

CENTRAL ELECTRICITY REGULATORY COMMISSION, NEW DELHI

Petition No. 142/2011 (Suo Motu)

Date of order: 13th June, 2011

IN THE MATTER OF

Determination of Forbearance and Floor Price for the REC framework to be applicable from
1st April 2012.

ORDER

A. BACKGROUND

1. In exercise of the power under section 66 and 178 of the Electricity Act, 2003 the Commission has notified the Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, 2010 (hereafter REC Regulations).
2. As per the first proviso to clause (1) of Regulation 9 of the REC Regulations, the Commission may in consultation with the Central Agency (Power System Operation Corporation Limited) and Forum of Regulators from time to time provide for floor price and forbearance price separately for Solar and Non-solar Renewable Energy Certificates.
3. Further, Clause (2) of Regulation 9 of the REC Regulations provides for the guiding principles for determining the forbearance and floor price for solar and non- solar Certificates. The relevant provisions are extracted as under:

“9. *Pricing of Certificate:*

(1) The price of Certificate shall be as discovered in the Power Exchange:

Provided that the Commission may, in consultation with the Central Agency and Forum of Regulators from time to time provide for the floor price and forbearance price separately for solar and non-solar Certificates.

(2) The Commission while determining the floor price and forbearance price shall be guided inter- alia by the following principles:

- (a) Variation in cost of generation of different renewable energy technologies falling under solar and non-solar category, across States in the country;*
- (b) Variation in the Pooled Cost of Purchase across States in the country;*
- (c) Expected electricity generation from renewable energy sources including:-*

- i. *expected renewable energy capacity under preferential tariff*
- ii. *expected renewable energy capacity under mechanism of certificates;*

(d) *Renewable Purchase obligation targets set by State Commissions”*

4. In pursuance of the powers vested under proviso to the Regulation 9 (1) of REC Regulations, the Commission came out with an Order dated 1st June, 2010 for ‘Determination of Forbearance and Floor Price for the REC framework’ (Suo Motu Petition No.99/2010) and prescribed forbearance price and floor price for dealing in Certificates under the REC Regulations:

	Non solar REC (₹/ MWh)	Solar REC (₹/ MWh)
Forbearance Price	3,900	17,000
Floor Price	1,500	12,000

5. Above determined forbearance price and floor price are valid for the control period upto FY 2012.
6. The Commission now proposes the following forbearance price and floor price for the REC framework for the next control period from 1st April 2012, as per the proposal enclosed as

Appendix-1.

	Non solar REC (₹/ MWh)	Solar REC (₹/ MWh)
Forbearance Price	3480	13690
Floor Price	1400	9880

7. Comments / suggestions of the stakeholders on the above proposal are invited by 05.07.2011. We direct that the matter be notified for hearing on 14.07.2011 before taking a final decision regarding the Forbearance and Floor Price for the REC framework.

Sd/-	Sd/-	Sd/-	Sd/-
(M. Deena Dayalan) Member	(V.S. Verma) Member	(S. Jayaraman) Member	(Dr. Pramod Deo) Chairperson

Appendix - 1

Proposal for Determination of Forbearance & Floor Price of REC for the control period starting from 1st April 2012

1. The forbearance price and the floor price under the REC framework proposed to be determined based on the following principles:-
 - (a) *RE target*: The target for RE generation (year 2012-13) has been taken as per the MNRE Report on “Renewable Energy in India: progress, Vision and Strategy.
 - (b) *Additional RE capacity addition*: To develop scenarios for future state level RE technology specific supply, for each RE technology across select states, the growth in capacity has been projected based on the Cumulative Aggregate Growth Rate (CAGR) for that RE technology in the states based on the past 5 years performance, current achievement, MNRE/GoI's 11th and 12th Plan Targets for Capacity Addition in RE and the untapped potential available in the state. Year 2011 has been taken as a base year for projection of capacity addition from RE.
 - (c) To estimate additional generation at the state level in year 2011-12 and 2012-13, the capacity added under a specific RE technology has been multiplied by the Capacity Utilisation Factor of the RE technology, as per the CERC RE Tariff Regulations 2009, for the sake of uniformity.
 - (d) *Cost of Generation/RE tariff*: Costs of Generation/ RE Tariff for different technologies for FY 2011-12 have been assumed as per the CERC RE Tariff Regulations 2009, for the sake of uniformity.
 - (e) *Average Power Purchase Cost (APPC)*: The APPC for a state represents the weighted average pooled power purchase by distribution licensees (without transmission charges) in the state during the financial year 2011-12.
 - (f) *Forbearance Price*: The forbearance price has been derived based on the highest difference between cost of generation of RE technologies / RE tariff and the average power purchase cost of 2011-12 for the respective states.

- (g) *Floor Price:* The floor price has been determined keeping in view the basic minimum requirements for ensuring the viability of RE projects set up to meet the RE targets. This viability requirement shall cover loan repayment & interest charges, O&M expenses and fuel expenses in case of Biomass and Cogeneration.

2. In pursuance of the guidelines specified in the Regulation 9 (2) of REC Regulations, the forbearance and floor prices for Solar and Non- Solar REC have been evolved based on following assumptions.

(a) Non-solar Forbearance price:

- i. The highest difference between the Costs of Generation/ RE Tariff and the APPC has been specified as the forbearance price for non-solar technologies. The highest difference in unit price has been rounded off to the next ten's, to arrive at the forbearance price of ₹ 3480/MWh (Annexure - 1).
- ii. Highest difference as forbearance price covers more than the target RE generation (as per MNRE Report on Renewable Energy in India: Progress, Vision and Strategy) and is considered necessary to take care of the risks involved for RE generators in opting for REC mechanism. This is also expected to give fillip to the promotion of RE generation.

(b) Non – Solar Floor Price :

- i. The difference between the project viability requirement and APPC is arranged in ascending order (Rs/kWh) for different RE technologies across states. The expected generation (MUs) from RE technology in a particular state is mapped with the respective difference between the project viability requirement and APPC.
- ii. In this case floor price has been taken as the price (difference between feasibility requirement and APPC) at which the target RE generation of 68000 MUs (as per MNRE vision Report 2010) will be realized. The difference in unit price at this

point has been rounded off to the next ten's, to arrive at the floor price of ₹. 1400/MWh (Annexure - 2).

- iii. This approach for floor price is considered adequate as the objective is to ensure that the basic minimum requirements (in terms of recovery of cost) of the target generation are met.

(c) Solar Forbearance price

- i. This has been derived based on the highest difference between the Solar PV/Thermal tariff for 2011-12 and the APPC of 2011-12 across states. The highest difference in unit price has been rounded off to the next ten's, to arrive at the forbearance price of ₹ 13690/MWh (Annexure - 3).

(d) Solar Floor price

- i. The floor price of solar RECs has been calculated based on the project viability approach. The project viability approach covers the cost required to meet viability parameters including O&M, interest, principal repayment etc.
- ii. The highest difference between the minimum requirement for project viability of Solar PV/Thermal and respective state APPC of previous year (2011-12) has been considered as floor price. The highest difference has been rounded off to the nearest ten's, to arrive at the floor price of ₹ 9880/MWh (Annexure - 3).

3. Based on the above principles, the following forbearance price and floor price are prescribed for dealing in Certificates under the REC Regulations:

	Non solar REC (₹/ MWh)	Solar REC (₹/ MWh)
Forbearance Price	3480	13690
Floor Price	1400	9880

4. The above stated forbearance and floor prices shall remain valid for the control period upto FY 2015.

ANNEXURE-1 (NON SOLAR FORBEAREANCE PRICE)

State/RET	APPC for 2011-12 (Rs/kWh)	Tariff as per RE Tariff Regulation (Rs/kWh)	Difference btw RE tariff and APPC (Rs/kWh)
Uttaranchal SHP	2.46	3.5	1.04
Tamil Nadu Wind	2.69	3.95	1.26
AP Biomass	2.50	3.78	1.28
Karnataka SHP	2.78	4.17	1.39
Uttar Pradesh Biomass	2.75	4.06	1.31
Punjab SHP	2.87	4.17	1.30
Maharashtra SHP	2.85	4.17	1.32
Maharashtra Biomass	2.85	4.31	1.46
Gujarat SHP	2.70	4.17	1.47
TN SHP	2.69	4.17	1.48
Maharashtra Bagasse	2.85	4.34	1.49
Rajasthan SHP	2.60	4.17	1.57
Karnataka Biomass	2.78	4.41	1.63
AP SHP	2.50	4.17	1.67
Rajasthan Biomass	2.60	4.28	1.68
Gujarat Biomass	2.70	4.41	1.71
Maharashtra Wind	2.85	4.63	1.78
HP SHP	1.70	3.5	1.80
TN Biomass	2.69	4.58	1.89
Karnataka Bagasse	2.78	4.68	1.90
TN Bagasse	2.69	4.6	1.91
Gujarat Wind	2.70	4.63	1.93
Uttarpradesh Bagasse	2.75	4.76	2.01
AP Bagasse	2.50	4.51	2.01
Haryana Biomass	2.77	4.94	2.17
Andhra Pradesh Wind	2.50	4.63	2.13
WB SHP	1.98	4.17	2.19
Punjab Biomass	2.87	4.97	2.10
Kerala SHP	1.91	4.17	2.26
Chhatisgarh Biomass	2.15	4.41	2.26
MP SHP	1.85	4.17	2.32
West Bengal Biomass	1.98	4.41	2.43
Kerela Wind	1.91	4.63	2.72
Rajasthan Wind	2.60	5.33	2.73
WB Wind	1.98	5.33	3.35
Madhya Pradesh Wind	1.85	5.33	3.48

ANNEXURE-2 (NON -SOLAR FLOOR PRICE)

State/RET	Supply at end 2011 (MU)	Supply at end 2012 (MU)	Additional Generation in 2013(MUs)	RE Supply in 2013 (Mus)	APPC for 2011-12 (Rs/kWh)	Viability req. (Rs/kWh)	Difference btw project viability req. and APPC (Rs/kWh)
	53164	61073					
Karnataka Wind			889	61962	2.78	2.94	0.15
Tamil Nadu Wind			1758	63720	2.69	2.94	0.25
Punjab SHP			18	63738	2.87	3.27	0.40
Maharashtra SHP			33	63771	2.85	3.27	0.41
Karnataka SHP			193	63963	2.78	3.27	0.48
Gujarat SHP			5	63968	2.70	3.27	0.57
TN SHP			2	63970	2.69	3.27	0.58
Maharashtra Wind			659	64629	2.85	3.46	0.60
Rajasthan SHP			0	64629	2.60	3.27	0.66
Gujarat Wind			1463	66092	2.70	3.46	0.76
AP SHP			6	66098	2.50	3.27	0.77
Uttaranchal SHP			59	66157	2.46	3.31	0.85
AP Biomass			207	66364	2.50	3.43	0.94
Uttar Pradesh Biomass			15	66379	2.75	3.71	0.95
Andhra Pradesh Wind			45	66424	2.50	3.46	0.96
Maharashtra Bagasse			325	66749	2.85	3.90	1.05
Maharashtra Biomass			124	66873	2.85	3.96	1.11
Karnataka Biomass			81	66954	2.78	4.06	1.27
WB SHP			0	66954	1.98	3.27	1.28
Rajasthan Biomass			70	67024	2.60	3.93	1.33
Kerala SHP			25	67050	1.91	3.27	1.36
Gujarat Biomass			0	67050	2.70	4.06	1.36
Rajasthan Wind			893	67943	2.60	3.97	1.37
Karnataka Bagsse			294	68237	2.78	4.18	1.40
MP SHP			27	68264	1.85	3.27	1.41
Uttarpradesh Bagasse			510	68774	2.75	4.17	1.41
AP Bagasse			135	68909	2.50	3.92	1.42
TN Bagasse			364	69273	2.69	4.16	1.47
TN Biomass			176	69449	2.69	4.23	1.54
Kerala Wind			11	69460	1.91	3.46	1.55
HP SHP			368	69828	1.70	3.31	1.61
Punjab Biomass			50	69878	2.87	4.59	1.72
Haryana Biomass			4	69882	2.77	4.62	1.85
Chhatisgarh Biomass			223	70104	2.15	4.06	1.91
WB Wind			0	70104	1.98	3.97	1.99
West Bengal Biomass			16	70120	1.98	4.06	2.07
Madhya Pradesh Wind			250	70371	1.85	3.97	2.12

ANNEXURE-3

Solar PV Forbearance and Floor Price

Rs/kWh	Solar PV	Solar Thermal									
O&M expenses	0.87	1.16									
Int. on term loan	3.92	3.75									
Int. on working capital	0.35	0.35									
Repayment	6.08	6.33									
Total	11.22	11.59									
State	APPC (2011-12)	CERC Tariff (PV)	Gap between tariff and APPC	Min Requirement	Gap between Min Req and APPC	State	APPC (2011-12)	CERC Tariff (Thermal)	Gap between tariff and APPC	Min Requirement	Gap between Min Req and APPC
Maharashtra	2.87	15.39	12.66	11.22	8.36	Maharashtra	2.87	15.04	12.17	11.59	8.72
Karnataka	2.85	15.39	12.54	11.22	8.37	Karnataka	2.85	15.04	12.19	11.59	8.73
Haryana	2.78	15.39	12.61	11.22	8.44	Haryana	2.78	15.04	12.26	11.59	8.80
Uttar Pradesh	2.77	15.39	12.62	11.22	8.45	Uttar Pradesh	2.77	15.04	12.27	11.59	8.81
Punjab	2.75	15.39	12.64	11.22	8.47	Punjab	2.75	15.04	12.29	11.59	8.83
Gujarat	2.70	15.39	12.69	11.22	8.52	Gujarat	2.70	15.04	12.34	11.59	8.89
Tamil Nadu	2.69	15.39	12.70	11.22	8.53	Tamil Nadu	2.69	15.04	12.35	11.59	8.90
Rajasthan	2.60	15.39	12.79	11.22	8.62	Rajasthan	2.60	15.04	12.44	11.59	8.98
Andhra Pradesh	2.50	15.39	12.89	11.22	8.72	Andhra Pradesh	2.50	15.04	12.54	11.59	9.09
Uttaranchal	2.46	15.39	12.93	11.22	8.76	Uttaranchal	2.46	15.04	12.58	11.59	9.12
Chattisgarh	2.15	15.39	13.24	11.22	9.08	Chattisgarh	2.15	15.04	12.89	11.59	9.44
West Bengal	1.98	15.39	13.41	11.22	9.24	West Bengal	1.98	15.04	13.06	11.59	9.60
Kerala	1.91	15.39	13.48	11.22	9.31	Kerala	1.91	15.04	13.13	11.59	9.68
Madhya Pradesh	1.85	15.39	13.54	11.22	9.37	Madhya Pradesh	1.85	15.04	13.19	11.59	9.73
HP	1.70	15.39	13.69	11.22	9.52	HP	1.70	15.04	13.34	11.59	9.88
			13.69		9.52				13.34		9.88

AVERAGE POWER PURCHASE COST (APPC) OF STATES			
State	APPC (Rs/kWh) 2009-10 2010-11	Remarks	APPC 2011-12 #
Gujarat	2.53	Tariff Order 2010-11	2.70
HP	1.60	HPERC Order dated 10/6/2010	1.70
Uttaranchal	2.14	UERC Letter 84/UERC/CERC Dtaed 19/4/2011	2.46
Karnataka	2.61	KERC Letter Y/04/09/9933, Dated 6/4/2011	2.78
Maharashtra	2.51	MERC Tariff Order 2009-10	2.85
Chattisgarh	2.11	CSERC Tariff Order 2010-11	2.15
Punjab	2.69	PERC APPC Order 2010-11 Dated 2/6/2011	2.87
Uttar Pradesh	2.43	UPERC Tariff Order 2009-10	2.75
Haryana	2.60	HERC ARR Order of UHBVNL & DHBVNL Dated 13/9/2010	2.77
Kerala	1.68	KSERC Tariff Order 2009-10	1.91
West Bengal	1.86	Tariff Order 2010-11	1.98
Rajasthan	2.60	Tariff Order 2010-11	2.60
Andhra Pradesh	2.52	Tariff Order 2010-11	2.50
Tamil Nadu	2.37	TNERC APPC Order: M.O.4/E/RPO dated 28-12-2010: Rs.2.37/kWh	2.69
Madhya Pradesh	1.74	MPERC letter :MPERC/D(RE)/2011/1138 Dtaed 13/4/2011	1.85
Assam	2.40	AERC: APDCL No. GM (Com-T)/AERC/MISC/2008/175 27/4/2011	2.55
Bihar	2.32	MYT Tariff Order 2010-11	2.47
Delhi	2.62	MYT Tariff Order 2010-11	2.79
# Latest Available data on APPC are considered and same is escalated with the CAGR of power purchase cost data of previous years as per PFC Report to arrive APPC for 2011-12			