The Need for Institutional Capacity Building for Developing Solar Rooftop Markets: Experience of the USAID PACE-D TA Program in India

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PACE-D Renewable Energy Key Components

REACHING for the SUN
“Advancing the National Solar Mission”

- State Level Policies and Programs
- Solar Rooftop Programs
- RPO Compliance Monitoring
- Solar-Wind Hybrid
- Solar Pumping and Decentralized Renewable Energy

• TA to Indian Railways and Indian Oil for Solar Program
• Energy Storage Demonstration projects- BHEL, REIL and IOCL
• NTPC – Solar Wind Hybrid project

Supporting Public Sector Undertakings

Skills Building in Clean Energy

- Solar Rooftop Evaluation Tool
- Infrastructure Debt Fund
- Green Bonds
- Microfinance

- Solar Energy Training Network
- Training Needs Assessment for the Solar Sector
- Training of Trainers on Solar Rooftop
- Training Programs on Solar Rooftop for Utility Engineers, Banks & Entrepreneurs
- Qualification Pack for Solar Rooftop by the National Skills Development Council

FINANCING for a Smarter Future
Key Challenges that need to be addressed for Scale-up

Policy Makers & Regulators → Utilities → Banks & Financers → Developers & Entrepreneurs → Consumers

- Awareness & Understanding of the Solar Rooftop Sector
- Understanding of Policy Mechanisms, Regulations, Implementation & Business Models
- Impact on Utility Finances
- Understanding of Contracts & Risks
- Interconnection Framework
- Evaluation Tools
- Restrictive Regulations
- High Work Load
- Track Record of Projects
- High Customer Acquisition Costs
- Institutional Capacity - Solar Rooftop
- Trained Manpower - Solar Rooftop
PACE-D TA Programs Approach to Solar PV Rooftop Development in India

Areas for Technical Assistance

Critical Success Factors
- Learning’s from past Programs
- Recognizing local conditions
- Consultative Approach
- Customized Solutions
- Effective & Simple Processes
- Relevance & Replicability of Interventions & Approaches

Institutional Capacity
- Adaptive Policy & Regulation
- Project Implementation Support
- New & Innovative Business Models

Design of Technical Packages & Processes
- Interconnection Framework
- Tools & Mobile Applications for Bankers/Utilities
- Proposal Evaluation Process

Training & Awareness Generation
- Targeted Training Programs
- Targeted Communication campaigns
- Knowledge Creation & Dissemination

Improved Investment Climate for GRPV

1. Attractive Investment climate for solar rooftop investors
2. Facilitative Policy & Regulatory Frameworks
3. Simple, Standardized & Efficient Interconnection Processes
4. Emergence of new & innovative business models
5. Easy availability of Finance & emergence of new & innovative financing mechanisms
6. Empowered Institutions: Policy Makers, Regulators, Utilities & Banks
7. Availability of adequate Trained Manpower: Utility Engineers, Developers, Bankers
8. Standardized & Replicable Training Programs
Creating an enabling ecosystem for the uptake of solar PV rooftop

- Policy & Regulatory Support
- Utility Support
- Assistance to Energy Users/PSUs
- Human Resource Development
- Finance
Solar Rooftop: Policy, Regulatory and Utility Support

Key Activities

Policy and Regulation
- Madhya Pradesh (MP) Decentralized and Distributed Generation Policy, 2016
- Rajasthan Net Metering Regulations, 2015
- Amendment to MP Net Metering Regulations, 2014

Support to Utilities
- Standardized Interconnection Framework for Utilities
- Technical and Process Committees and Training of Utility Engineers
- Tripartite Agreement for Third-Party Solar Rooftop Projects
- Study on Challenges for Solar Rooftop Scale up in BESCOM Region

Support to SDAs
- City-wide 5 MW Solar Rooftop Program in Rajasthan
- Solar Rooftop EPC Procurement in MP

Achievements & Impact
- Karnataka: 50 MW Installed
- Madhya Pradesh: 5 MW Installed
- Rajasthan: 27 MW Installed
Support to Public & Private Sector Undertakings

**Objective**
Enhance awareness & capacity of PSUs to procure solar energy

**3 Refineries**
Barauni, Panipat and Baroda

Corporate Solar Rooftop Policy

Program Design for Solarizing Petrol Pumps

Facilitating Indian Oil’s engagement with MPUVNL and Indian Oil for solar park development

**Innovative solar rooftop business models**

**Utility-based business model**
Offer services & earn revenue

**Community-based business model**
Allow consumers with limited rooftop space to develop solar rooftop systems on third party sites

**3 MW** installed

**2.5 MW** under implementation

**3** Refineries
Barauni, Panipat and Baroda

Corporate Solar Rooftop Policy

Program Design for Solarizing Petrol Pumps

Facilitating Indian Oil’s engagement with MPUVNL and Indian Oil for solar park development

**100 MW** under tender

**50 MW**
Zonal Railways

**100 MW REMC**
Solar RPO Strategy

**800 Stations**
EPC-based procurement using CAPEX mode for small solar rooftop systems

REMC
Solar Rooftop: Knowledge and Tools


Solar Rooftop Evaluation Tool for banks and FIs

TA to Punjab National Bank for entry strategy on solar rooftop lending
Solar Rooftop: Scale-up in Eight New States

(Haryana, Punjab, Uttar Pradesh, West Bengal, Assam, Maharashtra, Telangana and Andhra Pradesh)

- Policy and Regulatory Support to address gaps/challenges
- Net Metering Interconnection Framework
- Interconnection Forms and Formats - application, approval, site verification, etc.

- Solar Rooftop Technical & Process Committees
- Training of 5,000 Utility Engineers, 1,000 Entrepreneurs & 100 Trainers
- MOOC Framework
- Training Web Portal Framework
- Workshop for Senior Management of Utility
- National Workshop and Study Tours

- Public Outreach – Media campaign in local language – advertisement and brochures
- Monitoring and reporting of capacity addition progress to MNRE
- Unified Web Portal

- Empanelment procedures for equipment suppliers, EPC contractors, etc.
- Systematic changes for a robust, responsive and efficient interconnection framework and guidelines
- Consultation with ULBs, real estate developers and other stakeholders
Objective: Build a skilled solar workforce

Key Activities

• SETNET – 35 Partners - MNRE has aligned SETNET with Surya Mitra program
• Design and development of curriculum and training materials for Utility, Entrepreneur and Banker Training Programs
• Qualification Packs for training programs approved by NSDC
• Model curriculum for all three courses

Utility
- Engineers
  - 7 trainings
  - 5 states
  - 12 utilities
  - 300 engineers

Banks
- 2 trainings
- 2 banks
- 60 trainers

Entrepreneurs
- 2 trainings
- 60 entrepreneurs

Training of Utility Trainers
- 1 training
- 23 trainers
Knowledge Sharing amongst States

Objective
Exposure to cutting issues, challenges, and opportunities in RE

Three Knowledge Exchange Workshops for States
Representatives from Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Puducherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh & Himachal Pradesh

International Study Tour to the U.S. for Government Stakeholders in April 2016
Representatives from MNRE, Ministry of Railways, KREDL, RRECL, and BESCOM

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