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# Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 22-May-2025 | Report No: PIDDC01265

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## BASIC INFORMATION

### A. Basic Project Data

| Project Beneficiary(ies) | Operation ID | Operation Name | |
|---|---|---|---|
| Guatemala | P510015 | Guatemala Energy Transition Support Project | |
| Region | Estimated Appraisal Date | Estimated Approval Date | Practice Area (Lead) |
| LATIN AMERICA AND CARIBBEAN | 16-Jul-2025 | 30-Oct-2025 | Energy & Extractives |
| Financing Instrument | Borrower(s) | Implementing Agency | |
| Investment Project Financing (IPF) | Ministry of Finance | INDE | |

**Proposed Development Objective(s)**

To support security of power supply and enhance the operational efficiency of power utilities in Guatemala.

## PROJECT FINANCING DATA (US$, Millions)

### Maximizing Finance for Development

| | |
|---|---|
| **Is this an MFD-Enabling Project (MFD-EP)?** | Yes |
| **Is this project Private Capital Enabling (PCE)?** | Yes |

### SUMMARY

| | |
|---|---|
| **Total Operation Cost** | **200.00** |
| **Total Financing** | **200.00** |
| **of which IBRD/IDA** | **250.00** |
| **Financing Gap** | **0.00** |

### DETAILS

**World Bank Group Financing**

| | |
|---|---|
| International Bank for Reconstruction and Development (IBRD) | 200.00 |

| Environmental and Social Risk Classification | Concept Review Decision |
|---|---|
| Substantial | The review did authorize the preparation to continue |

Other Decision (as needed)

## B. Introduction and Context

Country Context

1. **Guatemala is an upper-middle-income country and is the largest economy in Central America, by population and economic activity.** In 2021, its population surpassed 17 million and its gross domestic product (GDP) and per capita income (GDP) were US$86 billion and US$5,025, respectively. The country has experienced a stable pace of growth (3.5 percent on average over the 2010-19 period), above the regional average (1.1 percent) in Latin America and the Caribbean, underpinned by prudent fiscal and monetary management and an open economy. While tax revenue collection has historically been low in Guatemala (12.4 percent of GDP in 2022), expenditures are also low, yielding low debt levels. However, it has been unable to attract significant levels of foreign direct investment (FDI) or to develop a strong manufacturing or services exporting sector. The size of the state has been growing slowly, but it remains too small to provide an adequate level of basic security, health, education, social protection, and infrastructure to the population, which has traditionally sought better opportunities abroad. Remittances have over time provided the basis for a growing middle class, in turn facilitating jobs creation in non-tradeable sectors and commerce. The size of the informal economy in Guatemala is estimated to be around 49 percent of GDP.

2. **After several decades of stable growth, Guatemala has seen its socioeconomic indicators degrade in recent years.** The COVID-19 pandemic caused significant declines in employment and income, and nutrition and educational indicators have deteriorated among children of all ages. By the measure of GDP per capita, Guatemala is the fifth-poorest country in Latin America and the Caribbean: one-fifth of Guatemalans live in extreme poverty, and 85 percent of the population is classified as poor or vulnerable to falling into poverty. Despite being classified as a middle-income country, Guatemala's human development indicators typically underperform compared with countries of its income level. Current development challenges include persistent, high crime levels and modest labor productivity (below the regional average), contributing to a weak social contract and an adverse business climate.

3. **Low investment spending and a lack of competitiveness have impeded Guatemala's achievement of inclusive growth, and worsened territorial and social inequities.** Low revenue mobilization has in turn constrained investment spending on infrastructure and human capital. Limited accessibility in rural areas has hampered the country's competitiveness and hindered it from contributing to regional and global value chains through productivity growth. Poverty rates in Guatemala have been high for many years, and there are large regional disparities in living standards. These challenges have systematically disadvantaged indigenous peoples and Afro-descendants, who represent over 40 percent of the population, and within these groups, women in particular.[1] Extreme poverty rates are higher for both indigenous peoples and rural populations.

[1] INE (National Statistics Institute of Guatemala), "Censo 2018," https://censo2018.ine.gob.gt/.

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4. **Guatemala's high level of exposure to the impacts of climate change and natural hazards, render its social and economic development highly vulnerable to natural disasters.** Guatemala ranks 16th among the countries most affected by climate-related events, such as tropical storms, floods, and extreme weather.[2] Recurrent droughts related to El Niño in the Dry Corridor endanger crops, livestock, and food security. Geophysical hazards that materialize frequently in Guatemala include earthquakes, landslides, and volcanic eruptions. Half of the territory and a third of the population are at high risk of experiencing disaster and humanitarian crisis.[3]

Sectoral and Institutional Context

5. **Guatemala's energy sector has undergone significant changes since the liberalization of the electricity market in 1996.** This shift has opened up power generation and commercialization to competition, while transmission and distribution remain regulated activities. The electricity market encompasses both public and private institutions, with a well-defined regulatory framework. The Ministry of Energy and Mines (MEM) is responsible for developing energy policies and plans for generation and transmission expansion. The National Electric Energy Commission (CNEE) regulates the operation of the electricity market, especially in transmission and distribution activities. The system – and market – operator is a private, non-profit organization known as the Wholesale Market Administrator (AMM), overseen by the CNEE, and which facilitates power market transactions.

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6. **The National Electrification Institute (INDE), a state-owned power utility, is the key player in Guatemala's power sector**. The INDE operates 19 percent of power generation (mainly hydro), as well as 63 percent of the transmission infrastructure, while also selling electricity to the Electricity Municipal Companies (EEMs), which represent 10 percent of the electricity demand in the country. Guatemala's transmission network has expanded at a rate of 1.2 percent since 2016, while demand has increased by 4 percent over the past ten years. This slow growth rate, together with delays in 69kv and 230k infrastructure construction from previous tenders are causing transmission constraints and equipment overload risks in certain areas of the country. The current 400kv network links Guatemala with Mexico through a 71km line.

7. **Guatemala's electricity distribution is handled by two major private companies, while EEMs manage 10 percent of the demand**. The EEMs of Guatemala are entities that distribute electricity and operate in their municipalities and neighboring municipalities and communities. There are 16 EEMs in Guatemala, and most of them face technical and financial performance issues, as well as governance problems, which result in inefficiencies and electrical losses that limit the growth and development of the EEMs over time. Furthermore, electricity sales to EEMs represent around 50 percent of INDE's total sales, who is the sole supplier of the EEMs, and as such, it is key that the EEMs regularize their debts with INDE to ensure the financial health of the utility.

8. **The country's electricity needs are mostly satisfied through clean energy sources**. In 2024, the country generated 52.0 percent of its electricity from renewable sources, primarily hydropower – which represented 35.6 percent of total generation and biomass (10.9). The rest of the – thermal – power matrix includes coal (17.9 percent), coke (11.1 percent), and fuel oil (5.8 percent). In 2024, peak demand and electricity consumption were 2,122 MW and 13,398 GWh respectively, showing growth rates of 7.7 percent and 6.0 percent from 2023, respectively. The average electricity tariff was 0.26 USD/kWh, and the average annual spot price was 116 USD/MWh. Guatemala is interconnected with neighboring countries Honduras and El Salvador via the Central American Electric Interconnection System (SIEPAC) and has a bilateral electricity connection with Mexico, from which it imports 12.17 percent of its electricity consumption.

[2] David Eckstein, Vera Künzel, and Laura Schäfer, "Global Climate Risk Index 2021," Germanwatch, Bonn, 2021, https://www.germanwatch.org/sites/default/files/Global Climate Risk Index 2021_2.pdf.
[3] Inform Guatemala: https://sara.humanitarianresponse.info/inform-guatemala

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9. **Guatemala is endowed with a wealth of renewable energy resources, including untapped geothermal potential estimated to be in the range of 900-1000MW.**[4] Geothermal resources are located in thirteen different fields, with five of them declared national geothermal reserve areas (Zunil, Amatitlán, San Marcos, Moyuta and Tecuamburro). These areas were granted a 25-year concession to INDE and the concession was extended for another 25 years in 2017. However, current geothermal installed capacity in the country is limited to 49.2MW (1 percent of the total installed capacity) in two privately-operated power plants (Zunil I and Ortitlán). Initial exploratory work has been limited due to high costs and higher risks during the geothermal exploration phase and given fluctuating availability of public financial resources.

10. **Guatemala's updated Nationally Determined Contribution (NDC) has set that 80 percent of power generation must be from renewable sources by 2030.** Given the country's reliance on imported coal and fossil fuels for electricity generation, investments in renewable energy generation and transmission projects would be crucial not only to promote decarbonization and diversification, but also the country's current accounts. Furthermore, local, clean energy generation can also support Guatemala's universal energy access agenda, which remains unfinished, with currently 90 percent of the population having access to electricity, and only 53 percent have access to clean cooking methods.

11. **The Government of Guatemala (GoG) is also aiming to increase geothermal electricity generation**. Between the 1970s and 1990s, INDE conducted preliminary studies to create conceptual models for the Tecuamburro, Moyuta, and San Marcos regions, with support from international and multilateral organizations. Recently, INDE reviewed the existing data, focusing on the Tecuamburro and Moyuta areas, and identified the necessity for detailed studies to confirm the feasibility of the field and develop an exploration drilling plan. This plan aims to enhance the predictability of geothermal resources in these regions to advance with the generation capacity expansion.

12. **Exploiting the country's abundant renewable resources requires addressing challenges in transmission and distribution.** The development of local geothermal energy resources can support power matrix diversification, enhance energy security and increase climate resilience, but only through a strong transmission network will the benefits of such generation be fully available to Guatemala. The development of a 400kv backbone network, with a transport capacity of approximately 2700 MW to 3000 MW, from the Los Brillantes substation, passing through the metropolitan region, to a point in the northern and eastern regions of the country, would connect the two largest generation hubs in the country with the major consumption center in Guatemala City, thereby reducing losses and optimizing load flow. These lines, essential for maintaining a reliable system, would provide a secure means for energy transactions between Mexico and Guatemala, offer an opportunity for interconnection with Belize, and strengthen existing connections with El Salvador and Honduras. The interconnection would also reduce supply costs and support the SIEPAC, enabling active participation from Mexico.

13. **Providing cleaner electricity and making an improved public service available to most vulnerable Guatemalans requires working with EEMs and INDE to address key constraints**. Municipal companies will need to work on improving their management, governance, and commercial practices to enhance the quality of electricity services in rural areas. At the same time, INDE also needs to enhance its governance, environmental and social management, operational performance and financial practices to gain the capacity to access private capital and efficiently develop projects. Mobilizing private capital and investments in generation, transmission, and distribution segments is crucial for developing the necessary network and generation infrastructure to ensure efficient, reliable and affordable electricity services.

14. **The proposed project aims to support Guatemala's energy transition** by supporting clean power generation, transmission, and distribution infrastructure, enhancing capacities and performance standards, to achieve competitive, high-quality electricity services while meeting climate goals and ensuring inclusive growth for Guatemala. The Project will support developing geothermal resources to increase the share of clean energy in the electricity mix, which will help

[4] Energía Geotérmica, MEM, 2018

reduce thermal generation, increase climate resilience, reduce GHG emissions, stimulate investments and job creation, and enhance energy security. Additionally, the project will contribute to expand transmission capacity to integrate more renewable energy and facilitate regional electricity trade. Finally, the Project will support INDE to improve its corporate governance structure and practices, environmental and social management, operational performance and financial practices to reach the standards and creditworthiness acceptable by the private sector for investing and will support the EEMs to improve its operational efficiency.

Relationship to CPF

15. **The proposed project will support achieving key objectives of Guatemala's FY 2024-27 Country Partnership Framework (CPF),**[5] and is aligned with other global commitments and programs. It contributes directly to meeting the CPF's High Level Outcome 2 (HLO 2) "Increased Resilience to Natural Disasters and Climate Change" by supporting clean energy technologies such as geothermal which both contributes to climate change mitigation through reduced emissions as well as to adaptation efforts as such technology is more resilient to droughts and other extreme weather events. Specifically, it also contributes to CPF Objective 3 "Improving capacity for the management of disaster risk and natural capital under a changing climate" due to the mitigation and adaptation contributions mentioned before as well as to the improved power infrastructure – at both the national and subnational levels – to be supported and whose design should help address key climate risks. The project also supports increased private sector investment in the generation, transmission and distribution subsectors which will support the creation of green jobs, in line with CPF HLO 3 "Improved Job opportunities" and CPF Objective 4 "Improving the quality and quantity of jobs". Finally, the Project would also contribute to the same HLO's CPF Objective 5 "Improving effectiveness of public investment and revenue mobilization and data quality" by increasing local capacities to develop infrastructure projects and attract private capital in the generation and transmission subsectors and by aiding INDE improve its efficiency.

16. **The proposed operation is also supportive of Guatemala's updated National Determined Contribution (NDC),**[6] **the National Action Plan on Climate Change (PANCC),**[7] **and is aligned with the Paris Agreement.** As the country's NDC has set the conditional goal of reducing GHG emissions 22.6 percent from the business as usual (BAU) scenario by 2030, achieving such objective will only be possible through its target of "Prioritizing Clean Energy for Electric Power Generation". Furthermore, the NDC contemplates that roughly 80 percent of power generation will come from clean or renewable energies and states that optimizing the transmission grid will be essential to develop such generation sources. As such, reducing losses and expanding transmission (or even distribution) lines to new power plants and communities will be vital to achieving Guatemala's NDC. The operation is also aligned with the PNCC goal for the energy industry of promoting renewable energy power generation for the diversification of the energy matrix. By financing geothermal exploration drilling to mitigate risks and enable future electricity generation from geothermal power plants, the project is fully aligned with the Paris Agreement's mitigation goals. Furthermore, by supporting the diversification of the electricity generation matrix and by increasing the resilience of transmission and distribution networks, the project also supports the Paris Agreement's adaptation goals. No specific risks to Paris Alignment Assessment are flagged at this stage.

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[5] World Bank. *Guatemala - Country Partnership Framework for the Period FY2024-2027 (English).* Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/099050523121019313

[6] https://unfccc.int/documents/499593

[7] https://www.marn.gob.gt/wpfd_file/plan-de-accion-nacional-de-cambio-climatico-pancc-edicion-actualizada-2020-2/

## C. Proposed Development Objective(s)

17. The proposed Project Development Objective (PDO) is to support security of power supply and enhance the operational efficiency of power utilities in Guatemala.

Key Results (From PCN)

18. The key results expected from the proposed project are:

- Renewable energy capacity enabled (Corporate Scorecard Indicator, MW)
- Reduction of electricity losses in EEMs (%)
- INDE's compliance with IFC Performance Standards on Environmental and Social Sustainability (Y/N)
- GHG emissions reduction (tCO2e)

## D. Concept Description

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19. The proposed project consists of the following three components:

20. **Component 1: Development of Geothermal and Transmission Infrastructure (estimated cost of US$ 140 million).** This component will focus on developing infrastructure to enable geothermal resources for renewable energy generation and enabling the enhancement of the transmission network through technical assistance (TA) activities. This component comprises two subcomponents as follows:

- *Subcomponent 1.1: Exploration drilling to confirm geothermal resources (estimated costs of US$125 million)*. This subcomponent will finance superficial exploration studies and well drillings in Tecuamburro and Moyuta fields to confirm the geothermal resource and complete the feasibility stage of the two geothermal fields. The drilling will include two campaigns, one for reduced diameter wells and another one for production size wells. Activities will also include financing of civil works for access to these wells, owner's engineer, complete feasibility studies of geothermal power plants in these fields and transaction advisory support for the structuring of these power plants projects.
- *Subcomponent 1.2: Technical Assistance for Transmission Infrastructure Development (estimated costs of US$15 million).* This subcomponent will finance Technical Assistance (TA) to support the development of the 400kV transmission network in Guatemala, in particular the expansion of the 400kV transmission line that currently connects the border with Mexico and Brillantes substation. This expansion aims to connect Brillantes, Escuintla and Guatemala City (with estimated investment costs of US$398 million). This TA will include the preparation of detailed technical studies, Environmental and Social Impact Assessments (ESIAs) as well as other required Environmental and Social (E&S) instruments and works bidding documentation. This subcomponent will also finance the required support to MEM to improve its planning capacity through the support of the National Transmission Expansion Plan and capacity building on planning.

21. **Component 2: Operational Efficiency Improvements for EEMs and INDE Performance Enhancement (estimated cost of US$55 million).** This component aims to enhance the operational efficiency of EEMs and improve the performance of INDE. It is divided into the following two subcomponents:

- *Subcomponent 2.1: Performance and Distribution Infrastructure Enhancement for EEMs (estimated costs of US$45 million)*. This subcomponent focuses on improving EEMs performance through: (i) rehabilitation and

reinforcement of distribution networks and substations; (ii) mass installation of meters; and (iii) management systems.

- *Subcomponent 2.2: INDE Performance Improvement Implementation (estimated costs of US$10 million).* This subcomponent aims to implement performance improvement measures for INDE regarding its corporate governance structure and practices, environmental and social management, operational performance and financial practices. Activities to be financed may include, but are not limited to, development of a business plan, efficiency and process improvement plans, corporate governance enhancements, financial management systems, software and digitalization.

22. **Component 3: Capacity Building and Project Implementation Support (estimated cost of US$5 million).** This component will support INDE to strengthen its technical, fiduciary and environmental and social capacity to implement the Project, manage E&S risks, and to conduct monitoring and evaluation activities. The support will include hiring expert personnel for the Project Implementation Unit (PIU) at INDE, capacity building activities for both INDE and the EEMs, and coordination among stakeholders to ensure effective project implementation. Additionally, this component will support the development of an E&S management system (ESMS), allowing INDE and the EEMs permanent adequate E&S management**.**

23. **GoG designated INDE as the Project Implementation Agency.** INDE is a public company created in 1959. INDE's President is the Minister of Energy and Mines, and three seats (out of five) of the Board of Directors are Government's members. INDE will carry out financial management of the project, procurement as well as environmental and social (E&S) management activities. A Project Implementing Unit (PIU) under the CEO's office will be established to implement project-related activities and coordinate with INDE's companies responsible for defining the technical design and support implementation, namely EGEE, ETCEE and ECOE. The PIU will have a Project Coordinator and dedicated fiduciary staff and will receive technical support from INDE's companies and directorates. The PIU will also monitor and report on project indicators and will oversee the Project's financial reporting.

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Legal Operational Policies

| Policies | Triggered? |
|---|---|
| Projects on International Waterways OP 7.50 | No |
| Projects in Disputed Area OP 7.60 | No |

Summary of Screening of Environmental and Social Risks and Impacts

24. **Environmental and Social risks are assessed as Substantial.** With respect to Subcomponent 1.1, while initial geothermal exploration drilling activities involving reduced diameter wells in Tecuamburro and Moyuta are expected to take place on very small footprints with modular equipment and relatively low water consumption requirements, if such initial efforts are successful, the project expects to finance a small number of production size wells, which entail larger and more permanent physical footprints, including potential access road development in rural areas, as well as more significant water demands. While Tecuamburro does not face significant water scarcity issues, Moyuta is inside the

Central American Dry Corridor, where water is seasonally scarce, meaning that water demands for well drilling might affect water availability for other users in the area. Drilling muds furthermore contain hazardous chemicals and that require specialized control and treatment systems to avoid contamination of the environment. Nonetheless, given the very low population density and moderate environmental sensitivity of both Tecuamburro and Moyuta areas (e.g., both locations are modified habitat agricultural landscapes), the risk profile is somewhat moderated. On the social side, drilling activities are not expected to result in significant labor influx nor related risks such as sexual exploitation and abuse/sexual harassment (SEA/SH) or communicable diseases, as the workforce required is small and highly specialized. While security risks are not expected to be significant in Tecuamburro or Moyuta, potential risks related to employment of security personnel to safeguard workers, materials and equipment and crime related safety risks for all subcomponents will also be further evaluated during preparation. Access road issues and possible related economic displacement impacts (these areas are low population density, but possibly some crops or coffee trees might need to be removed) may require Resettlement Action Plans (RAPs). Additionally, potentially there could be conflicts over water demands. The inherent risks associated with both reduced diameter as well as production size wells are exacerbated by the overall weak capacity and limited experience of INDE in carrying out geothermal drilling activities. With respect to the technical assistance for the development of the 400kV transmission lines (TLs) under subcomponent 1.2, even though their construction is not foreseen under this project, the risks associated with the TA are also expected to be substantial, given the scale of the future TLs. All TA activities under subcomponent 1.2 will be consistent with the ESF. Further scoping of the TLs' ESIA and related studies to be carried out under the project will be done during project preparation; nonetheless, at this stage it is expected that the future development of the TLs may lead to land acquisition, physical and/or economic displacement and the need to develop a Resettlement Planning Framework (RPF) and site specific RAPs, possibly also affecting Indigenous People (IPs) as well and thus possibly also requiring the development of site specific Indigenous Peoples Plans (IPP) and Free, Prior and Informed Consent (FPIC) processes. In addition, the future TLs may pass through environmentally sensitive areas. With respect to subcomponent 2.1 activities, the construction activities aiming to improve EEMs' performance, including rehabilitation and reinforcement of distribution networks and substations, as well as mass installation of meters, are anticipated to be of moderate environmental and social risk. To address these risks, a Preliminary Environmental and Social Assessment (P-ESA) will be developed and consulted prior to appraisal, along with a Stakeholder Engagement Plan (SEP) and an Environmental and Social Commitment Plan (ESCP). The P-ESA will include an outline for the Environmental and Social Management Framework (ESMF) to be developed at the outset of Project implementation that will specify the requirements for assessment and management of impacts related to activities under subcomponents 1.1 and 2.1, as well as a draft scope of work for the TLs' full ESIA and related management plans to be developed under subcomponent 1.2.

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### APPROVAL

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|---|---|
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### Approved By

| | | |
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| Practice Manager/Manager: | Lucia Spinelli | 08-Apr-2025 |
| Country Director: | Joelle Beatrice Dehasse | 22-May-2025 |

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