

# Renewable Energy Pillar

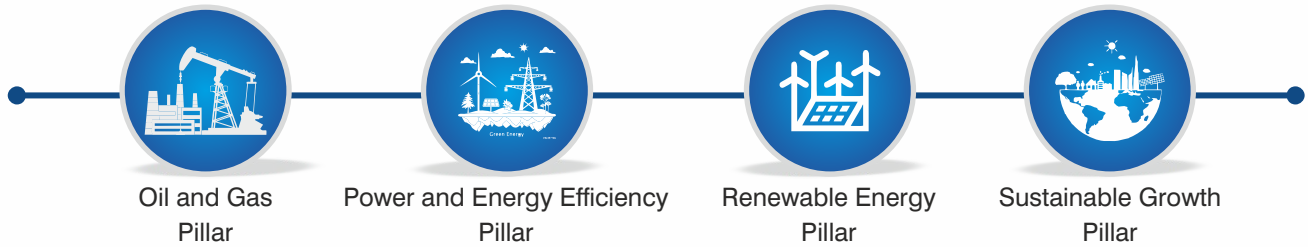
## U.S.- India Strategic Energy Partnership



### Highlights 2019-2020

The US-India Strategic Energy Partnership (SEP), launched in April 2018 by U.S. Energy Secretary Perry and Indian Minister of Petroleum and Natural Gas and Steel Pradhan at the direction of President Trump and Prime Minister Modi, set the stage for deeper and more meaningful engagement through Government and Private Sector Cooperation using an integrated interagency approach. The SEP’s focus is to elevate market-led energy security, expand innovation across the energy sector, deepen bilateral strategic alignment, and increase industry and stakeholder engagement. It also positions India as a key partner in the Asia Enhancing Development and Growth through Energy (Asia EDGE) initiative. The SEP is coordinated by the U.S Department of Energy and the Government of India, Ministry of Petroleum and Natural Gas.

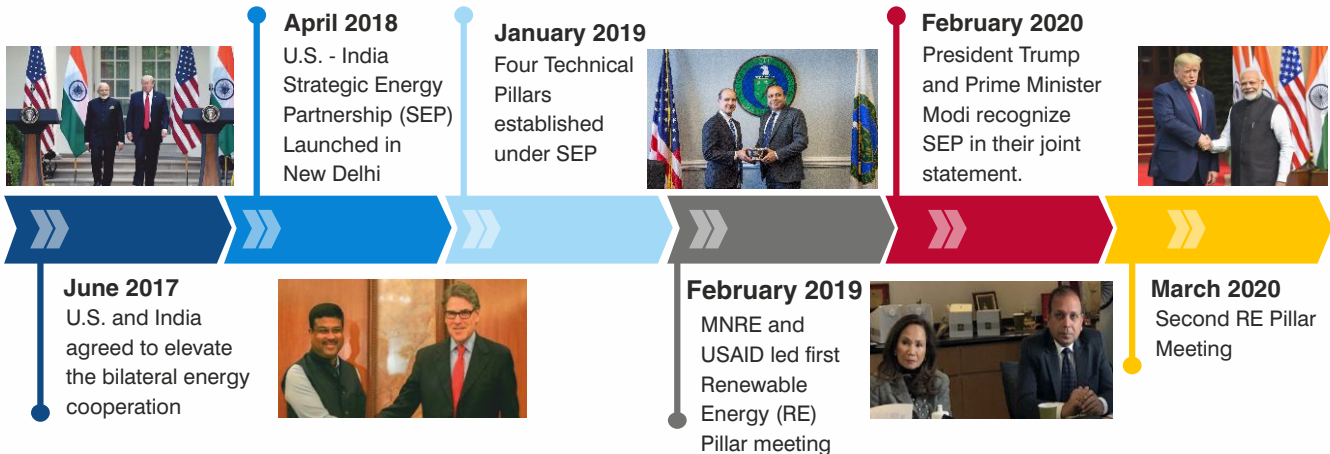
### Strategic Energy Partnership



### Renewable Energy Pillar

The Renewable Energy Pillar of SEP aims to support: 1) the development and deployment of affordable, green, clean, reliable and sustainable energy technologies to enhance equitable economic development; 2) universal energy access and energy security in India, South Asia, and the Indo-Pacific region; and 3) facilitate trade between the two countries and support India in achieving its RE target of 175 GW of RE by 2022. The RE Pillar is Co-chaired by Mr. Dinesh Jagdale, Joint Secretary International Cooperation, Ministry of New and Renewable Energy (MNRE), Govt of India and Mr. Javier Piedra, Deputy Assistant Administrator, Asia Bureau, United States Agency for International Development (USAID).

### SEP Renewable Energy Pillar-Timelines



# RENEWABLE ENERGY PILLAR KEY ACHIEVEMENTS

- Developed and deployed the Demand Forecasting module of the DISCOM Procurement Optimization & Smart Estimation (REPOSE) software in the states of Assam and Jharkhand. This tool helps electricity distribution utilities undertake mid- to long-term energy planning.
- Supported Central Electricity Regulatory Commission (CERC) in launching real-time trading of electricity.
- Quantified the benefits of distributed solar through the “value of solar” assessment for Gujarat and Jharkhand to drive a new compensation model for rooftop solar.
- Developed Quality Assurance Framework for Solar PV Rooftop sector to improve quality and safety.
- Supported RE integration by successfully operating a Gujarat thermal plant at 40 percent plant load.
- Informed Government of India's “Roadmap on the Flexible Operation of Coal Power Plants.”
- 50+ innovative distributed renewable energy solutions developed for agriculture, health, education and other livelihood activities.
- Established \$100 million credit guarantees with Indian financial institutions.
- Provided \$200 million in U.S. Development Finance Corporation (DFC) loans for solar power plants in Rajasthan.
- Supported the design of round-the-clock tenders by the Solar Energy Corporation of India (SECI)/MNRE. The tenders were worth \$4 billion in investments.
- Supported development of regulations across 17 states for renewable energy planning, rooftop solar, and grid integration.
- Trained 2300+ professionals on RE grid integration, strategic planning of renewable energy, distributed solar technologies, and system-friendly procurement practices.
- Facilitated 14 peer-to-peer partnerships among U.S. and Indian states.
- Launched the Flexible Resources Initiative (FRI) which will develop cost-effective strategies to ensure power system has adequate flexibility to support India's energy transition over the next decade.
- Launched collaboration between the U.S. Department of Energy (DOE) National Labs and MNRE National Institutions under the South Asia Group for Energy (SAGE) on clean energy research and development.
- Launched a Hydrogen Task Force to assess technology status, study innovative policy options and make recommendations to help scale up technology and drive down costs of deployment.



*“We are very proud of our partnership with the Ministry of New and Renewable Energy. Through the PACE program, we were able to make significant contributions to India's renewable energy journey. Now our partnership elevated through the Renewable Energy Pillar of U.S.-India Strategic Energy Partnership should align with the needs of the next phase of renewable energy deployment in India.”*

**Gloria Steele, Senior Deputy Assistant Administrator, Asia Bureau, USAID**



*“India has highly ambitious renewable energy plan to establish 450GW of generation capacity by 2030. The RE Pillar can help India achieve these goals by bringing next-generation technologies, private sector investments and establish India as a hub for manufacturing of advanced technologies to serve not only the Indian market but also the larger market in South Asia and Africa.”*

**Anand Kumar, Ex Secretary, Ministry of New and Renewable Energy, Govt of India**

## Renewable Energy Pillar Co-chairs



**Mr. Javier Piedra**  
Deputy Assistant Administrator, Asia Bureau,  
United States Agency for International Development



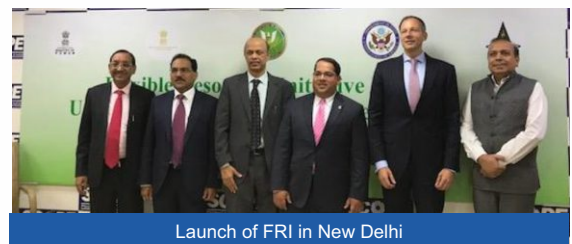
**Mr. Dinesh Jagdale**  
Joint Secretary,  
Ministry of New and Renewable Energy

# RENEWABLE ENERGY PILLAR SUCCESS STORIES

## Policy, Institutional and Regulatory

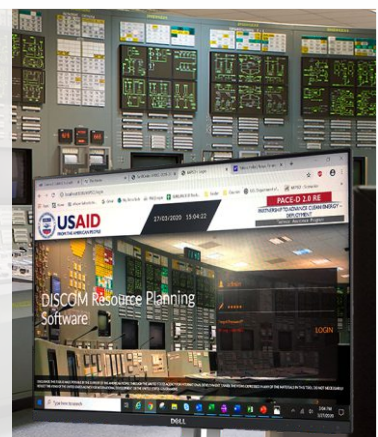
The RE Pillar supports development and implementation of new and innovative policies, regulations, and institutional measures that facilitate the increase of RE deployment (including distributed solar). It also supports policy makers in attracting investment from the private sector, improving energy planning and grid integration, and building partnerships.

- **Supported Grid Integration of Renewable Energy:** USAID's Greening the Grid-Renewable Integration and Sustainable Energy (GTG-RISE) initiative supported CERC in the launch of the Real-Time Market (RTM) for India. RTM, launched in June 2020, will support RE integration by shifting the country from long-term contracts to electricity spot markets. The initiative also brought greater uniformity to RE grid integration in 14 states by supporting regulations for Deviation Settlement Mechanism (DSM), Forecasting and Scheduling (F&S) Regulations, and SAMAST (Scheduling, Accounting, Metering and Settlement of Transactions in Electricity) implementation.
- **Developed strategies to scale Rooftop Solar:** USAID in partnership with the National Renewable Energy Laboratory (NREL) and the Lawrence Berkeley National Laboratory (LBNL) developed a methodology for arriving at the value of solar for rooftop installations in Gujarat and Jharkhand. This Value of Solar Assessment is based on the experience from the U.S.. It will help state regulators, policy makers, and utilities make informed decisions on the cost benefits of promoting rooftop solar through instruments like Net or Gross Metering. USAID's PACE-D 2.0 RE also developed the regulatory framework for the deployment of distributed solar plus storage to further enhance the value of distributed solar and encourage adoption of efficient energy storage technologies such that they become cost-effective and widely available.
- **Forged Partnerships between U.S. and Indian States:** The State and Urban Initiative facilitated the signing of 14 agreements between states in the U.S. and India for greater cooperation on policy and regulatory frameworks for RE Integration, energy efficiency, and Electric Vehicles (EVs).
- **Launched New Effort for Promoting Grid Flexibility:** The U.S. State Department launched FRI to identify actionable pathways for ensuring adequate flexibility in the Indian grid through cost-effective strategies. The initial findings were presented to the Government of India in May 2020.



Launch of FRI in New Delhi

- **Improved Planning of Renewable Energy at the State Level:** The USAID's PACE-D 2.0 RE initiative in partnership with MNRE and the states of Assam and Jharkhand is developing a Strategic Energy Planning Framework/Tool for RE Deployment based on international best practices and a state-of-the-art tool. This will help improve the precision of demand forecasting over the medium- to long-term and facilitate resource planning and procurement for portfolio optimization. The Demand Forecasting module, the first of the three modules, was delivered to the two distribution utilities in April 2020. PACE-D 2.0 RE also developed the model regulations for load forecasting, resource mapping, and power procurement optimization.



## Demonstration, Assessment, and Tools

The RE Pillar will enable effective and faster actions by key stakeholders through a range of interventions to support effective decision making such as market assessments, adoption of international best practices, demonstration of new and innovative technologies, and deployment of business models, policies and decision-making tools.

- **Demonstrated New Utility-Based Business Model for Low-paying Consumers:** USAID and the states of Jharkhand and Assam developed a pilot for the deployment of solar rooftop installations with low paying consumers. This SuperRESCO (Super Renewable Energy Service Company) based on a Public Private Partnership (PPP) model allows the market to deploy systems on low-paying consumers premises, reduce utility losses, and provide a model for replication across the country.



Powering a Village

- **Introduced System Friendly Procurement Strategies for Renewable Energy:** USAID's PACE-D 2.0 RE program collaborated with Solar Energy Corporation of India (SECI), Indian Railways, and generation companies to introduce new and innovative systems-friendly procurement models for renewable energy to minimize the need for grid integration efforts. SECI took inputs from the project in designing three tenders of 6GW capacity, worth \$4 billion of investments. USAID is engaging the Indian Railways to evaluate the adoption of these approaches to procure RE power for the Railways traction needs.

- **Enhanced Flexible Operations of Thermal Projects for RE Grid Integration:** USAID's GTG RISE initiative assisted Generation Companies (Gencos) like NTPC and Gujarat State Power Generation Utility (GSECL) in increasing flexibility of power plant operations. The GSECL successfully operated its 500 MW coal plant at a 40 percent load, with GTG providing key inputs for the nationwide roadmap for flexible operations of coal-power plants along with the pilot analysis with NTPC.



GTG-RISE team visits Coal Flexible Generation Pilot at KPCL Plant

- **Advanced Utility-Led Demand Aggregation Pilots:** The U.S.-India Clean Energy Finance Task Force (CEFTF) supported utility-led, community-based demand aggregation pilots in the states of Bihar and Delhi to strengthen utility solvency and develop a market-based pathway for the solar rooftop segment, do away from subsidy programs and expand such business and finance models to support greater grid flexibility.
- **Launched Hydrogen Task Force:** In collaboration between MNRE, DOE and USISPF, launched a new Hydrogen Task Force to assess technology status, study innovative policy options and make recommendations to help scale up technology and drive down costs of deploying hydrogen technologies for reduced emissions and enhanced energy security and resiliency.

## Financing Mechanisms

The RE Pillar will work with a range of public and private sector entities to address challenges to private sector investments. The aim is to leverage limited public funds to mobilize large-scale private capital.

- **Supported Innovation in DISCOM Procurement of RE for Commercial and Industrial (C&I) Consumers:** USAID in collaboration with Jharkhand and Assam designed business models that will allow C&I consumers to benefit from cheaper RE power while remaining within the DISCOM ecosystem through green tariff programs, green power subscription, and Super RESCO (Super Renewable Energy Service Company) programs for C&I. This will support C&I customers that have limited capability or interest in investing directly in renewable energy.
- **Established Credit Guarantee for Small RE Developers and Manufacturer:** USAID partnered with Ratnakar Bank and Caspian Impact Investment to establish a \$100 million USD credit guarantee program. Since its launch, Ratnakar Bank has lent \$25 million for clean energy projects, expanded its portfolio of small renewable energy by \$100 million, increased loan size by 50 percent, and reduced the need for collateral from 98 percent to 42 percent. USAID and the DFC is now working on a new \$25 million USD guarantee for the adoption of rooftop solar by small and medium enterprises.
- **Supported Investments in the RE Sector:** The U.S. Development Finance Corporation (DFC) approved \$142 million in loans to ReNew Power loans. DFC also approved \$50 million for Sitara Solar Energy to build and operate solar power plants in Rajasthan.



## Capacity Building and Best Practices

This sub-component aims to facilitate the development of training programs, knowledge tools, and platforms that enhance RE deployment.

- **Developed Best Practices to Enhance Solar PV Rooftop Quality through a Quality Assurance Framework:** MNRE-USAID PACE-D 2.0 RE program facilitated the adoption of better-quality standards and ensured better-quality assurance. USAID, working with NREL, suggested the deployment of three institutional solutions: 1) Vendor rating; 2) Module quality certification at a site; and 3) DISCOM safety inspections. USAID is now further developing the Vendor Rating Framework for adoption by Indian stakeholders.
- **Trained Key stakeholders on Renewable Energy:** The USAID programs trained and capacitated around 2300+ professionals, policymakers, utilities, etc. on grid integration, RE Strategic Planning, distributed solar, and new procurement approaches. USAID's GTG RISE initiative-built peer-peer partnerships among U.S. and Indian regulators and utilities, conducted study tours, and international workshops and exchange programs. The U.S. Department of Energy (DOE) through NREL is also assisting ISA in developing training modules for ISA's Solar Technology Application Resource Centre (STAR-C), providing capacity building, and no-cost technical assistance to ISA member governments.
- **Supported Solar Resource Assessment in India:** The U.S. DOE, through NREL, enhanced the accuracy of India's solar resource maps to help identify locations for high-quality, bankable solar energy projects to accelerate adoption of solar energy in India, in collaboration with the National Institute of Solar Energy.
- **Launched partnership between the U.S. DOE National Labs and MNRE National Institutions:** As a part of USAID's South Asia Group for Energy (SAGE), U.S. DOE National Laboratories, namely, LBNL, NREL and the Pacific Northwest National Laboratory (PNNL) will partner with MNRE National Institutions (National Institute of Wind Energy and National Institute of Bio-Energy) to enhance capacities within MNRE National Institutions on the emerging areas of RE.



