GUJARAT ELECTRICITY REGULATORY COMMISSION
Ahmedabad

Order No. 2 of 2010

In the matter of: Determination of tariff for Procurement of Power by the Distribution Licensees and others from Solar Energy Projects.

In exercise of the powers conferred under sections 61(h), 62 (1)(a) and 86(1)(e) of the Electricity Act, 2003 (36 of 2003) and all other powers enabling it in this behalf, the Gujarat Electricity Regulatory Commission (hereinafter referred to as "the Commission") determines the tariff for procurement of power by Distribution Licensees in Gujarat from Solar energy projects.

This order is culmination of an elaborate consultative process for considering the suggestions received from various stakeholders.

1. Background

1.1 Potential for Solar Power
1.2 Government of Gujarat (GoG) Solar Power Policy, 2009
1.3 Draft Order on Solar Energy Projects
1.4 Public Hearing

1.1 Potential for Solar Power

India receives solar energy in huge quantity but utilizes it to a negligible extent. Solar energy system does not require any fuel and, therefore, the running costs are lower. The other advantages of solar energy systems are that the systems are

modular, long-lasting, and reliable and require lower maintenance.

Solar radiation is received in the country in varying capacity depending on geographical condition for about 300 to 330 days in a year. Most parts of Gujarat receive solar radiation of a huge quantum per day. Broadly, solar electricity generation uses two types of technologies: Solar Photovoltaic (SPV) and Solar Thermal Power technology (STP).

The Government of India has launched the Jawaharlal Nehru National Solar Mission as one of the eight key National Missions which comprise India's National Action Plan on Climate Change. It has a twin objective - (i) to contribute to India's long-term energy security and (ii) its ecological security. The Solar Mission envisages its implementation in 3 stages leading upto an installed capacity of 20,000 MW by the end of the 13th Five Year Plan in 2022. It is envisaged that as a result of rapid scale up as well as technological developments, the price of solar power will attain parity with grid power at the end of the Mission, enabling accelerated and large-scale expansion thereafter. The cabinet has approved setting up of 1,100 MW of grid solar power and 200 MW capacities of off-grid solar applications utilizing both solar thermal and photovoltaic technologies in the first phase of the Mission. As a policy measure, it is proposed in the Mission that the Tariff

Policy, 2006 would be modified to mandate that the State electricity regulators fix a percentage for purchase of solar power. The solar power purchase obligation for States may start with 0.25% in phase I and go upto 3% by 2022. This could be complemented with a solar specific Renewable Energy Certificate (REC) mechanism to allow utilities and solar power generation companies to buy and sell certificates to meet their solar power purchase obligations. The Solar Mission also provides that the State Government would be encouraged to promote and establish Solar Generation Parks with dedicated infrastructure for setting up utility scale plants to ensure ease of capacity creation.

1.2 Government of Gujarat (GoG) Solar Power Policy, 2009

The Government of Gujarat, in order to promote grid connected solar energy generation, has come out with Solar Power Policy, 2009 under the Resolution No. SLR-11-2008-2176-B dated. 7.1.2009. The operative period for the scheme is upto 31.03.2014. The Policy envisages installation of 500 MW Solar Power generation and tariff for electricity generated from the Solar PV and Solar Thermal Power projects. The minimum capacity of Solar Power Projects should be 5 MW. The wheeling charges are 2% for wheeling of power for captive use till wheeling charges are determined by the Commission. Solar Power Generation is exempted from payment of Electricity duty. The Policy also has clauses on Security Deposit, Metering

of Electricity, Grid Connectivity and Evacuation facility, Open Access for third party sale, forecasting and scheduling, reactive energy charges and sharing of CDM benefits, etc.

1.3 Draft Order on Solar Energy Projects

The Commission prepared draft Order No.3 of 2009 on "Determination of tariff for Procurement of Power by the Distribution Licensees from Solar Energy Projects". The draft order was placed on the website of the Commission on 01.06.2009 for inviting comments and suggestions. The list of those who have communicated their views is given in Annexure-I.

1.4 Public Hearing

The public hearing was held on 3.12.2009. The list of the participants who participated in the hearing and expressed their views is given in Annexure-II.

2. Commission's Regulation on Procurement of Power from Renewable Energy Sources

The Commission had notified Regulation No.15 entitled "Power Procurement from Renewable Sources Regulations, 2005" on 29th October, 2005 which specifies Renewable Power Purchase Obligations for Distribution Licensees for the year 2006-07, 2007-08 and 2008-09. The Commission had prepared draft regulations entitled "Power

Procurement from Renewable Sources Regulations, 2009 and issued Public Notice and invited comments/ suggestions from the stakeholders. In the said draft regulations, the Commission has proposed Solar Power Purchase Obligation as 1.5% of total consumption for the years 2009-10, 2010-11 and 2011-12, which was under challenge before the Hon'ble High Court of Gujarat. Finally, the Hon'ble High Court of Gujarat disposed of the matter on 9.11.2009 by vacating interim stay which was granted earlier. The Commission is in the process of finalizing its regulations.

3. Determination of Tariff

There are multiple technological options such as Solar Photovoltaic (using different materials such as thin film, Poly-crystalline, amorphous, silicon etc.), and Concentrated Solar Thermal (dish, parabolic, tower) available in the market. Each such technology has different efficiency, project cost structure and performance parameters which differ significantly from one solar power project to another.

Determination of project specific tariff for each solar generation project would involve significant regulatory efforts and time to understand the technical nuances of the proposed projects and scheme/technology proposed to be deployed by each project developer.

The Commission has decided that selection of appropriate technology should be left to the discretion of solar project developers and hence, has adopted an approach of Generic Tariff determination.

Tariff for any type of power generating projects can be categorized in various ways:

(1) Market based or cost plus tariff.
(2) Project specific or Generalised tariff.
(3) Single part or two part tariff.
(4) Front loaded tariff, back loaded tariff or levelised tariff

Each of these has its merits and demerits. It is essential to reflect the time value of money in the tariff structure. Levelised tariff incorporates the time value of money.

The Commission has examined various options and has come to conclusion that in the context of Solar Energy Generators a single- part, generic levelised tariff arrived on cost plus basis is the best option. Accordingly, the Commission decided to proceed with determination of tariff for Solar Energy Generators on the above principles.

4. Components of Tariff

The following financial and operational parameters have been considered while determining the tariff.

1. Capital cost
2. Evacuation cost

3. Operations & Maintenance charges
4. Debt - Equity Ratio
5. Loan Tenure
6. Interest rate on loan
7. Return on equity
8. Rate of Depreciation
9. Interest on Working Capital
10 Capacity Utilization Factor
11 Duration of Tariff
12 Auxiliary Consumption

Technology for Solar Power Generation

There are two distinct technologies for solar power generation viz. (i) Solar Photovoltaic and (ii) Solar Thermal (also known as Concentrated Solar Power or CSP). While most of the above mentioned parameters are same for these two technologies, the others are dependent on the technology adopted by the project, as discussed in subsequent paragraphs.

4.1 Capital cost

In India, the Solar Power Technology is in its nascent stage and no authentic data regarding capital cost of a Solar Power Generation plant is available. The CERC has, in its order dated 3rd December, 2009 in suo motu petition no.284 of 2009, considered capital cost as Rs.17 Cr/ MW and Rs.13 Cr/MW for Solar PV power projects and Solar Thermal Power Projects respectively for the financial year 2009-10. The Commission has received a petition from M/s. Astonfield Solar (Gujarat)

Pvt.Ltd. in which the project developer has proposed capital cost of Rs.17.55 Cr/MW for Solar PV project.

It is important to note that with the advancement in the technology of the Solar PV based installations, economies of scale and competition would decrease the capital cost for Solar Projects over a period of time which is also envisaged in the Solar Mission of the Government of India. The Commission had, after considering the above aspects, proposed in the draft order a normative capital cost of Rs.17 Cr/MW for Solar Photovoltaic Power projects and Rs. 13 crores /MW for Solar Thermal Power Project.

Suggestions of the Objectors

Gujarat Energy Development Agency (GEDA) has intimated that Govt. of Gujarat had started deliberation with solar project developers in the month of June, 2008. After taking views of the project developers, the Govt. of Gujarat declared Solar Power Policy, 2009 vide GR dated 7th January, 2009 wherein tariff has been fixed for 25 years. In the aforesaid policy, the Govt. of Gujarat has prescribed rates at Rs.10/unit for Solar Thermal and Rs.13/unit for Solar Photovoltaic upto 12 years and from 13th year onwards, the tariff of Rs.3.00 per unit has been fixed for both types of technologies. The aforesaid tariff was determined by the Government of Gujarat based on consideration of various technical/operational parameters and financial parameters like

capital cost, Return on Equity, Depreciation, Project Life, and interest on loan, capacity utilization factor etc. and information provided by the representatives of the project. The Govt. of Gujarat signed Memorandum of Understanding with 44 companies for 3,257 MW worth Rs.66,251 crores during Vibrant Gujarat Global Investors' Summit in January,2009. The said companies have agreed to establish solar power projects as per the Govt. of Gujarat Solar Power Policy, 2009. After the Vibrant Gujarat 2009 event, some project developers who have not signed MoU have also shown there willingness to establish power plants as per terms and conditions of Solar Power Policy, 2009. In August 2009, Govt. of Gujarat has issued Letter of Intent to 34 project developers for establishing solar power projects of 710 MW. The developers have agreed to the tariff rate incorporated in the Solar Power Policy, 2009. Hence, the capital cost and other parameters may be kept as per the Government of Gujarat Solar Power Policy, 2009.

GUVNL has suggested that the capital cost of Solar PV power project be considered by the Commission should be as per the prevailing market rate.

M/s Torrent Power Ltd. has suggested that renewable energy generation would not obviate reduction in regular capital investment for capacity addition of conventional generation. Therefore efforts need to be made to reduce capital cost of

projects based on non-conventional and renewable sources of energy. Various project developers have suggested for capital cost of Solar PV projects in the range of Rs.17.55 to Rs. 20crores/MW. M/s CLP Power Ltd. suggested that while determining the capital cost it requires to consider the cost to owners, and also lenders' due diligence, stamp duties, companies incorporation charges, CDM registration charges, financing charges such as margin money, syndication fees, security and trustee fees, lenders fees, minimum amount to be retained in the Debt Service Reserve Account. They have also suggested that any change in law which affects the capital cost or operational cost assumption made for project cost should be allowed as pass through. M/s Solar Service Conductor Ltd. suggested that land cost of Rs. 1.15 crores to Rs. 5.20 crores per MW to be added in project cost.

Regarding Solar Thermal Power Projects, some of the objectors have suggested the capital cost as Rs.15-18 crores/MW.

Commission's Ruling

Solar Power projects are environment friendly and helpful in reducing the use of fossil fuel. However, in India,

Solar Power projects are in nascent stage of development. As such reliable cost data for solar projects are not available. Objectors have suggested different rates without evidence in support of the rates which they have proposed. The Commission has received a tariff petition from M/s Astonfield Ltd. for 25 MW SPV power projects in which it has proposed capital cost of Rs. 17.55 crore per MW. CERC has in its order dated 3rd December, 2009 in suo motu Petition No.284 of 2009 considered capital cost at Rs.17 crores per MW for Solar Photovoltaic power project and Rs.13 crores per MW for Solar Thermal power project. The project developers have also signed MoU with Government of Gujarat as per the Solar Power Policy, 2009 for substantial quantity of power projects which indicate that Rs. 17crores per MW and Rs.13 crores per MW for Solar Thermal Power Projects are adequate. However, globally the costs of Solar PV Projects have shown declining trend over past couple of years, particularly the last few months and similar trend has been projected for the immediate future. In India also, a large number of solar projects have been planned and with increased production facilities, the cost of Solar PV modules is bound to come down.

In view of above, the Commission decides to adopt Rs.16.50 crores per MW as capital cost for Solar Photovoltaic Power Project and Rs.13 crores per MW for Solar Thermal Power Project.

4.2 Evacuation Cost

Section 86(1) (e) of the Electricity Act, 2003 stipulates that the State Commission should take suitable measures for providing grid connectivity to the renewable energy sources. The Working Group constituted by the Forum of Regulators on Renewable Policies has also recommended that Grid Connectivity be provided by the transmission and distribution licensees for renewable energy sources in an optimal manner. The Solar Power Policy, 2009 of Govt. of Gujarat provides that the transmission line from the switchyard of the Solar Substation to the GETCO substation shall be laid by the GETCO. Hence, evacuation cost is not considered by the Commission for the purpose of this order.

Suggestions of the Objectors

Torrent Power Ltd. has suggested that it is the duty of STU (GETCO) to create the necessary infrastructure for evacuation facility from the Solar Power projects. GUVNL has suggested that the minimum capacity of solar power project should be 5 MW and above. The GETCO has suggested that the grid connectivity can be provided after carrying out systems study. However, for optimum utilization of 66 kV lines the

minimum requirement of the power generation and evacuation from one location requires to be fixed for solar power project developers. Whenever the consumers opt for wheeling of power to the desired location they should share certain portion of Open Access charges normally paid by the consumers as determined by the Commission.

Commission's Ruling

It is the duty of the State Transmission Utilities to ensure development of economical and efficient system of intra-state transmission to bring electricity upto the load centre. The grid connectivity is to be provided by GETCO (STU) after following necessary technical and commercial procedures as stipulated in the various regulations notified by the Commission. So far as installation of minimum capacity of solar power project and its evacuation are concerned, generation does not fall within the category of licensed activity. There is no restriction on generation capacity to be installed by any project developer. Hence, such a provision is against the spirit of the Electricity Act, 2003. It is also the duty of the STU to plan for evacuation of power from a generating station based on the capacity of the generating station. Hence, any restriction is not acceptable. In view of the above, the Commission decides that the STU has to provide necessary infrastructure for evacuation of power from Solar Power Projects.

4.3 Operations & Maintenance Expenses

Operations and Maintenance (O&M) expenses consist of spares, employee cost, administrative and general expenses, repairs and maintenance, and insurance expenses. There is limited operating experience of MW scale Grid-connected solar power plants, in the State as well as in the country. The CERC has, in its order dated 3rd December,2009 in Suo Motu petition No.284 of 2009, adopted O&M expenses at Rs.9 lakhs /MW for Solar PV Projects and Rs. 13 lakhs/MW for Solar Thermal projects for the first year of operation (i.e. 2009-10) with 5.72% escalation per annum. Solar power plant's operations and maintenance are carried out through a centralized maintenance system which results in economy in employee expenses, administrative and general expenses. The Commission had proposed O&M expenses for Solar PV Projects at the rate of 0.5% and for Solar Thermal projects @ 1% of the Capital Cost for the first year, to be increased @ 5% per annum from second year onwards. Additionally, insurance cost at the rate of 0.50% of the net asset of the project during the year had also been proposed.

Suggestions of the Objectors

Millenium Synergy has suggested O&M cost at the rate of 0.75% of capital cost in case of SPV project and 1.5 of the

capital cost for STP project with annual escalation of 5%. Refex Energy has suggested O&M cost to be considered at the rate of 0.7% of capital cost and insurance charges at 0.5% of capital cost. M/s Abengoa Solar has suggested O&M cost at 3% of capital cost which will be escalated at 7% per annum. M/s CLP Power suggested O&M expenses should also include local levies and taxes, land lease rentals, O&M fees levied by GETCO. GUVNL has suggested that on advancement of solar technology capital cost, cost of spare and components will be reduced. Hence, escalation on O&M cost be considered at 4% instead of 5%.

Commission's Ruling

The capital cost of Solar power projects is higher than other sources of electricity. The O&M cost at 0.5% for SPV works out to Rs. 8.25 lakhs/MW and 1% for STP works out to Rs. 13 lakhs/MW, which provides sufficient amount to project developers to carry out O&M activities. Moreover the 5% per annum escalation in O&M cost will address the issue regarding incremental cost in O&M cost to maintain plant in proper condition. The proposed rates of 0.5% for SPV and 1% for STP are in line with the rates adopted by the CERC. The rates adopted by the CERC include the insurance cost. However, keeping in view the huge investment involved, the Commission decides 0.35% of the net asset of the project as insurance charge in addition to the O& M charges at the above specified rates.

4.4 Debt-Equity Ratio

Clause 5.3(b) of the Tariff Policy (TP) notified by the Ministry of Power, Government of India stipulates a debt-equity ratio of 70:30 for financing of power project. The Terms and Conditions of Tariff Regulations, 2005, notified by the Commission also provide normative debt-equity ratio of 70:30 for Generating Company/Licensees. Accordingly, the Commission had proposed to keep Debt-Equity Ratio of 70:30 based on Tariff Policy and Terms & Conditions of Tariff.

Suggestions of the Objectors

CLP Power Ltd has suggested that solar power technology is at an extremely nascent stage. In the prevailing markets, finance is available with consideration of debt- equity ratio of 55: 45 for solar project. M/s. Essar Power Ltd. has suggested considering debt equity ratio of 80: 20. GUVNL has suggested debt equity ratio is to be considered as 75: 25 because higher equity will have significant impact on tariff.

Commission's Ruling

The Tariff Policy formulated by the Ministry of Power, Govt. of India, under section 3 of the Electricity Act, 2003 stipulates debt-equity ratio of 70: 30 for power projects. The Terms and Conditions of Tariff Regulation, 2005 notified by the Commission also provides that debt equity ratio should be

kept at 70: 30. Hence, the Commission decides to retain the same ratio for this order.

4.5 Loan Tenure

The project developer may require term loans for creation of capital assets. The Commission had proposed the tenure of term loan as twelve years with a moratorium of one year for determination of the tariff to ensure adequate yearly cash flow for Solar Power projects.

Suggestions of the Objectors

M/s Essar Power Ltd. has suggested to consider loan tenure of 15 – 20 year with one year moratorium. Lanco Solar Ltd. has suggested considering 8 to 10 years as repayment period. M/s.Moserbaer Ltd. has suggested considering tenure of loan as 15 years with moratorium of one year. M/s AES Solar has suggested keeping loan tenure period as 10 years.

Commission's Ruling

The CERC has, in its order dated 3rd December, 2009 in suo motu petition No.284 of 2009 decided the loan tenure period as 10 years. The Terms and Conditions of Tariff Regulations, 2005 notified by the commission also provides loan tenure as 10 years. As such, the Commission decides to keep the loan tenure period as 10 years.

4.6 Interest Rate on Loan

The Commission had proposed the rate of interest at 10.25% as considered for other orders of renewable energy sources for determination of tariff. This was because interest rates for both deposit and loans had been reduced by the financial institutions. The Commission also proposed specific Renewable Power Purchase Obligations (RPPO) for Solar energy projects for the financial years 2009-10, 2010-11 and 2011-12 and as such, sales of electricity by the renewable sources would have lower risks. Therefore, the Commission had proposed to keep the rate of interest on long term loan at 10.25%.

Suggestions of the Objectors

M/s Essar Power Ltd. has suggested that loans are available at the interest rate of 10% or cheaper rate. Adani Power Ltd., in their written submission, suggested interest rate of loan to be considered as 11.5%. Later on during public hearing they agreed that interest rate of 10.25% is correct. Refex Energy Ltd., Astronfield Ltd. have suggested to consider interest rate @ 12.75%. M/s. Lanco Solar Ltd. has suggested to consider 1 to 1.5% of the borrowed capital as additional financing charges in the capital cost like upfront fee, guarantee provisions, maintenance of debt service ratio, reserve

requirements etc. M/s CLP Power Ltd. has suggested to consider interest rate as long term Prime Lending Rate of SBI + 200 basis point. M/s. Solar Semiconductor Pvt Ltd. has pointed out that international loan is available at a low interest rate of 6% or less. However, there is risk of variation of foreign exchange rate. It is essential to avoid such uncertainty and to consider interest rate as 12% on loan. Millennium Synergy has suggested to consider interest rate at 12.75% per annum as per norms notified by CERC in the regulations. M/s Moserbaer has suggested to consider interest rate at SBI LTPLR basis.

Commission's Ruling

The Commission had proposed an interest of 10.25%. During the public hearing some of the stakeholders observed that the rate indicated in the Commission's proposal was reasonable, though many others asked for a higher rate. The Commission has also considered the prevailing prime lending Rates of the banks/ financial institutions on such projects in the market. Based on the above aspects, the Commission decides to revise rate of interest on loan as 10.75% for this order. This is equal to SBI PLR minus one percent.

4.7 Return on Equity

The Commission has notified Regulations on Terms and Conditions of Tariff, which envisages the return on equity at

14% per annum. On the same lines, for solar power projects also the commission had proposed the return on equity at the rate of 14% per annum. The commission has also proposed to allow Income Tax at 16.995% (MAT) for the initial period of 10 years and thereafter from 11th year onwards upto the 25th year, a Corporate Tax at the rate of (33.99%) for both, Solar PV and Solar Thermal based projects.

Suggestions of the Objectors

M/s Essar Pvt Ltd., Adani Power Ltd. Refex Energy, Lanco Solar, Millennium Synergy, Astonfield, WAREE Group suggested to consider post - tax Return on Equity as 16% as per the Terms and Conditions of Tariff of Renewable Energy Sources notified by the CERC. CLP Power Ltd. suggested to consider higher Return on Equity as higher risks associated with solar project.

Commission's Ruling

The Commission has notified Terms & Conditions of Tariff Regulations in which the Return on Equity norms is provided as 14% per annum. The Commission has also allowed Income-Tax @ 16.995% as MAT for 10 years and Corporate Tax @ 33.99% per annum from 11th year onwards. Any further enhancement in the RoE will burden the consumers. It is essential to ensure that the consumers are not burdened with

higher tariff. Hence, the Commission decides to retain RoE at 14%.

4.8 Rate of Depreciation

The Regulations on Terms and Conditions of Tariff, 2005 notified by the Commission provide that the depreciation rate should be calculated based on the straight line method as specified in the CERC Terms and Conditions of Tariff Regulations, 2004, which lay down that asset life is to be depreciated up to 90% of its initial value (considering residual value of 10% of its initial value) over the entire asset life. Depreciation is non-cash expenditure which has linkage with loan repayment. The Commission has, therefore, proposed the rate of depreciation as 6% p.a. as a promotional measure for the initial 12 years and the remaining depreciation shall be spread over the remaining useful life of the project from the 13th year onwards (which would be @ 1.385%) for determination of tariff.

Suggestions of the Objectors

Essar Power Ltd. has suggested to consider that assets should be depreciated at 80% of its initial value over the entire project life. M/s. Moserbaer has suggested to consider the rate of depreciation should be for initial 15 years and the remaining

depreciation shall be spread over the remaining useful life of the project.

Commission's Ruling

As proposed in the draft order, the Commission decides to adopt the principles of accelerated depreciation. However, in the draft order, depreciation @ 6% was proposed for initial 12 years in line with the term of loan. Now, the Commission has decided to adopt the term of loan as 10 years. Therefore, the higher rate of depreciation @ 6% is also proposed for initial 10 years only. The Commission, therefore, decides the depreciation rate of 6% of project cost for the initial 10 years and 2% from 11th year to 25th year of the plant.

4.9 Interest on Working Capital

The following parameters were considered for calculation of Working capital requirement.

(1) Receivables equivalent to one month's energy charges for sale of electricity calculated on a normative CUF.

(2) One month's cost on operations and maintenance expenses.

The Commission had proposed an interest rate on working capital @ 12.5% per annum for the purpose of this order.

Suggestions of the Objectors

GUVNL has suggested to consider interest rate on working capital at 10.25%

Commission's Ruling

In the draft order, the Commission had proposed Interest on Working Capital at 12.5%. The Working Capital required by the Project developers would be on short-term basis which are available on prime lending rate of the bank. The prime lending rate of SBI at present is 11.75%. Therefore, the Commission decides to revise the interest on working capital at 11.75%.

4.10 Capacity Utilization Factor (CUF)

The energy generation for Solar Power project depends on solar radiation measured in kWh/ sq m/day and number of clear sunny days. The output of Solar Cell is measured in terms of Wp (Watt Peak) and refers to nominal power under Standard Test Conditions (STC) (1000 W/m2, 250°C, 1.5PM). The capacity utilization factor depends on site specific parameters like insolation & ambient conditions as well as the technology adopted for power generation, viz SPV or STP.

After considering the above aspects, the Commission had proposed CUF at 20% for SPV and 25% for STP.

Suggestions of the Objectors

Essar Power Ltd. has suggested to allow hybrid technology based solar projects also as they have capacity utilization factor of more than 23%. M/s Adani Power Ltd. has suggested that the CUF of the SPV should be less than 18%. Moreover, there will be deterioration in cell/module efficiency. Refex Group has suggested to consider CUF as 17.12%. Astronfield suggested to consider CUF as 18% per annum with 0.6% degradation of solar panel. M/s Abengoa has suggested that plant performance degrade 0.5% per annum. Moreover CUF in initial years is lower and it will increase later on after stabilization of the plant. Solar semiconductor has suggested that CUF is to be considered as 28.1% instead of 20% proposed by the Commission. The higher CUF is achievable by adopting dual structure technology, but in such cases, capital cost will be high. Sun-borne has suggested to consider CUF as 17%. GUVNL and GEDA have suggested to consider CUF of 23% for SPV and 25% for STP power project. Millenium Synergy has suggested to consider CUF as 18% per annum with annual panel degradation of 0.6% per annum.

Commission's Ruling

The various objectors have suggested different capacity utilization factors for solar power project. Moreover, some of the objectors have suggested to consider CUF degradation of solar panel on annual basis. Some of the objectors have agreed

that CUF considered by the Commission is correct. It is also possible to achieve higher CUF with track mode structure. The Commission also observes that a number of developers have agreed to the recommended rate of Solar Policy, 2009 of Govt. of Gujarat in which Govt of Gujarat has considered the CUF as 23% for solar PV and 25% for solar Thermal. The CERC has, in its order dated 3rd December, 2009 in suo-motu petition No. 284 of 2009 adopted normative CUF of 19% in case of grid connected Solar PV based Power projects. The Commission has received a petition from M/s. Astonfield Solar (Gujarat) Pvt.Ltd. in which they have proposed the gross CUF at 23.96% and after deducting module loss, transmission loss and inverter efficiency, proposed a net CUF at 18.18%.

Considering the availability of Solar radiation, number of sunny days in the State of Gujarat and MoUs signed by several of Project developers in response to GoG Solar Policy, 2009 the Commission decides to retain the capacity utilization factor as 20% for SPV and 25% for STP projects.

4.11 Duration of Tariff

The Commission considered the life of a Solar PV power plant as 25 years and proposed that the tariff determined by this order be applicable for 25 years for the projects having Commercial Operation Date (COD) upto 31st December, 2011.

Suggestions of the Objectors

M/s.Essar Power Ltd. has suggested to decide the tariff for 30 years. M/s.Refex Energy Ltd. observed that the period of 25 years is appropriate.

Commission's Ruling

M/s.Essar Power Ltd. has not given any reasons for considering the project life of 30 years. Solar Power Technology is quite new and in a nascent stage. There is no adequate data available which specifies the project life of 30 years. The CERC in its order dated 3rd December, 2009 in suo motu petition No.284 of 2009 decided project life as 25 years. In view of above, the Commission decides to retain the project life as 25 years.

4.12 Auxiliary Consumption

In a conventional power station, there are number of electrically operated auxiliary equipment and provision has to be kept for electricity consumption by such equipment. In Solar PV project, auxiliary consumption is negligible. However, in Solar Thermal Project, auxiliary consumption cannot be ignored. Auxiliary system includes the use of auxiliary heater to ensure that the salt used to store heat is maintained in a molten state during extended non-sunny days/ period. The CERC has, in its order dated 3rd December, 2009 in suo-motu petition No

284 of 2009 adopted a normative auxiliary consumption factor of 10%. The Commission has proposed to adopt the same for this order.

Suggestions of the Objectors

M/s Essar Power Ltd. has suggested to consider auxiliary consumption as 10% for solar thermal project. M/s Abengoa Solar has suggested that solar thermal power plants require daily start and stop operation and drawn 10% to 15% of power from the grid. It is required to consider 3% addition towards auxiliary consumption for start and stop operation.

Commission's Ruling

After careful consideration, the Commission decides to provide for auxiliary consumption in case of STP at 10%. No separate provision for start and stop operations is considered necessary.

5. Tariff for solar PV and Solar Thermal Power projects

In view of the foregoing discussions, the various parameters considered by the Commission for determination of tariff are given in the table below:

Parameters for determination of tariff

	Parameter (per MW basis)	Solar PV Power Project	Solar Thermal Power Project
Project Cost			
1	Capital cost per MW **(Rs lakhs)**	1650	1300
2	Debt- Equity ratio	70:30	70:30
3	Interest on loan	10.75%	10.75%
4	Return on Equity	14% p.a.	14% p.a
5	Income-Tax for first 10 years	16.995%	16.995%
6	Income tax from 11th year onwards	33.99%	33.99%
7	O&M cost (% of the project cost)	0.5% of the capital cost (Rs. 8.25 lakhs) for the first year with escalation of 5% p.a.	1%of the capital cost (Rs. 13 lakhs) for the first year with escalation of 5% p.a.
8	Insurance Charges	0.35% of net asset	0.35% of net asset
9	Net CUF (at 100% grid & m/c availability)	20%	25%
10	Auxiliary consumption	Nil	10%
11	Actual machine availability	100%	100%
12	Actual grid availability	100%	100%
13	Project life (years)	25	25
14	Depreciation	6% for first 10 yrs. And 2% from 11th year onwards.	6% for first 10 yrs. And 2% from 11th year onwards.
15	Interest on working capital (i) Receivable of one month (ii) O&M expenses for one month	11.75%	11.75%

Based on the various parameters as discussed above, the levelised tariff including RoE of Solar PV power generation, using a discounting rate of 10.19% works out to Rs. **12.54** per

kWh and levelised tariff using the same discounting factor for Solar Thermal Power generation works out to **Rs.9.29** per kWh. However, the Commission feels that it would be appropriate to determine tariff for two sub-periods: 12 years and 13 years instead of the same tariff for 25 years. Hence, the Commission determines the tariff for generation of electricity from Solar PV Power project at **Rs.15** per kWh for the initial 12 (twelve) years starting from the date of Commercial operation of the project and **Rs.5** per kWh from the 13th (Thirteenth) year to 25th (twenty fifth) year. The Commission also determines the tariff for generation of electricity from Solar Thermal Power project at **Rs.11** per kWh for the initial 12 (twelve) years starting from the date of Commercial operation of the project and **Rs.4.00** per kWh from the 13th (Thirteenth) year to 25th (twenty fifth) year.

The above tariffs take into account the benefit of accelerated depreciation under the Income Tax Act and Rules. For a project that does not get such benefit, the Commission would, on a petition in that respect, determine a separate tariff taking into account all the relevant facts.

This tariff rate shall be applicable for purchase of solar power generation by Distribution Licensees and other entities for complying with the renewable power purchase obligation specified in the relevant Regulations of the Commission from time to time. This tariff will be applicable to solar power

generators, who will commission brand new solar energy plants and equipments during the control period applicable for this order.

6. General Issues

6.1 Plant and Machinery
6.2 Start-up power/ Stand-by supply
6.3 Reactive Energy Charges
6.4 Evacuation Facilities
6.5 Transmission/ Wheeling Charges
6.6 Cross-subsidy Surcharge
6.7 Security Deposit
6.8 Applicability of Intra-State ABT
6.9 Energy Accounting
6.10 Power Purchase Agreement (PPA)
6.11 Sharing of CDM Benefits

6.1 Plant and Machinery

Solar Power Projects established with only new Plants and Machinery shall be eligible for the benefit of tariff determined by this order.

6.2 Start-up power/ Stand-by supply

The commission has in the draft order proposed that STU/Distribution Licensee shall provide start-up power for the solar generator under kWh to kWh adjustment basis.

Suggestions of the Objectors

The GUVNL has suggested that whenever start-up power is provided by distribution licensee under shutdown period of the solar project, the developer has to settle the energy account for drawal of power from the grid by paying the tariff rate of Solar Power as decided by the Commission to the distribution licensee to avoid imbalance in energy account settlement.

Commission's Ruling

The Commission decides that the start-up/ stand-by supply provided by the distribution licensee to the Solar Power Project Developers should be charged as per the temporary charges provided for HTP category of the consumer in the tariff order by the Commission from time to time. The tariff of solar power generation and the pooled power purchase cost of the discoms are not on equal footing. There is large price difference in the two tariffs. Hence, the suggestion of GUVNL is not accepted by the Commission.

6.3 Reactive Energy Charges

The Reactive Power Charges as approved by the Commission in tariff orders for the Gujarat Energy Transmission Corporation Ltd. (GETCO) from time to time shall be applicable to such projects.

6.4 Evacuation Facilities

Interfacing line of appropriate capacity and voltage as per the CEA (Technical Standard for connectivity to the grid) Regulations, 2007 shall be provided by the STU/ Distribution Licensee at their cost. The intending generator shall apply to the STU/ Distribution Licensee concerned well in advance.

Switchyard equipment, metering and protection arrangement and RTUs at generator end shall be provided by the owners of solar generators at their cost. The inter-connection voltage at generator switchyard will depend on the quantum of power to be evacuated and as per the connectivity granted by the STU/ Distribution Company in line with the State Grid Code.

The transmission line from the switchyard of generator to the GETCO substation shall be laid by GETCO.

6.5 Transmission/ Wheeling Charges

Whenever the power is sold to a Distribution licensee, the generator will supply the power at the interconnection point of the generator-STU i.e. generator bus-bar. Thereafter, the transmission /wheeling charges will be borne by the distribution licensee.

Regarding transmission /wheeling charges for self use (captive use) or third-party sale, the Commission decides as under.

The Commission has in its draft order proposed 4% of the energy fed as transmission/ wheeling charges in case of open access availed by the captive users considering the lower power plant load factor of the Solar Power Projects. The cost of transmission/ distribution system (assets) created will be required to be recovered through tariff. The proposed charges do not recover fully the cost of transmission and distribution assets. The Commission has, therefore, reconsidered the same and decides that whenever any person utilizes the transmission the distribution network of the licensee, for own use or third party sale, he shall pay the following charges.

(a) **<u>Wheeling of power to consumption site at 66 KV voltage level and above</u>**

The wheeling of electricity generated from the Solar Power Generators to the desired location(s) within the State shall be allowed on payment of transmission charges and transmission losses applicable to normal Open Access Consumer.

(b) **<u>Wheeling of power to consumption site below 66 KV voltage level</u>**

(i) The wheeling of electricity generated from the Solar Power Generators, to the desired location(s) within the State, shall be allowed on payment of transmission charges, applicable to normal Open Access Consumer and transmission and wheeling losses @ 10% of the energy fed to the grid. The above loss is to be shared between the transmission and distribution licensee in the ratio of 4:6. This

provision shall be applicable to the solar power projects having capacity more than 5MW.

(ii) The wheeling of electricity generated by smaller projects with generating capacity below 5 MW, to the desired location(s), shall be allowed on payment of transmission charges, applicable to normal open access consumer, and transmission and wheeling losses @ 7% of the energy fed to the grid. The above losses are to be shared between the transmission and distribution licensee in the ratio of 4:3.

If a Solar Power Generator owner desires to wheel electricity to more than two locations, he shall pay 5 paise per unit on energy fed in the grid to Distribution Company in whose area power is consumed in addition to the above-mentioned transmission charges and losses, as applicable.

6.6 Cross-subsidy Surcharge

In the draft order it was proposed that third-party sale under Open access transactions carried out using generation from solar power generation, shall be exempted from levy of cross- subsidy surcharge under section 42 (2) of the Electricity Act, 2003.

Suggestions of the Objectors

Torrent Power Ltd. has suggested to consider third party sale as commercial transaction and be treated at par with open access consumer and in such cases cross-subsidy surcharge

should be levied. GETCO has suggested that the energy recorded in ABT meter should be given treatment as generation from the renewable sources in each 15 minute time block shall be set off against the open access user's consumption in the same 15 min. time block.

Commission's Ruling

The Solar power projects are at a nascent stage. Hence, as a promotional measure, the Commission decides that no crosssubsidy surcharge should be levied in case of third party sale. However, the Commission decides that the normal open access charges as specified for captive consumption in para 6.5 should be levied from such consumers/ users. No banking is allowed in case of third party sale. The energy wheeled is required to be consumed in the same time block. Any unutilized energy is to be considered as sale to the utility and for the same the distribution licensee should pay 85% of the tariff determined by the commission.

6.7 Security Deposit

The Commission decided that the developer would be required to provide Bank Guarantee @ Rs.50 lakhs per MW at the time of signing of PPA with the Distribution Licensee and in case the Developer fails to achieve Commercial operation within the time period mentioned in the Power Purchase

Agreement, the Bank Guarantee could be forfeited. The Bank guarantee shall be refunded, if the developer achieves commercial operation within the time period mentioned in the Power Purchase Agreement.

Suggestions of the Objectors

M/s Adani Power Ltd. suggested that Bank Guarantee amount is to be kept as Rs. 7.5 lakhs/MW as per standard bidding documents of Case-2 of the competitive bidding and penalty not made applicable for delay of 6 months. M/s Lanco Solar Ltd. suggested security deposit amount be kept as Rs. 5 lakhs/MW which is at par with wind energy developer. M/s. Astonfield Ltd. suggested to keep security deposit as Rs. 10 lakhs per MW. The maximum security deposit for individual project is to be Rs. 10 lakhs. 25% of security deposit amount is to be paid at the time of signing of PPA and the remaining 75% of amount is to be paid at the time of financial closure. M/s Moserbaer has suggested to keep the security deposit amount as Rs. 50,000/- per MW, to avoid financial burden on the developer. M/s Millennium Synergy has suggested to keep the security deposit amount as Rs. 5 lakhs/MW subject to maximum of Rs. 25 lakhs for any individual project. Further security deposit is to be paid 50% initially and 50% at the time of financial closure.

Commission's Ruling

Security Deposit amount is kept at Rs.50 lakhs/MW to ensure that serious project developers come forward for the establishment of the project. Rs. 50 lakhs/MW security deposit kept for solar project is against the capital cost of Rs 16.50 crores/ MW in case of SPV and Rs. 13 crore/MW in case of solar thermal power project. In case of wind energy project the security deposit is kept at Rs.5 lakhs/MW against the capital cost of Rs 5 crores/ MW. Moreover, the Wind Power Developers are required to create evacuation facility to the GETCO Sub-station within a range of 100 Kms whereas, in case of Solar Power Projects, GETCO has to arrange evacuation from the Switchyard of the Solar Power Project. As such, the Commission decides to keep the amount of Security Deposit at Rs. 50 lakh/MW.

6.8 Applicability of Intra-State ABT

The Intra-state ABT order shall not be applicable to solar power generation projects.

6.9 Energy Accounting

Solar based energy generation projects shall be out of the purview of the Intra-State ABT. However, for the purpose of energy accounting, such projects will have to provide ABT compliant meters at the interface points. Interface metering

shall conform to the Central Electricity Authority (Installation and Operation Meters) Regulations, 2006. The electricity generated from the Solar Power Generators shall be metered and readings shall be taken jointly by the Gujarat Energy Development Agency (GEDA)/ Gujarat Energy Transmission Company Ltd (GETCO)/ Distribution companies at the generating busbar of the sub-station of the Solar power projects.

6.10 Power Purchase Agreement (PPA)

The Commission had proposed that the solar generator shall sign a PPA with the distribution licensee for a period of 25 years with a tariff as determined by this order. The distribution licensee shall sign the PPA at the earliest from the date of submission of the application with all relevant details by the solar generators and get it approved from the Commission.

Suggestions of the Objectors

M/s Refex Energy has suggested that the following item may be incorporated in the Power Purchase Agreement.

(1) Payment Security mechanism
(2) Take or pay mechanism with relevant clause
(3) Event of defaults and consequences termination.

GUVNL has suggested that a committee be set up to analyze proposals for solar power projects based on their technical and financial parameters. The Commission may

stipulate that only the solar power projects approved by the Technical Committee set up by GoG as specified in the Solar Power Policy, 2009 will qualify for signing PPA with distribution licensee. The Commission may specify that once the draft PPA consisting of tariff, year of PPA, power purchase obligation, etc. is approved by the Commission, the same may be followed for future.

Commission's Ruling

The Commission has considered the suggestions of the objectors. The Solar Power Generators shall sign PPAs with the Distribution Licensee for a period of 25 years. The Distribution Licensee will take approval of the Commission in respect of the PPA.

6.11 Sharing of CDM Benefits

The Commission had proposed the sharing of CDM benefits as per the recommendation made by the Working Group for Renewable Energy Generation constituted by the Forum of Regulators and as per the CERC Regulation on Tariff for Renewable Energy Sources Regulations, 2009 which is as under:

"The CDM benefits should be shared on a gross basis, starting from 100% to developers in the first year after

commissioning, and thereafter reducing by 10% every year till the sharing becomes equal (50:50) between the developers and the consumers, in the sixth year. Thereafter, the sharing of CDM benefits should remain equal till the time that benefit accrues."

Suggestions of the Objectors

M/s. Lanco Solar Ltd. has suggested that sharing of CDM benefit be increased by a level of 5% each year from the second year till it reaches 25% instead of 10% and 50% in the draft norms proposed. M/s. Abengoa Solar has suggested that there should not be any sharing of CDM benefits. It may be passed on to the project developer entirely because for successful registration of project one has to prove that without CDM benefit solar projects are viable. Sharing of CDM with STU or distribution licensee will prove that CDM benefit is additional benefit. This will send wrong signal to the Executive Board of UNFCCC and probability of the Indian Solar Projects getting registered will further reduce. Question of sharing will arise only when the other person has a clear stake on the project. Distribution licensee does not have any stake. M/s.CLP Power Ltd. has suggested that CDM is devised to promote growth of renewable energy. After fixing the tariff for renewable projects, sharing of CDM revenues works to subsidize the cost of other power purchase by utility. This is against the fundamental purpose of CDM. Generation Based Incentives pronounced by

MNRE specifically directed that the benefits will not be considered while determining the tariff. CDM is a similar kind of benefit. Project cost of solar projects is very high compared to any other renewable project, due to infirm nature of power and low load factor. In such circumstances CDM benefit will assist to keep the project viable. Sharing should be on net basis as developer has to incur expenses in achieving registration, annual verification, finding the buyer and completing sale process. GUVNL suggested that CDM benefit available to solar project may be equally shared by distribution licensee with developer from 1st year because developer is allowed to recover tariff determined under cost plus approach wherein distribution licensees are shouldering all the project related costs.

Commission's Ruling

Various Solar Energy Project Developers and the licensee have proposed different ways for sharing of CDM benefits, which range from full benefits to developers to more benefits to consumers/licensees. Keeping in view the effort of developers to harness this renewable source of green energy and also the fact that the consumers are sharing all the costs of projects, the Commission decides that the formula mentioned in the draft order for sharing of CDM benefits is to be retained

7. Other Issues

7.1 Designated Authority

7.2 Control period
7.3 Non-applicability of Merit Order
7.4 Additional Incentives
7.5 Hybrid Power Projects
7.6 Separate RPPO for solar
7.7 Harmonics impact on grid, REC Mechanism etc.

7.1 Designated Authority

M/s Essar Power Ltd. has suggested that the Government should identify and designate the authorities who would facilitate the developers in acquiring land, consummating agreements, for water supply, environmental clearance and installation of various solar radiation measurement instruments.

Commission's Ruling

The suggestions submitted by M/s Essar Power Ltd. fall within the jurisdiction of the Govt. of Gujarat. Hence, the Commission does not give any ruling on it.

7.2 Control period

The Commission had proposed a control period for this order as the period from the date of final order of the Commission to 31.12.2011.

Suggestions of the Objectors

M/s Essar Power Ltd. has suggested that the control period should be kept 18 to 24 months for erection and

commissioning of the plant to avoid any uncertainty for developer on the tariff after completion of the control period. It is suggested that the control period could be extended till March 2014.M/s Abengoa has suggested the control period be extended upto 31.12.2012.

Commission's Ruling

It has been observed that the capital cost of the solar power project might reduce drastically as time elapses. However, since the gestation period for Solar PV projects is about 6 months and that for Solar Thermal Projects is 18-24 months, the Commission decides that the control period for this order will be 2 years.

7.3 Non-applicability of Merit Order

M/s Astonfield Ltd. has suggested that the merit order dispatch principles should not be applicable for solar power generation.

Commission's Ruling

Electricity generated from solar energy projects is of the infirm nature. Hence, the Commission decides that the power generated from the solar energy projects are kept out from the merit order dispatch principles.

7.4 Additional Incentives

M/s. Astonfield Ltd., M/s ACME Ltd and M/s Abengoa Solar Ltd. M/s Moserbaer Ltd, M/s Essar power ltd, and Millennium Synergy have suggested that there is absence of level playing amongst the developers who can avail of the benefit of accelerated depreciation and those new entrants who do not have appetite for tax exempted assets. Some additional benefit should be given to those who do not avail tax benefit. An adhoc one-time incentive should be allowed. The Commission may upfront determine the additional incentive available to the developers who are availing the accelerated depreciation. It can be provided to the firms who are not availing the accelerated depreciation benefits to provide a level playing field. Upfront determination of additional incentive for accelerated depreciation will shorten the gestation period which will mitigate the need for developers to re-approach the Commission.

Commission's Ruling

The Commission has determined the tariff assuming that accelerated depreciation under the Income Tax Act, 1961 is available to the project. It is also provided that the project developers who do not get such benefits are eligible to approach the Commission for project specific tariff. Hence, the Commission decides not to make any change in this regard.

7.5 Hybrid Power Projects

M/s ACME Group Ltd has suggested to allow hybridization of solar energy project to bring down the energy cost. Hybridization of solar energy will go a long way towards bringing down the energy cost.

Commission's Ruling

The Commission is of the view that in such cases it becomes necessary to maintain the data on utilization of the fuels used for the generation and impact on the tariff determination. Moreover, the tariff determined for solar energy project is quite high in comparison to the tariff for the conventional power projects utilizing fuel, such as gas/coal etc. When the Commission will specify a separate Renewable Power Purchase Obligation for solar energy, the energy generated from solar energy projects on Hybrid mode would also be equated with solar power generation for fulfillment of RPPO which may not be consistent with the provisions of the Regulations. However, in case any project developer approaches with specific proposal on hybrid solar project, the Commission will decide the same on merit.

7.6 Separate RPPO for solar

M/s.Acme Ltd. has suggested that the Commission specifies separate Renewable Power Purchase Obligation percentage for solar energy projects for distribution licensees in the regulation.

Commission's Ruling

The Commission shall deal with this issue separately while finalizing the Renewable Power Purchase Obligation Regulations.

7.7 Harmonics impact on grid, REC Mechanism etc.

GUVNL has suggested that the Commission may consider the following aspects while determining the tariff.

(i) Solar PV based power projects are the source of injection of harmonics in the system which will subsequently increase system losses. Commission may specify the allowable limit for total harmonic distraction and monitoring mechanism within permissible limit.

(ii) Any purchase after fulfillment of RPPO by the Discoms shall be allowed at lower price than tariff determined by the Commission.

(iii) Energy purchased by the Discoms should be certified by the GEDA/GETCO.

(iv) The order shall include Guideline for Renewable Energy Certificate, purchase and trading of it by the utilities, open access user(s)/consumer/captive users for fulfillment of RPPO obligation.

Commission's Ruling

(i) There are no technical details submitted by GUVNL regarding the impact of harmonics on the grid. They have also not submitted the commercial impact of

harmonics on the grid. In the absence of any technical/ commercial details, it is not feasible to comment on this aspect.

(ii) The Discoms have to procure energy from the Solar Power Projects for fulfillment of RPPO as specified by the Commission in its relevant Regulations. The present order determines the preferential tariff for fulfillment of this obligation. However, if the quantum of solar power available in the State increases to a large extent, the distribution licensees may go for the procurement of such power on competitive bidding basis.

(iii) In para 6.9 of this order, the Commission has already specified that the monthly billing for the energy supplied by Solar Power Generators will be carried out based on the joint reading taken by ERDA/ GETCO/ Discoms and concerned generator.

(iv) As regards REC Mechanism, the same will be specified by the Commission in the Regulations to be framed by the Commission.

8. Roof-top Solar PV and other small power plant connected to LT/11 KV grid

The Jawaharlal Nehru National Solar Mission, launched by the Government of India, envisages that roof-top solar PV and other small solar power plants connected to LT/ 11KV grid, need to be encouraged to replace conventional power and diesel based generators. The Commission recognizes the need to encourage such roof–top SPV projects. Accordingly, such operators of Solar PV rooftop device will also be eligible to receive the tariff decided by the Commission in this order. As envisaged in the Solar Mission, the distribution utility will pay the tariff determined by the State Electricity Regulatory Commission for the metered electricity generated from such applications (whether consumed by the grid connected owner of the rooftop/ ground mounted installation or fed into the grid). A normative Generation Based Incentive will be payable to the utility and would be derived as the difference between the solar tariff determined by the Central Electricity Regulatory Commission for the solar generation technology less an assumed base price of Rs. 5.50/kWh with 3% annual escalation. Funds will be disbursed through Indian Renewable Energy Development Agency (IREDA), a PSU under MNRE. The distribution utilities will be entitled to account such electricity generated and consumed within their license areas for fulfillment of RPO. The metering and billing arrangements between the utility and such solar power plants will be as per various regulations of the Commission.

9. Applicability of the Order

This order shall come into force from 29th January, 2010.

Sd/-	Sd/-
(Dr.P.K.MISHRA)	(PRAVINBHAI PATEL)
CHAIRMAN	MEMBER (T)

Place: Ahmedabad
Date: 29.01.2010

Annexure I	
List of objectors	
	Name of objector
1	Shree Ram Eco-friendly Energy Pvt.Ltd.
2	Gujarat Energy Transmission Corporation Ltd.
3	Moser Baer Energy and Devlopment Ltd.
4	Gujarat Urja Vikas Nigam Ltd.
5	SunBorne Energy Technologies Pvt Ltd.
6	Solar Semiconductor Pvt Ltd.
7	CLP Power India Ltd.
8	Abengoa Solar
9	Astonfield Solar (Gujarat) Pvt Ltd.
10	Lanco Solar Pvt Ltd,
11	Refex Energy Pvt. Ltd.
12	ACME Tele Power Ltd.
13	Acme Vasa Technologies Pvt Ltd.
14	Adani Power Ltd.
15	Essar Power Ltd.
16	Torrent Power Ltd.
17	Infinia Solar Pvt. Ltd.
18	Millenium Synergy Pvt Ltd.
19	WAREE Energies Pvt. LTd.
20	ACCIRA Solar Pvt.Ltd.

Annexure II

Objectors who participated in the hearing

	Name of the objector
1	Gujarat Energy Development Agency
2	Gujarat Energy Transmission Corporation Ltd
3	Moserbaer Energy and Development Ltd.
4	Gujarat Urja Vikas Nigam Ltd.
5	SunBorne Energy Technologies Pvt Ltd.
6	Solar Semiconductor Pvt Ltd.
7	CLP Power India Ltd.
8	Abengoa Solar
9	Adani Power Ltd.
10	Lanco Solar Pvt Ltd,
11	AES Solar
12	Acciona Energy India Pvt.Ltd.
13	Torrent Power Ltd.
14	Infinia Solar Pvt. Ltd.
15	Millenium Synergy Pvt Ltd.
16	WAREE Energies Pvt. LTd.