

# ADVANCING PROSPERITY AND TACKLING CLIMATE CHANGE IN CENTRAL AMERICA: U.S. DEPARTMENT OF STATE POWER SECTOR PROGRAM INITIATIVES

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## Foreword

We are pleased to publish the report *Advancing Prosperity and Tackling Climate Change in Central America: U.S. Department of State Power Sector Program Initiatives* in collaboration with our colleagues at the United States Department of State Bureau of Energy Resources and Deloitte, an Institute of the Americas Energy & Sustainability Program Steering Committee member.

Here at the Institute of the Americas, Central America and the role energy plays in economic development and broader regional integration goals has been an important area for our work and in line with our founding mission and objectives.

We have focused for many years on the important energy issues in Central America and particularly with regards to regional electric integration and the monumental SIEPAC infrastructure and MER regional electricity market. Our work in Central America over the years has also included country-specific issues such as market unbundling, the role of the state, regulatory frameworks and investment climates.

On many of these issues we have worked directly and in partnership with the State Department through their regional environment and energy office in San Jose, Costa Rica and later as part of the Energy and Climate Partnership of the Americas (ECPA). Through various grants, we worked closely with the Western Hemisphere Bureau and later, upon its creation, the Bureau of Energy Resources.




In addition, for over a decade, we have also been very involved in convening space for dialogue and discussion on the issues surrounding natural gas and liquefied natural gas from Panama to El Salvador to the broader regional implications.

We remain convinced of the importance for high-level dialogue and pragmatism to shape and foster policies that advance deployment of the most sustainable energy solutions for every country in Central America and the region overall.

This report and ongoing work by the State Department is crucial to reaching those goals and objectives and is an important contribution to the literature and work undertaken by myriad governments, institutions, think tanks, academia and the private sector.

**Jeremy M. Martin**

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# ACRONYMS

ARESEP	Costa Rica’s Public Services Regulatory Authority
CREE	Honduras’ Electric Power Regulatory Commission
DG	Distributed Generation
ENR	Bureau of Energy Resources
EV	Electric Vehicles
NARUC	National Association of Regulatory Utility Commissioners
NERC	North American Electric Reliability Corporation
NDC	Nationally Determined Contribution
PNNL	Pacific Northwest National Laboratory
PSP	Power Sector Program
SIGET	El Salvador’s General Superintendency of Electricity and Telecommunications
VRE	Variable Renewable Energy

# I. INTRODUCTION



**Central American nations, like many around the world, are working to address both economic and environmental challenges.** Governments need to ensure reliable and affordable electricity service to all of their citizens to stimulate their economies and improve standards of living. At the same time, as they shift toward more diverse renewable energy sources, their electricity systems must adopt advanced, clean energy technologies, which can present new opportunities and challenges for governments as they incentivize investment, regulate the market, and operate a power grid with larger amounts of variable renewable energy.



Since 2011, the Bureau of Energy Resources (ENR) of the U.S. Department of State, through its Power Sector Program, has helped Central American governments navigate this evolving energy landscape and strengthen national and regional electricity markets and the regional integrated power system known as Central American Electrical Interconnection System (SIEPAC). ENR's Power Sector Program (PSP) is a global technical assistance program that provides a wide range of technical, commercial, and regulatory support to create solvent, reliable, transparent, and sustainable power sectors, accelerate power and transport sector decarbonization, improve grid operations, and strengthen national and regional electricity market governance to increase energy security, mobilize investment, and expand cross-border power trade.

U.S. policy toward Central America is centered on creating economic and social opportunities for people in the region. Achieving this goal requires expanding the deployment of clean energy technologies, realizing SIEPAC's full potential to improve power system resiliency, and lowering electricity costs to make economies more competitive. In 2021, the Biden-Harris administration issued the Strategy for Addressing the Root Causes of Migration in Central America, which seeks to promote democracy, prosperity, and security in Northern Central America. Under the strategy's first pillar —**addressing economic insecurity and inequality**— the United States pledged to support renewable energy generation, energy efficiency, energy storage, and power grid improvements.<sup>1</sup> The strategy recognized the role of SIEPAC and small-scale renewable energy in contributing to the region's energy transition and resiliency. Later that year, the administration launched the Call to Action, which called on U.S. businesses and social enterprises to make significant commitments to promote economic opportunity for people in El Salvador, Guatemala, and Honduras, including investments in climate adaptation and clean energy. Building on these efforts, in February 2023, the administration launched Central America Forward, which combines private sector commitments with dedicated U.S. government programming and resources to facilitate investment-led growth.<sup>2, 3</sup>

**These initiatives align with the United States' broader energy and climate policies, which aim to reduce emissions to avoid dangerous levels of climate change and adapt to the impacts of climate change at home and abroad.** In 2021, the Department of State and the Executive Office of the President issued the Long-Term Strategy Pathways to Net-Zero Greenhouse Gas Emissions by 2050, which lays out how the United States can reach its net-zero goal in order to —**along with fellow nations around the globe**— keep a 1.5°C limit on global temperature rise within reach.<sup>4</sup> The United States has committed to reduce net greenhouse gas emissions 50-52 percent below 2005 levels in 2030 and reach 100 percent clean electricity by 2035.<sup>5</sup> In the international arena, President Biden has pledged to work with Congress to quadruple U.S. climate support for developing countries to more than \$11 billion a year by 2024 and called on other countries to be 1.5-aligned.<sup>6, 7</sup>

<sup>1</sup> U.S. Strategy for Addressing the Root Causes of Migration in Central America (Washington DC: National Security Council, the White House, July 2021)

<sup>2</sup> FACT SHEET: Vice President Harris Announces More Than \$1.9 Billion in New Private Sector Commitments as Part of Call to Action for Northern Central America," Statements and Releases, White House, June 7, 2022.

<sup>3</sup> FACT SHEET: Vice President Harris Launches Next Phase of Public-Private Partnership for Northern Central America," Statements and Releases, White House, February 6, 2023.

<sup>4</sup> The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050 (Washington DC: United States Department of State and the United States Executive Office of the President, 2021).

<sup>5</sup> FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies," Statements and Releases, White House, April 22, 2021.

<sup>6</sup> FACT SHEET: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate," Statements and Releases, White House, April 20, 2023.

<sup>7</sup> Remarks by President Biden at the 2023 Major Economies Forum on Energy and Climate," Statements and Releases, White House, April 20, 2023.

While Central America already has a relatively clean electricity matrix due mainly to hydropower, governments have committed to increase renewable energy capacity to combat climate change, deploy wind, solar, and advanced energy technologies, and deepen regional electricity integration to improve energy security. Several countries have pledged to cut energy sector emissions in their Nationally Determined Contributions (NDCs), which are countries' emissions reduction commitments under the United Nations-brokered Paris Agreement on climate change. In its latest NDC, Panama pledged to lower emissions from its energy sector by 24 percent between 2022 and 2050 compared to the business as usual scenario.<sup>8</sup> Costa Rica has a goal to decarbonize its economy by deploying a range of advanced clean energy technologies and increasing wind and solar generation to diversify away from its heavy reliance on hydropower while lowering electricity costs.<sup>9, 10</sup> El Salvador is seeking to increase renewable energy supply to 80 percent in 2050 and boost adoption of electric vehicles.<sup>11, 12</sup> As Belize looks to expand renewable generation, with the aim of reaching 85 percent renewable energy by 2030, the government is evaluating the potential to implement clean energy technologies like battery storage and improve overall grid operations. Honduras has vowed to cut energy sector emissions by 15 percent by 2030.<sup>13</sup> Additionally, Guatemala has a target to generate 80 percent of its electricity from renewable sources by 2027 compared to 36 percent in 2021.<sup>14</sup>



<sup>8</sup>"Panama", Markets, Climatescope by BloombergNEF, accessed June, 5 2023, <https://www.global-climatescope.org/markets/pa/>

<sup>9</sup>VII National Energy Plan of Costa Rica, 2015-2030," Government of Costa Rica, 2017.

<sup>10</sup>"National Decarbonization Plan, 2018-2050," Government of Costa Rica, 2018.

<sup>11</sup>"Renewable Readiness Assessment: El Salvador", IRENA, 2020, [https://irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA\\_RRA\\_El\\_Salvador\\_2020.pdf](https://irena.org/-/media/Files/IRENA/Agency/Publication/2020/Dec/IRENA_RRA_El_Salvador_2020.pdf)

<sup>12</sup>Consejo Nacional de Energía, Política Energética (El Salvador: CNE, 2020-2050).

<sup>13</sup>"Honduras", Markets, Climatescope by BloombergNEF, accessed June, 5 2023, <https://www.global-climatescope.org/markets/hn/>

<sup>14</sup>"Guatemala", Markets, Climatescope by BloombergNEF, accessed June, 5 2023, <https://www.global-climatescope.org/markets/gt/>



## II. ENR PSP SUPPORT FOR CENTRAL AMERICA

**The Bureau of Energy Resources (ENR) leads the U.S. Department of State's efforts to develop and execute international energy policy and respond to energy challenges around the world.** In Central America, ENR's Power Sector Program provided technical assistance to promote clean energy development, supporting the Governments of Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Panama in their efforts to integrate clean energy technologies, strengthen power sector governance and regulations, accelerate decarbonization, and enhance energy resilience and reliability. ENR PSP advances these efforts by advising governments through analysis, technical reports with recommendations, and trainings on how to develop regulations that are in line with global leading practices, advising on draft technical rules and norms, creating public-private dialogues to facilitate investment, and designing roadmaps with actionable steps for government entities and regional bodies to achieve their policy goals. In Central America, ENR PSP partners that implement the technical cooperation include Deloitte Consulting, the Pacific Northwest National Laboratory (PNNL), and the National Association of Regulatory Utility Commissioners (NARUC).

### 2.1. Rural electrification

**From 2021 to 2023, ENR PSP and its partner Deloitte supported the governments of Panama and Guatemala in their efforts to bring clean electricity to isolated rural communities outside the service territory of the national grids.**

In Guatemala, the government held a competitive tender to attract private investors to build and operate off-grid solar systems with batteries for homes and small businesses. ENR PSP advised the Ministry of Mines and Energy and the National Institute of Rural Electrification on how to structure and execute the tender, making recommendations on the terms of reference and responses to bidders to follow international practices. ENR PSP also developed investment promotion materials, including market research and a prospectus for international investors to improve the government's possibilities of attracting quality bidders and promoted the tender through the U.S. Embassy's Foreign Commercial Service in Guatemala and Guatemala's Association of Renewable Energy Generators.

In Guatemala, less than three quarters of the population has access to electricity.<sup>15</sup> The solar tender seeks to provide energy to 2,500 customers in up to 68 communities in the Alta Verapaz and Izabal provinces, which have high poverty rates and are among the five departments with the lowest electrification rates in the country. In Alta Verapaz, almost 84 percent of the mostly indigenous population lives in poverty, and electricity access promises to raise living standards for historically marginalized communities.<sup>16, 17</sup> In April 2023, the Guatemalan government awarded a contract valued at \$8.5 million to a local firm, generating significant private sector investment.<sup>18</sup>

<sup>15</sup>"Tracking SDG 7 – The Energy Progress Report 2022", Energy, World Bank, June 1, 2022, <https://www.worldbank.org/en/topic/energy/publication/tracking-sdg-7-the-energy-progress-report-2022>

<sup>16</sup>"2018 Census", National Institute of Statistics of Guatemala Instituto, accessed June 5, 2023, <https://www.citypopulation.de/en/guatemala/admin/>

<sup>17</sup>Christina Gutierrez, "Cuadrante Electoral", AgenciaOcoté, March 23rd, 2023.

<sup>18</sup>This figure is based on an estimate by implementing partner Deloitte and assumes that the standalone systems cost \$1,842 each, including the costs of PV modules, roof mounting, lithium-ion batteries, inverters, remote monitoring hardware, other balance of systems, transport, labor, developer overhead, and a 10% Engineering Procurement Construction profit margin. The cost estimates are based on a combination of industry metrics and actuals for certain types of kit.

**In Panama, ENR PSP supported the country's goal of creating energy cooperatives to operate off-grid, mainly renewable energy power systems in remote, underserved rural areas.** Under this model, energy cooperatives are owned and managed by the people who use their services, work in the area, or live in the community. ENR PSP advised the National Energy Secretariat and other Panamanian government agencies on the design and implementation of the energy cooperatives, developing a roadmap for the Panamanian government based on the U.S. model of the National Rural Electric Cooperatives Association. The roadmap lays out specific actions for Panamanian government agencies to establish, support, and then oversee the cooperatives and explains how to perform the feasibility analysis of rural electrification projects in Panama. ENR PSP also crafted an operational manual that energy cooperatives can adapt to establish their own policies and procedures in order to promote transparency and good governance. During an ENR PSP-hosted roundtable in May 2023, Panamanian and Guatemalan officials dialogued with Central American government officials, off-grid developers, and experts about challenges and leading practices in rural electrification business models, investment frameworks, and community relations.

Panama has an electrification rate of over **90 percent**, but thousands of people in remote, indigenous territories, known as comarcas, still lack access, and electrification rates in these areas are often below ten percent.<sup>19, 20</sup> <sup>21</sup> Further, **600 schools and 100 health centers** in 14 provinces of Panama operate without electricity.<sup>22</sup> Panama's 2021 National Strategy for Universal Access establishes a target to bring power to the 93,000 families lacking electricity and end energy poverty and inequality by 2030. The creation of energy cooperatives is identified in the strategy as one promising approach to rural electrification. The energy cooperatives roadmap that ENR PSP developed will serve as an important input to the government's universal access strategy, helping Panama to close the electrification gap, thus advancing social and economic development for the population.



Figure 1. ENR PSP Partner Deloitte Meeting with Panama's Office of Rural Electrification, March 2023

<sup>19</sup>"Panama", Access to Electricity % of population, Economic Tradiings, June 2023, [https://tradingeconomics.com/panama/access-to-electricitypercentofpopulationwbdata.html#:~:text=Access%20to%20electricity%20\(%25%20of%20population\)%20in%20Panama%20was%20reported,compiled%20from%20officially%20recognized%20sources](https://tradingeconomics.com/panama/access-to-electricitypercentofpopulationwbdata.html#:~:text=Access%20to%20electricity%20(%25%20of%20population)%20in%20Panama%20was%20reported,compiled%20from%20officially%20recognized%20sources).

<sup>20</sup>"Universal Access to Energy Project in Panama, Ngäbe Buglé Region" (Spain: Spanish Agency for International Development Cooperation AECID, 2019).

<sup>21</sup>Panama National Institute of Statistics and Cencus, (Panama: INCEC, 2014)

<sup>22</sup>"Access to Electricity (% of Population) - Panama," The World Bank, accessed October 25, 2022, <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=PA>



**ENR PSP's work on rural electrification furthered the U.S. government's policy goals of reducing economic insecurity and inequality in Central America and accelerating clean energy deployment.** Electrifying rural communities is essential to economic and social development. It helps to achieve food security, for example by allowing for refrigeration, reduces poverty by creating new opportunities for small businesses like cellphone charging or irrigation for agriculture, improves healthcare by allowing medical equipment to operate on electricity, and raises education levels as electric lights make after-work school programs possible. Electricity access results in average improvements of 7 percent in school enrollment, 25 percent in employment, and 30 percent in incomes.<sup>23</sup>

The off-grid projects that ENR PSP supported will also use almost entirely renewable energy sources, advancing U.S. and Central American clean energy and climate change objectives. The solar and battery systems that are expected to be deployed in Guatemala are zero-emissions, while in Panama, the energy cooperatives will primarily use renewable energy sources for the mini-grid systems.

## 2.2. Variable Renewable Energy and Battery Energy Storage Integration

**ENR PSP supported efforts by the governments of Belize, Costa Rica, El Salvador, and Honduras to increase the deployment of variable renewable energy (VRE) sources like wind and solar and enable utilities and customers to utilize this type of energy generation by promoting new clean energy technologies.**

The bulk of the VRE cooperation focused on regulations to incentivize small scale projects that generate electricity at or near where it is used, such as residential and commercial rooftop solar units, which are known as renewable distributed generation (DG) technologies. Given the small scale of Central American power markets, DG is poised to contribute greatly to the countries' renewable energy uptake. ENR PSP engaged with regulators from Central American countries, recommending improvements to regulations, incentives, standards, and technical norms to increase deployment of renewable DG technologies. ENR PSP partner Deloitte advised ARESEP on the regulations for connecting DG units to the grid, selling the excess energy back to the utility, and determining how much DG capacity the grid can integrate. In addition, ENR PSP held a roundtable on DG in Costa Rica, which provided a forum for dialogue between ARESEP and other Costa Rican DG stakeholders, including consumer advocates, electric power distribution companies, and renewable energy equipment manufacturers. The roundtable afforded ARESEP an opportunity to explain the new regulations to relevant private and public sector stakeholders and gave them a platform to share their perspectives, contributing to Costa Rica's goal of implementing its DG law.<sup>24, 25</sup>



<sup>23</sup>Development Effects of Rural Electrification (Washington DC: Inter-American Development Bank. 2017).

<sup>24</sup>"Distributed Generation Law Approved in Costa Rica," The Costa Rica News, October 15, 2021, <https://thecostaricanews.com/distributed-generation-law-approved-in-costa-rica/>

<sup>25</sup>Distributed Generation Law, ARESEP, 2021



Figure 2. ENR PSP and Partner Deloitte Meeting with Central American Regulators, January 2022

**In addition, ENR PSP partner NARUC designed a guidebook for Central American countries on DG regulations and advised regulators from El Salvador and Honduras on their national DG frameworks, and those national regulators updated their respective DG frameworks based on NARUC's recommendations.<sup>26</sup>**



Figure 3. ENR PSP Partner NARUC Following a Regional Peer Review, 2020

**ENR PSP, with its partner Deloitte, also advised regulators from Belize, Costa Rica, El Salvador, and Honduras on developing or updating regulations, tariffs, and standards for battery energy storage solutions.** ENR PSP hosted training workshops for Central American regulators and utilities on storage technologies, including batteries and pumped hydro, and their associated costs and regulations.

<sup>26</sup>Irina Botu-Tallis, Nikolay Nikolov, Meghan Riley, Bevan Flansburg "APPROACHES TO REGULATING DISTRIBUTED GENERATION IN CENTRAL AMERICA", NARUC, December 2022.

As countries seek to decarbonize their power sectors, utilities and energy regulators have to make adjustments to allow for the integration of VRE sources, which are not available at all times of the day and do not have predictable output like fossil fuel sources. The use of energy storage systems, such as batteries, facilitates integration of VRE sources by providing back-up power to the grid. In recent years, battery energy storage systems have undergone rapid development, rising from approximately 2.2 gigawatts of installed storage capacity in 2015 to 17 gigawatts by the end of 2020, and the International Energy Agency estimates that this number will grow further to 148 gigawatts by 2025.<sup>27</sup> Meanwhile, DG technologies provide an additional source of clean energy that complements utility scale generation.

The four Central American countries have all established policy objectives of increasing DG and storage capacity to advance their clean energy goals. ENR PSP support and expert advice from current and former U.S. regulators helped these countries to improve and implement their regulations, conduct stakeholder conversations, and engage with private sector companies, including local and U.S. investors, equipment providers and utilities. These steps will help attract investment and grow the region's DG and storage markets, which will in turn improve energy security and expand renewable energy deployment.



<sup>27</sup>George Kamiya, Shai Hassid, and Pablo Gonzalez, "Energy Storage," International Energy Agency, November 2021, <https://www.iea.org/reports/energy-storage>

## 2.3. Grid Reliability

**In light of Central America's regional transmission network, vulnerability to climate change and extreme weather events, such as hurricanes, as well as the region's near doubling of installed capacity of renewable energy over the next five years, ENR PSP provided critical work to enhance grid reliability and resiliency, including through strengthening Central America's regional grid SIEPAC.** ENR PSP also supported Costa Rica and El Salvador to improve grid reliability by advising on issues such as how to deploy smart grid technologies and how to optimally manage power system assets like power generation plants and transmission lines using advanced and integrated software systems.

Since 2012, ENR PSP has provided regional technical assistance to strengthen SIEPAC in a partnership with PNNL and Central America's Regional System Operator (EOR). EOR and national grid operators manage regional electric power reliability and power trade among six countries: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama, jointly serving a population of more than **50 million people**. Over the past decade, PNNL has trained and provided technical assessments to more than 450 Central American power engineers and system planners. The regional regulator adopted PNNL recommendations on reserve requirements to support increased levels of variable renewable energy deployment. PNNL advised EOR on the need to ensure continuity of control center operations that resulted in EOR planning, designing and securing funding for a new back up regional control center, as well as implement new cybersecurity measures in the six countries' national and regional power systems' control centers.



Figure 4. ENR PSP Partner PNNL in EOR's Control Center for SIEPAC, September 2022

### **A PNNL training series in 2020-2022 on renewable energy grid integration, resiliency, and reliability taught North American Electric Reliability Corporation (NERC) standards and procedures to national and regional grid operators.**

PNNL is also conducting a technical study to assess whether Central America's plans to double wind and solar capacity between 2023-2028 will affect regional grid operation and stability, using production cost modeling and other analytical tools, and helping EOR and CRIE adopt regional reliability and stability monitoring standards to help with increasing levels of variable renewables. Following implementation of PNNL recommendations and trainings, technical disturbances resulting from cross-border power trade, related to power oscillations declined from an annual average of 28 between 2010 and 2020 to only 3 in 2021. Overall, PNNL support has built technical capacity and improved Central America's grid security and its ability to integrate more variable renewable energy in the years ahead.

Smart grids are a set of technologies, infrastructure, and software systems that facilitate connections among the core components of the electricity system by creating a bidirectional communication framework and facilitating bidirectional power flow. These include smart meters, which allow two-way communication between utilities and customers, and information and technology systems that allow different generation, transmission, and distribution equipment to communicate virtually. Working with Costa Rica, ENR PSP partner Deloitte informed the Ministry of Environment and Energy's smart grid roadmap, part of its ten-year electricity sector strategy. Costa Rica's smart grids roadmap aims to help the country improve efficiency and defer costly investments in new generation assets. **ENR PSP also advised Costa Rican government agencies to identify and counteract potential privacy and cybersecurity concerns that smart grid systems can generate for utilities because of the collection of large volumes of data. In addition, ENR PSP provided recommendations to the state utility, the Costa Rican Institute of Electricity, to integrate its complex generation, transmission, and distribution asset management systems.**

El Salvador's National Energy Plan 2020-2050 emphasizes the need to modernize and improve efficiency of energy infrastructure, which includes deploying smart grids. AES Corporation, a U.S. company which serves 77 percent of customers in El Salvador, is executing a smart meter pilot program in the country and has ramped up investment in modernization and digitalization. In this context, ENR PSP and partner Deloitte advised El Salvador's government on developing a national smart grid strategy, updating its electricity tariff structure to promote investment in smart grids and incentivize customers to save energy, and adopting standards and regulations for smart grids.



**Deploying smart grids and integrated asset management systems will contribute to economic prosperity in Central America.** Smart grids improve electricity service, for example by allowing utilities to quickly fix outages remotely instead of physically sending field team personnel. This improved service is critical for economic and social development in countries like El Salvador that face frequent blackouts. El Salvador has made significant progress in electricity service quality over the last decade, but the average frequency and duration of interruptions remain higher than in the United States and Europe, and blackouts are still common in rural areas.<sup>28, 29</sup> Utilities can also employ smart grid technologies to incentivize customers to use electricity during non-peak hours, allowing them to defer investment in generation plants that only run during high-peak times, ultimately reducing energy costs for everyone. Providing reliable, low-cost electricity is critical to attract investment and develop competitive industrial and manufacturing sectors.

Smart grids also contribute to U.S. and Central American goals of mitigating climate change. Costa Rica and El Salvador are keen to deploy smart grid technologies in order to meet their decarbonization goals, optimize the deployment of VRE sources, and manage the grid integration of new technologies, including electric vehicles (EVs), DG, and battery storage. Smart grids also help utilities to manage other clean energy technologies like distributed solar generation and battery storage by making it easier for them to monitor and control the connection of these units in real time.

## 2.4. Clean transport

**ENR PSP helped the government of El Salvador advance its clean transport goals.** In an effort to reduce transport sector emissions, in 2020, El Salvador's National Assembly passed the Incentives Law for the Importation and Use of Electric and Hybrid Means of Transportation, which requires El Salvador's regulator, the General Superintendency of Electricity and Telecommunications (SIGET), to implement regulations governing charging infrastructure. ENR PSP partner Deloitte helped SIGET to improve its draft EV charging regulation and designed a roadmap for the development of EV charging infrastructure in the country. The roadmap includes steps to define electric mobility targets and plans, assess the state of EV readiness, conduct a grid stress test, and forecast EV infrastructure needs, evaluate ownership and financing structure options, and develop technical standards and siting regulations. In January 2023, ENR PSP also hosted an EV roundtable with leading automakers, utilities, and charging infrastructure providers from the United States, Latin America, and the European Union.

Electrification of transport will strengthen energy security and reduce El Salvador's oil import bill, improving its fiscal and trade balances. El Salvador relies heavily on imported oil, which represents about seven percent of its gross domestic product. Electric mobility can also bring investment to El Salvador. Already, U.S. companies AES and Blink Charging are planning to develop charging infrastructure in the country, and the participation of these companies and others at an ENR PSP-hosted roundtable enabled dialogue with U.S. private firms and prospective investors that improved understanding of the country's nascent EV framework.

<sup>28</sup>Mariana Weiss, Pauline Ravillar, María Eugenia Sanin, Franco Carvajal, Yuri Daltro, Enrique Chueca, and Michelle Hallack, Impact of Regulation on the Quality of Electric Power Distribution Services in Latin American and the Caribbean (Inter-American Development Bank, November 2021).

<sup>29</sup>"Política Energética: El Salvador 2020–2050", Consejo Nacional de Energía, 2020.

<sup>30</sup>"Imports and Exports El Salvador", Annual International Trade Statistics, Trade Economy, May 14, 2023. <https://tredeconomy.com/data/h2/ElSalvador/TOTAL>

<sup>31</sup>"El Salvador GDP", Country Summary, Trading Economics, 2022. <https://tradingeconomics.com/el-salvador/gdp#:~:text=El%20Salvador%20GDP%20The%20Gross%20Domestic%20Product%20%28GDP%29,record%20low%20of%200.63%20USD%20Billion%20in%201960>. "El Salvador GDP", Country Summary, Trading Economics, 2022. <https://tradingeconomics.com/el-salvador/gdp#:~:text=El%20Salvador%20GDP%20The%20Gross%20Domestic%20Product%20%28GDP%29,record%20low%20of%200.63%20USD%20Billion%20in%201960>.

**ENR PSP support for electric mobility will also help El Salvador to meet its climate goals.** El Salvador is in the initial stages of a long-term strategy to promote the adoption of EVs, including automobiles, buses, and motorcycles. At present, the number of EVs and charging stations in the country is minimal, but the government established an objective to expand electric mobility in its most recent NDC. In the most ambitious scenario presented in its NDC, El Salvador forecasted EVs to make up 20 percent of total vehicle sales by 2030. Moreover, electrifying transport reduces deadly air pollutants in dense urban areas, improving quality of life.

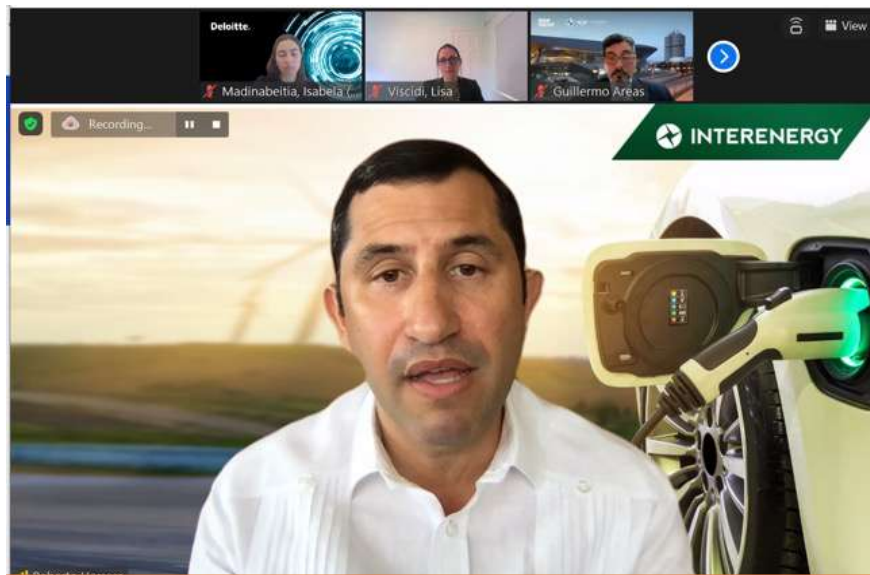


Figure 5. ENR PSP Roundtable on Electric Mobility in El Salvador, January 2023



### III. CONCLUSION

**Central American countries are key allies for the United States, and the region's economic, social, and environmental wellbeing is a U.S. foreign policy priority.** In the power sector, Central American countries face a host of new opportunities and challenges as they scale up clean technologies that are essential to the energy transition, while maintaining secure, reliable, and affordable energy supplies for all. ENR PSP's work has helped to deploy renewable energy capacity in off-grid, grid scale, and distributed energy systems; generate reliable and affordable electricity to improve living standards and economic competitiveness; and promote EV charging infrastructure to green the transportation sector. Building technical and regulatory capacity through cooperation requires a long-term and sustained commitment, but it ultimately pays off as countries like those of Central America better optimize power delivery, lower system costs, and enhance reliability for the region's electric grid. Such improvements can also reduce energy costs for residents and foster economic growth, raising the standard of living and increasing regional stability, and make the region more attractive to foreign investors.

By advancing rural electrification, variable renewable energy integration, regional power trade and integration, grid reliability and resiliency, and clean transport, ENR PSP has supported efforts by the Governments of Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Panama that will bring electricity access to thousands of people, deploy millions of dollars in clean energy investments, strengthen energy security and power systems, and help decarbonize power and transport sectors across the isthmus.







## IV. ABOUT THE AUTHORS



**Lisa Viscidi** is a Senior Manager in Energy, Climate and Natural Resources in Deloitte Consulting's government and public services practice, where she provides technical expertise in emerging markets for US government and international clients. She has led projects providing technical assistance in renewable energy, energy storage, electric vehicles, energy access, and industrial decarbonization to governments in Latin America, Asia, and the Middle East. As Team Lead for Deloitte, she led the implementation of Power Sector Program work in Central America on behalf of the Bureau of Energy Resources.

Viscidi has over 15 years of experience in research, project management, and business development. She is a non-resident Senior Fellow and the former founding Director of the Energy, Climate Change and Extractive Industries Program at the Inter-American Dialogue, where she oversaw policy programs in areas including clean energy, sustainable transport, climate resilience, and conservation. She is also an adjunct professor at the George Washington University School of International Affairs. Before joining Deloitte, she was New York bureau chief and Latin America team lead for Energy Intelligence Group. Her articles have been published in *The Financial Times*, *The New York Times*, *Foreign Policy*, *Miami Herald*, *Houston Chronicle*, and *Foreign Affairs*. Among other public engagements, she has testified before the House Committee on Foreign Affairs' Subcommittee on the Western Hemisphere, taught under a Fulbright Specialist grant at the Universidad del Rosario in Bogotá, and served on the Leadership Council for the National Capital Area Chapter of the US Association for Energy Economics from 2018 to 2020.

Viscidi has a bachelor's degree in History from the George Washington University and a master's degree in Latin American studies with a focus on economic development and public policy from New York University.



**Faith Corneille** is Team Lead of the U.S. Department of State's Bureau of Energy Resources' (ENR) Power Sector Program, which provides technical assistance to foreign governments to strengthen electricity markets and power systems and advance power sector decarbonization, resiliency, clean energy investment, regional power trade and electricity access goals. Ms. Corneille designs and leads implementation of engagements in Asia, Africa, Europe, Latin America, and the Caribbean, resulting in increased use of renewable energy, improved clean energy regulations; increased cross-border power trade; competitive tenders for renewable energy capacity; U.S. development finance; and capacity building in foreign energy ministries, electric utilities, and regulators.

From 2015 to 2018, Ms. Corneille served in the U.S. Embassy in Costa Rica as ENR's Senior Regional Energy Advisor, advising the U.S. Government on a Presidential Energy Security Task Force as well as on energy market development and regional electricity integration efforts in Central America and the Andes. From 2011-2015, she served as ENR's Acting Director and Deputy Director for the Office of Electricity and Energy Efficiency in Washington D.C., where she led a team implementing clean energy partnerships and coordinating energy transformation policy and analysis. She began her career at State as a Presidential Management Fellow and Regional Energy Officer for the Bureau of Western Hemisphere Affairs, where she supported energy policy dialogues and launched Presidential clean energy partnerships between U.S., Latin American, and Caribbean governments. Prior, she worked for The Carter Center in Atlanta, Georgia, where she organized election observations in Latin America involving heads of state. She has earned multiple Superior and Meritorious Honor Awards, Quality Step Increases, and national awards, including the U.S. Clean Energy Education & Empowerment (C3E) Award for Government a Federal Laboratory Consortium Award for her work in Central America.

Ms. Corneille holds Master's degrees in Public Administration and International Affairs from the Maxwell School of Citizenship and Public Affairs at Syracuse University and Bachelor's degrees in International Affairs and Spanish from the University of New Hampshire.



## V. ABOUT THE IOA

The Institute of the Americas (IOA) is a non-partisan, independent nonprofit organization whose mission is to be a catalyst for promoting economic development and integration, emphasizing the role of the private sector, as a means to improve the economic and social well-being of the people of the Americas.

The Energy & Sustainability program has played a crucial thought-leadership role in shaping policy discourse and informing policymakers and investors on the most important trends in the energy sector. We focus on matters related to energy development, investment, natural resource use, and energy transformation in the Americas.





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