Guatemala's Electricity Market: Investment Opportunities

Updated to April 2025

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Content

Introduction

Guatemala offers a highly attractive environment for investment in the electricity sector, supported by a stable and growing economy. With a track record of prudent macroeconomic policies, the country has maintained low inflation, sustainable public debt, and a sound financial system, providing confidence to businesses, investors, and other economic agents. In addition, its energy market has developed with a diversified generation matrix that includes both renewable and non-renewable sources, thus ensuring stability in the electricity supply at competitive costs. Its integration with the Regional Electricity Market (MER[1], by its acronym in Spanish) allows international energy transactions to be carried out to other Central American countries, expanding the profitability potential.

The regulatory framework for the electricity sector in Guatemala is robust and encourages private participation. The General Electricity Law (Decree No. 93-96) establishes a competition model that incentivizes efficiency and investment in infrastructure. In addition, the National Electric Energy Commission (CNEE[2], by its acronym in Spanish) and the Wholesale Market Administrator (AMM[3], by its acronym in Spanish) guarantee transparency and the definition of clear rules, providing legal certainty for investors. This constant and predictable regulatory environment, coupled with the country's macroeconomic stability, has allowed for the development of large-scale projects within Guatemala.

Another key factor is the country's privileged geographical location, which makes it a strategic point for trade and investment in the region. Its proximity to the main markets of North, Central and South America, together with its access to ports in the Atlantic and Pacific oceans, facilitates the expansion of businesses and the export of goods and services. In addition, the sustained growth in electricity demand, driven by industrial development and the expansion of key sectors such as manufacturing and agribusiness, reinforces the attractiveness of the electricity sector as a reliable investment opportunity.

Wholesale Market Administrator (AMM) Achievements

Since its inception in 1998, when the first Board of Directors of the AMM was formed, major milestones have been observed in the electricity market. In 1999, bilateral transactions between Guatemala and El Salvador began, which continue today, forming part of a regional electricity market, which was established in 2002, under the support and leadership of the AMM, since then, Guatemala has been the largest exporter of energy to all the rest of Central America.

In 2003, the establishment of specific regulatory agreements to carry out energy transactions between Guatemala and Mexico was launched, starting operations in 2010. Similarly, in 2011 a pioneering project was launched in Latin America for the implementation of phasor measurement units (PMU's) and data concentrators, which allows for an intelligent control scheme for the

[1] *Mercado Eléctrico Regional* in Spanish.
[2] *Comisión Nacional de Energía Eléctrica* in Spanish.
[3] *Administrador del Mercado Mayorista* in Spanish.

optimization of the dispatch. In 2018, the new AMM headquarters was inaugurated, designed under high standards of modernization and process optimization.

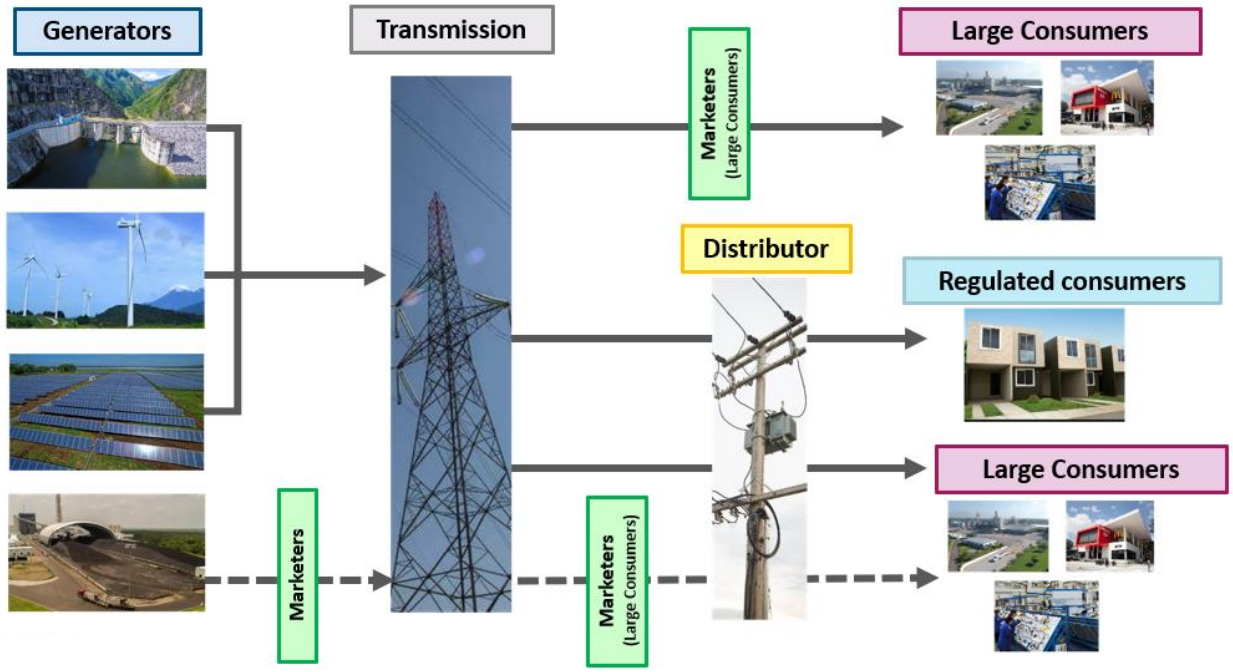
Finally, the AMM has the vision of being one of the engines in the economic development of the country through the efficient operation and administration of the National Interconnected System (SNI, by its acronym in Spanish), its international interconnections and Wholesale Market transactions and maintaining the values that with administrative autonomy contribute to the development of its participants.

Guatemala's electricity market

How does the electric power sector work in Guatemala?

Guatemala's electricity market has been operating as a free market since 1996, when the activities of the electricity industry were separated, so the generation and commercialization of energy was opened to free competition. Transmission and distribution operate as regulated activities where private and public companies participate to provide the service, granted through public bidding.

Illustration 1: Structure of the electricity subsector in Guatemala.

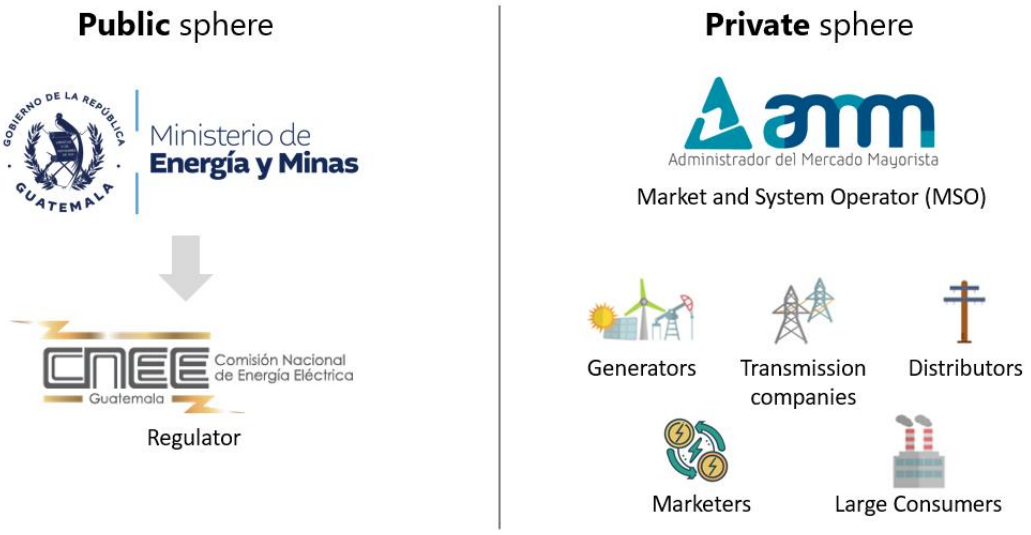


The operation of the electricity market is carried out through public and private institutions. Within the public sphere is the Ministry of Energy and Mines (MEM), whose main function is to dictate Energy Policy, Generation and Transmission Expansion Plans, among others. The National Electric Energy Commission (CNEE) is a technical body of this Ministry, which is the regulatory body for

the operation of the Guatemalan electricity market, especially transmission and distribution activities.

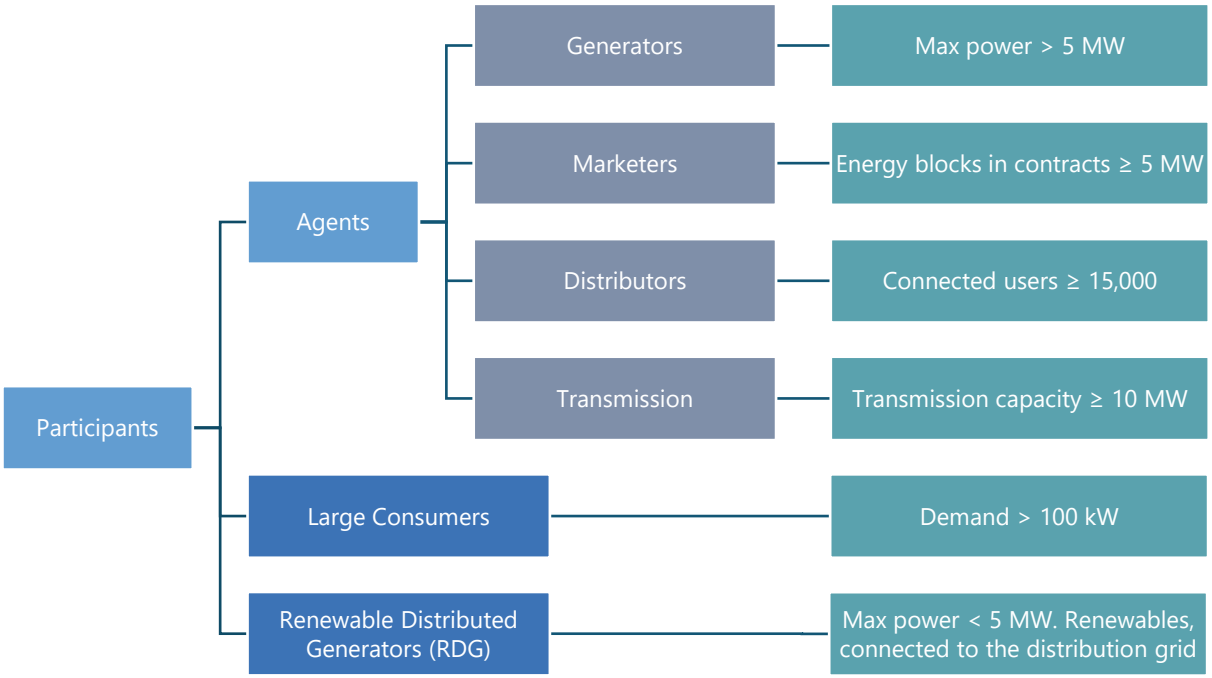
The Market and System Operator (MSO) operate as a single private, non-profit company called the Wholesale Market Administrator (AMM, by its acronym in Spanish), which oversees the operation of Guatemala's electricity system, and the settlement of transactions carried out in the market. The AMM provides a space where Market Agents carry out transactions for the purchase and sale of electricity or other derivative products.

Illustration 2: Institutional framework of Guatemala's electricity subsector



The Agents, according to Article 39 of the Regulations of the General Electricity Law (LGE), are Generators, Distributors, Transporters and Marketers. In addition, Large Consumers are considered Market Participants. All must meet certain requirements in order to acquire their status as participants and/or agents in the wholesale market, which are detailed below:

Illustration 3: Agents and Participants of the Wholesale Electricity Market.



Source: Prepared by the authors based on Article 39 of the Regulations of the General Electricity Law.

Consumer participants who demand more than 100 kW can acquire their status as Large Consumers, which allows them to make direct purchases with marketers or generators to cover their demand. Similarly, there is the figure of Renewable Distributed Generators (RDG), which are generating plants that contribute less than 5 MW of power to the system and are connected to distribution networks, which can obtain the possibility of carrying out transactions in the Wholesale Market.

Board 1: Number of market participants qualified as of 01/April/2025.

Participant	Quantity
Generators	63
RDG	64
Marketers	36
Distributors	3
Transmission companies	15
Large Consumers	1410

Source: Coordination of Participant Services, AMM. Data extracted as of April 01, 2025.

The operation of the sector has been governed by a Legal Framework in force since 1996, which has been characterized by maintaining legal certainty, stability and consistency since the enactment of the General Electricity Law (LGE) until its operational rules for the proper functioning of the market and the system (Regulation of the General Electricity Law, 1997).

Illustration 4: Legal framework of the electricity subsector of Guatemala.

Operation of the electricity market

The Guatemalan electricity market is a cost market, so the allocation of the products that are traded is made according to the Variable Cost of Generation (VCG) declared by the generating plants connected to the SNI. The market has two main premises for its operation:

1. **Firm Demand and Efficient Firm Supply**: It is mandatory for consumer participants to have contracted their power demand for the duration of one year[4], so annually the AMM calculates the Firm Demand (FD)[5], which must be covered with Efficient Firm Supply (EFS)[3], this is assigned to the generating participants in order to sell the power they have in contracts to cover FD. The EFS is also determined by the AMM, is calculated through the modeling of a long-term dispatch (two years) and is determined based on the effective power contributed to the SNI by each generating plant; and the availability it had when it was called during the previous Seasonal Year.[6]

[4] The year corresponds to a Seasonal Year determined according to the summer and winter season of Guatemala, so it begins in May and ends in the month of April of the following calendar year.

[5] The Firm Demand is a mechanism defined in the Regulations of the General Electricity Law (LGE) and the Commercial Coordination Norm No. 2, which sets an amount of power consumed during the duration of the Seasonal Year. For more information: https://www.amm.org.gt/portal/?wpfb_dl=211NCC-2%20actualizado%2005-2024.pdf/

[6] Plants that do not have an EFS assignment have the possibility of being assigned with a Firm Offer (FO), which allows them to support their power to carry out international transactions in the market. For more information, please refer to the AMM's Trade Coordination Norm No. 2.

2. **Economic dispatch of generation**: The energy opportunity market is programmed daily preserving the principle of being a cost market. The generating plants must submit periodic information regarding their VCG, which is used to make a list of merit until the demand for the SNI, reserves and international commitments is covered. This market is optimized through an economic dispatch that consists of using the available supply (energy and power) to supply the expected demand (energy and power) in a given period, minimizing the total cost of operation. Every hour, the generation dispatch is optimized, where one of its results is the Energy Opportunity Price (EOP) or spot price, determined through the VCG of the marginal generating unit (the last generating plant necessary to cover the demand and reserves of the SNI). Figure 5 exemplifies the economic dispatch of five generators (G1, G2, G3, G4 and G5) to cover a demand of 500 MW.
3. **Transmission services**: Include the toll (set by the CNEE) and are settled in accordance with the contractual agreements made by the Agents. In the absence of contractual agreements, the AMM assigns the tolls authorized by the CNEE in accordance with Commercial Coordination Norm No. 9.
4. **Complementary services**: The main ones include operating reserves. Similarly, frequency regulation, reactive power and voltage control and black start are considered. Operating reserves include:
    a. The Regulating Rolling Reserve (RRR),[7] which is mandatory for all generating plants and corresponds to 3% of generation in each hour.
    b. The Operational Rolling Reserve (RRO, by its acronym in Spanish),[8] which is provided by synchronized plants with a rapid response capacity to power imbalances in generation and transmission.
    c. The Quick Reserve (RRa, by its acronym in Spanish),[9] which is provided by fast start centers (less than one hour) that are available to be summoned for 24 hours.
    d. The Cold Reserve (RF, by its acronym in Spanish)[10] which is intended to supply the system during long-term events (up to 6 weeks). This service can be provided by thermoelectric generating units that qualify by meeting certain requirements.
    e. Interruptible Demand[11], which is a service that can be provided by a Large Consumer when withdrawing their demand, totally or partially, in response to a requirement from the Load Dispatch Center (CDC, by its acronym in Spanish) in favor of the security and reliability of the electricity supply.

[7] For more information, please refer to the AMM commercial and operational coordination norms (NCO-1, NCO-3, NCO-4, NCC-1, NCC-8).

[8] For more information, please refer to the AMM's commercial and operational coordination norms (NCO-1, NCO-3, NCO-4, NCC-1 and NCC-8).

[9] For more information, please refer to the AMM commercial and operational coordination norms (NCO-1, NCO-3, NCO-4, NCC-1, NCC-8).

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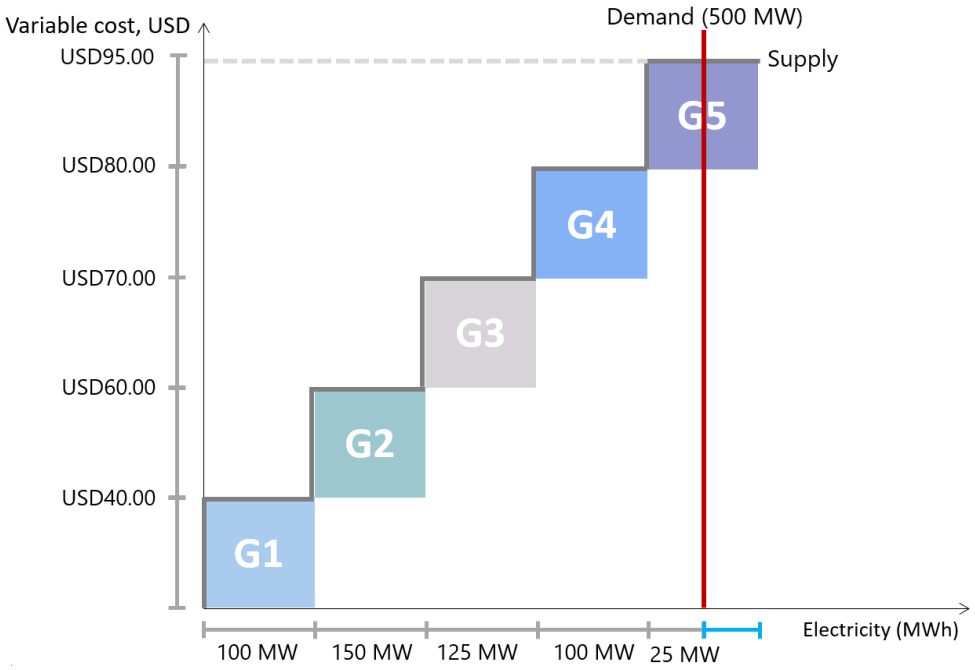
[11] For more information, please refer to the AMM Trade and Operational Coordination Norms (NCC-1, NCO-3, NCC-8)

5. **Forced Generation**: It is all the generation that is left out of economic clearance to meet requirements of safety, quality of service, exports, among others.

Illustration 5: Hypothetical example of the economic dispatch of the Wholesale Market in Guatemala.



What business/investment opportunities are there in the country?

In the Wholesale Market, two products are marketed:

1. **Power**: The speed with which energy is transformed into work or converted to another form of energy.
2. **Energy**: A physical attribute that can be converted into useful work or converted to another form of energy. When an electric current flows in any circuit, it can transfer energy by doing mechanical or thermodynamic work.

As indicated above, both products are remunerated under an economic dispatch principle, where plants with lower variable generation costs are dispatched with priority until demand and service quality requirements are met. Both power and energy can be remunerated economically, through six different markets:

1. Energy Opportunity Market: It is a market of surpluses and shortages where the price fluctuates, depending on the time and suppliers. In this market, the POE is set, which is the maximum variable cost incurred each hour to supply an additional kWh (short-term marginal cost).
2. Contracts market: These are bilateral power and/or energy contracts between Agents. These contracts are administered by the AMM.

3. Power Diversion Market: It is the set of exchanges in the Wholesale Market, which results from the surpluses or shortages of power committed in contracts between its participants.
4. Complementary services market: If they meet certain requirements and particular technical requirements of each reserve service (RRO, RRa and RF), generators can choose to bid in these markets. Likewise, Large Consumers who meet the requirements stipulated by the regulations can choose to participate in the Interruptible Demand service.
5. Regional Electricity Market (MER): Guatemala is connected to the Central American electricity market that functions as a seventh market where all authorized agents in the region can carry out energy transactions. This market has several institutions in charge of its operation, mainly the Regional Electricity Interconnection Commission (CRIE, by its acronym in Spanish)[12] which functions as the regulatory entity and the Regional Operator Entity (EOR, by its acronym in Spanish)[13] which is the system and market operator.
6. The Mexican electricity market, which has undergone significant transformations in recent years, allows transactions between Guatemala and Mexico, opening the possibility for Guatemala to export and import energy. Currently, the interconnection between the two countries has a transfer capacity of 240 MW for both imports and exports.

What investment projects are currently there?

Open Tender PEG-4-2022

The PEG-4-2022 Open Tender was a process initiated in November 2021 by the National Electric Energy Commission (CNEE) of Guatemala, aimed at contracting guaranteed power through long-term contracts to supply the country's energy distributors (EEGSA, DEORSA and DEOCSA). The main objective was to incorporate new generation projects, prioritizing renewable sources such as hydroelectric, wind, solar, biomass and geothermal, with a minimum of 50% of the power coming from these sources.

In August 2023, after a bidding process, contracts were awarded to more than 15 companies, in terms of 2 and 15 years, which will contribute a total of 399.27 MW to the national electricity system from 2026 and 2028, with an estimated investment of USD400 million.

Board 2: Summary of the award of the PEG-4-2022.

Installation	Start year	Awarded power (MW)	Number of generators	Fuel 1	Fuel 2 & 3
New	2026	10	2	Renewable	Renewable
Existent	2026	28	1	Renewable	-
New	2026	32	1	Renewable	-
New	2026	1.59	1	Renewable	-
Existent	2026	30	1	Renewable	-
New	2026	10.73	2	Natural gas	-
New	2026	33	1	Natural gas	-

[12] For more information: https://www.crie.org.gt/
[13] For more information: https://www.enteoperador.org/

Existent	2026	16.27	1	Bunker	-
New	2026	25	2	Charcoal	Renewable
Existent	2026	50	1	Coke Petroleum/Coal	-
New	2028	33.87	1	Coke Petroleum/Coal	Renewable
New	2028	5.9	2	Renewable	Renewable
New	2028	12.5	2	Renewable	Renewable
New	2028	12	1	Renewable	-
New	2028	38.41	1	Renewable	-
New	2028	60	3	Renewable	Renewable
		399.27			

Source: Resolution CNEE-196-2023

PEG-5 Open Tender

The PEG-5 Open Tender is a process initiated in October 2024 by the National Electric Energy Commission (CNEE) with the publication of resolution CNEE-270-2024, which presents the Terms of Reference to prepare the Bidding Bases. The process is intended to contract approximately 1,400 MW of power and the associated energy to supply the country's distribution companies and seeks to guarantee electricity supply as of May 1, 2030, with contracts of up to 15 years for new generation plants and up to 5 years for existing plants.

The tender will be open to projects that use renewable sources, such as solar, wind, hydroelectric, among others (those renewable sources recognized in the Law of Incentives for the Development of Renewable Energy Projects). As well as non-renewable technologies with carbon dioxide emissions equal to or lower than those of natural gas. This process is expected to boost investment in the energy sector and contribute to the diversification and sustainability of Guatemala's energy matrix.

Transportation System Expansion Plan (PET) 2024-2054

This instrument establishes long-term planning for the development and strengthening of electricity transmission infrastructure in the country for the period 2024-2054. The main objective of this plan is to guarantee a reliable, efficient and sustainable electricity supply, meeting the growth in energy demand and promoting the integration of renewable energy sources.

The PET 2024-2054 identifies the needs for the expansion of the transmission network, proposing the construction of new lines and substations, as well as the expansion and modernization of existing ones. Both the new works and the extensions are expected to be tendered for 2025 and 2026.

These actions seek to improve the system's capacity to transport energy from generation centers to end consumers, reducing losses and increasing the stability of the national electricity system.

What competitive advantages are there in Guatemala compared to other Central American countries?

Guatemala has a history of prudent macroeconomic policies, the country has maintained a low level of inflation, sustainable public debt and a solid financial system in the last 25 years, which provides confidence to companies, investors and other economic agents.

Similarly, the electricity sector has been characterized by having solid institutions with strict adherence to current regulations to preserve market stability and provide certainty to its participants.

Risk-Country Rating

Rating granted by agencies to credits and debts of companies and governments, based on the ability to repay financing. These ratings are intended to provide investors with information on risk levels and ability to repay their debts.

The ratings of the three agencies place Guatemala as one of the safest opportunities to invest among the countries in the region.

Board 3: Long-Term Sovereign Debt Ratings in Foreign Currency for Central American countries.

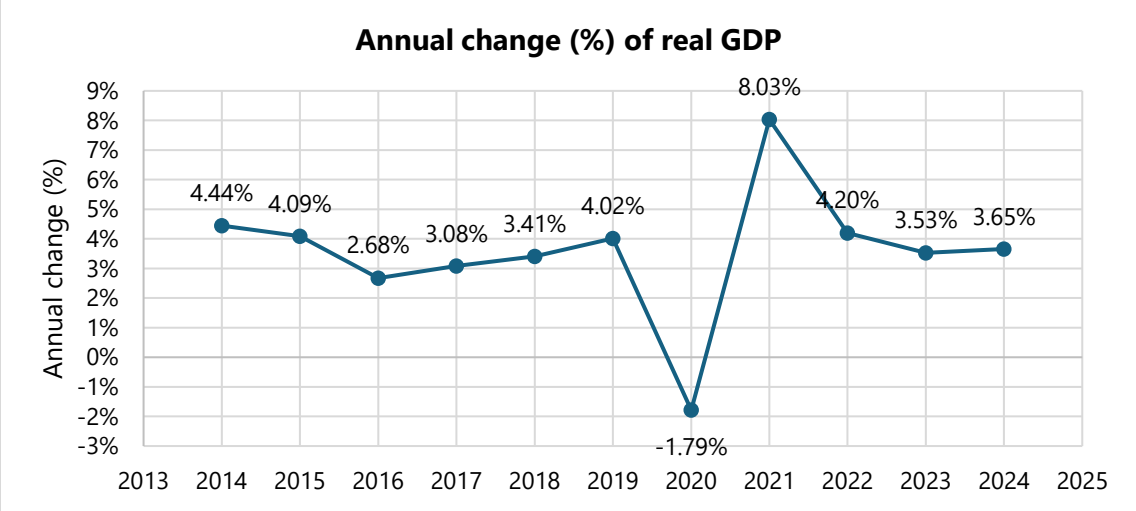
		GTM	SLV	HND	NIC	CRI	PAN
Fitch Ratings	Qualification	BB	CCC+		B	BB	BB+
	Perspective	Positive			Stable	Stable	Stable
Moody's Investor Service	Qualification	Ba1	Caa1	B1	B2	Ba3	Baa3
	Perspective	Stable	Stable	Stable	Stable	Positive	Stable
Standard and Poor's	Qualification	BB	B-	BB-	B+	BB-	BBB
	Perspective	Positive	Stable	Nagative	Stable	Stable	Nagative

Source: Country Risk Report, Fourth Quarter 2024. Executive Secretariat of the Central American Monetary Council and FitchRatings Rating Action Commentary.

Evolution of the Gross Domestic Product (GDP)

Since 2014, the country has presented sustained economic growth, with an average of 3.58%, only in 2020 it had a decrease of -1.79% due to the COVID-19 pandemic. By 2025, the Bank of Guatemala (the central bank) estimates growth between 3% and 5%.[14]

Graphic 1: Guatemala's economic growth, annual change in real GDP at 2013 prices.



Source: Prepared by the authors based on information from the Bank of Guatemala.

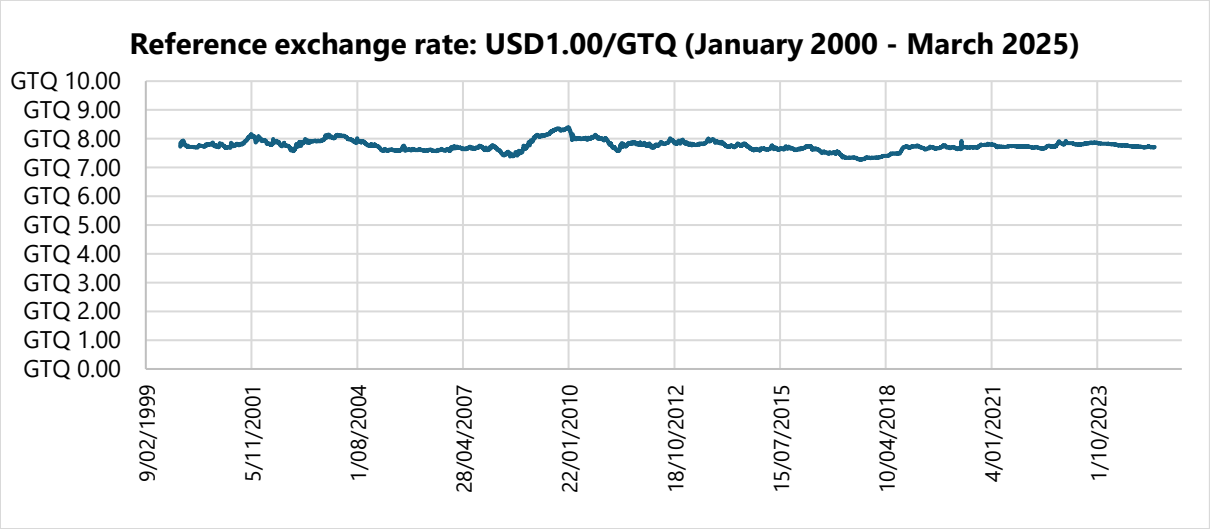
Evolution of the reference exchange rate[15]

The exchange rate between the U.S. dollar and the Guatemalan quetzal has had a stable behavior over time, fluctuating between GTQ8.39 and GTQ7.27 per USD1.00 from January 1, 2000 to March 27, 2025.

It is important to consider the exchange rate in the Guatemalan electricity market since it is a dollarized market, that is, all transactions are settled in dollars and currency fluctuations have a direct impact on the sector.

[14] Bank of Guatemala estimate as of February 2025.
[15] Prior to Dec 2, 2006, the average between the sale and purchase exchange rate of the Bank of Guatemala was used. After this date, the reference exchange rate published by the same institution was used.

Graphic 2: Reference exchange rate from 01/01/2000 to 27/03/2025.

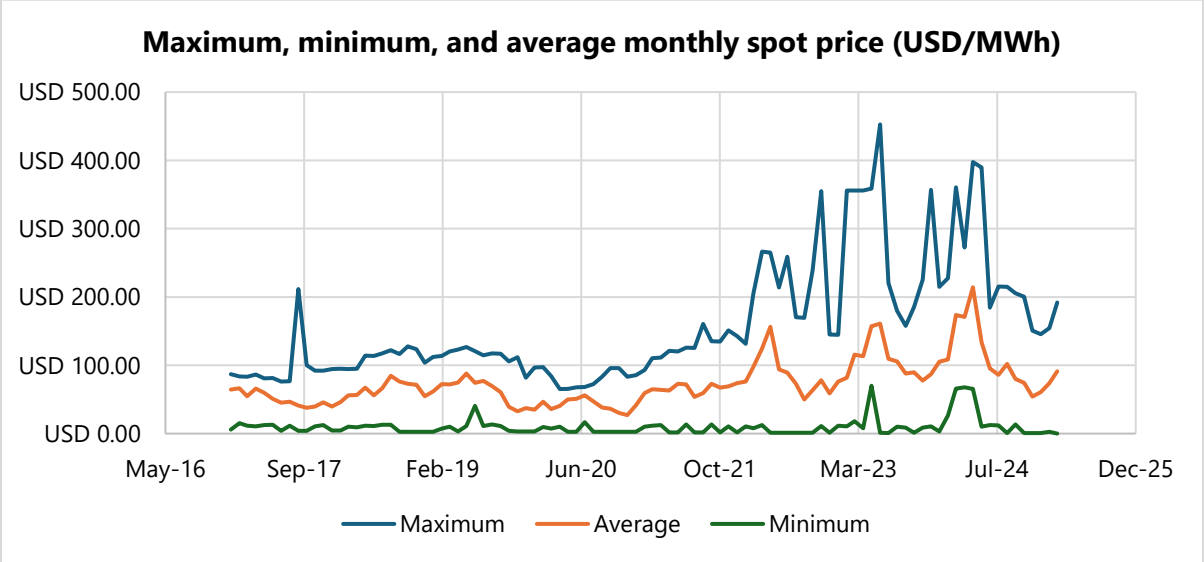


Source: Prepared by the authors based on information from the Bank of Guatemala.

Guatemala Spot Price and comparison with Exantes Prices in the MER

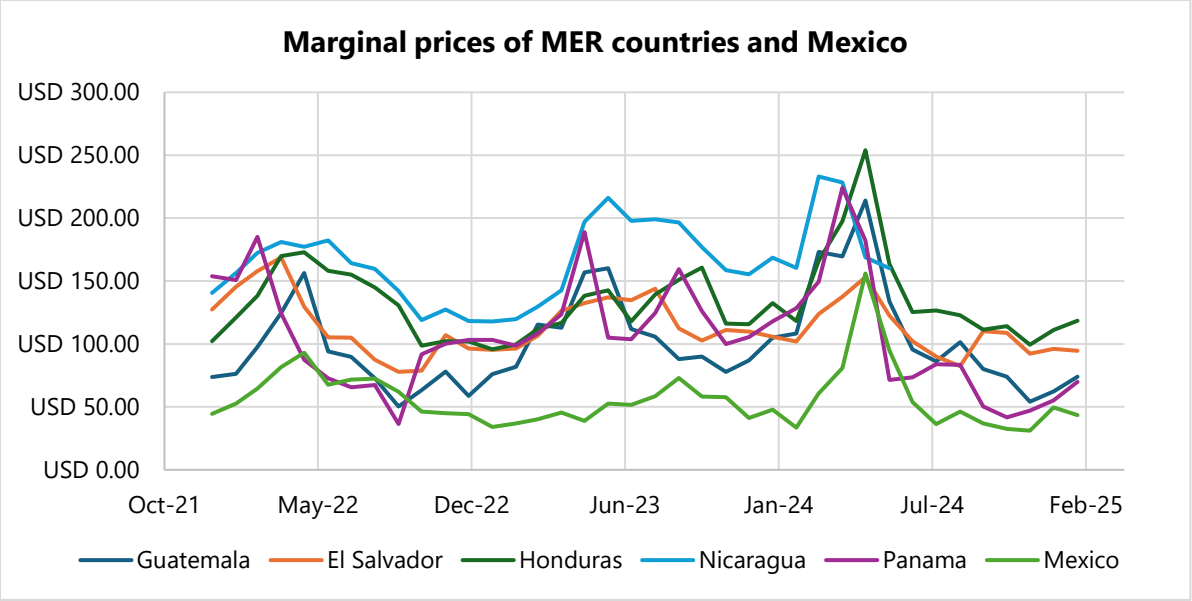
The Opportunity Price of Energy (POE) or Spot Price is defined in the Regulations of the Wholesale Market Administrator (RAMM) as "the value of the Short-Term Marginal Cost of Energy in each hour, or in the period defined by the CNEE, established by the Administrator of the Wholesale Market, as a result of the dispatch." The Spot Price is the price at which it is settled in the Guatemalan Energy Opportunity Market and is a reference for transactions carried out in the MER.

Graphic 3: Monthly top, low, and average spot price in Guatemala.



Source: Trade results, Spot Price, Maximum, Minimum and Average, AMM.

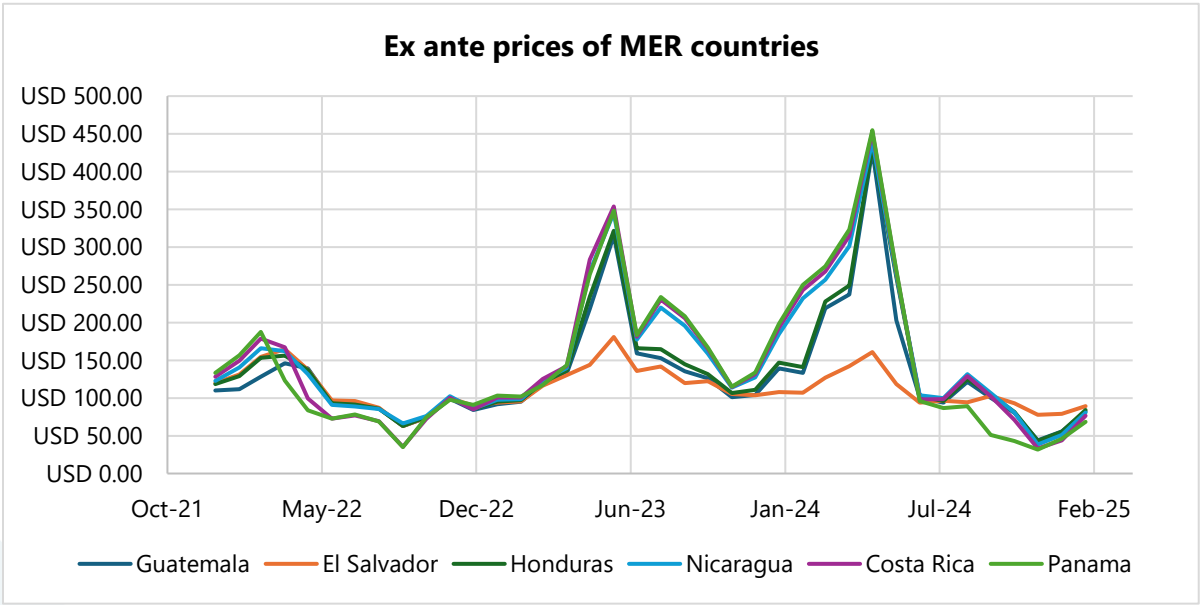
Graphic 4: Monthly marginal prices of MER countries and Mexico.



Source: Prepared by the authors based on information from the Coordination of International Transactions, AMM.

In the Regional Electricity Market (MER), exante prices refer to electricity prices that are determined before the actual operation of the electricity system, based on forecasts and estimates of demand and supply.

Graphic 5: Monthly ex-ante prices for MER countries and Mexico

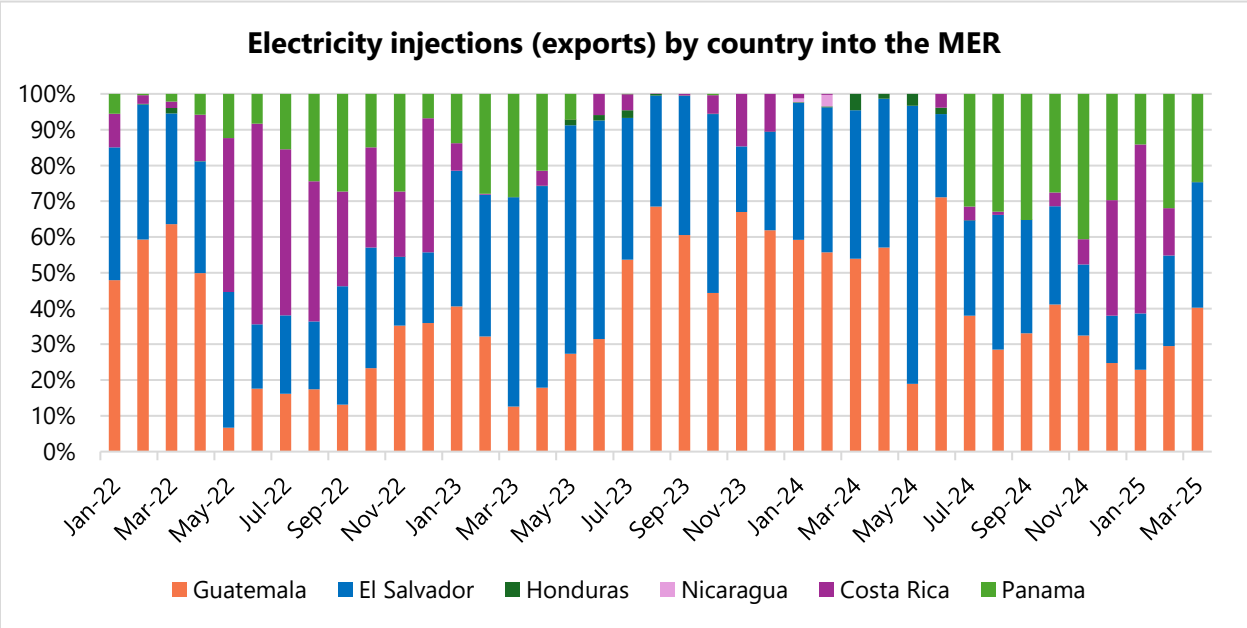


Source: Prepared by the author based on information from the Regional Operating Entity (EOR).

International transactions

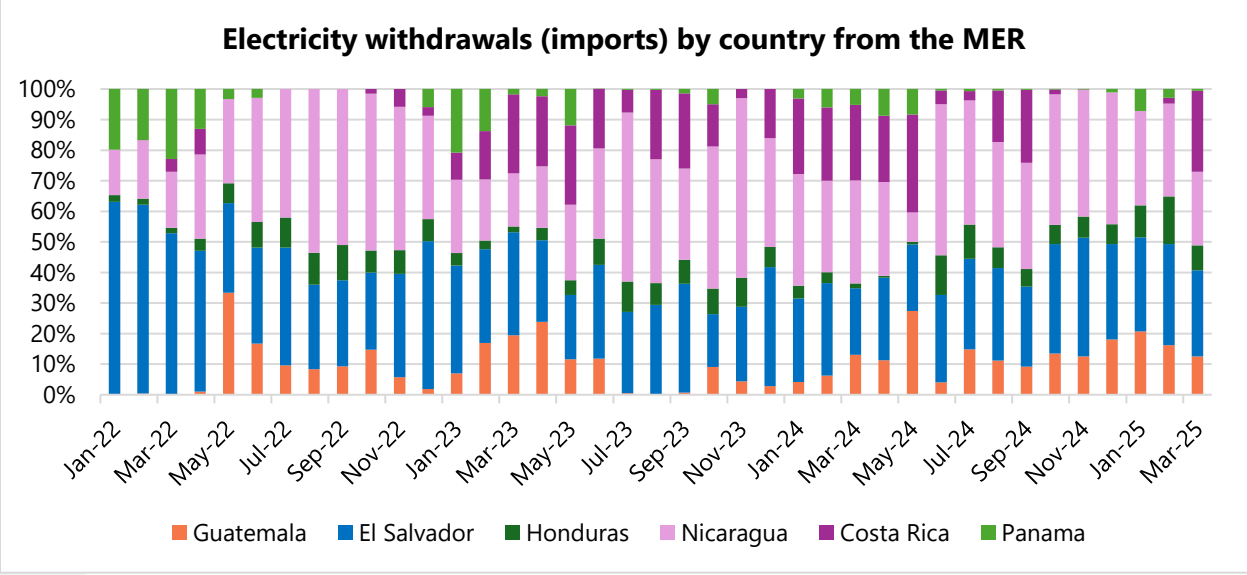
Guatemala is recognized as a net exporter of energy to the entire MER, from January 2022 to March 2025 its injections to the MER have represented 37.43% of the total. Meanwhile, their withdrawals, for the same period, have only represented 10.62% of the total.

Graphic 6: Injections of electricity by country to the MER.



Source: Prepared by the author based on information from the Regional Operating Entity (EOR).

Graphic 7: Withdrawals of electricity by country to the MER.

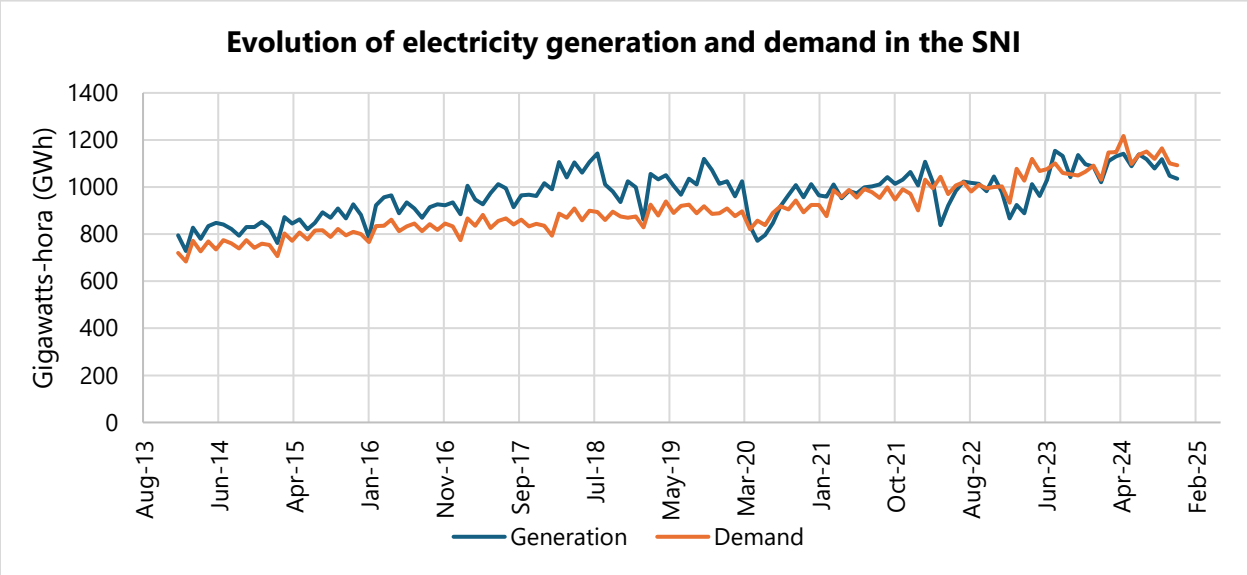


Source: Prepared by the author based on information from the Regional Operating Entity (EOR).

Generation and demand of electrical energy

By 2024, local generation reached 13,117.41 GWh and demand was 13,496.29 GWh, which is an indicator of the investment opportunity that exists in the electric power generation market.

Graphic 8: Historical behavior of the demand and supply of electricity in Guatemala.



Source: Annual Statistical Reports, AMM.

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