ABPS Infrastructure Advisory Private Limited



Presentation on

"Emerging Regulatory and Policy Issues in Grid-Integration of DRE"

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- Context Setting : Need for Grid Integration of Off-Grid DRE
- Policy and Regulatory Issues in Grid Integration of DRE
- Policy and Regulatory Initiatives for Grid Integration of DRE
- Way Forward



Distributed Renewable Generation Overview



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Off Grid RE Generation Scenario

Renewable Energy Programme/ Systems	Target for 2011-12	Achievem	ent during January, 2012	Total achievement during 2011-12	Cumulative achievement up to 31.01.2012	
I. POWER FROM RENEWABLES:						
B. OFF-GRID/ DECENTRALISED POWER (CAPACITIES IN MW _{EQ)}						
Waste to Energy -Urban -Industrial	15.00	-	-		3.50	
		0.94	27.31		89.43	
Biomass(non-bagasse) Cogeneration	80.00	4.4	51.89		347.85	
Biomass Gasifiers -Rural- Industrial	3.00	0.192	1.642		15.99	
	10.00	1.00	10.89		132.27	
Aero-Genrators/Hybrid systems	0.50	0.06	0.33		1.45	
SPV Systems (>1kW)	20.00	5.02	11.00		81.01	
Water mills/micro hydel	1.00(400 Nos.)	52 nos.	350 nos.		2025 Nos.	
Total	129.50	11.61	103.06		671.50	
II. REMOTE VILLAGE ELECTRIFICATION						
No. of Remote Village/Hamlets provided with RE Systems Source: MNRE	500	25.00	905.00		9009.00	

Context Setting : Grid Integration of Off-Grid DRE – 1/2

- Grid Integration of existing off-grid DRE projects will considerably increase their viability and sustainability and further have positive implications for enhancing electricity access.
- MNRE in its 12th plan working group report and Forum of Regulators (FOR) in its December 2011 meeting too have pointed in the same direction.
- Since the centralized grid acts like a large battery, feeding electricity into the grid will ensure lowering of the costs of DRE projects by improving their Capacity Utilization Factors (CUFs).

Context Setting : Grid Integration of Off-Grid DRE – 1/2

- In the immediate future, pure off-grid projects could supply electricity through micro-grids and in the long run, the grid-connected DRE projects work complementary to the centralized grid supply.
- If techno-economically feasible, DRE projects coupled with smart grid features could also isolate from the grid (when the grid is down) and supply only the micro-grid.
- Grid connected DRE would not be limited to rural areas in the future, given the emergence of urban rooftop solar as a serious contender with the sharply falling solar PV prices.

Case Scenarios – Regulatory Challenges



Biomass Gassifier based Rural Application

Metering

arrangement



Key Policy and Regulatory Issues



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Policy and Regulatory Issues for DRE Grid Integration

- A. Connectivity Issues
- B. Metering Arrangement Issues
- C. Energy Accounting Issues
- D. Scheduling Requirements
- E. Administrative cost Issues
- F. Wheeling Charges and Losses
- G. RPO Compliance related Issues

Regulation 2.1 (p) of MERC (RE Tariff) Regulations, 2010 defines Interconnection Point as follows:

"Inter-connection Point shall mean <u>interface point of renewable energy</u> <u>generating facility with the transmission system or distribution system</u>, as the case may be:

> 1. in relation to wind energy projects and Solar Photovoltaic Projects, inter-connection point shall <u>be the line isolator on outgoing feeder on HV</u> <u>side of the pooling sub-station.....</u>

> 2. in relation to mini/micro hydro power, small hydro power, biomass power and non-fossil fuel based co-generation power projects and Solar Thermal Power Projects the, inter-connection point shall be <u>the line</u> <u>isolator on outgoing feeder on HV side of generator transformer;</u>

a) Connectivity Related

- i. Technical Connectivity Standard Regulations by CEA namely, *Draft CEA (Technical Standards for connectivity of the Distributed generation resources) Regulations, 2010* are yet to be finalized. The General Connectivity Conditions as per Clause 5 (1) of said draft CEA Regulations envisage <u>requester to seek</u> <u>connectivity to transmission system or distribution system of Appropriate</u> <u>Licensee.</u>
- ii. If permitted, what should be the appropriate voltage level for such DRE plant connectivity? Should there be any norms or capacity (kWp) restrictions be specified for each voltage level? (e.g. upto 50 kW at 230 V, 50 kW to 500 kW at 440 V, 500 kW to 2 MW at 11 kV and > 2 MW at 22 kV/33 kV)

- iii. Who will be the parties to Connectivity Agreement? In case of Generator and Consumer being separate entity and same entity)? What are responsibilities of Host Distribution Licensee in such matter? What are the responsibilities of Procuring Entity (other Distribution Licensee) in such matter?
- iv. Should the generation from DRE installation and connectivity arrangements be verified / certified by third party?
- What should be the protocol for monitoring and third party verification for installation?
 What are the rights/responsibilities for Host Distribution licensee/Electrical Inspectorate for verification/certification?
- vi. How should subsequent generation capacity (DG/Back-up) additions at connection point be monitored?

Metering Arrangement Issues (1/2)

b) Metering Arrangement Related

Existing Regulation: Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006. (and amendments thereafter)

- i. Whether present CEA (Installation and Operation of meters) Regulations are relevant for DRE installation or need modifications thereto? Or
- ii. Whether concerned SERC through Metering Code as part of Grid Code should specify metering arrangement? Or
- iii. Whether licensees/generating companies should evolve suitable metering procedures and code through deliberations as part of Grid Co-ordination Committee (GCC) and upon gaining sufficient operational experience, appropriate code/regulations be formalised through due regulatory process?

Metering Arrangement Issues (2/2)

- iv Whether separate metering (Export /Import) arrangement or single meter with separate registry for Export/Import be insisted? (Requirements for Main Meter/Check Meter/Standby meter), if any?
- v What should be the Metering Location? (Connection Point for RE Power and Supply Point for Consumer Load), What should be the meter class, accuracy, type?
- vi What should be other facilities that meter should be capable of data storage, ToD slotwise, time-block, communication facility?
- vii Should above metering arrangement/protocol be linked to capacity of RE installation in stages? (e.g. upto 50 kW at 230 V, 50 kW to 500 kW at 440 V, 500 kW to 2 MW at 11 kV and > 2 MW at 22 kV/33 kV)

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Energy Accounting Issues

c) Energy Accounting related

- i. What are the responsibilities for Host Distribution Licensee in terms of joint meter reading, issuance of energy credit notes (if any) etc? Frequency of meter reading and protocol for measurement and issuance of credit notes for following cases.
 - i. Intra-Utility purchase
 - ii. Intra-Utility open access wheeling
 - iii. Inter-Utility purchase
 - iv. Inter-Utility open access wheeling
- ii. What are the responsibilities of SLDC and procedure for accounting of transactions for inter-Utility exchange?
 - i. Intra-Utility purchase
 - ii. Intra-Utility open access wheeling
 - iii. Inter-Utility purchase
 - iv. Inter-Utility open access wheeling
- iii. Whether line losses from RE Generation (inter-connection point) to Dist. system (Consumer Meter) should be accounted for or waived as generation is too small?

Scheduling / Administration Cost

d) Scheduling Requirements:

- i. If cumulative capacity of DRE installations is high, Whether they be exempted from requirements of scheduling?
- ii. Should there be any capacity (kWp) restrictions above which such scheduling requirements be made applicable (IEGC specifies the conditions as > 5 MW for solar, >10 MW for wind)

e) Recovery of Administration Costs:

- i. Should Host Distribution licensee be allowed to recover administrative cost associated with joint meter reading/credit note issuance etc?
- ii. If yes, what should be the basis to arrive at such administrative cost?
- iii. What should be basis for recovery of such costs? (one time linked kWp capacity of installation or recurring linked to monthly/annual generation?)



f) Applicable Wheeling Charges/Losses:

Whether wheeling transactions from such DRE generation be exempted from levy of wheeling charges and wheeling losses? (considering their small capacities)

g) RPO Compliance:

- i. Whether credit note by Host DISCOM be considered as sufficient proof for discharge of solar/ non solar RPO compliance requirements of obligated entities (DISCOM or CPP or OA consumer)?
- ii. In case of In-situ RE generation & consumption within consumer premises, how would RE generation be certified for RPO compliance by said consumer?

Way Forward

Issue	Possible Solution
Connectivity Standards	 CEA should address in Technical Standards for Connectivity of the distributed generation resources Regulation Clarity in Definition of Inter-Connection Point & Roles/Responsibilities of various Entities is necessary.
Metering Arrangements	CEA should address this issue in their metering related regulations
Energy Accounting	 Responsibility may be entrusted to Host Utility and SLDCs.
Wheeling Charges and Losses	 DRE projects may be exempted from levy of such charges and losses
Administrative costs	 Minimal charges based on capacity of the RE plant
RPO compliance	 Host Utility should be able to comply its RPO using such RE Power

Forum of Regulators (FOR) could initiate a process of formulation of Model Regulations & Model Connectivity Agreements for Grid integration of distributed RE projects



Thank you for your attention . . .

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Practical Solutions to Real Life Problems

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