CENTRAL ELECTRICITY REGULATORY COMMISSION

NEW DELHI

Petition No. 99/2010 (Suo Motu)

Date of order: 01st June, 2010

IN THE MATTER OF

Determination of Forbearance and Floor Price for the REC framework

ORDER

A. BACKGROUND

1. In exercise of the power under section 66 and 178 of the Act, 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 in consultation with the Central Agency and Forum of Regulators shall provide for the Forbearance and Floor 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 has consulted the Forum of Regulators (FOR) vide letter number 1/3/2009 Reg. Affairs (RE Tariff-FY-1010-11)(ii)/CERC dated 29th March, 2010 and the Central Agency before finalising the forbearance and floor price for the REC.
5. The Commission vide its Suo Motu Petition No.99/2010 issued an order dated 23rd March, 2010 for 'determination of Forbearance and Floor Price for the REC framework' and invited comments from the various stakeholders.
6. A public hearing was held on 27 April, 2010. A number of stakeholders submitted their comments/suggestions in response to the order dated 23rd March, 2010 proposing Forbearance & Floor prices for REC. Summary of the comments/suggestions is attached at Appendix – A to this order.

Consideration of the views of the stakeholders & analysis and findings of the Commission on important issues

7. The Commission considered the comments of the stakeholders received on the order, views of the participants in the public hearing as well as their written submissions received during and after the public hearing. Analysis of the important issues and findings of the Commission thereon are discussed in the subsequent paragraphs. Other comments of the stakeholders and observations thereon are enclosed as Annexure-I.

Comments/Suggestions received and Commission's decision thereon

8. <u>Average Power Purchase Cost (APPC)</u>

(a) Some of the State Electricity Regulatory Commission (SERCs) suggested that the Average Power Purchase Cost (APPC) used for calculating the forbearance and floor prices for REC should be updated as per the recent tariff orders issued by the respective SERCs. It was also found that certain States include transmission charges while calculating the APPC for the distribution licensees. This was required to be corrected to bring uniformity in the basis of working of APPC of the distribution licensees in different states.

(b) Based on the comments received related to APPC, the Commission has accordingly updated the APPC, as per the latest available orders, for the respective distribution licensee for calculating the weighted APPC for the state. The transmission charges have been excluded while calculating the APPC for the respective distribution licensees.

9. Issuing multiple RECs

(a) Stakeholders have submitted that multiple RECs can be issued based on the type of the technology and respective cost of generation.

(b) As per Regulation 7 (6) of the REC Regulations, each Certificate issued shall represent one Megawatt hour of electricity generated from renewable energy source and injected into the grid. Hence, it is clarified that issuance of multiple RECs is not envisaged in the REC Regulations.

10. Issuing RECs to obligated entities

(a) One of the stakeholders submitted that the entities in the State which are buying RE power at feed-in-tariff over and above their renewable purchase obligation should also be made eligible for getting REC for the additional quantity.

(b) As per the Regulation 5(2) of the REC Regulations, a generating company engaged in generation of electricity from renewable energy sources shall be eligible to apply for registration for issuance of and dealing in Certificates if it fulfils certain conditions. Hence, it is clarified that issuance of the REC to obligated entities is not envisaged in the REC Regulations.

11. Other Comments :

(a) Floor Price for Electricity component: One of the stakeholders submitted that the Commission should specify floor price for purchase of electricity component as well.

(b) Higher post-tax RoE: The stakeholders have submitted that under the REC framework, there is no assured return and investors are exposed to uncertainty of compensation through the REC price which will be determined through the power exchange and a higher post-tax RoE was requested to compensate the higher risk while calculating REC pricing.

(c) Switching from REC mechanism to feed-in tariff mechanism: One of the stakeholders has submitted that the project developer should be allowed to switch to the SERC feed-in-tariff mechanism as fallback in case of minimum floor price of REC not being sustained during the project life.

(d) It is clarified that the above comments/suggestions are beyond the scope of present regulatory process of determination of forbearance and floor prices.

B. Determination of Forbearance & Floor Price of REC

12. After consideration of the comments/suggestions of stakeholders, the Commission by this order determines the forbearance price and the floor price under the REC framework, based on the following principles:-

(a) *RE target:* The target for RE generation (year 2010-11) has been taken as 6% of the total projected energy requirement (National Action plan on Climate Change Target).

(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

Plan Targets for Capacity Addition in RE and the remaining potential available in the state. Year 2009 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 2010-11, 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 2009-10 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 last financial year (2009-10).

(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 2009-10 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.

13. In pursuance of the guidelines of 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 has been rounded off to the next ten's, to arrive at the forbearance price of Rs. 3900/MWh (Annexure - I).

ii. Highest difference as forbearance price covers more than the target RE generation (as per NAPCC i.e. 6% total generation in FY 2011) 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 (Rs. /kWh) and APPC) at which the target RE generation (as per NAPCC) of 54378 MUs (i.e. 6% total generation in FY 2010-11) will have been realized. The difference price at this point has been rounded off to the next ten's, to arrive at the floor price of Rs. 1500/MWh (Annexure - II).

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 tariff for 2009-10 (as per REC Regulations) and the APPC of 2009-10 across states. The highest difference has been rounded off to the next ten's, to arrive at the forbearance price of Rs. 17000/MWh (Annexure - III).

(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 and respective state APPC of previous year (2009-10) 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 Rs. 12000/MWh (Annexure - III).

14. 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 (Rs/ MWh)	**Solar REC (Rs/ MWh)**
Forbearance Price	3,900	17,000
Floor Price	1,500	12,000

15. The above stated forbearance and floor prices shall remain valid for the control period upto FY 2012.

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

Appendix - A			
Clause No.	**Issue**	**Stakeholder Comments**	**Commission's Views**
Rajasthan Electricity Regulatory Commission			
1	Method for calculation of Forbearance/Floor price	• For solar REC., the difference has been worked out based on Average Power Purchase Cost (APPC) of Chhattisgarh • Energy component would be purchased mostly by either the States where gap between availability and demand of energy is high or States where RE projects are located and Chhattisgarh doesn't fall in this category • Chhattisgarh is clearly non-representative as far as sale of energy component is concerned. • In view of this, RE generators would be getting considerably higher returns. • APPC of either Karnataka i.e. Rs.1.85/unit or Andhra (Rs. 1.78/unit) be assumed in working out Forbearance/Floor price	• The formula used for price determination may be as follows : o Forbearance Price = Maximum (Preferential Tariff – APPC) o Floor Price = Market Equilibrium Price (Minimum requirement for Project Viability of RE technologies – APPC) • Floor price has been calculated keeping in mind the demand and supply for the RE generation (India as a whole) based on the NAPPC targets. Hence, states having higher demand for RECs are expected to be states having lower RE generation & higher electricity consumption. • Forbearance price for REC is a maximum price and not the guaranteed price. Aim has been to set a forbearance price which provides adequate return to all the solar projects across all states. Hence Chhattisgarh because of lower APPC requires highest support.
2	Method for calculation of Forbearance/Floor price	• Assuming sale price to be average of Floor price and Forbearance price, the REC price of solar projects for many States would be higher than the feed-in-tariff. This would obviously result in States being dis-interested in buying REC and would rather prefer solar energy under feed-in-tariff regime. • Solar potential exists in more or less in the entire country - of course with varying cost of generation due	• The sale price of REC will depend upon the market conditions. REC mechanism is one of the options of promoting RE generation. Based on the risk appetite of the project developer and risk & return expected, one can either go for REC or feed-in tariff. The same is valid for State utilities also. • Apart from that one of the aims of REC mechanism is to cater to states not having adequate RE

		to difference in solar radiation.	generation.
3	Solar Generation Cost	• The cost of solar generation has been assumed as Rs.18.44/unit as against recently arrived rate of Rs. 17.91 /unit in draft order of CERC for the year 2010-11	• RE Tariff regulation of 2009-10 has been considered for REC price calculation
4	Solar Thermal projects	• Cost of solar thermal projects is lower whereas uniform cost of generation has been assumed in working out Forbearance/Floor price of solar REC. The cost of generation for thermal projects for 10-11 in the draft order of CERC works out to Rs. 15.31/unit as against Rs,17.91/unit of SPV • To place the certificates of the two distinct technologies at the same time footing and for making them competitive; one unit of energy of solar thermal project may be allocated .854 certificates as against 1 Unit (MWh)	• As per REC regulation, only two categories of certificates will be there – Solar & non-solar. • The aim has been to promote the solar sources without differentiation of solar technologies. The calculations are consistent with the provisions of the regulation • Multiplier mechanism for issuing RECs is not considered in the REC regulation
5	Impact of Accelerated Depreciation	• Additional benefit of accelerated depreciation has not been accounted for • The required cost recovery through REC in case of projects availing AD benefit would obviously be lower than those not getting AD benefit. • It would be appropriate that number of certificates for the projects of lower cost should be proportionately lower for each unit of energy	• The initial framework should encourage investments. A relatively higher level of floor or cap is only helpful to promote investments in solar which are at a negligible level today. Over time, as investments fructify, the framework can consider deduction of Accelerated depreciation for ensuring a balance between encouraging investments and reducing their impact on utilities. • Among the non-solar REC categories, it is only the wind projects which generally get AD benefits. For non solar investments the framework for determination of floor and cap price is uniform and cannot differentiate on the basis of AD benefits which is specific to wind only. • Multiplier mechanism for issuing RECs is not considered in the REC regulation.

6	Period of validity of Forbearance/ Floor Price	• Forbearance price as well as Floor price would need to be worked out for each year as cost of generation as well as APPC would vary for each financial year. • To ensure level playing field for projects of different vintages, the cost difference of energy needs to be suitably addressed in REC mechanism • One option seems to be in introducing flexibility in equivalence between one REC and one MWh of energy. • The projects commissioned in previous year i.e. F.Y. 10-11may be allocated higher or lower number of REC per MWh of energy pro-rata to Forbearance price of F.Y. 11-12	• The pricing of the REC is dependent on the market conditions. It is likely that developers in the initial years may get higher return due to huge demand & supply gap for meeting RE targets. To a large extent this depends on the risk profile of the developer and the market conditions. • The REC mechanism is one the measures to promote RE • Multiplier mechanism for issuing RECs is not considered in the REC regulation.
7	Treatment of RE purchase over and above RPO	• Entities in the State who are buying RE power at feed-in-tariff over and above their renewable purchase obligation should also be made eligible for getting REC for the additional quantity	• At present this framework is not envisaged in the REC regulation.
8	Redemption of REC	• Floor price of the renewable energy should be treated as "guaranteed price" through a suitable mechanism so that if some renewable energy certificates remain unsold then those may be redeemed at the guaranteed price for which a fund may be created by laying a penalty on the obligators who purchase less RE than prescribed.	• The regulation provides for a validity period of 365 days during which it can be sold. The CERC regulation does not provide for anything further on treatment of unsold RECs.
Orissa Electricity Regulatory Commission			
1	Orissa related	• The forbearance price arrived in our case is Rs.16.42/Kwh and floor price is Rs.l 1.47/Kwh which is lower than the prices of Rs.17.23/Kwh and Rs.12.28/Kwh proposed by the CERC in order to determine Forbearance and Floor Price for the REC framework.	• There are states having lower APPC than Orissa, hence the REC forbearance/floor price is higher than that calculated for Orissa
Chhattisgarh Electricity Regulatory Commission			

1	APPC related	• As per the Tariff order 2009-10,the APCC for 2009-10 is estimated as Rs 1.72 per unit. Excluding the cost of power purchase for renewable plants(mainly biomass),the APPC is estimated as Rs 1.69 per unit. This is for your kind information and needful please.	• The revised APPC indicated by CSERC is being considered for the calculation of floor and forbearance prices.
Haryana Electricity Regulatory Commission			
1	Forbearance Price	• To consider reduction in the Forbearance price which can be done by adopting National Average Pool Power Purchase Cost in place of state APPC	• As per the REC regulations the REC price will guided by the in the pooled power purchase cost across states in the country. Hence the state level APPC has been considered.
Kerala State Electricity Regulatory Commission			
1	APPC related	• The APPC applicable to KSEB for FY 2009 is taken as Rs 1.46/kWh instead of actual rate of Rs 2.48/kWh. Hence needs to be updated.	• The APPC has been updated based on 2009-10 Tariff order and transmission charges deducted from total power purchase cost.
2	RPO related	• The SERC has fixed an RPO of 5% for the state. If RPO makes it mandatory to purchase REC at a price fixed by CERC it will mean increasing consumer tariff considerably. The RPO fixation should also consider the carbon emissions	• Not related to the present regulatory process.
3	Forbearance related	• The suggested forbearance price of REC is on higher side.	• Forbearance price has been determined based on the guiding principles provided in the Regulations. Forbearance price for REC is just a cap and the actual price of the REC may vary between the floor and the forbearance price.
CLP Wind Farms (India) Private Limited			

1	Specify floor price for purchase of electricity component	• While fixing the prices of REC, the concept of average power purchase cost (APPC) has been applied and the data used for this is historical. Currently, the power shortage in India is pushing the prices up and it is reflected in the historical pricing used for APCC. However, it is envisaged that average power purchase cost (APPC) will come down significantly with the installation of UMPPs. • A renewable project may become unviable if developer is not able to recover cost of generation through APPC and REC realization. In order to protect the interest of RE developers, the Honorable Commission may specify floor price for purchase of electricity component as well.	• CERC Regulations on REC mechanism provide for APPC distribution utilities as the basis for the electricity component.
2	APPC state or distribution licensee level	• CERC REC Regulations leads to conclusion that APPC would be computed at host distribution licensee level while in the draft Order APPC figures are given at State level. It would be helpful if the Honourable Commission clarifies whether average pooled power purchase cost would be computed at State level or at host distribution licensee level	• The CERC regulation on REC mechanism has defined Pool cost of purchase as weighted average pool price at distribution licensee. • In the draft order the APPC has been considered for the state for calculation purpose. The State APPC represents the weighted average APPC of the distribution licensees.
3	Period for REC price	• Last Financial Year i.e. 2009-10 has been considered for determination of Floor price and Forbearance price and therefore, it appears that determined price would be applicable on REC transactions to be happened during next year i.e. FY 2010-11. It would be helpful if the Honourable Commission can clarify the period for which proposed Floor price and Forbearance price will remain applicable.	• As per the CERC regulation, 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.
4	APPC pricing	• Clause 5(1) (C) of CERC REC Regulations, 2010 specifies that electricity component should be sold at a price not exceeding average power purchase cost which provides an opportunity to distribution companies to negotiate for buying of electricity component at price lower than their APPC. • It is therefore requested to the Commission to specify that electricity component shall be purchased at Average Pooled Power Purchase Cost (APPC) of host distribution	• This is beyond the scope of the exercise of fixing forbearance and floor prices.

		licensee.	
5	Incentive mechanism for REC	• At broader level, maximum realization to a renewable project developer will be limited to normative tariff specified by the Commission. There is no incentive for a developer to switch from existing fixed feed-in tariff mechanism to REC mechanism that exposes developer to revenue risk on both fronts i.e. electricity as well as REC price. Therefore, as incentive mechanism, forbearance price should be higher than difference of RE tariff and APPC.	• The forbearance price is the maximum difference between RE tariff & APPC and will be related to a particular technology in specific region. All the other technologies in other regions have the opportunity to get higher returns than the difference between RE tariff & APPC. For example Wind project in Tamil Nadu may have opportunity of getting higher returns than wind projects in Rajasthan under REC mechanism. • This will promote development of the efficient RE projects.
6	Common framework for RPO	• States, which are deficit in renewable energy, are either yet to specify RPO targets inline with NAPCC framework or specify the penal provisions for non fulfilment of RPO. The proposed scheme may fall flat its face in the absence of demand for RECs which in turn depends on nationwide mandatory RPO. At first instance, it should be ensured that common framework for RPO, penalty for non-compliance, tariff principles etc is established across the States through appropriate regulatory measures.	• This is beyond the scope of the present exercise of fixing forbearance and floor prices.
7	Capacity Addition Targets	• Aggressive capacity addition targets have been proposed for some of RE technologies having low cost of generation. For an example, for small hydro, capacity addition of 450 MW has been considered for 2009-10 while in actual capacity addition in a year has not gone beyond 250 MW during the past 7 years. Such unrealistic assumptions artificially increase the renewable energy availability and drags down market equilibrium point for floor price computation.	• The capacity addition targets for RE technologies are based on the past capacity addition trend of RE technologies in different states and the capacity addition targets specified by the Government. It is also based on the assumption that the sector may overcome initial barriers related to clearances, process delays resulting in better investment scenario. • The Forbearance price is based on the maximum difference between RE tariff & APPC. The forbearance price is not directly related to the quantum of the electricity from RE projects.

8	Data related	• As FY 2009-10 has already been passed therefore the Commission may consider actual data for RE capacity addition, renewable energy generation, and average power purchase cost while finalizing floor price and forbearance price.	• The APPC has been updated to consider the latest data available. • The state wise RE Capacity addition details are not available for the complete FY 2009-10.
Acciona Energy			
1	Control Period	• Control period is required; it should be total life of the project to enable viability access and financing.	• Not envisaged in this order. • As per the CERC regulation on REC, 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	Switching to feed-in tariff	• To enable financing and viability analysis in the initial phase of RECs, the promoter should be allowed to switch to the SERC feed in tariff mechanism as fallback in case of minimum floor price of REC not being sustained during the project life. CERC should bring-in the enabling mechanism for this . • There should be a Provision for switchover from third party sale to utility sale and-Vice-versa. It should be expressly brought out	• As per CERC Regulations, will make the project developer ineligible for REC mechanism.
3	CDM related	• CDM revenue stream if available should go to promoter. No sharing with utility.	• Not envisaged in the CERC REC Regulation.
4	APPC price	• Average power purchase cost (APPC) should be determined the basis of previous financial year. This should be clarified.	• As per the CERC REC Regulation, the 'Pooled Cost of Purchase' is related to the previous financial year.
5	Minimum project viability	• The minimum project viability for solar & non-solar REC should be clarified.	• As detailed in the draft order, the floor price has been determined keeping in view the basic minimum requirements for ensuring the viability of RE projects. This viability requirement shall cover loan repayment & interest charges, O&M

			expenses and fuel expenses in case of Biomass and Cogeneration. • The Appendix I with the draft order details the floor price for solar & non-solar i.e minimum project viability requirement.
Torrent Power			
1	Forbearance price	• Under the REC framework, there is no assured return and investors are exposed to uncertainty of compensation through the REC price which will be determined through the power exchange. Hence, we request the Hon'ble Commission to set the forbearance price considering a higher post-tax RoE than the CERC tariff to compensate investor for the higher risk involved in the adoption of the REC framework.	• The floor price for REC provides assured returns on sale of RECs. • CERC tariff has been taken as reference for determination of forbearance and floor price.
2	Floor price	• RoE has been excluded in computing the minimum requirement for ensuring viability of RE projects. However, unless the floor price generates a minimum RoE, investors may perceive the REC mechanism to be unremunerative and hence too risky. • Commission may include a post-tax RoE of atleast 8% in determining the minimum requirement for viability of RE projects	• The basic minimum requirements for ensuring the viability of RE projects has been considered to cover loan repayment & interest charges, O&M expenses and fuel expenses in case of Biomass and Cogeneration. • The floor price need to be decided keeping in mind the viability for the RE projects as well as having lower impact on consumer tariff in event of compliance through purchase of RECs by the obligated entities. • The returns from the REC mechanism are subject to market conditions; however minimum project viability requirements are protected through floor price.
3	Floor Price of Solar and Non-Solar REC	• Specify in detail the components of the minimum requirement for the viability of RE projects on a per kWh basis and include a contribution towards RoE.	• The total minimum requirement for viability is represented by the floor price (Rs/kWh). The data is as per Annexure on RE tariff calculation provided along with the CERC RE Tariff Regulation 2009.

4	Capacity addition trend	• The guidelines expect a significant increase in the annual capacity addition of wind power of 3286.95 MW and 3247.54 MW in 2009-10 & 2010-11 respectively. • Suggested to suitably reduce the expected capacity addition in 2009-10 and 2010-11 in order to align the capacity addition plans with the achievement over the previous years.	• The capacity addition targets for RE technologies are based on the capacity addition trend of RE technologies in different states in the past 5 years and the capacity addition targets specified by the Government.
5	Solar RECs	• Forbearance price and Floor price of Solar REC will decrease over time. As a result, projects that are commissioned when capital cost and tariff for solar is high will not be able to achieve the minimum requirement for project viability in the latter years. Hence we request the CERC to formulate a suitable mechanism to alleviate the aforementioned problem	• As per the CERC regulation on REC mechanism, the CERC may from time to time issue such directions and orders as considered appropriate for the implementation of these regulations and for the development of market in power for Renewable Energy Sources.
6	Submission of fees	• To include these Accreditation, Registration, Issuance and Redemption of REC charges in the determination of the floor and the forbearance price of RECs.	• As per the CERC regulation on REC, the Commission may from time to time, based on the proposal in this regard from the Central Agency, determine, by order, the fees and charges payable by the eligible entities for participation in the scheme for registration, eligibility of certificates, issuance of certificates and other matters connected therewith.

Non-Solar Forbearance Price

Annexure - I

State	State/RET	Supply at end 2010 (MU)	Additional Generation in 2011 (MUs)	RE Supply (2010-11)(Mus)	Tariff as per RE Tariff Regulation (Rs/kWh)	APPC for 2009-10 (Rs/kWh)	Difference btw RE tariff and APPC (Rs/kWh)
	India	45924.62					
Tamil Nadu	TN Wind		816.97	46741.59	4.17	2.51	1.66
Rajasthan	Rajasthan SHP		39.03	46780.61	4.31	2.57	1.74
Maharashtra	Maharashtra SHP		7.45	46788.06	4.31	2.51	1.8
Tamil Nadu	TN SHP		40.06	46828.12	4.31	2.51	1.8
Uttaranchal	Uttaranchal SHP		126.03	46954.15	3.625	1.79	1.83
Arunachal	Arunachal SHP		45.83	46999.98	3.625	1.68	1.95
Karnataka	Karnataka SHP		554.88	47554.87	4.31	2.35	1.96
Andhra Pradesh	AP Biomass		346.9	47901.76	4.15	2.12	2.03
Punjab	Punjab SHP		78.05	47979.81	4.31	2.27	2.04
HP	HP SHP		265.34	48245.15	3.625	1.48	2.15
Andhra Pradesh	AP SHP		27.6	48272.75	4.31	2.12	2.19
Gujarat	Gujarat SHP		39.03	48311.78	4.31	2.1	2.21
Maharashtra	Maharashtra Biomass		378.43	48690.21	4.76	2.51	2.25
Maharashtra	Maharashtra Cogen		384.74	49074.95	4.8	2.51	2.29
West Bengal	WB SHP		105.33	49180.28	4.31	1.92	2.39
Madhya Pradesh	MP SHP		52.03	49232.31	4.31	1.81	2.5
Karnataka	Karnataka Biomass		157.68	49389.99	4.88	2.35	2.53
Tamil Nadu	TN Biomass		441.5	49831.5	5.08	2.51	2.57
Tamil Nadu	TN Cogen		268.43	50099.92	5.1	2.51	2.59
Kerala	Kerala SHP		66.97	50166.89	4.31	1.68	2.63
Andhra Pradesh	AP Wind		79.26	50246.15	4.9	2.12	2.78
Uttar Pradesh	UP Cogen		685.32	50931.47	5.21	2.43	2.78
Gujarat	Gujarat Wind		1259.25	52190.72	4.9	2.1	2.8
Andhra Pradesh	AP Cogen		162.31	52353.03	4.93	2.12	2.81
Karnataka	Karnataka Cogen		243.13	52596.16	5.17	2.35	2.82
Rajasthan	Rajasthan Wind		1327.36	53923.52	5.63	2.57	3.06
Maharashtra	Maharashtra Wind		1268.65	55192.17	5.63	2.51	3.12
Chattisgarh	Chattisgarh Biomass		63.07	55255.24	4.88	1.69	3.19
Kerala	Kerala Wind		22.24	55277.48	4.9	1.68	3.22
Karnataka	Karnataka Wind		1016.16	56293.64	5.63	2.35	3.28
West Bengal	WB Wind		61.32	56354.96	5.63	1.92	3.71
Madhya Pradesh	MP Wind		227.76	56582.72	5.63	1.81	3.82

Note :- The highest difference has been rounded off to the next ten's, to arrive at the forbearance price of Rs. 3900/MWh.

Non-Solar Floor Price

Annexure - II

State/RET	Supply at end 2010 (MU)	Additional Generation in 2011 (MUs)	RE Supply (Mus)	APPC for 2009-10 (Rs/kWh)	Feasibility req. (Rs/kWh)	Difference btw project viability req. and APPC (Rs/kWh)
India	45924.62					
TN Wind		816.97	46741.59	2.51	2.8	0.29
Rajasthan SHP		39.03	46780.61	2.57	3.1	0.53
Maharashtra SHP		7.45	46788.06	2.51	3.1	0.59
TN SHP		40.06	46828.12	2.51	3.1	0.59
Karnataka SHP		554.88	47383	2.35	3.1	0.75
Punjab SHP		78.05	47461.06	2.27	3.1	0.83
AP SHP		27.6	47488.65	2.12	3.1	0.98
Gujarat SHP		39.03	47527.68	2.1	3.1	1
AP Biomass		346.9	47874.58	2.12	3.19	1.08
Maharashtra Cogen		384.74	48259.32	2.51	3.64	1.13
Maharashtra Biomass		378.43	48637.75	2.51	3.67	1.16
AP Wind		79.26	48717.01	2.12	3.29	1.17
WB SHP		105.33	48822.34	1.92	3.1	1.18
Gujarat Wind		1259.25	50081.59	2.1	3.29	1.19
Rajasthan Wind		1327.36	51408.95	2.57	3.78	1.21
Maharashtra Wind		1268.65	52677.6	2.51	3.78	1.27
MP SHP		52.03	52729.64	1.81	3.1	1.3
TN Cogen		268.43	52998.06	2.51	3.87	1.36
Kerala SHP		66.97	53065.03	1.68	3.1	1.42
Karnataka Biomass		157.68	53222.71	2.35	3.77	1.42
Karnataka Wind		1016.16	54238.87	2.35	3.78	1.43
TN Biomass		441.5	54680.37	2.51	3.93	1.43
UP Cogen		685.32	55365.69	2.43	3.89	1.47
Uttaranchal SHP		126.03	55491.72	1.79	3.33	1.54
AP Cogen		162.31	55654.03	2.12	3.66	1.54
Karnataka Cogen		243.13	55897.16	2.35	3.9	1.54
Kerala Wind		22.24	55919.4	1.68	3.29	1.61
Arunachal SHP		45.83	55965.23	1.68	3.33	1.65
HP SHP		265.34	56230.56	1.48	3.33	1.85
WB Wind		61.32	56291.88	1.92	3.78	1.86
MP Wind		227.76	56519.64	1.81	3.78	1.97
Chattisgarh Biomass		63.07	56582.72	1.69	3.77	2.09

Note:- The highest difference has been rounded off to the next ten's, to arrive at the floor price of Rs.1500/MWh.

Solar Forbearance and Floor Prices

Annexure - III

Rs/Kwh	Solar PV	Solar Thermal
O&M expn	0.77	1.02
Int. on term loan	5.1	3.58
Int. on working capital	0.45	0.34
Repayment	7.17	
Total	13.49	4.94

State	APPC (2009-10)	CERC Tariff (PV)	Gap between tariff and APPC	Min Requirement	Gap between Min Req and APPC
Andhra Pradesh	2.12	18.44	16.32	13.49	11.37
Gujarat	2.1	18.44	16.34	13.49	11.39
Karnataka	2.35	18.44	16.09	13.49	11.14
Madhya Pradesh	1.81	18.44	16.63	13.49	11.68
Maharashtra	2.51	18.44	15.93	13.49	10.98
Rajasthan	2.57	18.44	15.87	13.49	10.92
Chattisgarh	1.69	18.44	16.75	13.49	11.8
Haryana	2.42	18.44	16.02	13.49	11.07
Punjab	2.27	18.44	16.17	13.49	11.22
HP	1.48	18.44	16.96	13.49	12.01
Tamil Nadu	2.51	18.44	15.93	13.49	10.98
Uttaranchal	1.79	18.44	16.65	13.49	11.7
West Bengal	1.92	18.44	16.52	13.49	11.57
Arunachal	1.68	18.44	16.76	13.49	11.81
Kerala	1.68	18.44	16.76	13.49	11.81
Uttar Pradesh	2.43	18.44	16.01	13.49	11.06
			16.96		12.01

Note:- The highest difference has been rounded off to the nearest ten's, to arrive at the forbearance and floor prices of Rs.17000/MWh and 12000/MWh respectively.