PARTNERSHIP TO ADVANCE CLEAN ENERGY - DEPLOYMENT TECHNICAL ASSISTANCE PROGRAM

RENEWABLE ENERGY TRAINING & CAPACITY BUILDING INITIATIVES

NISE

SCGJ SKILL COUNCIL FOR GREEN JOBS
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India proposes to deploy 175 gigawatts (GW) of renewable energy by 2022, the platinum jubilee year of its independence. A substantial 100 GW of this will be deployed in the form of solar energy, and 40 per cent of this total is targeted from solar rooftop installations. Achievement of these targets depends heavily on how India is able to scale up deployment, financing and human resource development in the sector. Particularly, human resource development through skill building efforts will be one of the key pillars on which the achievement of this target will be built. Growth in renewable energy is also vital to the success of the government’s flagship programs, including Make in India, the Skill India Mission, and will generate employment opportunity for over 300,000 people over the next five years.\(^1\)

To achieve the 40 GW target, there is a need to have qualified and skilled manpower in the field of design, development, financing, implementation, operations and maintenance. Globally, research demonstrates that smaller, distributed renewable energy projects such as solar rooftop are the most labor intensive, and create the most number of local jobs, unlike utility-scale energy, which creates jobs concentrated in certain areas. According to one estimate, solar rooftop added nearly 50 percent of all new jobs created in solar and wind energy in India in 2018, despite significantly lower installed capacity. Construction and commissioning related activities create the largest number of jobs within solar rooftop – a trend common to all forms of renewable energy.\(^2\)

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2. According to the estimate by SCGJ, NRDC and CEEW, additional workforce required in 2017 – 2018 was 9,500 in utility solar, 12,000 in solar rooftop and 3,500 in wind. Across sectors, construction and commissioning constituted nearly half of all the jobs.
The need for training is not limited to the solar industry, but also to other actors in the ecosystem who must understand this new and emerging technology. The sector also demands a large number of trained utility engineers to provide interconnection, site inspection and bankers who evaluate and approve loan applications, etc. Capacity needs to be built at the lowest tier of governance of these institutions to meet the requirement of installing thousands of systems simultaneously. Active participation of stakeholders and the business community is critical for solar rooftop to reach its potential, aligned with national goals. There is a need to upgrade skills, and provide capacity building support to power distribution companies, who must closely engage with developers and citizens. The ecosystem of players must act in concert and participate in an evolving regulatory and market landscape, and become electricity producer-consumers through their switch to solar rooftop.

A solar rooftop market study commissioned by GIZ and KfW in 2016 identified a couple of training initiatives run by public and private training institutions focused on solar PV, but none of these trainings were catering to the specific requirements of the solar rooftop sector. Given the vast employment potential from solar rooftop sector, and given its nascent nature, the industry has only now initiated organized planning for skills development and training. There remains a dearth of adequate and targeted training and capacity building programs. Existing institutional capacity needs to be augmented with necessary infrastructure, supplemented through standardized training materials and capacity building programs targeting various stakeholders in the rooftop ecosystem.

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Figure 2 - PACE-D TA Program’s Approach for Scaling Training Programs Nationally
The main focus of the MNRE-USAID PACE-D TA Program is the creation of the appropriate institutional framework for scaling up clean energy in India. One of the mechanisms envisaged for creating this institutional capacity is the design and implementation of customized, standardized training programs and support in the delivery of trainings. Initial Program design had a target of 39,600 man hours of training, the bulk of which were planned to be dedicated to renewable energy, the other focus areas being energy efficiency and clean fossil fuels. The Program actively began work under its training and capacity building component in 2015, and dedicated initial efforts on specific areas where training was required and most beneficial. To maximize impact, it worked by linking training and capacity building initiatives to its overall institutional support initiatives for states, distribution companies (DISCOMS) and other partners.

The successful adoption of solar rooftop policy, regulation and the interconnection guidelines and frameworks by the PACE-D TA Program’s partner states resulted in a demand for trained manpower for actual implementation of solar rooftop projects. In response, the Program shifted focus of its training initiatives to work with states in scaling up solar rooftop deployment. Because the bulk implementation burden of solar rooftop programs falls on distinct stakeholders, the Program specifically focused on three critical categories for whom, training was necessary, as depicted in Figure 1:

- Utility engineers, in-charge of integrating the solar rooftop systems into the grid
- Entrepreneurs, responsible for investing or developing solar rooftop projects
- Bankers, responsible for financing projects

The Program had the expertise and network to develop comprehensive, customized and standardized training programs for all three categories. Initial work on developing training programs started in 2015 in partnership with the National Institute of Solar Energy (NISE) and the Ministry of New and Renewable Energy (MNRE). Simultaneously, the Program also looked at developing a network of training institutions which could work on scaling up training programs.

Initial Foray with NISE for creation of SETNET

![SETNET Collaboration Diagram](image)

**Figure 3** - PACE-D TA Program's Collaboration with MNRE to Develop the SETNET Program
The Program started collaborating with NISE on solar rooftop training in 2015 as there was a need felt for solar rooftop specific training programs. The Program designed, developed and implemented a generic solar rooftop training Program with NISE. Four such programs were implemented in 2015, with MNRE funding. Based on feedback from the training program and other initiatives by NISE, a need was felt for a larger, network-based framework for rolling out solar rooftop and other training programs.

The collaboration with NISE resulted in creation of “Solar Energy Training Network” (SETNET), a network aimed to design, develop and deploy new and innovative training programs that would enable greater flow of knowledge and skills to the market. A schematic of the SETNET program and its structure is represented in Figure 3. Its goal was to develop a market, which works to build skills and capacities of professionals in order to ensure the availability of qualified solar energy professionals to meet the targets set under the National Solar Mission. The concept of SETNET was developed based on the highly successful DRUM (Distribution Reform, Upgrades and Management) bilateral project of USAID with the Ministry of Power.

Through an elaborate exercise undertaken by NISE and the PACE D TA Program, 35 partner institutions for training programs were selected. This was also the time when MNRE enhanced the National Solar Mission target significantly, the Skill India Mission was launched and National Skill Council or Green Jobs (SCGJ) was created. SETNET was best positioned to work with these arrangements to scale up solar and solar rooftop deployment. In June 2015, MNRE announced the launch of “Surya Mitra” program through NISE and SETNET. A number of training Institutes empaneled by SETNET participated and contributed to implementation of the program and helped add scale. However, limited budgetary support and lack of a portfolio of training programs meant the diffusion of the relevance of SETNET. The training institutes covered by SETNET were brought under the fold of the SCGJ, which started rolling its training programs through them.

Training Needs Assessment

One of the first tasks post formation of SETNET was to understand the training landscape and identify a range of training programs which could be taken up by MNRE, NISE and the PACE-D TA Program. For this purpose, the Program commissioned the Confederation of Indian Industries (CII) to undertake a detailed Training Need Assessment study. The study came up with specific recommendations on training needs, and captured a comprehensive picture on the value chain, skill needs, and training requirements desired by the solar industry. It established the context and laid the groundwork for upgrading existing training framework and modifying the training curriculum.
The study identified new job roles and training that can be imparted to an additional 143,000 professionals to meet the estimated manpower requirements for achieving a target of 100 GW of installed solar power. Hence, it emphasized the need to bridge the manpower competency needs by means of dedicated training solutions.

The Program, through CII, constituted an industry-led Task Force to guide and monitor project activities. The Task Force comprised of top officials from MNRE, SCGJ, NISE, and USAID, and key executives from leading solar companies. Multiple meetings were held during the course of the study, which helped establish a roadmap for the study, lay out tasks and milestones, and validate key findings of skill requirements and recommendations.
Pilot Training Programs

In order to validate the training modules prepared under the guidance of experts in the field, and to get direct feedback from various stakeholders, a number of training programs were conducted across the country. The key idea behind the pilot trainings’ phase was to develop a standardized program with appropriate training material, which in time could be handed over to NISE and other implementing agencies for use in conducting similar training programs in large numbers, through SETNET partners and other training organizations.
The Program played a critical role in assisting Karnataka-based Bangalore Electricity Supply Company (BESCOM) with the development of the standardized interconnection framework for solar rooftop. This framework provided the process and procedures for solar rooftop deployment by consumers working with the utility. One of the many challenges for large-scale implementation of the interconnection framework was the training and capacity building required for utility engineers to implement the framework’s procedures. The Program worked with BESCOM to organize two training programs for utility engineers. The strong and positive feedback from these training programs emphasized the need for a dedicated utility training program.

The Program used first-hand knowledge of the interconnection process and technical challenges for solar rooftop integration to further develop the utility engineers training program. The one-and-a-half-day module had the objective of providing an overview of solar PV technology, and administered through lectures, case studies and site visits. Training covered issues related to:

- Technology
- Policy & regulation
- Business models
- Interconnection processes and administrative processes
- Technical standards and safety requirements

The first pilot training program was launched in January 2016 in partnership with the DISCOM Jaipur Vidyut Vitran Nigam Limited (JVVNL). Between January and June 2016, the Program implemented six utility training programs across six states, training more than 500 utility engineers. The training programs were organized at Bangalore, Jaipur, Kolkata, Ludhiana, Hyderabad and Lucknow in association with state utilities. Training was imparted as per the structured agenda by experienced staff of the PACE-D TA Program. The programs were interactive, and received a number of important suggestions from the practicing engineers.
The seven initial training programs received positive feedback from participants. Based on successful completion of pilot phase of trainings and the positive feedback, MNRE requested the PACE-D TA Program to scale up training, and provided support by committing to fund these trainings. This was the point when MNRE and USAID started working on the scale up strategy for utility engineer training program for solar rooftop deployment to train 5,000 engineers.
Design of the Entrepreneurship Development Program

After the successful implementation of the pilot phase of the utility engineer training program, the Program identified a capacity gap within the developer community. Most solar rooftop developers were new entrepreneurs running small businesses with limited or no exposure to the solar rooftop market, technology, business models, regulatory framework, etc. The Program carried forward its understanding gained from the work with developers, policy makers and regulators and users to design a training program for entrepreneurs who wanted to enter the solar PV rooftop market.

The seven initial training programs received positive feedback from participants. Based on successful completion of pilot phase of trainings and the positive feedback, MNRE requested the PACE-D TA Program to scale up training, and provided support by committing to fund these trainings. This was the point when MNRE and USAID started working on the scale up strategy for utility engineer training program for solar rooftop deployment to train 5,000 engineers.

The Program rolled out its first entrepreneurship training program in partnership with NISE in June 2016. The structure of the training had an objective of providing an overview of the following areas.

- Solar PV rooftop market
- Business models
- Technology and technical architecture
- System design and costing
- Financing

A total of five pilot programs were organized in collaboration with NISE and SCGJ during 2016 and 2017 at Gurgaon, Pune, Bangalore, Faridabad and Ahmedabad in collaboration with NISE, National Power Training Institute (NPTI), Mahatma Gandhi Institute of Rural Energy Development (MGIRED) and Gujarat Energy Research and Management Institute (GERMI). The feedback from these five training programs was overwhelmingly positive and a number of partner institutions expressed interest in replicating and scale-up. The PACE-D TA Program took this feedback to MNRE, who clubbed the entrepreneur development program with the utility engineer training program for solar rooftop deployment and decided to train 1,000 entrepreneurs by May 2018.
While working with partner financial institutions, the Program developed an excel-based, Solar Rooftop Evaluation Tool and a Framework for Rating Solar Rooftop projects. This exposure and understanding of the financing process led the Program to evaluate the state of understanding amongst financial institutions of solar rooftop. The Program found that most financial institutions lacked specific understanding of solar rooftop technology and business models, resulting in multifold challenges faced while evaluating and financing projects, and in the process, hampering rollout efforts of solar rooftop.

The Program used its understanding of the solar rooftop design, development and funding process to develop a dedicated two-day training program for bankers for the review and approval of loan applications for solar rooftop projects. These were rolled out for faculty and trainers at the Punjab National Bank (PNB) and the State Bank of India (SBI) training academies. There were follow-up dedicated training programs for senior managers for PNB in 2017.

Key areas covered by the two-day training program are as follows:

- Overview of solar PV technology
- Exposure to actual installations
- Policies and regulatory ecosystem
- Risks and contract structures
- Business models and markets
Other Initiatives in Training Development

For scale-up and large-scale adoption across India, training programs need to be standardized and certified by National Skill Development Corporation (NSDC). The trainees of these programs should also be eligible for certification by NSDC or its associates. The Program collaborated with SCGJ, an associate of NSDC, for getting the training programs standardized and certified. Based on stakeholder feedback, the Program and SCGJ refined the training programs and developed Qualification Packs (QPs) and National Occupational Standards (NoS), which are now approved by NSDC. Trainees participating in these programs are now eligible for certification of NSDC. The Qualification Packs approved by NSDC are:

- SGJ/Q0104: Solar Rooftop Photovoltaic Entrepreneur
- SGJ/Q0105: Solar Proposal Evaluation Specialist
- SGJ/Q0106: Solar Rooftop Grid Engineer

The approval of QPs helps standardize the training programs, ensuring that they are delivered in a consistent manner by a large number of network training institutions. The standard training packages can be readily used, with little customization, by any training institute for conducting training, and include activities and quizzes, which ensure interactive trainings which help improve learning outcomes. These training packages are used by NISE and partner institutes to roll out training programs across states. Further, these training packages will be available with NISE, SCGJ and MNRE for public distribution. Training packages include:

- Qualification Packs and National Occupational Standards
- Agenda for the training program
- Model PowerPoint presentations
- Activities to engage the participants
- Videos and teaching resources
- Learner’s and Trainer’s Manual
- Feedback forms

The Program continues to work with SCGJ, and is developing handbooks for training programs. So far, the handbook for bankers’ training program has been developed and is under publication. Handbooks for other two programs are currently under development.

Training Scale Up

MNRE identified training of utility engineers and entrepreneurs as the key requirement for the scale up of solar rooftop deployment. In 2016, MNRE targeted to partner with the PACE-D TA Program to train 5,000 utility engineers and 1,000 entrepreneurs by May 2018. However, there was a lack of institutional infrastructure in India to scale up solar rooftop deployment. So, the Program prepared a roadmap for achieving this target. Target includes identifying a number of training institutes, building capacity and providing supporting.

In August 2017, MNRE sanctioned an amount of INR 60 million to NISE for conducting training of utility engineers and entrepreneurs under the PACE-D TA Program in eight states. These training programs will thus be financed by MNRE, certified by the SCGJ, technically supported by the Program and implemented through a program manager, NISE. The roles and responsibilities of the key stakeholders have been highlighted in Figure 5.
NISE and MNRE have identified ten training institutes from across the country with varying levels of exposure, expertise and training experience of solar rooftop.

Concerted efforts by NISE, MNRE and other stakeholders, with support from the PACE-D TA Program, have built a strong base upon which future initiatives for skills and development can be built. The iterative process and engagement of stakeholders at each step has ensured that the current structure is robust and designed in a manner which can deliver large-scale training at the local and regional level where it can be most effective. Given the strong importance of this sector, and localized need of skills of solar rooftop, it is vital that initiatives continue budgetary support and allocation from the MNRE as well as support from the industry, where possible.

Roles and Responsibilities of Key Stakeholders

- Sanction program strategy
- Sanction budget and provide funds
- Monitor implementation of program
- Program design, planning and implementation strategy - deployment
- Engagement of PTIs
- Signing of contracts for PTIs and release of payments for training programs
- Monitor training program implementation with SCGJ
- Identification and engagement of SPE and DE
- Design, development and approval of QP
- Design model curriculum
- Accreditation of PTIs and Trainers
- Organizing TOTs in partnership with USAID
- Feedback Assessment (FA)
- Certification of Trainees & Trainers
- Design, development and approval of QP
- Design and development of Learning manuals
- Handholding PTIs for implementing Training programs
- Support organization of TOTs
- Finalization of Training Materials & modules
- M&E and FA
- Design MOOC

Figure : Roles & Responsibilities of Key Stakeholders

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<tr>
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<td>1</td>
<td>Aligarh Muslim University</td>
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<tr>
<td>2</td>
<td>National Power Training Institute, Faridabad</td>
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<tr>
<td>3</td>
<td>National Power Training Institute, Durgapur</td>
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<tr>
<td>4</td>
<td>National Power Training Institute, Guwahati</td>
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<td>5</td>
<td>Mahatma Gandhi Institute of Rural Energy Development</td>
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<td>6</td>
<td>Malaviya National Institute of Technology, Jaipur</td>
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<td>7</td>
<td>G.B. Pant Institute of Engineering and Technology</td>
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<td>8</td>
<td>Central Institute of Rural Electrification</td>
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<tr>
<td>9</td>
<td>Gandhigram Rural University</td>
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<tr>
<td>10</td>
<td>Gujarat Energy Research and Management Institute</td>
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PTIs: Partner Training Institutions
SPE: Solar PV Expert
DE: Distribution Expert
TOT: Training of Trainers
FA: Feedback Assessment
M&E: Monitoring & Evaluation
CPOTs: Central Pool of Trainers
MOOC: Massive Open Online Course
Capacity Building and Rollout of Training

As highlighted earlier, MNRE sanctioned funding and appointed NISE to carry out capacity building of training institutes and subsequently rollout of the training for solar rooftop. The objective is to train 5,000 utility engineers and 1,000 entrepreneurs by May 2018. The focus for both these interventions will be on creating an institutional architecture for training, ensuring trained manpower for organization, and facilitating the implementation, monitoring, evaluation and certification (wherever possible). The PACE-D TA Program has been handholding NISE and its training partners with all these activities. Training is focused on eight partner states allotted to the Program: Andhra Pradesh, Assam, Haryana, Maharashtra, Punjab, Telangana, Uttar Pradesh and West Bengal.

Training of Trainers

Due to varying levels of exposure, expertise and training experience of solar rooftop, it is important to train the trainers before rolling out the training program. The primary objective of the Training of Trainers Program is to develop comprehensive capacity amongst training institutions and trainers across the country. The training program’s focus is on working with trainers using the standardized material developed by PACE-D TA Program and develop their knowledge and understanding of solar PV rooftop systems, on issues such as technology, policy and regulation, business models, economics and the market structure. The programs also target imparting knowledge on implementation challenges, administrative, procedural issues, and soft skills for effective delivery of training. The Program has carried out the following Training of Trainer programs:

- Utility Engineers’ Training Program
- Training of Trainer Program for NPTI staff from across the country at NPTI Faridabad (May, 2017)
- Training of Trainer Program for partner training institutes at NISE, Gurgaon (September, 2017)
- Entrepreneur Development Program - Training of Trainer program for all the partner training institutes at GERMI, Ahmedabad (February, 2018)

Rollout of Training Programs

For rollout of the training program, NISE has allotted training programs to DISCOM/Circle wise for utility engineers’ training and state wise for each training institute. The Program has provided extensive support to partner training institutes which includes the following:

- Physical monitoring: The Program participated in training programs to assess the quality of delivery and worked along with the partner institutes to improve the quality.
- Partner with DISCOMs: The Program introduced partner institutes to the relevant office of the DISCOMs to identify and mobilize trainees. Subsequently, the Program supported partner institutes to liaison with DISCOMs for effective implementation of training.
- Identify and engage individual experts: The partner institutes specialize and build strength in certain topics and rely on the individual experts from the sector for the rest of the topics. The Program assisted partner institutes in identifying and engaging experts.

Rollout of the training commenced in September 2017. As of March 2018, the partner training institutes, with the support from the Program, have trained 2,124 utility engineers in 56 training programs and 624 entrepreneurs in 15 training programs covering eight utilities and seven states.
The Program’s activities to support training and skills development for renewable energy have created a significant impact in a short period of time. The following key learnings summarize the findings, to serve as indicators for development of future programs, grouped by major stakeholder categories.

**Training Institutes**

- **Engaging Industry Experts:** Several training institutes serving the sector lack working knowledge and experience on solar rooftop. It is therefore imperative for training institutes to engage experienced industry experts for delivering part of the training.

- **Training Aids:** Training using aids like videos and activities (designed by the Program) improved engagement with the participants, which lead to improvement in the learning outcomes. Training institutes should use such training aids to improve the learning outcomes.

- **Online Forums:** Creating online forums for the participants, especially entrepreneurs, can be helpful with post training learning, experience sharing and provided solutions for issues faced during implementation. This has been clearly noticed in the WhatsApp messaging groups formed by the Program for the participants and trainers for every training program. Training institutes can create such forums to improve post training learning and interaction amongst participants.

- **Site Visits:** Practical exposure through site visits along with classroom training improved learning considerably. Working experience during the site visits like inspecting the earthing, lightning arrestors were helpful in improving the understanding of the solar rooftop design and functioning. Training institutes should make site visits integral part of training irrespective of duration of the training program.

- **Maintaining Diversity:** For entrepreneur training, it has been observed that a batch with participants of different expertise and educational background resulted in better participation and better learning outcomes. It is recommended to have such diverse groups for trainings.

**Implementing Agency/Project Management Unit (PMU)**

- **Multiple Step Training Process for Trainers:** As mentioned earlier, the expertise for training is limited in India as of now and this is applicable for the training institutes as well including the ones shortlisted. The Program feels, based on its experience of rolling out the trainings, one Training of Trainers program might not be adequate for developing the expertise required for training. First training program would help trainers understand the basics of solar rooftop and can be foundation for developing further expertise. It is recommended to build the expertise of trainers over a period of time:
  - Refresher training programs for the trainers should be organized at regular intervals.
  - Certification of trainers should be a two-stage process – interim certification on completion of training and final certification after evaluation of trainers’ performance in actual training programs.

- **Institutionalizing of Solar Rooftop Training:** For building capacity of all the junior and senior staff of DISCOMs across the country, the training should be institutionalized within the DISCOMs. Solar rooftop training should be organized and delivered (with the support of training institutes and external trainers) by and within the training centers of the respective DISCOMs. It should also be part of annual training calendars of DISCOMs. The same holds true for banks as well.

- **Continuous Improvement Process:** PMUs should identify the training as a multiple step process over a period of time rather than one-time process and should design the training schemes accordingly. PMUs should also develop mechanisms for post training learnings.
Entrepreneur Programs under Market Mode: Entrepreneur training programs have a large demand and have a huge market potential wherein the programs are funded by trainees. Moreover, carrying out entrepreneur programs in market mode is a sustainable way of building capacity of the sector. This will enable evolution of training as per market needs. PMUs should target transitioning to fully funded training programs, paid for by trainees. However, PMUs should provide handholding support to the training institutes to carry out such programs.

Training Aids: PMUs should encourage training institutes to use training aids to improve learning outcomes. To facilitate the same, PMUs can design standard training aid packages and make them available to training institutes. The importance and the usage of the training aids should also be demonstrated in trainer of training programs.

Engaging Industry Experts: Engaging industry experts is needed for better training. PMUs should identify and develop a network of industry experts who can be engaged by the training institutes.

DISCOMs

Institutionalizing: DISCOM staff has limited exposure to solar rooftop sector. It has also been noticed that many of them lack knowledge of basics or working of solar rooftop systems. One training program would not guarantee expertise of such staff on solar rooftop. It has been observed that learning outcomes have been different for participants based on their prior exposure, and engineers with some prior exposure fared better. For engineers without exposure, training led to introducing them the basics of solar rooftop. Such engineers would need more training programs to improve their expertise. Engineers should get repeated exposure to training programs for continuous improvement. This can be achieved if solar rooftop training is an integral part of training and capacity building activities of DISCOMs led by their respective training division and is part of utility engineers’ annual training calendar.

Monitoring and Evaluation: Currently, utility engineers do not have a requirement for evaluation of training outcomes. There is no quantifiable feedback process for training. It is recommended to institute such processes, and use it for refining training and continuous improvement. Utilities may:

- Consider SCGJ’s certification for assessing training of utility engineers
- Develop internal monitoring and evaluation processes for monitoring and evaluation

Financiers

Institutionalizing Training: All banks, especially public-sector undertakings, have an excellent network of training centers. These training centers and their staff should be used for effective rollout of training for solar rooftop. These banks also have annual training calendars for training on various aspects. Solar rooftop trainings should be included in annual training calendars of banks.

Continuous Improvement Process: The solar rooftop sector is dynamic with changing outlooks, policy and regulatory ecosystem, evolving technologies and business models. Bankers should be kept updated with the latest developments of the sector. Solar rooftop training should be a continuous process.

Monitoring and Evaluation: Banks do not have a requirement for evaluation of training outcomes to evaluate and improve the training outcomes. For such evaluation and feedback banks may:

- Consider SCGJ’s certification for assessing training of utility engineers
- Develop internal monitoring and evaluation processes for monitoring and evaluation
Way Forward for Training – Recommendations for MNRE

For the scale-up of capacity building and trainings to prepare the workforce to achieve 40 GW of solar rooftop capacity, the Program has the following recommendations for the way forward for MNRE and other key stakeholders and policymakers.

1. MNRE should integrate training as part of solar rooftop ecosystem development and this should be major support area of the ministry’s initiatives.
2. MNRE should collaborate closely with the SCGJ, to align its long-term policy objectives with skill development, identifying relevant stakeholders and developing relevant training programs.
3. Market needs have to be assessed on a regular time to time basis and necessary updates have to be made to existing training modules, and introduce new training modules introduced when needed.
4. MNRE should work towards strengthening and capacity building of training institutes so the training can be rolled out in market mode. As the sector matures, training institutes should seek to diversify their revenue stream and aim to get partial revenue from participant fees, where possible.
5. Centers of Excellence for solar rooftop training should be developed for each region. Centers of Excellence should be developed from existing training institutes, SCGJ and MNRE.
6. Training Institutes with focus on vocational training (rather than academics) should be promoted for solar rooftop training.
7. Training aids especially videos should be developed and be made available on online public platforms for self-learning and post training learnings.
The Partnership to Advance Clean Energy - Deployment Technical Assistance (PACE-D TA) Program was launched in July 2012, as a part of the bilateral initiative under the U.S.-India Energy Dialogue. The six-year program was led by the U.S. Agency for International Development (USAID) and the U.S. Department of State; and implemented in partnership with India’s Ministry of Power and the Ministry of New and Renewable Energy (MNRE).

The PACE-D TA Program focused on assisting the Government of India (GOI) in the deployment of energy efficiency (EE), renewable energy (RE) and cleaner fossil technologies. This was done by strengthening policy and regulatory institutions, enhancing institutional and human capacity, implementing pilot projects and increasing access to finance. The Program’s activities were aligned to support the GOI’s core energy priorities such as 100 GW of solar by 2022 and Power for All.

Anurag Mishra
Senior Clean Energy Specialist
USAID/India
Email: amishra@usaid.gov

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