

U.S.-India Partnership to Advance Clean Energy Deployment Program

Enabling Solar PV Rooftop Deployment in India

**National Workshop on Rooftop Solar
June 7, 2016, New Delhi**

Presented by

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Clean Energy and Environment Office, USAID/India**

U.S.-India collaborations in the field of Renewable Energy are designed to advance three core objectives:

1. Strengthen the “ecosystem” for expanded renewable energy deployment through cross cutting efforts.
2. Promote achievement of India’s National Solar Mission’s objectives, through laying of the groundwork for further solar deployment.
3. Promoting Energy Access through Clean Energy Deployment





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AND RENEWABLE ENERGY**

MNRE-USAID PACE-D TA program is focused on creating an enabling ecosystem for the uptake of solar PV rooftop at the national and the state level.



Policies and Regulations



Utility Support



Assistance to Energy Users/ PSU's



Human Resource Development



Financing

Program Partner Agencies

State level Policies and Regulations

- Karnataka Renewable Energy Development Ltd.
- Madhya Pradesh Urja Vikas Nigam
- Rajasthan Renewable Energy Corporation.
- Energy Department, Government of Rajasthan and Karnataka



Utility Support

- Bangalore Electric Supply Company (BESCOM)
- Jaipur Vidyut Vitran Nigam Ltd.
- Bhopal, Indore & Jabalpur Distribution Companies



Assistance to Energy Users/ PSUs

- Indian Railways
- Indian Oil Corporation Ltd.



Financing

- Indian Renewable Energy Development Agency
- Tata Clean Tech Capital Ltd.



Human Resource Development

- National Institute of Solar Energy
- Skills Council for Green Jobs





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State level Policies and Regulations

1

MADHYA PRADESH

- Support to the MPUVNL on the design and development – **Madhya Pradesh Rooftop Policy 2016** (under approval).
- Support to MPUVNL for developing a petition for modifications in the Net Metering Regulations for Solar PV Rooftop Deployment

2

RAJASTHAN

- Support to the State Energy Department on the design and development **Solar Rooftop program**.
- Developed a **White paper on Implementation and Regulatory Framework for Net Metering in Rajasthan**.

3

KARNATAKA

- Technical inputs to the **Karnataka Solar Policy 2014**, including specific inputs on the technical and programmatic procedures for solar PV rooftop.
- Developed a **White Paper on the case for Gross Metering for promoting Solar PV Rooftop Deployment in the state of Karnataka**.

Support to Utilities in Rajasthan and Karnataka

1

Build Basic Understanding amongst utility on Solar PV Rooftop

- Workshops involving Policy makers and Senior Management of Utilities



2

Establish Technical Requirements and Processes

- Establish Process and Technical Committees/ engage other departments
- Finalize
 - decision making flow and technical requirements
- Application requirements.
- Application/approval forms.
- Data management

3

Capacity Building of Utility Engineers at all the levels

- Standardized training programs covering basics to all critical technical and procedural aspects.

4

Public Communication and Awareness

- Devise outreach and communication strategy and aid in its implementation

5

Regular Monitoring and Improvement

- Collection of data from field engineers, developers and public feedback
- Comprehensive study after 18 months to identify barriers to scale
- Studies for new business models and second generation policies or regulations

Design and Implementation of PSU Programs

1 Indian Railways

Key initiatives

- 50 MW solar rooftop program on railway platforms.
- 100 MW rooftop program on key Rail Corridors.
- Clean Energy Strategy to meet RPO by 2020.



Program Support

- Rationale for solar PV deployment
- Site Surveys potential assessments
- Analysis of implementation models
- Addressing technical considerations
- Design of RFQs, RFPs and PPAs
- Capacity Building of Zonal/Regional Offices

2 Indian Oil

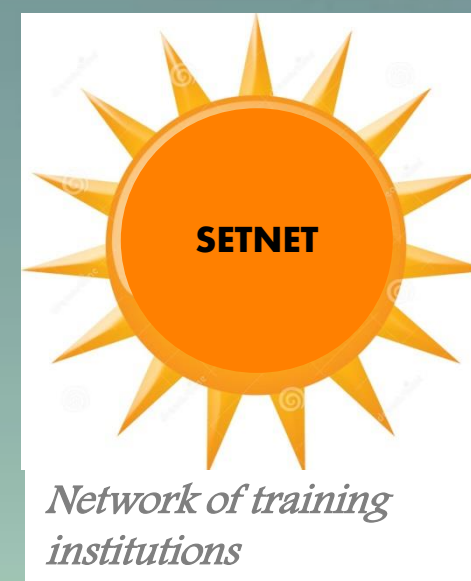
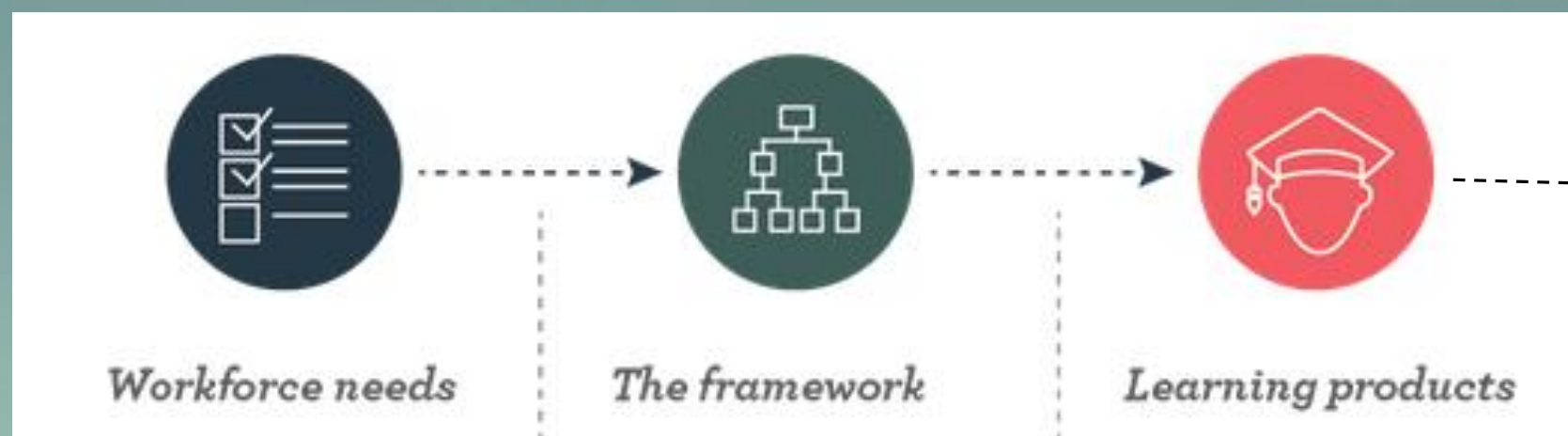
Key initiatives

- Solar rooftop program on three refineries (6.5 MW)
- Company level policy for solar PV rooftop deployment at all IOCL Buildings
- 1 GW Solar Park investment by Indian Oil and Oil India



Solar Energy Training Network - SETNET

To build skills and capacities to ensure the availability of qualified solar energy professionals to meet the national solar deployment targets



SETNET

1 Value Proposition

- 35 Training Institutions part of the Network spread across States
- Standardized training curricula and content
- Trained trainers through ToT's
- Certification from National Skill Council on Green Jobs.(under way)
- Led by the premier solar energy institute in India - NISE.

Three Training Programs Underway

- Training Program for Utility Engineers 1.5 Day).
- Entrepreneurship Development Program on Solar Rooftop (5 Day)
- Training Program for Banks and Financial Institutions.

2 Training programs



Progress

- 500 Engineers trained from 13 utilities
- 38 Solar Rooftop Entrepreneurs Trained
- Scale up and expansion of Utility, Entrepreneurs and Bankers Training Planned

Solar Rooftop Evaluation Tool - SRET

*Assisting Investment
Decision Making*



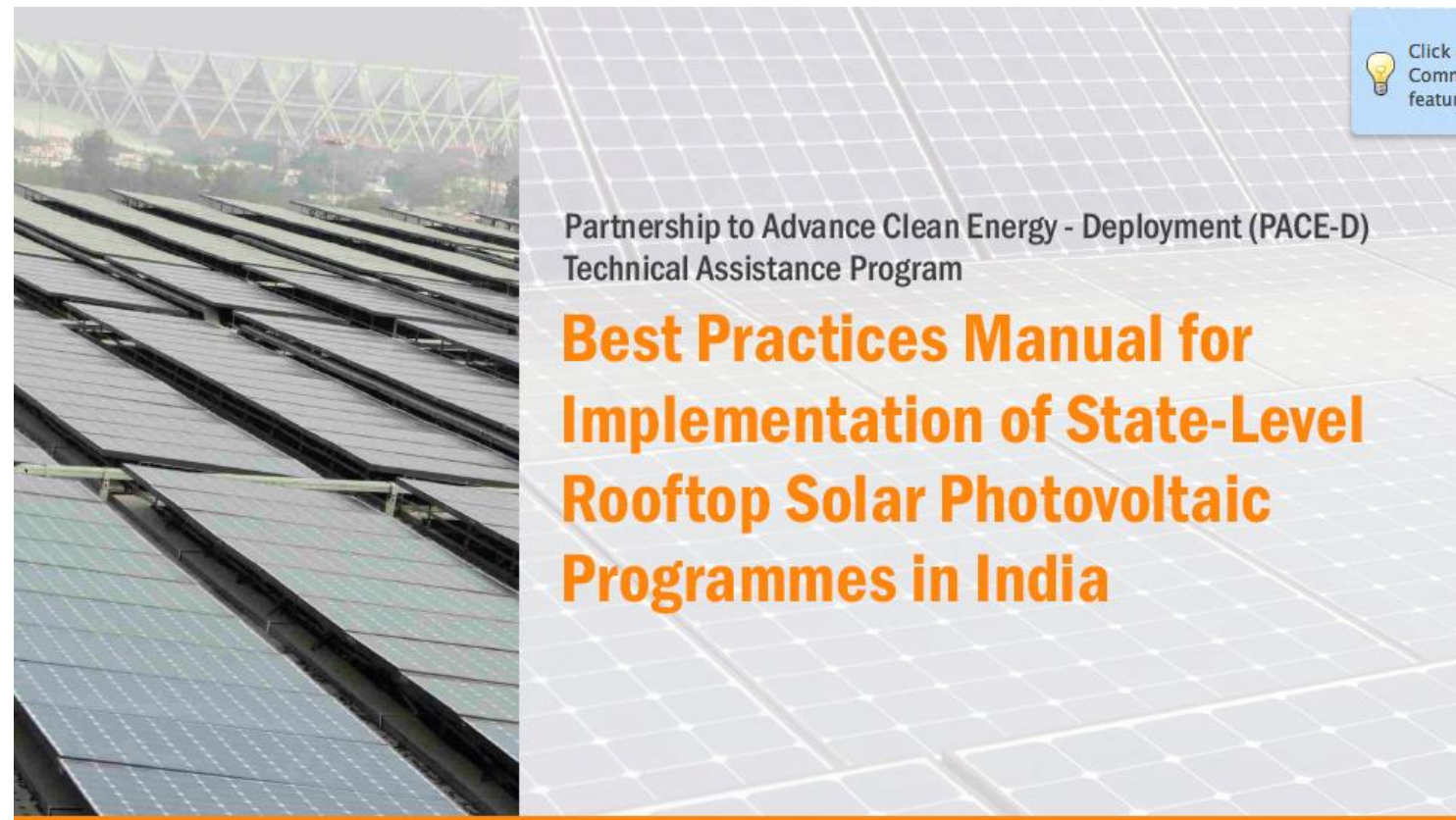
- Evaluate the key viability and sustainability parameters
- Enhance understanding of business models, system technical architecture and commercial terms of engagement
- Assist in identifying key risks and suggest mitigation options.
- Provides ready reference on the standard set of documents required for a bankable project/s
- Modular and customizable for integration with the project financing systems of banks.
- Used by IREDA to develop the rating framework for the rooftop project proposals.

Solar Rooftop
Evaluation Tool

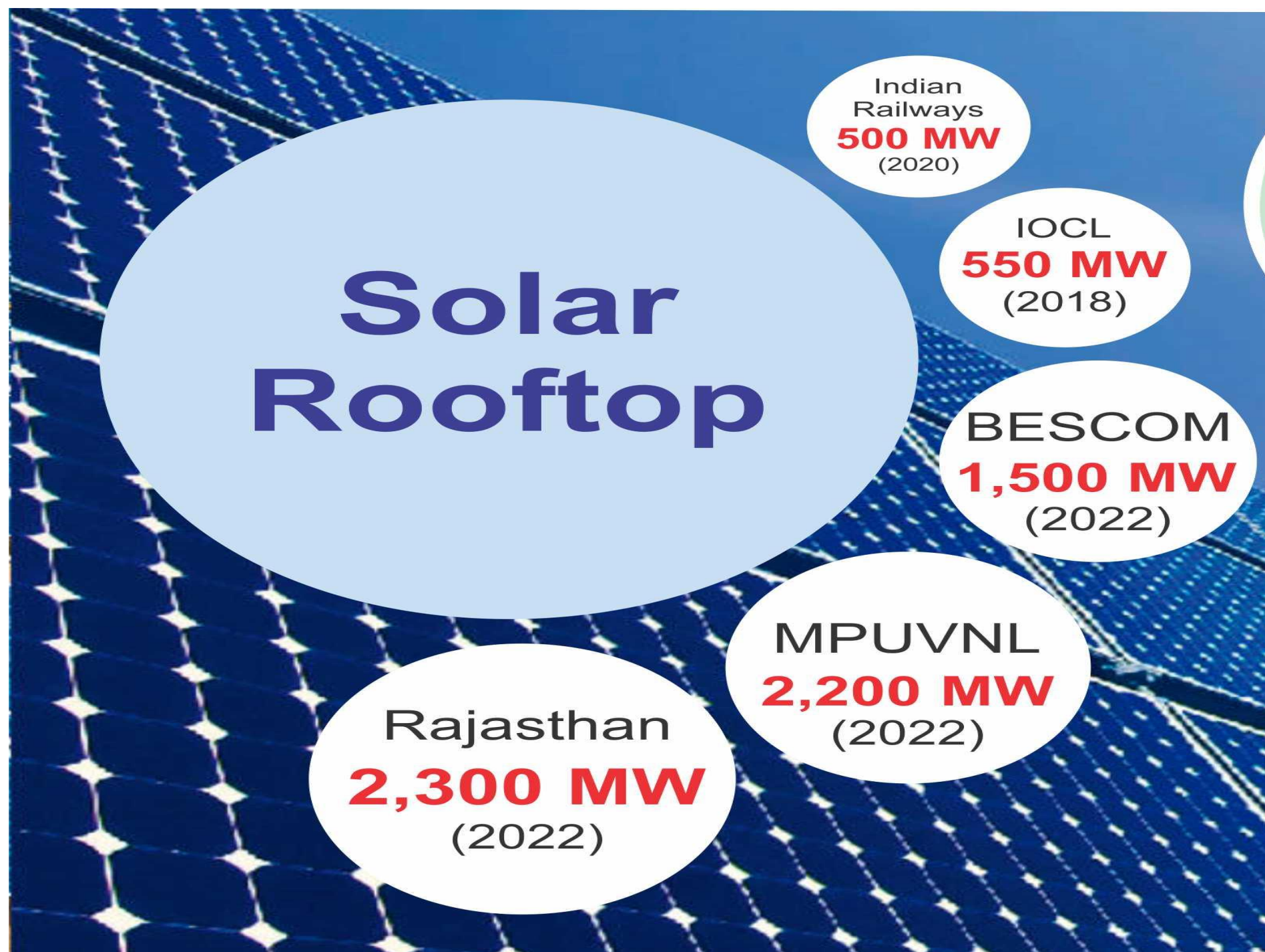


Best Practices Manual for Implementation of State-Level Rooftop Solar PV Programs in India

- Designed to serve as a **reference for a wide variety of state and national level stakeholders.**
- Lays out a comprehensive and efficient implementation processes for **solar PV rooftop** including business models, policy's and regulations, technical requirements and administrative processes.
- Captures national & global **best practices and learning**



This India and U.S. Partnership is Enabling.....



Thanks

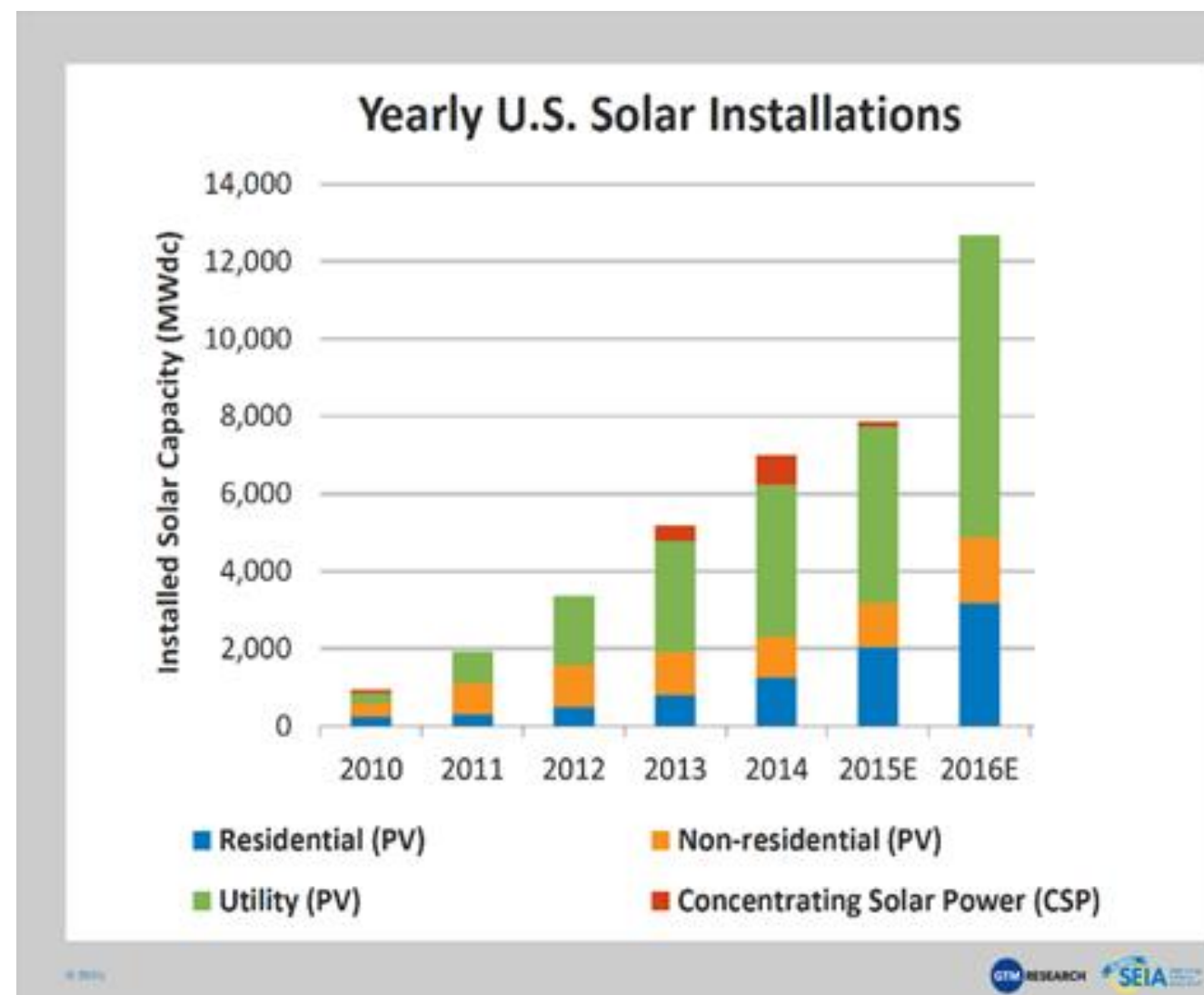
Rooftop Solar in the U.S.

Key drivers and trends:

- Federal tax credit (ITC)
- Continued decline in solar costs
- Third Party Leasing / PPA models dominate

State government and utility rules & incentives are critical

- NEM
- RECs/SRECs
- Rate design



Framing the Discussion: Distributed Solar Costs and Benefits



DPV Customer Compensation Rate



Reduced electricity bills
Additional power availability*

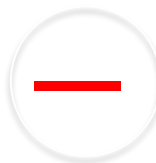
Accrued Benefits - Incurred Costs



Avoided generation costs
Reduced line losses
Deferred investments
Regulatory compliance



System cost
Meter cost
Interconnection cost



Program administration
Distribution network upgrades
Lost fixed cost recovery
Lost power re-sale margin

Relatively *simple* to calculate / predict

Relatively *difficult* to calculate / predict

Observed Pathways Away From Net Metering

