March 2014

PACE UPDATE

A Newsletter on the U.S.-India Partnership to Advance Clean Energy

A warm welcome to *PACE Update* - the inaugural newsletter on the U.S.-India Partnership to Advance Clean Energy Deployment (PACE).

Working under the auspices of the U.S.-India Energy Dialogue, PACE combines the resources of several U.S. agencies and Government of India Ministries. PACE focuses on spurring low-carbon inclusive development by supporting research and deployment of clean energy via its two components: PACE-R (research) and PACE-D (deployment).

This newsletter marks the beginning of a new communication platform to update stakeholders on the various clean energy initiatives under the PACE. Newsletter archives will be available at www.pace-d.com for your viewing!

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USAID/India

Promoting Energy Access through Clean Energy (PEACE)

During Prime Minister Singh's visit to the United States in September 2013, Minister of New and Renewable Energy Dr. Farooq Abdullah and Secretary of Energy Dr. Ernest Moniz agreed to a Memorandum of Understanding (MOU) between the Governments of India and the United States of America to launch the Promoting Energy Access through Clean Energy (PEACE) initiative as a new track under the PACE.

Indian Minister of New and Renewable Energy Dr. Farooq Abdullah

U.S. Secretary of Energy Dr. Ernest Moniz

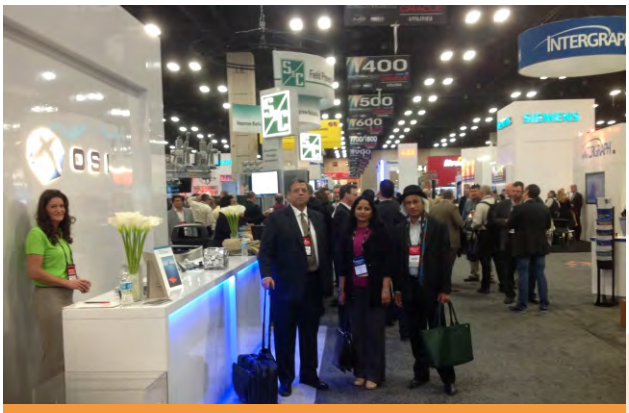
Both governments highlighted the potential for significant progress on this issue, in order to improve the lives of millions of Indians and to position India as a leader in global efforts for universal energy access. PEACE is aimed at harnessing commercial enterprises to bring clean energy to those currently un-served and under-served, and to develop best practices and lessons learned.

The four broad areas of PEACE include: sharing best practices and approaches; finance; technology innovation, standards, testing, and certification; and skill development and information sharing. Two activities already identified under the PEACE initiative are a PACEsetter fund, and an off-grid clean energy alliance. The USD 8 million "PACEsetter Fund" will provide seed financing for innovative small-scale off-grid business models and technologies to help businesses at early stage to grow. The fund will fill the market gap for very early capital and help scale up innovative rural off-grid clean energy solution providers. India and the United States have committed in principle for joint funding of PACEsetter, starting with equal contributions of USD 4 million each. The new off-grid clean energy alliance will strengthen the ecosystem of entrepreneurs, technologies and business models providing the means to meet the collective needs to bring market based approaches for energy access to scale. It will build partnership to deliver services for: finance; skills and training; testing and certification; policy advocacy; and networking.

Photos courtesy of U.S. Government websites and agencies (or as otherwise indicated).

Department of Commerce

RENERGY 2013: The U.S. Commercial Service participated and delivered remarks on "Advances in Renewable Energy Technology in United States of America" in the International Cleantech Collaboration seminar organized as part of the Renewable Energy Expo and Conference in May 2013 in Chennai.



Indian Delegation led by U.S. Commercial Service at the DistribuTECH 2014

BORG entry into North India: As a part of its initiative to bring U.S. manufacturers of solar power equipment to India, the U.S. Commercial Service facilitated the product launch of BORG Energy in North India in January 2014. Texas-based Borg Inc. specializes in the manufacturing of solar power plants and has rich experience in alternative energy and smart grid technology.

DistribuTECH 2014: Along with Indian Smart Grid Forum, the U.S. Commercial Service led a fifteen member Indian delegation to DistribuTECH 2014 in Texas from January 28-30, 2014. During the event, the Indian delegates were introduced to U.S. smart grid technology providers, and U.S. companies were counseled on market opportunities in India in the smart grid market.

Host U.S. Ex-Im Chairman Fred Hochberg: The U.S. Commercial Service also supported the visit of the Chairman of U.S. Export-Import Bank to Mumbai, Pune, and New Delhi during February 4-7, 2014 where he met senior Government of India officials and other key stakeholders.

Department of Energy

PACE-R

Solar: Highlights from research by the Solar Energy Research Institute for India and the United States (SERIIUS) include the understanding of the dust and soiling problems in India and a coatings-based mitigation strategy, and development of new polymers. SERIIUS recent highlights also include: improved efficiency and design of Concentrated Solar Power (CSP) specific for applications in India, an analysis of policies and techno-economics of grid-connected PV in India, and the creation of a "Roadmap for Energy Storage" for India. *Lead partners: the U.S. National Renewable Energy Laboratory and the Indian Institute of Science, Bangalore.*

Building Efficiency: Key accomplishments of the U.S.-India Joint Center for Building Energy Efficiency Research and Development (CBERD) include: the development of optimization tools for cool roofs, windows, and facade; and a building benchmarking roadmap and methods for assessing chiller and adaptive thermal comfort performance. CBERD also worked on the development of a luminaire controller, low cost energy meter, micro channel heat exchanger, and measurement and testing equipment. *Lead partners: Lawrence Berkeley National Laboratory and CEPT University.*

Biofuels: The U.S.-India Consortium for Development of Sustainable Advanced Lignocellulosic Biofuel Systems initiated trials on switch grass and sorghum breeding, genetic marker studies to screen for flood and drought tolerance as well as butyric acid production, and nitrogen uptake and use efficiency of switch grass. In addition, an agent-based model of stakeholders along the biofuel value chain has been developed to explore stakeholder behavior and how their decisions affect biofuel production. *Lead partners: University of Florida and Indian Institute of Chemical Technology, Hyderabad.*

Clean Energy Ministerial Meeting

Super-efficient Equipment and Appliance Deployment (SEAD): The SEAD initiative is working with India's Bureau of Energy Efficiency to support a number of equipment and appliance efficiency efforts, including the implementation of the Super-efficient Equipment Programme (SEEP) for ceiling fans. As part of this initiative, the Collaboration on Smart and Efficient Air Conditioning and Space Cooling was launched in June 2013 to facilitate the AC market transformation to super-efficient space-cooling technologies.

Smart Grid: Under the guidance of the Ministry of Power, the Power Grid Corporation of India and the Central Power Research Institute (CPRI) engage with the U.S. DOE through the International Smart Grid Action Network (ISGAN). On March 4-5, 2014, CPRI hosted a workshop for ISGAN's test bed and research facility network, bringing together experts from the United States, India, Japan, and Europe to advance joint work on PV inverter testing protocols.

Integration of Renewable Energy: U.S. DOE supported a series of three-day expert workshops following the 4th Clean Energy Ministerial in April 2013, under the auspices of the 21st Century Power Partnership, focusing on wind integration issues. It also organised a consultation workshop in September 2013 between international experts and the Central Electricity Regulatory Commission to support their development of wind forecasting regulations.

PACE-D

Solar Technology Deployment: U.S. DOE and the National Renewable Energy Laboratory (NREL) collaborated with MNRE and India's National Institute of Solar Energy (NISE) to develop and release: new solar resource data and maps for India using 10-km hourly solar resource data (2002-2011); and PV Watts Calculator for India, a web application that estimates the electricity production of grid-connected roof- or ground-mounted crystalline silicon photovoltaic systems, based on a few simple inputs.

Renewable Energy Purchase: Through a competitive award from U.S. DOE, the World Resources Institute launched the Green Power Market Development Group (GPMDG) in Bangalore and helped five companies including Infosys and Coca Cola to secure collaborative solar procurement in Bangalore.

Building Codes: U.S. DOE, Pacific Northwest National Laboratory and Brookhaven National Laboratory are helping accelerate the successful implementation and enforcement of India's Energy Conservation Buildings Code (ECBC) at the local level. Recent accomplishments include the development of several sets of training materials, including an introductory training on ECBC requirements, and on compliance-checking procedures and requirements.

Overseas Private Investment Corporation

Funding for Solar Project: OPIC made its initial disbursement under the AST Telecom Solar Private Limited ("AST Telecom") direct loan in February 2014. The disbursement of approximately USD 18.6 million was under OPIC's USD 150 million loan facility with AST Telecom, which provides solar hybrid power systems to telecommunication tower operators with either no access or unreliable access to the electrical grid.

Funding under Consideration: Currently OPIC is conducting due diligence for three RE projects in India:

- USD 20 million direct loan facility to be used for the build-out of a portfolio of rooftop solar projects in various Indian cities.
- USD 47 million investment guarantee for the build-out of a 50 MW wind generation farm in Maharashtra.
- USD 50 million direct loan to be used for the build-out of a 100 MW wind generation farm in Rajasthan.

U.S. Agency for International Development and Department of State

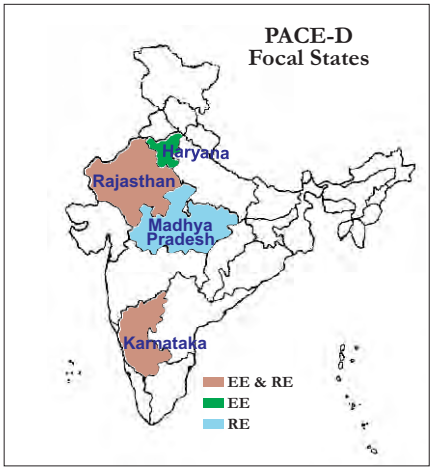
PACE-D TA Program

Clean Energy Finance: The program developed two reports on energy efficiency and renewable energy financing recommending innovative financing mechanisms. The program is in advanced stages of discussions with host organizations to implement financial instruments such as the Corporate Energy Audit Program. A detailed concept note was also developed for an off-grid fund.

Alok Srivastava, Joint Secretary, MNRE; R.P Watal, Secretary, MNRE; Jyoti Arora, Joint Secretary, MOP; and S. Padmanabhan, USAID/India releasing the clean energy finance reports in New Delhi in October 2013

Energy Storage: The program completed an assessment of the role of energy storage technologies for renewable energy deployment in India. This assessment mapped key energy storage technologies (costs, performance and maturity levels), analyzed potential energy storage applications for renewable energy deployment, and proposed an approach for an energy storage roadmap for India.

Institutional Strengthening in Focal States: Four states have been identified for support under the PACE-D TA Program. A detailed project report for a Centralized Monitoring Centre for off-grid solar systems in Madhya Pradesh has been developed. For Rajasthan, the program developed a state action plan and a white paper on a net-metering scheme. The program is also engaged in discussions with Haryana Electricity Regulatory Commission to identify activities leading towards the signing of an MOU.



Support GOI in Smart Grids Deployment: USAID via its PACE-D TA Program is building the capacity of the 14 utilities implementing the smart grid pilots. It conducted three training programs and one study trip to the U.S. on smart grid. The program is also supporting Ministry of Power in developing a draft outline for the smart grid regulatory framework under the guidance of a technical committee set up by the Ministry.

ECBC Technical Update: The program is supporting BEE in the technical update of the ECBC. Towards this, technical and steering committees, and working groups, were established to review and oversee the update process of ECBC. A stakeholder consultation was organized to discuss the potential for deployment of low-energy comfort systems in India, and a draft report on "HVAC Market Assessment Study and Strategies for Market Transformation" has been prepared.

Best Practices Manual for Indian Supercritical Plants: The program developed a best practices manual on supercritical technologies which included lessons learned in the United States. The manual will help Indian power producers improve their operational efficiency, and safety and productivity in the workplace. The manual was launched at NTPC's summit in February 2014.

Other PACE Initiatives

Development Credit Authority (DCA): USAID is supporting a USD 2.5 million loan guarantee to enable Orb Energy, a clean energy service provider, access to a USD 2 million loan from Deutsche Bank. As a result of the loan, Orb will reach its growth target of 500 branches by 2016 in the states of Karnataka, Tamil Nadu, Kerala, Maharashtra, and Andhra Pradesh.

wPOWER: Swayam Shikshan Prayog (SSP), which is implementing wPOWER, was awarded the Best Innovation: Social Entrepreneurship and Inclusive Business Models award by the Maharashtra State Rural Livelihoods Mission for its business model.

U.S. Trade and Development Agency

Clean Energy for Telecom Towers: USTDA awarded a grant to Idea Cellular Limited to pilot the development of a cleaner energy alternative to diesel to power Idea's telecom towers. The pilot, which is being carried out by ECP member company ICF International, will assess the technical, economic and financial viability of deploying solar hybrid methanol-based fuel cell systems.

U.S. Ambassador to India Nancy J. Powell and Himanshu Kapania, Managing Director, Idea Cellular signing the agreement

DSM Pilot Project: USTDA signed a grant for the Mumbai Demand Side Management (DSM) Pilot Project with Reliance Infrastructure Limited in May 2013, which is being implemented by Innovari. The pilot aims to demonstrate the DSM system's ability to manage peak demand by working with Reliance's industrial and commercial customers.

Smart Grid Test Bed: In June 2013, USTDA awarded a grant to the Central Power Research Institute (CPRI) for the development of a Smart Grid Test Bed in India. The test bed will allow CPRI to perform controlled evaluations of a variety of integrated Smart Grid technologies.

Shale Gas Development: USTDA is sharing the costs of two private sector development projects: 1) a feasibility study to assess the potential for shale gas and shale oil development in Essar Oil's coal bed methane concession areas; and 2) a feasibility study to assess the potential for shale gas in Deep Industries' concession areas.