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Training on

Grid Connected Rooftop PV Systems Technical & Economic Fundamentals

2018-Ahmadabad, Jammu, Shimla, Dehradun

Dr. Sudhir Kumar

Rooftop Solar Net Metering: Policies Regulations

Rooftop Concepts

CAPEX	OPEX*
Project owned by roof owner/consumer	Project owned by project developer/supplier
Roof owner/consumer responsible for O&M of system after initial 1-2 year period	Roof owner/consumer not responsible for O&M; O&M is responsibility of project developer
Can't be converted to OPEX model at a later date	Can be converted into CAPEX at a pre-decided date (option to buy back)
Power to be used for captive consumption; surplus power can be sold to distribution utility	Power can be sold to roof owner; Power can be sold to distribution utility; Power can be sold to third party**

•CAPEX – **Prosumers** (Produce + Consume)

* OPEX – Mostly RESCOs

** Some states do not allow 3rd party sale

Rooftop Solar Issues

- ❖ User eligibility criteria
- ❖ Rate of exported electricity
- ❖ Metering, billing and banking procedure
- ❖ Application and approval procedure
- ❖ Approval of PPA draft
- ❖ Sudden load on local transformer
- ❖ Exact technical specification
- ❖ Grid interconnection and safety regulation
- ❖ Loss of customer base of utilities
- ❖ Extra burden on remaining consumers
- ❖ Capacity cap on solar rooftop
- ❖ Quantity of solar electricity to be sold
- ❖ Eligibility for State/Central incentives
- ❖ REC trading eligibility
- ❖ RPO offsetting eligibility

Who will Attend the ISSUES?

- Central Government?
 - ❖ No Electricity – State Subject

- State Government
 - ❖ No Stake Holder – Vote Bank

- DISCOMS / Utilities?
 - ❖ No. Vested Business Interest

- Independent Authority needed
 - CERC?
 - ❖ Yes. But can only guide SERCs

- SERCs?
 - ❖ Yes. Fully Authorized

- ❖ Positive Developments
- ❖ 27 states and 6 UTs passed orders
- ❖ Points common to all:
 - DISCOMs to permit on a nondiscriminatory and 'first come, first serve' basis
 - All residential, commercial and industrial consumers are eligible
 - MNRE/State subsidy if available may be availed
 - SPV plant as per MNRE tech spec
 - Interconnection as per CEA Tech Spec
 - No banking, wheeling and cross subsidy charges
 - Tariff as per SERC in a given year
 - Interconnection agreement for 20-25 yrs
 - RPO to be claimed by utility

State Electricity Regulatory Commissions' : Orders



State	System Size	Capacity Cap	Transformer Cap	Banking Cap	REC Trading
West Bengal	5kW-100kW	90%	Silent	90%	Silent
Goa and 6 UTs	1kW-500kW	No cap	30%	No cap	Allowed
J & K	1kW-1MW (AC)	50%	20%	90%	Allowed

Observations:

1. Cap – limit, SL - sanctioned load
2. REC silent means as per CERC if eligible
3. Banking cap to protect interest of DISCOMs
4. Transformer cap silent implies case to case basis
5. 'Silent' banking cap - automatically limited by capacity

State Electricity Regulatory Commissions' : Orders

State	System Size	Capacity Cap	Transformer Cap	Banking Cap	REC Trading
Andhra Pradesh	1kW-1MW	100% of SL	Case to Case	No cap	Silent
Bihar	1kW-1MW	100% of SL	15%	90%	Allowed
Chhattisgarh	50 kW- 1MW	No cap	Silent	49%	Silent
Delhi	1kW-1MW	No cap	20%	No cap	Allowed
Gujarat	1kW – 100kW	50%	Silent	Silent	No

State Electricity Regulatory Commissions' : Orders

State	System Size	Capacity Cap	Transformer Cap	Banking Cap	REC Trading
Haryana	1kW-1MW	100% of SL	15%	90%	Silent
Himachl Pradesh	1kW-1MW	30/80% (1/2 part)	30%	Silent	Allowed
Jharkhand	1kW-1MW	100% of SL	15%	Silent	Allowed
Karnataka	1kW-1MW	No cap	80%	Silent	Silent
Kerala (Wheel Self)*	1kW – 100kW	No cap	80%	No cap	Silent

State Electricity Regulatory Commissions' : Orders

State	System Size	Capacity Cap	Transformer Cap	Banking Cap	REC Trading
Manipur	1kW-500kW	80% of SL	30%	80%	Not Allowed
Maharashtra	1kW-1MW	100% of SL	40%	No cap	Not Allowed
Madhya Pradesh	1kW-112kW	No cap	15%	No cap	Silent
Odisha	1kW-1MW	100% of SL	30%	90%	Not Allowed
Punjab	1kW-1MW	80% of SL	30%	90%	Allowed

State Electricity Regulatory Commissions' : Orders

State	System Size	Capacity Cap	Transformer Cap	Banking Cap	REC Trading
Rajasthan	1kW-1MW	80% of SL	30%	No cap	Silent
Tamil Nadu	1kW-1MW	100% of SL	30%	90%	Silent
Telangana	1kW-1MW	No cap	50%	No cap	Silent
Uttar Pradesh	1kW-1MW	100% of SL	15%	No cap	Allowed
Uttarakhand	1kW-500kW	No cap	Silent	95%	Silent

Achievement

Source: MNRE (**as on July 2018**)

- ❖ Installed: 1225 MW
- ❖ Slow progress against the target of 40,000 MW by 2022

- ❖ Needs to speed up through:
 - ❖ Simplified procedures
 - ❖ Innovative financing
 - ❖ Time bound auto approval
 - ❖ Innovative structure design
 - ❖ **Virtual net-metering**

Complete Information Available on MNRE Website

<http://mnre.gov.in/schemes/decentralized-systems/solar-rooftop-grid-connected/>

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Thank You