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MIDTERM PERFORMANCE EVALUATION

THE PARTNERSHIP TO ADVANCE CLEAN ENERGY – DEPLOYMENT (PACE-D) TECHNICAL ASSISTANCE PROGRAM

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COVER PHOTO

Launch of the Training Manual on Energy Efficiency Financing, June 1-3 2015 in Mumbai, India. The USAID PACE-D TA Program, in collaboration with the Bureau of Energy Efficiency (BEE) and the Indian Banks' Association, organized a workshop for training of trainers on energy efficiency financing.

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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TABLE OF CONTENTS

Acronyms.....	5
Executive Summary	8
Evaluation Purpose and Approach.....	8
Key Audiences and Use of the Evaluation	8
Program Background	9
Evaluation Methods and Limitations.....	9
Key Findings and Conclusions	9
Core Recommendations	12
Evaluation Purpose and Questions.....	15
Evaluation Purpose and approach.....	15
Audience and Users of Evaluation	15
Program Background	16
Program Overview and Objectives	16
Methodology and Data Limitations	19
Evaluation Team	19
Evaluation Approach and Process.....	20
Data Limitations	22
Findings and Conclusions.....	24
Evaluation Question 1	24
Evaluation Question 2	42
Evaluation Question 3	51
Recommendations	60
Recommendations for the Remaining Period of Performance	60
Strategic and Longer-Term Recommendations.....	62
Annexes	68
Annex I – Statement of Work.....	68
Annex II – PACE-D TA Implementation Team	76
Annex III – Data Collection Protocols	83
Annex IV – List of Key Informants	89
Annex V – Documents Reviewed.....	91
Annex VI – Data Collection Schedule	95
Annex VII – Indicator Results and additional outputs	97

Annex VIII – Partner Organizations	99
Annex IX – Capacity Building and Training Activities.....	103
Annex X – Case Studies	107
Annex XI – India Renewable Energy Targets.....	109
Annex XII – Pilot Case Studies	110
Annex XIII –Institutional Strengthening	113
Annex XIV – Clean Energy Finance Data	119

FIGURES

Figure 1: Core Recommendations.....	13
Figure 2: PACE Program Model	17
Figure 3: PACE-D TA Program Overview.....	18
Figure 4: Evaluation Process.....	20
Figure 5: Data Analysis and Synthesis	22
Figure 6: Recommendations for PACE-D TA Remaining POP.....	60
Figure 7: Example Theory of Change for PACE-D TA.....	67

TABLES

Table 1: Institutional Strengthening Findings.....	26
Table 2: Clean Energy Finance Findings.....	31
Table 3 : Capacity Building Findings	35
Table 4: Goal and Purpose Indicator	37
Table 5: Expenditures and Achievements per CLIN.....	37
Table 6: Performance of CLIN 1 and 2	39
Table 7: Qualitative Cost Effectiveness Findings	40
Table 8: PACE-D TA Progress Against Priority Indicators	44
Table 9: EE Findings.....	45
Table 10: RE Findings	46
Table 11: Senior Program Management Team.....	54

ACRONYMS

ACORE	American Council of Renewable Energy
AEEE	Alliance for an Energy Efficient Economy
AWP	Annual Work Plan
BEE	Bureau of Energy Efficiency
BESCOM	Bangalore Electricity Supply Company Limited
CenPEEP	Center for Power Efficiency & Environment Protection
CDCS	Country Development Cooperation Strategy
CEAP	Corporate Energy Audit Program
CERC	Central Electricity Regulatory Commission
CETC	Continuing Education and Training Centre
CF	Clean Fossil
CII	Confederation of Indian Industry
CLEEO	Clean Energy and Environment Office
CLIN	Contract Line Item Number
COP	Chief of Party
CREDA	Chhattisgarh Renewable Energy Development Agency
CSR	Corporate Social Responsibility
DRUM	Distribution Reforms Upgrades & Management
DEEP	Domestic Energy Efficiency Program
DESL	Development Environergy Services Limited
DISCOM	Distribution Company
DO	Development Objective
DOE	United States Department of Energy
DOC	United States Department of Commerce
DOS	United States Department of State
DRE-CFR	Decentralized Renewable Energy–Community Fund
DSM	Demand Side Management
ECBC	Energy Conservation Building Code
ECO	Energy Conservation and Commercialization Project
EDS	Environmental Design Solutions Pvt., Ltd.
EE	Energy Efficiency
EEO	Energy Efficiency Obligation
EESL	Energy Efficiency Services, Ltd.
EPRI	Electric Power Research Institute
ET	Evaluation Team
EVI	Emergent Ventures India Pvt., Ltd.
FI	Financial Institutions
GCC	Global Climate Change (Bureau)
GHG	Greenhouse Gas
GOI	Government of India
HAREDA	Haryana Renewable Energy Development Agency
HVAC	Heating, Ventilation, and Air Conditioning
HERC	Haryana Electricity Regulatory Commission
HRD	Human Resources Development
IAMCL	IIFCL Asset Management Company Ltd.
IIFCL	Indian Infrastructure Financial Company, Ltd.

IOCL	Indian Oil Corporation Ltd.
IP	Implementing Partner
IREF	Indian Renewable Energy Federation
IREDA	Indian Renewable Energy Development Agency
ISGTF	India Smart Grid Task Force
JVVNL	Jaipur Vidyut Vitran Nigam Ltd.
KERC	Karnataka Electricity Regulatory Commission
KI	Key Informants
KII	Key Informant Interview
KP	Key Personnel
KREDL	Karnataka Renewable Energy Development
M&E	Monitoring and Evaluation
MFI	Micro Finance Institutions
MNRE	Ministry of New and Renewable Energy
MOP	Ministry of Power
MOU	Memorandum of Understanding
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPUVNL	Madhya Pradesh Urja Vikas Nigam Ltd
MSP	Microfinance Support Program
MW	Mega Watt
NBFC	Non-Banking Financial Company
NGO	Non-Governmental Organization
NISE	National Institute of Solar Energy
NMEEE	National Mission on Enhanced Energy Efficiency
NSGM	National Smart Grid Mission
NTPC	National Thermal Power Corporation Ltd.(former name)
NZEB	Net Zero Energy Building
OES/EGC	Bureau of Oceans and International Environmental and Scientific Affairs, Office of
PACE	Partnership to Advance Clean Energy
PACE-D TA	Partnership to Advance Clean Energy – Deployment Technical Assistance Program
PACE-R	Partnership to Advance Clean Energy – Research Program
PAT	Perform, Achieve, & Trade
PEACE	Partnership to Advance Clean Energy – Off-Grid Energy Access Program
PGCIL	Power Grid Corporation of India, Ltd.
POP	Period of Performance
PMP	Performance Management Plan
PMU	Program Management Unit
PPTS	Panipat Thermal Power Plant
PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
PSL	priority sector lending
PV	Photovoltaic
RBI	Reserve Bank of India
RE	Renewable Energy
RERC	Rajasthan Electricity Regulatory Commission
RESCO	Renewable Energy Service Company
RFP	Request for Proposal
RRECL	Rajasthan Renewable Energy Corporation Ltd.
SDA	State Designated Agency
SETNET	Solar Energy Training Network

SI	Social Impact
SOW	Statement of Work
SVCL	SV Credit Company
TA	Technical Assistance
TCCL	Tata Cleantech Capital Limited
TCG	The Climate Group
TO	Task Orders
TOC	Theory of Change
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USCS	United States Commercial Service
USD	United States Dollar
USG	United States Government
Vayam BASIX	Vayam Renewable Limited Bhartiya Samruddhi Investments and Consulting Services
VCFEE	Venture Capital Fund for Energy Efficiency
WHU	Waste Heat Utilization

EXECUTIVE SUMMARY

EVALUATION PURPOSE AND APPROACH

The purpose of this midterm performance evaluation is to conduct a full and independent review of the Partnership to Advance Clean Energy – Deployment Technical Assistance Program (PACE-D TA) program activities and results from June 2012 through September 2015. This evaluation was conducted 3.5 years into implementation of this five-year program.

The evaluation identified the results during this time period, assessed implementation issues that need to be modified in the remaining period of performance, and provided specific recommendations for both the final year of the program and the United States Agency for International Development (USAID) strategic planning beyond the end of PACE-D TA. Specifically, the evaluation addressed the following questions:

1. How effective has the PACE-D TA program been in achieving results?
 - 1.1. How effective has the program's technical assistance approach been in institutional strengthening, capacity building, and increasing access to finance for clean energy deployment?
 - 1.2. How effective has the PACE-D TA program been in achieving results considering the resources expended?
 - 1.3. How has participant training under United States Government (USG) supported PACE-D TA Program built capacity of partner institutions, including capacity of women members, to enhance market deployment of clean energy technologies?
2. How effective and efficient has the program been so far in supporting the development outcome of accelerating India's transition to low emissions energy secure economy?
 - 2.1. What is the likelihood of achieving the expected results under each Contract Line Item Number (CLIN)?
 - 2.2. How successful was the implementation of CLIN 3 (which concluded in October 31, 2014) and how sustainable are these efforts?
 - 2.3. How sustainable and scalable different pilots proposed under the program are, considering the progress and remaining timeline?
3. How effective is program management?
 - 3.1. How effective is the prime contractor in managing sub-contractors, and what are the levels of ownership and commitment to results among the sub-contractors?
 - 3.2. How effective are PACE-D TA planning, management/accountability, and monitoring structures and processes?

KEY AUDIENCES AND USE OF THE EVALUATION

The primary intended user of this evaluation is USAID/India, particularly the Clean Energy and Environment Office (CLEEO) and Mission management. USAID/India plans to use this evaluation, to the extent possible, to understand PACE-D TA progress and relevant adjustments that need to be made towards the conclusion of the program as well as for the next phase of programmatic planning. The recommendations for the final year of the program and the reflections on results monitoring, sustainability, and scalability are intended for the implementing partner and the implementation team. It is the evaluator's sincere hope that the bilateral partners, the Indian Government's Ministry of Power (MOP) and Ministry of New and Renewable Energy (MNRE), and premier institutions dealing with energy efficiency and clean energy in India will also consider these reflections relevant for further fruitful collaboration with relevant programmatic components in the Indian energy sector.

PROGRAM BACKGROUND

The PACE-D (TA) program is a key component from the Partnership to Advance Clean Energy (PACE) umbrella initiative launched in November 2009 as part of the high level United States (US) and India energy dialogue, with the aim to accelerate inclusive low carbon growth by supporting research and deployment of low carbon technologies. The full PACE program includes three components: Research (PACE-R), Deployment (PACE-D), and Off-Grid Energy Access (PEACE). PACE-D TA program, the subject of this midterm evaluation, is a \$19.5 million 5-year program, having commenced in June 2012 and due to conclude in May 2017.

It is important to note that in 2015, midway through the PACE-D TA program, the Government of India (GOI) revised its Renewable Energy (RE) targets from 34GW by 2015 to 175GW by 2022.¹ In particular, in June 2015 the Solar Scale-Up Plan of achieving 100GW by 2022 spurred potential for rapid deployment.

EVALUATION METHODS AND LIMITATIONS

The core evaluation team was made up of experts from both the clean energy sector and the evaluation field, with support from Social Impact's core team of technical and process specialists. The team employed a Utilization-Focused Evaluation approach, which is rooted in the principle that an evaluation must have practical utility to its intended users and provide evidence that can help improve performance. The evaluation process included three phases: 1) planning and desk review, 2) in-country data collection, and 3) data analysis and synthesis. USAID/India staff were involved in each of these phases in order to provide guidance and feedback.

In addition to an extensive document review, the primary data collection method used during fieldwork was key informant interviews (KIs). The evaluation team was able to meet with 85 key informants (KIs) from 39 different institutions from across the broad range of stakeholders affiliated with PACE-D TA. The evaluators also conducted site visits to four states in which core program activities took place, including Haryana, Karnataka, Madhya Pradesh, and Rajasthan.

The evaluation team sought whenever possible to mitigate potential data limitations and ensure fidelity to both data quality and the information needs of the end users. One key challenge was that this was intended to be a midterm performance evaluation, but it occurred more than 3.5 years into the 5-year program. The evaluation focus, therefore, shifted slightly towards providing more strategic-level insights for future programming rather than focusing primarily on recommendations for the remaining period of implementation. Further, given the relatively short timeframe for data collection and the significant number of individuals and institutions associated with PACE-D TA spread geographically across India and the US, the evaluators were unable to speak with all relevant KIs. Reliance on a convenience sample was deemed necessary, but means that valuable perspectives may have been missed.

KEY FINDINGS AND CONCLUSIONS

Question 1: How effective has the PACE-D TA program been in achieving results?

To answer this question, the evaluation team focused its efforts on responding to the following three sub-questions. Question 1.1 asks about the effectiveness of the technical assistance approach, specifically in reference to institutional strengthening, mobilizing clean energy finance, and capacity building. Question 1.2 opens up a larger line of inquiry about the efficiency of the program, asking whether

¹ Bureau of Information, Government of India (<http://pib.nic.in/newsite/mainpage.aspx>).

program results are commensurate with the resources expended to date. The final question, question 1.3, goes into further detail about the capacity building component of PACE-D TA and asks whether partner institutions (and female beneficiaries in particular) indeed have improved capacity to enhance market deployment of clean energy technologies as a result of engagement with the program.

Overall, the evaluation team concludes that the PACE-D TA program has exhibited effectiveness in its capacity building and training efforts, relative to the other technical assistance measures. While mobilization of clean energy finance shows less relative progress and effectiveness, institutional strengthening technical assistance has shown varied levels of effectiveness dependent on the organization in question. PACE-D TA has not met quantitative indicator goals for CLIN 1 and CLIN 2 at this stage, with respect to deployable installed capacity for energy efficiency (EE) and renewable energy (RE) Technologies and uptake of policies and programs. CLIN 1 has performed less well relative to CLIN 2 in terms of quantitative targets and cost effectiveness. Lastly, the evaluation team did not see evidence of significant effort made in respect to the training women “to enhance market deployment of clean energy technologies.” This appears to be due to lack of foresight and initiative in seeding special efforts in PACE-D TA for this task. The following paragraphs detail findings and conclusions per sub-question in more detail.

Institutional strengthening efforts varied in their level of effectiveness across organizations. Strengthening efforts were not conducted in a similar fashion across all recipient organizations, as detailed in this report. With the exception of solar policy, demand side management (DSM), and Smart Grid policies, other initiatives have been slow to result in institutional change at this stage of the project. Respondents attributed this pace to issues including staff turnover in the partners themselves and lack of a systematic hands-on approach from PACE-D TA toward bilateral partners.

PACE-D TA’s efforts to mobilize finance for clean energy initiatives have only been partially effective in achieving results. Substantial mobilization of finances takes place with the pickup of the deployable clean energy (EE and RE). While the efforts with MFIs such as the Capital Group, Baisix, and Vayam are slowly picking up, the degree of success for efforts with Financial Institutions (FI)/ Non-Banking Financial Companies (NBFCs) is slow for a variety of market-related reasons. Influence of external factors (prevailing macro-economic situation) and maturity of the clean energy markets influence the ultimate results of this PACE-D TA effort.

Capacity building and training efforts have contributed to the programmatic efforts of several implementing organizations. Most evident effectiveness of capacity building and training efforts relates to the solar roof top programs, National Smart Grid Mission (NSGM), and MFIs, which account for over 70 percent of the training efforts. These programs have strong backing-organizations to accelerate and sustain the momentum. This is further elaborated in the text and dedicated Annexes IX, XII, XIV, and XV.

Regarding Question 1.2, PACE-D TA resources deployed through September 2015 have not met the initial project goal and purpose indicators despite improvements in the enabling environment and several other attributes such as conceiving and supporting pilots by implementing partners with promising results. CLIN 1 is less cost-effective than CLIN 2, based on the high-level financial data and operational (qualitative data) findings noted in this report. CLIN 1 tasks are not performing as well as other CLINs for a variety of reasons, such as discontinuity of the project team on several tasks. PACE-D TA is currently requesting a reduction in target for CLIN 1 (while maintaining original targets for CLIN 2). If this revision is accepted, the results gap between both CLINs will widen. This is an important consideration and decision on desired results and the focus of the PACE-D TA in the final year of

operations, as EE is also an important factor in the enabling environment for clean energy deployment.

Lastly, regarding Question 1.3,² gender issues have not attracted significant attention in the PACE-D TA program thus far in a systematic way. Only women bankers and micro finance institutions were included in activities.

Question 2: How effective and efficient has the program been so far in supporting the development outcome of accelerating India's transition to low emissions energy secure economy?

PACE-D TA has been supporting the Indian enabling environment and leveraging the knowledge and expertise from within the US and India to work towards target outcomes in individual capacity, institutional strengthening and access to finance that will serve as building blocks for India's development outcome goals. As of September 2015, the PACE-D TA program achieved 0.421³ million metric tons of its CO₂e target (39 percent), 2.3 megawatts (MW) of its RE target (0.02 percent), significant heat rate improvement in two thermal power plants (exceeding the program target), and 0 MW of its EE target (0 percent).⁴ However, these indicators are only partially representative of the program results, as the program also contributed towards policy and regulatory changes which contribute to the enabling environment for future progress towards results and greater developments towards India's lower emissions economy, as discussed in more detail in this report. The program is also implementing multiple pilots that show key sustainability and scalability factors, foreshadowing their potential for success in the long run. Some examples of successful pilots are TA for solar policy in IOCL, which is also supporting the solar rooftop pilots. Similarly with Indian Railways, TA for a solar rooftop pilot has provided confidence to establish very ambitious implementation targets for railway stations with solar rooftops nationwide, as well as solar photovoltaic (PV) installation on company-owned land. Further examples of pilot case studies can be found in Annex XII.

However, the evaluation team found a number of challenges in PACE-D TA execution that have limited programmatic effectiveness at this level to date (further detailed under Question 3). Key informant interviews (KII) and analysis reflect that the program has many components that are trying to deliver results at same time. However, due to balancing work between all components, focusing on ongoing enabling environment, and meeting stakeholders' current requirements and priorities, the PACE-D TA has struggled to achieve results. The evaluation team concludes that, while PACE-D TA shows below-target progress against program targets, the program could achieve project targets for key indicators by 2017. For sustainability of the program and fast progress towards the achievement of as many results as possible in remaining timeframe, many KIs mentioned the following as critical: engagement of potential stakeholders and efficient decision-making; limiting turnover in counter parties, central/state governments, Nexant, and USAID; commitment to consistent follow-up and efficient synergy between Nexant and potential stakeholders; and management and ownership of critical issues.

Question 3: How effective is program management?

Many of the program stakeholders viewed the PACE-D TA program model and management structure as both appropriate and necessary, in that it sought to leverage the best knowledge and expertise from

² Because the answer to question 1.1 gives some reflection on the capacity building component through the lens of partner institutions, the response in question 1.3 focuses on the gender component.

³ Heat improvement: Chandrapur FY14: 7,286 tCO₂ & FY15: 123,861 tCO₂; Panipat FY14: 86,078 tCO₂; NTPC Sipat FY15: 202,453 tCO₂ and BESCOM Solar rooftop FY15: 1,496 tCO₂

⁴ Note that for the purpose of this overall summary, the team focused on progress towards the core RE, EE, CF, and GHG emissions reduction targets only, as other performance indicators are covered above in Q1. For more information about achieved results against set indicators targets refer **Annex VII**.

within the US and India to work towards outcomes in individual capacity, institutional strengthening, and access to finance that will serve as building blocks for India's growing clean energy sector. However, the evaluation team found that there are a number of challenges in program execution that have limited programmatic effectiveness to date. These are not necessarily critiques of the management model per se, but a reflection of the incredible complexity of a program trying to do many tasks with relatively limited resources.

The core strength of the management structure was that it enabled PACE-D TA to create a roster of technical experts from across the key technical areas/CLINs and the cross-cutting practice areas of institutional strengthening, capacity building, and clean energy finance (though some gaps remain, as described earlier in this report). Given the wide variety of stakeholders and activities, it appears to have been beneficial that a single institution was able to provide oversight and guidance with a perspective towards the program as a whole. However, this created tension between Nexant's management and technical responsibilities, with the more functional and administrative roles receiving fewer resources than were needed. An interest in cost-effectiveness appears to also be the reason that relatively little time was set aside for direct engagement between TA recipients and US-based technical experts, a key pillar of the program model.

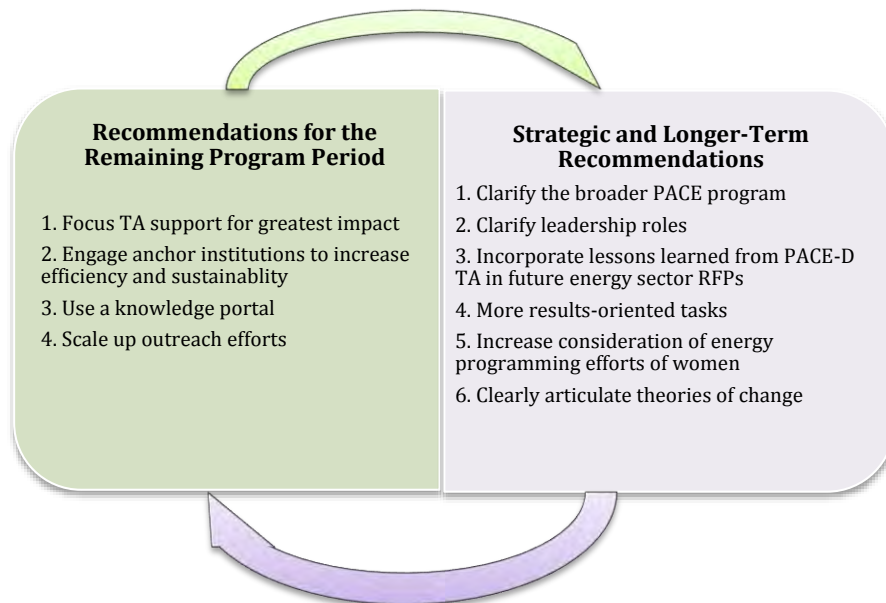
While sub-contractors across the board do appear committed to producing the program deliverables, the periodic nature of their engagement at times proved insufficient to generate meaningful, sustainable outcomes that will serve as the basis for longer-term results like reductions in greenhouse gas (GHG) emissions. USAID and its implementation team would do well to use the final year of implementation to reflect on the model and identify opportunities to build momentum for ongoing progress, such as further engaging and empowering key stakeholders (such as local anchor institutions or US-based technical experts), as well as considering how to more systematically monitor the program's effect on the enabling environment in order to inform more strategic decision making going forward.

CORE RECOMMENDATIONS

The core recommendations are divided between recommendations towards the remainder of the PACE-D TA program, addressed to the implementing partner and USAID, and strategic and long-term recommendations, addressed to USAID.

The figure below lists the recommendations for both periods and represents their interrelatedness.

Figure 1: Core Recommendations



For the **remaining period of PACE-D TA**, the ET identified four core areas for USAID and the implementation team to consider.

1. Given that the program covers a wide area of initiatives, in the final year of implementation it is important to identify specific initiatives which will benefit from focused program support and, therefore, achieve significant results. One recommendation detailed in the recommendations section is providing technical support to BEE as they work with other relevant actors towards the finalization of the Energy Conservation Building Code (ECBC) 2015, building capacity of state actors and DISCOMs towards the implementation of DSM, as well as the engagement of bilateral partners for identifying focus areas for institutional strengthening.
2. For sustainability, further engaging anchor institutions may be supplemented with development of detailed tripartite agreements with relevant State Actors and DISCOMs, implementation frameworks for solar rooftops and standardized training toolkits, which may be replicated in other States.
3. Regarding the existing PACE-D TA website, the ET recommends further development of a knowledge portal which will be beneficial for all the PACE-D partners and stakeholders, and may also greatly contribute to sustainability of ongoing initiatives.
4. In order to ensure that the programmatic efforts are well received and understood, it is recommended that the TA scale up ongoing outreach efforts with aim to enhance ownership of the TA by the relevant local actors.

For the **strategic and long-term recommendations**, the ET has identified six areas for USAID to consider.

1. USAID should clarify the broader PACE program.
2. USAID should clarify the leadership of PACE.
3. It is strategically important to integrate the lessons learned from PACE-D TA for future Requests for Proposal (RFPs) such as the establishment of a formal Program Management Unit (PMU) with consistent participation for the bilateral partners. Based on learning, USAID should

also ensure that future energy projects of this nature clearly establish intermediate results that are tracked in a performance monitoring system. PACE-D TA can provide valuable insight regarding feasible and useful outcome and process indicators in future programming.

4. Furthering to the deployment task, a shift towards more results oriented tasks in energy projects of this nature which build upon the existing market forces is recommended, in consideration that the enabling environment for clean energy deployment is furthering its market readiness indicators by numerous actors in India.
5. Involvement of women in energy initiatives (both as beneficiaries, stakeholders, and implementers) is also considered to be a strategic and long-term commitment for energy projects, especially in rural areas and with microfinance institutions.
6. Finally, USAID should ensure that all energy projects in the future have a clear theory of change that is linked to verifiable performance indicators (and intermediate outcomes, as noted in a previous recommendation). A theory of change model using the PACE-D TA process is presented in this report.

EVALUATION PURPOSE AND QUESTIONS

EVALUATION PURPOSE AND APPROACH

The objective of this midterm performance evaluation was to conduct a full and independent review of the Partnership to Advance Clean Energy – Deployment, Technical Assistance Program (PACE-D TA) program activities and results, from June 2012 to September 2015. The evaluation identified the results achieved by September 2015, assessed implementation issues that need to be modified in the remaining period of performance, and provided specific recommendations for the final year of the program and United States Agency for International Development (USAID) strategic planning beyond the end of PACE-D TA in this report. This evaluation was conducted 3.5 years into implementation of this five-year program.

The evaluation team employed a Utilization-Focused Evaluation approach. The evaluation process and product are designed around informing clear and specific decisions so as to increase the likelihood that evaluation findings are used to improve performance. In employing this approach, the evaluation team engaged the primary intended users early in the process to guide the development of the evaluation focus and methods, as well as throughout the evaluation. Below are the key questions that this evaluation addressed:

1. How effective has the PACE-D TA program been in achieving results?
 - 1.1. How effective has the program's technical assistance approach been in institutional strengthening, capacity building, and increasing access to finance for clean energy deployment?
 - 1.2. How effective has the PACE-D TA program been in achieving results considering the resources expended?
 - 1.3. How has participant training under United States Government (USG) supported PACE-D TA Program built capacity of partner institutions, including capacity of women members, to enhance market deployment of clean energy technologies?
2. How effective and efficient has the program been so far in supporting the development outcome of accelerating India's transition to low emissions energy secure economy?
 - 2.1. What is the likelihood of achieving the expected results under each Contract Line Item Number (CLIN)?
 - 2.2. How successful was the implementation of CLIN 3 (which concluded in October 31, 2014) and how sustainable are these efforts?
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3. How effective is program management?
 - 3.1. How effective is the prime contractor in managing sub-contractors, and what are the levels of ownership and commitment to results among the sub-contractors?
 - 3.2. How effective are PACE-D TA planning, management/accountability, and monitoring structures and processes?

AUDIENCE AND USERS OF EVALUATION

The primary intended user of this evaluation is USAID/India, particularly the Clean Energy and Environment Office (CLEEO), Program Office, and Mission management. CLEEO will use findings and recommendations concerning the performance of this program in order to plan for the remaining period of the program, determine the use of the technical assistance (TA) approach used in PACE-D TA program for future programs, and assess the effectiveness of implementation model which used a

number of local contractors as key implementers. USAID/India Program Office and Mission management will use this evaluation to understand the progress achieved to-date towards the Mission's broader development goals related to the energy sector and plan strategically for future programming.

The Global Climate Change Bureau (GCC) of USAID/Washington will use these findings to review the program performance and inform other U.S. Government agencies involved in the larger Partnership to Advance Clean Energy (PACE) initiatives.

Other intended users are the Indian Government's Ministry of Power (MOP) and Ministry of New and Renewable Energy (MNRE) and the leading institutions dealing with energy efficiency and clean energy in India.

Given the involvement of the Implementing Partner, Nexant, and the other 25 individuals and institutions that make up the implementation team (refer to **Annex II** for a full list of institutions and individuals involved in the program) in both program development and execution, the findings will be used in the final year of implementation to improve overall progress towards results, as well as to help identify and support the scalability and sustainability of key program components.

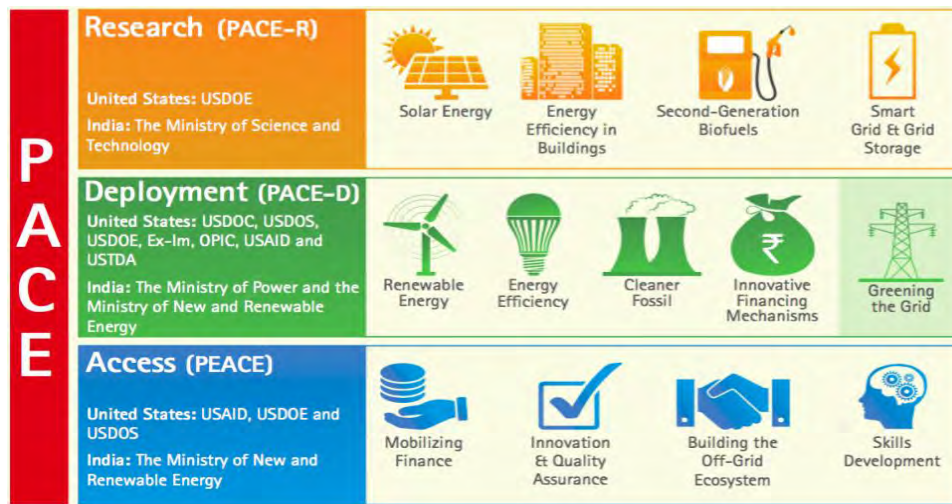
Additional external audiences may include further local Indian institutions and service-providers, other international donors, the private sector, and other USAID Missions worldwide.

PROGRAM BACKGROUND

PROGRAM OVERVIEW AND OBJECTIVES

The Partnership to Advance Clean Energy (PACE) is the flagship program on clean energy between the United States (US) and India, commenced by a Memorandum of Understanding on November 24, 2009 to enhance cooperation on energy security, energy efficiency, clean energy, and climate change. PACE seeks to accelerate inclusive, low-carbon growth by supporting research and deployment of clean energy technologies and relevant policies, including three key components combining the efforts of government and non-government stakeholders on both the US and Indian sides: Research (PACE-R), Deployment (PACE-D), and Off-Grid Energy Access (PEACE). These initiatives are presented in **Figure 2** below.

Figure 2: PACE Program Model⁵



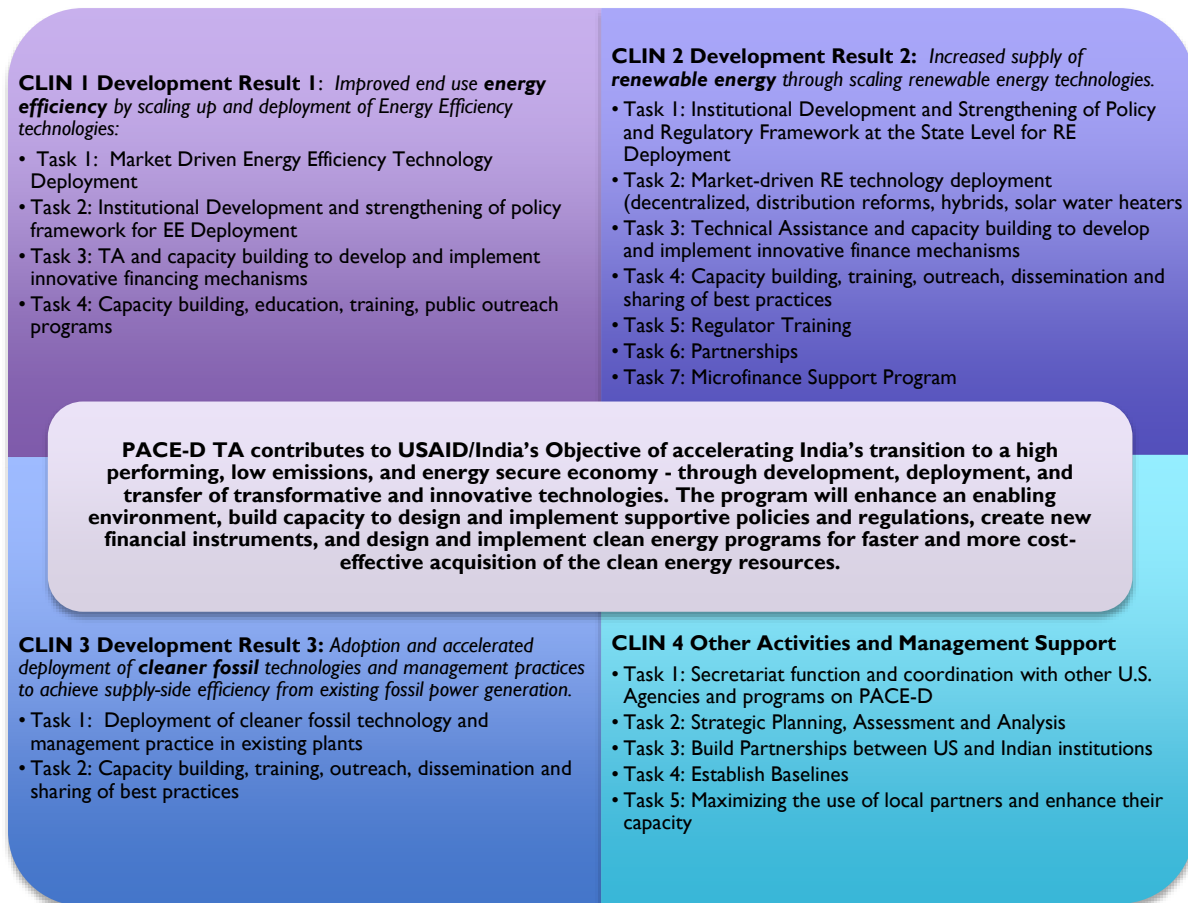
USAID has the lead in the design, planning, preparation and implementation of the PACE-D TA program in consultation with the Government of India (GOI) and is supported by members of the USG Interagency in New Delhi and Washington, DC. PACE-D TA houses the Secretariat for the entire PACE initiative, which plays a key role in coordinating and reporting on the program as a whole.

The PACE-D TA Program (July 2012 - June 2017) focuses on deployment of energy efficiency (EE), renewable energy (RE), and cleaner fossil (CF) technologies, with cross-cutting activities on institutional strengthening, capacity building and training, and clean energy finance. The program works with policy makers, regulators, state agencies, private companies, investors, clean energy associations, and other stakeholders to create an enabling environment for increasing the uptake of energy efficient and renewable energy technologies in India. The PACE-D TA program falls under Development Objective (DO) 2 of USAID/India's Country Development Cooperation Strategy (CDCS) that aims to "accelerate India's transition to a high performing, low emissions and energy scarce economy." **Figure 3** shows the overall program objectives and key program development components according to CLINs and tasks:

PACE is a collaborative effort combining efforts of US and Indian agencies – whereas PACE-D TA is a USAID-led program in consultation with GOI and USG Interagency teams, with Nexant serving as a prime implementer coordinating the Secretariat function for the whole program: organizing meetings and updates, and assembling, updating and hosting the PACE-D.com website.

⁵ Graphic provided by implementing partner, Nexant.

Figure 3: PACE-D TA Program Overview



PROGRAM IMPLEMENTERS AND STAKEHOLDERS

USAID's Implementing Partner (IP) for PACE-D TA is Nexant, Inc. along with a team of over 25 subcontractors (). The program is implemented at the national level and in the states of Rajasthan and Karnataka (both EE and RE components), Madhya Pradesh (RE component), and Haryana (EE component).

The GOI Bilateral Partners are the MOP and MNRE. The project partners on the national level include the Bureau of Energy Efficiency (BEE), Indian Smart Grid Task Force, Central Electricity Authority, National Thermal Power Corporation, Solar Energy Corporation of India, National Institute of Solar Energy, Indian Renewable Energy Development Agency, and state energy departments/nodal agencies in the four states: Haryana Renewable Energy Development Agency (HAREDA), Madhya Pradesh Urja Nigam Vikas Limited (MPUNVL), Rajasthan Renewable Energy Corporation (RREC), and Karnataka Renewable Energy Development (KREDL). This also includes Bangalore Electricity Supply Company (BESCOM), Uttar Haryana Bijli Vitran Nigam, Tripura State Electricity Corporation as well as the respective energy departments of Karnataka, Haryana and Rajasthan. Other Indian partners include: Indian Oil, Indian Railways, The Climate Group, TATA Cleantech Capital, Nalada University, and other public and private institutions across India. The program's microfinance component engages seven microfinance institutions (MFIs): Evangelical Social Action Forum, Mahashakti Foundation, Saija, Sarala, SV Creditline Private Limited (SVCL), Swayamshree Micro Credit Services, and Vayam Renewable.

PROGRAM MODEL AND MEASUREMENT

The PACE-D TA program model is based on a consultative approach towards the identified bilateral and state partner organizations. The initial consultations were led by USAID through a network of high caliber sub-contractors with proven track records in identified tasks. The program model developed out of these consultations includes a variety of complementary technical assistance (TA) approaches, including policy development, institutional strengthening, capacity building, increasing access to finance, pilots, and building partnerships. Consultations continue throughout program implementation as part of regular, iterative planning processes that further engage counterparts within the key GOI partner institutions. To implement the program, USAID provides contractual obligations, guidance and feedback to Nexant. Nexant engages subcontractors to perform specific tasks as agreed upon with USAID and the bilateral partners and state agencies. For example, state coordinators were given task order contracts by Nexant to assist in the implementation of the deliverables as agreed with state actors in the annual action plans. Different subcontracting companies were given specific assignments based on their expertise.

The Program Advisory Committee (PAC) is led by the two line ministries independently (MNRE and MOP). Meetings occur approximately twice per year (though were intended to be more frequent), although there is some discontinuity due to administrative changes at the senior levels. These meetings provide a forum to update the line Ministries on project progress, get their consensus on work plans, and resolve issues between the USAID and the bilateral partners, as well as their various stakeholders.

The PACE-D TA outputs reflect different types of products and services including seminars, technical reports, policy documents, action plans, knowledge portals, study visits, and trainings directed towards a variety of program beneficiaries, many of whom are also considered program partners. The outcomes, which are aligned with the program's development results, are primarily measured by a set of indicators aimed at tracking long-term results such as the quantity of renewable energy (RE) installed, energy saved due to energy efficiency projects, heat rate improvements in targeted power plants, and cumulative reductions in greenhouse gas (GHG) emissions.

The PACE-D TA seeks to utilize components of policy and institutional strengthening, capacity building and training, outreach, and clean energy finance to improve the enabling environment for clean energy deployment in India. To conduct the midterm evaluation, and to assess the program Theory of Change, the team had to consider both the existing outputs and long-term results (as defined in the Performance Management Plan- PMP), and also examine more appropriate measures of intermediate results. The evaluation team notes that a lack of intermediate indicators to measure steps toward the achievement of these long-term goals somewhat limits the ability to discuss progress.

METHODOLOGY AND DATA LIMITATIONS

EVALUATION TEAM

The Evaluation Team Leader for this evaluation was **Ms. Melita Rogelj**, who has over 15 years of experience in Monitoring and Evaluation for sustainable energy projects. Ms. Rogelj was supported by highly-qualified local energy specialists, **Mr. Kailash Mahajan** and **Mr. Juned Khan**. The team also included an Evaluation Specialist, **Ms. Carrie Huisman**, who provided process expertise and quality assurance support during fieldwork. **Ms. Chusana Han**, Social Impact's Gender Specialist, guided the team on gender integration. **Ms. Amanda Stek** (Program Manager) and **Ms. Julia Benjamin** (Program Assistant) provided logistical and administrative support to the Evaluation Team, together with **Mr. Ash Pachauri**, Social Impact's (SI) local County Representative based in India. Lastly, **Mr. Richard Columbia** served as the Senior Technical Advisor for the evaluation, ensuring that quality standards

were met.

EVALUATION APPROACH AND PROCESS

The evaluation team employed a Utilization-Focused Evaluation approach (explained above) using qualitative data collection and analysis methods. The evaluation process included three phases, which are depicted here and described in detail below:

Figure 4: Evaluation Process



Phase One: Project Planning and Desk Review

Evaluation planning began prior to the start of data collection and was an iterative process throughout the fieldwork phase. The team conducted a series of internal coordination meetings to discuss logistics for fieldwork, draft the Evaluation Work Plan, and determine the division of roles and responsibilities for the duration of the evaluation. The Team Leader consulted with SI's Gender Specialist, who suggested that team members complete USAID's *Gender 101: Gender Equality* training course. Team members then participated in a series of conversations with USAID/India to respond to questions about the proposed technical approach and timing to ensure that the work plan was feasible. The team also clarified expectations with the client and discussed the intended use of the evaluation to ensure that the process would be responsive to the Mission's needs. The team made revisions to the proposed schedule as they finalized the work plan.

The desk review phase began prior to the team's arrival in India, though the team received a significant proportion of the core program documents only after the fieldwork began, resulting in concurrent primary and secondary data collection. Nexant provided nearly 700 documents to the evaluation team, over 70 percent of which were technical program deliverables. Given the high volume of documentation, the team reviewed in detail a small number, focusing particularly on contracts, contract modifications, and task orders (TOs) for Nexant and the sub-contractors; key program deliverables associated with each CLIN; quarterly and annual reports; Monitoring and Evaluation (M&E) plans; and general financial documentation. A list of documents reviewed can be found in **Annex V**.

- Bilateral Partners
- National Public Institutions
- State Agencies
- US Interagency
- Implementing Partner
- Sub-Contractors
- Local Program Partners
- External Stakeholders

Phase Two: Data Collection

Key Informant Interviews

The team relied upon semi-structured key informant interviews (KIs)⁶ for the vast majority of primary data collection, supplemented by information gathered from the desk review and direct observation. The team engaged key stakeholders from across the PACE-D TA program, the US

⁶ Interviews were typically conducted with one to four individuals from a given institution. While a structured interview has a rigorous set of questions, which does not allow one to divert from the formal lines of inquiry, a semi-structured interview is open, allowing new ideas to be brought up during the interview as a result of what the interviewee says. The semi-structured format enabled the team to tailor the interview questions to different project stakeholders.

Interagency, and external sector experts. In total, the team interviewed 85 key informants (13 women, 72 men) from 39 different institutions across the stakeholder groups listed in the text box.

The full list of respondents (listed by institution, rather than name and title for purposes of confidentiality) can be found in **Annex IV**, and the full evaluation schedule is listed in **Annex VI**. The interviews followed a semi-structured interview protocol and lasted between 45 and 90 minutes. Most interviews were conducted in person, although team members also interviewed nine KIs over the phone who were based either in the US or were outside of the sites selected for fieldwork. The team developed separate interview protocols for each stakeholder group, though these were contextualized and made more specific to each participating institution. The interview protocols can be found in **Annex III**.

Respondents were selected in coordination with USAID/India and Nexant. An initial list of institutions was compiled during the preparatory phase. The list was expanded and refined during the team's in-briefings in India. Most of the respondents were selected because they had direct and sustained engagement with the program.⁷ Team members also relied on snowball sampling and asked targeted respondents for suggestions for other program stakeholders who might be available to meet with the evaluation team. In total, 29 of the KIs were identified in this manner (and were not from the initial list of respondents compiled with USAID and Nexant). The resulting set of respondents largely reflects a non-probability convenience sample of program stakeholders that were available to meet with the evaluation team (refer to the data limitations section below for more comments on the sampling strategy).

Nexant provided introductions to representatives from the national public institutions, state agencies, sub-contractors, and other local program partners. When necessary, USAID/India staff facilitated communication with the GOI bilateral partners and members of the US Interagency. Given this assistance and the persistent follow-up of SI's in-country logistics team, the evaluation team was able to meet with nearly all of the key institutions identified in the sampling frame over the course of the fieldwork.

Site Visits

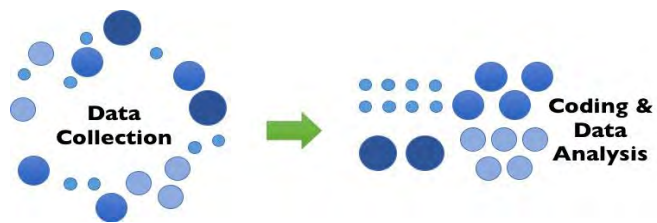
The team collected most of the evaluation data in and around New Delhi, as the majority of the program's key stakeholders are based in the capital. The team also traveled to four states that are host to program activities and pilots, including Haryana, Karnataka, Madhya Pradesh, and Rajasthan. These states and the targeted institutions were selected according to the nodal focus of PACE-D TA activities and based on guidance from USAID/India and Nexant. Sites and pilots were deliberately selected for inclusion in the evaluation even though they happen to be in different stages of implementation. In comparing these cases, the team assessed the success factors and the potential for scalability and replicability within the pilots. During the site visit in Bangalore, Karnataka, the team had a chance to see the implementation of the solar roof photovoltaic (PV) pilot and of the net metering policy. While in Jaipur, Rajasthan the evaluation team explored assistance to distribution companies (DISCOMs). Note that given the high volume of interviews around New Delhi, the field visits to each of the states were deliberately short; interviews and observations took place over one day in each state.

Phase Three: Data Analysis and Synthesis

⁷ The primary exceptions were some of the stakeholders from state agencies or the bilateral partner institutions. As a number of officials within these agencies changed positions over the course of the program, some of the KIs were relatively new to their posts and had only a limited understanding of PACE-D TA. Therefore, some of these conversations were more courtesy calls than detailed interviews.

The evaluation team worked to complete transcription and consolidate notes throughout the data collection period. The evaluators primarily utilized qualitative content analysis to assess each respondent's opinions and experience with the program. Team members engaged both in descriptive and interpretive analysis to identify key common themes and patterns across KIs' responses, as well as key differences across responses. The team members also relied on their significant expertise in the energy sector and understanding of previous programming in India to more deeply identify and investigate the factors that might influence or explain the findings. Key findings emerged from the themes occurring most often in the data, though the team also explored how strong deviations and discrepancies might reflect a more complete picture of the program, particularly given its complexity and wide range of stakeholders involved. This process allowed for generating both "horizontal" analysis (across main themes to create the big picture) and "vertical" analysis (in-depth understanding of the most important issues). The team also worked with key program stakeholders to verify and triangulate initial findings during the analysis phase. Team members compared data provided in program materials with that offered in KIs. Further, the evaluators took multiple opportunities to reality-test initial findings and conclusions with staff from both USAID/India and Nexant during the fieldwork. The evaluators held both a mid-brief and an out-brief session with USAID/India staff to solicit feedback and guidance.

Figure 5: Data Analysis and Synthesis



The team members also relied on their significant expertise in the energy sector and understanding of previous programming in India to more deeply identify and investigate the factors that might influence or explain the findings. Key findings emerged from the themes occurring most often in the data, though the team also explored how strong deviations and discrepancies might reflect a more complete picture of the program, particularly given its complexity and wide range of stakeholders involved. This process allowed for generating both "horizontal" analysis (across main themes to create the big picture) and "vertical" analysis (in-depth understanding of the most important issues). The team also worked with key program stakeholders to verify and triangulate initial findings during the analysis phase. Team members compared data provided in program materials with that offered in KIs. Further, the evaluators took multiple opportunities to reality-test initial findings and conclusions with staff from both USAID/India and Nexant during the fieldwork. The evaluators held both a mid-brief and an out-brief session with USAID/India staff to solicit feedback and guidance.

DATA LIMITATIONS

There were a number of aspects of the evaluation process that posed potential challenges to data access, reliability, and validity. The team sought wherever possible to mitigate these data limitations to both ensure the most accurate assessment of the program and maintain a focus on the evaluation's ultimate utility to its key users.

- There were delays in conducting the evaluation due in part to logistical and personnel constraints at SI. As a result, the intended midterm evaluation actually occurred 3.5 years into implementation of the five-year program, meaning that the evaluation may not be able to provide significant suggestions for course-corrections in the remaining year of activities before program close-out procedures begin.
- Much of the evaluation preparation and document review was only possible once the evaluation team was on the ground in New Delhi.⁸ Given the short timeframe for data collection and the high volume of program documents, team members found it difficult to review the documentation as deeply as would have been desired, particularly in order to gain a more detailed understanding of the stakeholders prior to delving into the interview process. Having a more consolidated set of findings from the desk review phase prior to arrival in New Delhi would have also enabled more effective data triangulation during fieldwork, though this was achieved by the team after return from India.
- The ET required assistance from the USAID and the implementing partner to identify a sampling frame (a list of stakeholders or potential respondents) and to establish contact with

⁸ This was in part due to the fact that two new team members were selected soon before the start of the fieldwork, but also because it took effort on the part of USAID and the IP to consolidate the full range of documentation eventually provided.

stakeholders that were of a senior-government level. While this had the benefit of narrowing down the list of stakeholders to those considered highest priority, the final set of KIs may not have been fully representative of all program stakeholders. The evaluation team implemented an additional snow ball sampling strategy to collect opinions and information from 29 beneficiaries or respondents not identified by USAID. While this situation could lead to bias, the evaluation team is confident that bias was mitigated by the triangulation of findings, as explained in the methodology section of the report above.⁹

- The data collection schedule was tight and only left time for the evaluators to meet with each KI or institution for a single interview.¹⁰ The team would have benefited from having the time and flexibility to follow up with some of the KIs a second time in person, particularly with members of the implementation team.
- The evaluation team at times had to split up for the sake of efficiency, including for the field visits.¹¹ Team members shared notes and had regular debriefs, though it is difficult to have the same depth of understanding of a stakeholder through secondhand information.
- The evaluation Statement of Work (SOW) and initial conversations between USAID/India and SI identified an interest in assessing the degree to which PACE-D TA's design, management, and results reflected gender considerations. The evaluation team had all interview protocols, plans, and reports reviewed by SI's Gender Specialist. The team also included gender-specific questions in interview protocols to collect any gender-related findings. However, few direct program stakeholders from within USAID or the implementation team are gender experts or were able to reflect deeply on important gender considerations related to the program (or the broader clean energy sector in India). Therefore, the evaluation cannot provide detailed findings related to the program's gender results.
- While the team was sure to reiterate its independence, some respondents may have still associated the evaluators with either USAID or PACE-D TA. This can result in a positive response bias on behalf of program partners and beneficiaries who want to increase the likelihood of follow-on funding or TA. However, the team did not feel as though this was a significant challenge, as many respondents were equally candid with their compliments and criticisms of the program.
- The evaluation team initially intended to conduct a web-hosted survey of capacity building participants as part of the evaluation design. However, the implementing partner had recently conducted similar research (Training Effectiveness Assessment), and so this data collection process was dropped from the methodology. Thus, the evaluators did not have the opportunity to solicit feedback directly from these stakeholders.

⁹ Of note, the evaluation team spoke with only half of all sub-contractors, none of the former Key Personnel (KP) who had left the IP's management team in the first three years of implementation, and very few senior-level GOI stakeholders with sustained engagement in the program. These perspectives (particularly with regards to the first 1.5-2 years of implementation) may not be fully captured in this report.

¹⁰ Note that the evaluators did visit a number of institutions multiple times, but typically for courtesy calls or to set up follow-up interviews with the proper stakeholders.

¹¹ In the first week, all four team members were present for the interviews in order to build common understanding of the program and the evaluation approach. Site visits in the four target states occurred in the second week, requiring that the team split in half in order to accommodate both the busy schedule and availability of respondents. The team continued to split into teams as needed to accommodate the large volume of meetings scheduled in the final week of data collection in New Delhi.

- The evaluation team approached the evaluation question related to cost effectiveness at a relatively high-level, as performing a thorough evaluation of cost effectiveness would have required reviewing more detailed financial information than the timing of the midterm evaluation would allow, as well as assessing the cost of alternative methods or programs for achieving the same results. The team could not measure cost effectiveness of training hours, institutional capacity building, pilots and other soft inputs in the absence of substantial cost and performance indicators.¹²

FINDINGS AND CONCLUSIONS

The evaluation team has addressed each key evaluation question and associated sub-questions in this section, with consideration to the methodology and data limitations. In answering each of these questions, the evaluation team relied on program reporting and M&E data, which was then verified whenever possible through KIs with USAID, the implementation team, and GOI stakeholders, as well as TA recipients themselves, including state agencies and various other public institutions. The evaluation team then integrated findings and conclusions towards actionable recommendations, which are elaborated in the recommendations section.

EVALUATION QUESTION 1: HOW EFFECTIVE HAS THE PACE-D TA PROGRAM BEEN IN ACHIEVING RESULTS?

This question is central to the entire evaluation, as it explores whether the overall PACE-D TA program model is an effective means of achieving the desired results and why. While a simple proposition in theory, this kind of analysis is challenging for a program with so many distinct components and stakeholders. As described above, the program strategy includes a variety of technical assistance types. In some documents, however, these “cross-cutting themes” include four areas – capacity building, institutional strengthening, clean energy finance, and outreach – whereas in other documents there are additional activity areas as well, including policy support, pilots, and partnerships. In order to levy an assessment on the program model as a whole, the evaluation team examined the key component pieces in as much detail as possible.

The evaluation team focused its efforts on responding to the following three sub-questions in order to answer evaluation question 1. Question 1.1 asks about the effectiveness of the technical assistance approach, specifically in reference to institutional strengthening, mobilizing clean energy finance, and capacity building, each of which are discussed in turn. Question 1.2 opens up a larger line of inquiry about the efficiency of the program, asking whether program results are commensurate with the resources expended to date. The final question, question 1.3, goes into further detail about the capacity building component of PACE-D TA and asks whether partner institutions (and female beneficiaries in particular) indeed have improved capacity to enhance market deployment of clean energy technologies as a result of engagement with the program. Because the answer to question 1.1 gives some reflection on the capacity building component through the lens of partner institutions, the response in question 1.3 focuses on the gender component of the question.

¹² During USAID review of this report, it became clear that USAID and the implementing partner would prefer to assess cost effectiveness of these aspects of the program. The evaluation team, then, recommends that PACE-D TA program M&E in future monitor and report on indices for comparing different tasks.

1.1 How Effective Has the Program's Technical Assistance Approach Been in Institutional Strengthening, Mobilizing Clean Energy Finance and Capacity Building Including Building the Capacity of the Partner Institutions for Clean Energy Deployment?

The evaluation team looked first to program reporting for evidence of TA affecting changes in the functioning of targeted institutions, the mobilization of finance, or the technical capacity of participating individuals. In addition to the findings presented in this section, a table has been provided in **Annex XIII** to further highlight the ET's assessment of institutional strengthening approaches and their effectiveness in consideration of a few important tasks.

There notably is a great deal of data available about program outputs, including important information about the delivery of TA services and the production of reports, manuals, policy documents, etc. Numerical figures about the leveraging of funds are similarly accessible and verifiable. Given that most program indicators are purely quantitative, it is relatively easy to gauge progress and identify areas of success or stagnation with regards to specific targets. **Annex VII** details progress against PACE-D TA indicators.

One of the most significant challenges in addressing this question, however, stems from the fact that the PACE-D TA program has relatively little qualitative or outcome-level data that speaks to changes in individual or institutional capacity among TA recipients. There is no systematic tracking of baseline status or progress markers towards defined results for these two key program components (e.g. through pre- and post-tests for training participants, or organizational capacity assessment frameworks for institutions).¹³ Filling this data gap fell out of the scope of this evaluation, so the team based its assessment on the best available data, both from document review and respondents.

For this sub-question, findings are detailed in tables so as to elucidate the results associated with relevant tasks or pilots under each TA area. Conclusions regarding the three types of technical assistance provided by PACE-D TA follow each table.

Institutional Strengthening

PACE-D TA sought to strengthen the following types of institutions: government organizations, state agencies, public utilities, catalytic partners, and implementing organizations. As detailed in **Table I** below (and in **Annex VIII and XIV**), the program used different types of TA toward this goal, including training, workshops, review of reports, and needs-based support specific to each institution. During data collection, USAID defined the Institutional Strengthening approach as including GAP analysis, state action plans, concept notes, prioritization of activities on annual basis, technical assessments/reports leading to next stages of work (storage), and engagement with partner institutions at senior management level and at the technical level. Most of the TA tasks were defined in the proposal stage, and project indicators were developed within a year of program kick off. The program used a consultative approach with all institutions, working collaboratively through the Program Advisory Committee (PAC) to ensure all work was directed toward the overall goal of deployment and achievement of set targets.

Observations regarding support provided to institutions are included in the **Table I** below. Because the program does not track outcome-level data that speaks to changes in individual or institutional capacity

¹³ The program includes a few sample/spot checks for individuals /groups to compare post training improvements, but nothing is completed in a systematic way, as far as the ET could determine.

among TA recipients, the evaluation team drew conclusions based on the findings presented below.¹⁴

Table 1: Institutional Strengthening Findings

Institutions	Institutional Strengthening Activities	Comments on Approach
Power Grid Corporation of India Limited	PACE-D provided TA to Indian Smart Grid Task Force; assisted with the knowledge transfer via a study mission; provided a few US experts toward the creation of intellectual capital including opinion papers, white papers, case studies; provided consistent support; and developed regulations for implementing the Smart Grid Vision and Roadmap. PACE-D TA supported the start of two pilots and provided training support for personnel technical workshops for state utilities and regulators.	This multi-faceted approach to providing institutional capacity strengthening (including study tours, US experts, regulatory development support, pilot support and training) to appears to the Power Grid Corporation of India Limited was noted by respondents to be effective. In fact, MoP is looking for additional TA support for the National Smart Grid Mission beyond the PACE-D TA project period.
Bureau of Energy Efficiency (BEE)	Energy Efficiency (EE) PACE-D TA is supported BEE with the technical update of the ECBC 2007. At the state level, the program is assisting BEE in ECBC implementation in Rajasthan by supporting the development of rules and regulations for ECBC compliance and building the capacity of the stakeholders. Additionally, the program envisages putting in place an accreditation (examination) scheme for certified building professionals for undertaking design and verification of ECBC compliant buildings. The program is also promoting the Near Zero Energy Buildings (NZEBs) through a pilot at Nalanda University, after signing a MoU with the project. The program has contributed to design and delivery of the NZEB knowledge portal and NZEB alliance. It has prepared a detailed report on market transformation strategy for Heating, Ventilation, and Air Conditioning (HVAC) technologies which has been disseminated through interactive workshops. EE Finance PACE-D TA provided TA experts to BEE on a range of other activities related to energy efficiency financing. These activities deal with the roll out of the Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and the Venture Capital Fund for Energy Efficiency (VCFEE), preparation of guidelines on EE	The approach used with BEE for building their capacity to independently build and manage energy efficiency program appears to have worked well based on program documents and respondent comments. The TA provided to BEE includes more innovative features than other PACE-D TA institutional strengthening initiatives (and in comparison to other partners' programs). The approach used by PACE-D TA with BEE for other tasks (EE Finance sub-tasks especially related to roll out of PRGFEE and VCFEE and PAT and Waste Heat Utilization Technologies) has been less effective in comparison to the approach detailed above for EE. Respondents noted that these efforts may not be as effective or sustainable (resulting in lasting institutional change) because of changes in BEE's senior decision-making level staff.

¹⁴ For more details on this statement, see the [Program Monitoring & Evaluation](#) section in response to evaluation question 3 below.

	financing, and preparation of a manual on training on EE financing for trainers. PACE-D TA, lastly, provided TA support to BEE for the components of Perform, Achieve, & Trade (PAT) Scheme and Waste Heat Utilization Technologies through concept papers, studies, and interactive workshops.	
Ministry of Renewable Energy And National Institute of Solar Energy (NISE)	PACE-D TA supports the national solar mission by supporting implementation in the targeted states. NISE has limited experience in establishing and sustaining a network of organizations for wide-scale training delivery, and so PACE-D TA provided pioneering support to Solar Energy Training Network (SETNET) which is gaining momentum (as noted by respondents). Regarding the solar rooftop program, PACE-D TA provided support to select training organizations and developed an operational strategy. A consultation workshop was organized with selected training organizations. The PACE-D TA program also participated in the Curriculum and Content Development team that designed two curricula. Further PACE-D TA support is being provided for Suryamitra initiatives related to the technicians for certification and skill development.	This approach was noted by respondents to be working well due to the positive and collaborative relationship between PACE-D TA and NISE. The efforts appear to be sustainable and scalable (resulting in eventual institutional change) thanks to the improved enabling environment due to national drive to speed up the solar roof top program.
National Thermal Power Corporation (NTPC)	PACE-D TA provides institutional strengthening support to NTPC as an anchor institution. Center for Power Efficiency & Environment Protection (CENPEEP) is an experienced organization catering to improvement of efficiency in thermal power generation. They actively work with US counterparts in demonstrative studies in two coal power plants and also their own Super critical power plant at Sipat for demonstrating software from US organizations.	Thanks to participative and collaborative work environment in the between PACE-D TA and NTPC, the approach has worked well according to respondents.
State designated agencies	PACE-D TA works with state designated agencies to implement the a) Karnataka Solar Energy policy, b) Rajasthan Net Metering Regulations, and c) several other programs. The program provided assistance to draft state action EE plans for Karnataka and Rajasthan; facilitate formation of the ECBC implementation; support the Task Force to facilitate the adoption of compliance and enforcement mechanisms in Rajasthan. The program also proposed the Karnataka RE Policy, Karnataka Hybrid Regulations, and Rajasthan Hybrid Regulations which are (as of this evaluation) still awaiting approval.	Respondents noted that this approach to institutional strengthening was not effective, as it did not enhance the pace of state programs. These agencies also receive TA support from other programs, meaning that the TA landscape is complex and “crowded”. Respondents also noted that the institutional strengthening efforts were not resulting in change because of local issues at the state levels.
HERC	PACE-D TA institutional strengthening with Haryana Electricity Regulatory Commission (HERC) resulted in the proposal and adoption of a regulation. The program is now partnering with the Commission and two distribution companies to provide technical	The approach to enhance the capacity of state regulator to actively participate in the process of generation of DSM proposals and follow up activities worked

	assistance for developing and implementing proposals. Energy Efficiency Services, Ltd. (EESL) is supporting state organizations (Discoms and HERC) in implementing domestic energy efficiency program capturing residential consumers.	well, respondents noted, as evidenced by the new regulation and follow-up activities.
Discoms	The PACE-D TA program developed a white paper that recommended a gross-metering regulation in Karnataka. The white paper was used by the Energy Department of Karnataka to propose the need for Karnataka Electricity Regulatory Commission (KERC) to adopt a gross metering regulation The PACE-D TA program also developed a policy paper that recommended net metering regulation. The policy paper was supported by a white paper. The white paper was used by distribution companies (JVVNL) to propose the need for Rajasthan Electricity Regulatory Commission (RERC) to adopt a net metering regulation. RERC framed and adopted the regulation which drew upon the outputs provided by the Program. Technical assistance and capacity building support was also provided by PACE-D TA for the following: developing interconnection framework of solar rooftops with the distribution grid; overall framework of processes and formats; identifying and developing the requisite standards for various components of solar PV system, inverters and meters; out-reach and community engagements through web-site and leaflets in addressing the procedural and technical issues; and organization of capacity building for state utilities and site managers/engineers.	This approach utilizes several TA activities jointly with one institution has worked well, as noted by respondents. They noted that this approach is mutually beneficial to the project team and state utilities that are new to the solar roof to program.
IOC, Indian Railways, and MFIs (Implementing Organizations)	PACE-D TA MOUs were established with MFIs (Arc Finance, The Capital, and Vayam) toward the joint goal of propagating clean energy finance. Joint efforts are also pursued by IOC and Indian Railways for implementing solar roof top programs.	KIIs revealed that TA is well received by these organizations. Respondents noted particular appreciation for the capability of the subcontractors and the very practical approach of trainings. They have seen improved capacity in their organizations in terms of engaging into a completely new field of endeavor, such as solar energy for Indian Railways. PACE-D TA provided them the needed confidence to step boldly into this field at a now accelerated pace (paraphrased from a respondent).
Indian Renewable Energy Federation (IREF) (Catalytic agency)	PACE-D TA support was provided to IREF for interacting with American Council of Renewable Energy (ACORE). Thus far, IREF has not moved forward beyond a study mission to the US, which was organized by ACORE. The expectations regarding TA	KII reveals that the partnership has been facing commitment constraints and is not able to meet the aspirations set in the TA.

	outcomes may have diverged, due to a very different enabling environment for clean technology deployment in US and India, several respondents noted. ACORE expressed readiness to continue engagement, while IREF leadership is unclear about their commitment for the future.	
Indian Heat to Power Alliance (Catalytic agency)	This Alliance is promoted as a part of the Clean Fossil Fuels (C3) task for promoting energy efficiency for coal-based thermal power plants. It is linked to CII-GBC (Hyderabad) and had taken part in a few pioneering capacity building activities in 2014 at the conclusion of CLIN 3 tasks.	KIs reveal that the partnership is not able to self-sustain without additional support beyond the TA which ended in Oct 2014. Respondents attributed this to a lack of resources.

Table 1 describes the use of various institutional strengthening strategies/approaches. PACE-D TA used a combination of approaches partnered with close engagement (and needs-based follow up) with each partner institution to ensure positive collaboration. Strengthening efforts were not conducted in a similar fashion across all recipient organizations or toward some agreed-on, similar goal (paired with needs-based, unique goals per agency/institution). In conclusion, institutional strengthening efforts varied in their level of effectiveness, according to respondents, across organizations listed in the table above. In some institutions, this multi-faceted approach to institutional strengthening worked well (and was based on the needs of that institution). Close coordination and PACE-D TA's consultative approach improved the uptake of skills and capacity within some government organizations. For BEE, however, the outcome of institutional strengthening support is mixed partly due to organizational issues at BEE affecting fructification of results for CLIN 1 tasks (such as PAT scheme and Waste Heat Technologies and EE Finance). KIs particularly from MOP (Smart Grid task force and Smart Grid Mission); NTPC (CLIN 3 task), MNRE and NISE, and Public Utilities mentioned increased capacity in their technical, policy and financing knowledge. Regarding implementing partners, the pilots for RE have progressed reasonably well thanks to the capacity building efforts for institutional strengthening. Implementing partners for the pilots for RE, including IOC and Indian Railways have progressed well, for example.

In others, however, the approach did not yield the desired results (strengthened institutions) due to issues like poor coordination with PACE-D TA (and the lack of a systematic hands-on approach from PACE-D TA toward bilateral partners), unsupportive enabling environment, transitional leadership/staff in partner institutions, lack of resources in partner institutions, and lack of commitment by the public agencies. Some respondents, particularly from BEE, commented that TA was not effective in their institution because there was no agreement on priorities, while many TA engagements commenced simultaneously.¹⁵ Regarding catalytic partners, institutional strengthening efforts were not found to be effective. KIs indicate that limited resources (physical and financial) and lack of efforts by mandate of PACE-D TA to fix the problems could be reasons for lack of results.

Mobilization of Clean Energy Finance

PACE-D TA worked with various organizations to deliver activities to increase clean energy finance in India. The PACE-D TA approach to increasing clean energy finance is presented in **Table 2**, by

¹⁵ This statement is referring to the areas under CLIN 1, addressing BEE and tasks related to Building Energy Efficiency (ECBC updates, ECBC Rajasthan, NZEB, and Accreditation of Professionals), EE Finance, State programs, Smart grid, and waste heat Policy. This statement is based on KII responses from BEE. USAID disagrees with this response from this BEE respondent, noting that all TA scopes are agreed to with MOP before implementation. BEE also leads its own directives and has control over priorities and implementation.

instrument used. The table depicts clean energy finance activities and comments on effectiveness by evaluation respondents.

Table 2: Clean Energy Finance Findings

Instruments	Anchor organization	Activities	Comments on the approach
Energy Efficiency Finance			
Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and Venture Capital for Energy Efficiency (VCFEE)	BEE	PRGFEE is a risk sharing mechanism to provide commercial banks with a partial coverage of risks involved in extending loans for EE projects. The VCFEE aims to leverage private venture investments in the EE sector by identifying the possible co-investment opportunities. These instruments are supported under National Mission on Enhanced Energy Efficiency (NMEEE) with the government budgetary support of 65 and 34 million USD. PACE-D TA soft support was directed to the market assessment and interactive discussions with the key actors.	Respondents noted that this approach to increasing energy efficiency finance was ineffective because it did not address barriers to the use of these instruments. A respondent noted frustration with PACE-D TA for being unable to provide a reputed Finance expert after disengaging Mr. Dalip Limaye, a resource person for BEE's EE Finance Tasks.
Corporate Energy Audit Program	Tata Cleantech Capital Limited (TCCL)- a Non-Financial Bank Company	PACE-D TA offers financing and advisory services to the interested TCCL customers for identifying viable EE opportunities through energy audit firms.	This TA has only been offered for a short period of time, so the evaluation team could not comment on the progress or sustainability of the approach (nor did respondents).
ESCO Project-domestic energy efficiency program (DEEP)	Energy Efficiency Services Limited program in Haryana	PACE-D TA is providing hand-holding support to the state agency HERC, and actively working with state Discoms for the upcoming DEEP.	Respondents noted that this instrument and the approach were effective and may also be sustainable. The DEEP program is being taken up in several states in ESCO mode with EESL support. In Haryana, thanks to PACE-D TA support, synergy between Discoms and the electricity regulator is likely to see results both in the short term and long term for sustenance of the program outcome beyond the project period.
Clean Energy Finance (Renewable Energy)			
Green Bonds	IIFCL Asset Management Company Ltd.	Green Bonds are standard fixed-income financial instruments (bonds) where the proceeds are exclusively utilized for financing climate change-related projects or	Despite significant buy-in and commitment from both USAID and IIFCL, hoped-for results from the MOU have not yet been realized. Respondents

		programs. Globally, Green Bonds have been growing exponentially since 2013. PACE-D TA has been working with a number of institutions such as Indian Renewable Energy Development Agency Limited (IREDA), PTC India Financial Services, YES Bank, and India Infrastructure Finance Company Ltd. (IIFCL) in building their capacity for the launch of Green Bonds through interactive meetings, concept papers, webinars, etc. IIFCL, a state-owned non-banking finance company, says it will float a mutual fund that would invest in green projects. A memorandum of understanding (MOU) was signed between USAID and IIFCL Asset Management Company Ltd. (IAMCL) to provide technical assistance to the latter for increasing investment in renewable energy sector in the country through Infrastructure Development Fund – Mutual Fund (IDF-MF) instrument.	also noted that capital market conditions are not conducive to the launch of this instrument.
Off Grid Fund–NBFC	The Climate Group (TCG)	PACE-D TA is assisting 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 a 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.	Respondents noted that this approach has worked well.
Decentralized Renewable Energy–Community Fund (DRE-CF):	Chhattisgarh Renewable Energy Development Agency (CREDA)	The DRE-CF will 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. PACE-D TA assisted CREDA in the design and development of the fund.	Respondents reported that this approach was not successful, as PACE-D TA did not encourage commitment and enthusiasm from potential investors. This was largely due to external factors, as the corporate sector did not respond to the initiative due to other priorities.

Risk rating of Solar roof top projects	Rating agencies, IREDA, FIs/banks/NFBCs	PACE-D TA mapped the policy and regulatory framework as well as the key technical requirements for the development of solar rooftop development projects. The program evaluated the risks associated with the solar rooftop business model and commercial contracting terms (PPA) by outlining the key issues related to the commercial contract between the buyer and the developer. A tool for risk rating of the roof top proposals had to be developed which has been tested over a series of live proposals and cross-checked by the four rating agencies. This comprehensive solar rooftop finance tool will assist FIs to evaluate and fund solar rooftop projects on a fast track.	This TA appears promising (based on program documents), though respondents noted that it was too early to comment on the progress against targets and potential for sustainability.
Renewable Energy Service Company (RESCO) Projects	Indian Railways	PACE-D TA facilitated Indian Railways in vetting the key technical, commercial, policy, and regulatory risks associated with solar rooftop power from RESCOs, allocate these risks to parties more suited to address it, structure commercial arrangements to procure power, define roles and responsibilities of key stakeholders, and develop formats and process for bidding.	The approach has worked well, respondents noted. It is a positive example for seeding the concept of RESCO.
PSU rooftop scheme	Indian Oil Corporation Limited (IOCL)	MNRE is providing a 15 percent subsidy to this public sector undertaking. PACE-D TA developed rapport with IOCL by assisting in the completion of MNRE forms for the allocation of a subsidy under the PSU rooftop scheme. The program mapped the critical policy and regulatory frameworks associated with rooftop solar across states as a part of the techno-financial feasibility reports for 5 MW solar PV generation across 3 refineries.	Respondents agreed that the approach was effective in generating a positive example of TA support for techno-financial feasibility in a large public sector undertaking.
Microfinance Institutions for Clean Energy Lending			
Clean energy lending portfolios	Short listed microfinance institutions (MFIs-	PACE-D TA promotes and helps to build partnerships between MFIs and renewable energy	Respondents noted that this approach was rewarding, and there is a gradual response of

	SVCL and Saija)	product/ technology suppliers. The program also builds the capacity of partner MFIs and technology suppliers to develop and expand clean energy product markets through improved service delivery and efficient after-sales service. PACE-D TA issued an expression of interest to more than 400 institutions to attract and establish partnerships with potential MFIs. Of the 400, thirteen MFIs expressed interest and eight were later shortlisted and selected based on pre-determined selection criteria. The program has since signed MOUs with two MFIs—SVCL and Saija—in March 2015. As part of the technical assistance to the MFIs, PACE-D TA conducted vision-building exercise sessions in February 2015 to develop business plans to accelerate clean energy lending.	the market.
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In addition to respondent comments on effectiveness, the mobilization of clean energy finance can also be measured by considering the Bureau of Oceans and International Environmental and Scientific Affairs, Office of Global Change (OES-EGC) indicators (that are also reported to USAID). OES-EGC Indicators in October 2015 show authenticated mobilization of USD 2.81 million (which includes USD 31,706 for CLIN 1 and USD 281,349 for CLIN 2 tasks). The evaluation team added USD 9.48 million as reported in CLIN 3 report (December 2014) to this OES-EGC number, totaling a cumulative USD 12.36 million mobilized for clean energy finance from July 2012 to September 2015. Based on the PACE-D TA quarter 13 report (June - Sep 2015)¹⁶ and KIs with Nexant, however, a more realistic figure being noted as USD 1.035 billion against the targeted total of USD 90 million. **Annex XIV** provides additional information about expenditures per task.

In conclusion, PACE-D TA's approach to mobilize finance for clean energy initiatives has been partially effective in achieving results given the variety of activities across the energy sector value chain noted in the table above. Substantial mobilization of finances only takes place with the pickup of the deployable clean energy (EE and RE), therefore the approach needs to consider the market readiness. A large amount of CF leveraged under PACE-D TA thus far relates to market instruments – green bonds and green ratings – which are hampered by the prevailing adverse market conditions. Overall, the participating organizations detailed above are backed by respective public or private entities. There are very few incentives, such as low cost funds and special instruments, to encourage higher uptake of these measures.

While the efforts with Saija, Sarala, the Capital Group, Basix and Vayam are slowly picking up, the

¹⁶ The program also reported on the amount of investment mobilized (in USD) for clean energy as supported by USG assistance in their PMEP and annual reports. The implementing partner reported USD 13.45 million as of September 2015.

degree of success for efforts with Financial Institutions (FI)/NBFCs is slow due to the influence of external factors (the prevailing macro-economic situation) and maturity of the clean energy markets.

Capacity Building

Capacity building, enhancing skills for new and existing personnel, and result-oriented trainings were the major activities of PACE-D TA. As of September 2015, the program had conducted 44 training programs including over 16,000 person hours (see **Annex VII**). The program engaged an external agency to adjudge the effectiveness of training activities, including a review of the person hours contributing to training efforts.¹⁷ The report details participants' perceptions of their changes in knowledge and efficacy at work, as well as whether participants have applied or shared new learning with colleagues. According to KIs from the implementation team, this appears to have provided valuable feedback to program managers and relevant sub-contractors about the relevance and utility of the trainings. However, there were some significant limitations to the study, including very limited disaggregation of responses (other than by gender and broad training topic), and a low response rate (13 percent). Considering these limitations, the evaluation team expanded its review beyond this study, to include all major blocks of training and human resources development interventions so as to ensure a comprehensive review of PACE-D TA capacity building efforts to-date.

Project documents and KIIs detail numerous strengths in the capacity building and training approach. Several major organizations, by task, are listed below with details about their experiences with PACE-D TA capacity building efforts (and **Annex IX** provides additional detail). The activities reviewed here are at various stages of implementation. Currently there is no clear mechanism at the ET's disposal to comment on the sustainability of the efforts and utilization of acquired knowledge other than: 1) NTPC being anchor partner and 2) Smart Grid mission actively leading efforts towards creating a demand for these services for a cadre of their staff.

Two additional case studies are referenced in the **Table 3** (and detailed in **Annex X**). One case study illustrates the efforts being made by PACE-D TA to revive DSM programs in the state through hand-holding, capacity building efforts. According to respondents, this is positive example in a key result area (DSM) and utilizes the influence of regulatory mechanisms to improve overall capacity. The second case study illustrates substantial PACE-D TA support to the national mission on solar energy. It is directed at the fast-catching solar PV Technology, and several gains were noted including improving availability of skilled solar personnel and the creation of jobs. The Solar Energy Training Network (SETNET) owes a part of this success to the pioneering work of PACE-D TA.

Table 3 : Capacity Building Findings

Organizations (Tasks)	Findings and Comments on Approach
Smart Grid	PACE-D TA developed a course design, with the outline and contents approved by a Working Group nominated by the Ministry of Power/ India Smart Grid Task Force/NSGM. Respondents noted that the efforts in drafting smart grid notification and developing a film for improving out reach of smart grid tasks made this approach successful.
EE Finance	PACE-D TA conducted two workshops for loan officers at banks and financial

¹⁷ Note that Nexant produced a *Training Effectiveness Assessment* report in September 2015 that summarized participant feedback across a series of energy efficiency, renewable energy, and cleaner fossils training programs. In total, 99 individuals responded to an online survey out of 743 total training participants.

(Bankers)	institutions toward improving understanding of successful business models. The workshops also trained bankers on how to appraise EE projects effectively. Program documents noted that, as a result of the workshops, loan officers were able to develop tools to evaluate risks in project financing of EE projects – an improvement from before the PACE-D TA program began implementation.
Haryana (HERC, DISCOMs) (See Case 1, Annex X for details)	Respondents noted that capacity building has positively contributed to the performance of state actors by improving their ability to implement result-oriented programmatic activities to curtail peak loads.
ECBC Update and accreditation/examination	PACE-D TA is supporting BEE's mission for updating the ECBC code. The Professional Certification Scheme is a first for the country, where an independent accreditation process through a comprehensive examination has been developed. Respondents (from BEE, RRECL, Department of Urban Development, and the Government of Rajasthan) noted appreciation for this development, but also noted that it is difficult to evaluate benefits of the revised ECBC, and similarly challenging to draw up an action plan for enforcement.
SETNET (See Case 2, Annex X for details)	SETNET adopted the institutional approach introduced to them through PACE-D TA capacity building efforts. They also developed and successfully demonstrated the USAID/India's Distribution Reforms, Upgrades and Management (DRUM) Program; and helped NISE in design and pilot testing of the SETNET scheme. Respondents noted that design and development of SETNET, including preliminary training programs and modules, was a challenging task.
MFIs	Partner MFIs in field locations have been re-training and orienting their field staff on clean energy products and services. Respondents noted that this has contributed to a kick off for field activities in off grid and decentralized locations.
Power Plants /NTPC (Sipat)	PACE-D TA support was linked to implementation and results both for existing utilities and NTPC, which is an anchor institution. This has worked well due to meticulous planning, specialist support, and involvement of the chosen organizations.
Regulators/State Agencies	PACE-D TA has developed training modules based on the current experiences in clean energy, especially regarding solar energy programs. This has provided motivation to state level initiatives for electric distribution companies besides state nodal agencies.

In conclusion, training efforts have contributed to the programmatic efforts of several implementing organizations. Most evident effectiveness of capacity building and training efforts relate to the solar roof top programs, National Smart Grid Mission (NSGM), and MFIs, which accounts for over 70 percent of the training efforts. These programs have strong backing-organizations to accelerate and sustain the momentum.

Additionally, momentum has already been noted and observed by the evaluation team. Regarding smart grid activities, for example, PACE-D TA will roll out a course with support of regional partner institutions working with the National Smart Knowledge Centers under (NSGM) in five locations. Additionally, MFIs training efforts are set to continue in the remaining period of the project with emphasis on defining anchor institutions.

1.2: How Effective Has the PACE-D TA Program Been in Achieving Results Considering the Resources Expended?

Due to the fact that the team could not measure cost effectiveness of training hours, institutional capacity building, pilots and other soft inputs in the absence of substantial cost and performance indicators,¹⁸ (as explained in the limitations section), the team addressed this question by asking respondents directly about whether they thought particular aspects of the program were cost effective, and also examining the relative contribution by CLIN 1 and CLIN 2 activities to development indicators in comparison with the relative cost of the activities. It is also useful to compare CLIN 1 figures for EE and RE (CLIN 2) programs which are performing differently, and also consider the drop in cost effectiveness due to much lower projections for CLIN 1 indicators at the end of the TA.

Table 4 below details the goal and purpose indicators of the program for reference:

Table 4: Goal and Purpose Indicator

Goal Indicator: Cumulative GHG reductions over years, measured in metric tons of CO ₂ e, reduced or sequestered as a result of USG assistance.
Purpose indicators for tasks: • CLIN 1: Energy saved due to energy efficiency/conservation projects as a result of USG assistance (in MW) • CLIN 2: Quantity of operational renewable electric generation capacity as a result of USG assistance (in MW) • CLIN 3: Percent Heat Rate Improvement in two power-plants that deploy Clean Fossil Technology and Management Practices • CLIN 4 is an important supportive function cross cutting CLIN 1, CLIN 2 and CLIN 3 tasks for program management, administration, monitoring and evaluation, knowledge exchange and out-reaches.

Findings

Table 5 presents the current state of expenditures and outcomes in each CLIN as of September 2015.

Table 5: Expenditures and Achievements per CLIN

	Budget (expenditure), remaining budget as a percentage	Key Activities	Achievements till Sep 2015
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¹⁸ During USAID review of this report, it became clear that USAID and the implementing partner would prefer to assess cost effectiveness of these aspects of the program. The evaluation team, then, recommends that PACE-D TA program M&E in future monitor and report on indices for comparing different tasks.

CLIN 1 ¹⁹	5,284,602 (4,012,832) 24.06%	ECBC NZEB Smart Grid DSM CEAP	0 against the target of 35MW of energy savings due to PACE D projects*.
CLIN 2	7,508,296 (2,698,079) 64.06%	Solar Roof top programs Solar Parks, Other RE projects Sale of clean energy including Solar products by MFIs	2.31 MW operational RE capacity against the target of 122 MW*
CLIN 3	2,000,000 (1917084) 4.14%	Heat rate improvements Best practices Chandrapura and Sipat mostly contributing to GHG emissions reduction target	5.6% Panipat and 2% Chandrapura against the target of 1%. PACE D achieved GHG emissions of 0.32781 against the target 0.414 because of CLIN3 outcomes contributing 99.54% of the GHG targets.
CLIN 4	4,012,282 (3613407) 10%	Supporting activities including M&E, out-reach	-

Table 6 depicts the actual performance of CLIN 1 and 2 against the targets as of September 2015. CLIN 3 is not depicted in Table 6 as it is already complete and met targets.

¹⁹ The evaluation team notes that PACE-D TA M&E assessments have not captured long term benefits from a) tasks which are likely to fructify in the future beyond the PACE D period such as tasks like ECBC, Smart grid, NZEB, etc. and b) attribution of benefits from the policy measures such as Karnataka Solar Policy.

Table 6: Performance of CLIN 1 and 2

	Proposed Goal	Approximate Investment targeted for Savings (USD)	Targeted savings/ capacity (MW)	Actual Savings/ capacity (MW)	Targeted Investment (in millions USD)	TA cost incurred (in millions USD)	TA Cost/ Investment
	A	B	C	D	E	F	G ²⁰
CLIN 1	Energy saved due to energy projects as a result of USG assistance (35 MW)	307600/ MW	35	Nearly zero	10.766	4.01	0.372 (37.2%)
CLIN 2	Operational renewable electric generation capacity as a result of USG assistance (122 MW)	1000000/ MW	122	2.31	122	2.70	0.0221 (2.21%)

Both **Table 5** and **Table 6** present CLIN 2 as more cost effective than CLIN 1. Additionally, a substantial amount of renewable capacity was being added at the time of the evaluation. Some of the potential benefits will accrue towards the end of PACE-D TA as well as beyond the project period. EE tasks in CLIN 1, on the other hand, require a variety of policy, programmatic, and technological changes before results in terms of MW of energy savings can be seen. Results of CLIN 1 interventions are yet to accrue into quantifiable energy savings. It is, therefore, difficult to account for the impact of CLIN 1 outcomes linked to the Purpose or Goal indicators as part of a midterm performance evaluation. The revised proposed goals indicate the target is 35 MW till September 2015. It increases till June 2017 when it is 150 MW. Actual achievement is nearly zero, as indicated in **Table 6**.

Because of these differences in context between the CLINs, CLIN 1 has so far underperformed as compared to CLIN 2. PACE-D TA is currently requesting a reduction in target for CLIN 1 (while maintaining original targets for CLIN 2).²¹ If this revision is accepted, the results gap between both CLINs will widen. This is an important consideration and decision on desired results and the focus of the PACE-D TA in the final year of operations, as EE is also an important factor in the enabling environment for clean energy deployment.

On the operations side, KI respondents noted several examples that reflect operational challenges in PACE-D TA execution that relate to cost effectiveness. These responses have been presented below in **Table 7**, according to CLIN and task. Respondents did not comment on every Task under the CLINs, and so only relevant Tasks are included.

²⁰ G = F/E

²¹ The revised proposal also includes a new indicator that GCC office at USAID has proposed, 'projected energy savings'.

Table 7: Qualitative Cost Effectiveness Findings

CLIN (Tasks)	Findings
CLIN 1 (PAT & Waste Heat Utilization Technologies)	These tasks have been discontinued after engaging the PACE-D TA team for 1 to 3 years. Some respondents noted that BEE wanted to exercise direct control for PAT, which turned out to be a national mission program with dozens of consultants working for time-bound programs. The Waste Heat Utilization Technologies policy report has not yet evoked a response from BEE. There appears to be a gap in internal planning and review activities, in addition to discontinuity of the project team. This has led to minor results for a level of labor effort equaling \$200,000.
CLIN 2 (IREF)	IREF is not progressing towards the implementation of renewable energy promotion and envisioned partnership functions. The lack of progress, according to documents and respondents, appears to be due to different understandings regarding possible results and aspirations of stakeholders involved.
CLIN 3 (Panipat Thermal Power Plant) PPTS	During the course of visit to HERC, the ET learned that Unit 5 and 6, both the coal-based power plants at the PPTS site targeted under CLIN 3, where 5.6 percent of heat rate improvement was demonstrated, were not in operation from December 2014. Further, units 1 to 4 at the site have been de-commissioned. The decision about de-commissioning the other units is not yet taken, but units 5 and 6 will continue to remain out of service due the following reasons: a) Haryana state has a power surplus with commissioning of more efficient new power plants at other sites in the recent years; b) utilities are deciding to buy power from more fuel efficient power plants in other states through power exchanges rather than banking on their own power stations; and, c) concerns to stop old fuel inefficient and polluting units. As a consequence, GHG emissions targeted out of improved performance of the power plant at Panipat are not captured under the PACE-D TA.
CLIN 1 and CLIN2 (timeliness)	For a variety of reasons, both CLIN 1 and CLIN 2 tasks have been lagging in terms of timeliness of development goals. This has also affected the achievement of the goal indicator for the TA in terms of cumulative GHG reductions over years.
CLIN 4 (Management and Outreach)	CLIN 4 contributes to CLINs 1, 2 and 3. The spending for this CLIN is 21.3 percent of the overall budget for the CLINs. As highlighted under Question 3, there is a substantial scope to improve the internal processes (program management and administration), monitoring and evaluation and out-reach functions. Functional tasks that remain unaddressed have cost and sustainability implications to the program that should be addressed.

Conclusions

PACE-D TA resources deployed through September 2015 have not met the initial project goal and purpose indicators despite improvements in the enabling environment and several other attributes such as conceiving and supporting pilots by implementing partners with promising results. CLIN 1 is less cost-effective than CLIN 2, based on the financial projections and operational (qualitative data) findings noted in the findings above. CLIN 1 tasks are not performing as well as other CLINs for a variety of reasons, such as discontinuity of the project team on several tasks as explained above. Additionally, some of the potential benefits will accrue towards the end of PACE-D TA as well as beyond the project period. Both CLIN 1 and CLIN 2, however, seem to be struggling to meet indicator targets for deployment of EE and RE. CLIN 2, however, has under-spent on the TA tasks as compared to the allotted budget.

CLIN 4 has used more funds than other CLINs. CLIN 4 needs additional budgetary support in view of its potential to influence the implementation, program evaluation, sustainability and scalability of the

entire TA program. TA support is needed for additional CLIN 4 tasks including out-reach programs, monitoring and evaluation and project secretariat function which will have to be stepped up in next 15 months to achieve better performance out of TA efforts.

1.3: How Has Participant Training Under The USG-Supported PACE-D TA Program Built the Capacity of Partner Institutions, Including Women Members, To Enhance Market Deployment of Clean Energy Technologies?

The evaluation team relied on program reporting and M&E data in answering the question 1.1 (regarding capacity building and training effectiveness), including the IP's September 2015 Training Effectiveness Assessment.²² The team also spoke with a number of KIs that contributed to PACE-D TA's capacity building efforts, including both sub-contractors and public institutions. This question provided an opportunity to discuss gender considerations in the design and implementation of training programs, which is the focus of the team's response in this section.

Findings

Integration of gender issues in each of the four program components of PACE-D TA was included in the contract with the aim to help ensure broad acceptance of the activity objectives, and to promote strong alliances to carry the work forward in the future.

Program implementation has not, however, taken adequate care to address gender in each CLIN as indicated by the contract, beyond the training of women. Only 8 percent of trainees have been women thus far, mainly because of the prevailing low level of women in clean energy programs. The program target in the Baseline Scenario Report was set at 24.6 percent participation of women relating to person-hours of training in energy related policy and regulatory practices provided with USG support and 25 percent participation of women relating to person-hours of training in technical energy fields provided with USG support. Specifically, the program engaged women bankers and MFI staff regarding energy finance. The women that were engaged in capacity building, from a small sampling of KIs, reported satisfaction with the training yet there was no direct implementation they could correlate the training subject matter to in their formal employment.

Conclusions

Gender issues did not attract significant attention in the PACE-D TA program. Only women bankers and microfinance institutions were included in activities. In the future programs, more focused planning and efforts would be needed at the launch of the program.

General Conclusions for Question 1

The PACE-D TA program has exhibited effectiveness in its capacity building and training efforts, relative to the other technical assistance measures. Respondents noted that training efforts have contributed to the programmatic efforts of their organizations. Momentum was also noted and observed by the ET. While mobilization of clean energy finance shows less progress, institutional strengthening technical assistance has shown varied levels of effectiveness dependent on the organization in question. PACE-D TA's multi-faceted approach to institutional strengthening, according to respondents, worked well (and

²² Note that the evaluation team initially intended to conduct a web-hosted survey of capacity building participants as part of the evaluation design. However, given that the IP had recently conducted similar research, this data collection process was dropped from the methodology. Thus, the evaluators did not have the opportunity to solicit feedback directly from these stakeholders. This has been noted in the limitations section of the report.

was based on the needs of that institution) with some organizations (as detailed above). However, the approach did not fully yield the desired results (strengthened institutions) with others due to issues like weak coordination with PACE-D TA, unsupportive enabling environment, transitional leadership/staff in partner institutions, lack of resources in partner institutions, and lack of commitment by the public agencies.

PACE-D TA has not achieved indicator targets for CLIN 1 and CLIN 2, with respect to goals for deployable installed capacity for EE and RE Technologies and uptake of policies and programs. CLIN 1 has performed less well as compared to CLIN 2 in terms of quantitative targets and cost effectiveness. Among the key factors affecting the performance of CLIN 1 tasks are that i) BEE was not deeply involved in identifying needed TA for tasks such as efficient HVAC and Waste Heat Utilization; ii) Partner organizations have to be more proactive in either strengthening their own capacity or acceptance of PACE-D TA inputs for programmatic tasks, and iii) Partner organizations would benefit from an assessment of their institutional capacity in the emerging fields of activities such as EE and RE deployment. Giving as well as receiving assistance is multi-faceted; therefore, attention needs to be given to the development of more conducive relationships and establishment of an acceptable consultative process.

There is not a lot of progress toward the training of women “to enhance market deployment of clean energy technologies.” This is due to lack of foresight and initiative in seeding special efforts in PACE-D TA for this task.

EVALUATION QUESTION 2: HOW EFFECTIVE AND EFFICIENT HAS THE PROGRAM BEEN SO FAR IN SUPPORTING THE DEVELOPMENT OUTCOME OF ACCELERATING INDIA’S TRANSITION TO LOW EMISSIONS ENERGY SECURE ECONOMY?

This evaluation question and its sub-questions examine PACE-D TA’s contribution to-date towards the long-term result of helping India transition to a lower-emissions economy. The corresponding sub-questions inquire as to the likelihood of achieving expected results associated with each CLIN, and the potential for sustainability and scalability of the various pilots initiated or supported under the program. Each of these areas of inquiry relied on both extensive document review and KIs with stakeholders from across the program.

Fueled by an uptake in political will and market readiness, India is experiencing a significant upswing in renewable energy deployment, energy efficiency, and conservation in different sectors. India is taking up different initiatives and actions, with a variety of donors and international organizations contributing towards this goal.²³ The USG remains a critical partner; in total, USG federal agencies committed a total of \$4 billion for projects and equipment sourcing, one of the biggest deals for the growing renewable energy sector in India.²⁴ Further, a joint Indo-US PACEsetter Fund was established to accelerate off-grid green energy innovation with a contribution of \$4 million from each side.

The GOI has identified the power sector as a sector of focus to promote sustained industrial growth, economic development and energy security. Some recent initiatives and targets of the GOI to boost the

²³ Other donors working on related programming in India include: the UN Development Program (UNDP), International Finance Corporation (IFC), the World Bank, British Department for International Development (DFID), Kreditanstalt für Wiederaufbau Bankengruppe (KfW), and Rockefeller Foundation, among others.

²⁴ January 2015 Obama and Modi agreement.

Indian clean energy include:

- A renewable power production target of 175,000 MW by 2022. This comprises generation of 100,000 MW from solar power (National Solar Mission), 60,000 MW from wind energy, 10,000 MW from biomass, and 5,000 MW from small hydro power projects.
- National Smart Grid Mission launched an efficient transmission and distribution network.
- Green Energy Corridor projects are being rolled out to ensure evacuation from renewable energy plants.
- A nationwide campaign for Energy Conservation was launched with the target to save 10 percent of current energy consumption by the year 2018-19.
- The Smart Cities Mission was launched to develop new generation cities by building a clean and sustainable environment.
- The Reserve Bank of India (RBI) has included renewable energy under priority sector lending (PSL). Therefore, banks can provide loans up to a limit of \$2.36 million to borrowers for renewable energy projects.

Additionally, the Indian power sector has an investment potential of INR 15 trillion (\$237 billion) in the next four to five years. The GOI's immediate goal is to generate two trillion units (kilowatt hours) of energy by 2019. This means doubling the current production capacity to provide 24x7 electricity for residential, industrial, commercial and agriculture use. The government has also sought to restart the stalled hydropower projects and increase the wind energy production target to 60 GW by 2022 from the current target of 20 GW.²⁵ **Annex XI** elaborates India's RE targets and revisions during the PACE-D TA time frame.

The PACE-D TA program, in this context, has been supporting India's transition to a low emissions energy secure economy through a variety of different components. As of September 2015, the PACE-D TA program achieved 0.421 million metric tons of its CO₂e target (39 percent); 2.3 MW of its RE target (1.9 percent); significant heat rate improvement in two thermal power plants (exceeding the program target); and 0 MW of its EE target (0 percent).²⁶ However, these indicators are only partially representative of the program results, as the program also contributed towards policy and regulatory changes which contribute to the enabling environment for future progress towards results and greater developments towards India's lower emissions economy.

Following are the findings and conclusions associated with each of the evaluation sub-questions, as well as concluding remarks.

2.1. What is the Likelihood of Achieving the Expected Results Under Each CLIN?

The evaluation team investigated this sub-question by discussing with subcontractors, beneficiaries, government bodies, line ministries, prime contractor and USAID, and assessing documents and literature review. The team looked at the sub-components of each CLIN and looked into set targets, achievements and progress. The team also looked at the enabling environment for each component, as the environment is an indicator of the likelihood of achievement of set targets. Here the team has focused on CLIN 1 and 2, as CLIN 3 is discussed in next sub-question (2.2), and CLIN 4 (the management component that cuts across each CLIN) is discussed in evaluation question 3.

²⁵ Of the target capacity, 100 GW would be from solar power, 60 GW from wind, 10 GW from biomass and 5 GW from small hydro power, according to the Union Ministry of New and Renewable Energy.

²⁶ Note that for the purpose of this overall summary, the team focused on progress towards the core RE, EE, CF, and GHG emissions reduction targets only, as other performance indicators are covered above in Q1. For more information about achieved results against set indicators targets refer **Annex VII**.

Findings

Table 8 details the progress against the high-level indicators referenced above.

Table 8: PACE-D TA Progress Against Priority Indicators

Priority Indicators	Cumulative Targets till Sept. 30, 2015 (Y3)	Cumulative Achievements till 30 Sept 30, 2015	Project Target
		<i>Percent against associated target in parenthesis</i>	
Clean energy generation capacity installed or rehabilitated as a result of USG assistance (MW)	122	2.3 (1.9%)	714 (0.32%)
Energy saved due to energy efficiency / conservation projects as a result of USG assistance (MW)	35	0 (0%)	150 (0%)
Greenhouse gas (GHG) emissions, estimated in metric tons of CO _{2e} , reduced, sequestered, and/or avoided as a result of USG assistance	1.09	0.421 ²⁷ (39%)	3.54 (11.9%)
Percent heat rate improvement through adoption and accelerated deployment of cleaner fossil technologies and management practices to achieve greater supply side efficiency from existing fossil power generation (percent of heat rate improvement)	1%	See below	2%
• Panipat thermal power station		5.60% (560%)	5.60% (280%)
• Chandrapur thermal power station		3.40% (340%)	3.40% (170%)

Initially CLIN I targeted additional initiatives than those being conducted currently by PACE-D TA but due to the bilateral partners' priorities, and decisions, not all proposed activities were considered (e.g. Waste Heat Utilization (WHU)). Tasks that have been continued include Smart Grid, building EE sector (NZEBC and ECBC), DSM in Haryana, and EE finance initiatives. The program has thus far achieved 0% of its cumulative Y3 target (35) and project target (100). Additionally, it has achieved 0.421 million metric tons of its CO_{2e} target (39 percent against the Y3 target and 11.9 percent against the project target). Respondents noted that these delays, staff turnover within partner institutions may have contributed to

²⁷ Heat improvement: Chandrapur FY14: 7,286 tCO₂ & FY15: 123,861 tCO₂; Panipat FY14: 86,078 tCO₂; NTPC Sipat FY15: 202,453 tCO₂ and BESCOM Solar rooftop FY15: 1,496 tCO₂.

the lack of progress against indicator targets in EE and GHG emissions. The program has been supporting Haryana, Karnataka and Rajasthan states through policy, regulations and technology guidance. Qualitative interviews did not reveal perspectives on the likelihood of achieving expected results, but respondents did provide additional insights into the management of EE tasks, as detailed below:

Table 9: EE Findings

Tasks	Findings
PAT	Regarding the Industrial EE and engagement with PAT scheme, the counterparty stated that they do not require any help from PACE-D TA on the PAT mechanism.
WHU	The counterparty suggested holding off activities with WHU (with potential uptake at a later stage). Therefore, spent time, resources, and work on WHU (low grade waste heat to energy in industries) could not take shape further (as per PAC meeting).
HVAC	The counterparty said that that BEE is evaluating internally various options for market transformation, and further steps can be taken when there is more clarity on the outcome of this process.

The program has also made headway in improving the enabling environment for EE. The following regulations have been adopted and/or implemented: Haryana DSM Regulations and ECBC Implementation Rajasthan. The former regulation has been implemented and offers a suitable environment for EE gains to be made against the targets noted above. Respondents noted that the latter regulation, however, faces more challenges in implementation. Guidelines and further action by the state are needed. The following regulations have been proposed: Karnataka EE Policy, Rajasthan EE Policy, and the National ECBC Update. Respondents noted that there is more progress toward the first and second policy than the third.

Despite the lack of progress against priority indicators noted above, the program could achieve its energy efficiency targets if all planned initiatives are managed well and the enabling environment surrounding EE tasks is supportive and continues to improve.²⁸ The various interventions include facilitating state DISCOMS to develop demand side management proposals that will save 10 MW of energy, Smart Grid Regulations that will result in saving of 22,980 MW of energy and in a reduction of GHG emissions by 137.46 mmt (until 2027), updating Energy Conservation Building Code for BEE, Energy Efficiency policy development for States that will save 163 MW of energy by 2020, and support for NZEB pilots (totaling an additional estimated 23,153 MW).

Specifically regarding CLIN 2, PACE-D TA has thus far provided support for 2.3 MW of installed capacity operational in BESCOM's distribution area and 0.01 MW of solar pump set capacity with Vayam in the State of Bihar (1.9 percent of the Y3 target and 0.32 percent of the project target). Qualitative interviews provided additional insights into specific RE tasks, as detailed below:

²⁸ In addition, a revised Monitoring and Evaluation Plan was presented to USAID by Nexant that reduces EE-related targets.

Table 10: RE Findings

Tasks	Findings
IOCL	Technical assistance to IOCL resulted in a procurement process for deployment of 5 MW rooftop at three refineries, and the proposed 30 MW rooftop deployment across the country.
Microfinance Support Program	The launch of the clean energy-lending program with seven MFIs under the Microfinance Support Program enabled more than 21,000 clean energy devices to be sold through the preliminary pilots. These delivered a total of 1,234 person-hours of training and leveraged approximately \$750,000. Respondents noted that existing programs and initiatives allowed PACE-D TA to put together an innovative approach.

Similar to the enabling environment for EE, the program has seen progress in the promotion and passage of policy in RE. The following policies have been adopted and/or implemented: Karnataka Solar Energy Policy and Rajasthan Net Metering Regulations. The former policy has been implemented while the latter is still being discussed among different DISCOMs (at the time of the evaluation). The following policies have been proposed: Karnataka RE Policy and Rajasthan Hybrid Regulations. Respondents noted that these policies faced more resistance and may not provide the enabling environment necessary to achieve priority indicator targets discussed above.

Despite the fact that the project has not reached Y3 targets as scheduled for priority indicators, the program could achieve its renewable energy project targets by 2017 if the enabling environment continues to improve and initiatives are managed as planned. A number of projects are in the process of being implemented and will most likely be commissioned by the end of the second quarter of 2016. A pipeline of 57.5 MW capacity of solar projects is in the process of installation and another 30 MW is in the process of allotment (totaling an additional estimated 87.5 MW). In addition, the program's support for developing the RE Policy, Solar Policy and Net Metering policies for the States are expected to result in large scale installed capacities

Solar Roof Top PV: Indian Oil Corporation Limited (IOCL)

- PACE-D TA assisted IOCL to access government bodies for subsidies/financing, organized framework, policy support, and negotiation in JVs for Solar Park. Now IOCL has encouragement for further continuation on RE.
- Technical assistance to IOCL resulted in procurement process for deployment of 5 MW solar PV rooftop systems at three refineries and the proposed 30 MW rooftop deployment across the country (as noted above).
- As per IOCL's activities with PACE-D TA, collaboration targets/projects/pilots are achievable.
- All started work with PACE-D TA will be completed before completion of PACE-D TA. After PACE-D TA, IOCL be continuing on this path of RE.
- There is learning and there is sustainability of this drive beyond PACE-D TA (as per IOCL responses).
- The PACE-D TA support is effective terms of providing support (as noted by respondents). IOCL seeks more technological support and engagement with USAID and any stakeholders for future technologies and opportunities like Electrical Transportation, Batteries, Energy Storage, RE Charging Stations and Second and third generation Biofuel.

over the policy period.²⁹ The text box provides an example of PACE-D TA's progress in CLIN 2 regarding the Solar Roof Top PV.

Conclusions

While the program has not met Y3 or project targets for priority indicators assessed in this question, ongoing initiatives and the enabling environment for both EE and RE show potential and led the evaluation team to conclude that the program could achieve project targets by 2017 if the enabling environment continues to improve and initiatives are managed as planned.

Ongoing initiatives that have potential to contribute to EE achievement and GHG reduction include Smart Grid and DSM. More activities have been added in the smart grid component due to GOI's interest, particularly in the context of the newly launched national Smart Grid Mission. These could achieve part of the expected results under the program, and major deployment/saving achievements will potentially be observable in the long term.

Under the CLIN 2, RE activities include those that are technology focused (solar PV roof top) and innovative (e.g. Energy Storage, CMC, and Clean Energy Lending (MSP)), as described above. PACE-D TA focused on solar PV roof top initiatives (as GOI in quarter 2 2015 reset the RE targets, explained in **Annex XI**) to achieve development result 2, in addition to other technology innovations targets (energy storage and CMC, etc.).

2.2 How Successful Was the Implementation of CLIN 3, Which Concluded in October 31, 2014, and How Sustainable Are These Efforts?

In addressing this question, the evaluation team identified and evaluated the achievements and results of CLIN 3, the cleaner fossils component of PACE-D TA. Given that the funding for this set of activities was time-bound and completed in December 2014, the team relied upon earlier program documents and conducted KIIs with relevant stakeholders that were available. The findings presented below are based on document review and KIIs. The evaluation team developed conclusions regarding potential success factors and opportunities for sustainability of results under CLIN 3.

Findings

The CLIN 3 component of PACE-D TA program performed well, with positive support from the National Thermal Power Corporation (NTPC). The program achieved key outputs under CLIN 3, including the following:

- Three new management practices were introduced; two technical reports were developed; three institutions were identified as having improved capacity; and one new institution was established: Indian Heat to Power Alliance (IH2PA)
- \$9,490,000 was leveraged

²⁹ (i) 5 MW capacity allocated under the MNRE's PSU Solar Rooftop Scheme is under implementation by Indian Oil Corporation (1.5 MW out of this 5 MW has already been tendered and the rest is to be tendered shortly), (ii) 2 MW of capacity for solar pump sets energization has been tendered by BESCO to SunEdison and is likely to be commissioned by the end of 2015, (iii) 50 MW of solar rooftop installations, currently in the final stages of approval with the Indian Railways Board, will be tendered out shortly. Further, (a) Indian Oil is in the process of submitting an application for allotment of 30 MW for rooftop development across its petrol pumps, installations and offices to MNRE, (b) BESCO has another pipeline of 75 MW capacity of solar rooftop projects under development (c) Jaipur Distribution Company has recently launched its scheme which will witness rapid deployment in the state in the next two years and (d) MPUVNL and MPERC are in the process of finalizing the Net Metering Policy and Regulations for solar rooftop implementation.

- 6,100 person-hours of training were provided to 300 participants
- A number of key regulations were updated and technological advancements were addressed

Critically, two state utilities demonstrated a heat rate improvement of 3.4 percent and 5.6 percent (achieving both Y3 and project targets as of September 2015 – see **Table 8**). Heat rate is part of tariff determinations and, therefore, there is GOI interest in improving heat rate, achieving zero emissions, and achieving zero discharge in the coming two years. This improvement also led to savings in fuel and reduction in GHG emissions by 0.07 million metric tons CO₂e.

Additionally, CLIN 3 supported a NTPC team’s study tour to the US and other study tours (including on cleaner fossil). The NTPC also received membership in the Electric Power Research Institute (EPRI), which has helped them learn about and adopt world class best practices, as well as provided opportunities for them to engage with experts and advance commercially viable technology providers.

Program documents and interviews did reveal, however, that the tasks were completed in such short time frames so as to not allow complete plans for implementation and sustainability.

Conclusions

PACE-D TA’s CLIN 3 achieved its targets and deliverables within the set time and budget. There are observable achievements in institutional strengthening, capacity building, and access to finance (as detailed in the Findings section). The main success factors for this component, as respondents noted, include: the engagement of appropriate experts, adequate consideration of best practices, and effective partnerships. There was also consistent learning among the local partner institutions and effective technical know-how transfer and support. Regarding sustainability, the HR improvements noted above may ensure sustainability and scalability in NTPC (based on the ET site visit, document review, and discussions with stakeholders).

However, the tight budget and time did not allow for full implementation or certain tasks, for example IH2PA (threatening sustainability). Toward sustainability and scalability, there is further need of technological support, technology transfer and capacity building, and funds. India supports clean coal technologies and has, for example, requested additional TA support.

2.3: How Sustainable and Scalable Are Different Pilots Proposed Under the Program Considering the Progress and Remaining Timeline?

In response to this sub-question, the evaluation team conducted an overview of the 17 pilots initiated or supported under the program, using more focused effort to look into three pilots in particular (Smart Grid, Solar Roof Top, and Microfinance Support). The team utilized document review and KIs to assess the sustainability and scalability of pilots. The findings are presented by CLIN, and conclusions and success factors are provided across the overall program. In addition, the team completed detailed case studies of three particular pilots.

Findings

PACE-D TA, as of September 2015, has supported 17 pilots in their targeted regions of India. The pilots are listed below according to CLIN:³⁰

- CLIN I (EE): 4 pilots

³⁰ Also see **Annex VII** for the list of pilots and other results of the program.

- o Smart Grids: Tripura State Electricity Corporation Ltd. and Ajmer Vidyut Vitran Nigam Ltd. (2 pilots)
- o Net Zero Energy Buildings (NZEB): Nalanda University and Uttar Haryana Bijli Vitran Nigam Ltd. (2 pilots)
- CLIN 2 (RE): 9 pilots
 - o Solar Pumps: Basix and Bangalore Electricity Supply Company Ltd. (2 pilots)
 - o Solar Rooftop: Indian Oil and Indian Railways (2 pilots)
 - o Clean Energy Finance: Corporate Energy Audit Program (Tata Cleantech Capital) (1 pilot)
 - o Microfinance: Sarala, ESAF, Saija, SVCL (4 pilots)
- CLIN 3 (CF): 4 pilots
 - o Clean Coal Technologies: Vista Coal Blending (Sipat); Advanced Pattern Recognition Software (Sipat); and Heat Rate Improvement (Chandrapur & Panipat) (4 pilots)

The four pilots initiated under CLIN 1 are at different implementation stages. For Smart Grids, Tripura started in October 2014 and is ongoing. The pilot with Ajmer Vidyut Vitran Nigam Ltd. is at an initial stage. The NZEB pilot with Nalanda University is progressing slowly due to in-house procedures and processes by involved organizations.

In CLIN 1, there were additional efforts noted in the WHU pilot and the ECBC pilot that did not come to fruition. Technical assistance to BEE to design and implement a low grade WHU pilot was initially planned by PACE-D TA, but this activity has been deferred based on the advice of Director General, BEE, and Project Advisory Committee (PAC). The PACE-D TA Program was also supporting the Department of Urban Development and Housing, Government of Rajasthan, Rajasthan Renewable Energy Corporation Limited (RRECL), and Jaipur Development Authority to develop and implement a state specific strategic road map for ECBC. This is currently moving ahead slowly due to institutional/bureaucratic issues, priorities, and delayed decisions as noted by respondents.

Regarding the Smart Grid pilot in particular under CLIN 1, the pilot is synched with National agenda of India (NSGM). Respondents noted that this was one of the key success factors for the pilot. The pilot, at the midterm, appears sustainable considering commitment of TSEL and Power Grid Corporation of India, Ltd. (PGCIL)/SGTSF and existing resources. The pilot is likely to be useful for long term GOI plans (National Mission on Smart Grid). The ET assessed that this pilot could be scalable if TA is provided continuously and engagement with appropriate experts is stable for the remainder of the program. The pilot also needs a self-sustaining financial model for utilities; efficient management of incoming data; and more increased awareness among end users and utilities. For CLIN 2, the service model for solar irrigation in Bihar (through the Basix pilot) is in its initial stage and is ongoing. The shared service model for solar irrigation demonstrates the techno-commercial feasibility of solar irrigation pumping based micro-grids, cost benefit, and a suitable business model. This concept and model requires consistent technical assistance, customized working business models, and more engagement with non-governmental organizations (NGOs) to achieve long-run impact.

Regarding the Solar Roof Top pilot in particular under CLIN 2, support is ongoing and involves policy support, web-tool development, and IT enabled tool CMC development. The pilot works with Indian Railways, IOCL. Respondents identified “partnership” and “synergy” with the PACE-D TA team as success factors for the pilot. To be sustainable, respondents explained that the pilot required commitment of stakeholders and consistent resources. Scalability appears feasible, based on the fact that policy is in place (central and state governments’ solar policy, and IOCL solar PV roof top policy). There is also a noted need/demand for clean energy. There is also cost effective commercial solar technology available, making scalability more feasible. See Annex XII for more details on this pilot. Regarding the Microfinance Support Program as the third pilot that the ET looked at in-depth, the program has completed the operational design for SVCL, Sarala, Saija, and ESAF. Sarala and Saija have started to pilot

energy lending in several of their branches. ESAF already had an ongoing energy-lending program, but after the PACE-D TA intervention, ESAF has made several changes to its operations. It has started a pilot with a new design in several branches. Respondents noted several success factors for this pilot including consideration of donor programs as learning for marketing and outreach (e.g. IFC's awareness raising campaigns in Bihar and UP); engagement of committed partners (Selection Criteria for MFIs); completion of qualitative and quantitative evaluation before and during the launch of the pilot; and establishment of a clear communication/engagement plan and business model. Respondents noted that sustainability is possible because the pilot uses a proven business model. Respondents also noted that scalability could be possible in the future if there is engagement of product/service providers; integration with policy; and training and capacity building.

For CLIN 3, technical assistance was channeled into pilots that involved critical technologies and management practices. Heat Rate Improvement support was extended to two state owned thermal power plants i.e. Panipat (Haryana) and Chandrapur (Maharashtra). In support of clean coal technologies, the program introduced APR software and provided training to Sipat station staff.³¹ Training on the software and models was provided from August 19 to August 22, 2014 for 16 persons (a total of 512 person-hours).³² PACE-D TA developed a benchmarking guide to provide NTPC a comparative reference for operating the Sipat plant more efficiently. The program also structured and facilitated an exposure visit to the US for NTPC team on various aspects of super-critical thermal power plants.

Conclusions

Based on a detailed look into all pilots launched by PACE-D TA program since program launch, some pilots across CLINs can likely be both sustainable and scalable in the long term with consistent TA support in remaining timeframe under the program, including the following: Solar Roof Top PV, Smart Grid, MSP, and Heat Rate Improvement in coal thermal power plants. The last example comes under CLIN 3, which was completed in October 2014. The evaluators feel, however, that it has potential for sustainability and scalability in India.

Across all pilots, the following key factors appear to significantly contribute to sustainability and scalability:

- Partnerships that are synergized (include partners that have a similar vision and commitment-level)
- Synchronization with the current GOI National Agenda
- Adaptation to available lessons learned from previous or ongoing donor programs in the same sector/field
- Established measures (both qualitative and quantitative) to be used for evaluation before and during the pilots
- Clear communication and engagement plan
- Use of customized business models
- Implementation of tailored and effective training and capacity building

General Conclusions for Question 2

In response to India's low emissions energy secure economy commitments, PACE-D TA has been tasked to support the Indian enabling environment and leverage the best knowledge and expertise from

³¹ Training was also provided to the staff of both these utilities, and they participated in a study tour to the U.S.

³² Not mentioned by respondents or included here is a discussion of the VISTA model and the training provided to NTPC staff.

within the US and India to work towards outcomes in individual capacity, institutional strengthening, and access to finance that will serve as building blocks for India's development outcome goal. Though behind on most Y3 and project targets, the program is on track to achieve targets set in EE, RE, and CF contingent on the enabling environment continuing to improve and the planned PACE-D TA initiatives being managed well. The program has also initiated multiple initiatives and pilots that show key sustainability and scalability factors, foreshadowing their potential for success in the long run.

However, the evaluation team found a number of challenges in PACE-D TA execution that have hindered effectiveness at this level (the achievement of outcome level indicators), to-date. KIs and analysis reflect that the program has many components and is trying to deliver results at same time; however, due to balancing work between all components, focusing on ongoing enabling environment, and meeting stakeholders' current requirements and priorities, the PACE-D TA has a challenge in achieving results.

For sustainability of the program and fast progress towards the achievement of as many results as possible in remaining timeframe, many KIs mentioned the following as critical: engagement of potent stakeholders and efficient decision-making; limiting turnover in counter parties, central/state governments, Nexant, and USAID; commitment to consistent follow-up and efficient synergy between Nexant and potential stakeholders; and management and ownership of critical issues (explained below in Question 3).

EVALUATION QUESTION 3: HOW EFFECTIVE IS PROGRAM MANAGEMENT?

The management approach of the PACE-D TA program is unique in a number of ways. The structure of the implementation team reflects the principles embedded within the USAID Forward initiative, which seeks to maximize the use of local implementing partners to both reflect existing indigenous capacity and expertise, as well as to facilitate further local capacity and solutions.³³ The result is a complex model with accountability relationships that flow upward towards the most senior levels of two governments, laterally between dozens of implementing institutions, and downward towards TA recipients at both the national and state level across India.

Given the complex nature of the program and the sheer number of stakeholders involved, assessing the quality of management across the entire program is challenging. As described earlier in this report, the implementation team managed by Nexant includes 25 sub-contractors split between the US and India³⁴ that are providing TA to at least 18 institutions at the national and state levels. While most of the programming is focused in four target states, program activities are occurring in 12 states nationwide. Over the course of the fieldwork, the evaluation team was able to speak with 20 sub-contractor KIs and six individuals representing program partners,³⁵ as well as each of the current Key Personnel (KP) at Nexant and several key programmatic staff at USAID's CLEEO office. However, it must be noted that the evaluators were unable to speak with 13 of the individual sub-contractors and none of the IP's former Key Personnel, a fact that may have conferred some bias to the data. Refer to the discussion of Methodology and Data Limitations or further discussion of potential data limitations.

³³ See: <https://www.usaid.gov/usaidtheforward>.

³⁴ The contract documents provided by the IP identified 25 sub-contractors, including seven individuals, nine Indian firms, and nine American firms. Note that Nexant also considered its three State Coordinators as sub-contractors, though they are not counted as part of this 25. The evaluation team also engaged with six additional Indian institutions that forged partnerships with PACE-D TA sub-contractors or engaged in joint activities with the implementation team. Note that not all sub-contractors remained consistently engaged with the program throughout its lifetime.

³⁵ Refer to **Annex IV** for a full list of key informants by stakeholder group.

The team addressed the assessment of PACE-D TA program management through the sub-questions provided by USAID/India. Question 3.1 looks at the management relationship between the IP and sub-contractors and the level of ownership and commitment to results among the sub-contractors. Question 3.2 focuses on planning, accountability, and M&E processes and their effect on the program. In exploring these topics, the evaluation team also found it important to explore the management relationship between the IP and USAID/India, as well as the engagement of the broader US interagency through the Secretariat Function played by Nexant.

Following are the findings and conclusions associated with each of the sub-evaluation questions, as well as concluding remarks about the management model and system overall.

3.1: How Effective Is the Prime Contractor in Managing Sub-Contractors, and What Are the Levels of Ownership and Commitment to Results Among the Sub-Contractors?

In addressing this question, the evaluation team looked at the management relationship between the IP and sub-contractors, the composition of the implementation team, the consistency of senior management, the nature of the sub-contracting mechanism, and the implications of each of these factors on ownership and commitment to results across the implementation team.

Findings

Working relationship between IP and sub-contractors

Respondents from both Nexant and the sub-contractors described the working relationship within the implementation team as integrated and collaborative. In KIs, 12 sub-contractors referred to their counterparts at Nexant as technically competent, responsive to their suggestions, or appropriately hands on. One sub-contractor remarked that the key technical staff at Nexant had contributed meaningfully towards advisory work on both EE and RE components. *“In contractual terms we have different roles and processes than Nexant, but the commitments are joint to deliver the outputs... This is the only way it works. If my manager doesn’t understand the process and the content, then it will be a problem.”* However, a smaller proportion of key informants felt that IP staff were occasionally overly involved in the day-to-day management of sub-contractors’ activities. As one sub-contractor argued, *“They were dealing with the minutia of what the sub-contractors were doing and losing track of the overall focus and overall direction of the program. They were concerned about why Consultant A was billing 100 hours to task 3.8.2, and not worrying about whether that consultant had produced a document or report or consultation with stakeholders that was meaningful. They were purely focused on the numbers.”* Given that the key personnel at Nexant had to play the role of both technical experts and program managers, the generally positive feedback received from sub-contractors is commendable and worthy of recognition. Yet, it also appears that balancing management duties with technical responsibilities was, at times, a challenge for the senior IP staff members.

Most of the management challenges reported from the implementation team were administrative in nature. A number of KIs felt that 1) financial reporting requirements were complicated and that it took a long time for some sub-contractors to receive payment. One sub-contractor did not understand why the IP and USAID were requesting certain financial information. *“GOI tax requirements include a VAT line and USAID asked for proof that this was set aside. We know that under Indian law we are being compliant. We know the rules and we follow them. Why do they want to see that? The delay [in receiving payment] as such doesn’t bother me, but the fact that they want this information bothers me. I’ve been told that this is a problem for all of the Indian sub-contractors.”* Additionally, 2) the processes for Task Order (TO) modifications were seen as onerously slow. This was frustrating for sub-contractors, as they typically continued their work without an official mandate or promise of compensation in the interest of maintaining momentum with the GOI or state-level agencies. This was reportedly addressed somewhat by switching from LOE-based to Fixed-Price contracts, according to a few sub-contractors. One sub-contractor remarked, *“Our relationship has changed since this year [since introducing a fixed-price contract]. The work and timeframe is*

defined and is simpler. We can't wait for modifications, so we have to do our work while we process goes on, and sometimes [the contractual changes] happen months after the work is already done... They ask about 'why will it take X amount of time?' and we have to say, 'Well, actually, it's already been done.' The KI went on to argue that the TO modifications also burden Nexant staff, as technical managers and headquarters staff are required to process these changes, which is quite time consuming. (See below for further discussion of the sub-contracting mechanisms and the impact on program results.)

Composition of the Implementation Team

The diversity of the implementation team is both one of the biggest strengths and challenges regarding the overall management model. Having a large number of sub-contractors helped to ensure that PACE-D TA's implementation team had significant breadth and depth of expertise. This also removed some of the burden from Nexant to house all of the necessary technical staff in-house for a program with so many distinct components. It was described as a two-way street, with Nexant providing guidance and technical support, and sub-contractors contributing specific expertise, visibility, and networks. One sub-contractor argued that this overall model is really quite central to the whole purpose of PACE-D TA as a concept. *"The government of India cannot possibly deliver on these targets without international help. But not from an aid perspective. I mean this in a positive way; it's a global market and a global business. [PACE-D TA] can bring the global know-how to bear here, and that's what's tremendously exciting."*

However, many KIs felt that this led to programmatic resources being spread too thin, particularly for sub-contractors who brought to the team expertise not embedded within Nexant's full-time staff. In particular, four stakeholders felt that more funding was needed for experts with up-to-date knowledge or specific expertise in programmatic areas such as clean energy finance or the operation of utilities. As one GOI respondent said when speaking about a manual produced under the program, *"The standard that we wanted to maintain is compromised unfortunately because of funding issues... I believe [Nexant] should include quality in their procurement process. They should give more value to the efficiency and accuracy to the good standard of work, rather than just looking at the cost. That's my biggest issue. If they had hired a good expert who had lots of experience, then all of these issues would not have cropped up."*

Five KIs also argued that there was too little technical contribution from the American perspective to the TA process, and that their engagement lacked sufficient continuity to be effective. As one subcontractor remarked, *"We had these task orders that were intermittent. We would do one thing and then do nothing for a while. That doesn't make sense... You talk about maintaining momentum, but then you have these intermittent TOs, which makes it difficult. If we'd planned and then laid out a yearlong TO as part of a larger strategy, then I think a coherent line of work could have been accomplished."* Another respondent argued that the lack of consistent US engagement ran counter to intention of the PACE program as being a partnership between the two countries: *"Cross-border expertise can really help. A program like this should not be limited to only that country and its resources. It should be able to bring the best talent from wherever in the world."* This was actually echoed from a few of the TA recipients as well, who said that they would have wanted more significant and sustained engagement with the US experts who have practical experience with deployment. This was largely understood by respondents (and the evaluation team) to be a cost issue, rather than a perception on behalf of USAID or Nexant that the US-based sub-contractors were not providing quality input.

Finally, the evaluators also looked at team composition when exploring the gender sensitivity of PACE-D TA. Of the seven core programmatic staff at Nexant, two are female. While the evaluation team did not inquire as to the gender makeup of all of the institutions making up the implementation team, just four out of 25 KIs representing sub-contractors and local partner institutions were female. This gender imbalance is perhaps unsurprising, as respondents from across the stakeholder groups agreed that the energy sector in India is quite male-dominated, both in the public and private sectors. However, team selection can certainly have an effect on whether and how gender issues are integrated into a program. As one KI from a local partner remarked, *"I think it has to start from the top. You need someone with*

gender-sensitivity on the team and then it will percolate down. There also needs to be an organization on the ground focusing on gender considerations...Otherwise the gender component evaporates.” Across the board, very few sub-contractors were able to speak to their activities having a gender component or being gender sensitive, save for the institutions or local partners working on the microfinance support activities. Having a lack of embedded gender expertise may be considered an area of weakness for PACE-D TA, particularly given that gender equality is a significant priority for USAID and its desired development results.

Consistency of Senior Program Management

Respondents from across the implementation team agreed that staff turnover within Nexant and changes within the roster of sub-contractors caused delays and disruptions in the delivery of outputs and service. This resulted in periods of time when the implementation team lacked either certain technical expertise or sufficient management staff, or both. Below is a brief summary of the changes in KP positions that occurred in the program to date, as well as when the staffing change occurred and how long it took to onboard new personnel.³⁶ Note that four out of the five KP staff were replaced in the first 3.5 years of the program – all except the Communications Specialist.

Table 11: Senior Program Management Team

Staff Title	Timing of Transition	Duration of Transition
Chief of Party (COP)	10/2013 (Year 2)	3 months
Deputy Chief of Party, Energy Efficiency (DCOP, EE)	10/2013 (Year 2)	1-2 months
Deputy Chief of Party, Renewable Energy (DCOP, RE)	10/2012 (Year 1)	6-7 months
Monitoring & Evaluation Specialist	10/2015 (Year 4)	1 month

Given that these transitions coincided with annual work plan processes, these decisions to bring on new staff appear to have been based upon strategic management conversations between USAID and Nexant. While Nexant worked quickly to replace these staff when needed, KIs acknowledged that the gaps in management still caused some delays in implementation and placed a greater burden on the other technical staff members. As one GOI respondent remarked in describing Nexant’s management, “They respond, but because they have too many things on their plate, they are not able to give you full, undivided attention.”

Sub-Contracts and Ownership for Results

The evaluation team both heard and observed that the contracting mechanisms were focused on the specific tasks and deliverables assigned to each sub-contractor, and that these efforts were typically siloed, rather than integrated or understood within the context of the broader PACE-D TA program. This has two key implications.

First, the sub-contractors were primarily focused on the deliverables and tasks outlined in their TOs. This is not surprising, as these are the outputs for which they are held accountable. However, what appears to be missing is ownership on the part of sub-contractors for the outcomes of technical assistance, meaning the intermediate changes in knowledge, skills, attitudes, behavior, or institutional functioning that result from capacity building or institutional strengthening efforts. In fact, four sub-contractors felt that they did not have the flexibility or mandate in their contracts to engage in the kind

³⁶ The data presented about IP staff turnover were obtained from quarterly reports and verified through KIs with current Nexant staff.

of follow up necessary to see whether they were having these kinds of results, even if they had interest in doing so. As one sub-contractor stated, *“Working day and night, you spend half a million dollars on a report, but at the end of it, people aren’t even acknowledging that it’s a good report or if it’s being used...I have no idea whether the best practices are being implemented. This should come from USAID and Nexant. We should have some feedback and then share this learning. This should be part of the contract.”* This has significant implications for programmatic sustainability, as another sub-contractor remarked: *“Normally, for all of our projects we have a 5-year project to make sure they stay on path and we do quarterly audits and annual reports to management to track progress and performance. This is in our DNA to ensure that projects succeed. For this project, though, we have no such arrangement after our contractual agreement is over, so there will be no accountability for this effort.”* The task-based structure also meant that sub-contractors did not always see how their activities and deliverables contributed to the program’s higher-level results. Roughly half of the sub-contractors said that it was difficult to reconcile the relationship between producing a policy document on one hand and contributing to the impact-level targets of reducing GHG emissions on the other.

The second key challenge related to the sub-contractors’ delineation of tasks was that their efforts appeared to be somewhat siloed, rather than treated as mutually reinforcing. A number of sub-contractors were eager for more collaboration across program components and CLINs, particularly between CLINs 1 and 2. As one sub-contractor remarked, *“Everything in PACE-D connects. If you want to improve building efficiency, for example, you need to look at RE, EE, smart grids, etc. But these were all distinct pieces in the PACE-D program.”* Another respondent said, *“PACE-D has a potential role here for promoting an integrated view of development that looks from a very practical perspective at what can be done. It’s based on actual deployment, not only theoretical...but it’s all very disjointed and needs to be more integrated...I don’t know where the compartmentalization is coming from; it’s part of the design maybe. But this is a constraint.”* While there is evidence of overlap in the cases of pilots having both RE and EE components, such as the NZEB pilot at Nalanda University, there could be even more opportunities for holistic integration if sub-contractors better understood how their tasks contribute to the broader goals of PACE-D TA.

Conclusions

The evaluation team found that program management was relatively effective in terms of achieving the deliverables outlined in the PACE-D TA contract. The IP and sub-contractors demonstrated high commitment to producing the desired outputs. They also pursued the key program activities in a highly collaborative manner, which appeared to leverage the partners’ strengths and contribute to the quality of deliverables. However, the nature of the contracting mechanisms meant that few sub-contractors were held accountable for delivering on program outcomes. The evaluation team feels that in particular may limit the program’s potential contribution to changes in individual and institutional capacity – bedrocks of the program approach and the core of its potential for sustainability.

There were also a number of administrative challenges that hindered implementation and may have affected results. Turnover within Nexant key personnel was significant, particularly during the program’s first two years. Also, the fact that many of the sub-contractors, particularly the international experts, were only intermittently engaged meant that it was difficult for the program to maintain momentum and provide the degree of hand-holding desired by TA recipients. These factors contributed to the recurrent theme of PACE-D TA being characterized by intermittent action and progress. One other stakeholder commented, *“I feel the program suffers from a MAFA complex – mistaking action for accomplishment.”* While just one person’s perspective, it highlights the need to look beyond the tangible deliverables like reports and white papers to really understand how and whether the program is affecting meaningful changes in the enabling environment that will facilitate market deployment. Making sure that sub-contractors not only understand, but feel responsible for all of the steps in this results chain, from outputs to impact, may help facilitate not just more and better data, but more continuous progress towards results.

3.2: How Effective are PACE-D TA Planning, Management/Accountability, and Monitoring Structures and Processes?

The evaluation team investigated this question by inquiring into its component pieces, looking at planning, particularly the annual work plan process; management and accountability structures, as well as the Secretariat function and coordination within the US interagency; and program monitoring and evaluation systems.

Findings

Program Planning

According to many KIs, planning processes were systematized and involved a great deal of consultation within the implementation team, as well as with the key USAID and GOI stakeholders. Nexant in particular viewed their annual work plans as living documents that they could refer to when making decisions. As one Nexant employee explained, *“We did the background research, preparation, and engagement in the first two years. In the third year we could say that now we’ve done our homework and we’re ready to transition into action. But this year is a year of consolidation and replication. We found the activities that have failed or exceeded expectations - we take those and embed them in the annual work plan to replicate it and try to achieve the targets... It’s all linked; it’s not a one-time exercise.”*

A practical challenge from Nexant’s perspective was the length of time it takes to go through the actual work plan process in order to take into account the input of so many stakeholders and receive the necessary approvals. This is not necessarily a criticism, but rather a reflection of the reality of implementing a program that has to respond to so many diverse needs and interests. The evaluation team heard and observed that planning processes (and implementation generally) were affected by the high rates of turnover within institutions like the national and state agencies. This was highlighted by KIs from the implementation team and also acknowledged by the agencies themselves. When key individuals shift in and out of positions within the Ministries or state agencies, understanding of and commitment to the program fluctuates, and priorities change. This certainly has implications for program planning, and it also leads to a lack of continuity in guidance provided by the participating government institutions. This is in part a structural challenge, as many of the more senior members from the bilateral partners meet only infrequently (such as through biannual PAC meetings), and because there are often different GOI representatives involved in each subsequent meeting. This lack of consistent leadership appears to have translated into very limited ownership of the program from the part of the bilateral partners in particular.

This raises a significant question for the implementation team regarding the ultimate client of the program. A number of the respondents said that they felt pulled in two directions between responding to the proscribed tasks assigned by the PACE-D TA Program Management, while also wanting the flexibility to be responsive to the needs and priorities of the national and state agencies. In other words, should the IP and sub-contractors be more focused on meeting the priorities of USAID, to whom they have contractual obligations, or the institutions receiving the TA, who are the intended beneficiaries of the program? One Nexant employee argued that flexibility in the contract and its deliverables is critical: *“We always have the belief that this is a bilateral agreement. It can’t be fixed purely to the contract because it has to be responsive to changes in priorities.”* This tension occasionally meant that resources (be they human or financial) were expended on activities or deliverables that were requested by one of the national or state agencies, but either fell outside of the scope of PACE-D TA or did not contribute directly or meaningfully to program results or targets. As one sub-contractor said, *“One would have loved a little more progress, but we have to adjust to the pace of the government of India, the state utilities, etc. They have their own absorption capacity that we have to recognize.”*

Management and Accountability Structures

On the whole, the ET found that the management structures for the implementation team were relatively strong. The roles and responsibilities ascribed to program managers within Nexant were clear. Further, the sub-contracts and TOs provided relatively explicit information as to what sub-contractors would be held accountable for doing and producing in terms of activities and outputs. Perhaps the biggest structural challenge identified by program stakeholders was that the management team was under-resourced, particularly in terms of staff. KIs from across the stakeholder groups (but particularly from within Nexant) noted in particular that too few resources were dedicated to outreach, M&E, and basic administrative staff. Nexant KIs and a number of sub-contractors felt that more support staff to do backstopping could have sped up financial and procurement processes, which would reduce administrative burdens on the IP's technical staff and ensure greater fidelity to program timelines. Similarly, having additional M&E personnel could have facilitated more learning and reflection, rather than just primarily serving to request data to feed into periodic reports. As a Nexant staffer remarked, *"If an M&E person goes to sub-contractors monthly, quarterly, annually, and only to solicit information, this is not as good as if you're engaged more directly and consistently."*

Further, having only one key personnel position devoted to outreach, partnerships, and media engagement appeared insufficient. In fact, a quarterly report from June 2013 said that the Communications Specialist was serving 50 percent of the time as a Finance Specialist, meaning that even fewer resources were devoted to these core functions. Respondents (from Nexant, sub-contractors, and USAID, as well as from interagency respondents) said that the most important implication of this is that too few people know about PACE-D TA. As a State Department staffer working on another component of the broader PACE program remarked, *"People will ask us, 'Why isn't the USG doing anything on energy issues?' And you just want to bang your head on the table because there are all sorts of efforts underway. It's not necessarily a fault of the program or the GOI, but India is a big country and it's sometimes hard to rise above the noise. This is a really common comment."* This does not just mean a lack of knowledge among the general public in India, but even among key stakeholders within the participating institutions.

Secretariat Function & Coordination within the US Interagency

The Secretariat function is a key part of CLIN 4 and reflects another opportunity to improve awareness of the program among key external stakeholders within the interagency and to create chances for collaboration. KIs offer a degree of conflicting feedback on the utility of the PACE Secretariat, with people internal to the program saying that it has not lived up to its potential and did not leverage field-level collaboration that benefited the PACE-D TA program, and a number of respondents from the US interagency saying it was in fact a model for the whole of government approach and very informative. The biggest criticism from the IP side was that it felt like another reporting mechanism whereby a handful of people sit together periodically to talk about what they have done, rather than identify opportunities to work together. Given the significant overlap in portfolios between PACE-D TA and the efforts on the part of the DOE or OPIC to support energy sector development or access to clean energy finance, there ought to be further evidence of ground-level collaboration. Referring to Nexant, one interagency KI said, *"They've taken on the annual reports and we're tremendously grateful to them – we wouldn't be able to tell this story without this. They've also tried in years past to have one-pagers of key highlights from overall PACE. To their credit, they've done those things. But we haven't maximized the potential of a Secretariat to be a champion for PACE overall."*

The good news is that this function of facilitating engagement across the whole PACE initiative is seen as necessary and useful, which means that the Secretariat could be strengthened going forward. As another interagency actor remarked, *"The curse and challenge throughout is understanding whether we have a program that is the sum of its parts, greater than the sum of its parts, or somehow mathematically less than the sum of its parts."*

Program Monitoring & Evaluation

Finally, a review of program documents reflected that M&E systems³⁷ are largely centered on indicators at the output-level (e.g. specific deliverables, person-hours of training) or at the impact level (e.g. energy savings due to EE/conservation projects). What are missing are process and outcome indicators to track: 1) changes in institutional capacity, 2) the utility of capacity building, and 3) changes in the so-called enabling environment. Even where there are indicators that reference these outcomes, there are not actual means and methods described for how PACE-D TA will track changes in institutional capacity, for example. For example, *“Number of institutions with improved capacity to address climate change issues as a result of USG assistance” is served by counting the number of partnerships established. However, this does not serve as a means to systematically measure changes in technical, operational, or human capacity over time. Also, while the program’s M&E plan does include some limited assessment of most indicators’ relevance to gender, very little gender-specific data is being collected aside from disaggregating “person hours of training.”*

Further, having a focus on impact-level indicators creates a disconnect in terms of the timeframe of program activities and when the ultimate results will actually be achieved. While the program certainly wants to be able to reflect potential energy savings as a direct result of EE or RE activities, the reality is that actual deployment and results may be a few years off. One sub-contractor stated it simply: *“The timelines of the pilots do not correspond with the timeline of PACE-D.”* In other words, pilot targets will be achieved after the life of the PACE-D project. Tracking intermediate progress markers will help better reflect the good work that is being done to create the environment for change so that the story is not that the progress towards the program targets is 0 percent or 2 percent, but that these other important processes and relationships are being built in the background that are not being systematically captured. As one USAID KI remarked, *“If we go for a policy intervention, we need to know the intermediate steps. Are we acting on all of the enabling requirements for that policy to be successful going forward? Or are we just focusing on producing the policy itself?”*

Finally, one of the implications of the M&E data being at the output and impact levels is that there appears to be too little data available to feed into operational program planning, management, and decision-making. In speaking about M&E data, one Nexant KI said the following: *“We tried to use it three ways: 1) to create quarterly progress updates so that we can see if there are deviations from the annual work plans; 2) to identify interim changes and immediate reactions needed; and 3) to gauge overall performance.”* However, the evaluators saw relatively little data that could really inform the types of intermediate reactions referred to here. While there is indeed evidence of adaptive implementation, this appears to rely more on the fact that the senior IP staff are directly involved in day-to-day activities and have strong relationships with their program partners. Certainly this is critical, but effective management could be made easier and more efficient if the data were available for more evidence-based decision-making.

Conclusions

In reviewing program documents and speaking to a wide range of stakeholders from across the implementation team, each of these management processes were perceived as necessary and showed some significant signs of effectiveness. However, these could have been better leveraged and resourced. In particular, annual planning processes are systematic and seen as deeply consultative, but are perhaps not sufficient for ensuring that the implementation team had consistent guidance and a clear sense of GOI priorities. The nature and frequency of GOI engagement through other outreach means was similarly episodic, resulting in limited ownership on the part of the bilateral partners.

³⁷ Note that the M&E Plan covering the period under review for this evaluation (June 2012-September 2015) was revised in late 2015 and is currently in the USAID approval process. For the purpose of this analysis, only the original M&E Plan was considered.

Recognizing that there is significant turnover within GOI bodies and public institutions, and also that these actors have so many different priorities and tasks (particularly at the state level), continual engagement through a strategic and resourced outreach strategy is needed to maintain momentum and interest in the program. As an interagency stakeholder suggested, *“We need to have clear, distinct products to distribute about PACE – even within the Ministries or utilities – that explain the program’s goal, activities, progress, etc. This would be useful even at the senior levels. The thing is, these institutions are so big, but only one or two people actually know about it.”*

With a program this complex and of such a high profile, these functions need to be priorities so as to sustain buy in and momentum, as well as to improve operational efficiency. While Nexant should maybe have foreseen the need to set aside more resources for core staff during the program design phase, USAID as well could have acknowledged that PACE-D TA would require a sufficient budget for more back-end personnel and provided this feedback to the IP prior to or in the early stages of implementation. The Secretariat function also reflects a huge opportunity for convening experts, networks, and resources in the clean energy sector. While it is being used relatively effectively for internal information-sharing within the US interagency, it is not clear that this is having significant impact on programming on the ground. Further, even key program stakeholders still have insufficient understanding of PACE-D TA and its relationship to the broader PACE program. This is certainly a potentially valuable model for pursuing a whole-of-government approach to common goals, so further discussion and strategic thought should be devoted to forging a clear mandate and making this mechanism as effective as possible.

General Conclusions for Question 3

Many of the program stakeholders viewed the PACE-D TA program model and management structure as both appropriate and necessary in that it sought to leverage the best knowledge and expertise from within the US and India to work towards outcomes in individual capacity, institutional strengthening, and access to finance that will serve as building blocks for India’s growing clean energy sector. However, the evaluation team found that there are a number of challenges in program execution that have limited programmatic effectiveness to date. These are not necessarily critiques of the management model per se, but a reflection of the incredible complexity of a program trying to do many tasks with relatively limited resources.

The core strength of the management structure was that it enabled PACE-D TA to create a roster of technical experts from across the key technical areas/CLINs and the cross-cutting practice areas of institutional strengthening, capacity building, and clean energy finance (though some gaps remain, as described earlier in this report). Given the wide variety of stakeholders and activities, it appears to have been beneficial that a single institution was able to provide oversight and guidance with a perspective towards the program as a whole. However, this created tension between Nexant’s management and technical responsibilities, with the more functional and administrative roles receiving fewer resources than were needed. An interest in cost-effectiveness appears to also be the reason that relatively little time was set aside for direct engagement between TA recipients and US-based technical experts, a key pillar of the program model.

While sub-contractors across the board do appear committed to producing the program deliverables, the periodic nature of their engagement at times proved insufficient to generate meaningful, sustainable outcomes that will serve as the basis for longer-term results like reductions in GHG emissions. USAID and its implementation team would do well to use the final year of implementation to reflect on the model and identify opportunities to build momentum for ongoing progress, including by further engaging and empowering key stakeholders (such as local anchor institutions or US-based technical experts), as well as considering how to more systematically monitor the program’s effect on the enabling environment in order to inform more strategic decision making going forward.

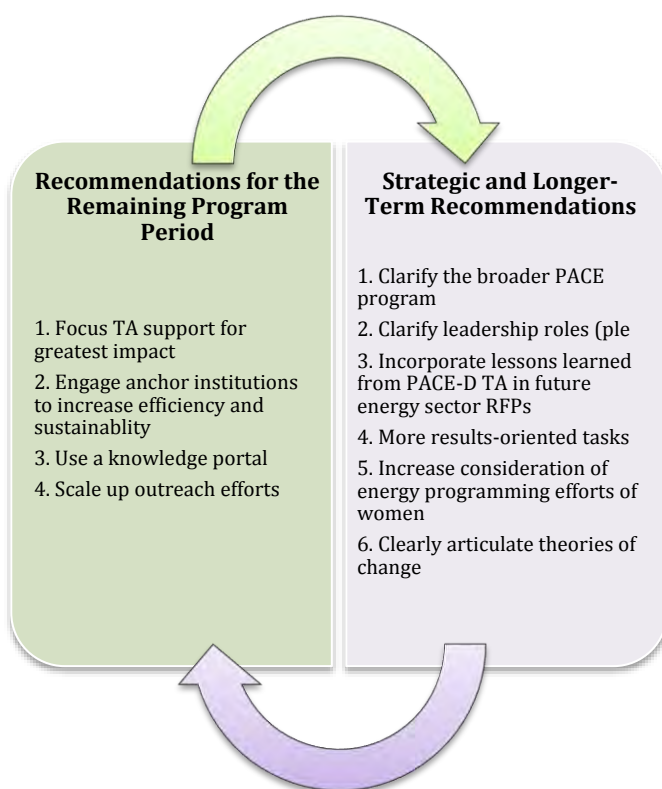
RECOMMENDATIONS

Recommendations resulting from analysis of all three evaluation questions are included in this section. The ET has generated recommendations for the remaining period of performance (POP), with an emphasis on strategic engagement, which is relevant to present and future programming in the clean energy sector in India. The ET developed these recommendations both based on associated conclusions per evaluation question and also specific recommendations noted by respondents.

Figure 6 depicts the key recommendations for PACE-D TA (until June 2017) and beyond, with an emphasis on the relatedness of present strategic direction the program on future planning and programming. These areas of recommendations are further explained below.

For each recommendation presented, the ET has provided an executor of the recommendation and also identified the link between the recommendation and the associated evaluation question.

Figure 6: Recommendations for PACE-D TA Remaining POP



RECOMMENDATIONS FOR THE REMAINING PERIOD OF PERFORMANCE

The ET has identified four core areas where USAID/India and the PACE-D TA implementation team can focus their efforts in the remaining period of performance to enhance the likelihood of achieving intended results and promoting sustainability of current achieved results.

1) Identify specific initiatives and institutions that will benefit most from focused TA support in the final year of implementation (Q1 and Q2)

The ET considers the following to be particularly important opportunities to achieve significant results:

- **USAID** and **PACE-D TA** should continue working with BEE and other relevant actors to finalize the drafting and approval of the ECBC 2015. This will require developing, testing, and

implementing a road map that includes clear benchmarks, roles and responsibilities, and processes capable of being replicated each time revisions to the building code are needed.

- **PACE-D TA** should redouble efforts to build the capacity of state actors and DISCOMs in Haryana (like EESL, the super ESCO) to implement DSM. Strengthening DSM cells in DISCOMs may be achieved through establishing a task force to guide state actors in a rollout of DSM programs and to sustain PACE-D TA momentum.
- **USAID** should encourage its bilateral partners to identify institutions, states, and/or thematic areas where additional institutional strengthening is needed beyond the lifetime of PACE-D TA so that the MOP and MNRE can clearly define their priorities for future programming.

2) Engage anchor institutions to increase efficiency and sustainability (Q1)

Related to the recommendation above, **USAID** and **PACE-D TA** need to select specific anchor institutions and/or partners who have capability as well as motivation to employ a suitable strategy for sustainability, and commitment to scalability of the main program components. Tools and techniques developed need to be handed over to an anchor institution identified by USAID, in consultation with MNRE.

- An example of how to effectively engage anchor institutions is with the solar roof top component. PACE-D TA is seeking partnerships jointly with the state nodal agencies in the target states. This will improve the uptake of EE and RE deliverables and better ensure that the efforts are adequately supported by USAID, MNRE, and allied organizations. Potential areas to support solar roof top programs through engagement with anchor institutions may include the following:
 - Development of a tripartite agreement for state DISCOMs for enabling direct payment to third-party solar rooftop developers.
 - Developing an implementation framework for city-wide solar rooftop projects and providing technical assistance to RRECL for implementing its first state pilot.
 - Developing a standardized training toolkit and a roll out of regional utilities training program for building the capacity of state utilities for implementing solar rooftop projects. This includes the development of both a five-day and 1.5-day training program for utilities regarding deployment of solar rooftop in collaboration with the SETNET partners.
- Another example of engaging anchor institutions is with banks' and NBFCs' experiences in leveraging debt instruments towards EE and RE projects. This may be delivered as technical capacity building for the financing officers in banks to assess and approve the technical reports of projects for energy financing/lending.
 - Green rating of solar roof top projects is expected to facilitate solar rooftop financing and this needs to be widely disseminated. Four rating agencies are engaged to evolve a framework for risk assessment for solar roof top projects. This will facilitate, providing green rating to the roof top proposals based on the data captured in loan applications. The benefit of this exercise is to develop the confidence of IREDA, banks and FIs who are new to lending for the solar roof top projects to reduce the process time and improve the accuracy of the loan appraisal. Based on the developed framework, IREDA, commercial banks, NBFCs will be able to quickly assess the roof top projects and this will help develop a pipeline of bankable proposals.

3) Develop and promote the use of a knowledge portal among TA recipients and program partners to facilitate the sharing of lessons learned and generate more effective results (Q1 and Q2)

- The knowledge portal can be integrated within the existing **PACE-D TA** website with the aim to capture and share critical learning in areas like policy development and implementation, training, building partnerships, and accessing CE finance. The portal can, therefore, be managed by the program's website host and manager with programmatic inputs provided from PACE-D TA leadership. In addition to the technical documents produced under PACE-D TA, the platform could in the longer term serve as a clearinghouse for additional practical resources for the EE, RE, and CF sectors. The portal may be designed to allow public access to select project reports and project outcomes, while specific programmatic information may be password protected for the selected partner institutions. Program stakeholders would be encouraged to share lessons learned and success stories, which is invaluable information for counterparts in other institutions and states that are undertaking similar efforts. Over time, this platform could be taken over by the MOP and/or MNRE to ensure its sustainability and reach.
- In the last year of the program, **PACE-D TA** should designate staff or individuals from partner institutions to regularly update the portal and encourage its use in the development of relevant projects in the states (with support from the state coordinators). If needed, the IP can designate an information architecture expert to design the appropriate structure of the portal in dialogue with relevant stakeholders as part of preparation for the legacy of the TA. The portal can provide a linkage to relevant tools and techniques for anchor organizations – such as BEE, SETNET, NSGM, and Indian Institution of Banking – in consultation with MOP, MNRE and USAID for the beneficiaries. The integrated information architecture and outreach to relevant partners and anchor institutions will need to occur at least six months before the end of the program in order to maximize visibility, use, and effectiveness.

4) Scale-up outreach efforts towards the core program partners as well as to all the relevant actors that make up the enabling environment for clean energy deployment (Q3)

- **PACE-D TA** should review and, if necessary, improve the outreach and communications strategy for the final year of implementation, particularly regarding outreach to key local stakeholders. As part of this, PACE-D TA should increase the frequency of direct government-to-government outreach to raise awareness about PACE-D TA within targeted GOI institutions and encourage buy-in for the continuation of successful aspects of the program either under MOP/MNRE or future USAID initiatives. The state coordinators have played an important role in selected states where they were active. PACE-D TA should also clarify an explicit outreach mandate for state coordinators for the remaining year of programming, which may require additional resources and support.
- **PACE-D TA** success in solar roof top PV with IOCL and IR can be solidified by publishing a good practice manual, which could serve a number of purposes from generating more interest across India towards replication and scalability to capturing international interest towards soliciting financing. This is especially relevant as the PACE-D TA is continuing the facilitation of contracting, business models, and joint venture structures.

STRATEGIC AND LONGER-TERM RECOMMENDATIONS

The evaluation team has made six long-term recommendations below regarding PACE as an overall program, future contracting of energy programs in India, results-oriented energy programming, and energy program models. These recommendations are largely for **USAID** consideration, as they highlight lessons learned from the implementation of PACE-D TA and recommendations mentioned by key informants during data collection in India.

1) Clarify the broader PACE program for both program partners and the general public through outreach and communication (Q3)

- Given the high-level, bilateral nature of the program, PACE is not very well understood by many of its own direct stakeholders or the general public. USAID should make more explicit the broader vision of PACE and the goals of all the components, including PACE-D, PACE-R, and PEACE. Currently, clear goals for PACE as a whole are missing, and respondents noted concern that the components under PACE-D TA may only have short-term result horizons and little sustainability in this context if treated as a stand-alone initiative.
- The Interagency can take a lead in developing a PACE website (uniquely separate from the PACE-D TA knowledge portal recommended above) that can be a first point of entry and reference for information about the overall program, as well as each of its sub-initiatives (including PACE-D TA). If considered important and timely, this initiative can be pursued in the remaining period of performance for PACE-D TA. USAID could also consider disseminating clear guidance on the overall PACE program at government coordination events or appropriate fora where government-to-government collaboration and coordination occurs. Additionally, the tool used by USAID to establish partnerships, the memorandum of understanding (MOU), especially for bilateral and state partners, could be a more visible and actionable tool, with the aim to enable a system that makes the PACE program development visible, understandable and interesting to any new official or program manager.

2) Clarify the leadership roles of the Program Advisory Committee and the PACE Secretariat, and empower members to have greater investment in program activities (Q3)

- The PAC should meet with greater regularity – at least once every quarter – to take stock of the ongoing activities and provide guidance to additional initiatives being planned or considered. As best as possible, the same representatives from each institution should be encouraged to attend each of these meetings to ensure greater continuity and shared expectations.
- USAID and its interagency counterparts must define a clearer mandate for the PACE Secretariat function both within and beyond the end of PACE-D TA. USAID should convene the relevant agencies for an After Action Review to identify which aspects of the Secretariat are working well and why, and which opportunities are not being sufficiently leveraged. The IP should continue its existing reporting and meeting facilitation responsibilities for the remainder of the PACE-D TA program, but it will be important to identify who will maintain these (and other) roles going forward, given that important components of PACE-D, PACE-R, and PEACE will remain underway after June 2017. Continuing this function will mean identifying the core purpose(s) of the coordination and designating clear roles and responsibilities going forward.
- The Secretariat may want to consider holding one or more of its interagency meetings in one of PACE-D TA's target states during year five so that USG stakeholders can better see and understand the results being achieved by activities and pilots on the ground. This would also present a valuable opportunity for leveraging media interest in the program. Each of these specific recommendations will help empower members to have greater investment in program activities.

3) Incorporate lessons learned from PACE-D TA in developing future energy sector RFPs (Q1 and Q2)

- Future programs that are bilateral in nature should have roles and responsibilities clearly outlined for all strategic planning, day-to-day management, and budgeting. A formal Program Management Unit (PMU) with the consistent participation of the bilateral institutions could be established within the program structure so that guidance and ownership on the part of the local ministries is more strategic.
- In developing future contracts, USAID should ensure that sufficient administrative and

management staff is budgeted within the implementation team, particularly in the areas of finance, outreach, and M&E. Building these responsibilities into the roles of senior technical staff is less effective and efficient in the long run than having capable, dedicated staff for these specific tasks. Additionally, using field-based IP staff to serve as facilitators throughout the process can contribute greater continuity to TA-focused interventions at the sub-national level.

- More strategic actionable requirements for gender integration should be included in the RFPs for future energy programs to ensure that the programming takes into consideration the different needs and experiences of men and women in program design and implementation. These may include requirements that the program collaborates wherever possible with other concurrent gender programs; collects gender-disaggregated M&E data; engages in sufficient and targeted outreach in soliciting a diversity of program participants, including women; employs gender experts in the program design; or ensures implementation teams reflect gender equality principles in its makeup.
- While it is likely too late in the PACE-D TA program to integrate new indicators into the M&E plan or to collect retroactive baseline data, it is recommended to further refine performance monitoring systems to track key intermediate results, such as measurable changes in individual capacity of training participants or in the functioning of institutions receiving tailored support.
 - o For example, USAID and IP staff may be able to reflect during year five on what sorts of results from the capacity building and institutional strengthening components are visible and could be documented more systematically in advance of the final evaluation. The IP could also provide valuable insight as to what would be feasible and useful outcome and process indicators in future programming. For instance, conducting pre- and post-tests for training activities could be useful for capturing changes in individual knowledge. Employing a method like an Organizational Capacity Assessment Tool (OCAT)³⁸ could be used to identify changes in institutional functioning related to TA. Creating a policy development assessment tool could be useful for program stakeholders to track obstacles in the process, the presence of leadership for implementation, changes in the political or energy context, resource mobilization, etc. These sorts of data could in the future inform more efficient and targeted decision-making among implementers and provide USAID with a clearer and more real-time picture of program results on the ground.

4) Shift to results-oriented tasks in EE and RE programming (Q2)

- As defined in recommendation 2, a PMU could better harmonize efforts between USAID and bilateral organizations towards shared goals and results-oriented programmatic tasks. **USAID** should place more focus on programs, which are market-oriented with higher scalability and sustainability. An emphasis towards further systemic integration and deployment of EE and RE programs with market ready actors such as Indian Railways and IOCL will contribute to verifiable energy/GHG emissions using existing market forces.

³⁸ An OCAT is a facilitated or self-administered tool to help institutions identify their strengths, weaknesses, and opportunities for growth. It can be used diagnostically or purely for M&E assessment purposes, or can serve as an iterative and ongoing reference point for a capacity building intervention. See the following resources for examples of OCATs from the Marguerite Casey Foundation (<http://caseygrants.org/resources/org-capacity-assessment/>) and from USAID (<https://www.usaid.gov/sites/default/files/documents/1864/OCA%20Tool%20for%20USAID-Funded%20Organizations%20Facilitators%20Copy.pdf>).

- USAID can better balance energy savings activities and commitments with deployment tasks that yield measureable results. Programs should emphasize a shift from producing policy papers to more targeted facilitation and pursuit of market-oriented activities that may be realized in the context of prevailing policies and market conditions.
- As an example of market-oriented TA, USAID may consider continuing its support to IOCL regarding preparation towards future mobility, readiness for plug-ins, and storage capacity. IOCL seeks more technological as well as TA support and engagement with USAID and other stakeholders for relevant future technologies and opportunities like electrical transportation, batteries, energy storage, RE charging stations, and second and third generation biofuels.

5) Increase consideration of energy programming impacts on women and better target the inclusion of women in activities and pilots (Q1)

- Establish a partnership with ongoing gender and energy programs such as wPower, with semi-annual update meetings.
- Ensure active participation of relevant gender group representatives at outreach events by designating them a more active role, such as a presentation/speech at the event.
- Some examples for integration of lessons learned can be found in organizations such as Energia – International Network on Gender and Energy (www.energia.org).

6) Streamline program models and clearly articulate theories of change (Q1, Q2, and Q3)

- The ET recommends that USAID/India and the IP develop a clear theory of change for PACE-D TA and future programs that are linked to verifiable performance indicators. The PACE-D TA program does not currently have a single clear articulation of its program model or theory of change that is used consistently across the implementation team or program outreach materials. As a result, there are also few, if any, M&E structures in place to demonstrate whether and how program activities contribute to changes in the “enabling environment” for scaling up clean energy deployment, which is the ultimate purpose of PACE-D TA. The following graphic, **Figure 7**, is one potential way of visualizing the PACE-D TA program model and theory of change.
 1. The **Inputs** (pictured at the upper left corner of the Figure) to the program are the financial resources, expertise, and networks provided by USAID, the bilateral partners, the IP, and other members of the implementation team.
 2. The **Activities** are the cross-cutting activity areas of the program’s TA, including: Policy Support, Institutional Strengthening, Capacity Building, Finance, Pilots, and Partnerships.
 3. The direct and indirect **Beneficiaries** of the program include the recipients of TA, as well as the wide range of actors that have a stake in the development results.
 4. The **Outputs** of the TA refer to the policy documents, reports, technical content, outreach mechanisms, and individuals and institutions reached through capacity building efforts.
 5. The **Outcomes** of the TA are the observable changes in the participating individuals and institutions (e.g. changes in knowledge, skills, behavior, networks, functioning). These outcomes are necessary preconditions for affecting changes in the enabling environment and achieving the program’s longer-term results.
 6. The **Impacts** of the overall program are the results that the program ultimately hopes to contribute to, but that may only be visible after the end of the intervention. For PACE-D TA, these might include the cumulative GHG emissions reductions or energy

savings that will be visible if current efforts in EE, RE, and CF are sustained over time.

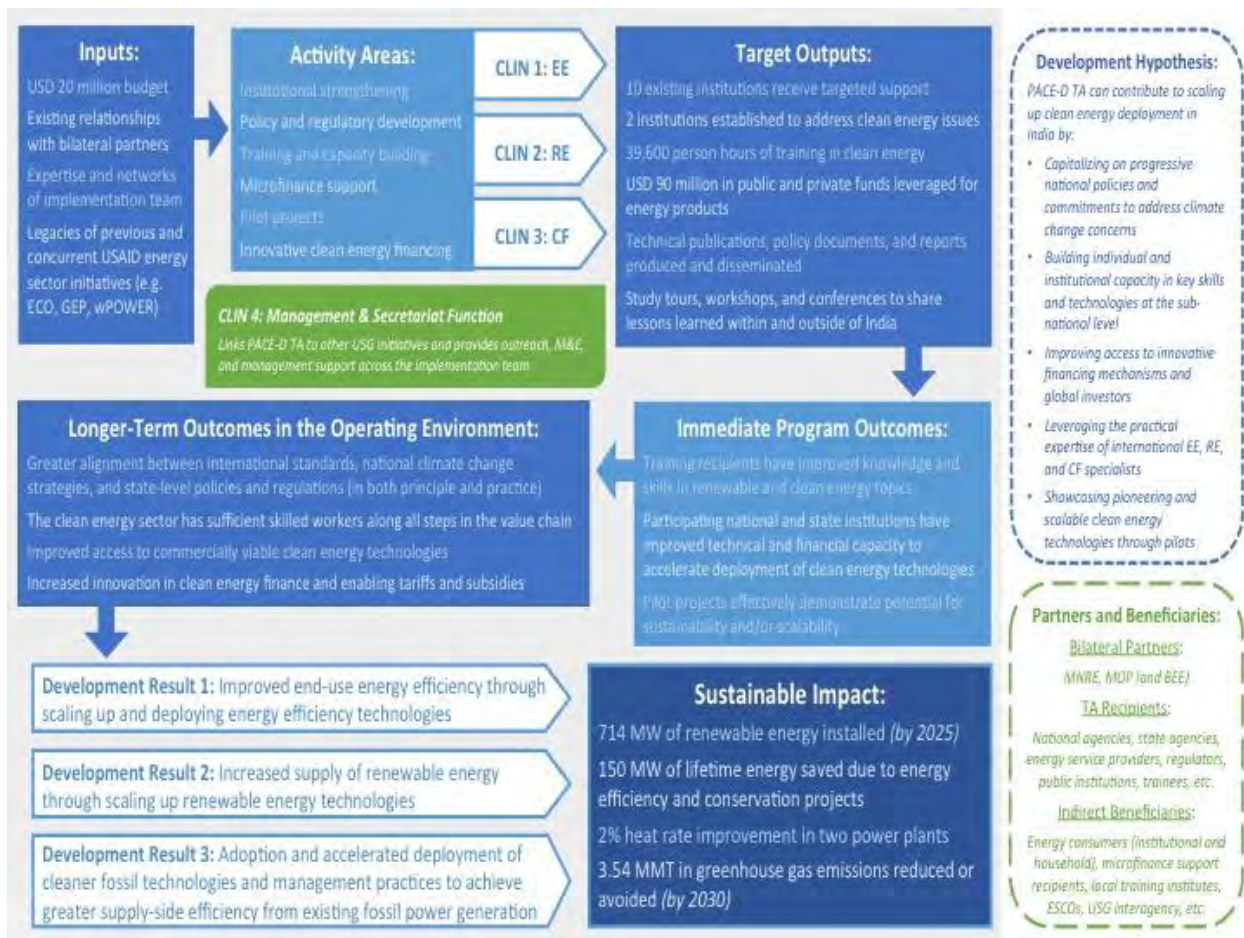
By developing a system to gather feedback from program stakeholders on monitoring and managing the change process as proposed in **Figure 7**, with the goal for informing strategic decision-making and implementing corrective action, individual program results may be observed while keeping in view the holistic approach for the entire program.

This graphic is based on the best available information from program documents (including PACE-D TA brochures and program materials, Nexant's in-briefing presentation, the M&E plan, etc.). ET own expertise in program design and evaluation was used to elucidate some of the intervening steps in the logic model that were not clearly articulated in program documents, but came up in our KIIs. These include the immediate program outcomes and outcomes related to the operating environment, both of which are critical to understanding how program activities and outputs are contributing to the program's longer-term objectives, such as GHG emissions. Without clearly articulating these intermediate steps it's much more difficult for implementers, partners, and final beneficiaries to see the link between activities and impact

Developing a clear theory of change (TOC) is useful in the following basis: (I) It orients the program design around what it intends to achieve (desired results), rather than around what the implementers will do (activities). Ideally this results in more effective and targeted program designs. (II) The donor, IP, and other key stakeholders are more likely to have a common understanding of what the program is all about if there is a shared ToC, reducing confusion and different expectations. (III) If all of the key stakeholders are able to clearly and concisely describe the purpose and logic of the program, they will also be more effective when communicating about it to outside parties, including prospective partners, members of the public, the media, etc.

Finally, it useful and recommended to engage in developing TOC, especially as it's also an iterative process that requires ongoing reflection throughout the program cycle to see if the program is progressing as planned, if there are any unintended results not captured in the TOC, or if any activities/results should be either scaled up or down. Both the donor and implementer need to work together, with feedback from other members of the implementation team and bilateral institutions to ensure the results are on targeted outputs and immediate outputs are aligned and desired results achieved.

Figure 7: Example Theory of Change for PACE-D TA³⁹



³⁹ The process of tracking PACE-D TA progress is complicated by the fact that there are so many different members of the implementation team contributing to program results, as well as a variety of other programs in India that are pursuing similar aims. Therefore, it's hard to determine contribution.

ANNEXES

ANNEX I – STATEMENT OF WORK

SECTION C – DESCRIPTION / SPECIFICATIONS/STATEMENT OF WORK

Mid-term Evaluation of Partnership to Advance Clean Energy - Deployment (PACE-D) Technical Assistance Program

I. PROGRAM INFORMATION

- a. **Program Title:** Partnership to Advance Clean Energy- Deployment Technical Assistance (PACE-D TA) Program
- b. **Start-End Dates:** May 31, 2012 - May 30, 2017
- c. **Budget:** \$19.50 Million
- d. **Program Description:**

Partnership to Advance Clean Energy (PACE) is the flagship program on clean energy between the U.S. and India to jointly work on a range of issues related to energy security, clean energy and climate change. PACE seeks to accelerate inclusive, low-carbon growth by supporting research and deployment of clean energy technologies and policies. PACE combines the efforts of several government and non-government stakeholders on both the U.S. and Indian sides and includes three key components: Research (PACE-R), Deployment (PACE-D), and Off-Grid Energy Access (PEACE).

USAID has the lead in the design, planning, preparation and the implementation of PACE-D Technical Assistance (TA) program in consultation with The Government of India (GOI) and is supported by The United States Government (USG) interagency teams in New Delhi and Washington.

The PACE-D TA Program focuses on deployment of energy efficiency (EE), renewable energy (RE) and cleaner fossil technologies, with cross cutting activities on institutional strengthening, capacity building and training, and clean energy finance. The program work with policy makers, regulators, state agencies, private companies, investors, clean energy associations, and other stakeholders to create an enabling environment to increase the uptake of energy efficient and renewable energy technologies in India. The PACE-D TA program falls under the Development Objective (DO) 2 of USAID/India Country Development Cooperation Strategy (CDCS) that aims to 'accelerate India's transition to a high performing, low emissions and energy scarce economy.

The PACE-D TA Program focuses on three key USAID development results, including:

- *Development Result 1: Improved end-use energy efficiency by scaling the deployment of Energy Efficiency (EE) technologies.* It focuses on scaling up and deploying energy efficient technologies, especially smart grid, Net Zero Building, Waste Heat Utilization

and Heating Ventilation and Air Conditioning, etc. This will be achieved by strengthening regulatory and policy environment, increasing innovative financing, and building capacity to implement energy efficiency programs.

- *Development Result 2: Increased supply of Renewable Energy (RE) through scaling up and adoption of RE technologies.* The objective is to accelerate the deployment of RE technologies and to expand cost-effective RE technologies for communities not served by the national power grid. This will be achieved by enhancing the enabling environment, build institutional and human capacities to design and implement policies and programs, and improve access to finance, to bring down the costs and accelerate adoption of clean energy resources.
- *Development Result 3: Adoption and accelerated deployment of cleaner fossil (CF) technologies and management practices to achieve greater supply side efficiency from existing fossil power generation.* The focus is to provide support to two Indian utilities in improving heat rates in power plant performance and also to design and develop the concept of Model Power Plant and Service Provider Network.

In addition, PACE-D TA Program is expected to provide Other 'Activities and Management Support' to USAID through the following activities:

- Secretariat function – Coordination with other U.S. Agencies and programs on PACE-D TA Program Strategic planning, assessment and analysis
- Build partnerships between U.S. and Indian institutions
- Maximize the use of local partners and enhance their capacity

The PACE-D TA is implemented by Nexant, Inc. through Cost-Plus-Fixed-Fee (CPFF) completion-type contract. Nexant is supported by a consortium of Indian and U.S. companies to implement the various components of the program. The above mentioned three development results are the 3 Contract Line Item Numbers (CLINs) and the 4th CLIN focuses on other activities and management support.

This initiative is based on 2 bilateral agreements signed by the U.S. and India on energy efficiency technology commercialization and innovation with the Ministry of Power (MOP) as the line ministry, and a renewable energy technology commercialization and innovation with the Ministry of New & Renewable Energy (MNRE) as the line ministry.

Geographic Locations: The PACE-D program is implemented at the national level and in the states of Rajasthan and Karnataka (both EE and RE components); Madhya Pradesh (RE component); and Haryana (EE component). At the national level, the GOI Partners are the MOP, MNRE, Bureau of Energy Efficiency (BEE), Indian Smart Grid Task Force, Central Electricity Authority, National Thermal Power Corporation (NTPC) Ltd., and Solar Energy Corporation of India, National Institute of Solar Energy, Indian Renewable Energy Development Agency, and state energy departments / nodal agencies in the four states.

II- TASK ORDER STATEMENT OF WORK

a) Evaluation Purpose

The objective of this mid-term performance evaluation is to conduct a full and independent mid- term review of PACE-D TA program activities and results from May 2012 to December 2014. The evaluation

will identify the results achieved by -December 2014, identify implementation issues that need to be modified and provide specific recommendations for the final two years of the program. The evaluation will assess the implementation of the program in terms of 1) the quality and timeliness of the outputs 2) efficiency and effectiveness of the activities carried out, 3) progress towards or early indications of outcomes and impact achieved by the program and 4) the sustainability of program interventions. The extent of engagement with relevant stakeholders and beneficiaries, and collaboration amongst different partners will also be assessed.

More specifically, the evaluation will:

1. Review progress toward achieving the deliverables under CLIN 1, 2 and 4;
2. Assess the achievements/impacts and sustainability of the various initiatives undertaken under CLIN No. 3 which concluded on October 31, 2014;
3. Identify challenges and any unexpected obstacles to implementation, and evaluate how effectively the program has responded to those;
4. Identify areas/themes that have progressed well and the laggards in past years and suggest approaches/areas on what the program should focus on to improve effectiveness.
5. Assess the management practices, including quality and financial controls, adopted by this program in meeting the intended objectives;
6. Analyze the relationships between resources available, resources used, and results achieved to determine the specific cost effectiveness of USAID's programming in each objective/CLIN, as well as the program as a whole; and
7. Provide specific recommendations for the remaining period of the program.

b) Evaluation Questions:

This evaluation will answer the following questions:

- I. How effective has the PACE-D TA program been in achieving results? Specifically, the evaluation shall respond to the following sub-questions.
 - I.1. How effective has the program's technical assistance approach been in institutional strengthening, capacity building, and increasing access to finance for clean energy deployment?
 - I.2. How effective has the PACE-D TA program been in achieving results considering the resources expended?
 - I.3. How has participant training under USG supported PACE-D TA Program built capacity of partner institutions, including capacity of women members, to enhance market deployment of clean energy technologies?

2. How effective and efficient has the program been so far in supporting the development outcome of accelerating India's transition to low emissions energy secure economy? This shall be addressed within the following parameters:

- 2.1 What is the likelihood of achieving the expected results under each CLIN?
- 2.2 How successful was the implementation of CLIN 3 which concluded in October 31, 2014 and how sustainable are these efforts?
- 2.3 How sustainable and scalable different pilots proposed under the program are, considering the progress and remaining timeline?

3. How effective the program management has been in the areas of:

- 3.1 Effectiveness of the prime contractor in managing sub-contractors and level of ownership and commitment to results with the sub-contractors; and
- 3.2 Effectiveness of the PACE-D TA planning (annual work plans, PMP, M&E, and deliverables), management (timeliness and quality of deliverables), and monitoring (results vs. resources) structures and processes?

c) Intended Uses or Other Audiences for the Evaluation:

The primary intended user of this evaluation is USAID/India, particularly the Clean Energy and Environment Office (CLEEO) and Mission management. CLEEO will be particularly interested in the findings and recommendations concerning the performance of this program thus far; in order to plan accordingly for the remaining period of the program. USAID/India will use this evaluation to understand the progress taken place and where adjustments need to be made.

The Global Climate Change (GCC) bureau of USAID/Washington will use these findings to review the program performance and inform other state department agencies involved with other larger PACE initiatives. The secondary audience would be local institutions, other donors, and other USAID Missions worldwide. The next intended users are the MOP and MNRE, Government of India, the premier institutions dealing with energy efficiency and clean energy in India.

III- TECHNICAL REQUIREMENTS FOR EVALUATION

a) Evaluation Design And Methodology

The evaluators must consider a range of possible methods and approaches for collecting and analyzing the information which are required to address the evaluation questions. Data collection methodologies will be discussed with and approved by the TOCOR prior to the start of the assignment.

USAID/India requires a 'mixed method' evaluation methodology that would include both quantitative and qualitative approaches. The evaluators must also assess the performance of the program against the baselines set by the program for key indicators (Baseline report is available for the program). The evaluation will employ a variety of methods to collect data, including individual interviews, structured group discussions, document review, site visits, and secondary data review. The evaluation will address the key questions stated above and the specific methodology will be discussed at length and refined during the work plan phase.

Desk review of documents: USAID/India will provide the team with all relevant country and program specific documents including proposals, baseline report, program Monitoring & Evaluation plan (PMEP), progress reports, monitoring indicators and other relevant documents for conducting this desk review. The evaluation team must collect and collate relevant documents, reports, and data, and all team members must review these documents in preparation for the team planning meeting.

Data sources: Data sources that the team will utilize, review and analyze include the program design documents, program proposal, annual work plans, M&E data including relevant baseline information on program sub-components, and other program-related documents and reports. Additional relevant documents related to energy programming in India may be utilized as supporting documents, as well as relevant international standards. More information are available in the program Website- www.pace-d.com

Specific Tasks

Specific tasks to be undertaken by the evaluation team in carrying out the mid-term evaluation include, but not limited to:

- Review of the program's Contract documents.
- Review of all program reports and annual work plans.
- Review of baseline data, (baseline reports are available), Program Monitoring & Evaluation Plan (PMEP), targets and performance reports as provided in the quarterly reports.
- Review of the program's performance management plan (PMP).
- Review of USAID/India's Country Development Cooperation Strategy, the relevant Development Objective and PACE-D's role therein.
- An inbrief and outbrief with USAID/India's Mission Director, CLEEO, Program Office, and USAID's Contracting Officer's Representative (TOCOR) of the PACE-D TA Contract and other related USG representatives.
- Meetings and interviews with Nexant. Inc. staff and the Sub-contractors.
- Meetings and interviews with the GOI, donor and private-sector counterparts and partners.
- Meetings and interviews with associated institutions and other relevant stakeholders associated in the program in each region of the country.

b) Composition, Technical Qualifications and Experience Requirements of the Evaluation Team:

USAID requires a three-member evaluation team comprised of a Senior Evaluation Specialist, a Senior Energy Specialist, and an Energy Specialist. All team members must have extensive energy program management experience with a focus on technical or implementation experience, energy efficiency, renewable energy promotion and challenges and prior evaluation/assessment experience. The team will have collective experience in the Indian power sector, policy, implementation and knowledge about energy sector in India and latest developments in the field. USAID procurement reform promotes a development approach that maximizes the use of, and reliance on, local implementing partners and experts.

Senior Evaluation Specialist (Team Leader): The evaluation will be led by the "Team Leader" and supported by other subject matter experts. The Team Leader will be responsible for the overall implementation of the evaluation and ensuring that all expected tasks and deliverables are achieved on time and of high quality. S/he must have significant professional experience coordinating similarly complex evaluations, and leading evaluation teams. The candidate must have exceptional

organizational, analytical, writing and presentation skills. S/he must have deep knowledge of evaluation methodologies and their practical applications; data analysis skills and prior work experience in India is highly preferred. S/he must be fluent in English and must have a master's level degree with 12 years of technical experience in a relevant analytical field (e.g. energy efficiency, renewable energy, cleaner fossil, clean energy finance) although doctorate level credentials are preferred. S/he will oversee the overall design of the evaluation framework, including methodology determinations; organization of calendar/travel/meetings; overseeing the desk study, interviews, and other data collection; and analyzing the data with input from team members to draft the evaluation report and presentation.

Senior Energy Specialist: The Senior Specialist must have an excellent understanding of the energy sector, particularly on energy efficiency and renewable energy in India. A minimum of 12 years of experience in design, management and evaluation of energy programs is required. S/he must possess a solid understanding of issues related to clean energy policies and programs at the national and state level, scaling of renewable energy technologies, cleaner fossil technology and management, greenhouse gas mitigation and engaging the private sector and mobilizing investments. Along with the team leader, s/he will contribute to the overall drafting of the evaluation framework and participate in the desk study, interviews, and other data collection; and analyzing the data with input from team members to draft the evaluation report.

Energy Specialist: In addition to the Team Leader and Senior Energy Specialist, the Energy Specialist will provide additional technical support to the evaluation team as well as support administrative and logistical functions necessary to carry out the evaluation. S/he must have a master's level degree with 6 years of technical knowledge and experience in a relevant field (e.g. program management, project evaluation, energy efficiency, and/or climate change mitigation). S/he will possess extensive knowledge of power sector in India, particularly with energy efficiency and renewable energy. The expert must also have the experience of evaluating energy programs and working with the GOI as well as the private sector. S/he must have a solid understanding of issues related to energy efficiency, scaling of renewable energy technologies, cleaner fossil technology and management, greenhouse gas mitigation and engaging the private sector and mobilizing investments. S/he will be responsible for assisting in coordinating the desk study, interviews, and other data collection, and providing overall support to the team.

Proposed Level of Effort:

It is envisioned that the team will have ten work-weeks to undertake the mid-term evaluation. It is envisioned that the team will have eight (8) days to undertake the desk study, and prepare the draft work plan. The team will have ten (10) days for meetings and consultations in New Delhi and eight (8) to travel to four cities/states where PACE-D TA program components is being implemented. These visits will be finalized in consultation with USAID and the project partners. The team will then have seven (7) days for analysis, draft report preparation and debriefing with the Mission. Then the team will have five (5) days to finalize the report after getting response from USAID.

c) Gender:

- The Offeror must indicate experience of addressing gender considerations. Experience in utilization of gender aspect in conducting various program evaluations; and demonstrated experience in conducting evaluations using various methodologies is required.

- The offeror must demonstrate comprehensive understanding of the incorporation of women's empowerment and gender equity as cross-cutting development principles in evaluation methodology and design.

IV. EVALUATION MANAGEMENT

a) Roles and Responsibilities:

Overall Guidance: The Evaluation TOCOR and the Contracting Officer (TOCO) will provide overall direction to the evaluation team.

- The Contractor will be responsible for obtaining visas and country clearances for travel for the consultants if required.
- The Contractor will be responsible for coordinating and facilitating assessment-related team planning meetings, field trips, interviews, and other meetings in conjunction with USAID and the PACE-D Program.
- The Contractor will be responsible for international and in-country logistics as applicable such as transportation, accommodations, communications, office support, etc.
- The evaluation team will receive support from USAID/India in selecting priority organizations and places to visit during the evaluation. The evaluation team is expected to schedule interviews or other modes of data collection with key stakeholders, though USAID/India can assist in providing contact information.

b) Schedule:

The duration of the evaluation shall not exceed 10 weeks.

The evaluation team must provide a schedule (in a tabular form) defining when specific steps in the evaluation process will occur and when the deliverables are due. Team Planning Meeting (TPM): A one-day team planning meeting will be held by the evaluation team at a convenient place in New Delhi before the evaluation begins. This will be facilitated by the evaluation team leader, and will provide USAID/India with an opportunity to present the purpose, expectations and agenda of the assignment. The evaluators shall come prepared with a draft set of tools and guidelines and a preliminary itinerary for the proposed evaluations. In addition, the TPM will also:

- Clarify team members' roles and responsibilities
- Establish the timeline, share experiences and firm up the evaluation methodology
- Finalize the methodology guidelines including tools and questionnaires to be used by the team.

Site Visits and Interviews: Conduct a thorough review of the Program through site visits and interviews. Interview questionnaire will be prepared in advance and finalized during the TPM. Site visits will be planned taking into consideration factors like geographical diversity, representation of various implementation agencies, and the scale of the interventions.

c) Delivery Schedule:

CLIN	DELIVERABLES	DUE DATE
1	Work Plan: The work plan will be submitted to the Evaluation COR at USAID for approval after the team is confirmed prior to departure for the field. The team will meet with USAID/India Program Support and the CLEEO team after arrival in Delhi and prior to starting field data collection process.	15 days
2	Interim briefings, including status reports: The team leader will provide weekly status reports to USAID on work plan implementation via email by OOB Monday (beginning of the next week). The evaluation team will provide a mid-point briefing to the USAID/India team, including evaluation and technical members, to clarify any outstanding queries that may have emerged since the initiation of the evaluation process by phone and e-mail. - Debriefing with USAID: The evaluation team will be required to debrief the Mission Director and Deputy Mission Director on the observations and recommendations after the field visit and draft analysis is over.	35 days
3	Debriefings with other stakeholders/implementing partner: The team will independently present the major findings of the evaluation to the USAID partner (as appropriate and as defined by USAID) and /or GOI in New Delhi and state government officials. The debriefing will include a discussion of findings, conclusions and recommendations. The evaluation team will consider partner comments and draft report accordingly, as appropriate.	40 days
4	Draft Evaluation Report: The evaluation team will present a draft report not to exceed 30 pages of its findings and recommendations to the USAID/India's Evaluation COR before the oral de-brief.	55 days
5	Final Evaluation Report: The final report, with the Executive Summary must be received by the Evaluation COR, within seven working days after receiving the final comments on the draft evaluation report from the USAID/India team. The final report should include an executive summary of no more than three pages, a main report with findings, conclusions and recommendations not to exceed 30 pages, a copy of this statement of work, evaluation tools used to collect information to answer the evaluation questions, and a list of persons and organizations contacted.	70 days

ANNEX II – PACE-D TA IMPLEMENTATION TEAM

Name	Partner Name	Location	CLIN or Program Component	Comments
Implementing Partner				
I	Nexant, Inc.	San Francisco, USA and New Delhi, India	CLINs 1, 2, 3, 4; all cross-cutting program components	
Indian Sub-Contractors				
I	Alliance for an Energy Efficient Economy (AEEE)	New Delhi, India	CLIN 1; EE Finance	
2	ADS Global Knowledge Academy (P) Ltd	New Delhi, India	CLIN 2; Capacity building component	
3	Confederation of Indian Industry (CII)	Hyderabad, India (Telangana)	CLIN 2; Capacity Building; CLIN 3; India Heat to Power Alliance (IH2PA)	
4	Continuing Education & Training Centre (CETC)	Mumbai, India (Maharashtra)	CLIN 2; Capacity building component	
5	Development Environenergy Services Limited (DESL)	New Delhi, India	CLIN 1 (Industrial EE)	Formerly known as Dalkia Energy Services Ltd. (DESL)
6	Emergent Ventures India (EVI)	Gurgaon, India (Haryana)	CLIN 1 (Smart Grid, EE finance); CLIN 2 (Solar PV rooftop, RE storage, off-grid pilots, Solar irrigation, RE finance)	
7	Environmental Design Solutions (EDS)	New Delhi, India	CLIN 1 (Building Energy Efficiency -NZEB, ECBC)	
8	Idam Infrastructure Advisory Pvt. Ltd.	Mumbai, India (Maharashtra)	CLIN 1 (policy frameworks, capacity building), CLIN 2 (policy frameworks, institutional strengthening, knowledge sharing, TA for pilots, CE regulation)	
9	Infesque Solutions	New Delhi, India	CLIN 4; Information Technology	

10	KPMG Advisory Services Pvt. Ltd. / Mercados Energy Markets India Pvt. Ltd.	Gurgaon, India (Haryana)	CLIN 1 (Smart Grid, Ajmer pilot, Tripura Pilot, SmartNet); CLIN 2 (policy frameworks)	
11	Meghraj Capital Advisors Private Limited	Gurgaon, India (Haryana)	CLIN 2; RE Policy and Deployment	
12	MP Ensystems Advisory Pvt Ltd	Mumbai, India (Maharashtra)	CLIN 1 (EE finance)	
13	Synterprise Energy Services Pvt Ltd	Mumbai, India (Maharashtra)	CLIN 3; Cleaner Fossils	
US Sub-Contractors				
1	American Council on Renewable Energy (ACORE)	Washington, DC, USA	CLIN 2 (IREF)	
2	Arc Finance Ltd	New York, USA	CLIN 2 (RE Microfinance Support Program)	
3	Ashton Consultant Services, LLC	Ohio, USA	CLIN 3; Cleaner Fossils	
4	Chemonics International, Inc.	Washington, DC, USA	CLIN 4; M&E	
5	GP Strategies Corporation	Columbia, MD, USA	CLIN 3; Cleaner Fossils	
6	Leonardo Technologies Inc	Tennessee, USA	CLIN 3; Cleaner Fossils	
7	P&RO Solutions	Pennsylvania, USA	CLIN 3; Cleaner Fossils	
8	SRC Global	Pennsylvania, USA	CLIN 1; CLIN 2 (access to finance)	
9	Stephen Storm Inc.	North Carolina, USA	CLIN 3; Cleaner Fossils	
10	The Small Scale Sustainable Infra. Development Fund Inc.	Massachusetts, USA	CLIN 2; Microfinance Support Program	
Individual Sub - Contractors				

1	Anita Khuller	Gurgaon, India (Haryana)	CLINs 1, 2, 3, 4; all cross-cutting program components (Editor)	
2	Arvind Vishwanath Karandikar	Pune, India	CLIN 2 (Solar PV rooftop, capacity building, knowledge sharing)	
3	Bibek Bandhopadhyay	New Delhi, India	CLIN 2; Solar Energy Training Network (SETNET)	
4	Dwipen Boruah	New Delhi, India	CLIN 2; Capacity building component	
5	Manab Chakraborty	New Delhi, India	CLIN 2; Micro-finance Support Program	
6	Milind Chittawar	Nagpur, India (Maharashtra)	CLIN 1; Energy Auditor for Corporate Energy Audit Program (CEAP)	
7	Pankaj Bhartiya	New Delhi, India	CLIN 3; Cleaner Fossils	
8	Pramod Deo	Mumbai, India (Maharashtra)	CLIN 1, 2 - RE Regulatory Partnership	
10	Ram K Berry	New Delhi, India	CLIN 2; Microfinance Support Program (MSP)	
11	Tom Dreessen	Jakarta, Indonesia	CLIN 1; EE Finance	Contracted only for a week
12	Sunil Gupta	New Delhi, India	CLINs 1, 2, 3, 4; all cross-cutting program components (Auditor)	Contracted for a short period at PACE-D office.
State Coordinators (individuals)				
1	Jubin Tiwari	Bhopal, India (Madhya Pradesh)	CLIN 2; RE	Active
2	K M Bhasin	Bhopal, India (Madhya Pradesh)	CLIN 2; RE	Currently not employed

3	Mohana Priya S	Bengaluru, India (Karnataka)	CLIN I, 2 both	Currently not employed; worked for Karnataka State, Bengaluru
4	Roshal Lal Surana	Jaipur, India (Rajasthan)	CLIN I, 2 both	Active
List of other institutes				
1	Ajmer Vidyut Vitran Nigam Ltd (AVVNL)	Ajmer, India (Rajasthan)	CLIN I - EE	
2	Bureau of Energy Efficiency (BEE)	New Delhi, India	CLIN I - EE	
3	Council of Architect (COA)	New Delhi, India	CLIN I - EE	
4	Dakshin Haryana Bijli Vitran Nigam Ltd (DHBVNL)	Haryana, India	CLIN I - EE (Haryana DSM)	
5	Department of Urban Development & Housing (DOUDH), Rajasthan	Jaipur, India (Rajasthan)	CLIN I - EE	
6	Energy Efficiency Services Limited (EESL)	Noida, India (Uttar Pradesh)	CLIN I - EE	
7	Haryana Electricity Regulatory Commission (HERC)	Chandigarh, India	CLIN I - EE	
8	Indian Institute of Architect (IIA)	New Delhi, India	CLIN I - EE	
9	Indian Smart Grid Taskforce (ISGTF)	New Delhi, India	CLIN I - EE	
10	Jaipur Development Authority (JDA)	Jaipur, India (Rajasthan)	CLIN I - EE	
11	Karnataka Renewable Energy Development Corporation Ltd (KREDL)	Bengaluru, India (Karnataka)	CLIN I - EE	

12	Ministry of Power (MOP)	New Delhi, India	CLIN I - EE	
13	Nalanda University	Rajgir, India (Bihar)	CLIN I - EE	
14	National Smart Grid Mission (NSGM)	New Delhi, India	CLIN I - EE	
15	New Financial Institution (FI)		CLIN I - EE	
16	Rajasthan Rajya Vidyut Prasaran Nigam Ltd. (RVPN)	Jaipur, India (Rajasthan)	CLIN I - EE (Substation Energy Audit)	
17	Srinivas Engineering Auto Component Pvt Ltd (SEACO)	Pune, India	CLIN I - EE (CEAP Energy Audit)	
18	Tata Cleantech Capital Ltd (TCCL)	Mumbai, India (Maharashtra)	CLIN I - EE (CEAP)	
19	Tripura State Electricity Corporation Ltd (TSECL)	Agartala, India (Tripura)	CLIN I - EE	
20	Uttar Haryana Bijli Vitran Nigam Ltd (UHBVNL)	Haryana, India	CLIN I - EE (Haryana DSM and NZEB Pilot)	
21	Ministry of New & Renewable Energy (MNRE)	New Delhi, India	CLIN 2 - RE	
22	Bangalore Electricity Supply Company (BESCOM)	Bengaluru, India (Karnataka)	CLIN 2 - RE	
23	Chhattisgarh Renewable Energy Development Agency (CREDA)	Raipur, India (Chhattisgarh)	CLIN 2 - RE	
24	Evangelical Social Action Forum/ESAF Microfinance and Investment Private LTD (ESAF/EMFIL)	Thrissur, India (Kerala)	CLIN 2 - RE	
25	Indian Infrastructure Finance Corporation Ltd. (IIFCL)	New Delhi, India	CLIN 2 - RE	

26	Indian Oil Corporation Ltd. (IOCL)	New Delhi, India	CLIN 2 - RE	
27	Indian Railways (IR)	New Delhi, India	CLIN 2 - RE	
28	Indian Renewable Energy Development Agency Limited (IREDA)	New Delhi, India	CLIN 2 - RE	
29	Indian renewable energy federation (IREF)	New Delhi, India	CLIN 2 - RE	
30	Jaipur Vidyut Vitran Nigam Ltd. (JVVNL)	Jaipur, India (Rajasthan)	CLIN 2 - RE	
31	Madhya Pradesh Urja Vikas Nigam Ltd. (MPUVNL)	Bhopal, India (Madhya Pradesh)	CLIN 2 - RE	
32	Mahashakti Foundation (MSF)	Bhubaneswar, India (Odisha)	CLIN 2 - RE	
33	National Institute of Solar Energy (NISE)	New Delhi, India	CLIN 2 - RE	
34	Rajasthan Renewable Energy Corporation Ltd. (RRECL)	Jaipur, India (Rajasthan)	CLIN 1 (EE policy, ECBC Implementation)CLIN 2 - RE	
35	Saija Finance Private Limited (Saija)	Patna, India (Bihar)	CLIN 2 - RE	
36	Sarala Women Welfare Society (Sarala)	Kolkata, India (West Bengal)	CLIN 2 - RE	
37	Solar Energy Corporation of India (SECI)	New Delhi, India	CLIN 2 - RE	
38	SV Creditline (SVCL)	New Delhi, India	CLIN 2 - RE	
39	Swayamshree Micro Credit Services (SMCS)	Bhubaneswar, India (Odisha)	CLIN 2 - RE	

40	The Climate Group (TCG)	New Delhi, India	CLIN 2 - RE	
41	Vayam Renewable Ltd (VRL)	Hyderabad, India (Telangana)	CLIN 2 - RE	
42	Gujarat Energy Research & Management Institute (GERMI)	Gandhinagar, India (Gujarat)	CLIN 2 - RE	
43	Chandrapur Super Critical Power Plant (CSCPP)	Chandrapur, India (Maharashtra)	CLIN 3 - CF	
44	Indian Heat to Power Alliance (IHPA)	New Delhi, India	CLIN 3 - CF	
45	National Thermal Power Corporation Limited (NTPC)	New Delhi, India	CLIN 3 - CF	
46	Panipat Super Critical Power Plant (PSCPP)	Panipat, India (Haryana)	CLIN 3 - CF	
47	Sipat Super Critical Power Plant (SSCPP)	Sipat, India (Chhattisgarh)	CLIN 3 - CF	

ANNEX III – DATA COLLECTION PROTOCOLS

Key Informant Interview Protocols

Sample Introduction & Informed Consent *(to be tailored as needed to each stakeholder group and data collection protocol, as needed)*

Thank you for participating in this interview. My name is _____ and I am a program evaluator with Social Impact (SI), Inc. USAID has contracted SI to conduct an evaluation of the PACE-D Technical Assistance program. The overall PACE program was established to accelerate inclusive, low-carbon energy sector development by supporting research and deployment of clean technologies. We are looking specifically at the PACE-D TA program, which began in 2012 and is focused on strengthening policy and regulatory frameworks, providing capacity building and training, offering financial incentives, and performing outreach to key stakeholders to advance clean energy.

[NAME OF INSTITUTION] is a [PARTNER/BENEFICIARY] of PACE-D TA, so we are here today to talk to you about your experience with this program. We are speaking to as many different institutions and agencies as possible to build a complete picture of what makes the program efficient and effective, and what could be done to improve it and to respond to challenges during the remaining period of the project.

Please note that we are not conducting a performance evaluation of your work, and the information you share will not affect your institution's likelihood of receiving future support from USAID.

Since this is an official evaluation process, we want to make clear that your participation in this interview is entirely voluntary. We encourage you to be as candid as possible, as your answers will be kept strictly confidential. We will not use your name or title in reference to any information you provide, nor in elsewhere in our report. If there are any questions that you prefer not to answer or if you do not remember, just let us know and we will skip them. Are you comfortable continuing with the interview?

We have 60 minutes planned for this interview. Do you have any time constraints or questions before we begin?

USAID

Name:

Position:

1. Can you describe your role in the PACE-D Technical Assistance program?
2. Can you describe the purpose of the PACE-D TA program, as you understand it?
3. What are some key examples of achievements that you have observed associated with the program?
 - a. How has the program performed in terms of achieving its desired outputs? *[Prompt with examples, if necessary]*.
 - b. What changes have you seen in individuals who have received technical assistance? *[Prompt with examples, if necessary]*.
 - c. What changes have you seen in the organizations or institutions that have received technical (or financial) assistance? *[Prompt with examples, if necessary]*
 - d. What changes have you seen in policy or regulatory frameworks? *[Prompt with examples, if necessary]*
 - e. What changes have you seen in terms of access to finance for clean energy?
4. What do you consider to be the most critical or telling indicators this project is tracking?
5. Describe the evolution of the program - what specific challenges, if any, presented themselves that required changes to the initial design, implementation and/or management and how did the program adapt in response?
6. Now we would like to ask you about the management structure.
 - a. How clear and effective is the division of roles and responsibilities between USAID, Nexant, and sub-contractors?
 - b. How is the quality of communication and coordination between Nexant and USAID?
 - c. How is the quality of communication and coordination between Nexant and participating sub-institutions?
 - d. How would you describe the efficiency and cost-effectiveness of program management?
 - e. What, if any, are key areas for improvement regarding program management?
7. Given the remaining time for the project, are there any program objectives, activities, or targets that will not be achievable?
8. What component of this program holds the greatest potential for sustainability? Why?
 - a. *[Prompt if necessary]* For instance, specific pilots or activities; policy developments; institutional changes, etc.?
 - b. Does PACE-D have a sustainability plan?
9. How have gender considerations been incorporated into program design, implementation and management?
 - a. Can you describe any observations about the engagement of women in the PACE-D TA program?
10. Relative to other large-scale initiatives in India (in the energy sector or otherwise), how cost-effective is this program?
11. What recommendations do you have for how to improve the program in the remaining period of implementation? *[Start first by leaving space for general reflections. Then, if necessary, can prompt to ask about more specific recommendations.]*

Bilateral GOI Partners

Name:

Position:

1. Can you describe your role in the PACE-D Technical Assistance program?
2. Can you describe the purpose of the PACE-D TA program, as you understand it?
3. What are some key examples of achievements that you have observed associated with the program?
 - a. How has the program performed in terms of achieving its desired outputs? *[Prompt with examples, if necessary]*.
 - b. What changes have you seen in the organizations or institutions that have received technical (or financial) assistance? *[Prompt with examples, if necessary]*.
 - c. What changes have you seen in policy or regulatory frameworks? *[Prompt with examples, if necessary]*.
 - d. What changes have you seen in terms of access to finance for clean energy?
4. How would you describe the program's effects on the broader energy sector in India, if any?
5. Describe the evolution of the program - what specific challenges, if any, presented themselves that required changes to the initial design, implementation and/or management and how did the program adapt in response?
6. Has your Ministry/Bureau faced any challenges in participating in PACE-D TA or contributing to the program's desired results?
7. Given the remaining time, are there any program objectives, activities, or targets that will not be achievable?
8. Are there any barriers to enhanced market deployment of clean energy in India? If so, how could PACE-D contribute to mitigating these?
9. What component of this program holds the greatest potential for sustainability? Why?
 - a. *[Prompt if necessary]* For instance, specific pilots or activities; policy developments; institutional changes, etc.?
 - b. Does PACE-D TA have a sustainability plan?
10. Can you describe any observations about the engagement of women in the PACE-D TA program?
11. Relative to other large-scale initiatives in India (in the energy sector or otherwise), how cost-effective is this program?
12. What recommendations do you have for how to improve the program in the remaining period of implementation? *[Start first by leaving space for general reflections. Then, if necessary, can prompt to ask about more specific recommendations.]*

Nexant staff

Name:

Position:

1. Can you describe your role in the PACE-D Technical Assistance program?
2. How long have you worked on the PACE-D TA program?
3. What are some key examples of achievements that you have observed associated with the program?
 - a. How has the program performed in terms of achieving its desired outputs? *[Prompt with examples, if necessary]*.
 - b. What changes have you seen in individuals who have received technical assistance? *[Prompt with examples, if necessary]*.
 - c. What changes have you seen in the organizations or institutions that have received technical (or financial) assistance? *[Prompt with examples, if necessary]*.
 - d. What changes have you seen in policy or regulatory frameworks? *[Prompt with examples, if necessary]*.
 - e. What changes have you seen in terms of access to finance for clean energy?
4. Please give us a brief overview of how Nexant tracks progress towards program objectives and targets.
5. What are the main M&E tools used to track progress?
 - a. What do you consider to be the most critical indicators this project is tracking?
 - b. What challenges have you faced in capturing/reporting results?
6. How do PACE-D TA management staff ensure that program targets are met?
 - a. How do you respond if targets are not met?
 - b. Have any key program targets needed to be refined during implementation? If so, what is this process?
7. Describe the evolution of the program - what specific challenges, if any, presented themselves that required changes to the initial design, implementation and management and how did the program adapt in response?
8. Now we would like to ask you about the management structure.
 - a. How clear and effective is the division of roles and responsibilities between USAID, Nexant, and sub-contractors?
 - b. How is the quality of communication and coordination between Nexant and USAID?
 - c. How is the quality of communication and coordination between Nexant and participating sub-institutions?
 - d. How useful was the process of developing and utilizing annual work plans and the PMP?
 - e. What, if any, are key areas for improvement with regards to program management?
9. Relative to other large-scale initiatives in India (in the energy sector or otherwise), how cost-effective is this program?
10. What component of this program holds the greatest potential for sustainability? Why?
 - a. *[Prompt if necessary]* For instance, specific pilots or activities; policy developments; institutional changes, etc.?

b. Does PACE-D TA have a sustainability plan?

11. How have gender considerations been incorporated into program design, implementation and management?

a. Can you describe any observations about the engagement of women in the PACE-D TA program?

12. What recommendations do you have for how to improve the program in the remaining period of implementation? *[Start first by leaving space for general reflections. Then, if necessary, can prompt to ask about more specific recommendations.]*

Public Institutions (National- and State-Level)

Name:

Position:

7. Can you describe your role in the PACE-D Technical Assistance program?

8. What are some key examples of achievements that you have observed associated with the program?

9. How would you describe the program's effects on the broader energy sector in India, if any?

10. Describe the evolution of the program. What specific challenges, if any, presented themselves that required changes to the initial design, implementation and/or management, and how did the program adapt in response?

11. Are there any barriers to enhanced market deployment of clean energy in India? If so, how could PACE-D contribute to mitigating these?

12. What component of this program holds the greatest potential for sustainability? Why?

a. *[Prompt if necessary]* For instance, specific pilots or activities; policy developments; institutional changes, etc.?

b. Does PACE-D have a sustainability plan?

13. Has your Ministry/Agency/Firm faced any challenges in participating in PACE-D TA or contributing to the program's desired results?

14. Given the remaining time, are there any program objectives, activities, or targets that will not be achievable?

15. Can you describe any observations about the engagement of women in the PACE-D TA program?

16. Relative to other large-scale initiatives in India (in the energy sector or otherwise), how cost-effective is this program?

17. What recommendations do you have for how to improve the program in the remaining period of implementation? *[Start first by leaving space for general reflections. Then, if necessary, can prompt to ask about more specific recommendations.]*

Nexant Sub-Contractors & Other Program Partners

Name:

Position:

1. Can you describe how you and your institution have been involved in the PACE-D Technical Assistance program?
2. Can you describe the purpose of the PACE-D TA program, as you understand it?
3. How did your organization become involved with PACE-D TA?
4. What are some key examples of achievements that you have observed associated with the program?
5. How would you rate your institution's overall progress toward achieving your objectives under PACE-D TA?
 - a. Are you aware of how your institution's objectives relate to the overall PACE-D TA program and its objectives?
 - b. How feasible are the targets provided to you by program management?
6. Are there any barriers to enhanced market deployment of clean energy in India? If so, how could PACE-D TA contribute to mitigating these?
7. What component(s) of your institution's activities hold the greatest potential for sustainability? Why?
 - a. *[Prompt if necessary]* For instance, specific deliverables or outcomes?
8. How would you rate the effectiveness of Nexant's management of partners like your institution?
 - a. How would you describe the quality of communication and coordination between your institution and Nexant?
9. How have gender considerations been incorporated into program design, implementation and management within your institution and your activities?
 - a. Can you describe any observations about the engagement of women in your program or the PACE-D program generally?
10. Have you faced any challenges in implementing PACE-D activities?
 - a. For example, challenges in data reporting, training logistics, management, etc.?
 - b. Have you faced any challenges in achieving the results that you sought out to achieve?
11. What recommendations do you have for how to improve the program in the remaining period of implementation? *[Start first by leaving space for general reflections. Then, if necessary, can prompt to ask about more specific recommendations.]*

ANNEX IV – LIST OF KEY INFORMANTS

Stakeholder Group	Institution	# of KIs	Location
Donor	USAID/India CLEEO Office	5	New Delhi
	USAID/India Program Office	4	New Delhi
GOI Bilateral Partners	Ministry of Power (MOP)	1	New Delhi
	Ministry of New & Renewable Energy (MNRE)	3	New Delhi
	Bureau of Energy Efficiency, MOP (BEE)	2	New Delhi
National Public Institutions	National Thermal Power Corporation (NTPC)	3	Noida
	National Institute for Solar Energy (NISE)	2	New Delhi
	National Smart Grid Mission	1	New Delhi
	Power Grid Corporation of India, Ltd. (PGCIL)	1	New Delhi
	Indian Oil Corporation, Ltd. (IOCL)	4	New Delhi
	Indian Railways (IR)	1	New Delhi
State Agencies	Bangalore Electricity Supply Company, Ltd. (BESCOM)	3	Bangalore
	Haryana Electricity Regulatory Commission (HERC)	1	Panchkula
	Jaipur Vidyut Vitran Nigam Ltd (JVVNL)	1	Jaipur
	Karnataka Renewable Energy Development, Ltd. (KREDL)	2	Bangalore
	Energy Department – Karnataka State	1	Bangalore
	Madhya Pradesh Urja Nigam Vikas, Ltd. (MPUVNL)	3	Bhopal
	Rajasthan Renewable Energy Corporation (RREC)	3	Jaipur
	Rajasthan Rajya Vidjut Prasaran Nigam Ltd. (RRVPNL)	1	Jaipur
Implementing Partner	Nexant, Inc.	7	New Delhi
Sub-Contractors	American Council on Renewable Energy (ACORE)	1	Phone (remote)
	Arc Finance	2	New Delhi; phone (remote)
	Confederation of Indian Industry (CII)	1	Phone (remote)

	Dalkia Energy Services, Ltd. (DESL)	1	New Delhi
	Environmental Design Solutions, Ltd. (EDS)	2	New Delhi
	Emergent Ventures India (EVI)	1	New Delhi
	Idam Infrastructure Advisory Pvt., Ltd.	3	New Delhi
	KPMG	2	New Delhi
	Leonardo Technologies, Inc.	1	Phone (remote)
	SRC Global	1	Phone (remote)
	Individual contractors	5	Various
Other Local Program Partners	Indian Infrastructure Financial Company, Ltd. (IIFCL)	1	New Delhi
	Saija Finance Pvt., Ltd.	1	New Delhi
	TATA CleanTech Capital, Ltd.	1	Phone (remote)
	The Climate Group	1	New Delhi
	Vayam Renewable, Ltd.	1	Phone (remote)
USG Interagency	US Department of State, US Embassy	5	New Delhi
	US Commercial Service, US Embassy	1	New Delhi
	Office of Global Climate Change, US Department of State	2	Phone (remote)
Other External Stakeholders	Individual sector experts not directly affiliated with PACE-D TA	3	Various
TOTAL:		85 (72 men, 13 women)	

ANNEX V – DOCUMENTS REVIEWED

The evaluation team made every effort to review the background documents provided.⁴⁰ The list of program documents and technical reports in the table below have been considered, with appreciation for their preparation by the Nexant team as well as the USAID Mission. Efforts have been made to consider key program documents and technical reports alongside the KIs.

Note: It is beyond the scope of the evaluation to assess the quality of technical documents/deliverables, though several technical reports were reviewed and are noted below

	Document type	Document reference/name
1.	Contractual documents	- Mother contract (with modifications) - Sub contractors – Individual and companies Task Orders - State Coordinators Task Orders
2.	EE & RE State Selection Reports	- PACE-D EE Tasks Report on State Selection 7 JAN - PACE-D RE State Selection Report
3.	Annual Work Plans according to CLIN 1 & 2	- Year 2 EE Annual Work Plan (AWP) - Year 3 EE AWP - Year 1 RE AWP - Year 2 RE AWP
4.	Contractual reports	1. Annual outreach reports: - Annual Progress Report – 2014 - Annual Progress Report-2015 2. Annual Reports - Y1 PACE-D TA Program Annual Report 2012-2013 - Y2 PACE-D AR Jul 2013 -Jun 2014 .pdf - Y3 PACE-D Annual Report -July 2014-June 2015 3. Financial reports (overview) 4. OES/EGC reports overview (incomplete data...) 5. Quarterly Progress reports: - Year 1 (2012-13), - Year 2 (2013-14) - Year 3 (2014-15) 6. Training Effectiveness Assessment

⁴⁰ Nexant and USAID provided the evaluation team a total of 738 documents for review before and during data collection.

		- Training Effectiveness Assessment Final (September 2015)
5.	Program Deliverables	According to CLINS and Tasks
5.a	CLIN I Task 1- Market Driven Energy Efficiency Technology Deployment	1. Smart Grid - Draft EM&V Guidelines - A Roadmap for Communication and Application Interoperability – India - Demand Response in the Indian Context Grid Tech Paper - Smart Grids An approach to Dynamic Pricing in India - Smart Imperatives for Grid Integration of Renewable Energy Sources of Electricity - Report on Smart Grid U.S Study Tour - Central Electricity Regulatory Commission (CERC) Model Smart Grid Regulations 2015 - Draft Model Smart Grid Regulation_23 June 2014 - Smart Grid Pilots in Tripura and Ajmer overview 2. Net Zero Energy Buildings (NZEB) - NZEB Pilots Nalanda University and UHBVN overview - NZEB Knowledge Portal overview including some background planning documentation for NZEB Alliance 3. Industrial EE – WHU overview including WHU Policy to be finalized 4. Heating, Ventilating, Air-Conditioning (HVAC) overview
5.b	CLIN I - Task 2 - Institutional Development and Strengthening of Policy Framework for EE	1. Energy Conservation Building Code (ECBC) update - overview 2. ECBC implementation - Rajasthan 3. Other states overview
5.c	CLIN I - Task 3 - TA and Capacity Building to Develop and Implement Innovative Financing	EE Finance overview - Market Assessment Report for Potential Project Pipeline for Partial Risk Guarantee Fund for EE (PRGFEE) and Venture Capital Fund for EE (VCFEE) - Investment Grade Energy Audit Report SEACO- to be finalized (December 2015) - EE Finance Training Modules, Manual and Guidelines overview - EE Finance Guidelines_2015 - EE Innovative Financing Report- 2013

5.d	CLIN 1 - Task 4 - Capacity Building, Education, Training, Public Outreach Programs	- Capacity Building - Smart Grid Pilots - SMARTNET
5.e	CLIN 2 - Task 1	- PACE-D TA Program RE State Selection Report - KARNATAKA including: - PACE-D Comments on Karnataka Solar Policy _301213 for circulation - Karnataka Technical Assistance Plan - BESCOM pilot overview - Karnataka Solar Irrigation Program - Accelerating Deployment of Solar Rooftop through Gross Metering - PPT for KERC 31 12 2015 - PACE-D TAP Gross Metering for Karnataka White Paper Version 4 19 Nov 2015 - Presentation on Development of RE Hybrid Framework, Karnataka MADHYA PRADESH - MP_CMC_RfP_USAID_PACE-D_28-01-15 - Revised DPR for Centralised Monitoring Centre March 2015_forcirculation - RI - Final Draft,_MPUVNL Technical Assistance Plan_ 10Mar2014 - USAID PACE-D TA Program Inputs for the MP Net Metering Policy - Draft Off-grid RE Policy development for Madhya Pradesh_7Oct2014 - Off Grid Policy overview - Solar Irrigation Policy overview - RAJASTHAN - JVVNL net metering policy - Solar Rooftop Net Metering Rajasthan - Draft TOC & Approach - Note for REHYBRID_Rajasthan - RPO Compliance monitoring framework_draft_210414 - Three Page Note on RPO Compliance Monitoring Framework_v1.0
5.f	CLIN 2 – Task 2	- Draft Report - Commercial RE Deployment 13082013 formatting 29.09.14 - Energy Storage Applications Report Draft

		- Energy Storage Roadmap - MNRE Steering committee on Energy Storage - IOCL Solar Pilot - Bihar Visit - Nalanda University - June 2014 - Presentation for Reliance Petrol Pumps – 09062014 - USAID and SECI signed - Concept Note - RE Deployment for Railways Stations - Note - RE Deployment for Oil Retail Outlets - Indian Railways pilot overview documents - IREF and ACORE partnership documents - Off Grid Background documents - Bihar Solar irrigation pilot
5.g	CLIN 2 – Task 3	- CSR Fund documents - PACE-D -Off Grid Fund - Green Bonds - Design of Off Grid Debt Fund - Infrastructure Debt Fund – Mutual Fund - RE Innovative Financing Report - Solar Rooftop Evaluation Tool
5h	CLIN 2 – Task 4	- Capacity Building Note on Aligning CB activities with MNRE - 16 Aug 2013 - SETNET pilot overview including: MoU-USAID and NISE signed, PACE-D SETNET Operational Strategy, NISE activities, State Knowledge Exchange Program
5.j	CLIN 2 – Task 5	National Workshop on Accelerating Clean Energy Deployment through regulations - 30.07.2015, Background documents
5.k	CLIN 2 – Task 6	- Microfinance Support Program (MSP) Report - MSP Implementation documents
5.l	CLIN 3	- Clean Fossil Results Report 02122014
6	M&E Documents	- PACE-D M&E Plan January 2013 - PACE-D TA Program Baseline Scenario Report Aug 2013 - Project Implementation Plan
7	PACE-D initial design	- Annexure 1 Assessment report for Clean energy centre, EE and RE - Annexure 2 - Cleaner Coal Assessment Report - Annexure 3 - Cleaner Coal Assessment Report Appendices - Annexure 4 - clean energy centre, EE and RE appendices

ANNEX VI – DATA COLLECTION SCHEDULE

The schedule below reflects the actual data collection program followed from January 17-February 10, 2016 by the evaluation team. Note that the team worked together in New Delhi and then split into teams of two for field site visits.

Legend:	
Yellow	Travel days (international)
Green	Data Collection around New Delhi
Blue	Field visits
Red	Planning, analysis, and synthesis
Purple	Off days

Date	Activity
Sunday, January 17	Travel to India
Monday, January 18	Team Planning Meeting
Tuesday, January 19	USAID/India in-briefing Nexant, Inc. in-briefing
Wednesday, January 20	USAID/India workplan review and finalization Idam Infrastructure Advisory Pvt., Ltd. (Idam) Arc Finance Emergent Ventures India (EVI)
Thursday, January 21	USAID/India Program Office Environmental Design Solutions (EDS) Indian Oil Corporation, Ltd. (IOCL)
Friday, January 22	Indian Infrastructure Financial Company, Ltd. (IIFCL) KPMG Nexant, Inc. Arc Finance
Saturday, January 23	Development Environenergy Services Limited (DESL)
Sunday, January 24	Off day
Monday, January 25	The Climate Group Bureau of Energy Efficiency (BEE) Nexant TATA CleanTech Capital Limited (TCCL) <i>Rajasthan</i> : Rajasthan Renewable Energy Corporation, Ltd. (RRECL) <i>Rajasthan</i> : Jaipur Vidyut Vitran Nigam Limited (JVVNL)
Tuesday, January 26	Vayam Renewable, Ltd. SRC Global
Wednesday, January 27	Saija Finance Pvt., Ltd. Indian Renewable Energy Federation (IREF) National Thermal Power Corporation, Ltd. (NTPC) <i>Karnataka</i> : Bangalore Electricity Supply Company, Ltd. (BESCOM) <i>Karnataka</i> : Karnataka Renewable Energy Development, Ltd. (KREDL)
Thursday, January 28	Ministry of Power (MOP) Confederation of Indian Industries (CII)

	<i>Madhya Pradesh: Madhya Pradesh Urja Vikas Nigam, Ltd. (MPUVNL)</i>
Friday, January 29	Skill Council for Green Jobs (SCGJ)/National Institute for Solar Energy (NISE)
	Nexant
	Mid-brief with USAID/India
Saturday, January 30	Leonardo Technologies, Inc.
Sunday, January 31	Off day and travel day
Monday, February 1	Ministry of New and Renewable Energy (MNRE)
	<i>Haryana: Haryana Electricity Regulatory Commission (HERC)</i>
Tuesday, February 2	Ministry of Power (MOP)
	US Department of State (DOS)
	Power Grid Corporation of India (PGCIL)
	American Council on Renewable Energy (ACORE)
Wednesday, February 3	US Commercial Service
	USAID/India Program Office
Thursday, February 4	Data Analysis and Synthesis
Friday, February 5	Ministry of Power (MOP), Power Grid Corporation of India (PGCIL), National Smart Grid Mission
	Indian Railways (IR)
	US Department of State (DOS)
Saturday, February 6	Data Analysis and Synthesis
Sunday, February 7	Off Day
Monday, February 8	Data Analysis and Synthesis
Tuesday, February 9	Preliminary Findings Briefing - USAID/India
Wednesday, February 10	Travel from India

ANNEX VII – INDICATOR RESULTS AND ADDITIONAL OUTPUTS

Achieved Results against Set Indicator Targets (as of September 2015)⁴¹

Indicator No.	Priority Indicators	Cumulative Targets till Sept. 30, 2015 (Y3)	Cumulative Achievements till 30 Sept 30, 2015 (Y3)
1.	Number of institutions with improved capacity to address climate change issues as a result of USG assistance	7	14
2.	Clean energy generation capacity installed or rehabilitated as a result of USG assistance	122 MW	2.3 MW
3.	Energy saved due to energy efficiency / conservation projects as a result of USG assistance (MW)	35	0
4.	Greenhouse gas (GHG) emissions, estimated in metric tons of CO _{2e} , reduced, sequestered, and/or avoided as a result of USG assistance	1.09	0.421
5.	Number of person hours of training completed in climate change as a result of USG assistance (M/F)	19,200	16,118
6.	Amount of investment mobilized (in USD millions) for clean energy as supported by USG assistance (disaggregated by guidance)	20	13.45
7.	Percent heat rate improvement through adoption and accelerated deployment of cleaner fossil technologies and management practices to achieve greater supply side efficiency from existing fossil power generation (percent of heat rate improvement)	1%	See below
	•Panipat thermal power station		5.6%
	•Chandrapur thermal power station		3.4%

Other Outputs under the Program

Pilots

17 Pilots (RE+EE+CF):

CLIN 2 (RE):

- Solar Pumps: Basix and Bangalore Electricity Supply Company Ltd.
- Solar Rooftop: Indian Oil and Indian Railways
- Clean Energy Finance: Corporate Energy Audit Program (Tata Cleantech Capital)
- Microfinance: Sarala, ESAF, Saija, SVCL

CLIN 1 (EE):

- Smart Grids: Tripura State Electricity Corporation Ltd. and Ajmer Vidyut Vitran Nigam Ltd.
- Net Zero Energy Buildings: Nalanda University and Uttar Haryana Bijli Vitran Nigam Ltd.

⁴¹ These indicators are those that Nexant was using for the first three years of project. Recently revised indicators were not yet approved in the course of the midterm evaluation.

CLIN 3 (CF):

- *Clean Coal Technologies: Vista Coal Blending (Sipat); Advanced Pattern Recognition Software (Sipat); and Heat Rate Improvement (Chandrapur & Panipat)*

Partnerships

18 Partnerships Established:

- Institutional Strengthening Support: Haryana, Karnataka, Madhya Pradesh and Rajasthan
- Clean Energy Finance: The Climate Group, Chhattisgarh State Renewable Energy Development Agency and IIFCL Asset Management Company Ltd.
- Renewable Energy: National Institute of Solar Energy and Solar Energy Corporation of India
- Energy Efficiency: Nalanda University and Uttar Haryana Bijli Vitran Nigam Ltd.
- Microfinance: ESAF, MSF, Sarala, Swayamshree, SVCL, Saija and Vayam Renewable Ltd.

Study Tours

2 International Study Tours

- Cleaner Fossil Technologies Utility Exchange Program
- Smart Grid Study Tour

Conferences

2 International Conferences

- Advanced Technologies and Best Practices for Supercritical Thermal Power Plants
- Seminar on Net-Zero Energy Buildings in India

Publications

8 Technical Publications

- Issue Paper on Green Bonds in India
- HVAC Market Assessment and Transformation Approach for India
- Assessment of Role of Energy Storage Technologies for RE Deployment in India
- Best Practices Manual for Indian Supercritical Plants
- Smart Grids: An Approach to Dynamic Pricing in India
- Smart Grids: A Roadmap for Communication and Application Interoperability in India
- Financing Renewable Energy in India
- Financing Energy Efficiency in India

Workshops

22 Consultation Workshops

Trainings

44 Training Programs

ANNEX VIII – PARTNER ORGANIZATIONS

Organizations	Previous Capacity	PACE-D TA Efforts	Benefits
Bangalore Electricity Supply Company (BESCOM)	The organization has no experience of implementing solar policy	The PACE-D TA Program provided technical assistance to BESCOM for implementing Karnataka Solar Policy. The Program was an invitee to the Technical Committee established by BESCOM. Specifically, the technical assistance focused on (i) finalization and implementation of interconnection scheme for the solar rooftop program, and (ii) initiation and implementation of Surya Raitha, a solar irrigation pump replacement pilot.	The assistance provided by the PACE-D TA Program to BESCOM which has resulted in the deployment of 2.3 MW under the solar rooftop program. BESCOM has also contracted SunEdison to implement the solar irrigation pump pilot which will deploy 2 MW of solar energy.
Jaipur Vidyut Vitran Nigam Ltd (JVNL)	The organization has no experience of implementing solar policy	The PACE-D TA Program provided technical assistance to JVNL to implement the Rajasthan Solar Policy by supporting the finalization of interconnection scheme for the solar rooftop program. The scheme will work under the net metering regulation developed earlier through the PACE-D TA Program's technical assistance.	JVNL has used the outputs of the PACE-D TA Program to issue guidelines and procedures for net metering and grid connectivity. Approvals for solar rooftop installations are being made on the basis of these guidelines. However, the program is yet to be officially launched.
Indian Railways	The organization has no experience of deploying solar energy	The PACE-D TA Program provided technical assistance for launch of the first phase of Indian Railway's solar rooftop program. The assistance included model documents such as request for proposal (RFP) and power purchase agreements; design of implementation models and detailed financial analysis to arrive at projected cost of delivery, site assessments across six locations, and outreach with potential solar developers.	Indian Railways is using the templates and outputs provided by the PACE-D TA Program to contract developers to deploy 50 MW of solar rooftop.
Indian Oil Corporation Ltd (IOCL)	The organization has no experience of deploying solar energy	The PACE-D TA Program provided technical assistance to establish rooftop installations across various sites owned and operated by IOCL. As part of the technical assistance an analysis of national policies and regulations was made and detailed pre-feasibility reports were prepared.	Taking forward the technical assistance provided by the PACE-D TA Program, IOCL mainstreamed solar rooftop in its energy mix by adopting a policy that calls for solar installations on all its rooftops.

National Institute of Solar Energy	The organization has no experience of establishing and sustaining a network of organizations to wide-scale training delivery	TA Program assisted to conceptualize and launch the Solar Energy Training Network (SETNET). This included support to select training organizations and development of an operational strategy. A consultation workshop was organized with selected training organizations. The PACE-D TA Program also participated in the Curriculum & Content Development team that designed two curricula. Further support is being provided by initiating a training needs assessment.	SETNET platform is available to NISE to wide-scale training activities under MNRE's Surya Mitra scheme.
Indian Smart Grid Taskforce (ISGTF)	The organization needed technical assistance to propose regulations for smart grids	The PACE-D TA Program provided technical assistance to ISGTF to develop regulations which could be proposed to regulators for implementing the Smart Grid Vision and Roadmap. The draft regulations have since been approved by the Forum of Regulators as model regulations.	The regulations on adoption by state regulators will support the implementation of Smart Grid Vision and Roadmap which is estimated to result in reduction of 137 MMT of GHG emissions by 2027.
Bureau of Energy Efficiency (BEE)	The organization needed support to initiate energy efficiency financing activities & Energy Efficiency Building Program	TA Program assisted on a range of activities. These include (i) preparation of a RFP for selecting M&V agencies; (ii) review of RFPs for selection of a management agency for the Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and the Venture Capital Fund for Energy Efficiency (VCFEE), (iii) preparation of guidelines on EE financing, and (iv) and preparation of a manual on EE financing for trainers.	With support of PACE-D, BEE was able to organized two training of trainers program delivering 421 person hours of training. The outputs of the PACE-D were shared with the participants during the training. Similarly, BEE was able to use PACE-D outputs to launch PRGFEE and VCFEE.
Bureau of Energy Efficiency (BEE)	Building Energy Efficiency Program	PACE-D TA Program is providing recommendations ECBC 2015 update, and this will be brought to MOP for approval before notifications. It is assisting for the ECBC professionals' certification examination. Survey to assess the Indian market on HVAC technologies and prepared a report on the same.	BEE got new inputs on the revised ECBC Update and on the curricula and guidance on the examination system to be offered to the architects market transformation strategies on HVAC was a new activity. BEE is evaluating internally various options for market transformation and further steps can be taken when there is more clarity on

		A web portal for NZEB best practice sharing is being developed under PACE-D TA. The NZEB concept has been working on buildings (program pilots of Nalanda University and Uttar Haryana Bijali Vitran Nigam Limited.	this. BEE got into NZEB concept with the lead advice provided by PACE D TA.
Sarala	The organization has no experience of designing and implementing an energy micro-finance program	The PACE-D TA Program worked closely with MFIs--MFIs Saija and Sarala-- to kick start their energy lending program. As part of the technical assistance, trainings were organized and business plans were developed. Both MFIs initiated pilots which were mentored by the PACE-D TA program during the period.	Saija has expanded to 10 branches and has sold 1,600 units of clean energy products. Saija plans to expand energy lending to all its branches in Jharkhand and Bihar by end of November. Sarala has expanded energy lending activities to more than 50 branches. It has, they have sold 20,000 units of clean energy products as of October 2015. The combined total energy lending portfolio of the two MFIs combined is around ~INR 40,000,000 (\$ (USD 650,000) which constitutes significant funds mobilization by the program.
Saija	The organization has no experience of designing and implementing an energy micro-finance program		
National Thermal Power Corporation (NTPC)	Lack of experience on O&M of super-critical units. There is a general dearth of access of structured knowledge on international best-practices, benchmarks and new tools and technologies.	Exposure Visit to US for NTPC officials Introduction of “Coal Blending Software” on pilot basis Introduction of “Advanced Pattern Recognition Software” pilot basis Best Practices Manual for Super-critical Power Plants Benchmarking Guide for Sipat Thermal Power Plant	NTPC's Sipat Power Plant has started benefiting from these activities The manual is being used as a reference The coal blending model has helped the station in understanding the impacts of blending different kind of coal on the efficiency of the plant. The observations from APR models are discussed by section heads and station management on a bi-weekly basis during their daily morning meetings.
Indian Renewable Energy Federation	India did not have an apex RE organization	The PACE-D TA Program has been supporting the establishment and sustainability of IREF as the apex RE organization for India. The program initiated a co-branded outreach program with IREF. The program also facilitated American Council on Renewable Energy (ACORE) and	IREF has recently organized a webinar with PACE-D assistance. IREF officials visited ACORE in US to learn from its practices and processes

		IREF to form a potential partnership s.	
Indian Heat to Power Alliance	Indian did not have an industry organization that could collaborate on technical and operational issues faced by the coal fired thermal power plant industry	The program has helped establish the Indian Heat to Power Alliance (IH2PA) - A member driven organization comprising of all stakeholders of the Indian coal fired thermal power plant industry through multiple consultations, preparation of white paper, and development of a business strategy and identification of a host institution. (it must be noted here that IH2PA as initially initiated as Indian Heat Rate Alliance)	CII-GBC, the host organization is launching IH2PA in October 2014 with participation from members of the industry and organizing its first training program in collaboration of NTPC, GP Strategies and PACE-D TA Program.

ANNEX IX – CAPACITY BUILDING AND TRAINING ACTIVITIES

CLIN #1			
Task /program	Man-days allocated	Linkage to the project goals	Comments
Smart grid	4000	This is aimed at strengthening the institutional capacity of the ISGTF, implementation of the pilot projects and capacity building activities. The Smart Grid training course and launching of Smart Grid Training Network (Smart-Net) enable meeting the capacity building targets as laid under the National Smart Grid.	Roadmap for development of two smart grid courses has been formed through a working group. There is demand for several such courses for engineers and operating personnel.
Roll out EE Finance	400	Training of Master Trainers under Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India	Timely
HERC	400	Three Organizations (HERC and two Distribution Utilities) with improved capacity draw a road map to identify and implement clean energy regulations and guidelines; aim is the identification of three possible quick gain DSM projects through brainstorming and group activity.	Seeding DSM program in the state
Sub-total	4800		
CLIN #2			
Task /program	Man-days allocated	Linkage to the project goals	Comments
SETNET	10000	Launch of Solar Energy Training Network (SETNET) and pilot testing of the training programs designed and organized for NISE. The standardized training materials developed will be housed under the National Institute of Solar Energy's Solar Energy Training Network (SETNET). SETNET will seek to scale the trainings in partnership with existing training organizations, nationally by adopting the institutional	Substantive effort commensurate with the national goals

		approach developed and successfully demonstrated under the USAID/India's Distribution Reforms, Upgrades and Management (DRUM) Program.	
Micro finance	8000	Frontline staff training for MFIs in field locations, Microfinance Technology Showcase and Partner Orientation, Product Showcase, Training for Preparation for Vision Building & Business Planning Exercise , Business planning and pilot finalization	Supports MFIs operations oriented to clean energy pilots
TA regulatory partnerships	3200	stakeholder consultation meets on Policy and Regulatory Framework for promoting Solar rooftops and the state regulatory commissions, the energy department, utilities, state agencies, project developers energy think tanks	Provide a forum of exchange of field experiences , overcoming barriers, exchange of success stories
States	2000	State agencies, utilities, multi-stake holders consultation meet on state action plans	Exchange of ideas to adopt RE & EE programs.
TA solar roof top	1500	stakeholder consultation on accelerated deployment of solar by Public Sector Undertakings,	Help in developing capacity for solar products
RE Finance	600	Provides a platform to exchange the PACE D work on the financing instruments and actively engage with the key players in the clean energy market.	Provides a forum to exchange ideas on RE products.
Sub-total	25300		
CLIN #3			
Task /program	Man-days allocated	Linkage to the project goals	Comments
Heat Rate Improvement in power plants	2995	Related to pilots on heat rate improvement which were very successful in actual improvements & realization of GHG Emissions.	Scalable
Bench marking & best practices for super critical	1484	Pilot at Supercritical power plant at NTPC which developed best practices manual and bench marking	Scalable within NTPC and other new generation plants

power plant, advanced technologies		guide through interactive training workshops	
Clean Fossil Utilities Exchange Program	792	“Advanced Technologies and Best Practices for Super-critical Thermal Power Plants” at New Delhi with US and Indian power plant specialists	knowledge sharing platform for the latest super-critical technologies and Best practices
Software (Sipat)	880	software for coal blending and advanced pattern recognition (APR), and organized a related training program	Exposed the power plant staff to these novel features leading to GHG emissions reduction & scalability to other NTPC plants
Exposure (“twinning”) visit to the U.S.		Two NTPC officers were exposed to U.S. power utilities and understand the pollution control measures, efficiency and reliability in fossil based plants	Establish net working relationship & exchange of knowledge
Heat to power Alliance		Establish a community of practice to support deployment of technologies and service provider network including the concept of model power plants	Launch of first training program of IH2PA with participation from 4 utilities and 1 service provider
Others	162		
Sub-total (CLIN #1, CLIN #2, CLIN #3)	6313		
Total	36413		

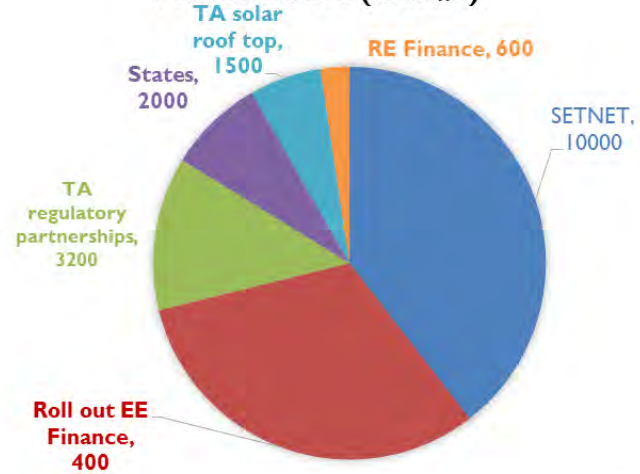
Source: PACE-D TA Annual Reports/Quarterly Reports

Graphics Detailing Person Days Per CLIN

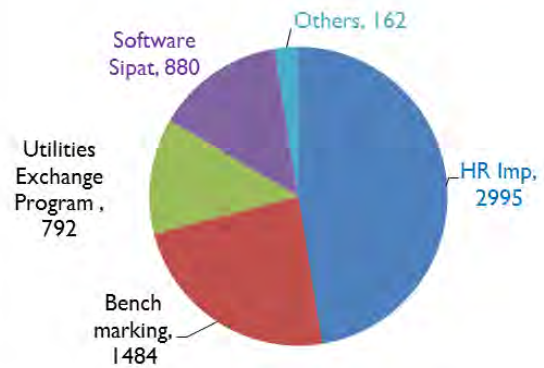
Person-Days (CLIN#1)



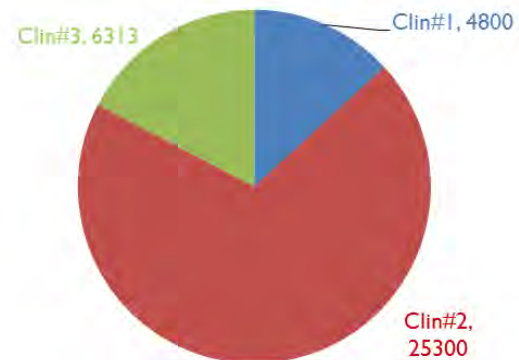
PERSON-DAYS (CLIN#2)



Person-Days (CLIN#3)



Person-days (Clin#1, Clin#2, Clin#3)



ANNEX X – CASE STUDIES

Case 1: DSM Program (HERC)

The Program partnered with Haryana Electricity Regulatory Commission (HERC) and supported in development of DSM Regulatory Framework for the State of Haryana. As a part of this TA support, the Program provided necessary institutional strengthening support to HERC in development and finalization of DSM Regulations for the State of Haryana. Subsequently, the Program also provided necessary support in development of two subordinate guidelines such as “Cost Effectiveness Assessment” and “Evaluation, Measurement & Verification” of DSM Programs. Support being provided by the Program to HERC would make the Regulations more complete and ensure that regulations are translated in to the action for the large scale deployment of DSM in the State of Haryana. TA also provided support for setting up DSM Ecosystem as well as enhanced Institutional Capacity for the large scale deployment of DSM in the State by constitution of DSM Advisory Committee and Conducting DSM Advisory Committee Meeting. Discoms were facilitated to pursue identification of three possible quick gain DSM projects through brainstorming and group activity as an outcome of capacity building workshops.

While KIs a part of the evaluation reveals that Haryana Discoms lack the motivated staff to take up DSM. HERC are leanly staffed and donor get into and their support for these activities is to improve the enabling environment – they do not take implementation directly. Further interactions with USAID and secondary information at HERC web-site confirmed that HERC conveyed their consent vide their order dated 22 Jan 2016 for the application under Section 13 of the HERC (Demand Side Management) Regulations, 2014 notified on 19.11.2014 for implementation of the Energy Efficient Lighting Program (EELP) for LED bulbs in the State of Haryana under 24x7 Power for all by the two Discoms through Energy Efficiency Services Limited , a super-ESCO under Ministry of Power . This program is proposing to offer 21,741,115 LED lamps (9W) to 4, 348,223 households in the state to replace of existing less efficient lights. It is estimated to reduce peak load in the state by 560.92 MW and result in energy savings of 1165.76 million units annually.

This is expected to be fast track flagship DSM program advocated by Bureau of Energy Efficiency (BEE) and Ministry of Power and similar to a scheme launched in the several states successfully. With regard to EELP Scheme, the Commission is of the view that the scheme has potential of energy saving and peak demand reduction and is in line with the National objectives. The Commission observes that the envisaged reduction in peak load will improve the utilization factor of distribution network which in turn will be used for releasing load pending on account of system constraints.

This is likely to result in a major scene for Clin#1 performance in terms of achievements of EE savings in MW. While the proposed DSM program look promising, this example needs more efforts to evaluate the outcome in view of the substantial potential for sustainability of the DSM initiative in the remaining period of the project and beyond the project boundary. There is a substantial scope for scalability of similar initiatives, which involves active participation of beneficiaries through a bottom up approach.

Case 2: SETNET (NISE)

SETNET will enable NISE with a structured platform for technical and business training in the solar space by building a strong network of qualified and trained professionals for the booming solar industry. There are several training programs organized throughout the country for building the skills and capacity of the manpower at different levels (lending engineers to operators). There is a need for certified training programs and standardizing the curriculum creating a good set of qualified solar trainers for improving the delivery of training and create positive impacts for scaling the training efforts.

The support of PACE-D TA Program commenced from May 2014 and will continue until September 2016. The PACE-D has carried out the following activities for NISE:

- a. Facilitated and supported organization one “training of trainers” program for NISE technical staff
- b. Supported organization of five training programs for NISE after reviewing and improving the course content and providing technical experts for training
- c. Facilitated and supported NISE in identification, evaluation and selection of partner institutions for launching the SETNET

MNRE launched the Green Jobs Sector Skills Council (GJSSC) and the Surya Mitra initiative on May 28, 2015. Under the Surya Mitra initiative, 50,000 persons will be trained to ensure manpower to implement MNRE’s two flagship schemes viz., scheme for setting up 10,000 MW of decentralized generation of solar energy projects by unemployed youths and farmers and solar rooftop program. Training of trainers is expected to be provided to 1,500 instructors. All trained Surya Mitras will be certified by GJSSC.

NISE has been allocated a budget of INR 220 crores under the Surya Mitra initiative.

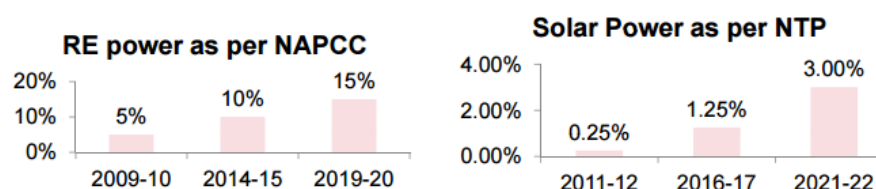
At the end of the TA, the capacity of NISE and SETNET would include practices, processes and benchmarks that would enable them to sustain trainings on solar technologies and leverage national and international expertise in scaling the training programs for achieving the objective of “building skills and capacities to ensure the availability of qualified solar energy professionals to meet the national solar deployment targets.” The following few indicators have been proposed by the PACE-D Program for establishing the sustainability of SETNET.

- a. A package of at least 4 standard trainings has been developed
- b. About 50 NISE accredited trainers are regularly providing training in SETNET member institutions
- c. At least 10 trainings under the SETNET have been organized
- d. Training effectiveness assessments are conducted annually

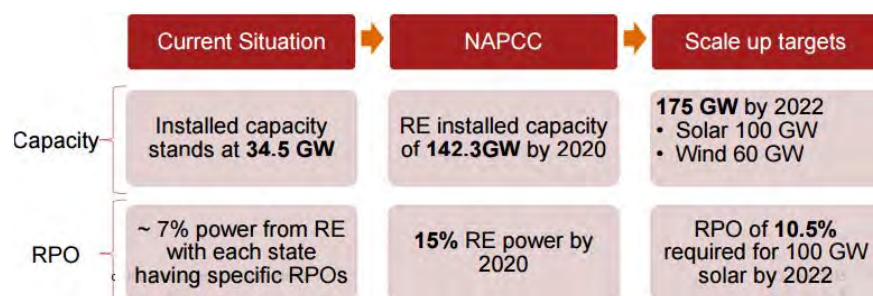
ANNEX XI – INDIA RENEWABLE ENERGY TARGETS

Source: Press Information Bureau, Government of India (<http://pib.nic.in/newsite/mainpage.aspx>)

India's RE targets previously:



India's new RE vision:



RE in India: Status and Revised targets:

Source	Capacities in MW			
	Installed capacity by end of 11 th Plan (March 2012)	Current installed Capacity (March 2015)	Target as per 12 th Plan (March 2017)	Revised Targets till 2022
Solar Power	941	3,383	10,941	1,00,000
Wind power	17,352	22,645	32,352	60,000
Biomass Power	3,225	4,183	6,125	10,000
Small Hydro	3,395	4,025	5,495	5,000
TOTAL	24,914	34351	54,914	1,75,000

India's Solar Scale-up Plans- 100 GW Vision:

- Category 1. Rooftop Projects = 40 GW
- Category 2. Large scale; Projects Category:
 - Inside Solar park = 20 GW
 - Outside Solar Park = 40 GW

40 GW through grid connected rooftop:

- Status:- 358 MW Projects sanctioned and 41 MW installed [Potential for 124 GW exists]
- Target:- 40,000 MW by 2022 of which 10 GW during 2015-16 to 2017-18
- Current Support:- Financial assistance of 15% of the benchmark [Reduced from 30% earlier]
- Updates:-
 - 14 States have rooftop provisions in their Solar Policy and 20 States/UTs have notified regulations
 - Rooftop included under IPDS and guidelines issued
 - Guidelines issued to include rooftop under housing loan and 9 banks have issued instructions
 - Central Electricity Authority (CEA) has notified technical standards for connectivity and metering

ANNEX XII – PILOT CASE STUDIES

PACE-D TA Pilots Selected for In-Depth Review

Pilot	Solar Roof Top (Indian Railways & IOCL (PSU))
Time	IR: Engaged since start of 2015 (ongoing) IOCL: Since November 2014 (ongoing)
Progress	Tendering process, engaging vendors for implementation e.g. Indian Railways' 500 kW at Delhi station and IOCL engaging the EPC vendors for implementation of identified potent locations.
Success Factors	Partnership and synergy
Sustainability	Becoming mature having commitment and resources.
Scalability	Policy is in place (central and state governments' solar policy and now IOCL has its own solar PV roof top policy) Need/demand of clean energy Internally set targets to install RE (e.g. Indian railway mandated that 1000 MW power will be from solar PV (in 2015 minister of railway declared in the assembly), now clear vision is there with IR.) Potential assessment has been done (have fair picture – where & what & how?) Cost effective commercial solar technology available
Key Stakeholders	IOCL, Indian Railways, MNRE
Source	KIIs & Document Review

Pilot	Smart Grids: Tripura State Electricity Corporation Ltd. and Ajmer Vidyut Vitran Nigam Ltd.
Time	Since October 2014 (ongoing)
Progress	Capacity building workshops for utility, publishing Technical/Opinion papers Development of draft Smart Grid regulations and support activities to ISGTF.
Success Factors	Synched with National agenda of India (NSGM)

Sustainability	Sustainable considering commitment and existing resources, likely to be useful for long term plans of Govt. of India (National Mission on Smart Grid).
Scalability	Scalable if: TA is provided sufficiently- Continuous & stable engagement of appropriate experts Project evaluation matrix and M&V for work activities Self-sustaining financial model for utilities Efficient management of overwhelming amount of incoming data and well-versed analysis Right Partnerships More awareness to end users & utilities
Key Stakeholders	TSEL, PGCIL/SGTSF
Source	KIIs & Document Review

Pilot	Microfinance (Clean Energy Products/Services Lending via MFIs)
Time	Since December 2014 (ongoing)
Progress	The Program has completed the operational design for MFIs SVCL, Sarala, Saija and ESAF. ESAF expressed interest in investing in another MFI partner Swayamshree and Sarala and Saija have both completed the pilot envisaged in the business plan and have progressed to the next phase. More than 21,000 clean energy devices have been sold through the initial pilots. Delivered a total of 1,234 person-hours of training and leveraged approx. USD 750,000.
Success Factors	Looked into other donor program as learning for marketing & outreach (e.g. IFC's awareness raising campaigns in Bihar and UP) Engagement of right partner (Selection Criteria for MFIs). Qualitative & Quantitative evaluation before & during the launch of the pilot. Clear communication/ engagement plan Business model development Training & CB of MFIs Arc Finance was involved in REMMP Program
Sustainability	Cut off rural areas' need energy with/without productivity Proven innovative business model

Scalability	Engagement of Product / Service Providers Integration with Policy Awareness & Training & CB
Key Stakeholders	Arc Finance Limited, MFIs (Sarala, ESAF, Saija, SVCL)
Source	KIIs & Document Review

ANNEX XIII –INSTITUTIONAL STRENGTHENING

Task (CLIN)	Brief description	Approach for Institutional strengthening	Effectiveness	Basis /assumption
Smart Grid (CLINI)	TA is supporting MOP in its mission objective to improve the efficiency of electric distribution. This component is being pursued on the lines delineated in the proposal and supported in the PAC. Support was needed for evolving and implementing the Smart Grid Vision and Roadmap and proposing regulations for smart grids.	A flexible multi -pronged approach is being adapted. To start with, a top down approach involving substantive support from international experts was pursued for the Indian Smart Grid task Force (IGSTF). It has now generated internal demand for the TA.	Reasonable demand for TA experts is recognized during the tenure of TA and even beyond the project period for the Smart Grid Mission.	KIIs, documents
ECBC Updates 2007(CLINI)	TA is supporting BEE in the task as a part of its proposal and is well supported in PAC. BEE is banking on the expertise of TA experts to manage this special task, even though there are other donors supporting ECBC implementation at the state level.	A consultative approach is being pursued. This task being complex involving contribution of several specialists including academic institutions suggested by BEE, TA experts provide a think tank support besides contributions for imbibing ideas specially framework for stringency analysis, synthesis of inputs from building sector experts, co-ordination and drafting the code. BEE's contribution is more administrative.	BEE owns this task and is appreciative of the TA support. The task encounters several procedural delays beyond the control of TA team.	KIIs, documents
Accreditation of	Being pursued as delineated in the program goal & task under	A consultative approach is being adopted with major	TA has devoted substantial efforts to put	KIIs, documents

ECBC Professionals (CLINI)	the proposal and supported in the PAC	responsibility on the TA experts for technical details including setting the course content and guide books, managerial and coordinating efforts. BEE is exercising administrative role for this national task.	in place the accreditation scheme for ECBC professionals which are being introduced for the first time in India.	
NZEB concept (CLINI)	Being pursued as delineated in the program goal & tasked under the proposal and supported in the PAC	Top down approach was pursued with main responsibility of seeding the concept and its pre-selling to BEE & others on the TA. With the flexible approach, TA is able to develop the concept and link it to BEE through a persuasive approach.	There is a partial success because BEE has not gone beyond accepting the NZEB portal in its web-site. At the moment, there is a lack of clarity on the sustainability of the concept without TA support.	KIIs, documents
HVAC Technologies (CLINI)	Linked to the Building Energy Efficiency program and pursued as delineated in the program goal & tasked under the proposal and supported in the PAC	Top down approach with the main responsibility of developing the programmatic task on the TA. BEE was consulted but did not adequately contribute to implementing the suggestions of the market assessment report disseminated as a part of the TA.	Did not contribute to strengthening BEE. It may also be linked to internal decisions at BEE.	Based on KIIs
EE Financing (CLINI)	Being pursued as delineated in the program goal & tasked under the proposal and supported in the PAC.	Top down approach was adopted with TA playing a lead role in consultation with BEE till Sep 2015. BEE was heavily dependent on the support provided by the TA with their	TA made limited impact to bring BEE and commercial bankers a bit closer. There is also a lack of efforts to pursue the goals jointly by	KIIs

		role to evaluate the outcomes. From Sep. 2015, this task TA has been discontinued.	Nexant and BEE due to inflexibility to move together.	
Waste Heat Utilization (CLINI)	Being pursued as delineated in the program goal & tasked under the proposal	Consensus based approach was adopted with substantial inputs from BEE/PAC in earlier phase till mid-2014, Subsequently, BEE is not contributing to sustenance of these efforts.	Capacity building efforts were abruptly closed without any significant results. This reveals that it did not contribute to the capacity building. It may also be linked to internal decisions at BEE or their organizational matters.	KIIs
Perform Achieve Trade Scheme (PAT) (CLINI)	Being pursued as delineated in the program goal & task under the proposal. This is a major national initiative leading to issuance tradable energy certificates.	BEE had a lead role in the task with inputs from several other experts besides Nexant. Due to administrative reasons (not clearly understood), TA's involvement was discontinued at the behest of BEE after its pursuit for about a year.	It is difficult to comment on the effectiveness of the TA on strengthening BEE. Some lessons need to be learnt regarding and sustainable capacity and results.	KIIs
State Policies and Programs (EE & RE) (CLINI & CLIN2)	Being pursued as delineated in the program goal & tasked under the proposal and supported/deliberated in the PAC	Top down approach with limited flexibility of the state organizations to pursue the state plans and programmatic tasks based on the needs of the partner organizations/ implementing organizations / beneficiaries was observed. TA has made substantial efforts for periodic follow-ups and hand holding support to strengthen institutional capacity of the	Very low impact. This is mainly because of the lack of adequate involvement of the partner organizations in TA design and the very nature of TA interventions conceived planned and general slowness by organizations in taking decisions for propagating EE& RE state	KIIs

		state government partner organizations.	action plans.	
Demand side Management (CLIN1)	Being pursued as delineated in the program goal & tasked under the proposal and supported/deliberated in the PAC for HERC under state EE Program	HERC has got into the area of Demand side Management. To use its regulatory mandate to work with state Discoms through a task force. TA provides need based support for strengthening HERC and Discoms.	Limited impact so far, though EESL is toying with two DISCOMs for state program for energy efficiency lighting program for domestic consumers.	KIIs
Solar Energy Training Network (SETNET) (CLIN2)	Being pursued as delineated in the program goal & tasked under the proposal and supported/deliberated in the PAC in tune with the growing demand for solar energy.	Partnered with MNRE & its affiliate (National institute for Solar Energy- NISE) for taking up programmatic tasks by providing specialist's support to develop the framework, select training organizations and development of an operational strategy. It provides a think tank support besides contributions for imbibing ideas, synthesis, drafting curricula, identifying partners, work plans, budgets and co-ordination.	TA is contributing to fast track plans on human resources development aimed at creating a resource pool and establishing and sustaining a network of organizations to wide-scale training delivery on Solar Energy programs.	KIIs, documents
Heat Rate Improvement in Coal Fired Power Plants (CLIN3)	Being pursued as delineated in the program goal & tasked under the proposal and supported/deliberated in the PAC.	Partnered with NTPC and its affiliate - Centre for Power Efficiency & Environmental Protection (CENPPEP) established with NTPC under MOP in collaboration with USAID for taking up joint activities in two existing power	This was quite effective and result oriented.	KIIs, documents

		plants to demonstrate heat rate improvements.		
Coal Fired Power Plants (CLIN3) at super critical power plant	Being pursued as delineated in the program goal & tasked under the proposal and supported/ deliberated in the PAC.	Top down approach with overseas experts developing capacity of NTPC (for Sipat power plant) piloting “Coal Blending Software” and “Advanced Pattern Recognition Software”, bench marking and best practices manual & knowledge exchange through training & out-reach activities and study mission.	This was quite result oriented	KIIs, documents
Coal Fired Power Plants (CLIN3) – Heat to Power Alliance	Being pursued as delineated in the program goal & task under the proposal and supported/ deliberated in the PAC.	New organization Indian Heat to Power Alliance affiliated to CII Hyderabad created to sustain the results beyond the CLIN3. One of the goals is to establish the model thermal power plant.	Sustainability of the concept based on the market response is doubted.	KII
Bangalore Electricity Supply Company (BESCOM) (CLIN2)	TA Program provided support for solar roof top program; metering and agricultural pump set pilots.	Bottom up approach (The Program was an invitee to the Technical Committee established by BESCOM for implementing Karnataka Solar Policy.)	BESCOM has acknowledged the inputs from the TA in kick starting its solar energy program.	KII, Documents
Jaipur Vidyut Vitran Nigam Ltd (JVNL) (CLIN2)	Implementing the Rajasthan Solar Policy. TA supported the finalization of interconnection scheme for the solar rooftop program and the net metering	TA supported JVNL based on their exposure on solar roof top program in BESCOM.	Contributed to kick off the solar roof top program.	KII, documents

	regulation under the TA.			
Indian Railways (IR) (CLIN2)	Implementing solar roof top program	using the templates and outputs provided by the TA Program to contract developers	TA has boosted the capacity to manage the pilot program and scale up.	KII, documents
Indian Oil Corporation Limited (IOCL) (CLIN2)	Implementing solar roof top program.	TA enabled an analysis of national policies and regulations was made and detailed pre-feasibility reports and tendering	TA has boosted the capacity to manage the pilot program and scale up.	KII, documents
MFIs Saija and Sarala (CLIN2)	TA Program worked closely with MFIs to kick start their energy lending program.	As a part of the TA, trainings were organized and business plans were developed.	MFIs are able to establish into the clean energy products and services	Documents

ANNEX XIV – CLEAN ENERGY FINANCE DATA

Task (CLIN)	Amount (million USD)	Approach for mobilization of clean energy finance	Effectiveness	Basis /assumption
NZEB Pilot (Nalanda)	300	Promoters of Nalanda University	Depends on the pace of implementation	Projected based on interactions with Nexant
Roof Top Programs	280	Likely investment by potential beneficiaries in roof top programs in the focused states	Depends on the pace of implementation	Projected based on interactions with Nexant
Indian Railways	150	Service contract/internal	Depends on the pace of implementation	Projected based on interactions with Nexant
Smart Grid	83	Govt. of India	Depends on the pace of implementation	Projected based on interactions with Nexant
Green rating	80	Projected for Green rated projects	Depends on the uptake of the scheme	Projected based on interactions with Nexant
Energy storage	51	MNRE	Depends on the uptake of the scheme	Projected based on interactions with Nexant
Green Bonds	50	Financial intermediaries	Depends on the uptake of the scheme	Projected based on interactions with Nexant
Rural Pilots	47.9	Service organizations	Depends on the uptake of the scheme	Projected based on interactions with Nexant
IOCL	35	Service Contract/internal	Depends on the pace of implementation	Projected based on interactions with Nexant
Chandrapura Power Plant	9.49	Budgetary support to Piloted power utility under CLIN3.	Already incurred	Document – CLIN3 report
Haryana DSM	6.6	Likely cost for Building energy	Depends on the pace of	Projected based on interactions

		program	implementation	with Nexant
Micro finance Institutions	4.5	Projected Cost of clean energy products and services	Depends on the pace of implementation	Projected based on interactions with Nexant
TCG	2.0	Likely to sourced	Likely	Projected based on interactions with Nexant
CEAP	1.6	Projected figure	Depends on the pace of implementation	Projected based on interactions with Nexant
CLINI (incurred)	0.397*	Incurred	-	OES-EGC Indicators Reporting in October 2015
CLIN 2 (incurred)	2.474**	Incurred	-	OES-EGC Indicators Reporting October 2015
Total	1035			

- BEE's Grant support to State Designated Agencies (SDAs) for participating EE finance workshop

** BESCOM customers for Roof top program, Customers of CE products, Grants from CEED, The Climate Group, Rockefeller Foundatio

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