

Promotion and Development of Renewable Energy in the State of Assam from AERC's Perspective

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Assam Electricity Regulatory Commission (AERC):

Set up in 28th February, 2001.

Functions of **AERC** as per section 86 of **The Electricity Act, 2003:-**

1. Determine the tariff for generation, supply, transmission and wheeling of electricity;
2. Regulate electricity purchase and procurement process of distribution licensees;
3. Facilitate intra-state transmission and wheeling of electricity;
4. Issue licences to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the state;
5. Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;
6. Specify or enforce standards with respect to quality, continuity and reliability of service by licensees; etc.

AERC has issued 5 numbers of **Tariff Orders** and 15 numbers of **Regulations**.

Sources of **Renewable Energy**:-

- Biomass
- Biogas
- Sun
- Wind
- Small hydro

Position of India in development of **Renewable Energy** in the world:

1. 2nd position in Biogas utilisation
2. 5th position in wind power and photovoltaic production
3. Renewable sources contribute to 5% of the total power generating capacity in the country

Provisions of **The Electricity Act, 2003** pertaining to non-conventional energy sources:

Sections 3(1) and 3(2)

Under Sections 3(1) and 3(2), it has been stated that the Central Government shall, from time to time, prepare and publish the **National Electricity Policy** and **Tariff Policy**, in consultation with the state governments and authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances, hydro and renewable sources and energy.

Section 4

Section 4 states that the Central Government shall, after consultation with the state governments, prepare and notify a national policy, permitting stand-alone systems (including those based on renewable sources of energy and other non-conventional sources of energy) for rural areas.

Section 61

Section 61, 61(h) and 61(i) state that the appropriate commission shall, subject to the provisions of this Act, specify the terms and conditions for determination of tariff, and in doing so, shall be guided by the following, namely, the promotion of cogeneration and generation of electricity from renewable sources of energy; and the **National Electricity Policy** and **Tariff Policy**.

Section 86(1)

Section 86(1) and 86(1)(e) state that the state commissions shall promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.

Tariff Policy on non-conventional sources of energy generation:-

The Tariff Policy notified by Government of India on 6th January, 2006 had the following provisions under Section 6.4 on renewable sources of energy:

1. The Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable to the tariffs to be determined by the **SERCs** latest by 1st April, 2006.

It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs determined by the Appropriate Commission.

2. Such procurement by distribution licensees for future requirements shall be done, as far as possible, through competitive bidding process under Section 63 of the Act within suppliers offering energy from same type of non-conventional sources. In the long run, these technologies would need to compete with other sources in terms of full cost.

Provisions on non-conventional sources of energy in the **Rural Electrification Policy** announced by Government of India:-

1. For villages where grid connectivity would not be feasible or not cost effective, off grid solutions based on stand alone systems may be taken up for supply of electricity. Where neither stand alone systems nor grid connectivity is feasible and if only alternative is to use isolated lighting technologies like solar photovoltaic, these may be adopted.
2. Decentralised distributed generation facilities together with local distribution network may be based either on conventional or non-conventional methods of electricity generation whichever is more suitable and economical. Non-conventional sources of energy could be utilised even where grid connectivity exists provide it is found it be cost effective.

Power Sector Reform and Restructuring in Assam Policy, 2003 has following provisions on development of **Renewable Sources** of Energy:-

1. Envisage development of non-conventional energy sources in a bankable and commercially viable manner.
2. Provides for development of framework to encourage private sector participation in non-conventional energy sector for setting up small hydroelectric project up to 25 Megawatt (MW).

Government of Assam has notified a policy for development of small hydro projects for private investors in the state of Assam:

- Estimated hydro potential from small renewable sources in the state of Assam is 117 MW.
- About 89 hydro potential sites identified by **ASEB** from survey of India maps.

Development of Renewable Sources in Assam:

- Population – 2.2 crores.
- Area – 80,000 square km.
- About 80% village electrified but household electrification is around 20%.
- About 2,519 remote villages to be electrified by alternative sources of energy.
- The Government of India's **National Electricity Policy** aims at electrification of all villages by 2007 and all households by 2012.

Non-conventional Energy in the **Tariff Order** of **AERC**:

Tariff Orders for 2005-06, 2006-07 and 2007-08 had a provision for rebate for use of solar water heating system:

- The Commission introduced a monthly rebate of Rs. 30 in Tariff Order 2005-06 for all consumers who have installed such solar water heating systems which was increased to Rs. 40 per month in Tariff Order for 2006-07 and which was kept at the same level in the Tariff Order for 2007-08.
- The solar water heating system being used by the consumer has to be an authorised / approved product of the **MNES**, Government of India or the **State Nodal Agency**.
- To avail this rebate consumers shall be required to give the licensee an affidavit to the effect that such a system has been installed on his premises and is being used to meet his water heating requirements. The declaration can be verified by licensees' representatives.

AERC (Power Procurement from Renewable Sources and Cogeneration by Distribution Licensee) Regulations, 2008 (Draft)

- Minimum quantum of electricity to be purchased by distribution licensee from cogeneration and renewable sources shall be 5% of its total consumption during a year which will be 10% by 2012 and progressively increased to 15% by 2015.
- The Commission may review the quantum of purchase of energy from renewable sources and cogeneration by distribution licensee once in every 3 years.
- Generator shall have open access to any licensee's transmission system and/or distribution system as the case may be under AERC (Terms and Conditions for Open Access) Regulations.
- Transmission charges payable by such sources
- Wheeling charges for use of distribution system.

5 numbers of new Renewable Energy Projects in private sector in Assam:-

1. **2.25 MW Champamati Mini Hydro Project** at Baska district promoted by M/s Hayen Hydel Power Project Company Pvt. Ltd.
 - Proposed levelised tariff Rs. 3.2 per unit for 35 years
 - MOU signed with LAEDCL for procurement of entire power
2. **10 MW Biomass based Power Project** at Jagirod promoted by Amrit Bio Energy & Industries Ltd.
 - Use rice husk and other agricultural residue
 - Entire power to be bought by CAEDCL
 - Price proposed is Rs. 3.50 per unit
3. **Badarpur 6 MW Biomass based Project** at Hilakandi promoted by Badarpur Energy Pvt. Ltd. Proposed as a captive generator for their cement plants.
4. **3 MW Cogeneration Power Project** in Guwahati proposed by Subhag Power Pvt. Ltd.
 - Will use hot flue gas discharge from Rotary Klin of India Carbon Ltd.
 - Proposed levelised tariff of Rs. 2.13 per unit for 8 years.
5. **6 MW Power Plant** at Integrated Solid Waste Management Project at Boragaon, Guwahati.

1. 2.25 MW Champamati Mini Hydro Project:-

The Commission approved a single part tariff calculated as per cost plus approach with pre determined parameters and levelised for 35 years covering the entire useful life of the generating equipments.

The Commission adopted the single part tariff for the project for the following reasons :-

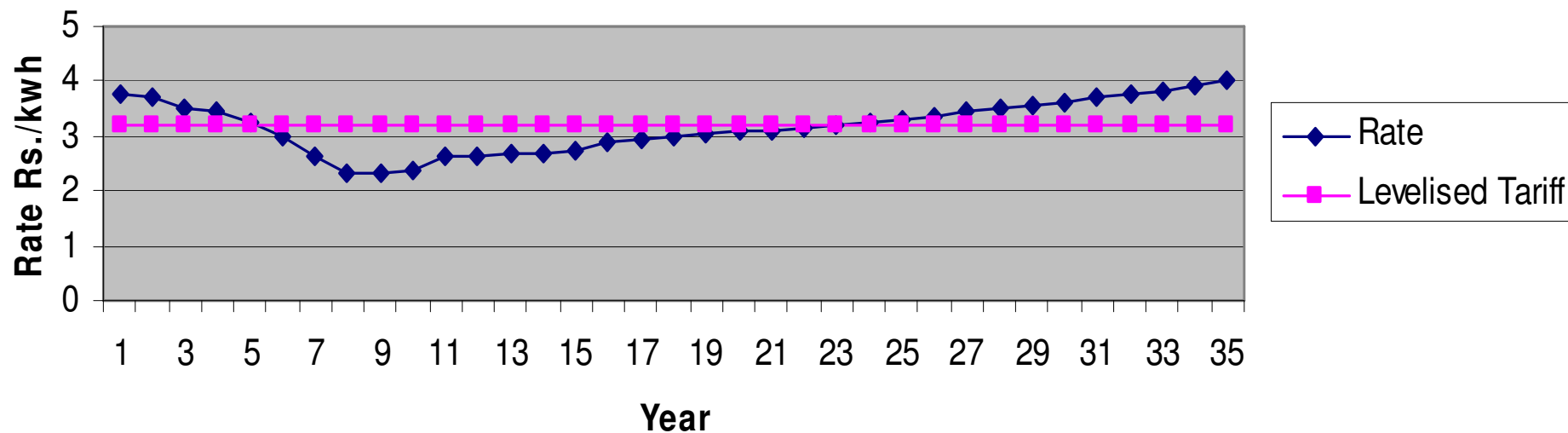
(a) Single part tariff offers a high level of investment certainty by providing a guarantee of recovery of fixed price for each kwh of power fed into the grid over a certain period.

(b) This approach would ensure adequate compensatory return and will provide reasonable incentive to developers as it gives stable tariff over a longer period.

(c) The levelised tariff approach incentives to operate and maintain the assets efficiently during the latter years of the agreement as against the approach of front loaded tariff.

(d) The single part tariff facilitates the easy monitoring and settlement for such small project.

The year wise tariff for 35 years along with the levelised tariff for the project is shown in the figure below :

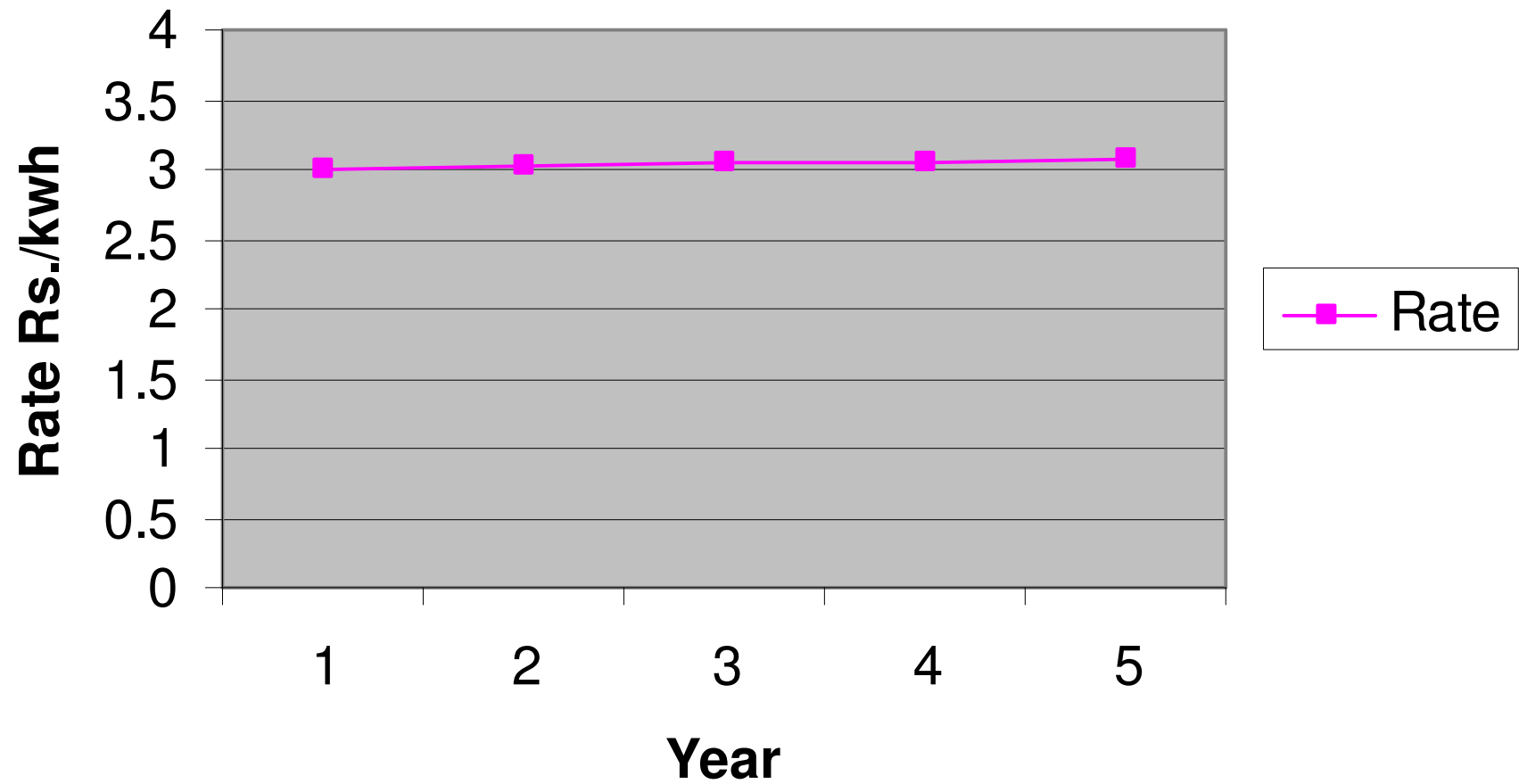


2. 10 MW Biomass based Power Project:-

- The Commission approves the Tariff for a period of five years from the initial Date of Commercial Operation which would form a part of Power Purchase Agreement (PPA) along with the parameters approved as below:

Year	Fixed Charge (Rs/kwh)	Energy Charge (Rs/kwh)	Total charge for billing in single part (Rs/kwh)
1 st	1.44	1.57	3.01
2 nd	1.37	1.65	3.02
3 rd	1.31	1.73	3.04
4 th	1.24	1.82	3.06
5 th	1.17	1.91	3.08

The year wise tariff for 5 years for the project is shown in the figure below :



- The Commission calculated the Tariff for a period of ten years from the Date of Commercial Operation as prayed for by the Petitioner. However, the Commission has reason to restrain from announcing the cost of fuel (rice husk) due to the uncertainty in its price in absence of an organized market and decided to limit the same for a control period of five years. It is expected that during the five year period the development in the field of Non Conventional Energy will come to a stage of maturity from the present stage of nascence where this project will be first of its kind in the state of Assam.

3. 6 MW Power Plant at Integrated Solid Waste Management Project at Boragaon, Guwahati:-

The Guwahati Waste Management Company Pvt. Ltd. intends to develop the project structure and obtain requisite clearances necessary for the project. It is envisaged that a suitable private developer cum operator will be selected through **competitive bidding process** who will implement the project taking over the entire equity holding of GWMCL.

The Commission approves the following :-

- (1) GWMCL shall carry out the bidding process on behalf of LAEDCL as per the approved RFP documents.
- (2) GWMCL shall go ahead with the bidding process along with the deviations in the RFP document as approved.
- (3) The qualification procedure adopted by GMC/IDCAL for short-listing of bidders has been approved where 9(nine) nos. of bidders have been short listed for issuance of RFP.

4. 3 MW Cogeneration Power Project in Guwahati proposed by Subhag Power Pvt. Ltd. (SPPL):-

The Commission directed SPPL,

1. To issue public notice inviting comments/observations from interested persons on the issues involved in the proceedings of the tariff petition of the Company.
2. To make available documents of incorporation of the company Subhag Power Pvt. Ltd. as a special purpose vehicle for the purpose of execution of the project and to serve copy of the same to LAEDCL and ASEB.

Renewable projects under construction
/shutdown in Assam under ASEB/APGCL:-

1. **20 MW Dhansiri Mini Hydro electric project**
2. **2 MW Bardikharu Micro Hydro electric project**
3. **9 MW Lungnit Project in Karbi Anglong District**
4. **9 MW Myntriang Hydroelectric Project in Karbi Anglong.**



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