

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 26 of 2004

In the matter of
**Rate and other dispensation for purchase of power from Bagasse and Other Non-Fossil Fuel
based Non-Qualifying Co-generation Projects**

**Dr. Pramod Deo, Chairman
Shri A. Velayutham, Member**

ORDER

Dated: May 25th, 2005

The Maharashtra Electricity Regulatory Commission, in exercise of the powers vested in it under Section 86 read with Section 61 of the Electricity Act, 2003 (EA 2003) and all other powers enabling it in this behalf hereby determines the power purchase rate and other aspects of purchase of power by the Maharashtra State Electricity Board (MSEB) and all other Distribution Licensees in Maharashtra from Bagasse and other Non-Fossil Fuel based Non-Qualifying Co-generation Projects in the State.

1. BACKGROUND

- 1.1 The Commission passed an Order on August 16, 2002 in the matter of MSEB's Application dated August 16, 2001 and Case Nos. 8/9/10/15/17/18/19/20/21 of 2001 for purchase of power from Non-fossil fuel based Co-generation Projects. The Commission specifically stated that the Order is not applicable to incidental bagasse and other non-fossil fuel based Co-generation Projects which typically would not be able to meet the qualifying criteria of co-generation efficiency stipulated under the Order. However, there could be several such installations already existing and likely to come up in future.
- 1.2 The Ministry of Power (MoP), Ministry of Non-Conventional Energy Sources (MNES) and Government of Maharashtra (GoM) have decided to promote renewable/non-fossil fuel based sources of energy such as bagasse based Co-generation Projects, recognising the need to explore alternatives to fossil fuels, socio-economic aspects and the environmental benefits associated with such Projects. India's energy scenario calls for the optimum management of all available resources in order to attain the national goals of development and social equity. A well-balanced energy mix, in which all energy resources are utilised on the basis of their economic value and environmental costs, is essential for sustainable development. Renewable energy resources are non-depletable, can effectively meet energy demand and are environmentally benign.
- 1.3 However, one of the issues with renewable energy technology is that, while some are feasible, both technically and economically, they are not always so commercially at present. However, even ignoring externalities, the financial costs of electricity generation from these technologies are comparable over the life cycle of such projects, although they have generally not yet reached a stage to achieve economies of scale.

- 1.4 The EA 2003 clearly sets out the intent to promote generation from captive generation, co-generation and renewables. EA 2003 also requires the State Electricity Regulatory Commissions to fix the percentage of electricity supply from the non-conventional energy sources that the Distribution Licensees must include in their total energy sales. It also empowers the Commissions to fix the tariff for supply of electricity from these sources.
- 1.5 Recognising the need for promotion of Bagasse and other Non-Fossil fuel based Co-generation Projects, the Commission had issued its Order dated August 16, 2002, inter alia laying down the qualifying criteria for such projects. However, the Commission also stated that the Order would be applicable to M/s Kay Pulp & Paper Mills Ltd as an exception even though its facility did not meet the stipulated qualifying criteria of co-generation. The Commission also directed that M/s Pravara Power Pvt Ltd should ensure the fulfilment of guidelines as enunciated by the Commission in its Order with regard to design, capacity and the norms for the fuel use. The Commission had noted further that, *“Except the above two specific cases of developers, other developers who are yet to implement their co-generation project shall adopt appropriate designs to meet the qualifying requirement for co-generation specified under this Order.”*
- 1.6 With regard to the demand supply gap in Maharashtra, the Commission has observed in its Order on Power Purchase and Other Dispensation in respect of Fossil Fuel Based Captive Power Plants (CPPs) dated September 8, 2004 ('CPP Order') as follows:

“1.3 Currently Maharashtra has been facing a significant demand-supply gap in the power sector with daily load shedding being undertaken both in the morning and evening peak hours by the MSEB. An analysis of the recent data published by the State Load Despatch Centre (SLDC), Kalwa (for the period October 2003 to March 2004) reveals average peak load shedding of over 1,500 MW in Maharashtra.

1.4 Additionally, as per MSEB's estimates¹, there is a bus bar energy shortage of about 1,704 MUs, which translates into a shortage of 1,079 MUs at the consumer end (after accounting for 36.62% of T&D losses). There is a potential to bridge this demand-supply gap through surplus saleable CPP power in the state.”

The Commission had issued that Order with a view, among other things, to utilise the surplus capacity available from CPPs in the State to mitigate the demand supply gap.

- 1.7 In fact, in a more recent submission dated 9th April, 2005, seeking directions under Section 23 of the EA, 2003, MSEB has stated that the shortfall in the evening peak hours is 3,100 MW, which is expected to increase to 3,500 MW in the next 2 months. In order to further mitigate the present demand supply gap in Maharashtra and to encourage the non-conventional and renewable energy generation in the State, the Commission believes that the available exportable capacity from those Co-generation Projects based on non-fossil fuels which do not qualify under the Order dated August 16, 2002 should be utilized. This has to be seen in the context of the fact that, in the circumstances of shortage likely to prevail for the foreseeable future, second-best options such as incidental co-generation cannot be ignored. The Commission recognises that such Co-generation Projects, due to their ability to utilise the available energy in more than one form, use significantly less fuel input to produce electricity, steam, shaft power or other forms of energy than would be needed to produce them separately. Thus, by achieving higher efficiency, Co-generation Projects can make a significant contribution to energy efficiency, and also promote the optimum use of resources.

¹ These estimates are based on MSEB letter dated 04/12/2003 addressed to the Commission.
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- 1.8 Non-fossil fuel based Non-Qualifying Co-generation Projects ('Non-Qualifying Co-generation Projects') offer several other benefits such as avoided use of fossil fuels, modular nature and efficient generation of heat and power, improved local and general security of supply, increasing cost-effectiveness, and reduced need for waste disposal. The environmental benefits associated with these projects include reduction in green house gases and protection of the ozone layer.
- 1.9 In view of the above, the Commission decided that it would be appropriate to provide a dispensation for such Non-Qualifying Co-generation Projects after due regulatory process, which would also enable utilisation of surplus generation from such Projects. The Commission engaged M/s ICRA Management Consultancy Services (IMaCS), a Division of ICRA Limited, to assist it in developing a Proposal regarding the power purchase rate and other dispensation for such projects. A draft proposal was circulated to the Distribution Licensees and authorised consumer representatives for technical validation prior to posing it for public comments and finalisation. The draft Proposal envisaged that the Order to be issued by the Commission would deal with two issues, viz,
- 1) criteria for Bagasse and other non-fossil fuel based Co-generation Projects that do not qualify under the criteria laid down in the Order dated August 16, 2002 and
 - 2) determination of tariff rate and process for purchase of electricity by MSEB/Licensees from such facilities.
- 1.10 After evaluating various approaches for tariff determination, the Commission proposed the following alternatives for the rate of purchase of power from such Non-qualifying Co-generation Projects for the first year of commercial operation:
- Tariff of Rs. 2.32/kWh or Rs. 2.21/kWh based on the average or minimum rate of purchase, respectively, for MSEB from the Incidental Co-generation Projects for FY 2003-04.
 - Tariff of Rs. 1.94/kWh based on the Commission's assessed pooled purchase cost of MSEB for FY 2003-04.

Further, it was proposed that the tariff would be escalated at the rate of 2% per annum on compounded basis.

The draft Proposal also stipulated that all other terms and conditions/principles of the Energy Purchase Agreement would be the same as those laid down in the Order dated August 16, 2002 to the extent that they are applicable under EA 2003.

- 1.11 The Technical Validation Session was held on January 19th, 2005, and the participants included MSEB, the Maharashtra Energy Development Agency (MEDA), Reliance Energy Limited (REL) and Tata Power Company Limited (TPC). The draft Proposal was finalised taking into consideration the comments of the participants at the Technical Validation Session, and thereafter put to the public for inviting comments/suggestions through a public notice in the Indian Express and LOKMAT on February 14th, 2005. The Commission received responses from three parties. A public hearing was held on April 5th, 2005 at the World Trade Centre, Cuffe Parade, Mumbai.

The following section summarizes the suggestions and comments received on the Proposal in writing as well as orally during the public hearing, and the ruling of the Commission on the points raised.

2. OBJECTIONS RECEIVED AND COMMISSION'S RULING

2.1 Tariff

The Commissionerate of Sugar, Maharashtra State, has submitted that the rate offered for purchase of electricity by the MSEB/Licensees from Non-qualifying Co-generation Projects for the first year of operation of the Project should be Rs. 2.80/kWh, and that the tariff should be escalated at the rate of 2% per annum. The Commissionerate has further suggested that the escalation clause may be removed after improvement in the power generation situation.

The Commissionerate of Sugar has added that higher rates are essential to give a strong financial incentive to sugar factories to tap a source which has not been utilised in the past. This is necessary in view of the financial crunch in the sugar sector post 2002. Further, if attractive rates are given and a long term policy framed, sugar factories would try to minimise their steam and electricity consumption and try to sell surplus power to the grid, thereby becoming more efficient. The Commissionerate has pointed out that most of the sugar factories in the State are old and have low-pressure boilers and turbines. It is not possible to replace these equipments immediately because of the large capital investment involved. If these sugar factories can generate income from the source available with them, it will be possible for them to replace the boilers and turbines in future for higher generation. This would enable them to achieve the qualifying efficiency criteria eventually.

Further, considering the fact that such sugar factories and co-generation plants are located in rural areas in proximity to users of electricity, transmission losses would be lower and the corresponding delivered cost of power to users would also be cheaper. Moreover, local generation will lead to an improvement in the voltage level thereby improving the working of irrigation pump sets. Hence, burning of motors in irrigation pump sets would be minimised.

Shri S.A. Patil on behalf of MEDA, submitted that incidental co-generation projects are inefficient and consume resources uneconomically. Therefore, it is essential to encourage them to set their system in order. These projects can be motivated to become efficient by offering a tariff higher than the proposed tariff, i.e. Rs 1.94/kWh. Further, capital expenditure needs to be incurred by sugar factories to carry out in-plant measures and/or on grid interfacing. Such capital expenditure needs to be internalised in the proposed tariff. Shri Patil also submitted that the variable cost needs to be determined considering the bagasse prices, which have increased substantially. He added that, in view of these factors, the tariff for incidental co-generation projects should be at least Rs 2.80/kWh instead of the proposed tariff of Rs. 1.94 per kWh. He added that, while giving this premium tariff, the Commission should also fix the time period within which sugar factories should upgrade their systems and meet the qualifying criteria laid down in the Order dated August 16, 2002. However, in case the tariff is not fixed at Rs 2.80 per kWh, the Commission may review the tariff rate and structure at the same time as the review of the same for projects qualifying under the Order dated August 16, 2002. This would also enable a holistic review of the tariff structure.

TPC has submitted that there should be a provision for revising the tariff since the price of bagasse is dependent upon the yield in a particular year. TPC has further suggested that the Commission should stipulate the permissible cost of fossil fuel for operation of the plant during the off-season due to non-availability of non-fossil fuel. TPC has added that it is not advisable to run the non qualifying co-generation plants on fossil fuels unless there is shortage of supply. MSEB Workers Federation has urged the Commission to review the proposed tariff to ensure that higher returns are not being offered to such Qualifying Co-generation Projects.

Commission's ruling

While determining the tariff for Non-Fossil fuel based Non-Qualifying Co-generation projects, the Commission has recognized the need to provide some incentive to sugar factories and similar facilities to upgrade their systems to utilise resources in a more efficient and optimum manner. Considering the fact that these Co-generation Plants are primarily developed to meet the captive requirement of sugar and other such factories, it is fair to allow part recovery of the fixed cost since it is envisaged to be primarily recovered through sugar processing or other operations.

No rational basis has been provided for the tariff of Rs. 2.80/kWh proposed by some stakeholders. Accordingly, the Commission is not in a position to form a judgement as to whether the proposed rate reflects the cost or not. At the same time, the Commission is of the opinion that the tariff for Non-Qualifying Projects should be fixed at a significant discount as compared to the tariff for Qualifying Projects in order to provide an incentive to the developers to opt for an efficient configuration for the plants. Based on its assessment of 3 Projects considered in the Order dated August 16, 2002, the Commission expects that the rate of Rs. 1.94/kWh in the first year of commercial operation with 2% escalation per annum would provide a sufficient incentive over and above the variable cost of Non-qualifying Co-generation Projects. The Commission expects that the capable Developers would be able to arrange funds for the capital expenditure necessary to further improve operating efficiency based on the savings arising out of efficiency gains.

As regards the linkage of tariff to the prevalent bagasse price, the Commission had evaluated the submissions of various parties in its Order dated August 16, 2002, and had selected the approach of deriving the price of bagasse on equivalent heat content basis. The Commission had considered a price of Rs 559/ tonne in the first year of operation considering that bagasse for the co-generation projects would be available in the nearby vicinity, and considered an escalation of 8% per annum for evaluation of Projects qualifying under the Order dated August 16, 2002. The Commission appreciates that the price of Bagasse is dependent on the yield of sugarcane and corresponding demand supply balance. However, providing a premium above the heat equivalent cost would burden the power sector for usage of Bagasse as a non-conventional source of generation. Hence, the Commission is of the view that the tariff should not be revised based on market price of Bagasse or other non-fossil fuel.

As regards the 'pass through' of the conventional fuel cost, the Commission has noted in its Order dated August 16, 2002 that "*The Commission wishes to highlight here that the 'pass through' of conventional fuel cost to MSEB, is certainly not permitted by the Commission, while addressing the need of the co-generation project to use conventional fossil fuel to a limited extent. Thus, the Commission has considered the bagasse as the base fuel to be used by the co-generation project during season as well as during off-season, and determined the current price of bagasse for the purpose of computation of variable cost of generation.*"

The Commission agrees with the suggestion of comprehensive review of the tariff structure for Non-qualifying Projects along with the qualifying Projects, as stipulated in its Order of August 16, 2002. This would enable an integrated assessment and view.

2.2 Qualifying criteria

Shri S.A. Patil of MEDA submitted that one of the presently proposed qualifying criteria of 20% in the Topping Cycle mode should not be specified for Incidental Co-generation Projects because only a few such Projects would be able to qualify under this criteria.

TPC has submitted that a mechanism to monitor the mode and parameters of operation of the plant i.e. incidental co-generation, topping cycle and bottoming cycle needs to be put in place in view of use of supplementary fossil fuel like coal.

TPC has also submitted that the treatment of projects which may become non-qualifying at a future date and vice-versa due to change in business, and the criteria for such change should be clearly set out. The validity of PPA for such Projects should be linked with their status .

Commission's ruling

The condition of at least 20% of total energy output being in the form of useful thermal energy is specified as a qualification criteria based on the qualifying requirements specified by Ministry of Power for the Co-generation Facility operating in Topping cycle mode as laid down in the Resolution No. A-40/95-IPC-1 dated November 6, 1996.

As regards the mechanism to monitor mode of operation of the Plant, the Commission has issued a Clarificatory Order dated November 11, 2003 setting out the definition of terms, method of computation, measurement and verification protocol for compliance monitoring and metering methodology to address the ambiguity, deficiencies and/or lack of uniformity on the part of the Licensees and/or the developers in interpreting and computing the qualifying criteria stipulated in the Order dated August 16, 2002. This Clarificatory Order shall be applicable for interpreting, computing and monitoring the qualifying criteria to the extent that it is relevant to Non-Fossil fuel based Non-Qualifying Projects.

If upon energy audit of the co-generation facility during the operation period, any Project fails to meet the qualifying criteria stipulated under the August 16, 2002 but meets the conditions of the present Order, then the tariff determined under this Order will be payable for such period.

2.3 Treatment of transmission charges and losses and reactive power drawal

TPC has submitted that the treatment of transmission charges and losses for energy purchase from such Projects, if applicable, should be specified. Further, TPC has submitted that the rate for reactive power drawal from the grid should be specified, and this rate should be linked to the voltage profile.

Commission's ruling

The transmission loss, wheeling charges, requirement of reactive power supply and charge for shortfall in reactive power supply shall be as per the Order dated August 16, 2002, and any other subsequent dispensation which may follow.

2.4 Adherence to grid discipline

TPC has submitted that, since Non-Qualifying Co-generation projects are connected to the grid, there is a need to ensure that they follow grid discipline. It has urged the Commission to lay down adequate protection requirements for these Generating Stations. TPC has suggested that the intra-state ABT mechanism should be applicable to plants with high installed capacity.

Commission's ruling

The technical standards relating to connectivity with the grid as may be specified by the Central Electricity Authority under the provisions of Section 73(b) of EA 2003 and as applicable for Generating Stations or Captive Generating Plants shall be applicable to Non-Qualifying Co-generation Projects. The Commission would consider the applicability of and requirements in respect of a market balancing mechanism at an appropriate stage as and when it is formulated.

2.5 Link with Renewal Purchase Obligation

TPC has submitted that it should be explicitly stated in the Order that purchases from such sources shall not be part of the Renewal Purchase Obligation of the Licensees since power from these plants will be highly infirm and seasonal.

Commission's ruling

Such Projects are included in the dispensation for obligatory purchase of power in terms of the Commission's Order on Determination of Renewable Purchase Obligation for Distribution Licensees in Maharashtra dated September 3, 2004.

3. Commission's Analysis and Determination of Tariff

After careful consideration of all the suggestions, comments and issues raised, the Commission determines the extent of the applicability of this Order, the tariff for purchase of power by MSEB and other Distribution Licensees from Non-Fossil fuel based Non-qualifying Co-generation Projects and other conditions as under:

3.1 Applicability of Order

This Order covers those Co-generation Projects which do not qualify under the Order dated August 16, 2002 but meet the qualifying requirements on the following criteria:

- Mode of Co-generation
- Fuel for the Non-Qualifying Co-generation Project
- Efficiency for the Non-Qualifying Co-generation Project
- Minimum Purchase Criteria from Non-Qualifying Co-generation Project

3.1.1 Mode of Co-generation: This Order is applicable to the following existing and future Non-Qualifying Co-generation Projects located in the State of Maharashtra and supplying power to MSEB or other Distribution Licensees in the State:

- Incidental Co-generation
- Topping cycle mode of Co-generation with efficiency level below 45% during the season

3.1.2 Fuel for the Non-Qualifying Co-generation Project: In keeping with the Order dated August 16, 2002, this Order is applicable only to Non-Qualifying Co-generation Projects which predominantly use non-fossil fuels such as bagasse, biomass, bio-gas, agricultural waste such as rice husk, groundnut shells, etc. Any other industrial co-generation or fossil fuel based co-generation will not be covered under the purview of this Order. The use of conventional fossil fuels in these Non-Qualifying Co-generation Projects may be necessary during the off-season period to augment the non-fossil fuel, and, therefore, the same is allowed. However, the fuel cost pass through on this account is not permitted. All other renewable/non-conventional energy generation projects including but not limited to municipal solid waste (MSW) based power projects, wind/solar energy generation projects, etc. are not covered by this Order.

3.1.3 Conditions for the Non-Qualifying Co-generation Project: Non fossil fuel based Non-Qualifying Co-generation Projects are required to meet the following minimum criteria specified under the MoP Guidelines for qualifying under this Order:

$$\frac{\text{Useful Thermal Output}}{\text{Total Energy Output}} = 20\% \text{ (minimum)}$$

- For typical topping cycle (without supplementary firing), the Co-generation Project must fulfil the following condition during seasonal operation:

- For topping cycle with supplementary firing facility, the useful heat to be utilised in the industrial activities should be more than the heat to be supplied to the system through the supplementary firing by at least 20%.

3.1.4 Minimum Purchase Criteria from Non-qualifying Co-generation Projects: To maintain grid stability and facilitate proper planning of the power system, the eligibility criterion shall be purchase of minimum 1 MW (equivalent to 700 units per hour during the period of supply) from such Non-Qualifying Co-generation Projects covered under this Order. The purchase criterion has been specified considering the size of Non-Qualifying Co-generation Projects already implemented, under implementation and under planning. However, such Non-Qualifying Co-generation Projects should be sized in co-relation to the locally available non-fossil fuel. The Developer should establish availability of the fuel for the project period.

3.1.5 Applicability in case of existing Contracts: The existing contracts between Non-Qualifying Co-generation Projects and the MSEB or other Licensees signed before the date of this Order will remain in force, unless stated otherwise. In its Order dated August 16, 2002, the Commission had specifically mentioned that the existing PPAs between MSEB and the Developers of 6 identified incidental co-generation projects, which were due for renewal/amendments, should be renewed on the same commercial terms (including the tariff thereof) as per the earlier executed PPA. However, the total tenure in respect of those identified Projects should be restricted to a maximum period of 13 years.

For any other existing Non-qualifying Co-generation Project, which would qualify under this Order, the tariff specified herein shall be applicable for a maximum period of 13 years from the Commercial Operation Date (COD) of the Project.

3.2 Tariff for purchase of Power by MSEB/other Licensee from such Non-qualifying Co-generation Project:

3.2.1 Tariff Philosophy

The Commission has generally been guided by the prudent practices of tariff determination which have been consistently applied since its first Tariff Order in the year 2000 for determination of tariff for MSEB. The Commission is aware that regulatory clarity and consistency in tariff principles and their application are necessary from the perspective of the developers, investors, and lenders in order to facilitate investments in non-fossil fuel based energy projects such as Co-generation Projects. The Commission has also considered the tariff philosophy adopted by the Commission in its Orders on Wind Energy, Bagasse and other Non Fossil fuel based Co-generation and Fossil Fuel based Captive Generation. As per the provisions of the EA 2003, while specifying the terms and conditions for the determination of tariff, the Commission has been guided by the factors which would encourage competition, efficiency, economical use of resources, good performance and optimum investments and the principles rewarding efficiency in performance.

The principles adopted by the Commission in determining the Tariff for the Non-Qualifying Co-generation Projects covered under this Order are:

- Implementation based on spirit of EA 2003 and the relevant provisions
- Consistency in tariff principles and their application
- Minimise uncertainty and regulatory intervention
- Fair and equitable treatment to all stakeholders
- Forward looking and implementable
- Incentives to Co-generation for efficient utilisation of Non-Fossil Fuels

- Transparency

3.2.2 Tariff Structure adopted for Non-Fossil fuel based Qualifying Co-generation Projects

In its Order dated August 16, 2002, the Commission had taken the view that, considering the size of each project and the number of such Co-generation Projects, determination and approval of the tariff for each Co-generation Project separately would require significant resources, time and skills on the part of the MSEB/other Licensees and the Commission. The Commission, therefore, adopted the approach of 'Uniform Tariff Level' for the Non-Fossil fuel based Co-generation Projects.

Accordingly, the Commission had determined the tariff structure for the Co-generation Projects using non-fossil fuel (such as bagasse, bio-mass, bio-gas, agricultural waste, etc.) qualifying under the Order dated August 16, 2002 for sale of electricity to the MSEB and other Licensees as follows:

“The Tariff for the purchase of electricity by the MSEB from the co-generation project based on any non-fossil fuel (such as bagasse, biomass, biogas, agriculture waste such as rice husk, groundnut shells etc.) shall be Rs.3.05 (Rupees three and paise five only) per kWh for the first year of operation of the Co-generation project and the tariff shall be escalated at the rate of 2% per annum on compounded basis.”

Further, the Commission had stipulated that the *“the ‘Tariff Structure’ for the sale of electricity to the MSEB as approved by the Commission by this Order is firm and the same will not be modified on account of exchange rate variation, conventional/additional fuel cost etc. In addition, the Tariff will not be modified on account of change in law, change in tax without the prior approval of the Commission. The Commission may consider revision in the Tariff, in case specific petition is filed in this regard.”*

3.2.3 Tariff structure as adopted in the Existing PPAs with Incidental Co-generation Projects

In line with the Commission's directions in its Order dated August 16, 2002, the PPAs have been renewed between developers of 4 out of 6 identified incidental Co-generation Projects and MSEB in FY 2003-04 on the same commercial terms (including Tariff) as per the earlier PPA. As per these revised PPAs, MSEB has paid Rs. 2.21/kWh to Rs. 2.43/kWh for purchase of power in FY 2003-04. The purchase rate band has increased to Rs 2.31/kWh to Rs 2.55/kWh in FY 2004-05 as per the provisions of the amended PPAs. The tariff for such projects is being escalated at 5% p.a.

3.2.4 Approach to tariff determination for Non-Fossil fuel based Non-Qualifying Co-generation Projects

While evolving a scientific and rational approach for the determination of tariff for the Non-Qualifying Co-generation Projects covered under this Order, the Commission had the option to choose from the following approaches:

- Tariff in accordance with MNES guidelines
- Tariff based on average (pool) power purchase cost
- Marginal Cost Approach
- Avoided cost of generation or power purchase
- Cost Plus Approach
- Fixing Tariff using the Standards/Benchmark Mechanism
- Competitive Bidding Route
- Tariff linked to average realisation rate or prevailing HT Industrial Tariff

- Tariff linked to Un-scheduled Interchange (UI) charges under the principles of Availability Based Tariff
- Tariff at a discount to the tariff offered to Non Fossil Fuel based Co-generation Projects qualifying under the Order dated August 16, 2002

In its Order dated August 16, 2002, though the easiest path for the Commission would have been to accept the MNES guidelines in totality and determine the purchase rate correspondingly, the Commission instead undertook a comprehensive review, adopting a public process for determining the tariff as well as the principles for the EPA, to obtain an overall perspective concerning the promotion of Co-generation Projects and for evaluating their impact on MSEB/other Licensees and their consumers on the one hand, and the project developers on the other.

The Commission has considered and evaluated the above approaches under its earlier Orders, including Order dated August 16, 2002. During the Public Hearing held in respect of the Order dated August 16, 2002, it was highlighted that the uniform tariff system is simple, transparent and easy to implement, and that around 3500 MW of capacity addition from non-conventional energy has taken place in India till date without any litigation. The Commission clarified in the Order dated August 16, 2002 that its intention was not to scrutinise and approve project parameters of each and every Co-generation Project. Instead, it was in favour of a normative approach that would yield uniform tariffs as against a 'case-to-case' approach.

In keeping with the above, the Commission has adopted the same approach for determining the Tariff for the purchase of power by Licensees from Non-Qualifying Co-generation Projects covered under this Order. The Commission's views on the various tariff alternatives have already been elaborated in great detail in previous Orders. In the paragraphs below, the Commission briefly sets out the reasons why these other approaches are inappropriate in the current case.

The two most widely discussed cost concepts based on the application of economic principles take into account avoided costs, and marginal costing. The latter has two variants, Short Run Marginal Costing (SRMC) and Long Run Marginal Costing (LRMC). Tariffs based on either avoided costs or SRMC would discourage private investments in these technologies by not allowing full recovery of costs along with returns. Under the constrained supply scenario, such as that prevalent currently in the State, the LRMC is a more appropriate basis for determining tariffs for a Licensee's procurement of power from Co-generation Projects, at least for the next few years. However, the information required to enable computation of LRMC is not available in the required detail at this stage.

Linking the rate of purchase with average realisation would mean that there will not be any linkage with either the cost parameters or the efficiency of operation of Co-generation Projects. Linking the Non-Qualifying Co-generation tariff to the industrial tariff would also mean that the tariff will progressively reduce, without any reduction in their input costs.

The long-term purchase contracts for Non-Qualifying Co-generation Projects should not be determined based on linkage with Un-scheduled Interchange (UI) Charges payable by MSEB/Licensees under the principles of Availability Based Tariff. The Commission is guided by the principle of promotion of Co-generation and generation from renewables. Since non-fossil fuel based generation helps in saving usage of fossil fuel and avoids the associated effects, the Commission's intention is to maximise non-fossil fuel based generation not only during peak hours but also throughout the day as well as year to the extent possible, and considering the availability of non-fossil fuel.

The Commission has been guided by the principle of efficiency and economic use of resources, and has to ensure that projects which utilise resources economically receive a premium as against

others. The Commission is also guided by the factors that would encourage competition, good performance and optimum investments and the principles rewarding efficiency in performance. After considering all these factors, the Commission is of the view that the tariff for the Non-qualifying Co-generation Projects should be fixed at a discount to the tariff available to the Co-generation Projects qualifying under the Order dated August 16, 2002.

However, it is also essential that the pricing structure at least meet the variable cost of generation for sale of electric power to the grid so that there is no penalty on the projects qualifying under this Order. Further, a margin over the variable cost of generation will provide an incentive to the existing Plants to offer electricity to the grid.

In its Order dated August 16, 2002, the Commission had evaluated the cost of generation for the Globe, Vaidyanath and Pravara Power Co-generation Projects. Based on the schedule of cost of generation for these three project cases, the Commission had noted that the variable cost of generation from these Plants ranges between Rs 0.46/unit and Rs 0.96/unit for the first year of operation, while the fixed cost of the Plants ranges between Rs 1.77/unit and Rs 2.52/unit.

The Commission recognises that the variable cost of the Non-qualifying Co-generation Projects would be higher than that of Qualifying Co-generation Projects, which needs to be compensated for. Since the main purpose of incidental Co-generation Projects is to meet the captive requirement of power and steam for the parent plant, it would be fair to allow only a part recovery of the fixed cost as an incentive over and above the variable cost of the Plant.

While promoting the renewable and non-conventional sources of energy, the Commission is also required to ensure that the MSEB/Licensees and the end consumers are not burdened with unduly high tariff. The MSEB/Licensee would normally be indifferent to the source of purchase in case the cost of procurement is less than or equal to its average cost of power purchase.

While prescribing single part tariff for purchase of power from Non-qualifying Co-generation Projects, it is necessary to compare the same with the total cost of power purchase, including fixed and variable components of cost. In FY 2003-04, the Commission had assessed the average power purchase cost for MSEB at Rs. 1.94/kWh.

The average power purchase rate effectively provides recovery of prudent fixed as well as variable costs and reasonable return to the conventional Generating Plants. The average cost of generation of Non-qualifying Co-generation Projects would be higher than the conventional Generating Plants. However, such Non-qualifying projects would typically be developed to meet the requirement of the parent plant. Hence, a tariff higher than the variable cost of generation of such Projects would provide an incentive to such Projects to offer electricity to the grid. The Commission has noted that the variable cost of generation ranged between Rs 0.46/kWh and Rs 0.96/kWh for the Projects meeting the efficiency criteria specified under the Order dated August 16, 2002. The Commission expects that the tariff of Rs 1.94/kWh for purchase of power from Non-qualifying Projects would provide an incentive over the variable cost of generation even after accounting for their relative inefficiency.

Accordingly, the tariff for purchase of electricity by the MSEB/ Licensees from Non-qualifying Co-generation Projects for the first year of operation of the Co-generation Project shall be Rs. 1.94/kWh.

The Commission has observed in its Order dated August 16, 2002 that the compounded annual growth rate (CAGR) of the cost of generation over the period of thirteen years under the three assessed project cases ranged between 1.9% per annum to 3.7% per annum. The Commission also noted that the variable cost component linked to bagasse price escalation rate had varied at the rate of 8% p.a., while O&M expenses linked to rate of inflation varied at the rate of 5% p.a., and

one of the major components of fixed cost, viz., debt service obligations, would reduce over the period of debt service. The aggregate impact of the varying rate of escalation in various cost components would result in a lower escalation in the total cost of generation. **Accordingly, the tariff shall be escalated at the rate of 2% per annum on compounded basis. The Tariff rate is linked to the year of operation of the Non-Qualifying Co-generation Project and not to the fiscal year.**

The above rate is uniform for all Non-fossil fuel based Non-Qualifying Co-generation Projects covered under this Order, without linkage to the efficiency levels. Less efficient projects would automatically have a higher variable cost as compared to relatively efficient projects. Uniform rate of tariff would ensure that the effective incentive available to the Project would reduce depending on its efficiency and variable cost, which in turn will encourage the establishment of more efficient projects .

The Commission wishes to encourage projects, which use resources economically and are efficient. Co-generation Projects which desire to earn higher returns should design the plant in line with the qualification criteria specified under the Order dated August 16, 2002 in order to become eligible for a tariff of Rs. 3.05 per kWh for the first year of Commercial Operation.

3.3 Tariff Conditions

3.3.1 Variation in Tariff

In line with its Order dated August 16, 2002, the Tariff Structure for the sale of electricity to the Licensees is firm and the Tariff will not be modified on account of exchange rate variation, conventional/additional fuel cost, etc. In addition, the Tariff will not be modified on account of changes in law, changes in tax, etc. without the prior approval of the Commission.

In its Order dated August 16, 2002, the Commission had noted that, in the context of the non-fossil fuel based Co-generation Projects under consideration, there is no firm energy supply commitment . Accordingly, the Commission has not determined different Tariffs for firm/infirm power.

3.3.2 Limit of Purchase

As mentioned earlier, energy from Co-generation Projects being infirm, there is no firm energy supply commitment on their part . Therefore, as far as supply of energy units by the Developer to the MSEB/Licensee is concerned, there shall be no limitation, except for Force Majeure conditions, on the maximum quantum of energy units to be supplied .

3.3.3 Review of Tariff and Tariff Structure

The Commission had stated in its Order dated August 16, 2002 that it would review the Tariff Rate and the Tariff Structure for the qualifying Co-generation Projects based on non-fossil fuels either after March 31, 2007 or on attaining the addition of 300 MW of additional capacity commissioned after 1st April 2001, whichever is earlier. The Projects covered under the present Order would be included within the above benchmarks for review of the Tariff Rate and Structure so as to enable an integrated assessment and view to be taken.

3.3.4 Reactive Power Supply

The Co-generation Project shall supply reactive power (RkVAh) at nominal voltage at point of injection equivalent to at least 36% of the active power (kWh) supplied to the grid on a monthly basis. In case of a shortfall in supplying the stipulated level of reactive power, the MSEB/Licensee shall charge the shortfall at the rate of Rs 0.25 per RkVAh.

3.3.5 Evacuation Facilities

In line with the Order dated August 16, 2002, the non-qualifying Co-generation Project shall bear the cost of project switchyard and interconnection facilities at the project site upto the point of energy metering. The MSEB/ Licensee shall bear the cost of transmission and associated facilities beyond the point of energy metering for the evacuation of power. The Non-qualifying Co-generation Project holder shall provide an interest free advance to the MSEB/ Licensee equivalent to an amount of 50% of the cost of works to be carried out by the MSEB/ Licensee for power evacuation purposes. In case there is more than one Developer sharing the transmission line/evacuation facilities to be set up by the MSEB/ Licensee the advance amount shall be shared amongst the Developer(s) in equal proportion. The MSEB/Other Licensee, as the case may be, shall refund the above interest free advance to the Developer(s), in five equal instalments, spread over the period of five years, commencing from one year after the date of commissioning of the respective Non-Qualifying Co-generation projects or the date of commencement of evacuation of power from such projects, whichever is later.

3.3.6 Other Conditions

Time of Day (ToD) meters shall be installed by the Non-Qualifying Co-generation Project at its end and by the Third Party consumer of Non-Qualifying Co-generation power, if any (i.e. at the entry and exit point of each transaction). The cost of such ToD meters shall be borne by the respective Non-Qualifying Co-generation Project and not by the Licensee. The Utility/Licensee shall provide check meter, if opted for by the Co-generation Project entity, at the cost of the Project, to assess the energy generated and fed into the grid during such period when the main meter or its related accessories such as CT/PT fail or develop problems, so as to avoid disputes in future.

The Licensee is required to separately maintain these details for Non-Qualifying Co-generation, including incidental generation. The Licensees shall submit the half yearly progress report on the capacity addition, purchase of energy and other relevant details in respect of non-fossil fuel based Non-Qualifying Co-generation Projects to the Commission and post the same on their website.

All other terms and conditions/principles of the Energy Purchase Agreement shall be the same as those laid down in the Order dated August 16, 2002 to the extent that they are applicable under EA 2003.

Sd/-
(A. Velayutham)
Member

Sd/-
(Dr. Pramod Deo)
Chairman

Sd/-
(A.M. Khan)
Secretary, MERC

Abbreviations used in the Order

COD	Commercial Operation Date
Commission	Maharashtra Electricity Regulatory Commission
CPP	Captive Power Plant
CPP Order	Order on Power Purchase and Other Dispensation in respect of Fossil Fuel Based Captive Power Plants dated September 08, 2004
CT	Current Transformer
EA 2003	Electricity Act, 2003
EPA	Energy Purchase Agreement
GoI	Government of India
GoM	Government of Maharashtra
kWh	Kilo Watt Hour
LRMC	Long Run Marginal Costing
MEDA	Maharashtra Energy Development Agency
MNES	Ministry of Non-Conventional Energy Sources
MoP	Ministry of Power
MSEB	Maharashtra State Electricity Board
MW	Mega Watt
Order dated August 16, 2002	Order dated August 16, 2002 in the matter of Maharashtra State Electricity Board's (MSEB) application dated August 16, 2001 and Case No. 8/9/10/15/17/18/19/20/21 of 2001 for purchase of power from Non-fossil fuel based Co-generation Projects
PPA	Power Purchase Agreement
PT	Power Transformer
REL	Reliance Energy Limited
SRMC	Short Run Marginal Costing
T&D	Transmission and Distribution
ToD	Time of the Day
TPC	Tata Power Company Limited
UI	Unscheduled Interchange