PACE-D TECHNICAL ASSISTANCE PROGRAM

Quarterly Progress Report
(October - December 2017)

Submitted on January 23, 2018

This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of Nexant Inc. and do not necessarily reflect the views of USAID or the United States Government. This report was prepared under Contract Number AID-386-C-12-00001.

PARTNERSHIP TO ADVANCE CLEAN ENERGY DEPLOYMENT (PACE-D)

Technical Assistance Program

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ACRONYMS

Acronym	Definition
ADB	Asian Development Bank
AEDA	Assam Energy Development Agency
AEP	Annual Energy Production
APDCL	Assam Power Distribution Company Ltd.
APEPDCL	Andhra Pradesh Eastern Power Distribution Company Ltd.
API	Application Programming Interface
APSPDCL	Andhra Pradesh Southern Power Distribution Company Ltd
AREAS	Association of Renewable Energy Agencies of States
AT&C	Aggregated Transmission & Commercial
ATM	Automated Teller Machine
ATEEF	Advisory Team for Energy Efficiency Finance
AVVNL	Ajmer Vidyut Vitran Nigam Ltd.
BEE	Bureau of Energy Efficiency
BESCOM	Bangalore Electricity Supply Company Ltd.
BHEL	Bharat Heavy Electricals Limited
BPG	Best Practices Guide
BRPL	BSES Rajdhani Power Ltd.
BSES	Bombay Suburban Electricity Supply
CAPEX	Capital Expenditure
CBA	Cost Benefit Analysis
CBI	Climate Bond Institute
CCDT	Curriculum and Content Development Team
CE	Clean Energy
CEA	Central Electric Authority
CEAP	Corporate Energy Audit Program
CESC	Chamundeshwari Electricity Supply Company
CEED	Centre for Environment & Energy Development
CFA	Central Financial Assistance
CLIN	Contract Line Item Number
CMC	Central Monitoring Centre
CREDA	Chhattisgarh Renewable Energy Development Agency
CO_2	Carbon Dioxide
CSR	Corporate Social Responsibility
DBMS	Database Management Systems
DHBVNL	Dakshin Haryana Bijli Vitran Nigam Limited
DERC	Delhi Electricity Regulatory Commission
DES – CEIG	Directorate of Electrical Safety and Chief Electrical Inspector to the Government
DOE	Department of Energy

DPR	Detailed Project Report
DRE	Decentralized Renewable Energy
DRE-CF	Decentralized Renewable Energy – Community Fund
DISCOM	Distribution Company
DSM	Demand Side Management
ECBC	Energy Conservation Building Code
EDP	Entrepreneurship Development Program
EE	Energy Efficiency
EELP	Energy Efficient Lighting Program
EESL	Energy Efficiency Services Limited
EI	Electrical Inspectorate
EOI	Expression of Interest
EEFP	Energy Efficiency Financing Platform
EMMP	Environmental Mitigation and Monitoring Plan
EM&V	Evaluation, Measurement and Verification
EPC	Engineering Procurement and Construction
ESCOs	Energy Service Companies
ESAF	Evangelical Social Action Forum
FI	Financial Institution
FOR	Forum of Regulators
FY	Financial Year
GEDA	Gujarat Energy Development Agency
GERC	Gujarat Electricity Regulatory Commission
GERMI	Gujarat Energy Research and Management Institute
GHG	Greenhouse Gas
GIIC	Green Infrastructure Investment Coalition
GOH	Government of Haryana
GOI	Government of India
GOK	Government of Karnataka
GOR	Government of Rajasthan
GOMP	Government of Madhya Pradesh
GW	Gigawatt
HERC	Haryana Electricity Regulatory Commission
HPSEB	Himachal Pradesh State Electricity Board
HVAC	Heating, Ventilation and Air-conditioning
IDF	Infrastructure Development Fund
IDF-MF	Infrastructure Debt Fund – Mutual Fund
IIA	Indian Institute of Architects
IIFCL	India Infrastructure Finance Company Ltd.
IGS	Indian Grameen Service

IOCL	Indian Oil Corporation Limited
IR	Indian Railways
IREDA	Indian Renewable Energy Development Agency Limited
ISGTF	India Smart Grid Task Force
IT	Information Technology
JDA	Jaipur Development Authority
JNNSM	Jawaharlal Nehru National Solar Mission
JVVNL	Jaipur Vidyut Vitran Nigam Limited
KERC	Karnataka Electricity Regulatory Commission
KREDL	Karnataka Renewable Energy Development Limited
kW	Kilowatt
LED	Light Emitting Diode
MEDA	Maharashtra Energy Development Agency
MF	Mutual Fund
M&V	Measurement and Verification
M&E	Monitoring and Evaluation
MFI	Microfinance Institution
MGIRED	Mahatma Gandhi Institute of Rural Energy Development
$mtCO_2$	Metric Tonnes of Carbon Dioxide
$MMtCO_2$	Million Metric Tonnes of Carbon Dioxide
MNRE	Ministry of New and Renewable Energy
MNIT	Malviya National Institute of Technology
MOP	Ministry of Power
MOU	Memorandum of Understanding
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPUVNL	Madhya Pradesh Urja Vikas Nigam Limited
MSP	Microfinance Support Program
MSEDCL	Maharashtra State Electricity Distribution Co. Ltd.
MW	Megawatt
MWh	Megawatt Hour
NCMC	National Level Central Monitoring Centre
NISE	National Institute of Solar Energy
NMEEE	National Mission for Enhanced Energy Efficiency
NOS	National Occupational Standards
NPTI	National Power Training Institute
NRDC	Natural Resources Defense Council
NREDCAP	New and Renewable Energy Development Corporation of Andhra Pradesh Limited
NU	Nalanda University
NSGM	National Smart Grid Mission
NTPC	National Thermal Power Corporation Limited

NZEB	Net Zero Energy Building
OIL	Oil India Limited
O&M	Operation and Maintenance
PACE-D	Partnership to Advance Clean Energy – Deployment
PAT	Perform Achieve Trade
PFR	Pre-Feasibility Report
PMP	Performance Management Plan
PNB	Punjab National Bank
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
PRCBW	Progress Reviews and Capacity Building Workshops
PSU	Public Sector Undertaking
PTM	Program Target Matrix
PV	Photovoltaic
QP	Qualification Pack
RE	Renewable Energy
REIL	Rajasthan Electronics & Instruments Limited
REMCL	Railway Energy Management Company Limited
RERC	Rajasthan Electricity Regulatory Commission
RESCO	Renewable Energy Services Company
RFP	Request for Proposal
RFQ	Request for Quotation
RISL	RajCOMP Info Services Ltd.
RPO	Renewable Purchase Obligation
RPO-CMR	Renewable Purchase Obligation – Compliance Monitoring and Reporting
RPOCS	Renewable Purchase Obligation – Compliance System
RRECL	Rajasthan Renewable Energy Corporation Limited
RVPN	Rajasthan Rajya Vidyut Prasaran Nigam Limited
SBI	State Bank of India
SBICAP	SBI – Capital Markets India Limited
SEAP	Super Efficiency Air Conditioning Program
SERC	State Electricity Regulatory Commission
SECI	Solar Energy Corporation of India
SETNET	Solar Energy Training Network
SIDBI	Small Industries Development Bank of India
Smart-NET	Smart Grid Training Network
SNA	State Nodal Agency
SRET	Solar Rooftop Evaluation Tool
SRS	System Requirement Specification

SCGJ	Skill Council for Green Jobs
TA	Technical Assistance
TCG	The Climate Group
TCCL	Tata Cleantech Capital Ltd.
TERI	The Energy and Resources Institute
TOT	Training of Trainers
TSECL	Tripura State Electricity Corporation Ltd.
TNA	Training Needs Assessment
UDH	Urban Development and Housing Department
UHBVNL	Uttar Haryana Bijli Vitran Nigam Limited
ULB	Urban Local Bodies
UPNEDA	Uttar Pradesh New and Renewable Energy Development Agency
USG	United States Government
U.S	United States
USD	U.S. Dollar
USAID	United States Agency for International Development
USRTP	Unified Solar Rooftop Transaction Portal
VCFEE	Venture Capital Fund for Energy Efficiency
WPAD	Work Plan, Activities and Deliverables
WHU	Waste Heat Utilization

EXECUTIVE SUMMARY

The Partnership to Advance Clean Energy – Deployment (PACE-D) Technical Assistance (TA) Program is a part of the overall Partnership to Advance Clean Energy (PACE) initiative which was launched on July 31, 2012. The six year bilateral program is led by the U.S. Agency of International Development and the U.S. Department of State, and implemented in partnership with the Ministry of Power (MOP) and the Ministry of New and Renewable Energy (MNRE).

The PACE-D TA Program has three key components: Energy Efficiency (EE), Renewable Energy (RE) and Cleaner Fossil Technologies.

This quarterly report presents an overview of the PACE-D TA Program achievements in the reporting period October - December 2017, lists the achievements of all Program indicators vs. the Program targets established in the Performance Management Plan (PMP); and presents progress on the six-year project implementation plan.

During the period 2013-2015, the Program design and approach had to evolve with the changed priorities of the new government whose focus on climate change was strengthened through the consolidation of the conventional and renewable energy sectors under a single ministry and sharper clarity on the national role of RE and EE.

The Program worked in building institutional, individual, financial capacity to enable institutions to propose, adopt and/or implement policies, regulations, plans and strategies that will result in scaling up of clean energy technologies to achieve the outcome of Greenhouse Gas (GHG) emissions reduction. The challenges in implementing a program of such a magnitude at a national level are typically and largely dynamic. Notably, the factors that frequently affect the performance of the program are external in nature, which are beyond the control of the Program. These include: changes in the global scenario with respect to climate change; subsequent modifications in the central and state government priorities, policies and regulations; changes in the national government itself resulting into revised targets and dealing with appointment of new set of administrators, and evolving perspective and approach of the stakeholders in the clean energy value chain, etc. These changing factors have a dominos effect on the timeline in achieving the laid down targets and result in deviation from the original overall Program planning perspective.

The exponential change in the national solar target (100 GW by FY22) has altered the perspective of the states and central governments' approach for the scale up of RE technologies, particularly solar. The Program had to absorb, analyze and reflect the intrinsic priorities of the Government of India (GOI) and align it with the overall target of the Program to reduce Greenhouse Gas (GHG) emissions.

Consequently, developing the institutional and regulatory framework for the solar rooftop became a major priority for the Program which is also a major achievement of the Program.

In terms of skill development within the reporting period, the Program organized twenty seven training programs and ten workshops during the reporting period and trained 893 people.

Similarly, on the EE front, significant resources were allocated to support the Bureau of Energy Efficiency (BEE) in finalizing and launching the Energy Conservation Building Code (ECBC) technical update; and providing TA to the National Smart Grid Mission (NSGM) to finalize its implementation framework.

Of the three focus areas, the Cleaner Fossils component concluded in October 2014. The EE component and RE Component has been extended till February 2018.
In April 2017, USAID sanctioned a new component on “Strengthening Enabling Ecosystem for the Scaling up of Solar Rooftop Projects in Eight States” under the existing RE component. Under this new component, the Program is scaling up its solar PV rooftop interventions to eight new states: Haryana, Punjab, Uttar Pradesh, West Bengal, Assam, Maharashtra, Telangana and Andhra Pradesh, covering 15 utilities. The implementation period for this component will end in May 2018. A host of related activities were implemented during this quarter and the Program has already made considerable progress under this activity.

It is worth mentioning that in spite of the challenges posed by the dynamic clean energy national and state-wide scenario, the Program has exceeded most of its targets and is confidently marching on its way to achieve the rest of the targets envisaged in the contract and subsequently in the revised Monitoring & Evaluation plan approved by USAID.

PACE-D TA PROGRAM

As of Dec 2017

INVESTMENT LEVERAGED
VIA VARIOUS PUBLIC SOURCES FOR CLEAN ENERGY
USD 727.35 MILLION

994,000 METRIC TONNES GHG EMISSION REDUCED

CLEAN ENERGY POLICIES AND REGULATIONS
6 PROPOSED
4 ADOPTED
23 IMPLEMENTED

PERSON HOURS OF TRAINING COMPLETED IN CLIMATE CHANGE
40,902

INSTITUTIONS **14** WITH IMPROVED CAPACITY TO ADDRESS CLIMATE CHANGE

OPERATIONAL RENEWABLE ENERGY INSTALLED (in MW)
552

ENTITY	INTERVENTION	VALUES (MW)	
		PIPELINE	INSTITUTIONAL TARGET
BESCOM-KA	Solar Rooftop		2,300
INDIAN RAILWAYS	Solar Ground-mounted		500
	Solar Rooftop	15	500
IOCL	Solar Rooftop		60
MNRE	MNRE Energy Storage	3	
MPUVNL	Solar Irrigation	29	
	Solar Rooftop	65	2,200
RRECL	Net Metering Policy		2,300
	Solar Rooftop		
NTPC	RE Hybrid	250	
	TOTAL	362	7,860

ACHIEVEMENTS

This quarterly report presents an overview of the PACE-D TA Program achievements in the reporting period October - December 2017, lists the achievements of all Program indicators vs. the Program targets established in the Performance Management Plan (PMP); and presents progress on the six-year project implementation plan.

The major activities carried out by the Program during this quarter include:

Energy Efficiency (EE)

India's rising energy demand needs to be met not only through capacity addition but also through efficient use of energy. This will enable India to meet the twin challenges of energy security and GHG emissions mitigation. The PACE-D TA Program is working across sub-sectors such as Smart Grid, green buildings, industry energy efficiency, financing, policy, and institutional strengthening with the goal of 26 Megawatt (MW) of expected lifetime energy savings from EE or energy conservation. The major activities under the EE component have been completed. The key achievements in the reporting period are:

Smart Grid NSGM Implementation Framework

- The Program organized Study Tour on Smart Grid to Spain, France and Italy consisting of senior officials from Ministry of Power (Government of India), Central Electricity Regulatory Commission (CERC), National Smart Grid Mission (NSGM), Central Electricity Authority (CEA) and utilities from December 2 – 9, 2017.

Renewable Energy (RE)

India is aggressively promoting clean sources of energy, not only to reduce its dependency on fossil fuels and lower its carbon footprint, but also to address issues pertaining to energy access and energy security. The PACE-D TA Program is working closely with the Ministry of New and Renewable Energy (MNRE), state governments and key public and private sector players to accelerate deployment of RE resources in new and emerging areas through innovative applications by supporting pilot projects, institutional capacity building and by increasing access to finance. It is also facilitating large-scale capacity building efforts for training of technical professionals required to meet India's proposed capacity target of 175 GW of RE by 2022.

Solar Photovoltaic (PV) Rooftop Stakeholders

- **Bangalore Electricity Supply Company Limited** (**BESCOM)**
    - Facilitated a cumulative capacity addition of 88 MW of solar rooftop in BESCOM's licensee area as of December 2017.

- **Rajasthan Renewable Energy Corporation Ltd. (RRECL) and Jaipur Vidyut Vitran Nigam Limited (JVVNL) and other State Utilities**
    - Facilitated a cumulative capacity addition of 53.45 MW of solar rooftop under RRECL's scheme and in other utilities' licensee area as of December 2017.

- **Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL)**
    - 10 MW of work has been allocated (additional 5 MW in the reporting quarter) from the 30 MW solar rooftop target being implemented in Madhya Pradesh for which the Program had supported in standardization of rates and selection of contractors.

- **Indian Railways (IR) and Railway Energy Management Company Ltd. (REMCL)**
    - Continued to support IR for the implementation of the initial target of 50 MW of solar rooftop and subsequent implementation of 100 MW of solar rooftop.
    - Of 50 MW of initial target, 6.50 MW has been installed and of the 100 MW subsequent target 3.50 MW has been installed.

Energy Storage

- Submitted revised Detailed Project Report (DPR) and Request for Proposal (RFP) documents to Indian Oil Corporation Ltd. (IOCL) after incorporating comments from IOCL.

RE Hybrids

- Completed Annual Energy Production (AEP) estimation report.
- Shared Infrastructure requirement report, draft white paper on design approach and Detailed Project Report (DPR) and bid management support to National Thermal Power Corporation (NTPC).

Renewable Purchase Obligation (RPO) Compliance Framework and Web Tool

- Conducted the close out meeting and launch of web-based RPO Compliance Monitoring & Reporting System in Jaipur, Rajasthan on November 27, 2017.
- Launched the Generic RPO framework dossier in the 16th Technical Committee meeting at Gir, Gujrat on November 24, 2017.

Training Programs

- Four Training Programs were conducted in the reporting quarter under the PACE-D Program.
- One Entrepreneur Development Program (EDP) on Solar Rooftop, one Study tour on Smart Grid to Spain, Italy and France, one study tour on Solar Rooftop to United States and one training for microfinance institutes (MFIs) on using energy lending handbook were organized.

(Details of the Training Program are given in Section 4 – Events & Trainings)

Microfinance Support Program (MSP)

- Facilitated the sale of 9,781 clean energy products in the reporting quarter taking the total tally of clean energy products sold since program inception to 367,328 through Microfinance Institutions (MFIs), across nine Indian states, with 100 percent women loan clients. [1]
- Leveraged USD 252,541 in loans disbursed and cash sales in the reporting quarter taking the total figure of funds leveraged in this segment to USD 12 million. [2]
- Organized a national-level conference entitled "Microfinance as an Effective Channel for Accelerating Energy Access" in Delhi on December 4, 2017. Over 80 individuals from MFIs, RE product companies, donor agencies and other stakeholders participated in the event.
- Organized three policy briefing and field visits for local policymakers in West Bengal, Odisha and Bihar, respectively, with the key objective of demonstrating to policymakers the role that energy lending through MFIs can play in the country's broader energy goal of 24x7 Power For All.
- Organized a training workshop for MFIs on Nov 16-17, 2017, on using the draft Energy Lending Manual and also took feedback from the participants on the manual.
- Delivered the MFI roundtable entitled "The Promise of Energy Lending for MFIs in India" at the Inclusive Finance Summit on December 11, 2017.
- Organized two workshops on the ESAF partnership model with potential MFI/NGO partners in Delhi and Jharkhand.
- Updated the MSP brochure, impact fact sheet and partner MFI fact sheets, produced two filmlets and a photo essay, as well as a PACE-D MSP knowledge brochure.

Strengthening Enabling Ecosystem for the Uptake of Solar Rooftop Projects in Eight States (Scaling up of Solar Rooftop Adoption and Implementation):

- Participated in the Technical Committee meeting organized by Punjab Energy Development Agency (PEDA) in the state of Punjab.
- Reviewed and submitted comments on Andhra Pradesh Solar Power Policy.
- Finalized Andhra Pradesh Interconnection Framework in consultation with the Distribution Utilities of the state.
- Shared letter of intent with Punjab, West Bengal and Uttar Pradesh to conduct senior management workshop.
- Conducted meeting with NISE to identify key stakeholders to develop and implement National Level Centralized Monitoring Center.
- Discussed with MEDA for becoming co-host for organization of Regional Workshop (for Urban Local Bodies, Real Estate Developers, Households) at Pune

[1] As of October 30, 2017

[2] As of October 30, 2017

Training Programs (Under Solar Rooftop Scale-up Program):

- A total of twenty three training programs on solar rooftop for utility engineers were conducted in the reporting quarter.

Of these:

- One Training of Trainers (TOT) Program on solar rooftop for utility engineers was conducted in Guwahati on November 28, 2017.
- Twenty two training programs on Solar Rooftop for utility engineers were conducted, of which twenty one programs were conducted by partner training institutes – NPTI (Faridabad, Guwahati, Durgapur), MGIRED, AMU and CIRE covering four Utilities (APDCL, PVVNL, WBSEDCL, MSEDCL). One training program on Solar Rooftop for utility engineers was conducted by PACE-D at NISE, Gurugram on October 5-6, 2017.

  (Details of the Training Program are given in Section 4 – Events & Trainings)

1. INTRODUCTION

The six-year PACE-D TA Program was launched in July 2012, with the aim to accelerate India's transition to a high-performing, low-emissions, and energy-secure economy through the development, deployment, and transfer of innovative clean energy technologies. The Program is working at the national and state levels to strengthen EE and RE policy and regulatory frameworks; design effective clean energy programs and pilot projects; and provide technical support for the development of innovative financing mechanisms with both public and private sector partners. The three key components of the Program are:

- **Development Result 1: Energy Efficiency**
  - Improved end use of energy efficiency by scaling up and deployment of energy efficiency technologies.

- **Development Result 2: Renewable Energy**
  - Increased supply of renewable energy through scaling up renewable energy technologies.
  - Strengthening Enabling Ecosystem for the Scale up of Solar Rooftop Projects in Eight States

- **Development Result 3: Cleaner Fossil Technologies**
  - Adoption and accelerated deployment of cleaner fossil technologies and management practices to achieve greater supply side efficiency from existing fossil power generation.

Since its launch, the Program has achieved several milestones. A snapshot of these milestones as of December 31, 2017 is presented below.


PROGRESS SNAPSHOT
PACE-D TA PROGRAM
As of Dec 2017
18
Partnerships Established
Institutional Strengthening Support: Haryana, Karnataka, Madhya Pradesh and Rajasthan.
Clean Energy Finance: The Climate Group and chhattisgarh State Renewable Energy Development Agency.
Renewable Energy: National Institute of Solar Energy and Solar Energy Corporation of India.
Energy Efficiency: Nalanda University and Uttar Haryana Bijli Vitran Nigam Ltd.
Microfinance: ESAF, MSF, Sarala, Swayamshree, SVCL, Saija and Vayam Renewable Ltd.
17
Pilot Projects
Solar Pumps: Basix and Bangalore Electricity Supply Company Ltd.
Net Zero Energy Buildings: Nalanda University and Uttar haryana Bijli Vitran Nigam Ltd.
Solar Rooftop: Indian oil and Indian Railways.
Clean Coal Technologies: Vista Coal Blending (Sipat): Advanced Pattern Recognition Software (Sipat): and Heat Rate Improvement (Chandrapur & Panipat).
Smart Grids: Tripura State Electricity Corporation Ltd. and Ajmer Vidyut Vitran Nigam Ltd.
Clean Energy Finance: Corporate Energy Audit Program (Tata Cleantech Capital)
Microfinance: Sarala, ESAF, Saija, SVCL
6
International Study Tours
Cleaner Fossil Technologies Utility Exchange Program
Smart Grid Study Tour
Renewable Energy Study Tour
MSP Investor Forum-Manila
Smart Grid study tour to Spain, Italy, France
RE study tour to U.S.
2
International Conferences
Cadvanced Technologies and Best Practices for Supercritical Thermal Power Plants
Seminar on Net-Zero Energy Buildings in India
9
Technical Reports
Best Practices Guide: For implementation of state-level solar PV rooftop programs in India.
Issue Paper on Green Bonds in India.
HVAC Market Assessment and Transformation Approach for India.
Assessment of Role of Energy Storage Technologies for RE Deployment in India.
Best Practices Manual for Indian Supercritical Plants.
Smart Grids: An Approach to Dynamic Pricing In India.
Smart Grids: A Roadmap for Communication and Application Interoperability in India.
Financing Renewable Energy in India.
Financing Energy Efficiency in India.
59
Consultation Workshops
40,902
Person-hours of Training
137
Training Programs

PROGRESS SNAPSHOT

ENABLING ECOSYSTEM - SOLAR PV ROOFTOP (NEW SCOPE OF WORK)

As of Dec 2017

2. INDICATORS

This section reports achievements of all of the Program indicators vs. the Program targets established in the Performance Management Plan.

STATUS OF INDICATORS

Sl. No:	Indicators	Program Target	Achievement till September 2017	Achievement till December 2017
1	Number of Institutions with improved capacity to address climate change issues as a result of United States Government (USG) assistance	12	14	Existing: 13 New: 1
2	Clean Energy generation capacity installed or rehabilitated as a result of USG assistance (MW)	714		
	Pipeline		387	362[3]
	Sanctioned		179.75	494.75[4]
	Installed		492.73	552.06[5]
3	Energy saved due to energy efficiency / conservation projects as a result of USG assistance (in MW)	26	79.52	93.42[6]
4	Greenhouse gas (GHG) emissions reduction, estimated in metric tons of CO_2e, reduced, sequestered, and/or avoided as a result of USG assistance	1.4	0.587	0.994[7]

[3] Indian Railways: 15; MPUVNL Solar Rooftop: 65; MPUVNL Solar Irrigation: 29; NTPC RE Hybrids: 250; MNRE Energy Storage: 3
[4] Indian Railways: 137; IOCL: 2.75; MPUVNL: 30; MPUVNL Solar Irrigation: 25, IREDA-SRET: 300
[5] BESCOM Solar Rooftop: 88; Rajasthan Solar Rooftop: 53.45 IOCL Solar Rooftop: 3.00; IREDA-SRET: 20; IREDA-Green Bonds: 100; Renew Power-Green Bonds: 275; Indian Railways: 10; BESCOM Surya Raitha Scheme: 2.59; Bihar Solar Pumps Pilot: 0.023
[6] Out of 373.67 MW capacity savings till Dec 31, 2017, PACE-D attribution is considered as 25 percent
[7] As of 30 Sep 2017

5	Number of person hours of training completed in climate change as a result of USG assistance (M/F)	39,600	38,214	40,902
6	Amount of investment mobilized (in million USD) for clean energy as supported by USG assistance. (Disaggregated by USAID GCC Indicator guidance)	90	679.83	727.35[8]
7	Percent heat rate improvement through adoption and accelerated deployment of cleaner fossil technologies and management practices to achieve greater supply side efficiency from existing fossil power generation (percent of heat rate improvement)	2 percent	2 percent	2 percent
8	Number of laws, policies, strategies, plans, or regulations addressing climate change (mitigation or adaption) and/or biodiversity conservation officially proposed, adopted, or implemented as a result of USG assistance	No fixed target	Proposed: 6, Adopted: 4, Implemented: 23	Proposed: 6[9], Adopted: 4[10], Implemented: 23[11]
9	Number of tools, technologies and methodologies developed, tested and/or adopted as a result of USG assistance	No fixed target	6	6[12]

[8] BESCOM: 97.74; RRECL: 59.13; IOCL: 3.93; BESCOM Surya Raitha: 3.21; Chandrapur: 9.49; HERC-Ujala: 3.90; MFI: 19.40; Green Bonds: 394; BEE: 0.03; MNRE Training: 0.1; WHU-Textile: 0.02; Indian Railways (Financial Closure): 136.40

[9] Karnataka RE Policy, Karnataka EE Policy, Rajasthan EE Policy, Surya Raitha – Grid Connected Solar Pumping Model; NSGM Implementation Framework; WHU Compendium

[10] ECBC TU 2017, MP Agricultural Policy, Energy Storage Demonstration Program, HVAC Implementation Program

[11] Karnataka Solar Policy, Haryana DSM Regulations, Rajasthan Net Metering Regulations, MP Net Metering Regulations, Smart Grid Regulations, Karnataka Gross Metering Regulations, IR Procurement-Documentary Strategy, NTPC RE Hybrid Strategy, MP Vendor Procurement Manual, TCCL-CEAP Strategy, EESL – Super HVAC, SCGJ – NOS & QPs, Smart Grid Pilot, MSP Pilots, TCG Funding, Vayam Pumping – Bihar; 2 DPR for REIL for Neil Island and Havlock island for Ground mounted Solar PV and Energy Storage for their island micro grids; 1 DPR for BHEL in designing Energy Storage of 1 MWH using a combination of three different battery technologies; 4 DFRs for assessment for Solar PV Rooftop in IOCL Refineries in Baroda, Barauni, Panipat - Naptha & Panipat – PPMC; 1 DFR in IOCL Asaoti for Ground mounted Solar PV with Energy Storage

[12] SRET; EE Finance Guidelines; RPO Compliance Tool, Training Tool Kit (EE Finance, Smart Grid, Utility Engineers, Entrepreneurs, Solar Rooftop Proposal Evaluation-Banks), NZEB Portal, Best Practices Guide

3. PROGRESS ON 5 YEAR PROJECT IMPLEMENTATION PLAN

DEVELOPMENT RESULT 1: IMPROVED END-USE ENERGY EFFICIENCY BY SCALING UP AND DEPLOYMENT OF ENERGY EFFICIENCY (EE) TECHNOLOGIES

Task 1: Market Driven Energy Efficiency Technology Deployment

Task 1.1 Smart Grids Electric System

Technical Assistance to Ministry of Power (MOP) on Implementation of Smart Grids Pilots

Objective: The India Smart Grid Task Force (ISGTF), set up by MOP, is an inter-ministerial group set up to provide policy direction to Smart Grid initiatives in the country. In 2012, the ISGTF shortlisted 14 Smart Grids pilots for implementation by various Distribution Companies (DISCOMs) across India. Under these pilots, 50 percent funding was covered through a central grant, and the remaining 50 percent is to be contributed by the respective DISCOM.

Task Description:

The Program, in close association with the MOP, implemented several key activities to build capacity of various stakeholders to successfully implement Smart Grid pilots in the country and enable their scale-up across all DISCOMs. The Program offered the following technical assistance:

- Organized regular Progress Review and Capacity Building Workshops (PRCBWs).
- Prepared technical papers on relevant topics.
- Prepared draft Smart Grid regulations.
- Developed a standardized Smart Grid Training tool-kit and network of institutions to provide training on Smart Grid.
- Developed the institutional framework for operationalization of the NSGM.
- Developed a film on Smart Grid under the guidance of the NSGM/MOP.
- Provided TA to TSECL and AVVNL on Smart Grid pilot projects.

The resultant outcomes of the activities include:

- Opinion papers on communication, dynamic pricing and M&V framework which will result in knowledge dissemination and recent updates on the above subjects.
- Technical assistance to TSECL pilot would result in sensitization of TSECL utility in data capture, analysis, reporting and M&V.
- Institutional framework developed for NSGM will facilitate an enabling environment for Smart Grid, and design of related policies and programs. It will also help to develop new ways of financing, promote new standards and technologies, build the capability of various stakeholders and monitor performance of Smart Grid initiatives implemented in the country.
- Smart Grid regulations will usher greater technology adoption across the value chain in the electricity sector and particularly in the transmission and distribution segments to bring about improvement in efficiency in licensee operations, manage the

transmission and distribution networks effectively, and enhance network security. It will also integrate renewable and clean energy into the grid at both large and distributed generation levels, enhance network visibility, enhance access, improve customer service levels and allow for participation of prosumers in operations of licensees. In addition, this will also help in leveraging USD 83 million previously earmarked public funds utilized to effectively implement Smart Grid pilots.

- Capacity building of fifteen organizations to implement Smart Grid (MOP and 14 DISCOMs) will result in an avoided generation in MWs.
- Basic Smart Grid training module developed by the Program will be used as training material and will be housed in Smart Grid Knowledge Centre. This module will act as basic course material to sensitize utility officials on Smart Grid concepts, functionalities, case studies, monitoring and verification etc. Smart Grid Training Network (Smart-Net) training program is a step towards facilitating the Government of India's target of training 10 percent of utility personnel in Smart Grid functions. TA support of the Program would result in 4,000 person-hours of training.
- AVVNL Smart Grid pilot project is a proof of concept stage project for a period of six months to demonstrate selected functionalities. The pilot enabled the utility to understand the areas of improvement for loss reduction and peak load management and also explore scale up the models.
- The Smart Grid film serves as a training tool which demonstrates how Smart Grid deployment can have a transformative impact on utility operations on the one hand and customers on the other hand.

S.No	Activities	Status
I	**Organization of PRCBWs and launch of technical papers**	
A	Launch of opinion papers on a roadmap for communication and application interoperability	Completed
B	Organization of capacity building workshop I & II	Completed
C	Technical assistance for development of templates for selecting service providers (SI, Request for Proposal (RFP), etc.)	Completed
D	Organization of U.S. study tour	Completed
E	Organization of capacity building workshop III	Completed
F	Launch of opinion paper on Dynamic Pricing	Completed
G	Organization of capacity building workshop IV	Completed
H	Preparation of opinion papers on M&V Framework for Smart Grid pilots and leveraging infrastructure being created under	Completed[13]

[13] Completed but yet to be approved

S.No	Activities	Status
	Restructured Accelerated Power Development and Reforms Program (R-APDRP) for optimal use	
II	**Technical assistance to TSECL**	
A	Selection of pilot for TA	Completed
B	Develop strategy for M&V and baseline development	Completed
C	Capacity building workshop of the Smart Grid project team	Completed - Three workshops conducted.
D	Review of Report Formats	Completed
E	Conceptual Framework for IT Policy	Completed
F	Draft IT Policy	Completed
G	Final IT Policy	Completed
H	Closure Report	Completed
III	**Recommend institutional structure for NSGM**	
A	Review of national and international institutional structures for country level missions/Programs	Completed
B	Develop an Institutional Structure for NSGM outlining the organization and governance structure, operational workflows and coordination mechanisms	Completed
C	Develop the draft Policy framework module for NSGM outlining the key policies required to achieve the Smart Grid goals	Completed
D	Develop the module on Smart Grid Standards outlining the key standards required to achieve the Smart Grid goals	Completed
E	Develop the draft module on NSGM- Business models, outlining the business models for Smart Grid	Completed
F	Develop the draft module on Measurement, Reporting and Verification (MRV) Framework for NSGM	Completed
G	Develop a plan for evolving ISGTF structure into NSGM including review of legal setup aspects, staffing plan, process flows, integration of different working structures, analysis of funding sources, etc.	Did not implement as NSGM did not request
IV	**Preparation of Smart Grid Regulations**	
A	Establishment of technical committee	Completed
B	Formulation of first draft of regulations	Completed
C	Presentation to technical committee	Completed

S.No	Activities	Status
D	Revision to prepare second draft of regulations	Completed
E	Presentation to technical committee	Completed
F	Presentation of draft regulations to FOR	Completed
G	Preparation of final draft incorporating FOR comments	Completed
H	Circulation of draft regulations by FOR to State Electricity Regulatory Commissions (SERC)	Completed
I	Monitoring of MW/MWh saved from implementation of draft regulations (subject to adoption of regulations by SERCs)	Ongoing
V	**Establishment of Smart-NET**	
A	Development of Smart Grid Course Outline	Completed
B	Formation of Working Group	Completed
C	Development of Three-day Smart Grid Course Content	Completed
D	Development of Executive Orientation Modules	Completed
E	Development of roll-out plan and identification of partner institutes and their on boarding	Completed
F	Finalization of strategy in consultation with MOP and Smart Grid Knowledge Centre	Completed
VI	**Support to Smart Grid Pilot at Ajmer**	
A	Base lining/Planning and pre-implementation analysis	Completed
B	Support in installation of equipment	Completed
C	Analysis/Generation of Reports	Completed
D	Consumer feedback	Completed
E	Cost-benefit analysis	Completed
F	Development of scale-up strategy	Completed
VII	**Smart Grid Film**	
A	Initial draft for a short film on “Smart Grid and its Transformative Impact on Utility Operations and Customer Energy Empowerment”	Completed
B	Final Draft of the film – Approval by MOP	Completed
VIII	**Smart Grid Cost-Benefit of 2 GoI Pilot Projects**	
A	Presentation on international case studies on Smart Grid CBA	Completed

S.No	Activities	Status
B	Framework for cost-benefit analysis and Baseline Assessment for Himachal Pradesh State Electricity Board (HPSEB), Himachal Pradesh Smart Grid Project	Completed
C	Framework for cost-benefit analysis and Baseline Assessment for Chamundeshwari Electricity Supply Company (CESC), Mysore Smart Grid Project	Completed
D	Presentation on Cost-Benefit Analysis - CESC, Mysore Smart Grid	Completed
E	Presentation on Cost-Benefit Analysis - HPSEB, Himachal Pradesh Smart Grid Project	Completed
IX	**Identification of Issues and Key Learnings from Implementation of Smart Grid Pilot Projects**	
A	Inception Report	Completed
B	Draft Questionnaire for CESC Mysore	Completed
C	Draft Questionnaire for HPSEB	Completed
D	Draft Questionnaire for IIT Kanpur	Completed
E	Draft Report on Case Study of CESC	Ongoing
F	Draft Report on Case Study of HPSEB	Ongoing
G	Draft Report on Case Study of IIT Kanpur	Ongoing
H	Final Report on key learnings and good practices for accelerated deployment of SG pilot projects	Ongoing
X	**Knowledge Support for Organizing International Knowledge Sharing Workshop/ Study Tour on Smart Grid**	
A	Draft Agenda and Background Note	Completed
B	Draft Speaker List and Invitation Letters for Participants and Speakers	Completed
C	Preparation of presentation for the workshop/ study tour	Completed
D	Workshop/ Study Tour Summary	Completed
XI	**Ajmer Smart Grid Pilot Case Study**	
A	Draft Case Study on Ajmer Smart Grid Pilot	Completed
B	Final Case Study on Ajmer Smart Grid Pilot	Ongoing

Brief description of activities this quarter:

Identification of Issues and Key Learnings from Implementation of Smart Grid Pilot Projects:

- Submitted and finalized inception report post discussion with Ministry of Power. The report contains the background of SG pilots at CESC, TSECL and HPSEB, and approach for questionnaire.
- Submitted and finalized detailed questionnaire post discussion with Ministry of Power. The questionnaire aims to identify issues and challenges faced during SG pilot implementation at CESC, TSECL and HPSEB.

Knowledge Support for Organizing International Knowledge Sharing Workshop/ Study Tour on Smart Grid:

- Smart Grid study tour was organized from 2nd December 2017 to 9th December 2017 covering 3 countries namely Spain, Italy and France. A total of 10 participants which included key officers of the officials of the Ministry of Power (Government of India), Central Electricity Regulatory Commission (CERC), National Smart Grid Mission (NSGM), Central Electricity Authority (CEA), and distribution utilities visited variety of utilities (public and private), power system operators, research institutions, and meter manufacturers to learn about Smart Grid programs that provide a diverse range of large-scale implementation experience and perspectives.
- Developed agenda and background note on study tour of Spain, Italy and France.
- Invitation letters were prepared for participants and speakers of study tour
- Completed technical presentations for study tour encompassing various topics such as smart meters, electric vehicles, smart grid testing platforms etc.
- A pre-orientation manual and training manual were prepared for the participants of study tour
- Final report was prepared on study tour summary and shared with participants

Challenges/risks: Delays in utility responses, obtaining visas from multiple countries

Support required from USAID: Consultation with NSGM to get their facilitation for the identified Smart Grid TA activities

Task 1.2.Cost Effective, Net Zero Energy Buildings (NZEBs)

Technical Assistance to BEE on Market Transformation for Net Zero Energy Buildings

Objective

- Demonstration and promotion of EE and RE technologies, design strategies, materials, construction and operational practices that can be instrumental in maximizing EE and meeting energy demands entirely/largely from RE sources.

- Creation of public awareness about highly energy efficient buildings and their benefits and encourage stakeholders to design and build NZEB.
- Identification of market and policy barriers in achieving NZEB.
- Identification and development of technical tools, practices and skills that would accelerate the growth of NZEBs across the diverse Indian climatic conditions.

Task Description:

The Program provided TA to BEE to structure and implement an India-specific NZEB market transformation framework.

It organized an international seminar on NZEBs, and a stakeholder consultation on NZEB design competition and knowledge portal.

It also provided TA to two NZEB pilots - Nalanda University and Uttar Haryana Bijli Vitran Nigam Limited (UHBVNL). The Program continued to provide technical assistance to the two NZEB pilots as per their requirements.

The Program had organized a stakeholder workshop in August 2015 to develop the vision for MNRE's new headquarter building, the new *Akshay Urja Bhawan*.

The Program developed a business plan and sustainability framework for the NZEB knowledge portal and launched the NZEB Knowledge Portal and NZEB Alliance in consultation with BEE in May 2016. In addition to providing key NZEB-related information, the knowledge portal includes information on related national and international events. Progress on NZEB policies and technologies in other countries, new information on NZEB products and technologies in India, also feature in the knowledge portal. The Program will hand over the website to identified organization for its regular maintenance, updates and its alliance.

The Program assisted Indian Railways in developing a NZEB vision document and action plan for its upcoming and existing facilities. The Program also assisted in developing technical specifications for all the NZEB stations, procurement of technologies and materials required for NZEBs, developing a Monitoring & Verification (M&V) protocol and developing training modules to train officials from Indian Railways in implementing the vision and M&V protocols.

Following were the outcomes due to the Program's TA support in building domain:

- Three organizations with improved capacity to implement NZEB (BEE, Nalanda University, and UHBVNL)
- Due to ECBC 2017 it is expected to achieve 317,697 GWh of energy savings, 261 metric tons of Carbon Dioxide ($mtCO_2$) GHG reductions and 16 GW peak demand reduction.
- ECBC state implementation document will enable the states to understand the process to adopt and notify ECBC.

- NZEB portal would serve as a one stop solution to understand the technology, updates of NZEBs and thus will result in knowledge dissemination.

S.No.	Activities	Status
I	**Increasing awareness of NZEB**	
A	Develop a plan to increase NZEB awareness through seminar, design competition and knowledge	Completed
B	Organize an international seminar on NZEB	Completed
C	Conduct stakeholder consultation on the feasibility of design competition and knowledge portal	Completed
D	Develop a sustainability framework for the NZEB knowledge portal	Completed
E	Launch NZEB knowledge portal	Completed
II	**Support on implementing NZEB pilots**	
A	Secure buy-ins through MOU with pilots	Completed
B	Advise Nalanda University (NU) on dossier for international competition	Completed
C	Support NU for selection of a winner from international competition	Completed
D	Prepare technical assistance plan for pilots	Completed
E	Implement technical assistance plan for pilots	Completed
F	Monitor NZE parameters and display on NZEB Knowledge portal	Ongoing
G	Data from NZEB pilot based on implementation and disseminating lessons learnt	Completed

NZEB Knowledge Portal:

Mainstreaming NZEBs in India requires information dissemination on a large-scale and in a sustained manner. To facilitate this, the Program developed a NZEB knowledge portal that provides information about EE and RE technologies that are integral to designing NZEBs.

Status: The tasks under this activity have been completed.

NZEB Pilot – Nalanda University:

The Program executed a MOU with Nalanda University and charted out scope of work for the pilot project.

Status: The tasks under this activity have been completed.

NZEB Vision, guidelines and action plan for Indian Railways:

With respect to NZEB, the Program supported Indian Railways to:

• Prepare Vision, Action plan and guidelines for tender and M&V document.

• Develop a NZEB vision to make nearly 400 railway stations energy efficient.
• Develop carbon neutral design with strategies for net zero energy use, net zero waste and net zero run off to achieve net zero status.
• Integrate renewables as a part of the design strategy which is a crucial aspect to achieve net zero status.
• Prepare guidelines for green and NZEB railway stations redevelopment.
• Prepare NZEB tender specifications and evaluation process.
• Design Measurement and Verification approach.
• Organize roundtables and workshops for NZEB knowledge dissemination.

Status: The tasks under this activity have been completed.

Challenges/risks: None

Support required from USAID: None

Task 1.3.Waste Heat Utilization (WHU)
Technical Assistance to BEE on WHU Policy

Objective:

The Program provided technical assistance to BEE for developing a strategy for WHU, and specifically for low grade WHU. The objective of the technical assistance activities was to complete a strategy paper for BEE to promote the priority technologies through appropriate policy mechanisms. The objectives also included developing a strategy paper for BEE to promote through appropriate policy mechanisms the priority technologies.

Task Description:

The Program supported BEE in developing and implementing a policy for saving energy through WHU interventions.

The Program completed a market assessment study for WHU technologies, and conducted a WHU pilot feasibility study for a sponge iron unit and developed a background paper outlining strategies which are being deployed globally for promotion of WHU technologies. The study revealed that despite the high potential, the actual penetration of WHU in key sectors is estimated at 30 percent, and there is a need to tap this potential to increase efficiencies.
While some projects have been implemented relating to high temperature WHU, in the case of low temperature WHU, the challenge is even greater, as very little information is available on market potential and technology diffusion. A compendium of WHU technologies was prepared for low grade WHU.

The outcomes of the activities include:

- WHU policy paper that encompasses international policies and regulations available worldwide, possible incentives and schemes to promote WHU.

- WHU technology compendium (an information booklet on available technologies for low grade WHU) that serves as a knowledge resource.

S.No	Activities	Status
A	Preparation of the draft WHU technology compendium	Completed
B	Dissemination work for WHU technologies for textile sector, Pali, Rajasthan	Completed
C	Preparation of the draft policy framework	Completed
D	Expert consultation meeting on draft policy framework and its priority technology and sectors programs	Completed
E	Finalization of Technology Compendium	Completed
F	Stakeholder Workshop for discussion on Policy Paper	Completed
G	Finalization of WHU policy	Completed

The tasks under this activity have been completed.

Challenges/Risks*:* None

Support Required from USAID: None

Task 1.4.Heating, Ventilation and Air Condition (HVAC) Technologies
Technical Assistance to BEE on Policy Framework for Heating, Ventilation and Air-conditioning Technologies

Objective:

Building comfort systems (both cooling and heating) consume a significant amount of energy in buildings and it is essential to arrest this trend. The objective of the technical assistance was to accelerate mainstreaming of energy efficient HVAC technologies in India.

Task Description:
The Program supported BEE in structuring a policy framework to this end based on an assessment of the market conditions, perception of stakeholders to EE HVAC technologies and barriers to bringing about a market transformation.
The Program conducted HVAC market transformation study to understand the current HVAC market for commercial and residential buildings and the report was launched. The report of this study recommends inputs for a broad policy framework.

The market study was able to provide information on available HVAC technologies, major players (manufacturers, vendors, designers, etc.), market size, growth potential and barriers facing energy efficient HVAC technology deployment in India. The Program also organized a

stakeholder consultation workshop for a focused discussion on the proposed market transformation strategies.

As a follow up to this activity, the Program assisted Energy Efficiency Service Limited (EESL) to develop a market transformation program for super-efficient air conditioners in India.

The outcomes of the activities include:

- Market transformation study report which provides an overview of market demand for HVAC.
- Support to EESL on implementing its Super-Efficient Air Conditioning Program (SEAP) for window and split air conditioners including:
  - Market transformation program for SEAP.
  - Design specifications of tender document.
  - Demand aggregation study.
  - SEAP implementation strategy.

The tasks under this activity have been completed.

Challenges/risks: None.

Support required from USAID: None

Task 2: Institutional Development and Strengthening of Policy Framework for EE Deployment

Technical Assistance to BEE for Implementation of Perform Achieve and Trade (PAT) Scheme

Background:

The MOP and BEE prepared the implementation plan for National Mission for Enhanced Energy Efficiency (NMEEE). Some of the initiatives proposed under NMEEE are:

- Perform Achieve and Trade (PAT)
- Market Transformation for Energy Efficiency (MTEE)

It was planned that the Program would provide programmatic support to BEE through technical assistance and capacity building activities to implement activities under NMEEE. It was also envisaged that the Program would partner with EESL by providing technical assistance and training to assist in designing and financing EE projects.

However, the TA on PAT was concluded at the request of BEE in December 2013.

Intended Result:
Strengthen BEE for the implementation of PAT scheme.

Technical Assistance to BEE to Update ECBC

Objective:

The objective was to update the existing ECBC which was developed in 2007 under the USAID Energy Conservation and Commercialization (ECO) II bilateral program. The Program supported BEE in building its capacity to enable it to amend and update the existing ECBC. The Program facilitated BEE as a process and knowledge partner through this update process.

Task Description:

The update process was designed to be a participative exercise that responded to the concerns of the building sector and its stakeholders while maintaining the technical rigor that must accompany any enforceable building energy code.

Five Working Groups, composed of the leading building EE and RE experts in the country, were constituted to oversee the code update process. Working Group members were associated with the development of original ECBC and have also been instrumental in developing building energy codes for states in the U.S. and South East Asia. Each Working Group was responsible for a building system under the scope of ECBC: building envelope, lighting and controls, comfort systems and controls, electrical and renewable systems. These groups met regularly to review the analysis informing update recommendations and the recommendations themselves.

The Program facilitated steering committee meetings to get collective inputs to finalize draft ECBC.

Outcomes

- Finalized and published ECBC 2017 code (an updated version of ECBC 2007) which will result in energy savings, demand savings and GHG reduction.

S.No	Activities	Status
I	**ECBC 2015 Stringency Analysis Report**	
A	Conduct stringency analysis for building envelope	Completed
B	Conduct stringency analysis for lighting	Completed
C	Working Group meeting(s) to review stringency analysis for building envelope and lighting	Completed
D	Conduct stringency analysis for comfort systems	Completed
E	Conduct stringency analysis for electrical and renewable systems	Completed
F	Prepare the administration and compliance documents, procedures, and process	Completed
G	Working Group meeting for review of stringency analysis for administration and compliance	Completed

H	Working Group meeting (s) to review stringency analysis for comfort systems, renewable and electrical	Completed
II	**Regional ECBC Stakeholder Consultation Workshops**	
A	Formation of Technical and Steering Committees	Completed
B	Regional Stakeholder Consultation Workshop in East Zone	Completed
C	Regional Stakeholder Consultation Workshop in West Zone	Completed
D	Regional Stakeholder Consultation Workshop in South Zone	Completed
E	Regional / National Stakeholder Consultation Workshop in North Zone	Completed
F	Meeting with all Working Groups to review recommendations from the workshops	Completed
G	Prepare final ECBC 2015 Stringency Analysis Report including recommendations from regional workshops on baseline, and stringency analysis	Completed
III	**Submission of ECBC update**	
A	Draft ECBC update (including feedback from regional and national stakeholder workshops)	Completed

The tasks under this activity have been completed.

Challenges/risks: None
Support required from USAID: None

ECBC Savings Study

The Program also worked on the energy savings estimation due to ECBC 2017. This report provided the projected energy savings that will be attributed by the adoption of ECBC 2017.

Outcomes
Saving study has been carried out for all climatic zones and for 5 performance scenarios such as Business as Usual (BAU), ECBC, ECBC+, Super ECBC and predicted compliance model. This study will help architects, end users and investors to appreciate and recognize savings due to ECBC 2017.

Status: The tasks under this activity have been completed.

Challenges/risks: None
Support required from USAID: None

Technical Assistance to BEE on ECBC Accreditation Program
The Program worked with BEE to develop and launch the ECBC Accreditation examination for building professionals. As a part of this initiative, a scheme for certifying ECBC building professionals has been developed by the Program. In addition, the Program also developed

draft reference material, question bank, and sample question paper and submitted the same to BEE.

Status: The tasks under this activity have been completed.

Technical Assistance to Government of Rajasthan for ECBC Implementation

Background:
While Rajasthan issued a notification for mandatory ECBC compliance in March 2011, no details of the compliance process were made available to stakeholders. The key components of ECBC implementation are compliance procedures, building bylaw amendment, and enforcement mechanism.

Objective:
To support the Urban Development and Housing Department (UDH), Government of Rajasthan (GOR); RRECL and Jaipur Development Authority (JDA) to develop and implement a state specific strategic road map for ECBC roll-out on a pilot basis for Jaipur.

Outcomes
The Program had detailed deliberations with the departments like UDH, GOR, RRECL and JDA during the preparation of ECBC implementation framework. These meetings helped the related organizations to build their capacity and to take the process forward.

S.No	Deliverables	Status
A	Establishment of Task Force and convening its first meeting	Completed
B	Drafting of ECBC compliance mechanism for Jaipur	Completed
C	Convening of second Task force meeting	Completed
D	Organization of a stakeholders awareness workshop	Dropped
E	Recommendation of amendments to building bylaws for Jaipur	Completed
F	Convening of third task force meeting and confirmation of compliance process and enforcement mechanisms	Dropped

Status: The tasks under this activity have been completed.

Challenges: None
Support required from USAID: None

Technical Assistance to Governments of Karnataka and Rajasthan to Develop and Implement State Level Energy Efficiency Policies

Objective:

The objective was to provide technical assistance to the Government of Karnataka (GOK), through Karnataka Renewable Energy Development Ltd. (KREDL), and the GOR, through RRECL, in the area of policy, regulatory and institutional strengthening for large-scale EE deployment in the state.

Task wise Description:

The Program has provided necessary support to KREDL in development of a separate "Karnataka Energy Efficiency and Conservation Policy 2014-19" with the objective of promotion and large-scale deployment of EE measures in the state.

The Program also provided necessary support to RRECL in development of "Comprehensive Energy Efficiency Policy" for the state of Rajasthan with the objective of promotion and large-scale deployment of EE measures in the state.

The policies will provide long term vision for driving EE and energy conservation across different consumer categories in the states and also help to establish them as leading states for deployment of large-scale EE programs.

Status of work-plan activities and deliverables:

S.No.	Activities	Status
I	**Development of an Energy Efficiency and Energy Conservation Policy for the state of Karnataka**	
A	Input on draft EE policy document prepared by KREDL	Completed
B	Summary note for proposed approach for development of sector-wise Target Setting Model- Karnataka EE Policy	Completed
C	Preparation of draft Karnataka EE & Energy Conservation Policy	Completed
D	Preparation of revised Karnataka EE & Energy Conservation Policy	Completed
E	Policy notification by GOK	Expected
F	Implementation support	Dropped
II	**Development of Comprehensive EE Policy for the state of Rajasthan**	
A	Development of detailed model on sectoral target settings	Completed
B	Summary Note for proposed approach for development of sector-wise Target Setting Model	Completed
C	Draft Comprehensive EE Policy for the state of Rajasthan	Completed
D	Revised draft Comprehensive EE Policy for the state of Rajasthan	Completed
E	Policy notification by GOR	Expected
F	Implementation support	Dropped

The Program followed up with RRECL to understand timeframe and finalization of the policy. But due to various procedural delays, RRECL has not taken the policy document forward for

stakeholder consultation and for final approval. Hence Program could not proceed further on this activity.

Status: The tasks under this activity have been completed.

Technical Assistance to HERC to Develop and Implement DSM Regulations

Objective:

The objective was to provide technical assistance to HERC for development and implementation of DSM regulations.

The Program developed the action plan for EE implementation and submitted it to the Department of Renewable Energy, Government of Haryana (GOH).

Task Description:

The Program engaged with HERC and two distribution utilities - Dakshin Haryana Bijli Vitran Nigam (DHBVNL) and UHBVNL - and provided technical assistance for creation of a regulatory framework and build institutional capacity for the large-scale deployment of EE and DSM in the state of Haryana. The activities undertaken were:

- Development of DSM regulatory framework
- Institutional strengthening and capacity building for implementation of DSM Programs

The Program provided necessary support to HERC in finalization of DSM Regulations through a public consultation process. HERC notified the regulations in November 2014. Subsequently, the Program provided support to HERC in development of two important guidelines-CEA and E, M&V of DSM programs. As per the E, M&V guidelines, the Commission will empanel list of third party evaluators. Distribution licensee will select from the Commission's empaneled third party evaluator list through competitive bidding process for E, M&V of DSM programs.

The Program organized a capacity building workshop on "Identification and development of DSM projects" for DHBVNL and UHBVNL at Panchkula. It also provided support to HERC in constitution of a DSM advisory committee.

The Program carried out the following activities jointly with HERC to assist the DISCOMs in submitting project proposals to HERC:

- Supported HERC to conduct first DSM advisory committee meeting.
- Revised and submitted CEA and EM&V guidelines of DSM programs to HERC for its notification.
- Assisted HERC in assessing and approving the energy efficiency lighting program

(EELP) proposals submitted by the distribution utilities.

The outcomes of the Program's TA support include:

- One regulation proposed and implemented (DSM Regulations)
- Three organizations with improved capacity to identify and implement clean energy regulations and guidelines (HERC and two DISCOMs)
- 400 person-hours of technical training on DSM
- USD 3 million expected to be leveraged from public and private funds for implementation of DSM projects
- 20 MW of energy savings

Status of work-plan activities and deliverables:

S. No	Activities	Status
A	Preparation of draft DSM regulations	Completed
B	Conduct of stakeholder consultations for DSM regulations	Completed
C	Preparation of final draft of DSM regulations	Completed
D	Notification of DSM regulations in state gazette	Completed
E	Preparation of Draft Guidelines for Cost Benefit Analysis of DSM Programs	Completed
F	Preparation of Final Guidelines for Cost Benefit Analysis addressing comments/suggestions of HERC/Stakeholders	Completed
G	Preparation of Draft Guidelines for EM&V of DSM Programs	Completed
H	Organization of first workshop for DISCOMs on DSM project planning	Completed
I	Preparation of Final Guidelines for Evaluation, Measurement and Verification of DSM Programs addressing comments/suggestions of HERC/Stakeholders	Completed
J	Organization of second workshop for DISCOMs for finalizing DSM projects	Completed
K	Organization of first DSM Advisory Committee Meeting	Completed
L	Organization of second DSM Advisory Committee Meeting	Dropped

The total number of LED lights distributed under the Ujala Scheme in Haryana is 14.37 million and the total energy saved under the Program is 373.67 MW. Of this, the PACE-D TA Program's attribution is 93.42 MW (25 percent).

Status: The tasks under this activity have been completed.

Task 3: Technical Assistance and Capacity Building to Develop and Implement Innovative Financing Mechanisms

Technical Assistance to develop and Roll out EE Financing Mechanisms

Objective:

The objective was to develop and support innovative financing mechanisms for EE which will be crucial for accelerating the commercial deployment of market-driven EE projects. The focus was also on facilitating the development of new financial instruments, processes, and investment pools to enhance resource availability to scale-up EE deployment, encourage market development, enable investors to increase investments, and make markets more efficient.

Task Description:

The Program worked on the three areas to accelerate EE financing in India.

- Support to BEE in their initiatives to launch funds
- Capacity Building of Banks/FIs and
- Mainstreaming EE finance in FIs through the Corporate Energy Audit Program (CEAP).

The Program initiated the EE finance activities by meeting stakeholders in Mumbai, Bangalore and New Delhi during July and December 2012. The stakeholders included senior representatives of debt and equity providers including Indian Renewable Energy Development Agency (IREDA), Tata Capital, Global Environment Fund, Standard Chartered Project Finance, and Infrastructure Development Finance Company (IDFC), amongst others. The key objective of these meetings was to identify the existing barriers to clean energy financing in India and explore potential solutions/mechanisms to address them. The Program evaluated several global financing mechanisms for EE and identified key mechanisms that have the potential to be deployed in India. The report on EE finance provides details of each of the proposed financial mechanisms and makes recommendations for their implementation as part of the Program.

The Program also set up an Advisory Team for Energy Efficiency Finance (ATEEF) in March 2013. The ATEEF members provide collective expertise on different technologies and financing sources including debt, equity, and mezzanine, among others to the Program. The ATEEF members comprised:

- Representative from Ministry of Power, Government of India
- Representative from Bureau of Energy Efficiency, Government of India
- Mr. Debashish Majumdar, Chairman & Managing Director, IREDA
- Mr. Rajiv Kumar, Deputy General Manager, SIDBI
- Mr. Jaisingh Dhummal, Chief General Manager (Technology Finance Group), ICICI Bank

- Mr. Ashish Khanna, India Energy Team Leader, World Bank
- Mr. G C Dutta Roy, CEO, Dalkia Energy Services Ltd.

The Program also organized roundtables with project developers and FIs in April 2013 in New Delhi and Mumbai. Each roundtable sought to deliberate and identify measures including innovative business models, incentives, regulations and capacity building to scale up EE deployment in India.

Similarly, the first meeting of ATEEF was held in April 2013 in Mumbai. The Program discussed the different proposed financing mechanisms in detail with the ATEEF members and deliberated on the barriers and challenges for each. The members also identified the next steps required for the design and roll out of the selected EE financing mechanisms.

Corporate Energy Audit Program (CEAP)

The Program worked with Tata Cleantech Capital Ltd. (TCCL) for CEAP implementation. As a first step, an initial list of potential TCCL clients for CEAP was prepared. Thereafter, meetings with two clients were held to introduce CEAP to them.

On behalf of TCCL, the Program prepared a RFP for selection of EE auditors. The Program conducted walk through and detailed energy audit of TCCL client and submitted the report to TCCL.

Partial Risk Guarantee Fund (PRGFEE) and Venture Capital Fund (VCFEE).

The Program supported BEE to launch PRGFEE and VCFEE. Towards this end, the Program prepared a RFP for selecting M&V agencies and reviewed the RFPs selection of a management agency for PRGFEE and VCFEE.

The Program also prepared a report for BEE on a potential EE projects pipeline for the two funds after conducting a survey of ESCOs and Financial Institutes.

Preparation of Guidelines on EE Financing

Draft guidelines on EE Financing for FIs were prepared and submitted to BEE. It is expected that loan officers working on EE projects will use the guidelines as a reference material. Training for trainers program on EE Finance was structured on the basis of these guidelines. BEE organized a stakeholder consultation meeting in July 2017 to finalize the guidelines.

***Training on EE Financing*:**

The Program supported BEE in organizing two training workshops on financing for EE projects at Delhi and Mumbai in September 2014. A total of 648 person hours of training was provided.

The Program thereafter developed a concept note for BEE on training of master trainers on the EE Finance to be delivered in collaboration with Indian Banks Association and its members. Thereafter with the draft guidelines as the base, the Program prepared modules on training of FIs on EE project financing. The modules were revised and finalized after receiving inputs from BEE and three independent experts on EE finance. The EE financing training manual was also prepared.

Two training of trainers on EE Financing was organized in June 2015 for staff of banks and FIs at Mumbai and Nainital. A total of 421 person-hours of training were provided. The EE financing training manual was released by Director General, BEE at the Mumbai training program.

Survey Report:
The Program supported BEE in preparing market assessment survey report for PRGFEE and VCFEE and the same was launched in July 2016.

Following were the resultant outcomes of the activities carried out**:**

- 648 person hours of training on financing for EE projects
- Energy audit report of client of TCCL.
- 421 person hours of training of trainers
- EE finance training manual
- Survey report
- Guidelines on EE financing.

Task 4: Capacity Building, Education, Training, Public Outreach Programs

The activities under this task were delivered together with activities in other tasks and have been discussed above.

Energy Efficiency Financing Platform (EEFP):

In Year 3, the Program supported BEE to build upon the training modules that have been developed and updated the same with case studies from the Indian context. The Program hired an international consultant and prepared a "Reference Guide for Banks Financing Energy Efficiency Projects". This reference guide details all the important basic aspects such as various EE technologies, models in EE financing, project stakeholders, etc.

In Year 4, BEE had constituted an expert committee to review the EE finance guidelines. The Program had addressed the expert comments received from BEE and submitted the revised guidelines to BEE for its finalization.

Financing of EE projects at Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (RVPN) substations

The Program, in partnership with RVPN and EESL, assessed the potential for EE projects at all substations of RVPN in Rajasthan. An audit of ten substations was carried out based on which investment requirements were assessed for all 480 RVPN substations. RVPN has awarded the work of implementing EE solutions at two substations through a tendering process. An Investment grade energy audit report and an energy savings estimate from potential EE projects were completed.

The status on various work-plan activities and deliverables (WPAD) is as under:

S.No.	Activities	Status
1	Energy audit at selected substations	Completed
2	Collect state level data on substations	Completed
3	Carry out assessment of investment requirements	Completed

S. No	Activities	Status
I	**Preparatory Activities**	
A	Review of existing international and national EE financing mechanisms	Completed
B	Prepare and launch are port on their view of EE financing mechanisms	Completed
C	Design a bouquet of financial mechanisms	Completed
D	Identify partner institutions for anchoring/launching	Completed
II	**CEAP with TCCL**	
A	Completion of discussions with TCCL Clients for identifying EE projects opportunities	Dropped
B	Selection of Energy Efficiency Auditors (for first client)	Completed
C	Review of Energy Efficiency Audit Reports (for first client)	Completed
D	Support TCCL clients in developing project loan documents	This activity is dropped after no response from TCCL.
E	Provide overall technical assistance to TCCL for CEAP Program implementation	Dropped
F	Recommendations for TCCL to mainstream EE project finance	TBD
G	Project implementation and monitoring	Dropped due to no status on activity II (d) above
III	**Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)**	
A	Support BEE by preparing RFP documents for launching PRGFEE	Completed
B	Review of RFPs for selection of implementing agency and fund manager	Completed
C	Preparation of guidelines for FIs and Banks for assessment of EE projects	Completed
D	Support BEE in preparing a projects pipeline that could avail PRGFEE	Completed
E	Support implementing agency to roll-out PRGFEE	On request

S. No	Activities	Status
F	Conduct training for PRGFEE clients—FIs & ESCOs	On request
G	Monitor energy savings & funds leveraged	Dropped
IV	**Venture Capital Fund for Energy Efficiency (VCFEE)**	
A	Support BEE by preparing RFP documents for launching VCFEE	Completed
B	Assist BEE in selecting Fund Manager	Dropped on BEE advise
C	Support BEE in preparing a projects pipeline that could avail VCFEE	Completed
D	Support implementing agency to roll-out VCFEE	Closed
E	Conduct training for VCFEE clients- FIs & ESCOs	Closed
F	Monitor energy savings & funds leveraged	Dropped
V	**Mainstreaming of EE Finance Program to Other Indian Banks/FIs**	
A	Engagement of Lending Institutes	Closed
B	Define a Policy for EE financing under EEFP	Closed
VI	**Energy Efficiency Financing Platform (EEFP)**	
A	Update training modules	Completed
B	Manual for EE financing	Completed
C	Training and capacity building for selected FIs for EE finance	Two trainings delivered
VII	Preparation of note for BEE for consideration of EE finance under priority sector lending	Dropped on BEE advise

Status: The tasks under this activity have been completed.

Support required from USAID: No support is required from USAID at this stage.

DEVELOPMENT RESULT 2: INCREASED SUPPLY OF RENEWABLE ENERGY BY SCALING-UP RENEWABLE ENERGY TECHNOLOGIES

Task 1: Institutional Development and Strengthening of Policy and Regulatory Framework at the State Level for RE Deployment

1.1: Technical Assistance for Transforming the Solar PV Rooftop Market in the Indian States of Karnataka, Rajasthan and Madhya Pradesh

Objective: Solar PV rooftop systems offer multiple economic benefits compared to centralized fossil fuel-based generation projects and even large, grid-connected solar PV projects. The GOI has provided a significant policy push by increasing the solar PV target for 2020 from 20 GW to 100 GW by 2022, with 40 GW slated to come from solar PV rooftop systems. This presents a major challenge, as the solar PV rooftop sector in India is still in its early stages of development. The solar PV rooftop market is now entering a phase of rapid and intense market transformation. The key challenge for the sector at this juncture is the gaps in the market eco-system, which include appropriate regulations, interconnection procedures, capacity building, financing guidelines, lease agreements, and the need for new and customized business models. All these issues need to be addressed in parallel in order for the market to scale up and even approach the GOI's ambitious target of 40 GW.

The Program had initiated its solar PV rooftop interventions, prior to the official announcement of the revised national targets (five times higher than previous targets). The Program has been working with state partners on the potential and attractiveness of the rooftop sector for future solar PV investment. The strategy of the Program is to increase the level of deployment of solar PV rooftop systems from a "kilowatt scale" to a "megawatt scale" by supporting the design and implementation of new policy, regulatory, programmatic, and financing processes. It has been working with different Indian stakeholders to put in place some of the building blocks for the solar PV rooftop eco-system:

- **Policy**: The Program assisted MPUVNL in finalization of its rooftop policy for distributed RE sources. The policy included detailed guidelines on the implementation of solar PV rooftop systems, the business models to be followed for the deployment of these systems, the technical standards and certifications required for these systems and the financial incentives available with consumers for the development of these projects. The policy also outlined the detailed interconnection guidelines for the utilities and consumers developing these systems, the interconnection framework, the business models, incentives, targets, interconnection process, guidelines, etc. for prospective solar PV rooftop installers.

- **Gross Metering Framework**: The Program finalized and published the White Paper on Gross Metering and also organized a webinar on Gross Metering in March 2016. The paper outlined the need and benefits of Gross Metering for key stakeholders including distribution utility, end consumers, third-party investors, etc. Further, the paper highlighted key design parameters and proposed feed-in-tariff for developing framework for Gross Metering in the state. The paper was also shared with Association of

Renewable Energy Agencies of States (AREAS) and it was appreciated by S K Shukla, Head of AREAS.

- **Interconnection Framework for Solar PV Rooftop Systems**: The Program provided assistance to DISCOMs in Karnataka, Rajasthan and Madhya Pradesh in developing and deploying a framework (i.e. set of technical rules, process and guidelines) for solar PV rooftop projects to interconnect with the utility grid. In this quarter, the Program provided assistance to MPUVNL and the state DISCOMs in the design and development of the interconnection framework for solar PV rooftop deployment in the state of MP.

Intended results: Specifically, the technical assistance is expected to result in the following by end of 2017:

- Two policies proposed and implemented (solar policy in Karnataka targeting 2,000 MW of deployment till 2021 leveraging USD 2,300 million in investments and Net Metering policy in MP).
- Three regulations proposed and implemented (Net Metering in Rajasthan and MP, and Gross Metering framework in Karnataka).
- Nine organizations (DOE, GOR; DOE, GOK; KREDL; Karnataka Electricity Regulatory Commission (KERC); BESCOM; JVNNL; Rajasthan Electricity Regulatory Commission (RERC); RRECL; MPUVNL; Madhya Pradesh Electricity Regulatory Commission (MPERC) with improved capacity to transform solar PV rooftop market.
- 200 MW solar capacity addition (150 MW in Karnataka and 50 MW in Rajasthan) leveraging USD 233 million of public and private funds.
- 2,000 person-hours of training provided.

Status of work-plan activities and deliverables: The Program provided specific inputs related to the promotion of the decentralized solar PV systems on rooftops to KREDL for its Solar Policy 2014. It also worked with DOE, GOR and RRECL in developing a White Paper and a policy directive for the promotion of solar PV rooftop systems in the state. In addition, the Program provided detailed inputs to RERC for the release of Net Metering regulations.

The Program undertook a detailed analysis of global best practices to devise a detailed process for interconnection of solar PV rooftop systems for BESCOM. The interconnection process included the forms, formats, roles and responsibilities of stakeholders and processes to be followed for the deployment of solar PV rooftop systems. The Program worked with BESCOM and other key stakeholders to roll out its Net Metering scheme introduce the interconnection process to its engineers and provide technical back-up support for process improvement, training and capacity building. It developed a White Paper on Gross Metering to identify the need and benefits of Gross Metering for key stakeholders including distribution utility, end consumers, third-party investors, etc. The paper also developed key design parameters and proposed feed-in-tariff for developing framework for Gross Metering in the state. In addition, the Program delivered a presentation to KERC for adoption of Gross Metering concept and filled joint comments with BESCOM on the discussion paper issued by KERC on adoption of Gross Metering in Karnataka. It also continued to provide technical backstopping support by participating in expert technical and

process committees set up by BESCOM to advise it on the roll-out and implementation of solar PV rooftop scheme.

The Program also made detailed presentations to Secretary, Department of Energy (DOE), GOR and the management team at JVVNL on the key requirements and challenges for interconnecting solar PV rooftop systems. It also assisted JVVNL to develop and deploy the process for interconnecting solar PV rooftop systems.

The Program also provided technical assistance to DOE, Government of Madhya Pradesh (GOMP) on Net Metering policy framework and its implementation.

The Program continued to provide technical assistance to utilities in Karnataka and Rajasthan in developing and deploying a framework (i.e., set of technical rules and guidelines) for solar PV rooftop projects to interconnect with the utility grid. The framework, deployed by BESCOM and JVVNL, has facilitated the solar PV rooftop projects in Karnataka and Rajasthan to start interconnecting with the utility grid. Based on the white paper developed by the Program on gross metering, KERC published the gross metering framework for solar PV rooftop projects for the State of Karnataka. The Program also assisted the State of Madhya Pradesh in the finalization of policy and regulatory framework and development of implementation framework for net metering based solar rooftops. Subsequently, the State of Madhya Pradesh also finalized both policy as well as regulatory framework for the net metering based solar rooftop projects. The Program also provided support to MPUVNL in the development of implementation framework for net metering based solar rooftop projects for the State of Madhya Pradesh.

The Program will continue to provide necessary technical assistance to BESCOM, JVVNL and distribution utility/state nodal agency of partner state such as Madhya Pradesh in resolving operational issues after launching various schemes/programs, interaction with technical committee and technical backup support for the process improvement, implementation of best practices, organization of workshops/training programs for capacity buildings of distribution utility staffs and organization of programs of the consumer awareness, etc.

S.No	Activities	Status
I	**Solar PV rooftop in Karnataka**	
A	Inputs for Solar Policy 2014	Completed
B	Analysis of international best practices on interconnection	Completed
C	Recommendation of detailed process for interconnection including forms & formats	Completed
D	Adoption of the Interconnection Framework including forms, formats, processes, systems, empanelment procedures etc. for BESCOM	Completed
E	Training BESCOM staff	Dropped
F	Preparation of a Tripartite Agreement between BESCOM, Rooftop Owner and 3rd Party Investors for facilitating 3rd Party Solar PV rooftop Models	Completed

S.No	Activities	Status
G	Technical backstopping by participation on technical and process committees	Ongoing
H	Support on outreach & communication	Completed
I	Re-design of the Interconnection Process based on feedback from developers and other utility personnel	Completed
J	Preparation of White Paper on Gross Metering	Completed
K	Stakeholder consultation on Gross Metering	Completed
L	Recommendation of regulations on gross metering	Completed
M	Presentation to KERC on Gross Metering and International Experience	Completed
N	Institutional capacity building	Ongoing
O	Hand-holding support	Ongoing
P	Finalization and release of White Paper on Gross Metering	Completed
Q	Organization of a Webinar on Gross Metering for Solar PV Rooftop Deployment by BESCOM	Completed
R	Development of business models for BESCOM for solar PV rooftop implementation	Dropped
II	**Solar PV rooftop in Rajasthan**	
A	Support to Government of Rajasthan, Department of Energy in developing Policy for deployment of solar power in Rajasthan	Completed
B	White Paper and recommendation of policy directive on promotion of solar PV rooftop for Energy Department and RRECL	Completed
C	Inputs on net metering regulations to RERC	Completed
D	Presentation on key requirements and challenges for inter-connecting solar PV rooftop systems to Energy Department & RRECL	Completed
E	Assistance to JVVNL to design, develop and deploy the process for interconnecting solar PV rooftop systems	Completed
F	Adoption of the Interconnection Framework including forms, formats, processes, systems, empanelment procedures etc. for JVVNL	Completed
G	Launch of the solar PV rooftop scheme	Completed
H	Hand-holding support	Completed
I	Organization of a two day training program on Solar PV Rooftop Deployment for Utilities with JVVNL	Completed
J	Organization of a regional one day training program on Solar PV Rooftop Deployment for Utilities in Jaipur	Completed
III	**Solar PV rooftop in MP**	

S.No	Activities	Status
A	Inputs for finalization of MP draft Net Metering policy 2015 and comments on Net Metering Regulations 2015	Completed
B	Presentation on key requirements and challenges for inter-connecting solar PV rooftop systems to Energy Department & MPUVNL	Completed
C	Finalization of Rooftop Policy for the state of Madhya Pradesh	Completed
D	Assistance to MPUVNL and the state distribution companies to design, develop and deploy the process for interconnecting solar PV rooftop systems	Completed
E	Adoption of the Interconnection Framework including forms, formats, processes, systems, empanelment procedures, etc. for MP	Closed
F	Organization of a training programs on Solar PV Rooftop Deployment for Utilities with MPUVNL	Dropped
G	Assistance to MPUVNL on development of Pre-Feasibility Report (PFRs) and Detailed Project Report (DPRs) for lake front Bhopal	Completed

Brief description of activities this quarter:

- **BESCOM**
  - Facilitated a cumulative capacity addition of 88 MW of solar rooftop in BESCOM's licensee area as of December 2017.
- **RRECL**
  - Facilitated a cumulative capacity addition of 53.45 in RRECL's licensee area as of December, 2017.

- **MPUVNL**
  - The Program had supported MPUVNL in standardization of rates and selection of contractors for 30 MW of Solar Rooftop, of which 10 MW of work has been allocated (additional 5 MW in the reporting quarter) in Madhya Pradesh.

Challenges/risks: No specific challenges/risks envisaged in the roll-out of the scheme.
Support required from USAID: No support is required from USAID at this stage.

Technical Assistance for Building Capacity of Key Stakeholders for Market Transformation of Solar PV Rooftop in India

Objective: The Program has been working with a variety of Indian stakeholders to put in place some of the building blocks for the solar PV rooftop eco-system with inputs for policy and regulation with states of Karnataka and Rajasthan. However, substantial gaps such as institutional capacity, financing, business models and implementation mechanisms for policies and regulation still exist. Therefore, the Program is engaged in building the capacity

of key stakeholders by orienting their staff on tools, models, methods and practices for transforming the solar PV rooftop market in India.

The key related activities include:

- **Solar Rooftop Evaluation Tool (SRET)**: Financing remains a key challenge due to the limited knowledge and bandwidth amongst banks and FIs to evaluate solar rooftop projects. To address this, the Program has developed a comprehensive evaluation tool that aims to assist banks and FIs to evaluate and fund solar PV rooftop projects, and thereby enhance the availability of debt for these projects.

- **Best Practices Guide (BPG)**: The Program has partnered with Gujarat Energy Research and Management Institute (GERMI) to develop a BPG for solar PV rooftop deployment. The BPG aims to bring standardization and uniformity in the solar PV rooftop design process and enhance the overall efficiency of implementation of solar PV rooftop programs undertaken at the state or local level. The BPG will also assist stakeholder's leapfrog the learning curve of solar PV rooftop technology by extracting the learning from similar programs across India and selected locations around the globe, and apply it to India as a whole.

- **Training**: A training program for utility engineers and management was needed to create a pool of common and applicable knowledge for effective implementation of solar PV rooftop programs by the distribution utilities. The Program also developed a comprehensive training program that addresses issues such as the basic understanding of the solar PV rooftop sector and the projects, the variability in understanding on solar PV rooftop projects, experience and access to resources to effectively implement solar PV rooftop programs through more uniform understanding of the solar PV rooftop interconnection process by key policy, regulatory and administrative stakeholders.

Intended results: The following results are expected to be achieved:

- 1,500 person-hours of training delivered
- A rooftop finance tool developed for adoption by financing institutions nationally
- A best practices guide available to the stakeholders nationally

Status of work-plan activities and deliverables: The Program undertook the following activities:

- **SRET**: The SRET was launched in September 2015 at an event in Mumbai. It was discussed there that the Program will talk to agencies including SBI-Capital Markets India Limited (SBICAP), IDBI, TCCL, IREDA, Punjab National bank (PNB), etc. to adopt the tool. IREDA showed interest and the Program worked with IREDA and its partner credit rating agencies to customize its project rating framework using the SRET. In the last quarter, the Program worked with IREDA and its five rating agencies on the risks associated with solar PV rooftop deployment, how these risks

can be identified, evaluated and addressed using the rating framework. IREDA adopted suggestions into its project evaluation process. In this quarter, the Program initiated discussions with various agencies for the adoption of the SRET. The Program met and held discussions with the Asian Development Bank (ADB), the World Bank and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) for using the SRET for lines of credit being provided by them to their partner banks for solar PV rooftop financing. The Program also initiated a dialogue with various banks and aggregators to move forward on deployment of the SRET and convert it into a web-based platform. Related discussions were held with three firms - Oorjan, InfraEx and SunFund. Based on the SRET, the Program also developed a checklist for banks and FIs for financing residential solar PV rooftop projects. The Program presented the SRET to SBI Caps, Punjab National Bank and TCCL. The Program discussed with various solar PV rooftop market players viz., Sun Fund, Oorjan, etc., for adoption of the SRET. It also leveraged SRET tool to restructure the credit rating framework for IREDA to support their 50 MW loan program for solar PV rooftop project. The Program also developed an appraisal note for IREDA for appraising solar PV rooftop projects. A Technical Assistance framework was developed by the Program for Punjab National Bank (PNB) to enhance the solar rooftop financing under the line of credit by ADB. The Program had engaged with the banks, FIs and aggregators for adoption of SRET in their appraisal process.

- **BPG**: The Program, in partnership with GERMI, finalized the BPG and submitted the draft to MNRE for its review and comments. The executive summary of the guide was launched after receiving and incorporating MNRE's comments in June 2016.

S.No	Activities	Status
I	**Financing tool**	
A	Mapping the policy and regulatory framework for solar PV rooftop development	Completed
B	Mapping of the key technical requirements	Completed
C	Evaluating the risks associated with the solar PV rooftop business model	Completed
D	Evaluating the commercial contracting terms (Power Purchase Agreements) and outlining the key issues related to the commercial contract between the buyer and the developer	Completed
E	Risk-appropriation mechanism	Completed
F	Testing the tool on live projects (10 MW IREDA)	Completed
G	Presentations of the tool at workshop/events and to Financial Institutions	Completed
H	Finalization of the manual	Completed
I	Used the section on Risk in the tool to restructure the credit rating framework for IREDA to support their 50 MW loan program for solar PV rooftop project	Completed
J	Checklist developed for financing residential solar PV rooftop projects.	Completed

S.No	Activities	Status
K	Discussions with banks, FIs and aggregators to adopt the tool	Completed
L	Develop an appraisal note for IREDA	Completed
M	Develop Technical Assistance framework for Punjab National Bank (PNB) to enhance the solar rooftop financing under the line of credit by ADB.	On request[14]
II	**Best Practices Guide**	
A	Study/survey of existing national and international policies and regulations; administrative procedures and practices; and technical standards	Completed
B	Critical analysis of these policies and regulations; administrative procedures and practices; and technical standards and draft manual	Completed
C	Stakeholder consultation	Completed
D	First draft of the Guide	Completed
E	Final draft of the Guide	Completed
F	Release of the Guide	Completed

- **ADB** has sanctioned long term concessional loan of USD 500 million to PNB for financing solar rooftop projects in India. ADB has also allocated USD 5 million for TA. Of this, PNB has been allocated USD 2.5 million for building the capacity of PNB officials across its branches. Prior to the TA effectiveness, ADB requested USAID to support PNB in finalizing and implementing the TA. The capacity development TA provided by USAID is covered under the existing USAID-ADB memorandum of understanding. One TOT for PNB Trainers was conducted in March 2017 and one Training Program on Solar Rooftop proposal evaluation was conducted in June 2017.
- **World Bank** has sanctioned long term concessional loan of USD 500 million to State Bank of India (SBI). Prior to the TA effectiveness, SBI requested USAID to support in training their trainers and the bank officials. In this quarter, one TOT for SBI Trainers was conducted in April 2017.

Brief description of activities this quarter:

- IREDA has successfully raised Green Masala Bonds for USD 300 million in September 2017 and the bonds have been listed in London and Singapore Stock Exchanges.

Challenges/risks: No specific challenges/risks.
Support required from USAID: No support is required from USAID at this stage.

[14] Initial assistance was given to develop Business Strategy. There was no subsequent support requested.

Technical Assistance for Development of a Comprehensive Renewable Energy Policy in Karnataka

Objective: The Karnataka Renewable Energy Policy 2009-14 notified on January 19, 2010, was the first of its kind policy by the state with a specific focus on the development of the RE sector. The policy tenure of 2009-14 witnessed successful capacity addition of 2,087 MW, but it fell short of the target envisaged in the policy document. There were certain issues such as the withdrawal of Accelerated Depreciation/Generation-based Incentive benefits from wind projects, fuel availability issues faced by biomass plants, ecology sensitive issues for development of small hydro in Western Ghats, etc. which caused slowdown in RE capacity addition in the state. Moreover, the earlier policy was valid until 2014, hence, the state government chose to undertake a comprehensive review of RE Policy and develop a new RE policy for the next period. The Program supported KREDL in the development of comprehensive RE Policy for the new control period. The exercise was undertaken with an objective to address shortcomings and barriers encountered during earlier policy regime and to further accelerate RE deployment in the state.

The Program did comparative analysis of the RE policies of various states and presented key learning in terms of innovative programs/schemes, incentive framework, institutional framework as relevant for wind, small hydro, biomass, cogeneration and solar power development that provided useful insights during development of comprehensive RE policy.

Keeping in view the long term vision of GOK for harnessing the available RE potential in the state, a target of around 3,600 MW over policy tenure of six years (2014-2020), has been proposed under the RE Policy. The comprehensive RE policy covers the operative period, objective, capacity addition targets, eligibility conditions, regulatory framework, government and institutional structure for implementation of RE projects, high level committee for renewable energy, innovative RE Programs such as repowering, wind-solar hybrid projects, etc., procedures for applications and allotment, implementation timelines, incentives and financial support mechanisms and governance structure.

Upon notification of the policy, the Program will coordinate with KREDL and provide implementation support for various programs to be undertaken in pursuance of the RE policy.

Intended results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One policy proposed targeting deployment of 3,600 MW of RE
- Leveraging USD 4,200 million in investment

Status of work-plan activities and deliverables:

S.No	Activities	Status
A	Comparison of RE policies of various states	Completed
B	Development draft RE policy for Karnataka	Completed
C	Presentation on draft RE Policy for First Steering Committee meeting	Completed
D	Participation in meetings/stakeholder consultation on draft RE policy	Completed
E	Presentation on draft RE Policy for Second Steering Committee meeting	Completed
F	Policy approval and notification	Awaiting GOK decision
G	Policy implementation support	Awaiting GOK decision

Brief description of activities this quarter:

The Program made a follow up with KREDL and DOE, GOK to ascertain the status of the draft comprehensive RE policy. GOK is yet to notify the comprehensive RE policy.

Challenges/risks: No specific challenges/risks envisaged in the roll-out of the scheme.

Support required from USAID: No support is required from USAID at this stage.

Technical Assistance to BESCOM to evaluate, design and implement business models for solar PV rooftop implementation based upon the key challenges identified

Objective: The key objective of this task is to assist in the rapid scaling up of solar PV rooftop implementation.

The Program initiated the activity on identification of challenges for solar PV rooftop scale up in BESCOM and rapid scale up of grid-connected solar PV rooftop program in BESCOM region in Karnataka. As a first step a survey was carried out to identify challenges faced by stakeholders in scaling up solar PV rooftop implementation and a report was submitted to BESCOM.

The Program is now working with BSES Rajdhani Power Ltd (BRPL) on this activity.

Status of work-plan activities and deliverables:

S. No	Activities	Status
I	**Conceptualize, evaluate, design and implement business models for solar PV rooftop implementation in BESCOM based upon the key challenges identified**	
I.1	*Part 1: Identify challenges faced by stakeholders in scaling up solar PV rooftop implementation*	
A	Project kick off meeting (MoM)	Completed

S. No	Activities	Status
B	Report on parameter list for questionnaire design	Completed
C	Questionnaire	Completed
D	Report on Survey Results	Completed
E	Stakeholder Consultation Workshop	Completed
I.2	*Part 2: Conceptualize, evaluate, design and implement business models for solar PV rooftop implementation in BESCOM*	
A	Report on evaluation of business models for key stakeholders	Tasks under this activity shifted to BRPL (BSES).
B	Stakeholder consultation workshop and model finalization	
C	Report on detailed program design of the finalized model	
D	Report on assistance provided to BESCOM for site identification	
E	Submission of Request For Quotation (RFQ), RFP	
F	Commercial Agreement	
G	Report on pre-bid assistance	
H	Report on technical assistance in bid evaluation	

Brief description of activities this quarter:

- No major activities were undertaken during the quarter.

Challenges/Risks: Yet to receive go-ahead decision from MD, BESCOM on the utility anchored business model.
Support required from USAID: No support is required from USAID at this stage.

Technical Assistance to BSES to evaluate, design and implement business models for solar PV rooftop implementation based upon the key challenges identified

The Program is assisting BSES to conceptualize, evaluate and implement community solar projects and utility-based business models across its jurisdiction in Delhi.

The Program has proposed four business models to BSES, Delhi, of which BSES has chosen one model for implementation. The Program is in the process of launching the business model in Dwarka under the alias of Dwarka Solar City.

Brief description of activities this quarter:

- Developed Technical Specification
- Initiated a stakeholder conference amongst developers for the program
- Developed a schematic and strategy for execution

- Held brain storming session with SNA Delhi, and evaluated their inputs.
- Site survey assessment of 6 societies in Dwarka
- Drafted a model EPC agreement
- Prepared a EOI to be floated to all vendors
- Prepared a handbook for Dwarka Solar City Program
- Developed a cost benefit analysis framework for solar rooftop projects for CGHS consumers
- Prepared pamphlets and mailers for outreach to all stakeholders involved.

Technical Assistance for Developing an Off-Grid Policy for the State of Madhya Pradesh

Objective: Madhya Pradesh has created an independent organization dedicated to the development of the off-grid RE sector in the state. However deployment of off-grid RE solutions has not accelerated in a big way due to the limited cross-sectorial uptake of these technologies and limited cross departmental cooperation in this area. This is due to the lack of a specific policy or regulatory framework for the proliferation of off-grid RE technologies across sectors, departmental programs and other developmental initiatives in the state.

Development of an off-grid RE policy for Madhya Pradesh can enhance focus on off-grid electrification and also catalyze new off-grid energy delivery models. The off-grid policy will not only identify the areas for off-grid RE deployment but will also analyze the possibility of using a wide variety of support mechanisms/specific end users for enhancing financial support for off-grid schemes from the state government using inter-departmental programs/budgets. The Program aims to provide assistance to the state agency in developing the basic background material and strategy for the off-grid policy for Madhya Pradesh.

The off-grid policy will provide the required overall framework for the deployment of off-grid-based RE projects/systems using a market-based approach.

Intended results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One policy proposed for off-grid development in the state of Madhya Pradesh.

Status of work-plan activities and deliverables:

S.No	Activities	Status
A	Scoping and initial meetings for the discussion paper on off-grid policy for Madhya Pradesh	Completed
B	Research and discussions with key stakeholders	Completed
C	Draft discussion paper for development of an off-grid policy for Madhya Pradesh	Completed

S.No	Activities	Status
D	Stakeholder consultation	Dropped
E	Final discussion paper for development of an off-grid policy for Madhya Pradesh	Dropped

Brief description of activities this quarter: No activities undertaken in the reporting quarter.

Challenges/risks: No specific challenges/risks envisaged.

Support required from USAID: No specific support is required from USAID at this stage.

Technical Assistance to MPUVNL to build its Institutional Capacity

Objective: The objective of this intervention is to build the institutional capacity of MPUVNL to enable it to deliver its mandate effectively. In this context, the Program is providing technical assistance to MPUVNL on two sub-interventions:

- **Establishment of a Centralized Monitoring Centre (CMC)**: One of the biggest challenges in evaluating the impact of RE investments and devising policies and incentive structures for future deployment is the availability of actual performance data from systems across the country. Although MNRE and State Nodal Agency (SNAs) mandate the capture and sharing of real time performance data for all systems above 5 kW, there is a lack of appropriate processes, protocols and platforms for the shared data.

  MPUVNL, the State Nodal Agency (SNA) of GOMP, has been grappling with this problem for years. The core challenge is whether to set up an alternate system to capture data directly from generating plants or to use the data that was being generated by its vendors.

  MPUVNL requested the Program to assist it in addressing this particular challenge. The Program evaluated both options and recommended the design of a CMC which will use software solutions and database management systems (DBMS) to capture data from the vendor's servers, transfer the data to a MPUVNL server and use a DBMS to collate, analyze and present performance data in an appropriate form.

  Initially, the CMC will assist MPUVNL in monitoring the performance of off-grid solar PV systems and can later be scaled-up to monitor other off-grid system applications like bio-gasifiers, solar-wind hybrid system, solar pumps, etc.

  The CMC will assist MPUVNL in monitoring the performance of off-grid systems and learning from it will facilitate the design of more inclusive and targeted programs. The approach adopted for the establishment of the CMC at MPUVNL would set a model for capture of performance data which can be replicated nationally or at the state level.

- **Preparation of a Manual on Vendor Policy**: MPUVNL is presently catering to different class of vendors/suppliers such as developers, manufacturers, battery pack suppliers, PV module/pack suppliers, etc. With proliferation of solar PV and other programs, the number of vendors/suppliers has increased manifold and difficulties/complexities of ensuring performance check/quality checks have increased tremendously. Further, the after sales support and operation and maintenance of facilities/support during the operation phase has been a major challenge and limitation for large deployment of decentralized/distributed solar programs in the state. The limitation of availability of service and support network, delay in providing support services/spare parts, etc. across all districts results in agitation and erosion of consumer faith in solar PV programs.

  In order to overcome the above mentioned issues, it was decided to develop a standard manual on vendor policy for MPUVNL by compiling best practices across states, interacting with vendors for realistic assessment of risk factors and assessing key learning from process of empanelment of channel partners. This manual will specify standard terms and conditions along with empanelment process, tendering process, evaluation/monitoring framework and standard procedures for after sales and support which would be useful for MPUVNL in the long run.

Intended results: Specifically, the technical assistance is expected to result in the following by end of 2017:

- One organization with improved capacity
- One framework proposed for capture, analysis and presentation of performance data that can be replicated nationally
- One policy manual for MPUVNL defining standard procedures for evaluation/monitoring and after sales support that can be replicated nationally
- USD 130,000 of public funds leveraged

Status of work-plan activities and deliverables*:* The Program undertook a detailed analysis of both approaches and presented the options to MPUVNL. Based on the feedback, a DPR was developed with option two as the viable model for implementation. The DPR incorporated the detailed system design, infrastructure requirements, cost estimates and roles and responsibilities of key stakeholders. The Program also developed a RFP which would be the basis for selection and contracting of the CMC developer by MPUVNL. Based on the DPR and the RFP, MPUVNL has requested MNRE for a budget sanction for CMC implementation.

In January 2015, MPUVNL requested the Program to provide necessary support in the development of a Manual on Vendor Policy. The Program undertook a detailed review of the existing vendor policies/guidelines/procedures followed by nodal agencies of various states. It also carried out comparative analysis and identified best practices adopted in the selection and empanelment of the vendors. Subsequently, the Program initiated work on development

of draft vendor guidelines based on the best practices identified through comparative analysis of guidelines/procedures adopted by various state agencies.

The Program:

- Presented the draft manual to the MPUVNL for their comments.
- Carried out a comparative analysis of different processes adopted by different states for vendor management and selection such as a) Empanelment process – Chhattisgarh. Tamil Nadu, Andhra Pradesh and b) Tendering and operation and maintenance process- Chhattisgarh, Maharashtra, Rajasthan.
- Prepared and finalized the background paper and draft vendor manual and submitted both documents to MPUVNL for its comments and suggestions.
- Carried out a detailed review of five RFPs i.e., Solar PV power packs, off-grid systems, LEDs and agricultural pump sets and submitted to MPUVNL for further ratification.

S.No	Activities	Status
I	**Centralized Monitoring Centre**	
A	Detailed option analysis	Completed
B	Preparation and submission of DPR	Completed
C	Preparation and submission of RFP documents	Completed
D	Design of the bid process management	Completed
E	Floating of RFP and pre-bid meeting	The activity could not be undertaken due to lack of budget sanction from MNRE.
F	Evaluation of bids	
G	Formation of steering committee within MPUVNL	
H	Implementation assistance	
II	**Manual on Vendor Policy**	
A	Initial meetings with MPUVNL for scoping study and for finalization of contours	Completed
B	Background research and comparative study of various RFP, vendor-related rules/procedures from other select SNAs	Completed
C	Draft vendor and after sales support policy/manual	Completed
D	Presentation to MPUVNL/prominent vendors about the draft vendor and after sales support policy/manual	Completed
E	Finalization of vendor and after sales support policy/manual	Completed

S.No	Activities	Status
III	**Technical assistance for Net Metering implementation**	Closed

Brief description of activities this quarter*:*

- **CMC**: The Program followed up with MPUVNL to discuss and finalize the next course of action. No specific activities were carried out during this reporting quarter.
- **Manual on Vendor Policy**: This activity is completed and closed.

Challenges/risks***:*** No specific challenges/risks

Support required from USAID*:* No support is required from USAID at this stage.

Technical Assistance to Develop a Framework for Development of RE Hybrids in the States of Karnataka and Rajasthan

Objective: Wind and solar energy resources are characterized by inherent intermittency due to seasonal and daily variations leading to challenges in management of the grid and infrastructure. Thus, hybridizing wind and solar resources provide a number of advantages ranging from complementarily in generation, shared infrastructure like evacuation and access as well as improved facility management. Such projects can improve the electricity generation from particular regions as well as lead to cost optimization due to sharing of infrastructure. The development of RE hybrid projects has a huge potential in states which boast good wind and solar resources.

However, the benefits from these projects are yet to be mapped and captured in appropriate policy and regulatory frameworks. The Program aims to work with the governments of two focal states (Karnataka and Rajasthan) to develop enabling policy and regulatory frameworks after identifying, mapping and monetizing the benefits associated with such projects.

Intended Results: The Program is assisting the DOE, GOK and DOE, GOR (through KREDL and RRECL) to create an enabling policy and regulatory ecosystem for the deployment of wind-solar hybrids in these states. Such an ecosystem can be replicated in other states.

Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One benefit framework proposed for the development of wind-solar hybrids that could be replicated nationally
- Two policy interventions/modifications proposed based on benefits framework for the development of wind-solar hybrids (one for each state)
- Two regulations proposed based on benefits framework for the development of wind-solar hybrids (one for each state)

- Six organizations (DOE of two states, two SNAs - RRECL and KREDL, and two SERCs) with improved capacity to identify and implement RE hybrid program
- 100 MW RE capacity addition

Status of work-plan activities and deliverables: The Program analyzed the key benefits for development of RE hybrid projects; and assisted the SNAs in developing a White Paper and guidelines for development of the suitable RE hybrid program in the states. The mode for development of the White Paper was via stakeholder discussions with developers, regulator, SNAs and state utilities. The White Paper focused on the national perspective and will be used as a reference tool to propose policy and regulatory interventions. The Program submitted the draft guidelines on RE Hybrid Project to MNRE and discussed with MNRE for fine-tuning it for brown field RE Hybrid projects. The Program also submitted its detailed comments on the draft National Policy on RE Hybrid published by MNRE. The Program continued to engage with KREDL for providing TA for their proposed RE Hybrid project at their existing wind farm.

At the same time, the Program initiated discussions with NTPC for providing TA for their proposed 100 MW RE Hybrid project in Kudgi, Karnataka.

S.No	Activities	Status
A	Initial scoping meetings in two states	Completed in Karnataka
B	Background research and information gathering	Completed
C	Preparation of draft White Paper on program design and implementation roadmap for RE hybrid project	Completed
D	Presentation of draft White Paper to DOE, SNAs and SERCs	Completed for Karnataka
E	Development of guidelines for development of RE hybrid program	Dropped as Karnataka and Rajasthan did not request for the same.
F	Organization of a stakeholder workshop	Completed in Karnataka
G	Finalization of White Paper and recommendation of policy and regulatory interventions	Completed for Karnataka

Brief description of activities this quarter:

- **Karnataka:** No activities were carried out during this quarter.

Challenges/risks: The SNAs have little or no experience in RE hybrid project design, planning and implementation. The Program proposes to address these challenges/risks through presentations and discussions to highlight benefits from RE hybrid projects and share work done for NTPC in development of Hybrid Park at Kudgi.

Support required from USAID: No support is required from USAID at this stage.

Technical Assistance to NTPC for development of solar wind Hybrid Park at Kudgi, Karnataka

S.No.	Activities	Status
A	Inception Report	Completed
B	AEP Estimation Report	Completed
C	Infrastructure requirement report	Shared with NTPC
D	Financial Model and sensitivity analysis	Shared with NPTC
E	White paper on measurement and metering	Draft paper shared
F	White paper on design approach	Final version of paper shared
G	DPR preparation	Submitted to NTPC after addressing the comments on 9.12.2017
H	Bid management support	Shared with NTPC on 12.11.2017

- **NTPC**
  - Conducted discussion with Wind OEMs for finalizing the metering and measurement approach of Wind-solar hybrid plant
  - Submitted the DPR, Infrastructure report, draft tender document and white papers for design approach of wind-solar hybrid plant and metering & measurement.
  - Conducted status update meeting with NTPC.
  - Revised the financial model as per comments on recent wind & solar tariffs, auxiliary charges and ash dyke area.

Technical Assistance to Develop and Implement RPO - Compliance Monitoring Framework in Rajasthan

Objective: RPO compliance monitoring is crucial to ensure that the RPO targets are met and that non-compliance is brought to the regulator's attention for necessary regulatory action. The Program is engaged with RRECL/RERC to provide technical assistance in the area of development of a registry for all obligated entities, design of forms/formats for reporting/compliance monitoring, and development of web-enabled tools for ease of access to information and ensure transparency in the process. Another important objective is to create a framework/institutional arrangement in order to streamline RPO compliance monitoring/enforcement framework in the state.

The Program developed a report on Renewable Purchase Obligation – Compliance Monitoring and Reporting (RPO-CMR) framework and submitted it to RRECL. The report provided a detailed outline for establishing RPO-CMR cell, standard formats for RPO compliance data collection and RPO information manual. Subsequently, the Program also made a detailed presentation to RERC. This would be a unique initiative by RRECL/RERC,

which could set an example for other states/SERCs to follow since no similar regulatory mechanism has been initiated in India.

Intended Results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One existing organization with improved capacity
- One replicable framework for RPO compliance and monitoring

Status of Work-plan activities and deliverables:

The Program is working with Rajasthan Renewable Energy Corporation Limited (RRECL)/Rajasthan Electricity Regulatory Commission (RERC) to provide technical assistance in the development of a registry for all obligated entities, design of forms/formats for reporting/compliance monitoring, and development of Web-enabled tools for ease of access to information and ensure transparency. Another important objective is to create a framework/institutional arrangement in order to streamline the RPO-CMR framework in the state. The Program developed a report on RPO-CMR providing a detailed outline for establishing a RPO–CMR cell, standard formats for RPO compliance data collection and a RPO information manual. Subsequently, RRECL requested the Program to provide handholding support through deployment of a resource for a couple of months and development of a Web tool for the RPO-CMR. The web tool has been developed for Rajasthan and went online in March 2017.

The Program has also developed generic web tool for RPO. During the 10th meeting of Forum of Regulators in January 2017, it was decided that the Program will assist Gujarat Electricity Regulatory Commission (GERC)/GEDA adopt generic web tool for RPO for state of Gujarat.

S.No	Activities	Status
A	Structure of the RPO Compliance Monitoring Framework	Completed
B	Design of RPO Cell	Completed
C	RPO compliance monitoring cell including systems, processes, manpower, reporting and control	Completed
D	Formats and forms for data capture and reporting	Completed
E	Presentation on RPO Compliance Monitoring framework in AREAS meeting	Completed
F	Presentation on RPO Compliance Monitoring framework to FOR	Completed
G	Submission of report to FOR on RPO Compliance framework for adoption by other states	Completed

Brief description of activities this quarter:

- Provided handholding support to Obligated Entities for successful registration on web tool successfully done registration of more than 40 Obligated Entities on Web Portal;

- Supported more than 30 Obligated Entities in uploading their energy consumption data (both conventional, RE procurement, REC etc.) and submission of compliance report to RRECL for FY 2016-17 and FY 2017-18 (first two quarters);
- Supported RRECL in organization of RPO Compliance Monitoring (RPOCS) Launch Event at RRECL Head Office, Jaipur;
- Prepared Agenda, Invitation Letters and Presentations for RPOCS Launch Event,
- Prepared RPO Web Tool Dossier for the State of Rajasthan;
- Prepared Closure Report covering technical assistance provided for RE and EE activities during last four years;

The Program successfully conducted Close Out Meeting and Launch of web-based RPO Compliance Monitoring and Reporting system, in the State of Rajasthan. Important stakeholders such as RRECL, RERC, Distribution Utilities (JVVNL & AVVNL) participated in close out meeting. All activities identified for providing technical assistance were successfully completed

Launched the Generic RPO framework dossier in the 16th Technical Committee meeting at Gir, Gujrat on November 24, 2017

Status: This activity is completed

Challenges/risks: The following challenges are anticipated:

Support required from USAID: No support is required from USAID at this stage.

Technical Assistance to develop framework for RE infrastructure like solar parks through Public-Private Partnership (PPP)-based investment models in Rajasthan

The aim of this activity was to identify suitable business models that can be adopted to promote investments in large-scale RE assets such as solar parks.

Brief description of activities this quarter: No activities this quarter.

The Program was unable to get any traction from the state. Consequently, it has taken a decision on not to move ahead with this activity.

Technical Assistance to Design City-wide 5 MW Solar PV Rooftop Program in Partnership with RRECL and JVVNL

Objective: The Program received a request from the GOR and RRECL for assistance for the design and implementation of a city level rooftop program for the city of Jaipur. If successful, similar programs can also be launched for the cities of Ajmer and Jodhpur. The Program will assist RRECL in the design of the program and handhold RRECL to bid out of the city-wide

program. The Program aims to use a PPP approach for the implementation of city-wide 5 MW solar rooftop program. The key aim of the PPP approach would be to successfully develop large-scale city level programs through the following:

- **Business Model**: Showcasing a business model for solar rooftop project development using large-scale development of both public and private rooftops in a PPP mode. This is particularly important in states across India as most retail consumers lack the financial and technical resources to develop and install rooftop systems.
- **Policy:** Providing policy, regulatory and technical clarity for large-scale replication of solar rooftop projects in the emerging regime of Net/Gross Metering and achievement of expanded solar rooftop targets. This includes devising and laying down specifications, configurations and norms for these small dispersed un-schedulable systems with buy-in from policy makers, regulators and electricity utilities. This clarity has the potential to provide the framework for development of a large generation base in the future.

The Program supported RRECL in the development of the bid by preparing the concept note, inception report, due diligence on regulatory, commercial and technical aspects of the solar rooftop sector, business mode and structures including the risk matrix. The bidding documents were prepared for RRECL which was subsequently published inviting bids from the private sector.

The Program also supported Malviya National Institute of Technology (MNIT) for the design of solar rooftop project for its campus.

Status of Work-plan activities and deliverables*:*

S. No	Activities	Status
I	**Project Preparation**	
A	Inception meeting with RRECL	Completed
B	Preparation of concept note on commercial assessment of RESCO based model	Completed
C	Preparation of Inception Report	Completed
II	**Analysis and Strategy – Due Diligence**	
A	*Regulatory Due Diligence***-** Evaluation of regulatory aspects applicable for solar PV rooftop projects in Rajasthan	Completed
B	*Commercial Due Diligence*- Identification of tariff for different categories, assessment of project profitability based on decision making factors like Payback period, Internal Rate of Return (IRR), Return on Equity (ROE)	Completed
C	*Technical Due Diligence***-** Impact assessment and	Completed

S. No	Activities	Status
	associated risks of key technical parameters on project viability	
D	Site visit, survey, selection and site key parameters assessment and development of technical assessment inputs	Completed
III	**Manage and Structure**	
A	*Business Model and Structure*- Identification of Business Models, Risks, evaluation of severity, impacts and strategy to mitigate risks and develop approach to reduce risks and preparation of draft bid documents in consultation with RRECL.	Completed
B	*Final version of bid documents*- Developing bid documents in consultation with RRECL and MNIT	Completed
IV	**Design and Evaluation**	
A	*Bid process completion*-Coordinate with RRECL for announcing the bid, stakeholders pre-bid meeting, and closing of bid process	Completed
B	*Bids technical and financial evaluation***-** Opening of bids and evaluation of technical and financial proposals of eligible and qualified bids	Completed
C	*Scale-up Strategy Report for Rajasthan Cities*- Discuss with RRECL and develop a strategy for scaling the city wide solar PV rooftop projects /program in Rajasthan	Completed

Brief description of activities this quarter: No major activities carried out in the reporting quarter.

Task 2: Market-driven RE technology Deployment

Technical Assistance on Commercial & Industrial Pilots to Public Sector Undertakings (PSUs) for Deploying Solar Projects

Objective: PSUs have a huge potential for RE deployment due to their:

- High cost of energy
- Ability to invest
- Access to appropriate land and infrastructure

The Program is working with two PSUs—IOCL and Indian Railways—that have sufficient capacity to undertake large-scale RE deployment, especially decentralized solar PV rooftop systems.

- **IOCL**: IOCL has tremendous potential to deploy RE across its supply chain including refineries, townships, warehouses and retail outlets. It has requested the Program to assist its foray into decentralized solar deployment with specific focus on the design and deployment of rooftop installations. Based on this request, the Program is providing technical assistance to IOCL to deploy rooftop systems on its refineries and petrol pumps:
  - *Refineries*:
    - Develop 5.75 MW of solar PV rooftop at Panipat, Baroda and Barauni refineries under MNRE's PSU scheme.
  - *Petrol Pumps:*
    - Implement a program for solarisation of 1,000 petrol pumps.
    - Prepare a guidebook for solarisation of petrol pumps.
  - *Solar Park:*
    - Provide support to IOCL and Oil India Ltd. (OIL) to establish 1,000 MW in solar park(s). These two PSUs are uniquely positioned to tap this opportunity due to their ability to invest, enhance size of the energy portfolio and develop into integrated energy companies. As a part of this initiative, the Program will help IOCL and OIL to develop the basic investment framework for this endeavor.

The Technical Assistance provided to Indian Railways is summarized below:

- **Indian Railways**: Indian Railways has pledged to achieve ambitious green targets under the 'Railway Vision 2020' including 10 percent electricity from renewable sources and 15 percent reduction in energy use. At 2011-12 consumption levels, the achievement of a 10 percent RE target would result in generating 860 MW. In this context, the overall target implementation of solar PV rooftop projects for the Indian Railways is 200 MW by 2022.

  One of the biggest energy costs for the Railways is the cost of procuring power from DISCOMs for operation of its stations, workshops and office installations. Indian Railways has vast land and roof-top space resources available which can be leveraged for distributed solar PV systems.

  In 2014, the Railways received an allocation of 15 percent centralized financial assistance/viability gap funding for the establishment of 50 MW of solar PV rooftop systems under MNRE's scheme.

  The Program started engaging with the Indian Railways through SECI for the establishment of solar PV rooftop under SECI's own program. Indian Railways independently requested the Program for technical assistance to implement 50 MW under the MNRE scheme, while the SECI scheme was still under discussion.

- **REMCL:** REMCL is a subsidiary of Indian Railways. It is exploring business opportunities in green energy including generating, selling its power and providing

consultancy in economic power procurement for Railways based on competitive bidding and through energy exchanges. The key potential business area of REMCL includes development of green energy project for Indian Railways e.g. wind and solar energy project, bringing cost efficiencies in energy management, providing consultancy business in wind and solar sector, develop EE projects for Indian Railways and power procurement and its management.

- REMCL has received a mandate to support Indian Railways in deploying 1 GW of RE till 2022. REMCL also aims to develop RE projects as an Independent Power Producer to supply electricity to the consumers other than Indian Railways, and it sought assistance from the Program on this. REMCL intends to explore the potential to deploy solar and wind projects.

Intended results*:*

Indian Railways and REMCL: The Program will continue to assist Indian Railways in the development of clean energy projects. Specifically, the technical assistance is expected to result in the following by the end of 2017:

- 50 MW of deployment of solar PV rooftop
- 100 MW deployment of solar PV rooftop
- One organization with improved capacity to procure solar power through RESCOs/developer and integrate low voltage distributed systems in their own network
- USD 134 million funds leveraged (including approximately USD 21 million public funds)
- Strategy for large scale ground mounted solar and wind projects

IOCL: The Program assisted IOCL in developing solar PV rooftop installations across its refineries and petrol pumps.

IOCL initiated engagement with OIL to develop a 500 MW to 1,000 MW solar park. IOCL is currently developing the business case for the development of the solar park and has requested assistance from the Program for developing the investment case for the solar park(s). Towards this, IOCL along with Oil India Limited (OIL) engaged with the Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL) to sign a Memorandum of Understanding for a site in the state of Madhya Pradesh.

The Program will facilitate establishment of a joint venture between IOCL and MPUVNL to set up a solar park in MP.

Specifically, the technical assistance is expected to result in the following:

- 5 MW of deployment of solar PV rooftop on refineries
- 3 MW of deployment of solar PV rooftop on petrol pumps
- One organization with improved capacity to procure solar power and integrate low voltage distributed systems in their own network

- USD 13 million funds leveraged (including USD 2 million public funds)
- Model documents for replication within IOCL

Status of Work-plan activities and deliverables: The Program undertook the following key activities:

Indian Railways

- Mapped the key technical, commercial, policy, and regulatory risks associated with solar PV rooftop power from RESCOs/developer, allocated these risks to parties more suited to address it, structured commercial arrangements to procure power, defined roles and responsibilities of key stakeholders, and developed formats and processes for bidding.

- Supported Indian Railways to procure 50 MW equivalent of solar PV rooftop power under the RESCO model for which the procurement will be undertaken through its regional offices. For this propose, the Program assisted the Indian Railway Board to develop a model RFP and Power Purchase Agreement (PPA) which can be directly bid out by Zonal offices. It conducted a stakeholder consultation for all Zonal Railways offices to discuss the bid documents, PPA clauses and bidding process with the representatives from these zones. It helped Indian Railways during RFP and RFQ stage to provide the clarifications to the Zonal Railways as well as to the developers on the bid documents. Letter of Award was issued by Zonal Railways to the developer for implementing 4 MW solar rooftop project.

- Supported Indian Railways to procure 100 MW equivalent of solar PV rooftop power under the RESCO model for which the procurement will be undertaken through its regional offices (Zonal Railways). The Program supported Railway Board, in a series of Zonal Meetings held at Rail Bhawan, to explain the objective and approach of solarizing the station along the selected routes. All the stations along the selected routes will be solarized under RESCO model except the stations with capacity less than 10 kW. Zonal Railways will identify the stretch of the route in their respective zone and will conduct the bidding for the same, under 100 MW program.

- Completed the customization of the model bid documents for 100 MW to incorporate the revised Central Financial Assistance scheme by MNRE (MNRE Achievement Linked Incentives and Awards Scheme) and the corrigendum issued for 50 MW program.

- Analyzed the landed cost of power for the procurement of solar power from within and outside for Karnataka based for the Indian Railways and Zonal Railways to meet its state level Solar RPO targets by 2022. The Program undertook a detailed analysis of the solar policies and regulations for these four states and provided inputs to Indian Railways and REMC on the key policy and regulatory exemptions which could benefit them while procuring solar power.

Railway Energy Management Company Limited (REMCL)

- Engaged with REMCL for supporting them in developing a strategy to deploy RE.
- Supported REMCL to finalize of bids for 100 MW solar rooftop power project as it is conducting the bid management process for Indian Railways to procure 100 MW from solar rooftop projects.

The Program continued to support the implementation of 50 MW and 100 MW or any future rooftop solar PV power programs up to 250 MW. The key activities planned are:

- Support in structuring the implementation concept of low capacity stations under 250 MW and future rooftop programs (most feasible premises are rolled out under 50 MW and 100 MW programs).
- Establish the aggregation framework for different classes comprising of lower and distributed capacities. Financial analyses will be conducted for each class to estimate the expected tariff.
- Support in the bidding process in devising the bidding framework incorporating changes in the applicable policies and regulations and in the bid evaluation.
- Support in preparation of RFP for:

    - Technical/Financial Qualification and Cost Bid for 4.50 MWp Grid-Connected Rooftop Solar Projects on Indian Railway Installations (approx. 800 Stations) under the Design, Engineering, Procurement and Supply, Erection, Testing, Commissioning and Comprehensive Operation and Maintenance (O&M) for 25 years (necessary for 10 years) for Indian Railways on Turnkey Basis.

    - Implementation, Comprehensive Operation and Maintenance for 25 years (necessary for 10 years) for Centralized Monitoring Centre at Indian Railways Premises.

- Prepare Engineering, Procurement and Construction (EPC) contract for the rooftop installations and CMC centre for Indian railways for the above capacity.
- Prepare O&M contract for the rooftop installations and CMC centre for Indian Railways for the above capacity.

Indian Oil Corporation Ltd. (IOCL)

- Mapped the critical policy and regulatory frameworks associated with solar PV rooftop across states, prepared detailed feasibility reports for 5 MW across three refineries, and assisted in completion of MNRE forms for allocation of subsidy under the PSU rooftop scheme.

- Assisted IOCL, Oil India Ltd. (OIL) and MPUVNL in developing a coordination committee to arrive at the location for the proposed solar park as well as the terms of reference for each of the partners for the work associated with the development of the solar park.

The Program had supported these three agencies (IOCL, OIL and MPUVNL) in

developing the framework for deployment of the solar park comprising Identification of location and size of the solar park, evacuation from the solar park and business model for the solar park.

S.No	Activities	Status
I	**Indian Railways**	
A	Mapping key risks associated with project and their impact on commercial arrangements	Completed
B	Development of state-wise policy and regulatory analysis for deployment of rooftop	Completed
C	Mapping and benchmarking request for proposals for solar PV rooftops	Completed
D	Preparation of draft model PPA and RFP	Completed
E	Site visits to selected railway stations and facilities	Completed
F	Finalizing model PPA, RFQ and RFP	Completed
G	Facilitation of stakeholder consultations	Completed
H	Implementation support at RFQ and RFP stage	Completed
I	Presented approach for the deployment of 100 MW to the Zonal Railways in a series of meeting.	Completed
J	Customization of Model Bid Documents for 100 MW rooftop solar PV power project	Completed
K	Landed cost of power analysis for the procurement of solar and wind power from within and outside for Karnataka state.	Completed
L	Landed cost of power analysis for the procurement of solar and wind power from within and outside for 9 states.	Completed
M	Finalization of centralized RFQ and RFP document and revision in the model PPA document for 100 MW	Completed
N	Implementation Support at RFQ and RFP for 100 MW	Completed
O	Facilitation of stakeholder consultation (review meeting held on 14.02.17) for REMCL tender	Completed
P	Preparation of draft model agreements for EPC and Operation and Maintenance Contract for 800 stations for IR under CAPEX model	Completed
Q	Initiated decarbonization of Indian Railways for traction loads in the state of Rajasthan	Ongoing
II	**Indian Oil Corporation Ltd.**	
A	Recommendation of strategy for securing allocation from MNRE	Completed
B	Mapping state-wise policy and regulatory frameworks	Completed
C	Site assessments at three refineries	Completed
D	Preparation of detailed feasibility report for three refineries	Competed
E	Preparation of standard documents for procurement	IOCL prepared the standard documents for procurement

S.No	Activities	Status
F	Bid process management	Completed for 5.75 MW
G	Allotment of EPC contracts	Completed for 3 MW
H	Implementation support	Ongoing
I	Scale-up plan for refineries and other rooftop installations	Ongoing
J	Conduct an event in September 2015 to share experiences to accelerate solar energy deployment by PSUs	Completed
III	**Railway Energy Management Company Limited (REMCL)**	
A	Conducted a kick off meeting with REMC to present the methodology to develop a Renewable Energy procurement strategy for REMCL.	Completed
B	Data required to develop the strategy was collected from REMC.	Completed
C	Development of Overall Strategy Approach	Completed
D	Customization of Model Bid Documents for 100 MW rooftop solar PV power project to incorporate rooftop above 25 kWp	Completed
E	Implementing 67 MW rooftop capacities for Zonal Railways from untendered capacities of previous IR rooftop tenders.	Completed
IV	**IOCL Solar Park**	
A	Report on state selection for solar park development	Completed
b	Report on the framework for site selection for solar park	Completed
c	Report on GIS mapping of the selected sites	Dropped
d	Report on financial attractiveness of sites	Dropped
e	Report providing techno-commercial assessment report of selected site(s)	Dropped
F	Report on required approvals and statutory clearances.	Dropped

Brief description of activities this quarter:

Indian Railways*:*

- Continued to support IR in implementing 50 MW of solar rooftop for which the Program had assisted IR with developing tender documents and carryout bidding.
- Continued to support IR with subsequent steps of implementing 100 MW for which the Program had assisted IR develop tender documents and carryout bidding.
- Of the 50 MW, 6.5 MW has been installed and of the 100 MW, 3.5 MW has been installed.
- Initiated discussion for decarbonization Indian Railways for traction loads in 5 states.

- Maximizing solar rooftop potential across 4 stations in Delhi. Conducted site surveys across 4 stations - NDLS, HZN, AV, DLI
- Developed a framework for Group Net Metering (GNM) to be used across 4 stations in Delhi
- Developed a framework for Solar Rooftop + Energy Storage System (ESS) systems for different station categories – Rail Coach Factory (RCF), Station Category D & E.

IOCL: The Program is working with IOCL on Energy Storage pilot project, which has a solar PV component. Please refer to the section on Energy Storage for update on activities in the reporting quarter.

REMCL

- Continued to support in allocation for 67.38 MW of solar rooftop for which the Program had supported in the bid process.

Challenges/Risks: No challenges/risks envisaged

Support Required from USAID: No support is required from USAID at this stage.

Technical Assistance to Develop and Roll out Rural Pilots

Objective: Solar irrigation, when promoted through appropriate models, offers tremendous potential in reducing the demand for agriculture sector power consumption and dependence on diesel for irrigation, thereby improving the financial health of DISCOMs as well as enhancing rural livelihoods. The Program is working on two such models: (a) a grid-connected solar pumping project in Karnataka under the *Surya Raitha* Program of GOK, and (b) a shared service model for solar irrigation in Bihar.

- **Grid-connected solar irrigation project in Karnataka:** A grid-connected solar pumping project in Karnataka is being implemented under the *Surya Raitha* Program of GOK. The *Surya Raitha* Program comprises of three components: (a) estimating economics of the program for BESCOM and GOK; (b) support during design, implementation and monitoring of pilot; and (c) support for scaling up at the state level. Under this initiative, the farmers will replace their existing pumps with the energy efficient net metered solar water pump sets. The various benefits expected to be accrued to the farms are:
    - Farmers become net power generators completely eliminating energy usage for agriculture and earn a tariff for net energy exported.
    - Improve agrarian livelihood by providing farmer cash income for “growing” solar energy as a remunerative cash crop.
    - Conserve the environment through a built-in incentive to conserve groundwater and energy use in pumping.
    - Enhance the quality of irrigation by providing farmers reliable, uninterrupted, daytime power supply.

- Reduce the carbon footprint of groundwater irrigation by reducing electricity and diesel use in pumping water.
- Improve finances of the power sector by liberating DISCOMs from the deadweight of farm power subsidies.
- Reduce Transmission & Distribution losses by replacing grid power by locally generated power.

- **Shared service model for solar irrigation in Bihar**: Bihar has low cropping intensity due to limited access and control over water for irrigation. Due to very high peak power deficit it is difficult for farmers to access water for irrigation through power from the grid and thus run on diesel pump sets - own or rented. With increasing price of diesel, the cost of irrigation is increasing. The increase in cost is even higher for water buyers. On the other hand, the state is rich in groundwater availability. Thus the conditions are apt for large-scale adoption of solar pumping technology. The key challenges in this are creating an appropriate institutional mechanism and meeting the financing needs of the farmers.

  To address this challenge, the Program is working on a solar pumping initiative in Bihar with BASIX/Indian Grameen Services (IGS), a well-known not-for-profit organization. The Program has developed a model for implementation and reached out to the possible donors, and prepared concept notes, presentations and proposals. It has also finalized cost and technical specifications based on actual field requirements.

Intended Results:

Grid connected solar irrigation project in Karnataka

- 2 MW of solar deployment
- USD 2 million leveraged for deployment of RE
- One model developed for national scale-up

Shared service model for solar irrigation in Bihar

- 0.06 MW of solar deployment
- USD 148,000 leveraged for deployment of RE
- Three organizations with improved capacity to implement shared service model (BASIX/IGS, farmer producer organizations, and self-help groups)

Status of work-plan activities and deliverables*:*

***Surya Raitha* Program of GOK:**

The Program:

- Provided technical assistance to design and implement a large-scale grid integrated solar pumping program and generate inputs in designing and scaling a state wide program.

- Designed the basic concept, estimated the economics of the pilot program, evaluated the institutional requirements and identified the most appropriate implementation model for launch of the pilot project.
- Assisted KREDL and BESCOM to evaluate and provide technical inputs to the DPR for the pilot project implementation at Harobele, Karnataka, benefiting 250 farmers (Phase-I) and 60 farmers (Phase-II).
- Provided inputs for the pilot design and the bid structure
- Developed monitoring parameters and a monitoring plan
- Developed the initial draft of the white paper on business models, lessons learnt, best practices and scale-up plan under the pilot program for submission to USAID.
- Completed the field visit to the pilot site along with the implementing agency (SunEdison) and held discussions on the ongoing implementation.

SunEdison has been successful in installing 310 solar irrigation systems (5HP: 210 & 7.5 HP: 100), the Solar PV capacity of these pumps is 2.59 MW (5 HP: 7.2 kWp; 7.5 HP: 10.80 kWp per pump).

A shared service model for solar irrigation in Bihar:

The Program:

- Collaborated with Indian Grameen Services (IGS) as the pilot partner and interacted with the Climate Group and the Centre for Environment and Energy Development (CEED) who agreed to support the pilot. They offered 12 solar pumps of which eight have been installed and are operating satisfactorily.
- Assisted IGS and Vayam in identifying potential solar pump set suppliers and assessing their technical and financial proposals.
- Provided TA to IGS and Claro Energy (the identified supplier) in commissioning the pumps at four sites and undertaking a preliminary impact assessment of six other sites which had been commissioned earlier.
- Developed a Monitoring and Evaluation (M&E) framework for this pilot.
- Developed first draft of the white paper on business models, lessons learnt, best practices and scale-up plan under the pilot program for submission to USAID.

The Program will monitor the performance of the Bihar Pilot and carryout any TA activity if requested by IGS.

S.No.	Activities	Status
I	**Grid-connected solar irrigation project in Karnataka – Harobele**	
A	Baseline for the pilot	Completed
B	Finalization of program economics	Completed
C	Review and finalization of the DPR for the pilot	Completed

S.No.	Activities	Status
D	Inputs in the technical specifications of SPV IP sets and controls	Completed
E	Inputs in finalization of the pilot design	Completed
F	Inputs in the bid structure for implementation	Completed
G	Monitoring parameters and plan	Completed
H	Technical evaluation report of bids (if requested by BESCOM)	No request
I	Structure of farmers' cooperative (if requested by BESCOM)	Not requested by BESCOM
J	Submission of White Paper on "Business Models, Lessons Learned, and Best Practices"	Completed
K	Scale up plan (as part of White Paper)	Completed
L	Submission of first quarterly monitoring report	Completed
II	**Grid-connected solar pumping project in Karnataka – Phase 2**	
A	Report on learnings from Surya Raitha pilot project	Ongoing
B	Monitoring Report – Baseline	USAID has intimated to PACE-D to halt any further activity on this project till further communication
C	Monitoring Report - Post implementation	
D	Report on techno-commercial due-diligence of the proposal submitted by SunEdison submitted by SunEdison	
E	Stakeholder Workshop: Business Model for scale up incorporating learnings from Phase-1 pilot	
F	Submission of RFQ, RFP	
G	Report on pre-bid assistance	
H	Report on technical assistance in bid evaluation and contracting	
I	Report on monitoring framework for the program	
J	Report on scale up plan	
III	**Shared service pilot for solar irrigation in Bihar**	
A	Finalization of concept notes, PFR, presentations and customized proposals	Completed
B	Identification of possible donors and pitching to Donor	Completed

S.No.	Activities	Status
C	Finalization of costs and technical specifications	Completed
D	Finalization of governance structure	Completed
E	Contracting and field execution	Completed
F	Capacity building of users/operators	Completed
G	Development of M&E plan and its implementation	Completed
H	Preparation of a White Paper on lessons learned and its presentation in a stakeholder workshop together with a scale-up plan	Completed

Brief description of activities this quarter: No specific activity has been undertaken during this quarter.

Challenges/risks:
Surya Raitha: The grid-connected solar pumping project in Karnataka under the *Surya Raitha* Program has been awarded to SunEdison, which is currently implementing the project. The Surya Raitha scheme is receiving positive feedback from a range of stakeholders and can potentially be a game changer in tackling the challenge of irrigation electricity consumption, not only in the state of Karnataka but also in other peninsular Indian states. The feed-in tariff of INR 9.56 announced by GOK is also quite attractive. What needs to be seen is how the farmers respond after they participate in the project. This has ramifications on the state wide launch of the program. The Program proposes to capture the learning from this pilot and provide inputs to GOK/KREDL/BESCOM to up-scale the initiative.

The project is completed.

Support Required from USAID: No support is required from USAID at this stage.

Development of Unified Solar Rooftop Transaction Portal for one Distribution Utility in Partner State

Objective:
The solar rooftop market is still at a nascent stage and a number of critical links are required for the development of market eco-systems for scaling of deployment. Also, institutional framework is yet to be fully developed or matured for the solar rooftop development and deployment. Any consumer who wishes to implement the solar rooftop project may not have the detailed information available at one place with respect to potential for installation of solar rooftop systems on their roofs, area requirements, types of technologies, information related to major vendor/channel partners, processes/procedures to be followed for interconnections, availability of subsidy and finance.

The Program thus intends to design and develop a common integrated platform that can provide all information at one single point and also allow transactions between multiple stakeholders for the acceleration of deployment of the solar rooftop projects. The Program will associate with distribution utility of partner state and provide necessary technical assistance in development of 'Unified Solar Rooftop Transaction Portal (USRTP).

Intended results:

- Providing a one stop solution for consumers who are prospective prosumers with improved access to information;
- Integrating all the stakeholders (consumer, distribution utility, SNA, SERC, Electrical Inspectorate, banks/financing institution and facilitators/manufactures) on a single platform;
- Facilitation of online approval by all stakeholders for solar rooftop system installation; and
- Enhanced deployment of solar rooftop systems through distribution utility due to ease in process.

Status of work plan activities and deliverables:

The table below lists the status of deliverables/activities

S.No.	Activities	Status
A	Conceptualization of Transaction Tool	Completed
B	Finalization of Concept through Stakeholder Consultation	Completed
C	Development of Business Requirement Document	Completed
D	Development of Design Interface With Banks, Utilities and SNAs	Ongoing
E	Development of Software Requirements Specification and Webhosting Requirement Document	Completed
F	Development of Transaction Portal	Ongoing (January 2018)
G	User Acceptance Testing	Ongoing (February 2018)
H	Support in Security Audit and Necessary Modifications	Ongoing (March 2018)
I	Preparation of Manual of the Tool	January 2018
J	Organization of Training Program on Tool for Capacity Buildings of BESCOM, Banks and SNAs	February 2018

Brief description of activities this quarter:

- Received consent from NREDCAP in Andhra Pradesh to develop the USRTP in July 2017.
- Completed finalization of the Concept Note and submitted Business Requirement Documents through stakeholder consultation.
    - Undertook multiple rounds of interaction with Non-conventional Energy Development Corporation of Andhra Pradesh Ltd. NREDCAP to finalize the functionalities for NREDCAP on the Portal.
    - A Draft Note on Procedures for Subsidy Application and Disbursement for Proposed Unified Solar Rooftop Portal was submitted to NREDCAP also a Draft Note on IT Approval and Clearances for USRTP was submitted to

NREDCAP. The Draft Note for Subsidy Application and Disbursement process was finalized.

- The program during its interaction understood that Andhra Pradesh Directorate of Electrical Safety and Chief Electrical inspector to the Government (DES – CEIG) has developed an Ease of Doing Business (EOBD) Portal. The Process of seeking drawing and statutory clearance will be mediated through the EODB Portal and the USRTP will provide a link of the DES – CEIG EODB Portal. Multiple rounds of interaction using detailed questionnaires were undertaken to decide the functionalities for the DISCOMs. The team met with General Manager (Commercial and Solar Energy), Andhra Pradesh Eastern Power Distribution Company Ltd. (APEPDCL) and revised the Draft Note on Interconnection Procedure of Distribution Companies for Unified Solar Rooftop Transaction Portal. The revised note with incorporated changes was submitted to Andhra Pradesh Southern Power Distribution Company Ltd (APSPDCL) and APEPDCL and the Program received consent from both the DISCOMs on the functionalities proposed. .
- To decide the points of interlinking for development of design interface with APEPDCL and APSPDCL the Program met with APEPDCL CMD, GM (Solar), ADE (Solar) and APEPDCL IT Team on December 4-5, 2017 and shared the Minutes of the Meeting with APEPDCL IT Team. Subsequently on December 19-20, 2017 the Program met the CGM (IPC and MM), DE (IPC and MM) and APSPDCL IT Team and shared the Minutes on Meeting with APSPDCL. Based on this the Program initiated seeking data form both the DISCOMs for developing the Design Interface with the DISCOM Stakeholders.
- To integrate the Payment Module on the USRTP interaction with the Officials of the 'Billdesk Payment Gateway' has been undertaken and a request seeking a proposal from 'Billdesk Payment Gateway' to NREDCAP has been sent.
- A Demi Officio (DO) letter has been prepared and shared with multiple banks seeking their consent to participate on URTP. Consent from Bank of Baroda, IREDA and India Bank has been received to participate on the USRTP. The Program is in the process of co-ordination to seek agreement of the banks/FIs on the functionalities proposed. The functionalities have been proposed by preparing and sharing a 'Draft Note on Functionalities of Unified Solar Rooftop Transaction Portal for Banks and Financing Institutions'
- Completed submission of 'Draft Note on System Requirements Specification and Webhosting Requirement'.

- Development of the USRTP is ongoing.
- Received consent from BESCOM for development of the USRTP.

Challenges/Risks: Challenges in seeking consent on finalizing functionalities of Banks/FIs.

Support Required from USAID: No support is required from USAID at this stage.

Technical Assistance to Forum of Regulators in development of Generic RPO Web tool

Objective: RPO compliance monitoring is crucial to ensure that the RPO targets are met and that non-compliance is brought to the regulator's attention for necessary regulatory action. The Program is engaged with RRECL and helped them in development of a web based portal for RPO compliance monitoring of obligated entities in the state. This web based portal will facilitate distribution licensee, Chief Electrical Inspector (CEI) and State Load Dispatch Centre in identifying and certifying the entities as obligated entities. Web portal will also help in streamlining the increasing number of entities on day to day basis and thereby developing a systematic database of information on RPO obligated entities in the state. Presently, RPO web tool is hosted on the energy portal of the government of Rajasthan. This tool is one of the unique initiatives by RRECL/RERC which can set an example for other states/SERCs to follow, since no similar regulatory initiative has been initiated in the country. Forum of Regulators has also supported and appreciated the work undertaken by the Program for the monitoring and compliance reporting of RPO in the state of Rajasthan. During the last meeting, FOR has also suggested exploring/extending this framework for all other states by generalizing it.

The Program is presently assisting FOR in development of Generic RPO web tool based on the analysis of regulations and processes of six states: Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, and Madhya Pradesh. The Program will share the generic RPO tool with the FOR for further sharing with Nodal Agencies of the selected states. The Program will also demonstrate the key functionalities of the web-tool to the nodal agencies of the selected states and provide necessary technical assistance in development of their state specific RPO compliance tool by doing necessary customization to the generic web tool. This will help all state nodal agencies in developing their state specific RPO compliance monitoring and reporting framework.

The Program is providing TA to GERC/GEDA to adopt Generic webtool for RPO for the state of Gujarat.

Intended Results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One replicable framework of RPO compliance and monitoring which can be customize in six selected states.

Status of Work-plan activities and deliverables:

S.No	Activities	Status
A	Submission of Note on Analysis of RPO Regulations and Processes of Selected five/six states	Completed
B	Meeting / Presentation to Technical Committee of FOR	Completed
C	Development of Standard Forms and Formats for filling information of Obligated Entities	Completed
D	Submission of URS/SRS document and Webhosting Requirement	Completed
E	Development of Generic RPO Compliance Tool	Completed
F	Submission of Training Manual	Completed
G	Meeting/Presentation to Technical Committee of FOR	Completed
H	Outreach and Demonstration of Key Functionalities of Webtool to FOR and selected five/six States	Completed

Brief description of activities this quarter:

- Post 14 Technical Committee meeting, Program met with GEDA on September 20, 2017 and demonstrated the functionalities of the tool.
- Further, incorporated the additional features as requested by GEDA in the tool such as filter based reporting structure for customized reports in reporting section, provisions for Generating Analytical Report based on percentage achievement of RPO targets, provision of timelines on data update for control in terms of data updating for applicable FY, creation of database for obligated entities (OEs) as registered with GEDA within the tool, creation of modality for mass mailing to OEs which are not registered under the tool but available in GEDA's OE list
- Demonstrated the features to GEDA through TeamViewer for their consent and confirmation
- Shared the Source Code of Webtool with GEDA to initiate security audit
- Technical assistance to GEDA during the complete security audit process;
- Received Security Audit Clearance Certificate from GEDA;
- Shared Source Code and Application Forms with GEDA for deployment of Web Tool on GEDA's Server;
- The Program also demonstrated RPO Webtool to APSLDC, APDISCOM on Sept 27, 2017 and discussed modalities of the tool.
- Reviewed the forms and formats shared by APSLDC for incorporating modalities in the tool and presently working on the new functionalities that has to be incorporated in the AP RPO Webtool
- Finalized the procedures and forms & formats of RPO Web Tool for the state of Andhra Pradesh;
- Initiated the work on development of RPO Compliance system (RPOCS) for the State of Andhra Pradesh;
- Also discussed the functionalities of RPO Webtool with Assam

- Further, shared APIs with TERI for national portal and received their confirmation on successful integration of API with their IT application
- Updated the status of the RPO activity during the 15 and 16 technical committee of Forum of Regulators. During the 16th Technical Committee meeting, the Program appraised the Committee members about the completion and launch event of the RPO web-tool for the State of Rajasthan, and unveiled a brochure on the Generic RPO Tool launched from Shri Bakshi along with Shri Anand Kumar, Shri Hiremath and Shri M.K.Iyer.

Technical Assistance to Build Capacity of MNRE on Storage Technologies

Objective: Energy storage technologies have a critical role to play in enhancing the deployment of RE technologies. These technologies have the ability to integrate greater amounts of RE to the grid and enhance the use of solar and other stand-alone RE technologies for standalone applications.

MNRE requested the PACE-D TA Program to undertake a detailed study on the potential for application of energy storage technologies in India.

Intended results: The Program's assistance to MNRE will lead to the design and development of the following:

- One institution with improved capacity to address clean energy issues (MNRE)
- One program designed and implemented (National Energy Storage Mission)
- One nationally replicable pilot program designed and implemented
- 10 MW of equivalent RE capacity implemented leveraging USD 11 million

Status of work-plan activities and deliverables:

The Program:

- Identified three distinct set of applications for energy storage for enhancing deployment of RE technologies. These included improved grid integration, enhanced onsite generation and reliable energy access using a combination of RE and storage.
- Developed a report which identified the key technologies including the established and emerging technologies, and their characteristics, performance and economics.
- Provided recommendations for increasing the deployment of energy storage technologies including the development of an Energy Storage Roadmap for RE integration and the launch of a demonstration program to evaluate technology performance and implementation models across various end use applications.
- Published the findings and recommendations of the study in a report titled "The Assessment of Role of Energy Storage Technologies for RE Deployment in India".

Based on the recommendations of the study, MNRE has requested the Program to assist them in the following areas:

- Developing a program to set up pilots demonstrating energy storage technology solutions for different applications, and
- Developing a roadmap for increasing deployment of energy storage solutions in India.

The two initiatives are described below:

- Demonstration Program: The demonstration program will improve the understanding of promising energy storage technologies and their performance for various applications. It is expected to lead to deployment of energy storage solutions in large-scale for grid-connected and decentralized applications.
- Roadmap for Energy Storage in India: The roadmap will set the vision and targets for the energy storage including deployment and manufacturing and detail out steps for achieving the targets along with timelines. It will also assist the government in developing appropriate policy interventions and appropriate times.

The Program supported MNRE launch a pilot program for development of demonstration projects. It also assisted MNRE in evaluation of proposals received against the Expression of Interests (EOIs) and provided technical assistance to MNRE for short listing ten proposals for funding. Finally, three PSUs--Rajasthan Electronics and Instruments Limited (REIL), IOCL and Bharat Heavy Electrical Ltd. (BHEL)--were selected by MNRE for demonstrating their energy storage projects with MNRE's funding support. The Program worked with MNRE to develop M&V framework for energy storage projects. The Program also developed Model RFP for energy storage projects. As part of its support to shortlisted project proponents, the Program is currently assisting REIL in preparation of DPRs and Bid Process Management for PV-Diesel Hybrid with storage at Havelock and Neil islands in Andaman and Nicobar.

The Program will continue its assistance to the shortlisted agencies--REIL (Andaman), IOCL (Asaoti) and BHEL (Hyderabad)--for finalizing and submitting the DPR to MNRE for funding.

The Program prepared the Energy Storage Roadmap document and was shared with USAID for finalization.

S.No	Activities	Status
A	Provide Technical Support to Expert Group constituted by MNRE on a continuous basis	The expert group was formulated and first discussion meeting conducted
B	Support MNRE for demonstration projects • Identification of end users who would like energy storage applications designed and implemented on facilities a. EOI Process for identification of potential projects b. Short list of projects for funding under the program • Identification of end users who would like energy storage applications	Identification of end users Completed – EOIs submitted and shortlist for allocation completed MNRE intimated that 3 projects have been finally approved for the program viz., IOCL, REIL and BHEL Model RFP and M&V documents were

S.No	Activities	Status
	designed and implemented on facilities • Development of detailed use case scenarios and terms of reference for technology solution providers • M&E Support	prepared and approved by MNRE. Meetings and discussions with all the three parties.
C	Develop roadmap for increasing deployment of energy storage solutions in India	Completed
d	RFP Preparation	Completed
E	Report on the assistance extended to selected parties for pre-bid meetings and drafting responses on behalf of MNRE	Dropped
F	DPR preparation for three (3) project proponents	DPR for IOCL has been submitted, comments are being incorporated
G	RFP preparation for the selected projects	Tender for IOCL has been submitted and final comments are being incorporated.
H	Report on the assistance provided to MNRE for evaluation of proposals	Dropped
I	Bid Process Management Assistance to selected parties	Tender document has been shared with the selected parties, however no communication has been received for further support required from our side
J	Report on M&E framework	Completed
K	Report on learnings from the entire technology demonstration process	Submitted
L	Report on policy recommendations and scale up plan	Dropped

Brief description of activities this quarter:

Assisted all three PSUs selected by MNRE for DPR preparation.

- Submitted the draft DPR and RFP to IOCL. Received the comments and incorporating the same in the DPR
- Conducted page by page review of RFP document with IOCL.
- IOCL to freeze financial model (Assumptions related to replacement cost of Power Conditioning Units)

Challenges/risks*:* Challenge was faced in deciding the penalty to be imposed on contractor for short fall in capacity or efficiency of plant. .

Support required from USAID*:* No support is required from USAID.

Task 3: Technical Assistance and Capacity Building to Develop and Implement Innovative Finance Mechanisms

Technical Assistance to develop and Roll out RE Financing Mechanisms

Objective: One of the key areas of work for the PACE-D TA Program is to facilitate scale-up and investments in RE generation capacity. Over the last two and a half years, the Program has worked on a number of emerging areas with the objective of scaling-up capacity addition and investments in RE by working towards the design and development of new and innovative financing instruments such as Green Bonds, Off-grid Debt Fund and a Decentralized Renewable Energy - Community Fund (DRE-CF).

Intended results: Specifically, the technical assistance is expected to result in the following by 2017:

- FIs with improved capacity to implement innovative financing instruments for financing RE projects training on RE financing
- Investment leveraged from public and private funds for implementation RE projects
- RE capacity addition

The approach adopted under the Program for the design and deployment of Green Bonds and the Off-grid Debt Fund has the potential to create a replicable and scalable business model for other FIs to set up similar financing schemes for financing clean energy projects.

Status of work-plan activities and deliverables: The Program's activities were focused on building on initiatives with a more detailed approach on RE financing within the following identified financing mechanisms, namely Green Bonds, Off-grid Debt Fund, Decentralized Renewable Energy - Community Fund (DRE-CF) and Infrastructure Debt Fund – Mutual Fund (IDF-MF).

The summary of the activities during is provided below:

- **Off-Grid Fund**: The Program provided TA to The Climate Group (TCG) to develop a debt fund for financing off-grid projects in India. The key objective of the fund is to provide debt financing in the space of off-grid energy applications. While TCG will provide grant for the formation of the fund and investments undertaken, the vision is to develop a fund that can leverage market capital and hence offer market driven returns. Subsequent to the Program providing the TA to TCG, the board provided its consent for the launch of the Off-Grid Fund. TCG initiated the process of completing the formalities with the host of the Off-Grid Fund facility, namely Oiko Credit and its Indian counterpart, Maanaveeya Development and Finance Pvt. Ltd. However the TCG Board changed its priority and is not going ahead with the fund. The Program does not anticipate any future request for TA by TCG as the fund was not launched.

- **Decentralized Renewable Energy - Community Fund (DRE-CF):** The Program provided TA to Chhattisgarh Renewable Energy Development Agency (CREDA) in structuring a fund for funding decentralized renewable energy projects in villages**.**

The DRE-CF aims to garner soft funds through grants, corporate social responsibility (CSR) contributions, etc. which it will utilize for the development of off-grid projects in the state. The Program assisted CREDA in the design and development of the fund and raising investments for the fund. It made several efforts to reach out to corporates and presented the concept of the DRE-CF as well. However, the priority of corporates shifted towards investing in sanitation projects due to GOI's Clean India Initiative. As such, it was challenging to seek investments from the corporates for establishing the DRE-CF for CREDA. Subsequently, the Program decided not to pursue further on this activity.

- **IIFCL- Infrastructure Debt Fund – Mutual Fund (IDF-MF):** IDFs can operate either as a trust or a company. An IDF formed as a trust is a mutual fund (MF) referred as IDF-MF; whereas an IDF formed as a company is a Non-Banking Finance Companies (NBFC), referred as IDF-NBFC. India Infrastructure Finance Company Ltd. (IIFCL) plans to launch Series III close ended, privately placed IDF-MF of INR1,000 Crores (app USD 160 million) with a tenor of 10 years. The funds raised shall be placed for various green initiative including energy (wind, solar, hydro), sustainable urban development, etc. Previously, IIFCL has launched its maiden 10 year tenor "IIFCL Mutual Fund Infrastructure Debt Fund – Series I" in 2013 through 'Private Placement' with total corpus of INR 300 Crore. The Program engaged with IIFCL after execution of MOU between IIFCL and USAID during 2015 for green IDF issuance. As IIFCL's second tier of IDF has run into some difficulties due to low investor interest, IIFCL needed more time for working on green IDF issuance.

- **Green Bonds:** Green Bonds are standard fixed-income financial instruments (bonds) where the proceeds are exclusively utilized for financing climate change related projects or programs. Globally, Green Bonds has been growing exponentially since 2013, with fresh issuances in last two years accounting for over 80 percent of the total outstanding. As of December 2016, the international market size for labeled Green Bonds is USD 160 billion, which includes USD 81 billion of fresh issuance in 2016, making 2016 as the biggest year ever in the history of issuance of Green Bonds. The Program published an issue paper on Green Bonds and has been working with a number of institutions such as IREDA, PTC India Financial Services, YES Bank, IIFCL, EESL, Axis Bank, SBI, etc., in building their capacity for the launch of Green Bonds. The Program engaged with FIs specifically focusing on Green Bonds and provided TA to link them with the international investors for accessing international funds leading to successful issuances. The Program organized three roundtables with Indian/International Investors/Merchant Bankers for issuance of Green Bonds in Mumbai and New Delhi during May 2016. It engaged Climate Bond Initiative (CBI) who assisted four Indian Green Bond Issuers for issuing Green Bonds. The Green Infrastructure Investment Coalition (GIIC) in collaboration with USAID organized an India centric meet on June 30, 2016 in London and the Program participated in this event along with prospective Indian investors.

S.No	Activities	Status
I	**Preparatory Activities**	
A	Review of existing international and national RE financing mechanisms	Completed
B	Prepare and launch a report on their view of RE financing mechanisms	Completed
C	Design a bouquet of financial mechanisms	Completed
D	Identify partner institutions for anchoring/launching	Completed
II	**Off-grid Debt Fund (with TCG)**	
A	Signing of MOU	Completed
B	Draft of business plan presentation	Completed
C	Developing Financial Model	Completed
D	Stakeholder (TCG and team) consultation	Completed
E	Finalization of Information Memorandum (Business Plan as basis) including Business Plan	Closed
F	Presentations to potential Investors	Closed
G	Stakeholder Event	Closed
H	Review of Documentation for formation of Anchor Charter, Fund Structure (financial and legal)	Closed
I	Develop Standard Operation Procedures and Operational policies/structure of the fund	Closed
J	Submission of White Paper on Lessons Learned	Closed
III	**Green bonds**	
A	White Paper/concept note on Green Bonds	Completed
B	Organization and participation of events on Green Bonds	Completed
C	Outreach to potential anchor institutions, speaking with merchant bankers, multilateral agencies, etc.	Completed
D	Establish network with international investors, documentation of discussions and feedback and schedule meetings with IREDA, TCCL and other FIs. TCCL and or other potential FIs	Completed
E	Execution of MOUs/Agreements with FIs and International Investors and International Financing Institutions	MOU with IIFCL signed
F	Secure in-principle approval for launch of Green Bonds from at least one of the four institutions: IREDA, IIFCL, PTC Financial Services (PFS) and YES Bank	Ongoing
G	*Phase- I: Creating awareness with investors & issuers*	
g.1	Summary notes on the roundtables	Completed
g.2	Summary report on highlights of the Green Investment Infrastructure Coalition event	Completed

S.No	Activities	Status
g.3	Journey report	Completed
H	*Green Bond Issuance*	
h.1	MoU signed with at least 1 issuer	Completed
h.2	Bond issuance Program Design completed	Completed
h.3	Green certification for at least 1 bonds issue	Completed
h.4	Investor connect for 1 potential issuer completed, including brief presentation	Completed
h.5	Engagement of all necessary service providers completed for 1 investor	Completed
h.6	At least 1 Green Bond issuance	Completed
h.7	Concluding meet	Completed
IV	**Decentralized Renewable Energy-Community Fund (DRE-CF)**	
A	Presentation on the Fund to CREDA	Completed
B	Prepare concept note (for CREDA) and presentation to corporates for CSR contributions)	Completed
C	MOU signing	Completed
D	Stakeholder workshop (for CREDA)	Completed
E	Road shows and meetings for raising awareness amongst corporate and raising first round of capital	Completed
F	Defining the internal rules, systems, procedures and institutional structures of the fund within CREDA	Dropped
G	Structuring of programs for which the Corporate Social Responsibility funds will be routed	Dropped
H	Hand holding support	Dropped
I	Dissemination Strategy Paper	Dropped

Brief description of activities this quarter:

- No Major activity was carried out in the reporting quarter.

Challenges/risks: No specific challenge envisaged as of now.
Support required from USAID: No support is required from USAID.

Task 4: Capacity Building, Training, Outreach, Dissemination and Sharing of Best Practices

30,000 person-hours of training was intended to be provided under the Program to meet the objectives of the interventions discussed in Tasks 1-3, 5 and 6.

Technical Assistance to National Institute (NISE) of Solar Energy to Establish and Sustain the Solar Energy Training Network (SETNET)

Objective: The objective of SETNET is to build skills and capacities to ensure the availability of qualified solar energy professionals to meet the national solar deployment targets. The aim is to provide a structured platform to NISE for solar-related technical and business training by building a strong network of qualified and trained professionals for the booming solar industry.

Intended results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- One organization with improved capacity to address clean energy issues (NISE)
- One new institution established to address clean energy issues (SETNET)
- 10,000 person-hours of technical training

Status of work-plan activities and deliverables: The Program conceptualized SETNET and worked in collaboration with NISE to deliver market-based business mode training. It supported NISE to organize six training programs including a training of trainers (TOT) program.

The Program also provided technical assistance to NISE to manage the partner selection process with a call for Expression of Interest (EOI) that elicited 101 responses and participated in the evaluation committee meeting that reviewed the EOIs and short-listed partner organizations. The Program established SETNET, developed an operational strategy and facilitated the formation of Curriculum and Content Development Team (CCDTs) to develop outlines for training programs.

The Program contracted the CII - Green Business Centre (GBC) to undertake a Training Need Assessment (TNA) under SETNET. As a part of this initiative, it developed an inception report, did a pilot survey of eight-ten companies and prepared a preliminary findings report. It also finalized the themes for the training programs for developing the Qualification Packs (QP) under the National Occupational Standards (NOS), in discussions with Skill Council for Green Jobs (SCGJ) and NISE. The Program also engaged with the Natural Resources Defense Council (NRDC) and SCGJ and shared the preliminary findings of the ongoing work (survey) in order to avoid any duplication of efforts, since NRDC and SCGJ had commissioned the TNA similar to the Program's TNA.

In Year 5, the Program finalized and released the TNA report.

S.No	Activities	Status
A	Facilitate NISE to select SETNET partner institutions	Completed
B	Developing an operational strategy	Completed
C	Conduct a partner consultation	Completed

S.No	Activities	Status
D	Form and facilitate CCDTs to develop training materials for at least 1 training program (5 day training program)	Completed
E	Initiate Training Needs Assessment	Completed
F	Summary Report – Pilot Studies	Completed
G	Launch SETNET with organization of first training	Completed
H	Facilitate organization of industry interface	Dropped
I	Release training needs assessment report	Completed

Brief description of activities this quarter: No major activities undertaken this quarter

Challenges/Risks: No challenges/risks.

Support required from USAID: No support is required from USAID.

Technical Assistance in Developing a 1.5 Day Training Program on Solar PV Rooftop for Utility Engineers

Objective: The SETNET, developed by the Program in collaboration with NISE, provides an appropriate institutional framework for the deployment, replication and scale up of structured training programs for capacity building and institutional strengthening to support the solar initiative of the country. In the view of above and for utilities to play a facilitating role in deployment of solar PV based rooftop systems, the Program has developed a unique 1.5 day regional training program with the following two fold objectives:

1. To provide basic information and overview on technology, policy, regulatory framework and business models on solar PV rooftop.
2. To provide specific information on grid interconnection process, relevant standards and safety requirements for interconnection and customer interface and process management for grid-connected solar PV rooftop system.

Intended results:

Specifically, the technical assistance is expected to result in the following by the end of 2017:

- SETNET partners or other qualified training organizations with improved capacity to train utility engineers for grid-connected PV rooftop systems.
- Capacity building of the utilities in different states for successful implementation of PV rooftop program.
- Roll out of five training programs in across various geographical regions of the country.

- 3,600 person-hours of technical training.

Status of work-plan activities and deliverables:

S.No	Activities	Status
A	Development of course curriculum and program strategy	Completed
B	Development of power point presentations for 7 training sessions	Completed
C	Packaging of power point presentations for all training sessions	Completed
D	Development of Handbook for Utility Engineers	Completed
E	Development of Trainer's Manual	Completed
F	Organizing one pilot training at JVVNL, Jaipur	Completed
G	Organizing second pilot training at Kolkata	Completed
H	Organizing third pilot training program at Punjab	Completed
I	Organization of the fourth pilot program at Hyderabad	Completed
J	Organization of the fifth pilot program (UP/Maharashtra)	Completed
K	Development of QPs and NOS	Completed
L	Organization of one TOT Program	Completed

Brief description of activities this quarter: No major activities undertaken this quarter.

Challenges/Risks: No challenge envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

Technical Assistance in Developing a Five (5) Day Entrepreneurship Development Program (EDP) on Solar PV Rooftop for Entrepreneurs

Objective: The SETNET, developed by the Program in collaboration with NISE, provides an appropriate institutional framework for the deployment, replication and scale up of structured training programs for capacity building and institutional strengthening to support the solar initiative of the country. In the view of above, the Program has developed a unique five day EDP for entrepreneurs with the following two fold objectives:

1. To provide basic information and raise awareness amongst entrepreneurs on the following:
   - Concept, design and components with specific focus on technical architecture of solar PV rooftop system/project.
   - Policy and regulatory framework for solar PV rooftop at the national and state level.
   - Different implementation/business models followed in the solar rooftop market and role of stakeholders.

2. To provide specific information to the entrepreneurs and project managers on the following:
    - Solar PV rooftop project costing and financing.
    - Preparation of feasibility report, tenders, and techno-economic reports.
    - Solar PV rooftop Project Management: Procurement, contract management, financing and work scheduling.

Intended results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- SETNET partners or other qualified training organizations with improved capacity to train entrepreneurs.
- Capacity building of entrepreneurs in the solar PV rooftop sector.
- 4,080 person-hours of technical training (including one TOT).

Status of work-plan activities and deliverables:

The Program designed and launched a five day training program for budding entrepreneurs in this sector. The first five day training program was conducted at Gurgaon with NISE and the SCGJ in May 2016 and the second one was organized in July 2016 at Pune. This training program provided a thorough grounding to existing and potential entrepreneurs entering this sector on the structure of the sector, the business models, technology and technical architecture and costing as well as financing. The Program received a positive response from the market with each training program being oversubscribed by two to three times.

The Program aims to hold one more such training program to develop a comprehensive standardized package.

S.No	Activities	Status
A	Development of course curriculum and program strategy	Completed
B	Development of power point presentations for 22 training sessions	Completed
C	Packaging of power point presentations for all training sessions	Completed
D	Development of Handbook for Entrepreneurs	Completed
E	Development of Trainer's Manual	Completed
F	Development of QPs and NOS	Completed
G	Organization of one TOT Program	TBD
H	Organization of three pilot trainings	Two completed.

Brief description of activities this quarter: No major activities were undertaken during the reporting quarter.

Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

Technical Assistance in Developing a One Day Training Program on Solar PV Rooftop for Bankers

Objective: The SETNET, developed by the Program in collaboration with NISE, provides an appropriate institutional framework for the deployment, replication and scale up of structured training programs for capacity building and institutional strengthening to support the solar initiative of the country. In the view of above, the Program has initiated development of a unique one day training program for the bankers with the following objectives:

The primary objective of this training program is to develop comprehensive capacity amongst bankers and financial institutions to appraise and finance commercial and industrial solar PV rooftop projects. The specific objectives of the training program would focus on working with the bankers and the financial institutions to develop the following:

- basic understanding of the solar PV rooftop sector in India, the market structure, business models prevalent in the sector and the policy and regulatory framework for solar PV rooftop project development;
- key technical, policy, regulatory, commercial and implementation challenges facing solar PV rooftop projects and mechanisms to address these;
- an improved understanding of the key parameters that drive the viability and sustainability of commercial and industrial solar PV rooftop projects;
- enhanced understanding of the various business models for solar PV rooftop, the and the technical architecture and commercial arrangements of commercial and industrial solar rooftop projects;
- categorization of key risks associated with the solar rooftop projects to make informed credit decisions; and
- evaluation of the techno-commercial proposals and sanctioning of the loans

Intended results:

Specifically, the technical assistance is expected to result in the following by the end of 2017:

- SETNET partners or other qualified training organizations with improved capacity to train bankers.
- Capacity building of bankers in the solar PV rooftop sector.

Status of work-plan activities and deliverables:

The Program initiated the design of a one day training program for bankers and professionals from financial institutions and others involved in the financing of solar PV rooftop projects. The Program subsequently assisted Skill Council for Green Jobs in

developing the Qualification Pack and National Occupational Standards for Solar Rooftop Financial Proposal Evaluation Specialist.

The Program has completed the training program modules and learners' manual and organized programs on training of trainers and training of loan officers in partnership with FIs and Banks. This training program aims to provide a thorough grounding to bankers and FIs entering this sector on the structure of the sector, the business models, financing opportunities, risks and risk mitigation strategies and costing.

S.No	Activities	Status
A	Development of course curriculum and program strategy	Completed
B	Development of power point presentations	Completed
C	Packaging of power point presentations for all training sessions	Ongoing
D	Development of Handbook for Bankers	Submitted to SCGJ
E	Development of Trainer's Manual	Completed
F	Development of QPs and NOS	Completed
G	Organization of one TOT Program	Completed

Brief description of activities this quarter: No major activity was carried out in the reporting quarter.

Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

Semi Annual Knowledge Sharing Workshop for Partner States

In order to facilitate knowledge sharing between the focal states and other national and state level stakeholders, the Program organized knowledge sharing workshops at Puducherry, Delhi and Bangalore respectively.

The Program regularly brings together the partner states (Rajasthan, Karnataka, Madhya Pradesh, and Haryana) and other targeted states under one roof for consultation on policy, regulations, programs and institutional capacity development in the domain of energy efficiency, renewable energy through organization of knowledge sharing workshops. The semi-annual knowledge sharing event will provide a platform for:

- Highlighting key cross cutting issues, challenges, opportunities across the states.
- Putting forward key RE and EE initiatives undertaken in partner states.
- Discussing policy, regulatory, programmatic and institutional issues.

- Highlighting the importance of institutional capacity development.
- States to interact with other present states to understand innovative policies, regulations and programs implemented.
- Field visits to showcase successful implementation enabling confidence building.

The table below lists the broad activities planned:

Sr. No.	Activities	Status
1	Preparation of Concept Note, Draft Agenda and List of Invitees	Proposed to be conducted in Jan – Mar 2018
2	Completion of Management of Invitations and Coordination for Participations	
3	Preparation of Presentation for the Knowledge Sharing Workshop	
4	Preparation of Workshop Proceedings Report	

Brief description of activities this quarter: No major activities carried out during this quarter.
Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

International Study Tour on Renewable Energy Training Programs

Increasing energy access, clean energy development, and job creation are national priorities for the Indian government. Scaling up renewable energy will address growing energy demands, and simultaneously add as many as one million new engineers, technicians, installers, maintenance workers and performance data monitors to the workforce from the solar and wind energy sectors alone.

Given the large employment generation potential of India's clean energy targets, a significant proportion of the Indian workforce needs to be trained with necessary skills to support the market for growing number of green jobs. Most of these will be local jobs, created across the country, providing a much needed boost to local regional economies. The country urgently needs a clear skills and training roadmap that will ensure that rapid growth towards realization of these renewable energy goals and targets is not stymied by lack of poor availability of a skilled workforce.

Policy makers, regulators, utility personnel, financers, trainers and other key stakeholders from public sector organizations will play a critical role in developing such a roadmap. However, these stakeholders often lack the wherewithal and opportunity to learn and understand the challenges of an expanding RE market. Exposing stakeholders to experience

of developed markets can help sensitize them to challenges and solutions adopted elsewhere, better preparing them to lead India towards its renewable energy future.

The proposed study tour outlined offers an opportunity to build capacity and awareness of key Indian stakeholders through a visit to the United States. By developing a tailored program including site visits, government and practitioner meetings and discussions, the tour will expose stakeholders to new ideas, which can be adapted and applied in the Indian context. Recognizing the urgent need for building technical capacity, enhancing awareness and exposure of key stakeholders to new and emerging ideas and areas of implementation in renewable energy will go a long way in helping build local capacity to achieve India's ambitious renewable energy targets.

The study tour to United States will focus on areas such as ongoing capacity building and training initiatives, mechanisms and certification successfully implemented by U.S Government and the private sector in the areas of solar rooftop, grid interconnection, policy and regulatory frameworks, innovative business models, establishing standards and quality and certification. A visit to a mature market for renewable energy will help high level Indian participants appreciate the critical role played by training, learning and skill development programs on successful industry outcomes.

The tour will also help policymakers visualize how different aspects of skills and training development fit together in a mature renewable energy market, and can be implemented through a variety of actors. These inputs will form a critical ingredient in helping India prepare its own medium term roadmap to take advantage of its demographic dividend, and steer the country's growing workforce towards greener, sustainable jobs of the future.
The Government of India has already kick started efforts to address training needs and implement of skill development initiatives through the National Skill Development Mission and establishment of a Skill Council for Green Jobs (SCGJ), which is promoted by the Ministry of New and Renewable Energy (MNRE). The experience gained through this study tour will help provide much needed momentum to India's efforts in scaling up renewable energy through a planned approach to skill development.

The table below lists the broad activities planned:

Sr. No.	Activities	Status
1	Preparation of Concept Note, Draft Agenda and List of Invitees	Completed
2	Coordination for Participation and preparation of Study Tour Guide book	This activity is on hold
3	Preparation of Orientation & Travel Advisory PPT	

4	Organization of Study Tour	
5	Report on Visit	

Brief description of activities this quarter: No major activity was carried out in the reporting period.

Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this stage

International Study Tour for Solar Rooftop

The PACE-D TA program has been working with a wide variety of stakeholders at the central and state level and has developed a comprehensive work plan for development of the solar rooftop market in the country. The Program also worked closely with a variety of Indian stakeholders, predominantly State owned Utilities, for the development of solar rooftops through policy support, regulatory assistance, implementation support, programmatic support etc.

The Program also assisted State Utilities in Karnataka, Rajasthan and Madhya Pradesh in developing regulatory and procedural framework for interconnection that has resulted into significant rise in rooftop system installations in the utilities circle.

The PACE-D TA Program, consisting of U.S. and Indian experts, under the guidance of MNRE, aims to organize a study tour focused on development and deployment of new and innovative technologies, applications, interconnection procedures and business models of solar rooftop.

This study tour will provide the participants with access to best practices in the area of solar rooftop deployment in the field implemented in the U.S., and networking opportunities between U.S. organizations and Indian stakeholders. During Year-4, the PACE-D TA Program successfully organized a study tour which provided all the participants with access to best practices in the area of RE deployment with a focus on new and emerging policies and regulations as well as the latest advances in energy storage technologies, solar rooftop development, large-scale RE. The Program will support organizing international study tour for the distribution utilities of partner states and other important stakeholders,

The table below lists the broad activities planned:

Sr. No.	Activities	Status
1	Preparation of Concept Note, Draft Agenda and List of Invitees	
2	Coordination for Participation and preparation of Study Tour Guide book	

3	Preparation of Orientation & Travel Advisory PPT	Completed.
4	Organization of Study Tour	
5	Report on Visit	

Brief description of activities this quarter: The Program organized an international study tour from December 12 – 21, 2017, to the United States on Solar Rooftop. A total of 11 participants were a part of the team, which included senior officials from Utilities, State Nodal Agencies, MNRE and Dept. of Economic Affairs.

Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

Task 6: Microfinance Support Program

MSP: Technical Assistance to Microfinance Institutions for Clean Energy Lending

Objective: The Program's MSP component aims to enhance lending for clean energy deployment through microfinance. The Program aims to achieve this objective by:

- Creating a Technical Assistance Package for MFIs for lending to the rural poor for clean energy
- Rolling out the Technical Assistance Package with identified partners
- Creating linkages between RE suppliers and MFIs
- Policy advocacy to address the policy barriers that MFIs face while lending for renewable energy

Intended results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- Three MFIs with improved capacity for clean energy deployment
- Two product suppliers with improved capacity for partnering with MFIs on clean energy deployment
- 8,000 person hours of training provided
- USD 5 million leveraged

Status of work-plan activities and deliverables: The Program undertook the following activities:

- Partner Assessment and Identification
- Business Plan Development
- Operational Plan Development
- Partnership with manufacturers
- Training and Capacity Building

- Pilot Implementation
- Investors partnership for leveraging investments
- Informal Microfinance and Energy Network

The Program worked on the above areas as well as the areas listed in the chart below.

The table below lists the status of deliverables/activities:

S.No.	Activities	Status
I	**TA Component 1: Financing Retail Clean Energy Products and Services**	
A	Identification and shortlisting of potential MFI partners	Completed
B	Assessment and finalization of MFI partners	Completed
C	Identification and shortlisting of energy product/service providers	Completed
D	Business plan development with selected MFIs	Completed
E	Preparation of operational plan development with selected MFIs	Completed
F	Partnership formation between MFIs and energy product/service providers	Completed
G	Identification of training needs and development of training modules	Completed
H	Training for MFIs, intermediaries and end-users	Completed
I	Pilot implementation	Completed
II	**TA Component 2: Financing Micro-Grids based Clean Energy Services**	
A	Identification and shortlisting of potential MFI	Completed
B	Assessment and finalization of MFI partners	Completed
C	Identification and shortlisting of micro-grid partners product/service providers	Completed
D	Business plan development with selected MFIs	Completed
E	Preparation of operational plan development with selected MFIs	Completed
F	Partnership formation between MFIs and micro-grid partners service providers	Completed
G	Pilot implementation	Completed
III	**TA Component 3: Activities Related to Recommending Off-Grid Policy and Institutional Reforms**	

S.No.	Activities	Status
A	Preparation of a report highlighting experiences related to new implementation models and impacts on end users	Completed
B	Preparation of best practices manual for energy lending	Completed
C	Preparation of a paper for inputs for policy on microfinance for clean energy deployment	Being prepared
IV	**TA Component 4: Scaling Up**	
A	Scale up of clean energy lending by selected MFIs	Completed
B	Phone Survey	Completed
V	**TA Component 5: Leveraging Investments**	
A	Investment Deck	Completed
B	Establish an informal MFI RE Network	Completed
C	Investor Roundtables	Completed - 5 investor roundtables Investment leveraged target completed
D	Partnerships between MFI & Investors	Completed – 5 partnerships between MFIs and investors cemented
VI	**TA Component 6: Outreach and Communication**	
A	Outreach and Communication program	Completed
B	Roundtables for MFIs to exchange lessons learned	Completed
C	Case Studies	Completed
D	Webinars	Completed
E	Two Filmlets	Completed
VII	**TA Component 7: Policy Engagement**	
A	Engagement with policy makers Draft background paper Draft policy brief	Engagement Completed; Final policy paper being prepared.

S.No.	Activities	Status
VIII	**TA Component 8: Leveraging Investments**	
A	Prepare a sector wide investment dossier and demonstration of specific MFI opportunities	Completed
B	Host investment roadshows	Completed
IX	**TA Component 9: Productization**	
A	Training Effectiveness Assessment	Completed
B	Online training resources	Not started
C	MIS Plug-in	Being Prepared
D	Product diversification	Completed

Brief description of activities this quarter:

- Facilitated the sale of 9,781[15] clean energy products in the reporting quarter taking the total tally of clean energy products sold through MFIs to 367,328, across nine Indian states, with 100 percent women loan clients.
- Leveraged USD 252,541[16] in loans disbursed and cash sales in the reporting quarter taking the total figure of funds leveraged in this segment to USD 12 million.
- Evangelical Social Action Forum (ESAF):
    - Technical assistance to ESAF during this quarter focused on the regular review of the execution of the business plan, facilitation of the workshops for the partnership model, and product diversification
    - Provided detailed feedback to improve the business plan to promote and sell clean energy products through cross selling and the partnership model.
    - Also conducted monthly review on the progress against the business plan. Regularly followed up with different stakeholders within ESAF Small Finance Bank and ESAF Retail to ensure coordination through monthly progress review meetings. Advised ESAF Small Finance Bank and ESAF Retail to track energy loans outstanding, portfolio quality and profitability.
    - Facilitated two workshops for ESAF with potential partners for its partnership model; 9 MFIs attended in Delhi on November 17, and 11 NGOs attended in Deogarh, Jharkhand on December 20. Prior to the workshops, supported ESAF in preparing the presentation materials and inviting MFIs/NGOs.
    - Supported ESAF in exploring new energy product offerings, including organizing a visit by Solaric, a solar home system provider in Bangladesh, to share itd SHS with ceiling fan, and Ekotek, a manufacturer of energy efficient LED light bulbs and various solar products.

[15] As of October 30, 2017
[16] As of October 30, 2017

- Regular follow-up with EASF leadership to provide strategic advice.

- Sarala :
  - Technical assistance to Sarala during this quarter focused on product diversification and the strengthening of the agent network.
  - Product diversification:
    - In the previous quarter, Sarala began discussions with Solaric, a solar home system provider in Bangladesh, to explore potential partnerships. In this quarter, with the active facilitation of the MSP team, Sarala finalized product specifications (a solar home system with a ceiling fan), pricing and other terms and conditions with Solaric, signed a MoU, and placed an order of 100 units of solar home systems.
    - During this process, the MSP team conducted in-depth interviews with Sarala staff, clients and non-clients in order to understand product preferences, existing solar usage and competitors in the region, capacity to repay loans, preferred loan features etc.
    - The team also assisted Sarala in designing and preparing for a pilot in Samastipur and Begu Sarai branches in Bihar. Two demonstration units of Solaric's solar home systems have been installed at Sarala branch offices to build awareness among clients. The pilot marketing of the products started in mid-December and actual sales and product delivery will start in January 2018.
    - In addition to solar home systems, the MSP team introduced Sarala to the energy efficient "Magic Bulb". Sarala finalized an order of 2,000 pieces, which will be delivered to Sarala in February 2018. This product is ideal for agents to sell.
  - Agent network:
    - The MSP team, with an external software developer, developed and piloted an Android-based software application that enhances business literacy and entrepreneurship skills for Sarala's energy sales agents who were selected from its client base. The App enables agents to keep track of inventory, sales, operating expenses, and earned profits.
    - Sarala selected eight agents to pilot the App. Their feedback was incorporated into the development for the App.
  - The MSP team regularly coordinated and followed up on the progress of the App development and pilot. Completed market research analysis on the potential for developing an agent network as an additional sales channel.
  - Provided advice to senior management about a range of expansion strategies including product diversification and a legal structure that ensures the growth of the energy program.

- Saija:
  - Technical assistance to Saija during this quarter focused on the development of MIS plug-in software.
  - The MSP team completed the needs assessment based on the interviews with the IT department, energy team and branch staff, hired a software developer, and developed the software. The main function of the software is inventory management, including keeping track of inventory at each branch, organizing stock transfer, monitoring replacements, and sales reports. The

software was refined through feedback from the relevant staff at Saija. The training was given to users at head office and selected branches. Completed market research on the potential for developing an agent network as an additional sales channel.

- Policy Engagement
    - Conducted three policy briefing and field visits for local policymakers. The key objective was to demonstrate to policymakers the role that energy lending through MFIs can play in the country's broader energy goal of 24x7 Power For All. Each event was structured as a day-long event, consisting of a presentation on partner MFIs' success stories, discussions with policymakers, and a field visit to interact with energy microfinance clients and MFI staff. The events took place in the following locations:
        - Kolkata, West Bengal on December 8, 2017
        - Bhubaneshwar, Odisha on December 12, 2017
    - Patna, Bihar on December 28, 2017
    - The final policy paper is being finalized.

- Investment
    - Met with potential investors including Microvest, DWM, Bajaj Finserv and Baytree and introduced the PACE-D MFI partners as potential investment opportunities.
    - Updated the investment collaterals prepared for ESAF, Saija and Sarala

- Knowledge Products
    - Updated the MSP brochure, impact fact sheet and partner MFI fact sheets.
    - Developed a PACE-D MSP knowledge brochure.
    - Completed the production of two filmlets and a photo essay

- Training
    - Completed and submitted the Training Effectiveness Assessment report.

- Productization
    - Energy Lending Handbook: Finalized the handbook by incorporating the feedback collected from MFIs that attended the training workshop on August 8-9, 2017. Conducted the second training workshop on November 16–17 using the revised Energy Lending Handbook. The objective of the workshop was two-fold; to train MFIs on how to design and implement an energy lending program as well as to validate the handbook. 9 MFIs participated in the workshop. Their feedback was also incorporated into the handbook
    - Product Diversification: Supported Sarala and ESAF in exploring new energy product offerings. See ESAF and Sarala sections above.
    - MIS Plug-in: Developed and piloted the MIS Plug-in software with Saija and Sarala. See Saija and Sarala sections above.

- Outreach
    - Delivered the national-level conference entitled “Microfinance as an Effective Channel for Accelerating Energy Access” in Delhi on December 4, 2017. Over 80 individuals from MFIs, RE product companies, donor agencies and other stakeholders participated in the event.
    - Delivered the MFI roundtable entitled “The Promise of Energy Lending for MFIs in India” at the Inclusive Finance Summit on December 11, 2017. Four partner MFIs (ESAF, Saija, Sarala and MSF) shared their experiences and visions for the future at the panel discussion.

Challenges/Risks: No challenges envisaged at this point in time.

Support required from USAID: No support is required from USAID at this point in time.

ENABLING ECOSYSTEM – SOLAR PV ROOFTOP TA FOR INDIAN STATES (New Scope of Work)

Purpose of this Activity: To strengthen enabling ecosystem for the uptake of solar PV rooftop projects in selected states

The ongoing PACE-D TA Contract has aligned its core activities to support the Government of India’s clean energy priorities, and has implemented several activities to support the 40 GW of rooftop solar target. During the visit of Indian Prime Minister to the United States in June 2016, the Joint Statement announced the expansion of PACE-D TA Program’s support for solar rooftop deployment at the state level. It was agreed to expand support to additional eight (8) states and fifteen (15) utilities, and train 5,000 utility engineers, 1,000 entrepreneurs and 200 trainers. MNRE has committed about USD 0.9 million to cover the cost of trainings. USAID and MNRE had identified Maharashtra, Uttar Pradesh, Assam, Punjab, Haryana, Andhra Pradesh, Telangana and West Bengal as the potential states support under this activity.

The objectives of this scope of activities are to:

- Help utilities in quickly administering best practices, developing new, innovative and customized business models and developing streamlined access for consumers for implementing grid-connected Solar PV Rooftop projects.
- Train manpower at all the levels of utilities, and new entrepreneurs for scaling-up of rooftop solar PV power.
- Support MNRE in designing and establishing national level initiatives to support rooftop solar PV scale-up.

Task 1: Technical Assistance (TA) Support to State Distribution Utilities (15 utilities covering eight states):

The Technical Assistance will involve identification of gaps (in policies, regulations and utility processes) and the capacity requirements for each state/utility related to the implementation of grid connected solar rooftop projects, and addressing them through a focused and time bound approach.

The Program carried out the following activities during the reporting period:

- Participated in Technical Committee meeting organized by PEDA in the State of Punjab;
- Reviewed Andhra Pradesh Solar Power Policy and submitted comments/suggestions on the same
- Finalized Andhra Pradesh Interconnection Framework in consultation with both the Distribution Utilities
- Participated in the discussion meeting on new draft solar net metering regulations with HERC;
- Met PSERC to discuss possibilities on Regulatory interventions ins Punjab's solar rooftop Regulations;
- Met UPERC to discuss the possibilities of doing necessary amendments in Regulatory Interventions based on the best practices and recently notified Solar Power Policy for the state of UP;
- Met UPNEDA to discuss the modalities of organization of Senior Management Workshop in the month of January 2018;
- Met UPPCL to identify the areas of technical assistance and handholding support required for development and implementation of web based solar rooftop tool;
- Supported Assam Energy Development Agency (AEDA) Project Management Unit 14 MW of Solar Rooftop Project under CAPEX & RESCO Mode;
- Met Executive Director, MSEDCL to identify and finalize the areas of technical assistance;
- Met General Manager and other Senior Officials of MEDA to discuss the modalities for organization of senior management workshop in the month of January 2018 and other identified activities for providing technical assistance;

- Initiated work on development of Solar Rooftop Policy document as well as background Paper for the state of Maharashtra;
- Initiated work on background note on solar rooftop for NREDCAP and AP DISCOMs;
- Shared letter of intent with Punjab, West Bengal, and Uttar Pradesh to conduct senior management workshop;
- Outreach activity initiated in all eight States to develop customized outreach strategy.
- Followed up with Distribution Utilities of Assam, West Bengal and Punjab on the gap analysis carried out by the Program on their Interconnection Framework;

Technical Assistance to Develop and Implement National Level Centralized Monitoring Center

Objective: A number of policies and programs promoting the deployment of grid-connected and off-grid solar PV rooftop systems have been designed and implemented in India. These systems and their performance data form a vast treasure trove for analyzing the performance of various programs, technologies, incentives schemes and policies. However, the biggest challenge for policy makers and program designers remains accessing this data in a form that would allow them to analyze the performance of systems and their impact on the ground. Although MNRE and SNA mandate the capture and sharing of real time performance data for all systems above 5 kW, there is a lack of appropriate processes, protocols and platforms for the shared data. In order to address this challenge, there is a need for development of a solar PV rooftop monitoring center at the centralized level which will help monitor the performance of all existing and upcoming projects and design of more inclusive and targeted programs

In this regard, the Program will work with MNRE to create a working committee involving SECI, Indian Renewable Energy Development Agency Limited (IREDA), National Informatics Centre, key SNAs, Central Electricity Authority and select solar PV rooftop vendors to deliberate on key functionalities of the proposed solar rooftop monitoring center and implementation schedule. The Program will provide necessary TA to the working committee and MNRE at the conceptualization stage, predevelopment stage, development stage and post development/operational stage.

Intended Results: Specifically, the technical assistance is expected to result in the following by the end of 2017:

- Capturing of solar generation from solar rooftop and ground-mounted projects at the national level.

Status of Work-plan activities and deliverables:

The Program is working with National Institute of Solar Energy (NISE) to provide technical assistance in the development of a centralized monitoring center for to capture the actual generation of solar energy from ground mounted and rooftop solar projects in the country. The National Level Central Monitoring Centre (NCMC) will capture the critical performance parameters of grid connected, subsidized and non-subsidized residential, commercial, and industrial projects with a capacity of more than 5 kW across the country, which will enable the users to closely monitor and assess the Program. The data collected and report generated by the NCMC will help MNRE to refine the Program's design and to link incentives/subsidies to the Program's performance.

The NCMN will capture static and dynamic data on each project. Static data will include the project data on location, capacity, host, commissioning date, etc. while dynamic data will include real time data on generation and performance.

For MNRE, the NCMC will assist in identifying the effectiveness of the Program and real time performance of projects across all states, depending on which MNRE can improve the Program's design, including alterations in incentives/subsidies. Through the NCMC, DISCOMs can identify the exact generation in projects connected to the grid, which may help them to know the real time loads on the distribution transformers (DTs) and the network, in general. Therefore, SNAs can also monitor the Program's performance and channel partners. Finally, consumers will be able to monitor the plant's performance and actual energy generation

List of activities Centralized Monitoring Center:

S.No	Activities	Status
A	Preparation of Concept Note/feasibility report on solar rooftop monitoring center	Ongoing
B	Participate during working group meeting and providing necessary TA support	Completed
C	Preparation of Detailed Project Report	Pending
D	Preparation of Request for Proposal Document for engagement of IT Implementing Agency	Pending
E	Assistance in evaluation of proposals received from bidders and finalization of successful bidder	Pending
F	Support during monitoring and reporting the development during implementation	Pending

Brief description of activities this quarter:

- Conducted a meeting at NISE to identify key stakeholders and to define way forward;
- Prepared presentation and concept note for meeting with NISE;
- Prepared draft letters for site identification for pilot projects, shared it with NISE
- Developed technical specification format for assessment and shortlisting of sites;
- Submitted revised Concept Note;

Challenges/risks: The following challenges are anticipated:

- Clear identification of stakeholders using NCMC.
- Identification of their specific requirement which NCMC can meet.

Support required from USAID: No support is required from USAID at this stage.

Engagement of Urban Local Bodies and Large Real Estate Developers (Two Regional Workshops to be organized at Mumbai and Delhi)

Objective:

A huge potential exists for deployment of solar PV rooftop on public buildings owned by housing societies, flats and individual house owners as well as Urban Local Bodies (ULBs) operating their own public buildings. However, most real estate developers, housing societies and ULBs rarely install solar PV rooftop due to challenges associated with accessing subsidies or interconnections. There is a need to create an eco-system through which the ULBs can become one-stop shop for all solar PV rooftop approvals and subsidies, and thereby facilitate scale up of solar PV rooftop market.

Intended results: The Program's assistance will lead to the following:

- Detailed mapping of key challenges faced by ULBs.
- Development of an issue paper which will be debated at two regional workshops at Delhi and Mumbai.
- National guidelines depicting the role of ULBs to accelerate the deployment of solar rooftop.

Status of work plan activities and deliverables:

The table below lists the status of deliverables/activities

S.No	Activities	Status
A	Background research and identification of challenges in solar PV rooftop adoption by ULBs and housing societies	Ongoing
B	Preparatory Work for the Organization of First Workshop	Ongoing
C	Presentation & Participation in First Workshop	Ongoing
D	Preparatory Work for the Organization of Second Workshop	Pending
E	Presentation & Participation in Second Workshop	Pending
F	Report on Guidelines of Solar PV Rooftop deployment by ULBs;	Pending

Brief description of activities this quarter:

- Carried out background research for solar rooftop deployment for ULBs
- Prepared a background note to be sent along with the meeting request emails/letters
- Followed up with ULBs from Delhi, Jaipur, Chandigarh, Gurgaon, Lucknow and Pune
- Meetings done with ULBs from Delhi, Jaipur and Pune, Circulated Minutes of Meetings
- Draft Issue Papers submitted;
- Received Comments/suggestions on the draft issue paper;
- Initiated Preparatory Work for organization of Regional Workshops;
- Discussed with MEDA for becoming co-host for organization of Regional Workshop at Pune;
- Initiated work on revising the issue paper

Task 2: Training and Capacity Building of Key Actors:

The Program intends to train 5000 Utility Engineers, 1000 Entrepreneurs and 200 Trainers by May 2018.

The following activities during the reporting period:

- A total of twenty three Training programs were conducted in the reporting quarter. Of these, two were conducted by PACE-D and twenty one programs on Solar Rooftop for Utility Engineers were conducted by partner Training Institutes.
- One TOT (1 day) on Solar Rooftop was organized in Guwahati for Utility Engineers
- One Training (2 days) on Solar Rooftop was organized for Utility Engineers in NISE, Gurgaon.
- The following Training Programs (1.5 days) on Solar Rooftop for Utility Engineers were conducted by Training Institutes:
  - NPTI, Faridabad: 3; NPTI, Guwahati: 10; NPTI, Durgapur: 2; MGIRED: 3; AMU: 1; CIRE: 2

(Details of the Training Program are given in Section 4 – Events & Training)

STATUS OF INDICATORS (New Scope of Work)

Sr. No.	Indicators	Program Targets	Target for reporting quarter	Achieved this Quarter (Oct-Dec 2017)
Policy Indicators				
1	Number of institutions with improved capacity to address climate change issues as a result of USG assistance.	15 utilities and 8 states[17]		Kick Off Meetings in all eight states completed
2	Number of people receiving USG supported training on solar rooftop supported by USG assistance disaggregated by gender.			
	Utility Engineers	5,000	1,500	779 (Cumulative: 930)
	Entrepreneurs	1000	300	0
	Trainers	200	60	34 (Cumulative: 142)
3	Number of laws, policies, strategies, plans, or regulations addressing climate change (mitigation or adaptation) and/or biodiversity conservation officially proposed, adopted, or implemented as a result of USG assistance.	5	1	Proposed: Net Metering Regulations to HERC (Haryana)
4	Number of tools, technologies and methodologies developed, tested and/or adopted as a result of USG assistance.	4	1	0

[17] Punjab (PSPCL), Haryana (UHBVNL, DHBVNL), UP (PVVNL, MVVNL), WB (WBSEDCL), Assam (APDCL), AP (APSPPDCL, APEPCL), Telangana, Maharashtra (MSEDCL)

Status of Deliverables (Scale up of Solar Rooftop)

State/Utility Level			
Sl	**Deliverable**	**Status/Progress**	**Likely date of completion**
1	**Analysis for selection of states/utilities**	Completed, 8 states selected	
2	**Kick-off meetings at the state level**	Completed in all 8 states	
3	**Gap Analysis and Action Plans (each State)**	- Completed in all 8 states - No Progress in Telangana	
4	**Workshop for Senior Management (one each utility)**	- Completed for Haryana, Assam, Andhra Pradesh. - To conduct workshops in Uttar Pradesh, Assam and West Bengal post policy notification of respective states - Not proceeding with Telangana	UP & Maharashtra in Feb 2018
5	**Establishment of Rooftop Solar Coordination teams, Technical and Process committees at the State/utility level**	- Completed for Haryana, Punjab, Uttar Pradesh, and Andhra Pradesh. - Shared Terms of Reference with Maharashtra, West Bengal, and Assam. Awaiting response. - Not proceeding with Telangana	Awaiting response from Maharashtra, West Bengal and Assam.
6	**Deliverables for each utility**		
6.a	**Technical requirements and process for net-metering interconnection**	- Finalized in Andhra Pradesh and Uttar Pradesh. Awaiting notification. - Draft framework submitted in Punjab, discussion with technical process team completed. Working with PSPCL for the revised framework with their inputs. - Submitted draft frameworks to West Bengal, Maharashtra & Assam. - Not proceeding with Telangana.	Jan - Mar 2018
6.b	**Forms and formats for interconnection application, approval, site verification finalized**		
6.c	**Empanelment procedures set up, and e service providers, developers, invertors, net-meters etc. empaneled**		
6.d	**Systemic changes identified for putting in place a robust, responsive and efficient interconnection framework and guidelines, such as billing system etc.**		
6.e	**Public notification of interconnection guidelines / framework by utilities**		
7	**Unified web-portal and a customer support center (one each state)**	- Working with Andhra Pradesh to develop a Unified Web Portal. - Based on this a generic framework would be developed and shared with other states.	Likely to be completed by Feb 2018
8	**Two Regional Workshop for ULB's, Real Estate Developers and other stakeholders (Delhi & Mumbai)**	- MEDA to host Workshop in Pune. 2nd workshop will be conducted in Delhi. - Issue paper is being developed	By Feb 2018
9	**Media Campaign Design (framework) focused on local language, (ULB's, Households, Developers) 1 advertisement in local language and brochures**	Vendor selection in process	

10	**One Massive Open Online Course (MOOC) design translated into local languages for ULB's, Households and Developers by MNRE or States**	In process to identify an anchor for hosting the MOOC	
National Level			
11	**DPR of the National Monitoring Center, and tendering support to MNRE**	- Conducted meeting at NISE to identify key stakeholders. - Submitted revised Concept Note. - Developed technical specification format for assessment and shortlisting of sites. - Prepared draft letters for site identification for pilot projects, shared it with NISE	
12	**National Guidelines for Urban Local Bodies.**	Will be followed by the Regional Workshops for ULBs	Tentative timelines (after the workshops): Feb 2018
13	**Model tender documents and PPAs for SNA's/State level Public Agencies to implement RESCO projects**	Handholding support, on request	
14	**Two National Knowledge Exchange Workshops**	One completed in Chandigarh	Tentative timeline: Feb 2018
15	**Two Study Tours**		Tentatively planned Jan-Mar 2018
Additional Activities being undertaken			
16	**Support for Policy**	- Inputs to draft policy to West Bengal, Uttar Pradesh, Assam. - Note on incentive mechanisms to Assam. - Submitted comments on Andhra Pradesh policy to NREDCAP	Already provided these support
17	**Regulatory Support**	- Inputs to draft regulations to West Bengal. - Inputs to Haryana (HERC) on solar net metering regulations 2nd amendment. - Prepared draft HERC solar net metering Regulations for Haryana.	
18	**Others**	- White paper on Solar Rooftop in West Bengal. - Background paper on solar rooftop in Haryana. - 14 MW solar rooftop tender to Assam. - RESCO based business model for promotion of solar rooftop to Uttar Pradesh	

DEVELOPMENT RESULT 3: ADOPTION AND ACCELERATED DEPLOYMENT OF CLEANER FOSSIL TECHNOLOGIES AND MANAGEMENT PRACTICES TO ACHIEVE SUPPLY-SIDE EFFICIENCY FROM EXISTING FOSSIL POWER GENERATION

Task 1: Deployment of Cleaner Fossil Technology and Management Practice in Existing Plants

Activities under the task were completed in October 2014.

Task 2: Capacity Building, Training, Outreach, Dissemination and Sharing of Best Practices

Activities under the task were completed in October 2014.

OTHER ACTIVITIES AND MANAGEMENT SUPPORT

Task 1: Secretariat Function—Coordination with Other U.S. Agencies and Programs on PACE-D

No activities were carried out during the reporting period.

Task 2: Strategic Planning, Assessment and Analysis

Activities under this task are aligned to activities in CLIN 1 and 2.

Task 3: Build Partnerships between US & Indian Institutions

Activities under this task are aligned to activities in CLIN 1 and 2.

Task 4: Establish Baselines (Monitoring & Evaluation)

Compliance Reporting: The following reports were prepared and submitted to USAID:

- Quarterly report for Q4 of FY 17

Preparation of the Program Target Matrix (PTM): The Program updated the PTM which is a tool to track the monthly progress on the Program achievements vis-à-vis its targets.

Preparation of MSP Tracker: The Program verified and updated the MSP deliverables data in terms of hours of training provided and the amount of funds leveraged. The MSP tracker developed is updated with the monthly figures.

Preparation of the Training Dashboard: The Program continued to update the PACE-D training dashboard which includes MSP as well as utility and other training programs since the inception of the Program.

Framework for Systemic Collection and Analysis of Pre & Post Training Feedback: The Program facilitated the design and collection of the participant pre-training assessment and post training feedbacks on the recently conducted trainings: Three-day Smart Grid Training Program for Utilities in Bengaluru. The program also finalized the analysis and presentation on the participant post training feedbacks on the recently conducted Three-day Smart Grid Training Program for Utilities.

Preparation of Brochures:

- Energy Storage – Future of Energy
- Indian Railways – making Railway stations more Energy Efficient
- Indian Railways – Scaling up Renewable Energy
- RPO Tool – Rajasthan
- Generic RPO Compliance framework & Webtool
- Scaling up of Clean Energy in Rajasthan
- Indian Railways – Chugging on the Green Track
- NTPC – Hybrid Energy systems
- IOCL – Tapping Solar power for captive use
- Generic brochure: PACE-D (Updated)
- Transforming Solar Rooftop Market (Updated)
- Generic brochure: Microfinance Support Program (Updated)
- MSP Case studies & fact sheets

Task 5: Maximizing the Use of Local Partners and Enhancement of their Capacity

Activities under this task were dropped after discussion with USAID.

4. EVENTS AND TRAININGS

LIST OF EVENTS AND TRAININGS ORGANIZED (OCT - DEC 2017):

SUMMARY OF EVENTS

Date	Event	Location
Nov 17, 2017	ESAF - 2nd Aggregator Model Workshop	Delhi
Nov 22, 2017	Consultation Workshop: Accelerating Renewable Energy Deployment in Public Sector Undertakings	Delhi
Nov 24, 2017	Launch of Generic RPO Framework (at 16th Technical Committee meeting, Forum of Regulators)	Gir (Gujarat)
Nov 27, 2017	Launch of Web-based RPO Compliance Monitoring and Reporting System in Rajasthan	Jaipur
Dec 04, 2017	MSP National Conference	Delhi
Dec 06, 2017	MSP Policy Makers' field visit – Kolkata	Kolkata
Dec 11, 2017	MSP Stakeholder consultation (Roundtable)	Delhi
Dec 12, 2017	MSP Policy Makers' field visit	Bhubaneswar
Dec 20, 2017	ESAF - 3rd Aggregator Model Workshop	Deoghar
Dec 28, 2017	MSP Policy Makers' field visit	Patna

SUMMARY OF TRAINING PROGRAMS – PACE-D TA PROGRAM (OCT – DEC 2017)

Start Date	End Date	Program	Category	Venue	Participants			Total Person hours
					Male	Female	Total	
9-Oct-17	13-Oct-17	Five (5) Days Training Program on Solar PV Rooftop for Entrepreneurs - GERMI	EDP	Gandhinagar	38	3	41	1,640.00
16-Nov-17	17-Nov-17	Two (2) Days 2nd Training on Designing & Implementing Energy Lending Programs for MFIs	Microfinance	Delhi	17	1	18	288.00
3-Dec-17	9-Dec-17	Smart Grid Study Tour to Spain, Italy and France	Energy Efficiency	Spain, Italy, France	10	0	10	320.00
13-Dec-17	20-Dec-17	US Study tour for Utilities on Solar Rooftop Deployment	Solar Rooftop	USA	9	2	11	440.00
Total					**74**	**6**	**80**	**2,688**

SUMMARY OF TRAINING PROGRAMS – SCALING-UP SOLAR ROOFTOP (OCT – DEC 2017) BY PACE-D TA TEAM

Start Date	End Date	Program	Category	Venue	Participants			Total Person hours
					Male	Female	Total	
5-Oct-17	6-Oct-17	Two (2) Days Training Program on Solar PV Rooftop for Utility Engineers, NISE	Solar Rooftop-Utility Engineers	Gurugram	30	2	32	512.00
28-Nov-17	28-Nov-17	One (1) Day Training of Trainers Program on Solar PV Rooftop for Utility Engineers, Assam	ToT Solar Rooftop-Utility Engineers	NPTI, Guwahati	33	1	34	272.00
		TOTAL			**63**	**3**	**66**	**784**

SUMMARY OF TRAINING PROGRAMS – SCALING-UP SOLAR ROOFTOP (OCT – DEC 2017)

BY TRAINING INSTITUTES (NPTI-Faridabad, Guwahati, Durgapur; MGIRED, AMU, CIRE)

Start Date	End Date	Program	Category	Venue	Participants			Total Person hours
					Male	Female	Total	
30-Oct-17	31-Oct-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL	Solar Rooftop-Utility Engineers	NPTI, Guwahati	17	4	21	252.00
2-Nov-17	3-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Bongaigaon, Kokrajhar)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Bongaigaon)	45	2	47	564.00
6-Nov-17	7-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Rangiya, Mongoldoi)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Rangiya)	27	0	27	324.00
9-Nov-17	10-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Nagaon, Kanch, Morigaon)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Nagaon)	36	1	37	444.00
13-Nov-17	14-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, PVVNL (Meerut Circle)	Solar Rooftop-Utility Engineers	NPTI, Faridabad (Meerut)	39	2	41	492.00
16-Nov-17	17-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Jorhat, Golaghat)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Jorhat)	27	4	31	372.00
20-Nov-17	21-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, PVVNL (Moradabad Town)	Solar Rooftop-Utility Engineers	AMU (Morabad)	36	0	36	432.00

29-Nov-17	30-Nov-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, WBSEDCL (Kolkata)	Solar Rooftop-Utility Engineers	NPTI, Durgapur (Kolkata)	37	4	41	492.00
5-Dec-17	6-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Dibrugarh, Tinsukia)	Solar Rooftop-Utility Engineers	NPTI, Guwahati	32	2	34	408.00
6-Dec-17	7-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, MSEDCL (Nanded, Osmanbad)	Solar Rooftop-Utility Engineers	MGIRED, (Nanded)	29	5	34	408.00
7-Dec-17	8-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Sivasagar)	Solar Rooftop-Utility Engineers	NPTI, Guwahati	22	2	24	288.00
11-Dec-17	12-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, PVVNL (Meerut urban, Bagpat)	Solar Rooftop-Utility Engineers	NPTI, Faridabad (Meerut)	29	1	30	360.00
11-Dec-17	12-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, MSEDCL (Solapur)	Solar Rooftop-Utility Engineers	MGIRED, (Solapur)	41	8	49	588.00
11-Dec-17	12-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Barpeta)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Barpeta)	26	1	27	324.00
14-Dec-17	15-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, MSEDCL (Satara, Sangli)	Solar Rooftop-Utility Engineers	MGIRED (Satara)	33	10	43	516.00
14-Dec-17	15-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Tezpur, North Lakhimpur)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Tezpur)	32	3	35	420.00

18-Dec-17	19-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, APDCL (Cachar, Badarpur)	Solar Rooftop-Utility Engineers	NPTI, Guwahati (Silchar)	27	1	28	336.00
19-Dec-17	20-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, MSEDCL (Vasai, Palghar)	Solar Rooftop-Utility Engineers	CIRE, Hyderabad (Kalyan)	28	4	32	384.00
21-Dec-17	22-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, MSEDCL (Kalyan)	Solar Rooftop-Utility Engineers	CIRE, Hyderabad (Kalyan)	30	14	44	528.00
21-Dec-17	22-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, PVVNL (Ghaziabad)	Solar Rooftop-Utility Engineers	NPTI, Faridabad (Ghaziabad)	41	2	43	516.00
22-Dec-17	22-Dec-17	One and half (1.5) Days Training on Solar PV Rooftop for Utility Engineers, WBSEDCL (Kolkata)	Solar Rooftop-Utility Engineers	NPTI, Durgapur (Kolkata)	37	6	43	516.00
		TOTAL			**671**	**76**	**747**	**8,964**

LIST OF PROPOSED TRAINING PROGRAMS AND EVENTS IN THE QUARTER JAN – MAR 2018

TRAINING PROGRAM	Training Institute	DATE/MONTH
Solar Rooftop to Utility Engineers-APEPDCL	MGIRED	Jan 4-5, 2018
Solar Rooftop to Utility Engineers-APSPDCL	Gandhigram	Jan 8-9, 2018
Solar Rooftop to Utility Engineers-APEPDCL	MGIRED	Jan 9-10, 2018
Solar Rooftop to Utility Engineers-APSPDCL	Gandhigram	Jan 10-11, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Jan 10-11, 2018
Solar Rooftop to Utility Engineers-APEPDCL	MGIRED	Jan 11-12, 2018
Solar Rooftop to Utility Engineers-PVVNL	AMU	Jan 15-16, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Jan 17-18, 2018
Solar Rooftop to Utility Engineers-PVVNL	AMU	Jan 22-23, 2018
Solar Rooftop to Utility Engineers-DHBVN	NPTI, Faridabad	Jan 24-25, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Feb 6-7, 2018
Solar Rooftop to Utility Engineers-PVVNL	AMU	Feb 9-10, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Feb 15-16, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Feb 20-21, 2018
Solar Rooftop to Utility Engineers-PVVNL	AMU	Feb 23-24, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Mar 6-7, 2018
Solar Rooftop to Utility Engineers-PSPCL	NPTI, Faridabad	Mar 20-21, 2018

EVENT	LOCATION	MONTH
National Conference – Smart Grid	Jaipur	Jan-Mar 2018
Senior Management Workshop – Punjab, UP, West Bengal, Maharashtra	Individual states	Jan-Mar 2018
Regional Workshop (for ULB/Real Estate Dev) – Maharashtra, Delhi	Pune, Delhi	Jan-Mar 2018

5. PROJECT MANAGEMENT

CONTRACTUAL ISSUES

The Program had no contractual issues during this period.

STATUS OF CONTRACT DELIVERABLES

Presented below is the status of standard Contract Deliverables:

S.No	Reporting Requirement	Delivery Date as per contract	Status
1.	Mobilization Plan	Draft Plan along with the technical proposal. Final plan within 30 days from the Award date.	Final Mobilization Plan submittedonJune29, 2012.
2.	Branding and Marketing Plan	Within 30 days of the Award date.	Final Branding and Marketing Plan submitted on June 29, 2012
3.	Program Implementation Plan	Within 30 days of the Award date.	Project Implementation Plan submitted on July 22, 2014 together with bullet version of PACE-D Y3 Work Plan.
4.	Annual Work Plans	Subsequent annual work-plans will be submitted not later than 30 calendar days before the close of the each preceding fiscal year.	Submitted Annual Work Plan for CLIN 1 and CLIN 2 to USAID.
5.	Environmental Mitigation and Monitoring Plan (EMMP)	The final EMMP shall be submitted 60 days after the contract is signed.	Draft Environmental Mitigation and Monitoring Plan submitted on July 30, 2012.
6.	Monitoring & Evaluation (M&E) Plan	Draft M&E Plan shall be submitted within 30 days of the award and shall be finalized within 90 days from the date of the award.	M&E Plan and Performance Monitoring Plans were approved on March 9, 2013 after multiple discussions and alterations. Revised M&E Plan submitted to USAID and approval received
7.	Performance Monitoring Plan	Draft PMP shall be submitted within 90 days from the date of the contract.	M&E Plan and Performance Monitoring Plans were approved on March 9, 2013 after several discussions and alterations Revised M&E Plan submitted to USAID and approval received

S.No	Reporting Requirement	Delivery Date as per contract	Status
8.	Quarterly Progress Report	15 calendar days after the end of the quarter.	Reports submitted on: • Oct15, 2012, • Jan 15, 2013, • Apr 15, 2013, • July 15, 2013, • Oct 15, 2013, • Jan 15, 2014, • April 15, 2014, • July 15, 2014, • Oct 15, 2014, • Jan 15, 2015, • May 21, 2015, • July 27, 2015, • Oct 20, 2015, • Jan 29, 2016 • Apr 21, 2016 • Aug 1, 2016 • Oct 21, 2016 • Jan 25, 2017 • Apr 20, 2017 • July 24, 2017 • Nov 3, 2017
9.	Quarterly Financial Report	15 calendar days after the end of the quarter.	Reports submitted on: • Oct15, 2012, • Jan 15, 2013, • Apr 15, 2013, • July 15, 2013, • Oct 15, 2013, • Jan 15, 2014, • April 15, 2014, • July 15, 2014, • Oct 15, 2014, • Jan 15, 2015, • May 21, 2015, • Aug 04, 2015, • Oct 20, 2015, • Jan 29, 2016 • Apr 21, 2016 • July 22, 2016 • Oct 21, 2016 • Jan 25, 2017 • Apr 20, 2017 • July 24, 2017 • Nov 3, 2017
10.	Annual Progress Report	30 calendar days after the end of the year.	Year 4 Annual Progress Report (July 6June 2017) submitted on October, 2017.
11.	Annual Program Review	As may be requested annually.	Completed during the period October – December 2016-.
12.	Financial Closure Report	90 calendar days from the end date of the contract.	Will be submitted 90 days after the end of the contract.
13.	Special Reports	As requested.	As requested by USAID.

ADMINISTRATIVE ACTIONS

Status of Sub-contracts

Under the sub-contracts, each firm/individual has been provided with a Master Service Agreement for the life of the project. Specific output-oriented task orders are issued from time to time to all subcontractors. The Program continued to issue and modify task orders to subcontractors for Year 5 based on the Annual Work Plan developed by the Program and approved by the USAID for CLIN 1 and CLIN 2.

International Deployment

No specialists were deployed internationally (Indian specialists abroad and international specialists in India) during this quarter.

Changes in Staff

- Mr. Sanjay Ghosh rejoined the Program as Accounts Manager in with effect from October 6, 2017.
- Ms. Tripti Agarwal, Accounts Manager, resigned in October 13, 2017.
- Mr. Babul Patel took over as Chief of Party, with effect from November 7, 2017

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