

THE USAID-NREL PARTNERSHIP

Delivering Clean, Reliable, and Affordable Power in the Developing World

“A strong economy and a healthy planet are mutually reinforcing. We recognise the opportunities for innovation, sustainable growth, competitiveness, and job creation of increased investment into sustainable energy sources and clean energy technologies and infrastructure.”

— G20 Leaders' Declaration
Hamburg, Germany, July 7, 2017

The USAID-NREL Partnership

The U.S. Agency for International Development (USAID) and the National Renewable Energy Laboratory (NREL) are partnering to support clean, reliable, and affordable power in the developing world. The USAID-NREL Partnership helps countries with policy, planning, and deployment support for advanced energy technologies.

Through this collaboration, USAID is accessing advanced energy expertise and analysis pioneered by the U.S. Department of Energy national laboratories. The Partnership addresses critical aspects of advanced energy systems, including renewable energy deployment, grid modernization, distributed energy resources and storage, power sector resilience, and the data and analytical tools needed to support them.

The U.S. Provides Global Leadership in Clean Energy

For more than 40 years NREL has provided world-class research and development in advanced energy systems. The laboratory's work stimulates the U.S. economy, inspires innovation, and enhances energy security. NREL is seen as a global leader, with leading-edge approaches and expertise that can be applied around the world. USAID has tapped this resource to help partner countries transition toward advanced, modernized power systems supporting energy security and clean economy goals.

Global Technical Platforms

Global technical platforms provide free, state-of-the-art support on common and critical challenges to scaling up advanced energy systems. These platforms, informed by country demand and NREL's domestic and international experience, are universally relevant to



Solar modules installed on the roof of the Satyanarayanpur Health Center in West Bengal, India. *Photo from West Bengal Renewable Energy Development, NREL 08904*

developing nations and provide a combination of analytical tools, training, and knowledge products. Our technical platforms include:

Renewable Energy (RE) Explorer

The RE Data Explorer is a user-friendly geospatial analysis tool for analyzing renewable energy potential and informing decisions. The web platform provides free renewable energy data, analytical tools, and technical assistance to developers, policymakers, and decision makers in developing countries.

Learn more about RE Explorer: www.re-explorer.org.

Greening the Grid

Greening the Grid is a platform for expertly curated information, tools, and technical assistance to support countries in power system transformation and grid modernization through three approaches:

Grid Integration: The Grid Integration Toolkit provides state-of-the-art resources to assist developing countries in integrating variable renewable energy into their power grids.

Renewable Energy Zones: The Renewable Energy Zone (REZ) Toolkit helps power system planners and other stakeholders to connect areas of cost-effective renewable energy generation to the grid through the REZ transmission planning process.

Distributed Photovoltaics (PV): The Distributed Photovoltaics Toolkit provides resources to support developing countries in addressing barriers to safe, effective, and accelerated deployment of distributed solar power.

Learn more about Greening the Grid: www.greeningthegrid.org.

International Jobs and Economic Development Impacts (I-JEDI)

The International Jobs and Economic Development Impacts (I-JEDI) model is a free online tool for analyzing the potential economic impacts and job benefits from wind, solar, biomass, and geothermal energy projects around the world.

Learn more about I-JEDI: www.i-jedi.org.

Resilient Energy Platform

The Resilient Energy Platform provides expertly curated resources, training materials, data, tools, and direct technical assistance in planning resilient, sustainable, and secure power systems. The platform enables decision makers to assess power sector vulnerabilities, identify resilience solutions, and make informed decisions to enhance power sector resilience at all scales.

Learn more about the Resilient Energy Platform: www.resilient-energy.org.

Country Support

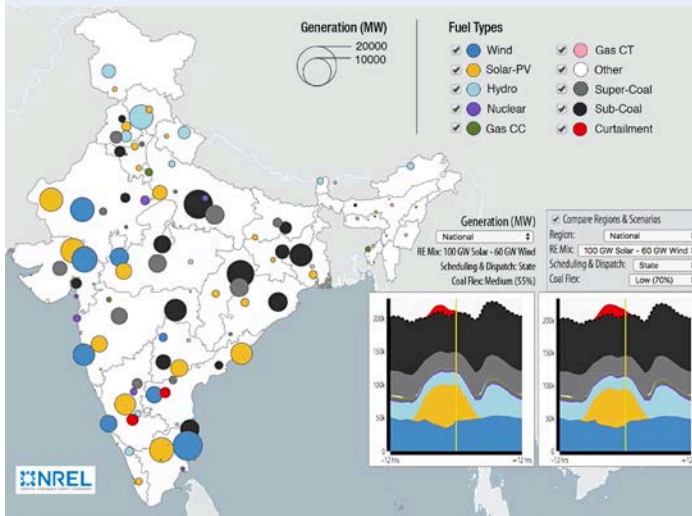
In addition to the technical platforms, the Partnership addresses country-specific challenges through targeted, fully customized technical assistance. These activities, often based on the technical platforms, address technical energy sector challenges that may include planning, policy formulation, and market barriers.

The Financial Impacts of DPV to Utilities in Thailand

Thailand is currently implementing a 60-MW distributed PV (DPV) program amid growing consumer interest in this technology. The USAID-NREL Partnership, with support from Chulalongkorn University's Energy Research Institute, addressed distribution utility concerns about DPV deployment, assessing the impact of DPV on utility revenues and customer electricity rates. Results showed that with proper planning, distribution utilities should see minimal impacts on their financial health from an increase in DPV deployment in the medium- and long-term, and that DPV can provide substantial benefits to Thai energy stakeholders.

Evaluating Clean Energy Goals in India

Greening the Grid [2], an Indian-led study, showed that the Government of India's target of 175 gigawatts (GW) of installed renewable capacity by 2022, including 100 GW of solar, is technically achievable. The study team, comprised of India's Central and Regional Power System Operator, NREL, and Lawrence Berkeley National Laboratory, with support from India's Ministry of Power and USAID, demonstrated that the nation's power system can be balanced at operational timescales and identified actions that will enable successful wind and solar integration.



The Greening the Grid study used a state-of-the-art model, illustrated above, to show how the India power system balances generation and demand for every 15-minute interval of the year. States can successfully integrate high levels of wind and solar through enhanced coordination and increased flexible operation of existing thermal plants.

References:

- [1] Bloomberg New Energy Finance. November 7, 2017. *New Energy Outlook 201-Solar*.
- [2] D. Palchak, et al. "Greening the Grid: Pathways to Integrate 175 Gigawatts of Renewable Energy into India's Electric Grid Vol. I—National Study and Vol. II—Regional Study. NREL. <https://www.nrel.gov/docs/fy17osti/68530.pdf>. June 2017.

www.nrel.gov/usaid-partnership



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