PACE-D TECHNICAL ASSISTANCE PROGRAM

Quarterly Progress Report
(January - March 2017)

Submitted on April 20, 2017

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

Quarterly Progress Report
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ACRONYMS

Acronym	Definition
ADB	Asian Development Bank
AP	Andhra Pradesh
AC	Alternating Current
AREAS	Association of Renewable Energy Agencies of States
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
CCDT	Curriculum and Content Development Team
CEA	Cost Effectiveness Assessment
CEAP	Corporate Energy Audit Program
CEGE	Chief Electrical General Engineer
CENPEID	Centre for Power Efficiency in Distribution
CERC	Central Electricity Regulatory Commission
CESE	Chief Electrical Service Engineer
CII	Confederation of Indian Industry
CLIN	Contract Line Item Number
CMC	Central Monitoring Centre
CREDA	Chhattisgarh Renewable Energy Development Agency
COA	Council of Architecture
COR	Contracting Officer's Representative
CO2	Carbon Dioxide
CPP	Captive Power Plant
CPRI	Central Power Research Institute
CSR	Corporate Social Responsibility
DBMS	Database Management Systems
DC	Direct Current
DCA	Development Credit Authority
DHBVNL	Dakshin Haryana Bijli Vitran Nigam Limited
DOE	Department of Energy
DOIT&C	Department of Information Technology and Communications
DPR	Detailed Project Report
DRE	Decentralized Renewable Energy
DRE-CF	Decentralized Renewable Energy – Community Fund
DISCOM	Distribution Company
DSM	Demand Side Management
EC	Energy Conservation
ECBC	Energy Conservation Building Code

EDP	Entrepreneurship Development Program
EE	Energy Efficiency
EELP	Energy Efficient Lighting Program
EESL	Energy Efficiency Services Limited
EMMP	Environmental Mitigation and Monitoring Plan
EEFP	Energy Efficiency Financing Platform
EM&V	Evaluation, Measurement and Verification
EOI	Expression of Interest
EPC	Engineering Procurement and Construction
ESCOs	Energy Service Companies
ESAF	Evangelical Social Action Forum
FD	Fixed Deposit
FIs	Financial Institutions
FOR	Forum of Regulators
FY	Financial Year
GBC	Green Business Centre
GERMI	Gujarat Energy Research and Management Institute
GHG	Greenhouse Gas
GIIC	Green Infrastructure Investment Coalition
GOI	Government of India
GOK	Government of Karnataka
GOR	Government of Rajasthan
GOMP	Government of Madhya Pradesh
GW	Gigawatt
HERC	Haryana Electricity Regulatory Commission
HVAC	Heating, Ventilation and Air-conditioning
IDBI	Industrial Development Bank of India
IDF-MF	Infrastructure Debt Fund – Mutual Fund
IIA	Indian Institute of Architects
IIFCL	India Infrastructure Finance Company Ltd.
IGS	Indian Grameen Service
IL&FS	Infrastructure Leasing & Financial Services
INR	Indian Rupees
IOCL	Indian Oil Corporation Limited
IP sets	Irrigation Pump sets
IR	Indian Railways
IREDA	Indian Renewable Energy Development Agency Limited
ISGTF	India Smart Grid Task Force
IT	Information Technology
JDA	Jaipur Development Authority

JNJPSL	JNJ Powercom Systems Limited
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
LBNL	Lawrence Berkeley National Laboratory
LEDs	Light Emitting Diode
MD	Managing Director
M&V	Measurement and Verification
M&E	Monitoring and Evaluation
MFI	Microfinance Institution
MMtCO2	Million Metric Tons of Carbon Dioxide
MNRE	Ministry of New and Renewable Energy
MNIT	Malviya National Institute of Technology
MOP	Ministry of Power
MOU	Memorandum of Understanding
MP	Madhya Pradesh
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPUVNL	Madhya Pradesh Urja Vikas Nigam Limited
MVVNL	Madhyanchal Vidyut Vitran Nigam Limited
MSF	Mahashakti Foundation
MSP	Microfinance Support Program
MU	Million Units
MW	Megawatt
MWh	Megawatt Hour
NGOs	Non-government Organizations
NISE	National Institute of Solar Energy
NOS	National Occupational Standards
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
OA	Open Access
OIL	Oil India Limited
PACE-D	Partnership to Advance Clean Energy – Deployment
PFR	Pre-Feasibility Report
PFS	PTC Financial Services

PHDCCI	PHD Chamber of Commerce and Industry
PMP	Performance Management Plan
PNB	Punjab National Bank
PPAs	Power Purchase Agreements
PPP	Public-Private Partnership
PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
PRCBWs	Progress Reviews and Capacity Building Workshops
PSUs	Public Sector Undertakings
PTM	Program Target Matrix
PV	Photovoltaic
Q2	Second Quarter
QPs	Qualification Packs
RE	Renewable Energy
REIL	Rajasthan Electronics & Instruments Limited
RECL	Rural Electrification Corp Ltd.
REMCL	Railway Energy Management Company Limited
RERC	Rajasthan Electricity Regulatory Commission
RESCO	Renewable Energy Services Company
RFP	Request for Proposal
RFQ	Request for Qualification
RFS	Request for Selection
RISL	RajCOMP Info Services Ltd.
ROE	Return on Equity
RPO	Renewable Purchase Obligation
RPO-CMR	Renewable Purchase Obligation – Compliance Monitoring and Reporting
RRECL	Rajasthan Renewable Energy Corporation Limited
RSIPL	Radius Synergies International Private Limited
RTP	Regional Training Program
RVPN	Rajasthan Rajya Vidyut Prasaran Nigam Limited
R-APDRP	Restructured Accelerated Power Development and Reforms Programme
SBICAP	SBI – Capital Markets India Limited
SERC	State Electricity Regulatory Commission
SECI	Solar Energy Corporation of India
SETNET	Solar Energy Training Network
SLA	Service Level Agreement
Smart-NET	Smart Grid Training Network
SNA	State Nodal Agency
SRET	Solar Rooftop Evaluation Tool
SCGJ	Skill Council for Green Jobs

TA	Technical Assistance
TCG	The Climate Group
TCCL	Tata Cleantech Capital Ltd.
T&D	Transmission and Distribution
TOT	Training of Trainers
TraiNet	The Training, Resource, Advocacy, and Information Network
TSECL	Tripura State Electricity Corporation Ltd.
TNA	Training Needs Assessment
TPDDL	Tata Power Delhi Distribution Limited
UDH	Urban Development and Housing Department
UHBVNL	Uttar Haryana Bijli Vitran Nigam Limited
URS	User Requirement Specification
USG	United States Government
U.S.	United States
USD	U.S. Dollar
USAID	United States Agency for International Development
VCFEE	Venture Capital Fund for Energy Efficiency
VLE	Village Level Entrepreneur
WG	Working Group
WHU	Waste Heat Utilization

EXECUTIVE SUMMARY

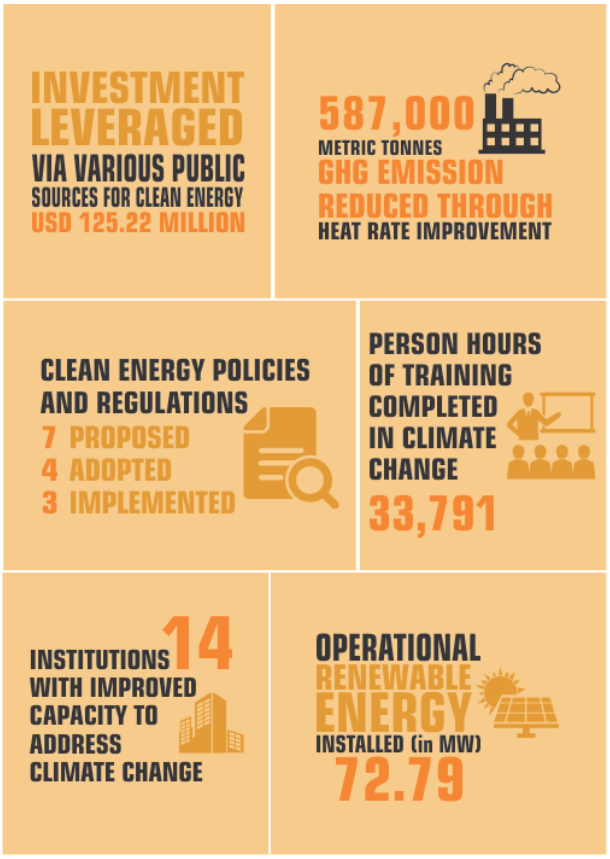
The Program has always maintained the intervention approach that "Partnership to Advance Clean Energy – Deployment (PACE-D) Technical Assistance (TA) Program will build institutional, individual, financial capacity to enable institutions to propose, adopt and/or implement policies, regulations, plans and strategies that will result in scaling up of clean energy (CE) technologies to achieve the outcome of Greenhouse Gas (GHG) emissions reduction." As per the recent contract modification #6, this intervention approach is expected to result in 26 megawatts (MW) of energy savings from energy efficiency (EE), 714 MW installed capacity from renewable energy (RE) projects and 1. 4 million metric tons of carbon dioxide or MMtCO2 equivalent of GHG emissions reduction.

The CE priorities of the Government of India (GOI) during the design phase of the Program and its launch (Years. 2010-2012) were nascent and modest as to its policy goals and institutional frameworks. For instance, energy sub-sectors such as coal, power and RE were administered by separate ministries with limited coordination, thereby impacting design and the implementation of an integrated CE plan aimed at reducing GHG emissions. Thus 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 above mentioned changes in the national scenario provided the Program with a greater mandate to perform and deliver on its goals but required significant attention to policy and institutional strengthening. For instance, developing the institutional and regulatory framework and laws for solar rooftop programs became a major priority for the Program which is also the major achievement of the Program. Similarly, given the renewed thrust by the government in improving the financial and technical performance of the power distribution companies (DISCOMs) required a major commitment to the design and implementation of key activities to improve the performance of these Indian utilities. The Program again rose to the challenge by focusing significant attention of its RE component in the development of institutional capacity in this frontier area. The Program's technical assistance package provided to Bangalore Electricity Supply Company Ltd. (BESCOM), Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL) and Jaipur Vidyut Vitran Nigam Limited (JVVNL), conceptualization and launch of Solar Energy Training Network (SETNET), design and execution of solar rooftop training for utility engineers to meet the capacity building and capacity installation targets as laid down by the Ministry of New and Renewable Energy (MNRE) are a testimony to this fact. On the EE front, significant resources have been allocated for supporting the National Smart Grid Mission (NSGM) on its Smart Grid activities and for assisting the Bureau of Energy Efficiency (BEE) in finalizing the Energy Conservation Building Code (ECBC) technical update besides providing Technical Assistance (TA) to Haryana Electricity Regulatory Commission (HERC) for adoption of Demand Side Management (DSM) regulations and implementing DSM projects.

The thrust of the Program hitherto has been in creating institutional capacity in key EE & RE agencies and institutions at the federal and state levels. Thus the target of the number of institutions with improved capacity to address climate change issues under the Program has already been achieved. However the rebalancing and reallocation of the Program's resources required a downward adjustment to the other indicators such as avoided capacity under the Energy Efficiency Program and GHG emission reductions. The avoided capacity was revised downwards from 150 MW to 26 MW and the GHG emission reductions were revised downwards from 3.54 MMTCO2 to 1.4 MMTCO2. The target indicator for installed Renewable Energy capacity and the investment mobilization remained unchanged. The revised Monitoring and Evaluation (M&E) Plan for the Program incorporating these revisions was submitted to USAID and was approved by USAID during this period.

As of March 2017, the installed RE capacity achievements against the target still remain a fraction (10%) of the stipulated Program targets however the achievements by the Program during this period in creating an enabling institutional and policy ecosystem under RE are significant and unprecedented. As a result, a large and an impressive pipeline has been created on solar rooftop projects by Indian Railways (IR), Indian Oil Corporation Limited (IOCL), State Utilities in Karnataka and Rajasthan, Energy Storage projects under the MNRE demonstration scheme, RE Hybrid, Madhya Pradesh Solar Irrigation Policy and Karnataka RE Policy as shown in the figure below.



Entity	Intervention	Values (MW)	
		Potential	Legacy
BESCOM	• Solar Irrigation • Solar Rooftop	2.7 100	
Indian Railways	• Solar Ground-mounted • Solar Rooftop • Wind Energy	100 150	500 500 500
IOCL	• Solar Rooftop	5.75	20
KREDL	• Karnataka RE Policy • RE Hybrid Deployment	100 0	3600
MNRE	• MNRE Energy Storage	2.95	940
MPUVNL	• Solar Irrigation • Solar Rooftop	1 50	7
RRECL	• Net Metering Policy • RE Hybrid Deployment • Solar Rooftop	0 0 50	2300 0
SRET	• SRET	50	100
VAYAM	• Solar Irrigation	0.023	

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 fresh set of bureaucrats, etc. and evolving perspective and approach of the stakeholders in the clean energy value chain, etc. These detrimental 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 focus of the Program in creating an enabling institutional and policy ecosystem has made it almost certain, barring any change in future GOI climate change/CE policy, to achieve and in all probability over achieve on the targets set on these two counts, in the remaining period of the Program and in the years following the post-Program period beyond 2017. It is important to note that underpinning the major savings in energy and harnessing solar energy as never before is the enormous potential unleashed by the introduction of Smart Grids, DSM and solar rooftops. The basic foundation for this is being undoubtedly contributed by the PACE-D Program. The Program's major achievements during this period under the RE will certainly and significantly contribute to leaving behind a legacy and an enabling environment, not only for the central and state governments, but also for a range of public and private sector stakeholders across the clean energy value chain. The beneficiaries of the Program's TA will gain significantly from such heritage, both in the short

and long term, as they will have access to innovative financing mechanisms, new business models, enabling policy and regulatory frameworks, etc. facilitated by the Program.

With the national RE targets being drastically revised to increase India's solar power capacity target under the Jawaharlal Nehru National Solar Mission (JNNSM) by five times, reaching 100 GW by 2022 as compared to earlier 20 GW by 2021-22, the policy, financing and market dynamics are continuously evolving. While the market as usual would have achieved 20 GW by 2021-22, the sudden exponential change in the national scenario altered the perspective of the state and central governments' approach for the scale up. The Program had to absorb, analyze and reflect the intrinsic priorities of the Government of India and align it with the overall target of the Program to reduce GHG emissions.

At this point, it is worth mentioning that in spite of the challenges posed by the dynamic clean energy national and state-wide scenario, the Program is confidently marching on its way to achieve most of the targets envisaged in the contract document and subsequently in the revised M&E plan approved by USAID.

ACHIEVEMENTS

This quarterly report presents an overview of the PACE-D TA Program achievements in the reporting period January-March 2017, lists the achievements of all Program indicators vs. the Program targets established in the Performance Management Plan (PMP); and presents progress on the five-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 greenhouse gas (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 150 Megawatt (MW) of expected lifetime energy savings from EE or energy conservation. The key achievements for the reporting period are:

Smart Grid

- **National Smart Grid Mission- Implementation Framework**
  - Developed the module on Institutional Structure for NSGM outlining the organization and governance structure, operational workflows and coordination mechanisms for the mission to achieve its vision and goals Developed the Policy framework module for NSGM outlining the key policies required to achieve the SmartGrid goals laid out in the NSGM institutional structure.
  - Developed the module on SmartGrid Standards outlining the key standards required to achieve the SmartGrid goals laid out in the NSGM institutional structure.
  - Developed the module on NSGM- Business models, outlining the business models for SmartGrid Programs that will help attract private investments and resultant benefits across all stakeholders including government, private sector, distribution companies and consumers.
  - Developed the module on Measurement, Reporting and Verification (MRV) Framework for NSGM outlining the framework for the NSGM, and its programs and pilot projects.

- **Smart Grid Pilot in Ajmer**
  - Presented analysis for December 2016 – February 2017 data for reducing losses to Managing Director (MD) and Chief Engineer, Ajmer Vidyut Vitran Nigam Ltd. (AVVNL) along with other AVVNL officials.

- Two Reports on Cost Benefit Aanalysis (CBA) and scale up were completed and submitted to AVVNL.

Waste Heat Utilization (WHU)

- Completed revision of the technology compendium including feedback from the Program
- Expenditure Finance Committee (EFC) memo to promote WHU in industries was submitted to BEE in March 2017

Heating, Ventilation and Air Conditioning (HVAC)

- Assisted EESL in engaging with banks, ATM operators and public sector organizations to aggregate demand for super-efficient air conditioners.
- EESL constituted an expert group of manufacturers for review of the technical specifications for super-efficient air conditioners. PACE-D TA team supported EESL in organizing the review meetings and assimilating suggestions from the manufacturers. The final tender documents were revised by PACE-D team to incorporate suggestions accepted by EESL.
- PACE-D team also assisted EESL in launching the tender for the first batch of super-efficient ACs. The team finalized the tender document and worked with EESL to clarify queries from the bidders.

Energy Conservation Building Code (ECBC) Technical Update

- ECBC steering committee meeting approved ECBC 2017 on January 30, 2017.

Demand Side Management (DSM) Regulations in Haryana

- Organized second capacity building workshop in consultation with HERC at Gurgaon during the month of January 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 Gigawatts (GW) of RE by 2022.

Solar Photovoltaic (PV) Rooftop

- **Bangalore Electricity Supply Company Limited** (**BESCOM)**
  - Facilitated a cumulative capacity addition of 41.80 MW of solar rooftop in BESCOM's licensee area as of March 2017

- **Rajasthan Renewable Energy Corporation Ltd (RRECL) and Jaipur Vidyut Vitran Nigam Limited (JVVNL) and other State Utilities**
    - Facilitated a cumulative capacity addition of 26.80 MW of solar rooftop under RRECL's scheme and in other utilities' licensee area as of March 2017

- **Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL)**
    - Supported financial bid opening and analysis for standardization of rates for EPC of rooftop projects

- **Indian Railways**
    - Supported IR to prepare note on revisions needed in tender documents for 100 MW rooftop based on the feedback received from the project developers during the pre-bid conference.
        - Post-closing of 100 MW tender, carried out analyses of the tender and assisted IR strategize re-tendering of sites for which no tenders have been received.
        - Based on the strategy, Program have identified sites with 100 kWp and above capacities, aggregating 25 MWp for re-tendering
        - IR issued Letters of Award for a cumulative capacity of 25 MW.
    - Supported IR carryout stakeholder consultation meeting for Chief Electrical Service Engineer / Chief Electrical General Engineer (CESE/CEGE) of zonal railways.

- **REMCL**
    - Assisted REMCL, managing the centralized procurement of the 100 MW Solar Rooftop Power on behalf of Indian Railways, to create the framework for a single one time centralized bid.

Energy Storage

- Assisted the three Public Sector Units (PSUs) selected by MNRE for pilot Energy Storage projects in preparation of Detailed Project Reports (DPR).
- Worked towards the finalization of the technical specifications for their tender documents after completion of the site visits for REIL, IOCL and BHEL

RE Hybrids

The Program is assisting the state energy departments of Karnataka and Rajasthan through their state nodal agencies (SNAs) - Karnataka Renewable Energy Development Limited (KREDL) and Rajasthan Renewable Energy Corporation Limited (RRECL) - to create an appropriate policy and regulatory ecosystem for the deployment of wind-solar PV hybrids in these states.

- Engaged with NTPC for providing TA for their upcoming 100 MW Solar Wind Hybrid in Kudgi, Karnataka.

Renewable Purchase Obligation (RPO) Compliance Framework and Webtool Development for Rajasthan Renewable Energy Corporation Limited (RRECL)

The Program is assisting RRECL in the development of a RPO compliance reporting framework for the state of Rajasthan.

- Provided support to RISL in successful migration of web tool on the energy portal of Government of Rajasthan and Successfully migrated RPO web tool on energy portal of Government of Rajasthan
- Provided training and hands on experience to RRECL and designated resource on key functionalities of RPO web tool;

Training Programs

Organized one Training of Trainers (TOT) for PNB Trainers:

- The Punjab National Bank (PNB), in partnership with the U.S. Agency for International Development (USAID), launched the first Training of Trainers (TOT) program on March 27-28, 2017 at the PNB's Central Staff College in Delhi.
- The TOT focused on building the capacity of PNB trainers who can further train PNB loan officers to evaluate and finance solar rooftop projects. This is expected to mobilize finance for solar rooftop projects and facilitate the Government of India in achieving its target of 40 Gigawatts (GW) of solar rooftop by 2022, as a part of its wider goal of 100 GW under the Jawaharlal Nehru National Solar Mission.
- Nearly 25 trainers from various PNB Training Centres (Central Staff College, Regional Staff College, Zonal Training Centres, and IT Training Centre) were trained on various aspects of solar rooftop over the two days training program.

Microfinance Support Program (MSP)

- Facilitated the sale of 12,414 clean energy products in the reporting quarter taking the total tally of clean energy products sold to 272,296 through Microfinance Institution (MFIs), across nine Indian states, with 100% women loan clients. [1]
- Leveraged USD 414,000 in loans disbursed and cash sales in the reporting quarter taking the total figure of funds leveraged in this segment to USD 9.5 million. [2]
- Continued seeding of a Microfinance Energy Network.
- Knowledge Products:
  - Completed the draft case studies for Saija and Sarala MFIs.

Strengthening Enabling Ecosystem for the Uptake of Solar Rooftop Projects in Eight States

[1] As of February 28, 2017.
[2] As of February 28, 2017.

- White paper on Solar Rooftop accepted by the Government of West Bengal.
- Engaged with the State of Maharashtra and organized the kick-off meeting and made presentation on the proposed Technical Assistance under the new scope of work and identified activities for providing TA.
- Engaged with the State of Haryana (HERC, State Utilities and State Nodal Agency) and facilitated establishment of the Technical Committee for Solar Rooftop.
- Supported Madhyanchal Vidyut Vitran Nigam Limited (MVVNL) in Uttar Pradesh in finalization of the interconnection framework.
- Submitted comments on the draft policy and regulations of Assam and West Bengal to Governments of Assam and West Bengal.
- Developed draft interconnection framework and submitted the same to Haryana, West Bengal and Assam.
- Developed note on regulatory interventions requirement and submitted the same to the Government of Uttar Pradesh.
- Initiated development of White Paper for Maharashtra for Solar Rooftop Implementation;

1. INTRODUCTION

The five-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.
- **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 is presented in Figure 1.

Figure 1: Program Snapshot as of March 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

Indicators	Reporting Frequency	Cumulative 5 year Targets	Cumulative Achievement till Q2FY 2017 (March 31, 2017)
Quantity of GHG emissions, measured in million metric tons of CO_2 equivalent, reduced or sequestered as a result of USG assistance.	**Annual (at end of FY)**	**1.40**	**0.587**[3]
Number of institutions with improved capacity to address climate change issues as a result of USG assistance	**Annual (at end of FY)**	**12**	**6**
Number of existing institutions with improved capacity to address climate change issues as a result of USG assistance		**10**	**4**
Number of institutions established to address clean energy issues as a result of USG assistance		**2**	**2**
Person hours training completed in clean energy supported by USG assistance	**Quarterly (at end of each quarter)**	**39,600**	**33,791**
Number of men		**29, 700**	**26,546**
Number of women		**9,900**	**7,245**

[3] (Unit: $MMtCO_2$) Panipat TPS: 0.064562; Chandrapur TPS: 0.126013; Sipat TPS: 0.214885; BESCOM Solar Rooftop: 0.014640; IOCL Solar Rooftop: 0.000909; Rajasthan Solar Rooftop: 0.005958; HERC DSM, Regulations, EESL: 0.131617; BESCOM Solar Irrigation: 0.000354; Bihar Solar Irrigation Pilot: 0.000021; MSP: 0.027924-estimated as of 30 Sep 2016

Indicators	Reporting Frequency	Cumulative 5 year Targets	Cumulative Achievement till Q2FY 2017 (March 31, 2017)
Number of enabling policies and regulations for wide-scaling clean energy proposed, adopted and/or implemented as a result of USG assistance	**Annual (at end of FY)**	**No fixed target**	**7**
Proposed			**7**[4]
Adopted			**4**[5]
Implemented			**3**[6]
Quantity of operational renewable electric generation capacity as a result of USG assistance (in MW)	**Annual (at end of FY)**	**714**	**72.79**[7]
Energy saved due to energy efficiency/conservation projects as a result of USG assistance (in MW)	**Annual (at end of FY)**	**26**	69.02[8]
Percent heat rate improvement in two power plants utilities (cumulative)	**Annual (at end of FY)**	**2%**	
Panipat thermal power station			**5.6%**[9]
Chandrapur thermal power station			**3.4%**[10]

[4] Karnataka RE Policy, Karnataka EE Policy, Rajasthan EE Policy, Smart Grid Regulations, MP Net Metering Policy, Karnataka Gross Metering Regulations, Technical Update of ECBC
[5] Karnataka Solar Policy, Haryana DSM Regulations, Rajasthan Net Metering Regulations, MP Net Metering Policy
[6] Karnataka Solar Policy, Haryana DSM Regulations, ECBC
[7] (Unit – MW) BESCOM Solar Rooftop: 41.80; Rajasthan Solar Rooftop: 26.8 IOCL Solar Rooftop: 3.00; BESCOM Surya Raitha Scheme: 1.17; Bihar Solar Pumps Pilot: 0.023
[8] Out of 276 MW capacity savings till March 31, 2017, PACE-D attribution is considered as 25%
[9] As of 30 Sep 2016
[10] As of 30 Sep 2016

Indicators	Reporting Frequency	Cumulative 5 year Targets	Cumulative Achievement till Q2FY 2017 (March 31, 2017)
Total public and private funds leveraged by USG for energy projects (in millions USD)	**Annual (at end of FY)**	**90**	**125.22**[11]

[11] (Unit - USD million) BESCOM Solar Rooftop: 54.82; MSP: 16.69; Rajasthan Solar Rooftop: 35.15; Cleaner Fossils: 9.49; IOCL Solar Rooftop: 3.93;; BESCOM Surya Raitha Scheme: 1.87; MNRE: 0.10; CEED: 0.04; TCG: 0.04; BEE: 0.05, HERC DSM regulation –EESL LED 3.05 (25% of total investment)

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 1.1Smart Grids Electric System

Technical Assistance to Ministry of Power (MOP) on Implementation of SG 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 SG initiatives in the country. In 2012, the ISGTF shortlisted 14 SG pilots that are currently at different stages of implementation by various distribution companies (DISCOMs) across India. Under these pilots, 50 percent funding is proposed to be covered through a central grant, and the remaining 50 percent is to be contributed by the respective DISCOM.

The PACE-D TA Program, in discussion with MOP, sought to build capacity of various stakeholders to successfully implement Smart Grid pilots in the country and enable their scale-up across all DISCOMs. After consultation with MOP, it was agreed that the Program will offer the following technical assistance:

- Organize regular Progress Review and Capacity Building Workshops (PRCBWs).
- Prepare technical papers on relevant topics.
- Prepare draft Smart Grid regulations.
- Support a selected DISCOM on Smart Grid pilot implementation.
- Facilitate establishment of a network of institutions to provide training on Smart Grid.
- Advise on institutional structure of the NSGM.

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

- Fifteen organizations with improved capacity to implement Smart Grid(MOP and 14 DISCOMs)
- One new organization established (NSGM)
- One regulation proposed
- USD 83 million previously earmarked public funds utilized to effectively implement Smart Grid pilots
- 4,000 person-hours of training provided
- MW of avoided generation[12]

[12]The savings from the pilot projects are in various stages of estimations as the detailed project reports (DPRs) are being prepared.

Status of work-plan activities and deliverables: The following activities were carried out in Year 2:

- Organized a study tour to the U.S in January 2014.
- Organized two PRCBWs for the 14 pilots in Puducherry.
- Developed four opinion papers, of which two were formally launched.
- Prepared draft Smart Grid regulations for adoption by State Electricity Regulatory Commissions (SERCs).

In Year 3 and 4, the Program:

- Supported the Central Electricity Regulatory Commission (CERC) for finalization of the Smart Grid Model Regulations for adoption by SERCs.
- Selected Tripura and provided TA to the state DISCOM in the areas of development of EM&V framework, organized capacity building workshops, and assisted in review of software documentation submitted by vendor and software database, display and report definition, drafted the IT Policy document.
- Conceptualized and launched Smart-NET to meet the capacity building targets as laid under the National SG Vision and Roadmap. A WG was established to provide guidance for the development of two SG courses and roll out strategy of Smart-NET.
- Delivered the first three-day training program on innovative Smart Grid technologies and applications for 22 utilities across the country.
- Selected Ajmer DISCOM for implementing Smart Grid Pilot in 1000 households in a given area by engaging two different Smart Grid meter manufacturer and solutions provider. Provided TA in the areas of base-lining/planning and pre-implementation analysis, generation and analysis of various reports for each of the Smart Grid functionality selected, regular monitoring and generating recommendation on the loss levels and cost-benefit analysis. Developed the Consumer feedback and draft engagement strategy, for Ajmer DISCOM.
- Completed and released a short film on “Smart Grid and its Transformative Impact on Utility Operations and Customer Energy Empowerment”
- Initiated development of an Institutional Structure for NSGM outlining the organization and governance structure, operational workflows and coordination mechanisms.
- Initiated development of the modules on policy, standards, business models, and MRV framework.

In Year 5, the Program will :

- work towards finalizing the R-APDRP paper and Evaluation, Measurement and Verification (EM&V) guidelines and publishing on the web.
- finalize the M&V strategy and baseline development
- complete software documentation review
- assist in database, display and report definition
- initiate and complete IT Policy document
- complete the institutional framework and other modules for NSGM
- review (based on further request from NSGM) the need for revising the training

material and modules based on the participants' feedback from the training programs.

- closely work with AVVNL for completing and consolidating data monitoring, cost benefit analysis of the pilot, providing support for data analytics and documenting lessons learnt and to devise scale up strategy.
- initiate and complete Smart Grid Cost-Benefit analysis of 2 Government of India (GoI) Pilot Projects

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 R-APDRP for optimal use	Completed[13]
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 SG 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	Scheduled for April 2017

[13] Completed but yet to be approved

S.No	Activities	Status
H	Closure Report	Scheduled for April 2017
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 SmartGrid goals	Completed
D	Develop the module on SmartGrid Standards outlining the key standards required to achieve the SmartGrid goals	Completed
E	Develop the draft module on NSGM- Business models, outlining the business models for SmartGrid	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.	Initiated[14]
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
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 SERCs	Completed
I	Monitoring of MW/MWh saved from implementation of draft regulations (subject to adoption of regulations by SERCs)	Post notification of regulations

[14] though deferred on MOP advice, the Program was requested in this quarter to resume work

S.No	Activities	Status
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 reports till February 2017
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	Scheduled for April 2017
B	Framework for cost-benefit analysis and Baseline Assessment for HPSEB, Himachal Pradesh Smart Grid Project	Scheduled for April-May 2017
C	Framework for cost-benefit analysis and Baseline Assessment for CESC, Mysore Smart Grid Project	Scheduled for April-May 2017
D	Presentation on Cost-Benefit Analysis - CESC, Mysore Smart Grid	Scheduled for April-May 2017
E	Presentation on Cost-Benefit Analysis- HPSEB, Himachal Pradesh Smart Grid Project	Scheduled for April-May 2017

Brief description of activities this quarter:

- Presented the report on modules on SmartGrid to the NSGM office.
- Presented analysis for December data for reducing losses to MD and DT, AVVNL along with other AVVNL officials. Basis the analysis, MD AVVNL directed the field officials to initiate actions on the loss reduction measures recommended
- Completed monthly loss analysis for the period of January and February and shared the same with MD, AVVNL
- Basis the results from the operational period of the pilot, finalized the Cost-Benefit analysis and Scale-up strategy. The same was presented to NSGM and to MD and DT, AVVNL. Basis the report submitted, AVVNL to revert on continuance/ scale-up of the pilot program
- Based on TSECL's need, finalized the scope of developing an IT policy/guideline for TSECL.
- Conducted a survey visit to TSECL, with meetings with IT stakeholders and senior management to understand scope of IT Policy and get an overview of IT organizational structure, roles and responsibilities
- Finalized the IT Policy Framework and a Draft TSECL IT Policy/ Guidelines document which is to be finalized post walkthrough discussion with TSECL IT team
- Prepared Questionnaire for establishing baseline and quantifying benefits for CESC, Mysore Smart Grid Projects. The same was shared with CESC, and basis response received a final set of clarifications was sought to complete the baselining and Cost-Benefit Analysis for the project
- Questionnaire for establishing baseline and quantifying benefits for HPSEB Smart Grid projects was prepared and shared with HPSEB officials.

Challenges/risks: Adequate support/ active engagement from field level offices of CESC, HPSEB would be required for obtaining requisite data to complete Cost-Benefit Analysis.

Support required from USAID: Support from USAID to coordinate with NSGM for getting the data required in a timely manner from Smart Grid Pilots in Karnataka and Himachal Pradesh.

Task 1.2.Cost Effective, NetZero Energy Buildings (NZEBs)

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

Objective: Globally, NZEBs are becoming the benchmark for new buildings to demonstrate the commitment to clean energy. In India, it is estimated that 80 percent of the new building stock is yet to be made. Also, several buildings, currently under construction, are planned to conform to the Leadership in Energy and Environmental Design/Green Buildings Rating System India standards which is a penultimate step towards achieving net zero energy status.

Thus, it is important to structure and implement an India-specific NZEB market transformation framework.

Towards this end, the PACE-D TA Program is partnering with BEE to provide TA to two NZEB pilots, establish a knowledge portal and update the existing building code. The updated ECBC will also include provisions for RE systems for new buildings to mainstream the use of RE in buildings in India and prepare them for easier eventual transformation to NZEBs.

The Program's NZEB pilot projects--NU and UHBVNL aim to support BEE's efforts to address EE in the building sector by promoting large-scale development of NZEBs. The demonstration projects will be used as vehicles to highlight the concept of NZEB developments through applicable, cost effective technologies and design strategies. The selected pilot projects are public sector buildings which can build confidence amongst private sector to follow the lead taken by the government agencies.

To this end, the objectives can be summarized as:

- 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.

Policymakers and private sector players can direct their resources in developing local markets that are needed for constant supply of these technologies in a cost effective manner. These pilot projects will also build the technical capacity of a range of stake holders to develop NZEBs across India.

Mainstreaming NZEBs in India requires information dissemination on a large-scale and in a sustained manner. To facilitate this, the Program has developed a NZEB knowledge portal that provides information about EE and RE technologies that are integral to designing NZEBs. Similarly building design strategies that are intrinsic to buildings that consume less energy compared to conventional buildings have also been shared. The portal will also provide a platform to users for discussion with subject matter experts and leading experts who will be invited to share latest research activities, policy interventions and concepts related to NZEBs.

The portal includes the following features:

- Online knowledge center with complete details of the NZEB definitions, approaches, system boundary, international NZEB policies, strategies, equipment and technologies, various tools for calculations, glossary of terms and terminologies for NZEB.
- Online NZEB Alliance that will feature discussion forum and blogs from EE and RE experts.

- Case studies to demonstrate the feasibility of designing and constructing NZEBs, and the technologies that need to be used in buildings to attain energy consumption neutrality.
- Relevant news and events from India and abroad.

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

- Three organizations with improved capacity to implement NZEB (BEE, NU, and UHBVNL)
- USD 300 million public funds leveraged
- MW of avoided generation from conventional grid-connected electricity supply

Status of work-plan activities and deliverables: In Year 2, the Program developed a plan to increase awareness and organized an international seminar on NZEBs. It also organized a stakeholder consultation on NZEB design competition and initiated work on the knowledge portal. The Program also initiated providing TA to two NZEB pilots for which an MOU has been signed with the two organizations.

In Year 3, the Program developed a sustainability framework for the knowledge portal in consultation with BEE.

In Year 4, the Program launched the NZEB Knowledge Portal and NZEB Alliance in consultation with BEE. The Program continued to provide TA for the design and implementation of its existing pilots based on specific requests for assistance. Meetings with design teams and periodic site visits to Nalanda University were carried out to review and assist in implementation of EE and RE measures in the pilot project.

In Year 5, the Program will continue to maintain the website. The Program will continue to provide TA for the design and implementation of the NZEB pilot for Nalanda University on a limited basis subject to remaining period of the CLIN 1 component and resource availability.

In Year 4, the Program assisted Indian Railways (IR) in developing a NZEB vision document and action plan for its upcoming and existing facilities. The Program will also assist 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.

In Year 5, the Program will continue to support IR to develop an action plan for implementing a net zero energy vision, technical specifications for net zero energy railway stations and measurement and verification protocols. Additionally, the Program will support IR in the procurement of NZEB materials and technologies in the first few net zero energy facilities. This assistance will ensure that IR is able to institutionalize the procurement processes for NZEBs in their portfolio.

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 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	Ongoing
F	Monitor NZE parameters and display on NZEB Knowledge portal	Ongoing
G	Data from NZEB pilot based on implementation and disseminating lessons learnt	Scheduled for 2016-17

Brief description of activities this quarter: The Program continued to provide TA for the design and implementation of its NZEB pilot projects.

- **Portal**
  - Continued to connect with academic and research institutions, architectural practitioners, manufacturers and technology providers in the building sector to encourage them to join the NZEB Alliance.
  - Updated information on the portal (international and national NZEB events, details about case studies, etc.)
  - Initiated efforts to expand membership of the NZEB Alliance by engaging with stakeholders from the building industry.

- **Indian Railways**
  - Submitted comments on technical specifications of RE components of the tender document.

Challenges/risks: The pilots are progressing slowly. The main reason for this is the need to follow in-house procedures by the pilot organizations. It is now certain that completion of pilot projects will not coincide with the Program completion, which formally concludes in May

2017.The Program may have to consider devising mechanisms that ensure continuance of NZEB vision of the pilots beyond the Program itself. The Program is also required to disseminate the learning's from these pilots. It may be challenging to extract tangible outputs resulting from PACE-D TA till May 2017.

Support required from USAID: USAID is requested to follow up with MOP and BEE to plan for disseminating the learning and achievements of PACE-D NZEB pilots. It should be kept in mind that these may have to be integrated within the larger context of outreach activities to publicly share the program level outputs and achievements of the PACE-D TA Program with stakeholders.

Task 1.3.Waste Heat Utilization (WHU)

Technical Assistance to BEE on WHU Policy

Objective: The Program is providing technical assistance to BEE for developing a strategy for WHU, and specifically for low grade WHU. The objectives also include developing a strategy paper for BEE to promote through appropriate policy mechanisms the priority technologies. The objective of the technical assistance activities is to complete a strategy paper for BEE to promote the priority technologies through appropriate policy mechanisms. This will be done by taking forward the work done in previous years and engaging with key stakeholders.

Intended results: The deliverables expected from the activity are:

- Consultation meeting with Key experts on the WHU technology compendium developed in Year-2
- Release of WHU technology compendium after incorporation of the suggestions from consultation meeting.
- Develop a draft policy paper for BEE
- Prepare a recommendation report on WHU policy

Status of work-plan activities and deliverables: The Program is supporting BEE in developing and implementing a policy for saving energy through WHU interventions.

In Year 1 and 2, the Program undertook a WHU market assessment study, conducted a WHU pilot feasibility study for a sponge ironunit and developed a background paper outlining the strategies which are being deployed globally for promotion of WHU technologies. The study revealed that despite high potential, the actual penetration of WHU in key sectors is estimated at 30 percent and that 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. To address this challenge, the Program prepared a compendium for low grade WHU in Year 2.

In Year 3, the Program initiated the development of a strategy and a policy paper for BEE to promote priority technologies through appropriate policy mechanisms.

In Year 4, the Program in collaboration with BEE carried out an expert consultation on the policy and compendium.

In Year 5, the Program will incorporate expert comments and submit the final policy paper and compendium to BEE.

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

Brief description of activities this quarter:

- Completed the revision of policy report.
- Completed revision of the technology compendium including feedback from the Program.
- Submitted the report to BEE with cover page options.
- Submitted a EFC note on demonstration projects financing support to BEE for WHU projects.

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 is to accelerate mainstreaming of energy efficient HVAC technologies in India. The Program is supporting 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.

Intended results: This intervention will result in:

- One policy proposed (HVAC policy)
- One HVAC market transformation program design

Status of work-plan activities and deliverables: The market transformation study was completed and launched in Year 2. The report of this study recommends inputs for a broad policy framework. Further activities can be planned once BEE advices on the preferred strategies for HVAC market transformation program.

In year 4, EESL requested USAID to provide technical assistance in designing an energy efficient HVAC market transformation program for window and split air conditioners. These two AC products represent the largest and fastest growing segment of HVAC products in India. Any improvement in baseline energy efficiency of these products is anticipated to have amplified effects on the overall energy efficiency of HVAC sector in India.

In Year 5, the Program will continue to assist EESL to develop a market transformation program for super-efficient air conditioners in India.

Brief description of activities this quarter:

- Assisted EESL in engaging with banks, ATM operators and public sector organizations to aggregate demand for super-efficient air conditioners. EDS has been interacting with the following to understand their inventory and devise customized solutions for replacing and upgrading their stock of split ACs with the super-efficient ACs:
    - State Bank of India
    - Punjab National Bank
    - Axis Bank
    - HDFC Bank

- EESL constituted an expert group of manufacturers for review of the technical specifications for super-efficient air conditioners. PACE-D TA team supported EESL in organizing the review meetings and assimilating suggestions from the manufacturers. The final tender documents were revised by PACE-D team to incorporate suggestions accepted by EESL.
- PACE-D team also assisted EESL in launching the tender for the first batch of super-efficient ACs. The team finalized the tender and worked with EESL to clarify queries from the bidders.

Challenges/risks: Since the PACE-D TA Program is ending in May 2017, it is important that the design of the market transformation program is completed within this timeframe.

Support required from USAID: USAID can expedite the process by frequent and regular consultations with EESL officials so that the decision on the award of the tender is completed by EESL.

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

Technical Assistance to BEE to Update ECBC

Objective: The ECBC 2007 code is being updated to reflect the latest trends in construction practices, enhanced performance of EE building technologies and materials available in Indian markets. In urban areas, buildings are and will be increasingly designed to harness as much of RE as possible. The code will also be updated to include RE systems that can be used in non-residential buildings.

The Program will compile an updated version of ECBC that will be based on life cycle analysis of the saving potential of all possible energy conservation measures on 16 prototype buildings in five climatic zones. The draft version of the code will be reviewed by three committees constituted by BEE, namely steering committee, technical advisory committee, and expert WGs for wider consultation.

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

- One policy/regulation proposed
- One organization with improved capacity to identify and implement clean energy regulations and guidelines (BEE)

Status of work-plan activities and deliverables: In Year 4, the Program conducted a stringency analysis for the technical update of ECBC, and provided the necessary technical support in following activities:

- Carry out the analysis across the major sections of ECBC: building envelope, lighting systems, comfort systems, electrical systems and compliance processes.
- Facilitate meetings of the WGs to review the progress and findings of the stringency analysis. This exercise will culminate in an interim ECBC Stringency Analysis Report summarizing the findings and the process followed by the Program.
- Facilitate an open and collaborative stakeholder engagement process through four stakeholder workshops, one each for the North, South, East and West Zones, and to present key findings of the stringency analysis and the baseline development in regional stakeholder consultation workshops.
  Complete final ECBC Stringency Analysis Report after collating the observation of participants from the stakeholder workshops. The report will include recommendations from major stakeholders in the construction industry, and officials from regulatory and enforcement agencies. The draft stringency report will be presented to the technical committee for review.

In Year 5, the Program will support BEE in facilitating ECBC steering committee meeting to finalize ECBC 2017. The Program will further undertake ECBC 2017 savings potential study.

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	WG 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	WG meeting for review of stringency analysis for administration and compliance	Completed
H	WG 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 WGs 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	TBD
III	**Submission of ECBC update**	
A	Draft ECBC update (including feedback from regional and national stakeholder workshops)	Completed

Brief description of activities this quarter*:*

- ECBC steering committee meeting held on Jan 30, 2017. All comments and feedback on the draft ECBC has been incorporated. The final ECBC 2017 draft has been sent to the Ministry of Power for their final approval.
- Initial discussion on final ECBC launch event has been initiated.

Challenges/risks*:* The challenge is to schedule convenient dates for ECBC launch event before May 2017.

Support required from USAID: Regular follow ups with BEE on the launch date for the ECBC 2017.

Technical Assistance to BEE on ECBC Accreditation Program

The Program is working 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. BEE, along with the Council of Architecture (COA) and Indian Institute of Architects (IIA), plans to launch the first exam by Q2 of 2016. Draft reference material, question bank, and sample question paper has been prepared by the Program to support BEE on its initiative. A MOU was expected to be signed in October 2015 among BEE, COA, and IIA to take this initiative further but has been delayed.

No activities were undertaken during the reporting period.

Challenges/risks*:* BEE to identify a partner institution to conduct the first ECBC accreditation examination.

Support required from USAID: USAID to discuss with BEE the need to expedite the ECBC examination initiative so that the PACE-D TA Program can provide the required technical assistance before the Program ends in May 2017.

Technical Assistance to Government of Rajasthan for ECBC Implementation

Objective: 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.

The Program is supporting 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.

Intended results*:* This intervention will result in:

- One policy/regulation implemented (ECBC)
- Three organizations with improved capacity to identify and implement clean energy regulations and guidelines (UDH, GOR; RRECL and JDA)

The ECBC implementation framework adopted by Jaipur could be further replicated by other cities in the state and with appropriate modifications to other cities in India.

Status of work-plan activities and deliverables*:* In Year 3, the Program carried out ECBC state-level implementation activities including facilitating the formation of task force, and capacity building of a cadre of consultants and government officials to enforce ECBC in the states. Other activities include:

- Recommendation of amendments needed in bylaws (legal local guidelines for building construction in urban areas) to incorporate ECBC compliance as a pre requisite to building sanction process and gaining occupancy license for new buildings.
- Outlining of complete ECBC compliance procedures for Jaipur municipal area including:
    - Sequence of procedures for demonstrating compliance and gaining approval from ECBC implementation authorities
    - Penalties and fees
    - Dispute resolution
    - Performance reporting
    - Compliance checklists and forms
    - Submission drawings and documents for demonstrating compliance

In year 4, the Program focused on ongoing state level ECBC implementation work.

In Year 5, the activities will be decided as per the directions from the GOR subject to availability of adequate time and resources. However, the Program will prepare a generic document on ECBC State implementation with an objective that any Indian state can refer the document for the ECBC implementation purpose. This document will cover compliance mechanisms and necessary amendments to bye-laws.

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	Awaiting GOR concurrence
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	Post GOR concurrence

Brief description of activities this quarter: ECBC implementation handbook has been prepared and the same is now in sync with the BEE's rules and regulation. BEE has proposed to launch the handbook along with the ECBC 2017 launch.

Challenges/risks: The technical capacity of RRECL and other state agencies to comprehensively understand ECBC is inadequate; the major reason being that the state is implementing a building energy code for the first time. However, RRECL has decided to overcome this problem by holding awareness programs to inform stakeholders and officials about ECBC. This is expected to help the Program in executing its mandate. The state government has taken initiative in this but interdepartmental approvals and management have led to delays in organizing the workshop.

Support required from USAID:

- Approval of handbook on ECBC implementation guidelines and compliance procedures from BEE

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

Objective: The Program is engaged with the Government of Karnataka (GOK), through KREDL, and the GOR, through RRECL, to provide technical assistance in the area of policy, regulatory and institutional strengthening for large-scale EE deployment in the state.

- The state of Karnataka faces several challenges such as energy and peak deficits and increased dependence on short term power purchase, etc. The state also depends pre-dominantly on conventional energy sources with a huge dependence on coal-based generation for meeting its current as well as rapidly growing energy and peak demand.
- The state is also grappling with issues such as demand supply gap, higher subsidy, higher transmission and distribution (T&D) losses and energy security. Also, the state's energy requirement is growing continuously and is expected to increase with higher growth rate in near future.

To sustain continuous growing requirement in the environment of depleting conventional energy sources and geographical challenge, relying only on supply side option is not an economically viable option. There is an urgent need to increase end use efficiency which would in turn result in reduced demand to be met.

The GOK has also emphasized the importance of EE and its role in addressing the development challenges faced by the state. The state government had announced "The Karnataka Renewable Energy Policy 2009-14" in 2009 to promote and harness the RE and EE potential in the state. Subsequently, the GOK and KREDL undertook several measures at the policy, regulatory and program implementation levels to promote the EE sector in the state. However, in spite of these efforts, large-scale deployment of EE in the state has not happened due to certain limitations in the existing framework. 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.

Similarly, the GOR and RRECL have also taken several initiatives at the policy, regulatory and programmatic levels to promote large-scale deployment of EE. However, the existing framework has certain limitations and possesses several challenges which can be conquered through development of state specific comprehensive EE policy. The Program has 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.

The Program provided necessary support to KREDL in development of draft EE and energy conservation policy for the state. It also provided support to KREDL in addressing the comments received from the various stakeholders. KREDL has submitted the revised draft policy document to the Department of Energy (DOE), GOK. DOE is in the process of notifying the same through cabinet approval.

During year 4, the Program expected to provide necessary support to KREDL in implementation of policy document upon its notification through development of energy efficiency and conservation action plan for the policy period. GOR did not notify the EE Policy.

In Year 4, after due follow up with RRECL on EE policy, RRECL has since then shared the draft EE policy with the major stakeholders including the PACE-D TA Program and sought comments. The Program has submitted comments on draft EE policy to RRECL.

In Year 5, the Program will finalize EE policy for its notification by RRECL.

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

- Two policies proposed (EE policy for each state)
- Four organizations with improved capacity to develop and implement energy efficiency and energy conservation policy (Energy Departments of GOK and GOR, KREDL and RRECL)
- USD 5 million expected to be leveraged from public and private funds for implementation of energy efficiency and conservation projects;(INR 150 million in each state)
- 28 MW (130 million units (MU)) of electricity savings over policy tenure through implementation of EE measures in different consumer categories; (50 MU in Karnataka and 80 MU in Rajasthan)

Presently, none of the state designated agencies or state governments have issued a separate and dedicated policy for EE. The approach adopted under the Program in the two focal states has the potential to create replicable and scalable models. The state designated agencies of other states may also consider development of their state specific policy which will help them to put in place an overarching framework for identification, development, implementation, monitoring and verification of EE programs to tap huge energy savings potential.

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 & EC Policy	Completed
D	Preparation of revised Karnataka EE & EC Policy	Completed
E	Policy notification by GOK	Awaited
F	Implementation support	Scheduled post policy notification
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	Awaited
F	Implementation support	Scheduled post policy notification

Brief description of activities this quarter:

- Followed up on the current status of the draft policy in GOK regarding the state cabinet's approval.
- Followed up with RRECL on the current status of the comments/suggestions received from the major stakeholders on the draft policy document;
- Met with RRECL to discuss the next steps and time frame for the finalization of the policy document through stakeholder consultation.

Challenges/risks: The state designated agencies have little or no experience in designing, planning, implementing, monitoring and verifying EE and energy conservation programs. Also, most of the existing programs are being implemented through government grants and subsidy. The implementation of EE and energy conservation programs through public private partnership and through involvement of Energy Service Companies (ESCOs) is currently limited.

Upon notification of the policy by the state governments, the Program proposes to address these challenges/risks by providing necessary support to KREDL and RRECL in development of EE and energy conservation programs/schemes for the policy period. The action programs/schemes would include amongst others: the details of the various EE programs, their objective, program implementation schedule, funding requirements, possible sources of funding, expected savings, monitoring and reporting framework, roles and responsibilities, business models and awareness campaign.

Support required from USAID: Continued engagement with state energy departments of Karnataka and Rajasthan for follow-up on policy notification.

Technical Assistance to HERC to Develop and Implement DSM Regulations

Objective: The Program is engaged with HERC to provide technical assistance for development and implementation of DSM regulations. The present strategy to meet the growth in electricity demand through increasing power generation through conventional sources is likely to have significant negative impacts on the environment and is considered financially unsustainable. Globally there is adequate experience to indicate that DSM can play a key role in reducing demand for electricity and thus reduce the financial requirements for power generation.

While some states have issued DSM regulations, there has been very limited effort to identify and implement large-scale DSM projects. The Program will facilitate HERC and DISCOMs to pro-actively identify and implement such projects.

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

- 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 DSM projects
- 20 MW of energy savings

The approach adopted under the Program in Haryana has the potential to create a replicable and scalable model for identifying and implementing DSM projects in the country leading to achievement of India's energy saving targets.

In Year 3, 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 empanelled 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 further identified some quick gain DSM projects which both the distribution utilities may consider for development and implementation. A draft concept note and agenda for the second capacity building workshop for both the distribution utilities were also developed in Year 3. The Program worked towards finalizing the identified DSM projects for further implementation in consultation with both distribution utilities and HERC.

In Year 4, the Program carried out the following activities jointly with HERC to assist the distribution companies (DISCOMs) in submitting project proposals to HERC.

- Supported HERC to conduct first DSM advisory committee meeting
- Revised and submitted CEA and E,M&V guidelines of DSM programs to HERC for its notification
- The Program assisted HERC in assessing the energy efficiency lighting program (EELP) proposals submitted by the distribution utilities.

In Year 5, the Program will support HERC in conducting Monitoring and Verification of Energy Efficiency Lighting Program (EELP) implemented by its two DISCOMs. Further, the Program will support DISCOMs in development of DSM program document in the second workshop.

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

S. No	Activities	Status
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	To be scheduled (April 2017)

Brief description of activities this quarter:

Support to DISCOMs & HERC:

- Initiated the preparatory work such as development of agenda, preparation of invitation letters, presentations etc. for the second capacity building workshop organized on January 09, 2017 at Gurugram.
- Organized second capacity building workshop at DHBVNL Training Center, Gurugram on January 09, 2017;
- Submitted workshop proceedings report to HERC, highlighting the key findings and learnings of the workshop;

Challenges/risks: The DISCOMs have little or no experience in DSM project design, planning and implementation. Resistance is also expected from DISCOM management to spend scarce funds on DSM projects that may result in reduced energy consumption and thus overall reduction in revenues.

The Program proposes to address these challenges/risks by providing training to DISCOMs which will highlight the benefits from DSM projects and thus the need to allocate resources. Specific case studies from utilities from India and abroad will be used to orient and train DISCOM officials on DSM projects.

The guidelines on cost benefit analysis and EM&V will improve the DISCOM's capacity to implement DSM projects to address clean energy issues.

Support required from USAID: Engaging with HERC to organize the second DSM Advisory Committee meeting.

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 Program will develop and support innovative financing mechanisms for EE which will be crucial for accelerating the commercial deployment of market-driven EE projects. It intends to facilitate 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.

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

- Two organizations with improved capacity to identify and implement financing for EE projects (BEE and Tata Cleantech Capital Ltd. (TCCL)
- 400 person-hours of training on EE project financing
- USD 1.6 million expected to be leveraged from public and private funds for implementation DSM projects
- 10 MW of avoided capacity

The approach adopted under the Program with TCCL has the potential to create a replicable and scalable model for other FIs to set up similar financing schemes for EE projects.

Status of work-plan activities and deliverables: In 2013, the Program reviewed existing international and national EE financing mechanisms and prepared a report on EE finance which proposed seven financing mechanisms.

Subsequently, three financing mechanisms were selected for detailed elaboration and launch. Activities undertaken on these three mechanisms include:

- **Corporate Energy Audit Program (CEAP)**: The Program is working with TCCL to roll out the CEAP pilot and has identified an initial list of TCCL's potential clients for CEAP.
- **PRGFEE and VCFEE**: The Program is supporting BEE to launch the PRGFEE and the VCFEE. In the current quarter, the Program reviewed the Request for Proposal (RFPs) for PRGFEE and VCFEE and conducted a survey of ESCOs and FIs to identify the potential for an EE project pipeline for the two funds.

Corporate Energy Audit Program: In Year 2, the Program initiated the launch of CEAP with TCCL for its clients. The Program held meetings with the TCCL team and introduced CEAP and its process. Subsequently an initial list of potential clients for CEAP was developed and introductory meetings held with the clients.

In Year 3, the Program met TCCL's top five clients to introduce CEAP. The Program also initiated the process of selection of an energy auditor to carry out detailed investment grade energy audit at the client premises of TCCL.

In Year 4, the Program selected an energy auditor and carried out detailed investment grade energy audit of SEACO, an industrial client of TCCL. The Program presented the findings to the client and TCCL. In order to mainstream EE finance to other FIs/Banks, the Program in collaboration with TCCL organized a roundtable on "Energy efficiency investment opportunities under the Corporate Energy Audit Program (CEAP).

In Year 5, the Program will carry out activities to expand CEAP to other potential corporates through partnerships with banks and financing institutions, who wish to implement EE projects and who need financing.

Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE):

In Year 2**,** the Program provided technical assistance to BEE for launching PRGFEE. As a part of this initiative, it prepared a RFP for selecting M&V agencies. It also facilitated BEE in organizing two outreach events at Pune and Chandigarh for FIs and other stakeholders. In addition, two training programs were organized for FIs and ESCOs at Delhi and Mumbai, with the aim of preparing EE projects to access finance through PRGFEE and also help FIs on how to appraise EE projects for funding.

In Year 3, the Program assisted BEE to structure the rules for the empanelment of FIs under the PRGFEE and same was notified by BEE in Year 4.

Venture Capital Fund for Energy Efficiency (VCFEE):

In Year 2, the Program initiated support to BEE to launch VCFEE. Towards this end, specific comments were provided by the Program on the terms of reference for selecting the fund manager for VCFEE.

In Year 3, the Program assisted BEE in drawing up the terms of the operations of the fund manager and outreach activities for preparing a project pipeline for VCFEE. It provided TA support to BEE in organizing two "Training of Trainers" training on EE finance for scheduled commercial banks at Mumbai and Nainital during June 2015. It also prepared an EE finance training manual which is a reference material for loan officers in banks/FIs. The training manual was launched officially by Director General, BEE, at the Training of Trainers Program in Mumbai.

In Year 3, the Program carried out market assessment for PRGFEE and VCFEE by preparing the survey questionnaires, and reached out to BEE-accredited ESCOs and FIs and submitted the survey report to BEE.

During Year 4, the Program finalized the market assessment report and the report was launched in July 2016.

During Year 5, the Program has not planned any activities under this Task for PRGFEE and VCFEE.

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

In Year 4, the Program, in partnership with RVPN and Energy Efficiency Services Limited (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 there 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	Ongoing
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 receiving no response from TCCL.

S. No	Activities	Status
e	Provide overall technical assistance to TCCL for CEAP Program implementation	Post loan sanction
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
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	On request
e	Conduct training for VCFEE clients- FIs & ESCOs	On request
f	Monitor energy savings & funds leveraged	Dropped
V	**Mainstreaming of EE Finance Program to Other Indian Banks/FIs**	
a	Engagement of Lending Institutes	On request
b	Define a Policy for EE financing under EEFP	On request
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

S. No	Activities	Status
VII	Preparation of note for BEE for consideration of EE finance under priority sector lending	Dropped on BEE advise

Brief description of activities this quarter: No major activities were carried out during this quarter related to this activity.

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

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

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

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

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 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 MP 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 middle 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;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: In Year 2, 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.

In Year 3, 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, 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.

In Year 4, 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 has 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 has 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 MP.

During the Year 5, 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	On request(participated in 3 training programs)
F	Preparation of a Tripartite Agreement between BESCOM, Rooftop Owner and 3rd Party Investors for facilitating 3rd Party Solar PV rooftop Models	Completed
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	Ongoing
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

S.No	Activities	Status
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	Ongoing
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**	
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	Ongoing
F	Organization of a training programs on Solar PV Rooftop Deployment for Utilities with MPUVNL	Ongoing
G	Assistance to MPUVNL on development of Pre-Feasibility Report (PFRs) and Detailed Project Report (DPRs) for Indore and Bhopal	Ongoing

Brief description of activities this quarter:

- **BESCOM**
  - Facilitated a cumulative capacity addition of 41.80 MW of solar rooftop in BESCOM's licensee area as of March 2017.
- **RRECL**
  - Facilitated a cumulative capacity addition of 26.80 MW of solar rooftop under RRECL's scheme and in other utilities' licensee area as of March 2017
- **MPUVNL**
  - Supported analyzing the technical bids of RFP for standardization of rates for EPC of rooftop projects;

- Finalized concept note and agenda for the organization of one day workshop and shared the same with MPUVNL;
- Supported financial bid opening and analysis for standardization of rates for EPC of rooftop projects;
- Supported in finalizing the agreement signing with successful bidders;
- Supported in analysis and capacity estimation of rooftop projects for 38 Collectorates;
- Support in mobilizing the lakefront SPV power plant project;
  Participated in discussions for preparation of RFP document for identification of RESCO;

Challenges/risks: No specific challenges/risks envisaged in the roll-out of the scheme. However, the success of the schemes depends on incentive structures.

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:

- **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 is partnering 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 has 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: In Year3 and Year 4, 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 has 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. 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. 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. In Year 5, the Program will continue to engage 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 (PPA) 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 a couple of live projects	Ongoing
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
K	Discussions with banks, FIs and aggregators to adopt the tool	Ongoing
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.	Ongoing
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 to PNB for financing solar rooftop projects in India. ADB has also allocated USD 5 Mn for TA. Out of this USD 5 MN, PNB has been allocated USD 2.5 Mn 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.

Brief description of activities this quarter:

- Held several meetings with ADB and PNB officials for designing the capacity development strategy and organizing workshops
- Conducted the first capacity development workshop during December 2016 and was well received by PNB.

Challenges/risks: Availability of appropriately experienced and qualified manpower under the Program delayed certain activities under this intervention.

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

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 under took 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: GOK is yet to notify the comprehensive RE policy. Delay in notifying the policy will make it difficult to achieve the specified targets in a timely manner. Also, in order to achieve the target set under the policy, it is important that KREDL develops a detailed implementation roadmap.

Upon notification of the policy, the Program will provide necessary assistance to KREDL and GOK in preparation of the implementation roadmap, and design and development of innovative programs in order to achieve the specified targets during the policy period.

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.

In Year 4, 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.

In Year 5 the Program, upon confirmation from BESCOM will conceptualize, evaluate, design and implement business models for solar PV rooftop implementation by BESCOM.

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
B	Report on parameter list for questionnaire design	Completed
C	Questionnaire	Completed
D	Report on Survey Results	Ongoing
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	Revised timelines to be worked out after meeting with BESCOM during the next quarter.
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 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

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

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

Objective: MP 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 MP 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 MP.

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 MP

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 MP	Completed
B	Research and discussions with key stakeholders	Completed
C	Draft discussion paper for development of an off-grid policy for MP	Completed
D	Stakeholder consultation	On request
E	Final discussion paper for development of an off-grid policy for MP	On request

Brief description of activities this quarter:

The Program followed up with MPUVNL to ascertain the status of the draft policy. The DOE, GOMP is yet to notify the same.

Challenges/risks: GOMP was unable to finalize the policy framework since Year 2 of the Program. The new MD of MPUVNL is keen to finalize the policy framework and present it to GOMP for approval. The Program will work with MPUVNL to finalize the framework.

Support required from USAID: No specific support is required from USAID at this stage except ongoing follow up by both the Program and USAID with GOMP.

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 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 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 May 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*:* In Year 2, 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.

In Year 4, 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, LED's 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	Awaiting budget sanction from MNRE
f	Evaluation of bids	New proposed date after budget sanction
g	Formation of steering committee within MPUVNL	Post selection of vendor
h	Implementation assistance	Post selection of vendor
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	After receiving and incorporating comments from MPUVNL
III	**Technical assistance for Net Metering implementation**	Ongoing

Brief description of activities this quarter*:*

- **CMC**: Followed up with MPUVNL to discuss the next step and way forward for the implementation of CMC. MPUVNL is yet to receive budget allocation from MNRE. MPUVNL is planning to allocate necessary budget from its own fund for implementation of CMC. The Program has shared DPR as well as revised RFP

document with MPUVNL for further consideration. MPUVNL is in the process of finalization of the RFP document for engagement of CMC implementing agency. The Program has provided necessary inputs on the RFP document.

- **Manual on Vendor Policy**: Followed up with MPUVNL in order to seek their inputs/suggestions on the vendor manual. The Program is yet to receive feedback on the manual on vendor policy.

Challenges/risks*:* The implementation of CMC critically depends upon the allocation of budget by MNRE and hence may result in delays. Presently, MPUVNL is considering implementation of CMC through own funding. MPUVNL is in the process of finalizing RFP document for engagement of IT implementing agency.

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: In Year 3 and Year 4, 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. The Program initiated discussions with NTPC for providing TA for their proposed 100 MW RE Hybrid projects 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**
  - Followed up with MNRE to schedule a meeting to discuss on the draft guidelines on brownfield RE Hybrid Projects.
- **NTPC**
  - Engaged with NTPC and finalized the TA for their proposed 100 MW Wind Solar Hybrid green field project in Kudgi, Karnataka.

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.

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

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 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*:*

In Year 3 and Year 4, the Program provided extensive support to RRECL for establishing the database for RPO compliance. Detailed meetings were held with RRECL, RERC and other stakeholders and a committee was established. Subsequently the Program developed the RPO Compliance Monitoring Web Tool for Rajasthan in close consultation with the Committee members. A manual RPO Web Tool was also developed and a training program was organized in Rajasthan for the stakeholders. The RPO Tool was also presented at AREAS meeting and at FOR and was well received by the members. Based on FOR's request, a report on RPO Compliance framework for adoption by other states was also submitted to FOR and circulated to all the regulatory commission.

During Year 5, the Program will select five to six new states represented by technical committee members of FOR and carry out the detailed analysis of their regulations and processes adopted for the RPO compliance monitoring and reporting. It is proposed that five to six states like Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, Madhya Pradesh, etc. will be selected in consultation with FOR technical committee of FOR for the study purpose. Subsequently, the Program will convert RPO web-tool developed for the state

of Rajasthan in to generic tool by incorporating the key learnings of the selected five states and submit the same to Forum of Regulators for further sharing with the 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.

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:

- Successfully completed the security audit of the RPO web tool;
- Held detailed discussions with RRECL and RISL for migration of web tool to the energy portal of government of Rajasthan;
- Demonstrated the key functionalities of RPO web tool to RRECL and took its sign off;
- Provided support to RISL in successful migration of web tool on the energy portal of Government of Rajasthan;
- Successfully migrated RPO web tool on energy portal of Government of Rajasthan;
- Initiated work on updating the help manual of RPO web tool;
- Provided training and hands on experience to RRECL and designated resource on key functionalities of RPO web tool;
- Continued to provide a designated resource to RRECL for managing the RPO-related activities.

Challenges/risks: The following challenges are anticipated:

- RRECL and RERC lack adequate and relevant experience in RPO-CMR design, planning and implementation.
- The Program suggested the structure, roles and responsibility of the RPO-CMR cell to RRECL which sent the proposal to DOE to constitute the RPO-CMR cell, but approval is still pending.

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 is 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. As suggested by USAID, a paper on the business models will be developed and published on the Solar Parks.

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

Objective: In year 4, the Program has 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 PV 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 PV 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 PV rooftop projects in the emerging regime of Net/Gross Metering and achievement of expanded solar PV 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 project will identify potential sites for development as solar PV rooftops and showcase the methodology to be adopted by the state for the proliferation of the solar PV rooftop program.

Brief description of activities undertaken so far:

- **Task I: Project Preparation**
  - Inception meeting with RRECL to share ideas about the information and ideas about the existing business models
  - Based on the preliminary commercial analysis, prepared a concept note based on the data provided by RRECL. The purpose of the concept note was to estimate the cost of generation from solar RTS and comparing with the benefits to the consumers. The outcomes were discussed in detail with RRECL officials and helped to analyze the minimum pay out to the RESCO by the consumer and also, the overall benefits to the consumers
  - Based on the inputs from the meetings Inception report was prepared, including-
    - Existing scenario of RTS in Rajasthan;
    - Existing provisions under State Solar Policy and State Solar Rooftop Regulations and their implications thereof;
    - Assessment of solar potential on a sample roof in Jaipur;
    - Analysis of self-owned and third-party owned business model options available to roof owners;
    - Commercial assessment of third party based RTS implementation model.
- **Task II: Analysis and Strategy- Due Diligence**
  - Regulatory Due-Diligence- Under the Program, Regulatory Due-Diligence report was prepared which included the following-
    - Analysis of existing provisions of the Net Metering Regulations, such as– allowable capacity linked to sanctioned/connected load of consumer, capacity at Distribution Transformer, applicable tariff for energy accounting and settlement, applicable charges and losses, etc.;
    - Recommendations based on best practices followed in other states of India that leads to successful implementation of RTS;
    - Other enabling provisions that can accelerate RTS capacity addition in state, such as- Group metering, virtual metering, applicability of electricity duty and other cess, introduction of RTS service charge, etc.
  - Commercial Due-Diligence- As part of the Program, report on Commercial Due-Diligence was prepared which encompassed the following-
    - Identification of the available business models for implementation of RTS projects in the state. This included- Self-owned model, System rental based third party model and Tariff based third party model;
    - Assessment of the commercial viability (cost-benefit analysis) under each applicable model from the perspective of the involved stakeholders. This involved- total cost for the implementation of the project, total benefit to the consumer or the roof space owners, arrangement of payments to be made to the third party, if applicable, overall project viability from the perspective of both project developer and roof space owner.
  - Site visit- The Program had a meeting with MNIT, Jaipur and discussed the implementation aspects of the Solar RTS. The Program conducted the site visits to the MNIT campus to understand the arrangement and technical feasibility. Based on the visit to the campus, a Site Assessment Report was prepared which included the following-

        - Solar Resource- Global solar radiation, Sun path and tilt, RTS system orientation, climatic factors etc.;
        - Infrastructural parameters- rooftop area, infrastructure strength, site accessibility, water availability, module soiling, RTS system protection;
        - Grid connectivity and availability- Utility connections, 11kV & LT network/cables, distribution transformers, metering arrangement, protection devices etc.
    - Technical Due-Diligence- Based on the inputs from the Site Assessment Report, the Technical Due Diligence Report will be prepared.

- **Task III: Manage and Structure**
    - Business Model and Structure- Based on the regulatory and commercial due-diligence, the risk matrix was prepared including the following-
        - Issues, potential risks and their impact
        - Appropriate risk mitigating strategies to reduce to completely mitigate the risk
        - Mechanism to appropriately share risks among the stakeholders.
        - Different options like Service Contract, Management Contracts, Lease Contract, Concession/ Franchisee, Joint Venture etc. will be also be analyzed
    - Draft Bid Documents- Based on the discussion with RRECL and inputs from bidding documents at central and state level as case studies, draft bidding documents for bidding out 5MW of RTS capacity in the state of Rajasthan has been prepared for RRECL. Further, the Program has also drafted the bidding document for the RTS bidding by MNIT.
- **Task IV: Design and Evaluation**
    - Bid process completion- Meetings and discussions will be carried out with RRECL, JVVNL and other stakeholders to assess the required amendments in the bid documents. Required support will be provided to set up the Data Room, which will facilitate bidders to access bidding related information. The bidding strategy in consultation with RRECL and JVVNL will be decided. The selection criteria will also be decided and finalized based on consultation with RRECL and JVVNL. The final bid documents will be floated to invite bids
    - Bids technical and financial evaluation- Based on the identified criteria and parameters to evaluate bids, bid evaluation report will be prepared to select the successful bidder.

Scale-up Strategy Report for Rajasthan Cities- The findings of the project will be discussed with RRECL to develop a strategy for scaling the city wide RTS projects in Rajasthan. The Scale-up Strategy Report for Rajasthan Cities will be prepared.

Status of Work-plan activities and deliverables*:*

S. No	Activities	Status
I	**Project Preparation**	

S. No	Activities	Status
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, IRR, ROE	Completed
C	*Technical Due Diligence***-** Impact assessment and associated risks of key technical parameters on project viability	Ongoing
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	Ongoing
B	*Bids technical and financial evaluation***-** Opening of bids and evaluation of technical and financial proposals of eligible and qualified bids	To be undertaken
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	To be undertaken

Brief description of activities this quarter:

Task II: Analysis and Strategy – Due-Diligence

- **Technical Due-Diligence**:
    - The Program conducted site visits to MNIT campus to capture the details of the site and assessed different parameters to prepare Technical Due Diligence Report. These parameters are- Shadow analysis, RTS system yield prediction, plant performance monitoring. This also included technical risks, grid interconnection issues and metering issues.
    - The objective of this report is to estimate the system performance, assessing and validating technical issues and risk associated with the system to achieve optimum performance with the existing electrical infrastructure for the evacuation of power from the upcoming RTS Projects with defined system capacities and meeting all the safety standards.
    - The Program has prepared the draft Technical Due Diligence Report and will finalise before March 31, 2017.

Task III: Manage and Structure

- **Draft version of bid documents for RRECL**
    - Based on the discussion with RRECL, the Program has prepared and submitted the draft bid documents to RRECL.
    -
- **Notice Inviting Tender (NIT) issued by RRECL**
    - Upon approval of the bid documents from Finance Department, Government of Rajasthan, the NIT was issued by RRECL, inviting bids from the prospective bidders for implementation of the RTS projects.
- **Pre-bid meeting**
    - The Program conducted a pre bid meeting on January 06, 2017 to address the concern of the prospective bidders. The key concerns were further discussed with MD, RRECL.
- **Issuance of revised bid document**
    - Based on the concerns raised by the bidders, RRECL has modified the document and issued revised bid document. Initially, the last date to submit the bids was February 28th, 2017, which was extended to March 08th, 2017 through a corrigendum. Further, RRECL has issued another corrigendum to extend the bid submission deadline to March 22nd, 2017.

Challenges/risks: It was verbally informed by RRECL that only two bids are received so far. Thus, RRECL has extended the date for bid submission expecting more participation. As the bid document does not have the provision for deemed generation and terminal payments by government rooftop owners the response has been a bit lukewarm thus far from the prospective bidder. As per RRECL officials, the model of implementation may be changed to capex model in place of RESCO, if the response is not appropriate.

The team had prepared bid documents and submitted to MNIT for implementation of 600kW solar rooftop projects within the MNIT campus. Through the recent developments, the team

has been informed that MNIT is considering allocation of the capacity under the Solar Energy Corporation of India (SECI)'s route, which poses uncertainty on the support to MNIT under this program.

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—as potential partners with 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 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:*
    - The Program is also providing support to IOCL and 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 TA provided to IOCL during Year 3 and Year 4 is summarized below :

> 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.

- **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 the Solar Energy Corporation of India (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 &solar energy project, bringing cost efficiencies in energy management, providing consultancy business in wind and solar sector, develop energy efficiency projects for Indian Railways and power procurement and its management.
- REMCL has received a mandate to support Indian Railways in deploying renewable energy of 1 GW capacity till 2022. REMCL also aims to develop RE projects as an Independent Power Producer to supply electricity to the consumers other than Indian Railways. Regarding same, it is seeking TA from the Program. 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 will assist 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 alongwith 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 by the end of 2016:

- 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.

A Strategy will be developed for REMCL to procure RE from solar and wind to optimize the cost of procurement and to meet the RPO obligations.

Status of Work-plan activities and deliverables: In Year 3 and Year 4, 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 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 4 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.

In year 5, the Program will continue the implementation support of 50 MW and 100 MW or any future rooftop solar PV power programs up to 250 MW. The key activities planned are as follows:

- 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.

- Prepare Request for Proposal (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 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 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.

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 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.

In Year 5, the Program :

- will support 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

S.No	Activities	Status
G	Facilitation of stakeholder consultations	Completed
H	Implementation support at RFQ and RFP stage	Ongoing
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	Ongoing
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 OMC for 800 stations for IR under CAPEX model	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 has prepared the standard documents by itself
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	Ongoing
D	Customization of Model Bid Documents for 100 MW rooftop solar PV power project to incorporate rooftop above 25 kWp	Ongoing

S.No	Activities	Status
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	TBD
d	Report on financial attractiveness of sites	TBD
e	Report providing techno-commercial assessment report of selected site(s)	TBD
F	Report on required approvals and statutory clearances.	TBD

Brief description of activities this quarter:

IR*:*

- Continued to support IR with implementing 50 MW solar rooftop for which the Program assisted IR develop tender documents and carryout bidding.
- Continued to support IR with subsequent steps of implementing 100 MW for which the Program assisted IR develop tender documents and carryout bidding.
- Supported IR to prepare note on revisions needed in tender documents for 100 MW rooftop based on the feedback received from the project developers during the pre-bid conference.
    - Post-closing of tender, carried out analyses of the tender and assisted IR strategize re-tendering of sites for which no tenders have been received.
    - Based on the strategy, Program have identified sites with 100 KWp and above capacities, aggregating 25 MWp for re-tendering
    - IR issued Letters of Award for a cumulative capacity of 25 MW.
- Supported IR carryout stakeholder consultation meeting for CESE/CEGE of zonal railways.
- Analysis of rooftop above 25 kWp from Zonal Railways (who did not bid earlier) as a part of the remaining 100 MW tender to be re-floated with a capacity of 52 MW.
- Drafting RFP, EPC and O&M agreements for 4 / 5 MW solar rooftop projects, under CAPEX model.

IOCL: No specific activity was undertaken during this quarter

REMCL

- Analysis of capacities above 25 kWp in zonal areas which received no bids/areas dropped out, under 100MW bid of REMCL. .
- Incorporated all approved amendments in the RFP, RFQ and PPA, issued by REMCL after successful stakeholder consultation of bidders.
- Assisted REMCL, managing the centralized procurement of the 100 MW Solar Rooftop Power on behalf of Indian Railways, to create the framework for a single one time centralized bid.

- Supported in responding the queries of the solar project developers during the pre-bid conference

Challenges/Risks: IOCL Solar Park MOU signing between IOCL and MPUVNL has been delayed for the past 4 months

The data available at the centralized information system of Railways is not sufficient to conduct the study to develop the RE procurement strategy. The study will be conducted based on certain assumptions which need to be confirmed by REMCL.

The go ahead letter on the wind support is delayed from IR on the receipt of which REMC can also issue the request for support to PACE-D TA.

Support Required from USAID: Urgent support requested from USAID in co-coordinating a high level meeting with IOCL to understand the bottlenecks and select an alternative site (if required) in Madhya Pradesh for the Solar Park.

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 pumping 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 T&D 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/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 pumping 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:**
In Year 3 and 4, 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.
- 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 130 out of 256 solar PV pumps (capacity of these pumps is around 1 MW).

In Year 5, the Program will provide support for monitoring the performance of the Surya Raitha Pilot if requested by BESCOM.

A shared service model for solar irrigation in Bihar:

In Year 3 and 4, 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.

In Year 5, 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 pumping 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
D	Inputs in the technical specifications of SPV IP sets and controls	Completed

S.No.	Activities	Status
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
C	Finalization of costs and technical specifications	Completed

S.No.	Activities	Status
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 pilot is currently under execution and 130 pumps have been installed and the remaining pumps are expected to be commissioned before end of 2016.

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: The Program's assistance will lead to the following

- 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
- 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	March 2017
C	Development of Business Requirement Document	March 2017
D	Development of Design Interface With Banks, Utilities and SNAs	April 2017
E	Development of Software Requirements Specification and Webhosting Requirement Document	April 2017
F	Development of Transaction Portal	March-June 2017
G	User Acceptance Testing	July 2017
H	Support in Security Audit and Necessary Modifications	July –August 2017
I	Preparation of Manual of the Tool	August 2017
J	Organization of Training Program on Tool for Capacity Buildings of BESCOM, Banks and SNAs	September 2017

Brief description of activities this quarter:

- Undertook comparative analysis of existing solar rooftop portals developed by state and central level agencies to understand the key functionalities;
- Identified major stakeholders involved in the process of solar rooftop development and deployment in the State;
- Developed a draft concept note on solar rooftop transaction portal highlighting the key functionalities, major stakeholders and possible transaction/interaction between them;

- Shared draft concept note with BESCOM and sought initial consent to collaborate on development of SRTP;

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 to explore/extend 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 such as Gujarat, Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka, 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.

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	April 2017
e	Development of Generic RPO Compliance Tool	April 2017
f	Submission of Training Manual	April 2017
g	Meeting/Presentation to Technical Committee of FOR	May 2017
h	Outreach and Demonstration of Key Functionalities of Webtool to FOR and selected five/six States	June – July 2017

Brief description of activities this quarter:

- Presented comparative analysis of RPO regulations and processes of six states and approach and scope for development of generic RPO webtool to the Technical Committee of FOR;
- Participated in 10th Meeting of Technical Committee of FOR held at Kolkata on January 20, 2017 and gave live demonstration of the web tool developed for Rajasthan;
- Suggested key regulatory interventions/measures to implement RPO web tool across the states;
- Acceptance of regulatory interventions/measures suggested by FOR and urged SERCs to initiate necessary changes /amendments in their respective RPO/ REC regulations;
- Initiated work on preparation of standard forms & formats for generic RPO web tool;
- Initiated work on development of generic RPO web tool;
- Initiated dialogue with GERC for the implementation of generic RPO web tool in Gujarat;

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:

During Year 2 and Year 3, 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.

In Year 4, the Program supported MNRE launch a pilot program for development of demonstration projects. The Program 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 Public Sector Units (PSUs)- REIL, IOCL and 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 Rajasthan Electronics and Instruments Limited (REIL) in preparation of Detailed Project Reports and Bid Process Management for PV-Diesel Hybrid with storage at Havelock and Neil islands in Andaman and Nicobar.

In Year 5, the Program will continue its assistance to the shortlisted agencies- REIL (Andaman), IOCL (Asaoti) and BHEL (Hyderabad) for finalizing and submitting the DPRto 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 designed and implemented on facilities • Development of detailed use case scenarios and terms of reference for technology solution providers • M&E Support	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 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	Ongoing
d	RFP Preparation	Completed
E	Report on the assistance extended to selected parties for pre-bid meetings and drafting responses on behalf of MNRE	Yet to start
F	DPR preparation for three (3) project proponents	Ongoing (for all the three projects). Site visits for REIL and IOCL completed

S.No	Activities	Status
G	RFP preparation for the selected projects	Ongoing
H	Report on the assistance provided to MNRE for evaluation of proposals	Yet to start
I	Bid Process Management Assistance to selected parties	April 2017
J	Report on M&E framework	Completed
K	Report on learnings from the entire technology demonstration process	April 2017
L	Report on policy recommendations and scale up plan	May 2017

Brief description of activities this quarter:

- Assisted all the three PSUs selected by MNRE for DPR preparation
- Completed the site visits for all the three projects (REIL, IOCL and BHEL) and final sites were selected.
- Developed initial technical specifications and shared with the three PSUs.
- Shred preliminary technical specifications with IOCL and BHEL.
- Worked towards the finalization of the technical specifications for tFinalized DPR and RFP and shared with REIL and awaiting their approval.
- DPR draft submitted to IOCL and received comments and incorporating the same in the DPR.
- Reviewed the DPR shared by BHEL and provided comments and awaiting financial details from them.
- he projects
- Worked towards the preparation and finalization of the RFP for the PSUs. It will be submitted to MNRE for review in April 2017

Challenges/risks*:* No specific challenge envisaged as of now.

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: In Year2, the Program's activities were focused on building on Year 1 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 Year 3 and Year 4 is provided below :

- **Off-Grid Fund**: The Program provided TA to 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 are 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 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 referred as IDF-MF; whereas an IDF formed as a company is a NBFC, referred as IDF-NBFC. IIFCL plans to launch Series III close ended, privately placed IDF-MF of INR1,000 Crores (app USD 160 Mn) 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 Rs.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. The Program 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 the 30th of June, 2016 in London and the Program participated in this event alongwith prospective Indian investors.

In Year 5, the Program will continue to work on Green Bonds and organize a concluding Workshop to share the experience in working with Indian Green Bonds Issuers during May 2017.

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

S.No	Activities	Status
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	On request from TCG
F	Presentations to potential Investors	After (e)
G	Stakeholder Event	After (f)
H	Review of Documentation for formation of Anchor Charter, Fund Structure (financial and legal)	On request from TCG
I	Develop Standard Operation Procedures and Operational policies/structure of the fund	On request from TCG
J	Submission of White Paper on Lessons Learned	After launch of Off-Grid Fund
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 between IREDA /TCCL/other FIs and International Investors and International Financing Institutions	MOU with IIFCL signed; MOUs shared with IREDA, Yes Bank and PFS for Signing
F	Secure in-principle approval for launch of Green Bonds from at least one of the four institutions: IREDA, IIFCL, 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 Coilation event	Completed
g.3	Journey report	Ongoing

S.No	Activities	Status
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	May 2017)
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 CSR funds will be routed	Dropped
H	Hand holding support	Dropped
I	Dissemination Strategy Paper	Dropped

Brief description of activities this quarter: The Program drafted the Table of Contents for the Green Bonds Journey Paper to capture all the activities undertaken so far.

Challenges/risks: The success of the proposed mechanisms depends completely on the buy-in of the partners. For Green Bonds, the hedging costs for Euro and Green Bonds and discernible yield benefits of a green issue v/s. vanilla bond remain a key challenge. Although there are a few examples (Export Import Bank of India, Axis Bank and NTPC) where green bond issuers have seen small yield benefits of issuing Green Bonds, we should wait for a large sample size to make any conclusions of the yield benefits. Further, there are delays due to slow movement by FI's on signing the MOU despite finalizing the scope of assistance required by them.

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 will 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: During Year 2 and Year 3, 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 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 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 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 will finalize and release 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
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:

The TNA report was finalized and will be uploaded on PACE-D website.

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:

- Received approval from National Skill Development Corporation (NSDC) for the Qualification Packs (QPs) and National Occupational Standards (NOS) for training Grid Engineers, Entrepreneurs and Bankers developed by the Program for Skill Council for Green Jobs.
- USAID reviewed the final report developed and provided comments for final submission during January 2017

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:

In Year 3 and Year 4 the Program designed and launched a five day training program for budding entrepreneurs in this sector. The five day training program was first conducted at Gurgaon with NISE and the GJSC in May 2016 and the second one was organized in July 2016 at Pune. This training program provided a thorough grounding to present 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 Program being oversubscribed by two to three times.

In Year 5, 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

S.No	Activities	Status
B	Development of power point presentations for 22 training sessions	Completed
C	Packaging of power point presentations for all training sessions	Draft Completed
D	Development of Handbook for Entrepreneurs	Draft 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 the proposed 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:

In Year 4 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.

In Year 5, the Program will complete the training program modules and learners' manual and organize 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	Ongoing
C	Packaging of power point presentations for all training sessions	Ongoing
D	Development of Handbook for Bankers	Ongoing
E	Development of Trainer's Manual	Ongoing
F	Development of QPs and NOS	Completed
G	Organization of one TOT Program	Completed

Brief description of activities this quarter:

- Completed the presentations for the training of Bankers
- Completed the Learners Handbook for Bankers Training Program
- Organized one TOT for PNB Trainers :
    - The Punjab National Bank (PNB), in partnership with the U.S. Agency for International Development (USAID), launched the first Training of Trainers (TOT) program on March 27-28, 2017 at the PNB's Central Staff College in Delhi.
    - The TOT focused on building the capacity of PNB trainers who can further train PNB loan officers to evaluate and finance solar rooftop projects. This is expected to mobilize finance for solar rooftop projects and facilitate the

Government of India in achieving its target of 40 Gigawatts (GW) of solar rooftop by 2022, as a part of its wider goal of 100 GW under the Jawaharlal Nehru National Solar Mission.

- Nearly 25 trainers from various PNB Training Centres (Central Staff College, Regional Staff College, Zonal Training Centres, and IT Training Centre) were trained on various aspects of solar rooftop over the two days training program.
- The trainees also got an opportunity to visit a solar rooftop project owned by the Centre for the Study of Developing Societies.

During the next quarter, the Program will be organizing similar TOT for State Bank of India. and will be discussing with PNB and SBI for organizing training programs for the loan officers.

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

The Program is designing innovative policies and programs to wide-scale deployment of clean energy technologies.

In year 3 and Year 4, 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.

In Year 5, the Program aims to bring 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 at regular interval. 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 for Year 5:

Sr. No.	Activities	Status
1	Preparation of Concept Note, Draft Agenda and List of Invitees	May 2017
2	Completion of Management of Invitations and Coordination for Participations	June 2017
3	Preparation of Presentation for the Knowledge Sharing Workshop	June 2017
4	Preparation of Workshop Proceedings Report	July 2017

Brief description of activities this quarter: No 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 1 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 for Year 5:

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	April 2017
3	Preparation of Orientation & Travel Advisory PPT	April 2017
4	Organization of Study Tour	May 2017

5	Report on Visit	June 2017

Brief description of activities this quarter: Concept note was finalized and submitted to MNRE for approval.

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

Support required from USAID: Request USAID to discuss with MNRE for a timely approval for initiating the preparation for the training program.

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 and partnership with the Ministry of New and Renewable Energy 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. During year-5, 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 for Year 5:

Sr. No.	Activities	Status
1	Preparation of Concept Note, Draft Agenda and List of Invitees	July 2017
2	Coordination for Participation and preparation of Study	August 2017

	Tour Guide book	
3	Preparation of Orientation & Travel Advisory PPT	September 2017
4	Organization of Study Tour	September 2017
5	Report on Visit	October 2017

Brief description of activities this quarter: No 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.

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:

- Five 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: In Year 3 and Year 4, 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

In Year 5, the Program will continue to work on the above areas and also finalize the policy paper and manual besides the activities related to productization.

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	Training hours provided target completed
i	Pilot implementation	Ongoing
II	**TA Component 2: Financing Micro-Grids based Clean Energy Services**	
a	Identification and shortlisting of potential MFI partners	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**	
a	Preparation of a report highlighting experiences related to new implementation models and impacts on end users	Ongoing

S.No.	Activities	Status
b	Preparation of best practices manual for energy lending	Ongoing
c	Preparation of a paper for inputs for policy on microfinance for clean energy deployment	Ongoing
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 MFI RE Network	Ongoing
c	Investor Roundtables	Completed - 5 investor roundtables Investment leveraged target completed
d	Partnerships between MFI & Investors	Ongoing
VI	**TA Component 6: Outreach and Communication**	
a	Outreach and Communication program	Ongoing
b	Informal Microfinance and Energy Network	Ongoing
c	Case Studies	Ongoing
d	Webinars	Ongoing
e	Two Filmlets	Ongoing

Brief description of activities this quarter:

- Facilitated the sale of 12,414[15] clean energy products in the reporting quarter taking the total tally of clean energy products sold through MFIs to 272,296, across nine Indian states, with 100% women loan clients.

[15] As of February 28, 2017.

- Leveraged USD 414,000[16] in loans disbursed and cash sales in the reporting quarter taking the total figure of funds leveraged in this segment to USD 9.5 million.
- ESAF :
    - Conducted a workshop to support development of business/expansion planning for 2017 – 2020, including strategic advice to senior management and assistance on designing and implementing market research surveys.
    - Supported development of a standard term sheet for the ESAF partnership model.
    - Facilitated opportunities for ESAF to present the partnership model to MFIs at sector events.
- Sarala :
    - Conducted a meeting at Sarala to review the ongoing energy lending program.
    - Initiated planning of an exposure visit for Sarala to learn from leading energy microfinance institutions and product companies in Bangladesh, to enable Sarala to better strategize about diversifying energy product offerings and to expand its energy portfolio.
- Saija :
    - Conducted a review meeting with the senior management of Saija.
    - Held planning meetings on the launch of the agent model and of integrating solar irrigation pumps to the product mix.
    - Designed, developed and piloted a mobile App-based reporting system.
- Vayam :
    - Vayam launched the second microgrid in Gaya, Bihar. The 7kw solar microgrid supplies electricity to 33 households and powers a 5HP irrigation pump.
- MSF :
    - Changed the target location for the planned installation of solar pump-based microgrids from tribal areas to peri-urban areas, after farmers in the tribal areas backed out from the project due to the extension of government subsidies for pumps.
- SV Creditline :
    - Conducted a meeting with CEO and decided to re-start a pilot with a new product and new locations.
    - Supported the team in preparing for the re-launch of the pilot, including advising on negotiations with product company. The pilot will start in April.
- Swayamshree :
    - MFI continued selling solar products though sales were low due to demonetization.

- Policy Paper

[16] As of February 28, 2017.

    - Submitted the outline of the paper.
    - Completed the secondary research.
    - Identified and scheduled interviews with policy makers and sector experts.

- Investment
    - Continued interactions with potential investors to explain PACE-D and introduce MFI partners.
    - Prepared concept notes on investor roadshows.

- Knowledge Products
    - Finalized the Saija case study.
    - Finalized the Sarala case study.
    - Developed the webinar PPT and logistics plan for the first webinar.
    - Prepared RFP and evaluated proposals from production agencies for the filmlets.
    - Started the preparation for the second round of Customer Satisfaction phone surveys.
- Training
    - Designed the framework and questionnaires for Training Effectiveness Assessment.

Challenges/risks: Some partners have been so successful with their energy lending programs that they are now thinking about reaching out to non-clients. MSP has identified a model through which the partners can service non-clients (e.g. ESAF aggregator model and Sarala Village Level Entrepreneur (VLE) model where they can use their existing clients as sales agents). These models are not common in the MFI space and as such it presents both a challenge as well as an opportunity. Several MFI partners have not been able to fully focus on their energy lending programs due to other factors.

All partners have been focused on year end close out so activities in March were slower than in previous months.

Demonetization has had a negative impact on the sale of clean energy products. Several MFIs have been forced to focus on core MFI operations instead of expanding energy lending.

ESAF launched the ESAF Small Finance Bank in March and has been occupied with transitioning into a bank most of this quarter. It is anticipated that once these distractions pass, more focus will be given to the energy program.

Support required from USAID: It would be helpful to have USAID support in identifying and engaging the relevant policy makers to explain the role of MFIs in promoting energy lending.

Other Activities

New Scope of Work: 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 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 states and 15 utilities, and train 5,000 utility engineers and 1,000 entrepreneurs. MNRE has committed about $0.9 million to cover the cost of trainings. USAID and MNRE had identified Maharastra, Uttar Pradesh, Assam, Punjab, Haryana, Andhra Pradesh, Telangana and West Bengal as the potential states support under this activity[17].

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 Program carried out the following activities during the reporting period :

- Visited State of Maharashtra for kick-off meeting and made presentation on the proposed Technical Assistance under the new scope of work;
- Met Nodal Officer, MEDA and identified/short listed activities for providing technical assistance to Government of Maharashtra;
- Supported MVVNL in finalization of the interconnection framework;
- Reviewed draft policy and regulations of West Bengal and submitted comments/suggestions on the same to Government of West Bengal;
- Reviewed draft policy of Assam and submitted comments/suggestions on the same to Government of Assam;
- Developed draft interconnection framework and submitted the same to Haryana, West Bengal and Assam;

[17] Actual states will depend on the willingness of states to receive the technical assistance under this project.

- Developed note on regulatory interventions requirement and submitted the same to the Government of Uttar Pradesh;
- White paper on RTSPV accepted by the Government of West Bengal;
- Received confirmation from HERC for organization of stakeholder consultation on regulatory interventions and identification of innovative business models for large scale deployment of solar rooftop;
- Initiated development of White Paper for Maharashtra for Solar Rooftop Implementation;

Task 2: Training and Capacity Building of Key Actors:

- Discussed with MNRE and finalized the training implementation strategy for training 5,000 Utility Engineers and 1,000 Entrepreneurs
- Assisted MNRE's Solar Rooftop Team in issuing the letters to the Training Organizations seeking their consent to deliver training programs
- Followed up with Training Organizations for receiving their Expression of Interests for organizing Training Programs for Utilities and Entrepreneurs
- Updated MNRE on the Training Program implementation and provided the Terms of Reference for organizing the Steering Committee for Solar Rooftop Training Program Implementation
- Initiated discussions with Skill Council for Green Jobs for developing the overall training implementation framework and the curriculum for the training of trainers.

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 16

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. 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:

- ECBC 2017
- NZEB for Indian Railways station more Energy Efficient
- NZEB brochures for Raising Awareness & Showcasing Technologies
- EESL Super-efficient Air-Conditioner Program

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

Activities under this task were dropped after discussion with USAID.

4. PROPOSED EVENTS AND TRAININGS DURING NEXT QUARTER

LIST OF KNOWLEDGE SHARING AND OUTREACH EVENTS

Event	Proposed City	Proposed Date
Roundtable on Energy Access – Policy for MFI's Inclusion	New Delhi	April 2017
Stakeholder consultation for NSGM Institutional Framework	New Delhi	May 2017
Launch of Rajasthan RPO Tool	Jaipur	May 2017
ECBC 2017 Launch	New Delhi	May 2017
Green Bonds Event and Journey Paper	TBD	May 2017
WHU Compendium and Policy Paper release	New Delhi	May 2017
Solar Rooftop Implementation in Madhya Pradesh	Bhopal	May 2017
US Study Tour on RE Training	US	May 2017
Microfinance Support Program – Showcase	Manila	June 2017

LIST OF TRAINING PROGRAMS

Event	Proposed City	Proposed Date
Smart Grid Training to TSECL Utility Officials on M&V and Workshop on IT Guidelines Developed	Tripura	April 2017
TOT for SBI Trainers – Solar Rooftop Evaluation	New Delhi	April2017
Assam Workshop on Solar Rooftop	Guwahati	May 2017
TOT for NPTI - Utility Engineers – Solar Rooftop	TBD	May 2017

5. PROJECT MANAGEMENT

CONTRACTUAL ISSUES

The Program received the communication from USAID seeking clarifications on the proposal submitted for implementing new scope of work to strengthen enabling ecosystem for the uptake of solar PV rooftop projects in selected states. The Program submitted the clarifications to USAID.

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 during the reporting quarter.

S.No	Reporting Requirement	Delivery Date as per contract	Status
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 during the reporting quarter.
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
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
10.	Annual Progress Report	30 calendar days after the end of the year.	Year 4 Annual Progress Report (July 2015-June 2016) submitted on October 8, 2016.
11.	Annual Program Review	As may be requested annually.	Completed during the period October – December 2016-.

S.No	Reporting Requirement	Delivery Date as per contract	Status
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 4 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. Ripu Bhanjan Singh, Monitoring and Evaluation Specialist resigned in February 2017.
- Mr. Alok Piri will join as replacement to Mr. Ripu Bhanjan Singh from April 10, 2017.
- Ms Kakoli Guha, Office Manager resigned in March 2017.

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