



USAID
FROM THE AMERICAN PEOPLE

NREL
Transforming ENERGY

The USAID-NREL Partnership

Advancing clean, resilient, and equitable energy systems in the developing world by drawing on expertise from the U.S. Department of Energy national laboratories

The U.S. Agency for International Development (USAID) and the U.S. Department of Energy (DOE) National Renewable Energy Laboratory (NREL) maintain a dedicated interagency agreement to accelerate the global clean energy transition, mitigate climate change, and promote resilient and equitable energy system development within emerging economies.

Through the **USAID-NREL Partnership**, USAID Missions and their host country counterparts can access the best-in-class research, resources, and expertise housed within the DOE national laboratory network to tackle critical energy sector challenges experienced in the developing world. The Partnership delivers tailored technical assistance packages framed around four interrelated strategic pillars:

Advanced and frontier power systems, innovation and grid interaction in buildings, electric mobility and sustainable transport, and integrated energy solutions. Just energy transitions and rigorous data analytics are foundational themes considered in the design and implementation of all Partnership interventions.

USAID-NREL PARTNERSHIP STRATEGIC PILLARS

Provision of demand-driven technical assistance through USAID Mission engagements, global knowledge platforms, and project implementation



ADVANCED & FRONTIER POWER SYSTEMS

Utility-scale clean energy generation, transmission, distribution



INNOVATION & GRID INTERACTION IN BUILDINGS

Energy efficiency, distributed generation, storage



ELECTRIC MOBILITY & SUSTAINABLE TRANSPORT

Electric vehicles, charging infrastructure, hydrogen



INTEGRATED ENERGY SOLUTIONS

Holistic energy sector scenario planning, impact assessments, and programming



JUST ENERGY TRANSITIONS

Gender equity, air quality, resilience, job creation, energy access – foundational to all USAID-NREL activities

BEST-IN-CLASS ENERGY DATA & ANALYTICS





Photo from iStock 1067310138

How We Work

The USAID-NREL Partnership works with USAID Missions and their stakeholders to identify country-specific energy sector priorities and jointly design and implement responsive and high-impact interventions. Illustrative means of technical assistance delivery include:

Energy system analysis and collaborative tool development

The Partnership engages with utilities, ministries, and project developers on energy system modeling, policy/regulatory review, strategic planning, as well as on the development and testing of customized tools for in-depth energy sector analysis. NREL also conducts studies with partner countries to determine how they can meet future electricity demand with a 100% clean energy system.

Renewable Energy Integration

in India: This landmark modeling effort confirmed the technical and economic viability of integrating 175 GW of renewable energy into the national grid by 2022. Informed by this study, India subsequently deployed over 115 GW of renewable energy into its power system.¹

Air Quality and Health Benefits Modeling for Southeast Asia:

This multiyear study estimates the benefits to air quality and health derived from increased renewable energy deployment. Through this analysis, governments and organizations can make informed energy planning and policy decisions that involve closer consideration of social and environmental externalities.

Replicable and scalable pilot projects

Through engagement with local technicians, the labs pilot first-of-their-kind interventions with a focus on enabling scale and replication in other countries and contexts.

Sustainable Transportation

Solutions in Mexico: The Partnership supports municipal governments in Mexico with transport electrification programs designed to reduce carbon output, provide equitable transport solutions that maintain the reliability and resiliency of the electricity grid, and stimulate economic growth. This portfolio of sustainable transportation projects is replicable by other subnational governments that aim to modernize their transportation sector and reduce emissions.

Demand-Side Management (DSM) Benefits in South Africa:

The DOE's Lawrence Berkeley National Laboratory is assisting the South African Ministry of Energy with developing a DSM strategy to conserve 600 MW in the short term to reduce load shedding and maximize energy savings. Improved DSM alleviates pressures on the grid that cause rolling blackouts, can abate costs associated with building new generators and transmission lines, and saves customers money. Such interventions can be scaled geographically to support other ministries in the region experiencing similar challenges.

Interactive exchanges and study tours at laboratory facilities

NREL's state-of-the-art laboratory campus offers a variety of experiential learning opportunities. Representatives of partner countries can plan short- or long-term visits to work with leading scientists on-site and develop actionable energy sector plans to implement upon their return home.

Philippines Competitive Renewable Energy Zones (CREZ) Research

Exchange: Through the Partnership's support for the Philippines' CREZ development process, NREL hosted a cohort of modeling technicians from the Philippines for a month-long research exchange. The group worked with NREL's power sector experts to refine key models used in the country's expansion planning for its transmission network into regions of high renewable energy potential.

Women in Power System Transformation (PST) Internship

Program: The Women in PST initiative sponsored seven women graduate interns at NREL and the Electric Power Research Institute. Internship activities were designed to expand professional networking opportunities, build technical knowledge, and increase agency and empowerment. At the conclusion of the program, interns presented their technical work and discussed how their experiences will help strengthen their decision-making and drive development of dynamic energy solutions.

¹ Physical Progress, Ministry of New and Renewable Energy. <https://mnre.gov.in/the-ministry/physical-progress>.

Targeted workshops, trainings, and peer learning

NREL develops and facilitates demand-driven knowledge exchange and capacity building activities across the Partnership's technical focus areas. Exchanges can be flexibly designed to meet host countries' needs and priorities, ranging from focused trainings with specific groups to broader educational programming.

Transmission Planning and Software Training in Tanzania:

In conjunction with Power Africa, USAID and NREL are helping Tanzania expand their renewable energy generation capacity safely and reliably. NREL hosted workshops with Tanzania's electricity system operator staff focused on using advanced power system modeling software for renewable energy integration. The workshops were designed to maximize hands-on activities so attendees could immediately apply new skills to real-world circumstances.

Best-in-class energy data collection, analysis, and dissemination

The Partnership uses multiple geographic information systems to produce data, maps, models, and visualizations foundational to climate-smart decision-making, evidence-based policy planning, and clean energy investment mobilization.

High-Fidelity Solar Resource Data for Southeast Asia: Through the **Advanced Energy Partnership for Asia**, NREL produced high-resolution multiyear solar resource data for countries throughout Southeast Asia. Policymakers, project implementers, and academic researchers have used this data set to directly inform region-wide renewable energy planning, investment, and deployment decisions.

Unified lab support

Country partners are not limited to working with a single laboratory—they can also leverage unique expertise from across DOE's laboratory network for cross-sector support and implementation assistance.

Power Sector Transformation in Pakistan: USAID, NREL, Pacific Northwest National Laboratory, and Argonne National Laboratory are working with local Pakistani institutions on a suite of grid expansion, electric vehicle deployment, and integrated energy-planning projects to help the Government of Pakistan reform its power sector and increase sustainability, reliability, and affordability.

Inclusive stakeholder engagement and collaboration with USAID implementing partners

The USAID-NREL Partnership is a valuable complement to existing USAID implementing partners, capable of scoping work around ongoing or planned energy sector programming, leveraging implementing partners' on-the-ground presence to maximize impact, and offering strategic approaches to stakeholder engagement.

Collaborative Support for Colombia's Energy Transition: USAID, NREL, and USAID implementing partners Tetra Tech and the United States Energy Association are working together to advance Colombia's clean and equitable energy transition by providing training targeted to women, youth, and indigenous communities in all aspects of renewable energy deployment—helping underrepresented groups gain access to professional opportunities within the energy sector.



Photo from iStock 1155899168

Global Knowledge Platforms

The USAID-NREL Partnership provides free, state-of-the-art online resources pertaining to common and critical challenges faced in scaling up the deployment of advanced energy systems. These **Global Knowledge Platforms**, driven by country demand and NREL's domestic and international experience, are widely applicable to developing nations and host a combination of analytical tools, training materials and recordings, and knowledge products.



Greening the Grid www.greeningthegrid.org

A platform for expertly curated information to support countries in power system transformation and grid modernization, offering toolkits and resources across five technical focus areas: grid integration, distributed photovoltaics, renewable energy zones, electric vehicles, and energy storage.



International Jobs and Economic Development Impacts (I-JEDI) model www.i-jedi.org

A free online tool for analyzing the potential economic impacts and job benefits from wind, solar, biomass, and geothermal energy projects around the world.



Renewable Energy (RE) Explorer www.re-explorer.org

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



Resilient Energy Platform www.resilient-energy.org

A platform designed to help decision makers assess power sector vulnerabilities, identify resilience solutions, and enhance power sector resilience at all scales. The Resilient Energy Platform also hosts the cybersecurity resilience toolkit, which addresses common cybersecurity challenges faced by small and under-resourced utilities.



EE4D www.ee4d.org

A global platform that helps countries with policy, planning, and deployment support for energy efficient development and smart technologies uptake through Lawrence Berkeley National Lab.

Interested in collaborating with the USAID-NREL Partnership?
Reach out to our team: www.nrel.gov/usaidth-partnership/contact-us.html



www.nrel.gov/usaidth-partnership

This work was authored, in part, by the National Renewable Energy Laboratory (NREL), operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by the United States Agency for International Development (USAID) under Contract No. IAG-22-22434. The views expressed in this report do not necessarily represent the views of the DOE or the U.S. Government, or any agency thereof, including USAID.

NREL/FS-6A20-84665 | December 2022
NREL prints on paper that contains recycled content.



USAID
FROM THE AMERICAN PEOPLE

NREL
Transforming ENERGY