

Regulatory interventions for promoting grid connected Solar Power projects in Gujarat

February, 2010

Renewable Sources of Energy

- ◆ In the context of climate change issues and ever increasing demand for electricity, the renewable sources of energy hold special importance.
- ◆ The Electricity Act, 2003 also emphasises need for promotion and development of renewable sources of energy
- ◆ The Tariff Policy of Govt. of India mandates the State Commissions to fix the preferential tariffs for electricity generated from renewable sources and to fix a minimum percentage for purchase of energy from such sources

GERC's Renewable Purchase Regulations

- ◆ GERC (Power Procurement from Renewable Sources, Regulations 2005)
 - 2006-07 : 1.0 %
 - 2007-08 : 1.0 %
 - 2008-09 : 2.0 %
- ◆ Draft Regulations 2009
 - Specific RPPO for Solar

Year	RPPO	
	Solar	Total
2010 - 11	1.50%	8%
2011 - 12	1.50%	9%
2012 - 13	2.50%	10%

Solar Power Potential

- ◆ High Solar Insolation levels in India
- ◆ The North Western Part of India (Gujarat & Rajasthan) gets high levels of solar radiations, almost throughout the year
- ◆ Solar Radiation Map of India

Govt. of India Initiatives

- ◆ MNRE's Generation based Incentives Schemes for Solar PV (January 2008) & Solar Thermal (March 2008)
- ◆ Jawaharlal Nehru National Solar Mission, 2009

Govt. of Gujarat Initiatives

- ◆ Solar Power Policy, 2009

- Tariff for 25 years-

- ◆ Project commissioned before 31.03.2010

- Solar PV- First 12 years = Rs. 13 per kWh and remaining period Rs. 3 per kWh

- Solar Thermal- First 12 years = Rs. 10 per kWh and remaining period Rs. 3 per kWh

- ◆ Project commissioned before 31.03.2014

- Solar PV- First 12 years = Rs. 12 per kWh and remaining period Rs. 3 per kWh

- Solar Thermal- First 12 years = Rs. 9 per kWh and remaining period Rs. 3 per kWh

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- ◆ The transmission line from solar substation to GETCO substation shall be laid by GETCO
 - ◆ Wheeling charges for captive use within the State – 2% of the energy injected
 - ◆ Govt. of Gujarat allocation of Solar Power Capacity
 - Solar PV (24 companies) : 365 MW
 - Solar Thermal (10 Companies) : 351 MW
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- 716 MW

GERC order dated 22.01.2009

- ◆ Government of India had issued guidelines for Generation Based Incentives (GBI) for grid interactive solar based generation plants – where it was mentioned that preference would be given to the projects from the State where the SERC have announced or in process of announcing tariff for Solar power
- ◆ In response to above the GERC issued order on 22.01.2009 allowing Discoms to purchase solar power @ Rs. 3.37 per kWh and the developer can claim GBI upto Rs. 11.63 per kWh GBI for PV project and Rs. 8.63 per kWh GBI for Solar thermal Project under GoI Scheme
- ◆ Two proposals in this regard forwarded by the state Government to MNRE

Brainstorming session 07.02.2009

- ◆ Experts from SERCs, NLDC, MNRE, CEA, WISE & Wind Power Industry
- ◆ Important Issues :
 - Possible to bring down capital cost
 - Requirement for database related to solar radiation
 - Planning required for Grid Connectivity
 - Should be kept out of Intra-state ABT

Draft Regulations for RPPO

- ◆ As earlier regulations covered Renewable Power Procurement Obligation (RPPO) upto FY 2008-09 only, the GERC issued draft Regulations for RPPO for the subsequent period
 - Separate RPPO of 1.5% for solar power for the years 2010-11 & 2011-12 and 2.0% for 2012-13

Draft Regulations for RPPO (contd.)

- ◆ Applicability of RPPO to Captive consumption and consumption through Open Access arrangement also stipulated
- ◆ Provision for Renewable Energy Certificates (REC) including Solar specific REC
- ◆ Third party sale exempted from Cross-subsidy Surcharge

Draft Tariff Order dated 23.07.2009

- ◆ Tariff for 25 years-
 - Applicable to projects commissioned upto 31.12.2011
 - ◆ Solar PV- First 12 years = Rs. 14 per kWh and remaining period Rs. 4 per kWh
 - ◆ Solar Thermal- First 12 years = Rs. 10 per kWh and remaining period Rs. 3.50 per kWh
- ◆ The transmission line from solar substation to GETCO substation shall be laid by GETCO
- ◆ Wheeling charges for captive use within the State - 4% of the energy injected

Assumptions considered in Draft Order

Description	Solar PV Project	Solar Thermal Project
Capital Cost per MW	Rs. 17 crore	Rs. 13 Crore
Capacity Utilization Factor	20 %	25 % & Aux. cons. 10%
O & M as % of capital cost	0.5 %	1 %
Insurance as % of NA	0.5 %	0.5 %
Depreciation –first 12 years	6 %	6 %
Depreciation- Remaining	1.38 %	1.38 %
Return on Equity	14 %	14 %
Tax – first 10 years MAT	11.33 %	11.33 %
Tax- remaining	33.99 %	33.99 %
Interest on Term Loan	10.25 %	10.25 %
Interest for Working Capital (WC Req= 1 month O & M and 1 month receivables)	12.50 %	12.50 %

Issues deliberated during Hearing

- ◆ Public hearing on Draft Order held on 3rd December 2009
- ◆ Major issues raised in the hearing :
 - Capital cost
 - Evacuation of power
 - CUF
 - Interest rate
 - Hybrid projects

Tariff Order dated 29.01.2010

◆ Tariff for 25 years-

- Applicable to projects commissioned upto 31.12.2011

◆ Solar PV- First 12 years = Rs. 15 per kWh and remaining period Rs. 5 per kWh

◆ Solar Thermal- First 12 years = Rs. 11 per kWh and remaining period Rs. 4 per kWh

- Evacuation facility to be provided by the STU from Solar project bus

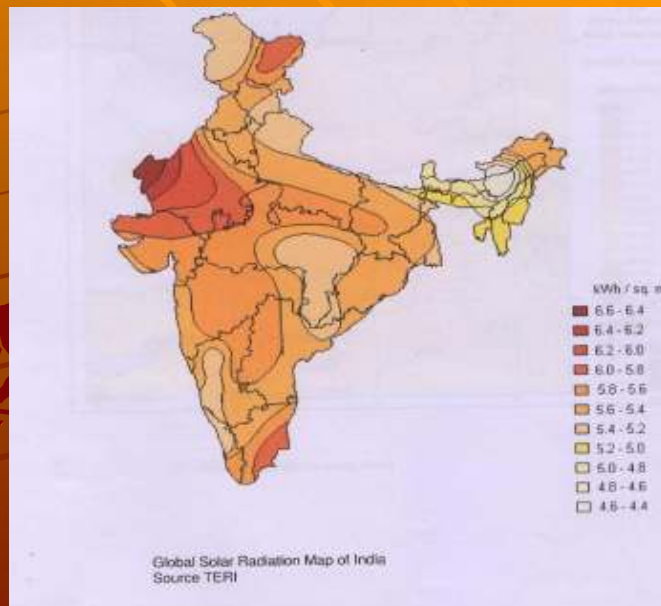
Assumptions considered

Description	Solar PV Project	Solar Thermal Project
Capital Cost per MW	Rs. 16.50 crore	Rs. 13 Crore
Capacity Utilization Factor	20 %	25 % & Aux. cons. 10%
O & M as % of capital cost	0.5 %	1 %
Insurance as % of NA	0.35 %	0.35 %
Depreciation -first 10 years	6 %	6 %
Depreciation- Remaining	2 %	2 %
Return on Equity	14 %	14 %
Tax – first 10 years MAT	16.995 %	16.995 %
Tax- remaining	33.99 %	33.99 %
Interest on Term Loan	10.75 %	10.75 %
Interest for Working Capital (WC Req= 1 month O & M and 1 month receivables)	11.75 %	11.75 %

Tariff Order dated 29.01.2010 (contd.)

- ◆ Solar generation kept out of Merit Order Despatch and Intra-state ABT
- ◆ In line with the National Solar Mission, Roof-top & other small solar projects encouraged
- ◆ Third party sale exempted from cross-subsidy surcharge
- ◆ Sharing of CDM according to CERC Regulations

Solar Radiation Map of India



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