reduced.

The proposed change therefore implies a loss of market efficiency (higher costs to supply the same demand) that will have effects on electricity end user tariffs and the competitiveness of CFE in its role as SSB.

2. Lower LMPs

To calculate the Local Marginal Prices (LMPs), CENACE shall consider the generation of CFE, which is dispatched out of merit due to the change in dispatch order, as "obligated generation". As a result, a reduction in the LMPs of the system is expected, since the marginal units will be renewable plants (wind, solar) or High-efficiency Combined Cycle plants.

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- Other thermal power plants

Expected effects

3. Cost overruns by obligated generation

The change in the dispatch order will result in generation cost overruns since generators with obligated dispatch produce energy with costs higher than the LMPs. The cost overruns must be paid by consumers, which will increase the cost of supply.

4. Congestion in the transmission system

The dispatch of out of merit generation together with the allocation of transmission capacity to CFE's plants, will very possibly determine a higher level of congestion in the transmission system, mainly affecting the energy exporting regions of the SIN, that will have higher balance surpluses (local generation minus local demand) due to the forced dispatch of CFE plants.

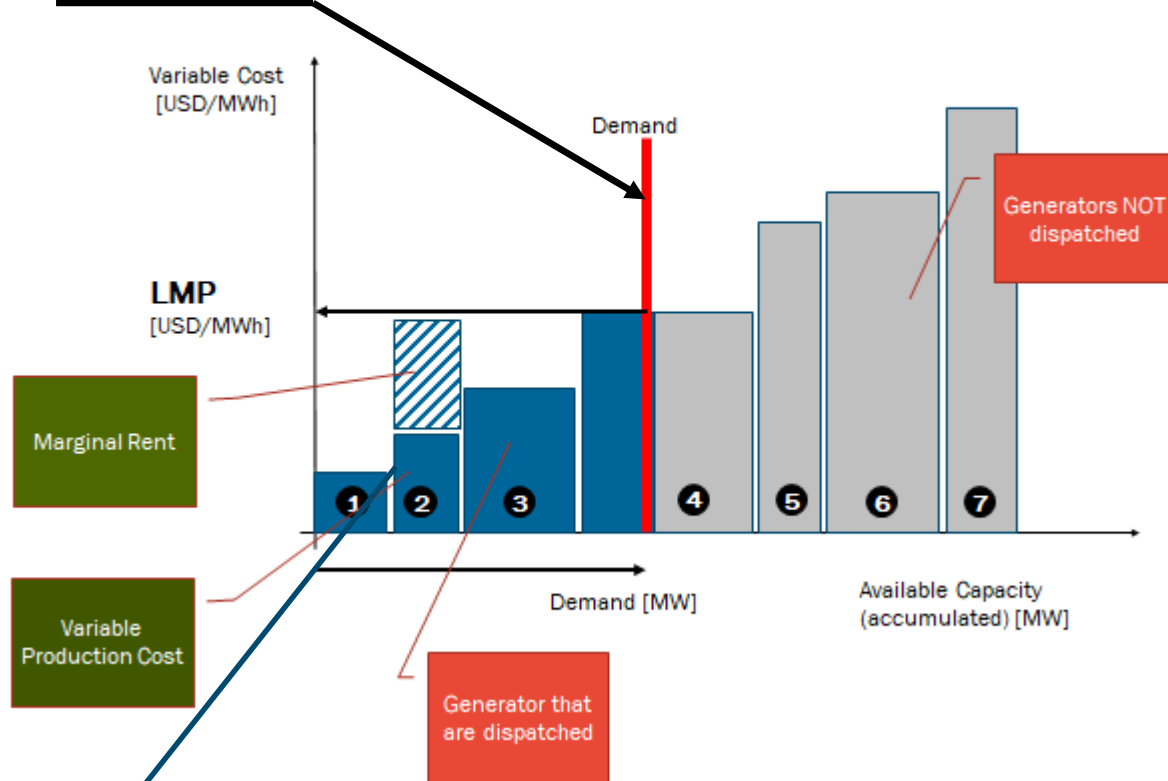
5. Higher greenhouse gas emissions

Energy production and the fuels used for this purpose determine the emissions of greenhouse gases (CO₂).

This implies that the proposed change to the LIE to the order of dispatch of the plants will produce increases in the volume of greenhouse gas produced by the combined effect of a lower thermal efficiency and that the CO₂ emission factor of fuel oil is higher than that of natural gas.

Generation dispatch WITHOUT changes in the LIE

System demand is supplied by generators with lower variable costs

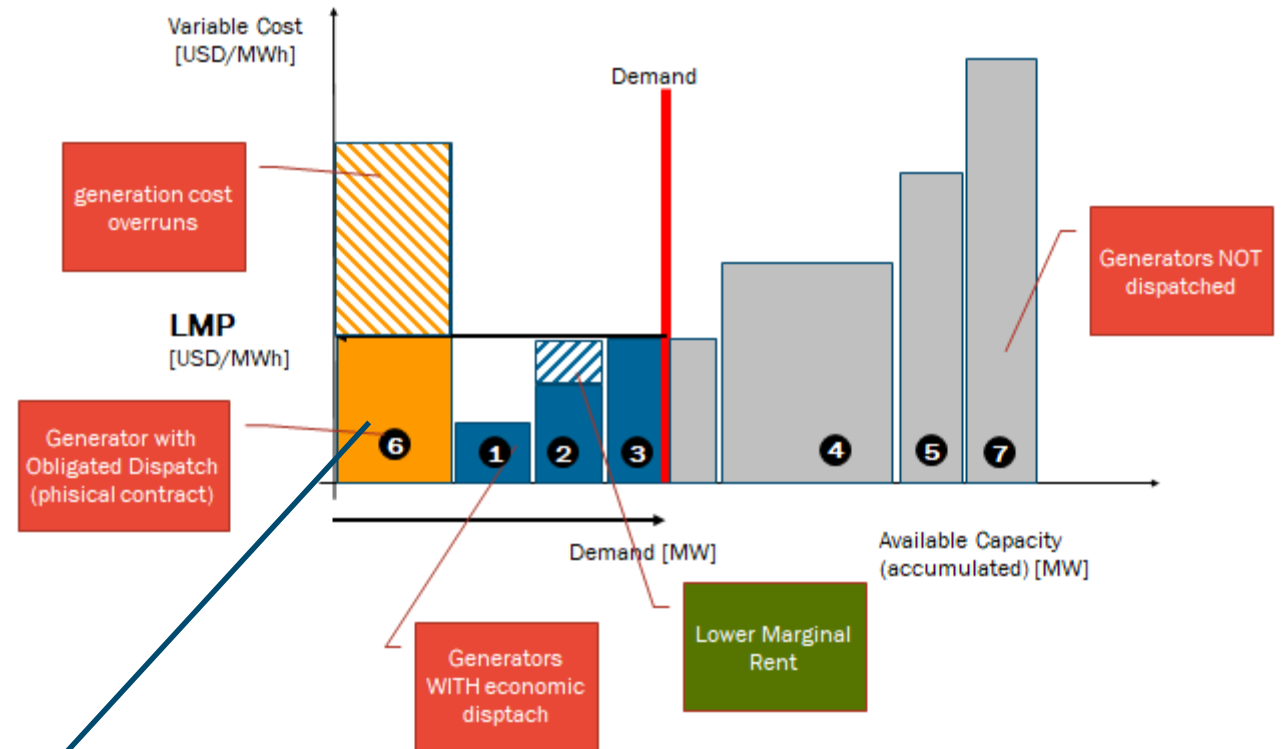


LIST OF MERIT. Available Generators (G1 to G7) are order by its Variable Production Cost (VPC), the cheapest first

$$Supply\ Cost = LMP \times Demand$$

Generation Dispatch WITH LIE reforms

System demand is supplied by the generators with LOWER variable cost and by generators WITH physical contracts (out of merit)



LIST OF MERIT. A Generator with a physical contract (G6) it is considered with a VPC=0.0, so it is dispatched first, resulting lower LMPs, dispatch overruns costs and higher curtailment risk of renewables

$$Supply\ Cost = LMP \times Demand + Overruns$$

$$Marginal\ Rent = Eg \times (LMP - VPC)$$

SECURITY IN THE OPERATION OF THE ELECTRICAL SYSTEM

Proposal

The proposed modification to the LIE grants the SENER the power to grant permits for new generation assets considering the planning criteria of the National Electric System established by the Energy Secretariat.

Expected effects

Security of supply is one of the key aspects of the proposed modification to the LIE.

The increase in the capacity of intermittent renewable generation (wind, solar) observed in recent years, introduced an intermittent component in the available generation every hour into the electrical system.

Since the demand must be supplied at all times, the intermittency in renewable production must be compensated by flexible generation (engines, GTs, hydraulic generation, batteries).

Given the low existing reserves of flexible generation, a growing limitation imposed by the government on the expansion of renewable generation (wind, solar) in Mexico is to be expected.

Therefore, it is very likely that in 2024 the participation goal of clean energies (35%) in the generation mix will not be met.

BASIC SERVICE PROVIDER (SSB) END USER TARIFFS

Proposal

Within the explanatory statement of the proposal to modify the LIE, the government's commitment to keep SSB electricity end user tariffs constant in the long term is mentioned..

Expected effects

Electricity tariffs include generation costs incurred to supply SSB demand.

As mentioned before, the modification in the order of dispatch proposed by the reform of the LIE will increase the cost of the generation that supplies the demand of the SSB.

Preliminary estimates show increases in generation cost in the range of 2-3 billion USD, depending on the use made of fuel oil for thermal generation, which implies an increase in rates of the order of 10% to 15%.

PHISICAL CONTRACTS

Proposal

The proposed changes to the LIE include the creation of an Electricity Coverage Contract with Physical Delivery Commitment.

Expected effects

A contract with physical delivery commitment is one where the generating company fulfills the energy delivery obligation established in its contracts with energy from its own generators.

The so-called “Financial Contracts” are included as a fundamental part of the electricity markets created in the last three decades around the world. The Mexican LIE includes these types of contracts.

In financial contracts, the generator supplies the energy committed in the Electricity Coverage contract in two ways:

- With its own production, if the minimum cost dispatch of the system results in enough generation of its own units.
- By purchasing all, or the remainder, of the energy committed in its contracts, in case it does not achieve enough dispatch.

For the generator, financial contracts are better than physical contracts since they can supply their contracts with the same or lower costs compared to physical contracts.

Therefore, if CFE-SSB adopts an energy purchase modality through Electricity Coverage Contracts with Physical Delivery Commitments, it will very possibly imply higher generation costs that will increase the electricity end user tariffs and/or the subsidies required by CFE. -SSB.

CLEAN ENERGY CERTIFICATES MARKET (CELS)

Proposal

The proposed modification of the LIE grants CELs to all of CFE's clean generation regardless of the date of entry into operation of its plants

Expected effects

CELS are commercial instruments that seek to encourage the expansion of clean energy generation.

To give a value to the CELs, an obligation to purchase CELs is established for all consumers, proportionally to their respective energy consumption (in 2022, approx 40TWh).

The proposed modification of the LIE enables legacy power plants that produce clean energy to sell CELs. This will increase the supply of CELs by approximately 70 TWh.

This implies that the supply of CELs will be much higher than the CEL demand, so very low CEL prices are expected (much higher supply than demand), so there will be no incentives via CELs to increase the share of clean energy in the generation matrix.

SELF SUPPLY PERMITS

Proposal

The proposed modification of the LIE grants the CRE the power to revoke the self-supply permits granted or processed under the Electric Power Public Service Law.

Expected effects

Self-supply of energy consists of the installation of an electric power generator that supplies the demand of a consumer independently of the electricity market. There are two types of Self-supply:

1.Local: Demand and generator are located on the same site;

2.Remote: The demand and the generator are located on different sites. The generated energy is transported, via the transmission system, from the generator to the consumer. An interconnection contract signed with CFE defines the transmission capacity available for Self-supply and the corresponding charges for use of the transmission system (porting or *porteo* in Spanish).

The dispatch of the Self-supply generator is not subject to the economic generation dispatch made by CENACE, that is, the self-supplied energy depends solely on the owner of the generator.

The proposed modification of the LIE allows the CRE to cancel Self-supply permits.

In that situation, the demand and the Self-supply generator must migrate to the electricity market and in the case of the generator, it must follow the dispatch instructions indicated by CENACE.

SELF SUPPLY PERMITS

Proposal

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Expected effects

This new situation can have multiple consequences on the generator and the consumer:

- **Security of supply:** The production of the power plant will depend on the dispatch made every hour by CENACE, following the dispatch order proposed in the modification of the LIE. This can compromise the consumer's security of supply since its supply will depend on the availability of energy in the electrical system and any restrictions imposed by the transmission system.
- **Usage Charges for the transmission and distribution system facilities:** The generator and the consumer must pay the regulated rates, under the same conditions as other market agents, for the use of the transmission and distribution networks. It is estimated that the resulting total rates (sum of regulated charges for transmission plus distribution) may be significantly higher than the porting charges agreed with CFE, particularly if the demand is in medium / low voltage and therefore corresponds to pay distribution fees
- **Losses and congestion charges:** The generator/consumer must pay CENACE the charge for congestion/losses in the transmission system resulting in each hour from the difference between the LMPs of the node where the generator is connected to the transmission system and the node where the consumer is connected to the transmission system.

In typical situations, the congestion/loss charges depend on the location of the generator and consumer within the transmission network. Charges are very volatile (difficult to predict) and can vary over a wide range (2.0 to 15.0 USD/MWh annual average)

The proposed revocation of the self-supply permits is perhaps the measure with the greatest impact on the private sector in Mexico and in particular on industrial consumers, who may see a significant impact on their electricity supply costs.

ELECTRICITY SUPPLY TENDERS FOR SSB

Proposal

The proposed modification of the LIE eliminates the obligation of Basic Service Providers to acquire energy and associated products exclusively through auctions.

In the explanatory statement, the president indicates that the auctions are “a perverse scheme devised with the sole purpose of guaranteeing the profitability of the investments of private generators to the detriment of the CFE, since the corresponding contracts are valid for twenty years, prices are not subject to market variations, generation from CFE power plants is relegated and, as if that were not enough, they take advantage of CFE's infrastructure, in addition to giving them dispatch priority”

Expected effects

Long-term power purchase tenders are instruments used throughout the world to ensure competitive processes that result in minimal energy costs for consumers.

The tenders establish long-term commitments (15-20 years) where the generator commits to deliver a certain amount of energy each year, receiving in exchange a payment that allows it to cover the investment and operating costs of the power plant, plus a reasonable profitability which is lower the more competitive the tender.

Allowing CFE-SSB to purchase energy outside of competitive processes should be limited to opportunity purchases in the wholesale market (MDA).

The possibility of CFE-SSB buying energy without competitive processes, when the costs are paid by consumers via the SSB Tariffs, compromises the compliance with the primary objectives of the reform of the Electricity Sector of Mexico since it will not be possible to ensure that the purchase of energy corresponds to the minimum cost.

CONCLUSIONS

If the proposed reform to the LIE succeeds, significant adverse impacts on the Electricity Sector of Mexico are expected, negatively affecting both the general population that purchases energy from CFE-SSB, the private sector (large energy consumers and generators) and the CFE itself.

The expected adverse consequences are:

On the general population	Increases in the electricity tariffs and greater environmental pollution due to higher GHG emissions
On industries (Qualified Consumers)	Higher electricity transportation cost resulting from the cancellation of self-supply permits. These higher costs will increase supply costs and may reduce the competitiveness of industries and therefore the possibilities of competing in the international market to sell their products.
On private generators	The most affected generators will be those that sell their energy production in the market (MDA) for the lower LMPs expected as a result of the higher (forced) dispatch of CFE plants. Renewable generators (wind, solar) may see their dispatch reduced (curtailment) due to the activation of transmission restrictions due to dispatch of CFE plants.
On clean energy goals achievement	CELS will tend to values close to zero due to oversupply. This, added to the low expected LMPs and the cancellation of auctions, make it very likely that the goal of 35% share of clean energy in the generation mix will not be met in 2024.
On CFE	The higher SSB tariffs will promote the migration of consumers, mainly the larger ones, to be supplied by other suppliers (SSC, generators) at lower prices (with discounts on the tariffs). As a result of this, electricity rates will be further increased due to the fixed costs of the SSB, which must be covered by a lower volume of energy sales.

ABOUT GME

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We were pioneers in global energy consulting, with the first market reforms in the 90s, and it is thanks to our expertise, our vocation for excellence, and our vision for the future that today we continue to be a strategic partner for all our clients

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