



Jawaharlal Nehru National Solar Mission

JNNSM Phase-I Journey so far

16th May 2012

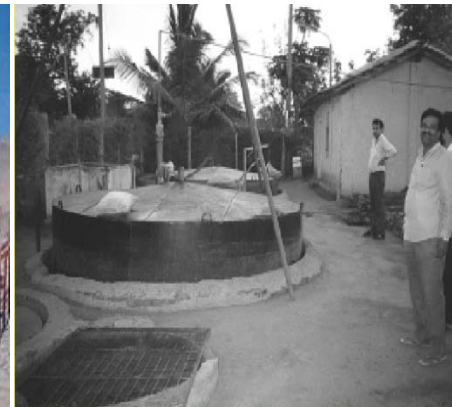
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Background

- India is located in the equatorial sun belt of the earth, thereby receiving abundant radiant energy from the sun.
- About 5000 trillion kWh of energy is incident over India's land area with most parts receiving 4-7 kWh per sq. m per day.
- National Action Plan on Climate Change identified National Solar Mission as one of the eight Missions emphasising shift from non-renewable sources to renewable sources of energy.
- JNNSM (Jawaharlal Nehru National Solar Mission), launched on 11th January, 2010 by the Hon'ble Prime Minister, aims at development and deployment of solar energy technologies in the country to achieve parity with grid tariff by 2022.

Figure shows map of India with solar radiation levels in different parts of the country. It can be observed that although the highest annual global radiation is received in Rajasthan, northern Gujarat and parts of Ladakh region, the parts of Andhra Pradesh, Maharashtra, Madhya Pradesh also receive fairly large amount of radiation as compared to many parts of the world especially Japan, Europe and the US where development and deployment of solar technologies is maximum.

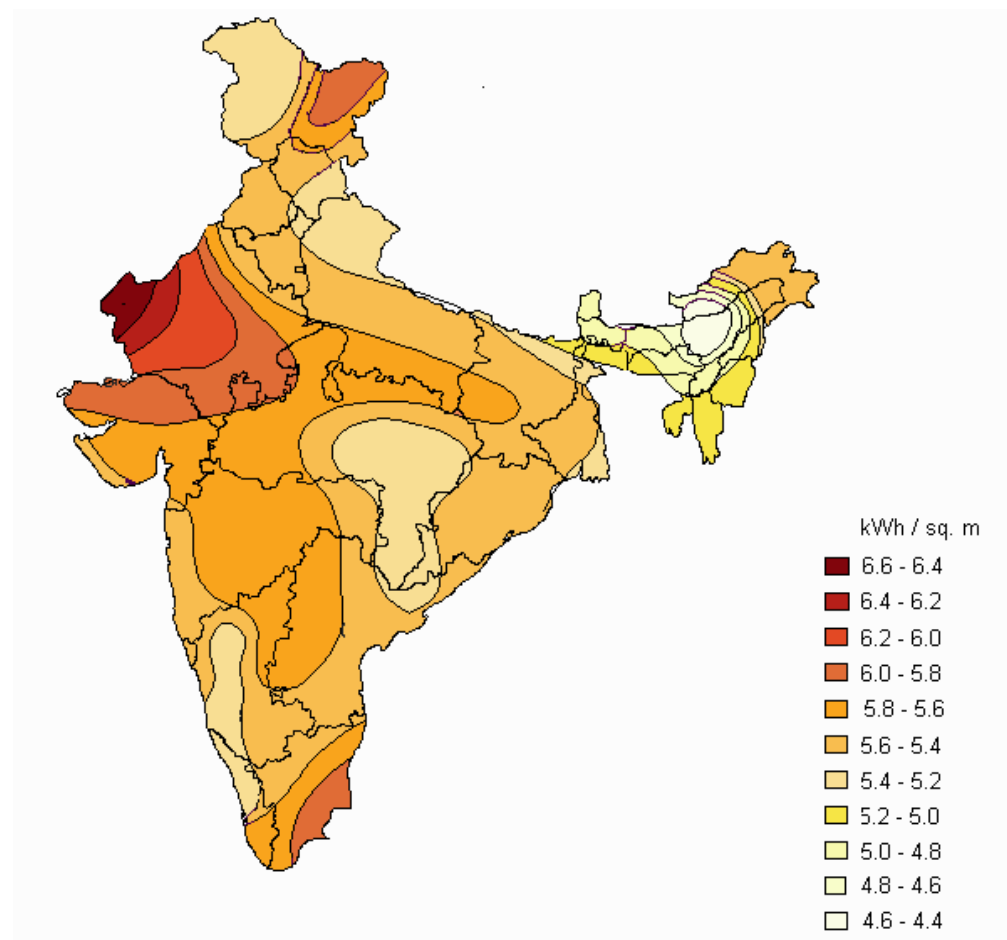


Figure : Solar radiation on India (Source: TERI)

- The National Solar Mission is major initiative of the Government of India –
 - To promote ecologically sustainable growth;
 - Addressing India's energy security challenge.
- The Mission is set in three phases-
 - Phase-I (up to 2012-13) – 1000 MW
 - Phase-2 (2013-17) – 4,000 MW
 - Phase-3 (2017-22) – 20,000 MW

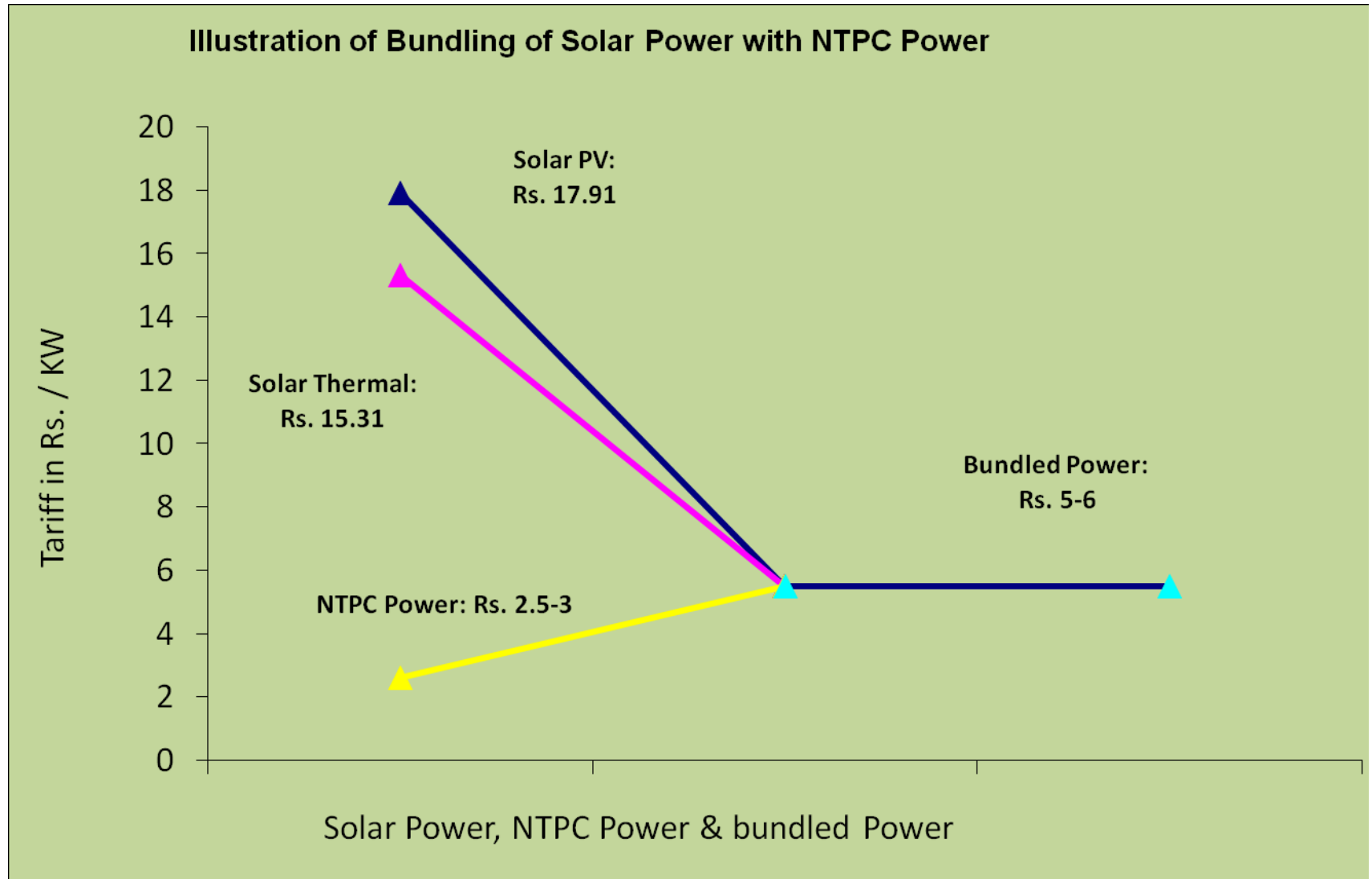
Key events

- Cabinet approved the Jawaharlal Nehru National Solar Mission on 19th November, 2009
- Govt. of India designated NRVN as the Nodal Agency on 22nd December, 2009.
- National Solar Mission launched by the Hon'ble Prime Minister on 11th January, 2010.
- Guidelines for Migration Projects issued by Ministry of New and Renewable Energy (MNRE) on 9th February, 2010.
- Guidelines for New Projects (Batch-1) of Phase-I issued by MNRE on 25th July, 2010.
- Guidelines for New Projects (Batch-2) of Phase-I issued by MNRE on 24th August, 2011.

Implementing JNNSM

- In order to facilitate grid connected solar power generation in the first phase, a mechanism of “bundling” relatively expensive solar power with power from the unallocated quota of the Government of India (Ministry of Power) generated at NTPC coal based stations, which is relatively cheaper, has been proposed by the Mission.
- This “bundled power” would be sold to the Distribution Utilities.
- For each MW of installed capacity of solar power for which a Power Purchase Agreement (PPA) is signed by NVVN, the Ministry of Power (MoP) shall allocate to NVVN an equivalent amount of MW capacity from the unallocated quota of NTPC coal based stations and NVVN will supply this “bundled” power to the Distribution Utilities.

Bundling Scheme



Current Status

Migration Projects

- 16 Solar Power Developers have been selected for 84 MW Solar Projects.

State	Solar PV	Solar Thermal	Total
Rajasthan	36	30	66
Punjab	7		7
Maharashtra	11		11
Total	54	30	84

Migration Projects

- Power Sale Agreements (PSAs) signed with Discoms of Rajasthan, Punjab and Maharashtra by 15th October, 2010.
- Financial Closure achieved in January, 2011.
- Scheduled Commission Date
 - Solar PV – 12 months from signing of PPA, i.e. mid October, 2011.
 - Solar Thermal – 28 months from signing of PPA, i.e. mid February, 2013.

Commissioning Status of Solar PV Projects under Migration scheme

State	Solar PV capacity to be commissioned as per PPA (MW)	Solar PV capacity actually commissioned* (MW)	Balance Capacity to be commissioned (MW)
Rajasthan	36	35	1
Punjab	7	2	5
Maharashtra	11	11	0
Total	54	48	6

*** Based on confirmation received from State Nodal Agencies**

**Total Bundled Power Traded from Migration Projects
Up to 31.03.2012 is 166 MU.**

New Projects

- Guidelines for selection of New Grid-connected Solar Power Projects under Phase-I of JNNSM issued on 25th July 2010.
- Phase-I to be implemented in 2 batches in two financial years as under:
 - First batch – FY 2010-11
 - (150 MW of Solar PV, 470 MW Solar Thermal)
 - Second batch (remaining capacities for Solar PV Projects)- FY 2011-12
 - (500 MW less 150 MW & Migration Projects capacity)

New Projects (Batch-I)

- PPAs signed with selected Solar Power Developers in January, 2011-
 - 28 nos. Solar PV for 140 MW; and
 - 07 nos. of Solar Thermal for 470 MW Power projects.

State	Solar PV (MW)	Solar Thermal (MW)	Total (MW)
Rajasthan	100	400	500
Uttar Pradesh	5		5
Maharashtra	5		5
Gujarat		20	20
Andhra Pradesh	15	50	65
Karnataka	5		5
Tamilnadu	5		5
Orissa	5		5
Total	140	470	610

New Projects

Corresponding Power Sale Agreements (PSAs) were also signed with Buying State Utilities/Discoms of Andhra Pradesh, Karnataka, West Bengal, Rajasthan, Orissa, Punjab, Uttar Pradesh, Chhattisgarh, Maharashtra, Assam and DVC.

Financial Closure achieved by Solar Power Developers in July, 2011.

Commissioning status of the Solar PV Projects (Batch-I)

State	Solar PV Capacity to be commissioned as per PPA (MW)	Solar PV Capacity actually commissioned* (MW)	Balance capacity to be commissioned (MW)
Rajasthan	100	100	0
Uttar Pradesh	5	5	0
Maharashtra	5		5
Andhra Pradesh	15	10	5
Karnataka	5		5
Tamil Nadu	5	5	0
Orissa	5	5	0
Total	140	125	15

** Based on confirmation received from State Nodal Agencies*

Details of Bundled Rate for Projects under JNNSM (Phase-I)

JNNSM Scheme	Technology Type	CERC Tariff Rs/kWh	Discounted Tariff (Rs./kWh)		Wtd. Avg. Tariff Rs/kWh	Bundled Rate (Rs./kWh) Range between		
			Min	Max				
Migration Projects	Solar PV	17.91				5.40	-	5.72
	Solar Thermal	15.31				5.31	-	5.62
	Solar Power	16.86				5.36	-	5.69
Batch-I Projects	Solar PV	17.91	10.95	12.76	12.12	4.34	-	4.67
	Solar Thermal	15.31	10.49	12.24	11.48	4.49	-	4.81
	Solar Power	16.86			11.61	4.46	-	4.78
Batch-II Projects	Solar PV	15.39	7.49	9.44	8.77	3.73	-	4.05

* 1 USD = Rs 52

Second Batch of Phase I

- Guidelines for Second Batch for 350 MW Solar PV issued by MNRE on 24.08.2011.
- PPAs signed with 21 selected bidders for 27 Solar PV Projects (340 MW) by 27th January,2012.

State	No. of Projects	Project Capacity (MW)	Solar PV (MW)
Rajasthan 24 Projects	5	5	295
	9	10	
	4	15	
	6	20	
Maharashtra 2 Projects	1	5	25
	1	20	
Andhra Pradesh	1	20	20
Total Projects	27		340

- Commissioning – 13 months from the date of signing of PPA i.e. February, 2013.

Payment Security Mechanism

- Government of India have approved the Payment Security Scheme (PSS) on 30th June, 2011 for grid connected solar power projects under Phase-I of JNNSM,
- Gross Budgetary Support (GBS) - Rs.486.05 Crore to be utilised in the event of default by State Utilities/Discoms from Plan Funds.
- NVVN to open the Solar Payment Security Account (SPSA).

Payment Security Mechanism....contd.

- PSS is perceived as “fall-back” arrangement-
 - to be accessed only when other payment security provisions available in PSA such as six months revolving Letter of Credit linked with Escrow account have been exhausted.
 - If NVVN cannot meet a default by any distribution utility from the Letter of Credit and the Default Escrow Agreement, it shall have the right to approach the SPSA.

Payment Security Mechanism....contd.

- In case of default in payment by the Distribution Utilities-
 - NVVN has the right to divert bundled power for sale to third parties through bilateral contract with a paying Distribution Utilities; or
 - move to sell in Power Exchange in Spot/day ahead/ Term ahead Market by using its best efforts to realize the most favourable rates for such power.

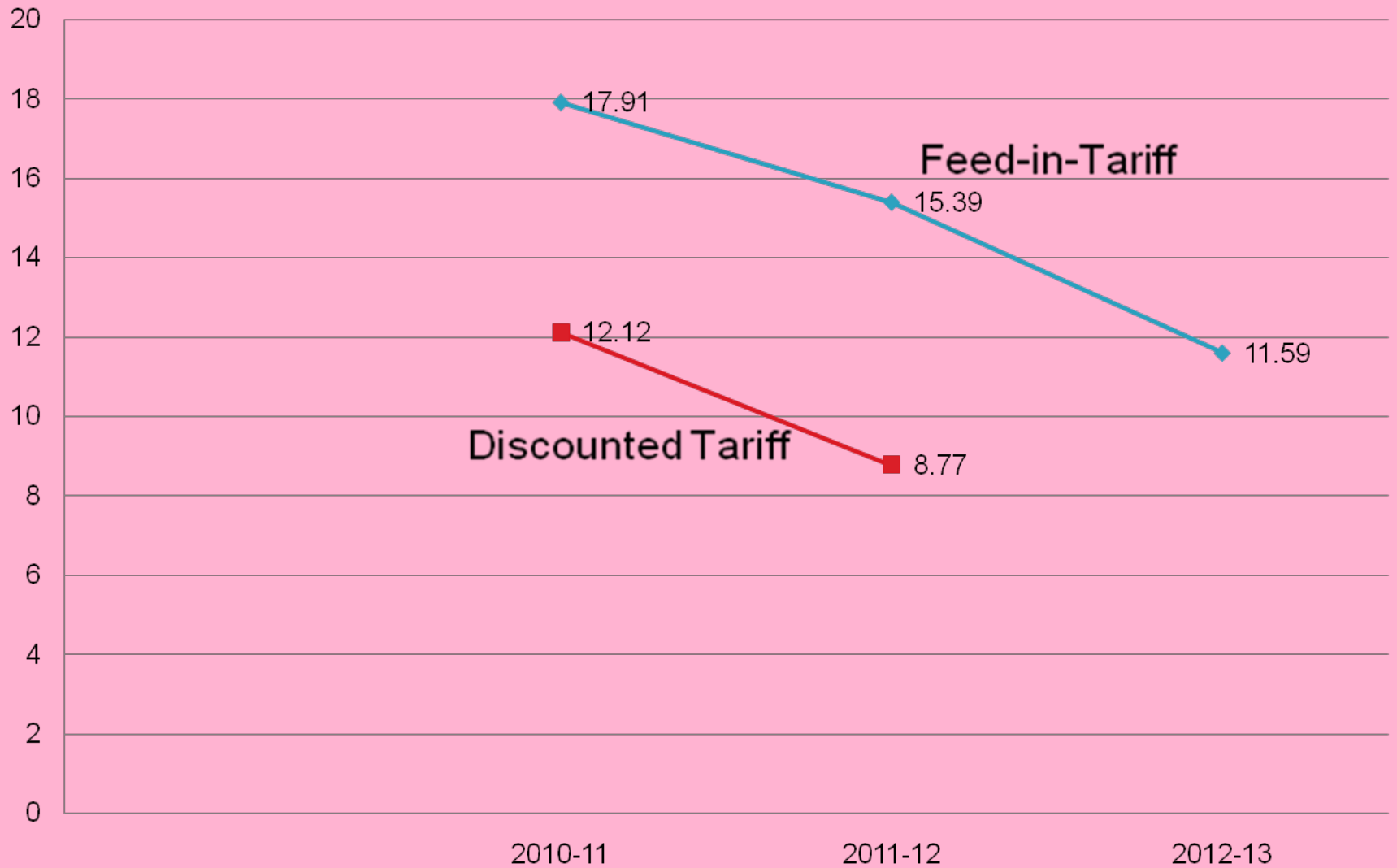
Payment Security Mechanism....contd.

- Review/ Monitoring of the Payment Security Scheme (PSS)
 - The MNRE will undertake review/monitoring of the implementation of the PSS through a PSS Management Committee (PMC) under the Chairmanship of Secretary, MNRE and having representatives of MOP and MOF.
 - The PMC will be empowered to issue any directions to remove difficulties with regard to implementation of the PSS in consultation with Planning Commission.
 - MNRE will also undertake monitoring of solar power projects to minimize defaults.

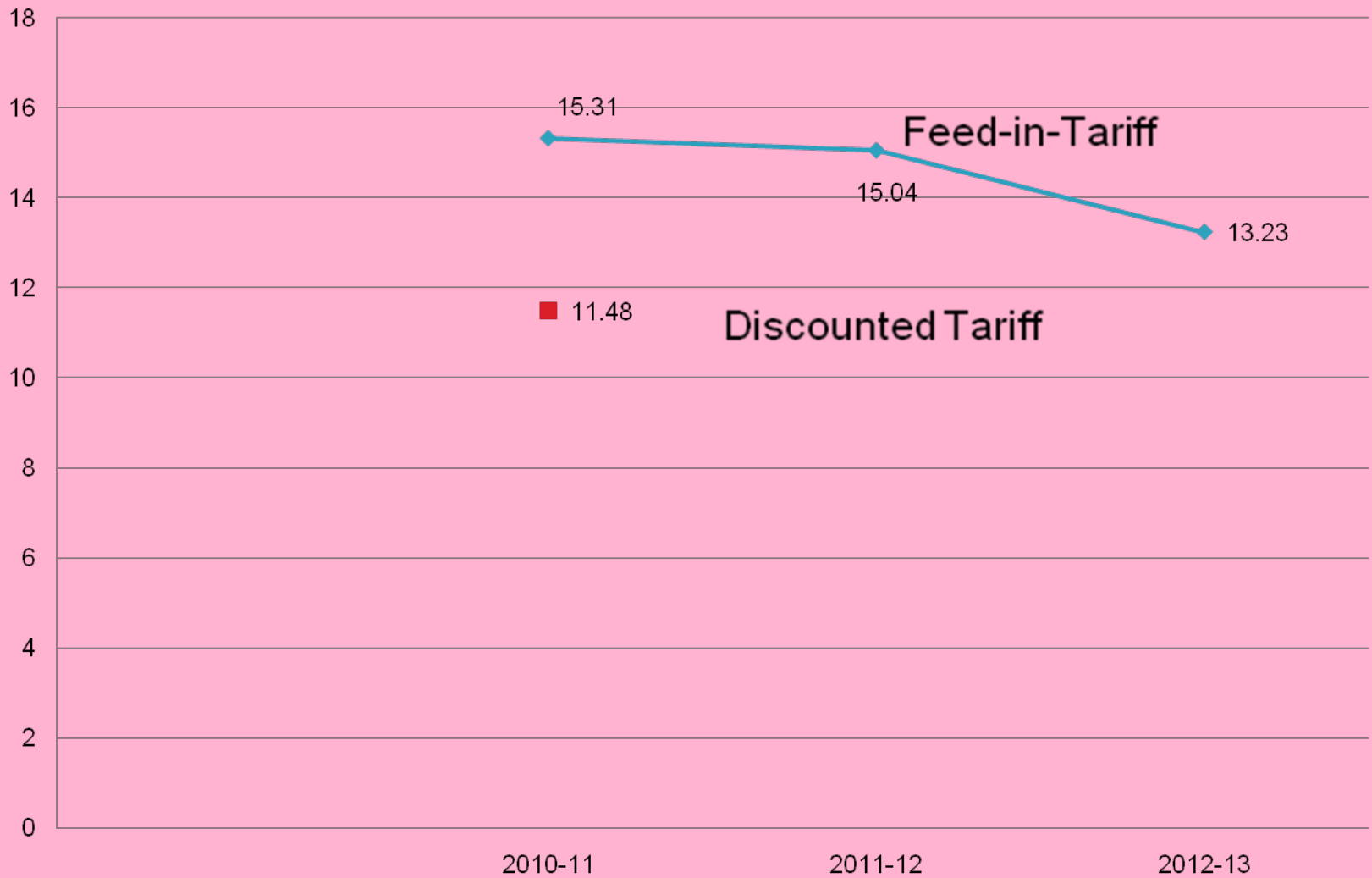
Solar tariff determined by CERC

	Control Period	Type of solar Project	Benchmark Cost Rs. Cr/MW	Tariff Rs./kWh	Validity of tariff	Conditions for PPA	Conditions for Project Commissioning
1	2009-10	Solar PV	17.00	18.44	2009-10		Project Commissioning by 31.03.2010
		Solar Thermal	13.00	13.45	2009-10		
2	2010-11	Solar PV	16.90	17.91	2010-11 & 2011-12	PPA to be signed by 31.03.2011	Project Commissioning by 31.03.2012
		Solar Thermal	15.30	15.31	2010-11, 2011-12 & 2012-13		Project Commissioning by 31.03.2013
3	2011-12	Solar PV	14.42	15.39	2011-12 & 2012-13	PPA to be signed after 31.03.2011	Project Commissioning by 31.03.2013
		Solar Thermal	15.00	15.04			Project Commissioning by 31.03.2014
4	2012-17	Solar PV	10.00	11.59	2012-13	PPA to be signed by 31.03.2013	Project Commissioning by 31.03.2014
		Solar Thermal	13.00	13.23	2012-13		Project Commissioning by 31.03.2015

Feed-in-Tariff vs Discounted Tariff for Solar PV Project (Rs./kWh)



Feed-in-Tariff vs Discounted Tariff for Solar Thermal Project (Rs./kWh)



Thank You