

POWER SECTOR PROGRAM



U.S. Department of State, Bureau of Energy Resources (ENR)

The Power Sector Program (PSP) is a U.S. Department of State, Bureau of Energy Resources (ENR)-led effort to provide a wide range of technical support to create solvent, reliable, transparent, and sustainable power sectors in countries across the globe. The PSP is conducted through a combination of direct contracting, peer-to-peer exchanges with regulators and system operators, and leveraging of U.S. institutional capacity through interagency agreements with agencies and laboratories.

Depending on priorities, technical support provided through ENR's PSP is designed to: 1) fill niche gaps in power sector development; 2) build on prior donor reform efforts in order to help ensure long-term success; 3) jump-start market and sector reforms; and 4) catalyze private investment in reformed power sectors.

ACTIVITIES INCLUDE

- In-country advisor support to develop and revise regulatory, legal, and planning structures to further reforms and stimulate private investment.
- Specialized assistance to develop tendering and bidding processes for power projects, and mechanisms to attract the most optimal investment for the region, while protecting a country's resources and financial investment.
- Workshops and seminars designed to facilitate the removal of institutional and regulatory roadblocks impeding progress on country-specific power sector reforms.
- Expert guidance on generation, transmission, and distribution infrastructure options, particularly to incorporate clean and advanced technologies.
- Technical, legal, and regulatory guidance for ongoing or planned transmission system interconnection projects to ensure country links are utilized effectively and provide optimal value.
- Innovative financing mechanisms to incentivize the flow of private capital for clean and alternative energy development.
- Guidance on assessing, avoiding, and mitigating potential environmental impacts of power projects.
- Bilateral and multilateral diplomatic engagement to overcome political, regulatory and technical obstacles to the benefits of electrical interconnections and integrated electricity markets, in order to expand access to energy services, increase regional energy trade, and bolster energy security.
- Training in energy resource and system optimization.

CAPABILITIES

PSP utilizes a range of modeling software, including Power Factory, ETAP, MATLAB, SDDP, Plexos, DigSILENT, and PROMOD to conduct power system analysis.

Technical:

- Optimal generation and transmission expansion scenarios
- Renewable integration analysis
- Dispatch optimization and load forecasting
- Contingency analysis
- Stability and reactive power compensation analysis
- Transmission capacity analysis
- Integrative resource planning

Commercial and regulatory:

- Market monitoring and surveillance tools
- Competitive and transparent procurement processes
- Power market regulations and procedures, including contractual frameworks and reliability standards
- Financing models, credit enhancement mechanisms, and business development
- Tariff rate review and design
- Grid code assessment

Geothermal Tender, St. Kitts & Nevis

As with many Caribbean islands, St. Kitts and Nevis is a small island nation dependent upon relatively high-cost imported fuel that discourages the investment necessary to build sustainable energy systems. ENR provided technical assistance to the Nevis Island Administration and Nevis Electricity Company to support development of the island's geothermal resources, which could provide sustainable renewable power to the entire country.

PSP supported development of a competitive and transparent procurement process for a geothermal power plant on Nevis, guidance on negotiating a fuel concession agreement and power purchase agreement, evaluation of financing opportunities, and technical analysis on the electric system and a possible interconnection with St. Kitts. This assistance directly led to the signing of a power purchase agreement between the Government of Nevis and a project developer in November 2015.



Market and Investment Framework , Southern Africa

Of the 280 million people living in Southern Africa, only about 36 percent have access to electricity. Improved access and energy security could be achieved with investment in cleaner, cheaper generation technologies, and through increased power trade.

PSP supports the Regional Electricity Regulators Association of Southern Africa (RERA) in its efforts to increase private sector investment, particularly from clean and renewable energy sources. PSP consultants are assisting RERA in developing a regional framework for independent power producers (IPPs) and public-private partnerships (PPPs) that will facilitate harmonization of the regional regulatory environment. The framework's implementation would facilitate access for local and international investors to a larger regional market .

Increase in Regional Trade, Central America

One of the best prospects for Central America to lower electricity prices and attract private investment is enhanced regional electricity integration. Since 2013, PSP has provided support to the regional market regulator and system operator to conduct the first market audit; assess commercial options for integrating extra-regional neighbors into the market; evaluate options for expanding trade capacity on the regional transmission line; assess methodologies for allocating transmission rights; recommend operational requirements to account for a significant increase in renewable generation; and provide analysis and recommendations for tracking disturbances in the power system. To date, the region has used the line to procure lower cost power and emergency supply during shortages. PSP analysis was used to confirm financing for transmission upgrades necessary for increasing power trade on the regional line.



Improvement in Energy Service, Cambodia

In order to meet Cambodia's significant growth in electricity demand, the Royal Government of Cambodia has prioritized increasing access to energy and extending grid services. PSP, through the National Association of Regulatory Utility Commissioners, has supported a number of peer-to-peer exchanges with the Electricity Authority of Cambodia (EAC) to address regulatory issues related to energy supply. As a result of this engagement, EAC implemented changes to its billing and data collection processes and improved its service quality and consumer education.