

**Discussion Paper on incentives for off grid captive solar energy systems.**

Several consumers in the state have installed solar panels in their premises / roof tops and use solar energy for their own use after installing storage batteries and invertors. These units cannot be tied to the grid due to technical limitations. Consumers using such off grid solar systems have approached the Commission seeking incentives for their solar generation and consumption.

‘A discussion paper on incentives for off grid captive solar energy systems’ is attached as Annexure I. The Commission intend to incorporate Generation Based Incentive for off-grid-solar generation in the Tariff order for the FY 2014-15. All stake holders are requested to submit their views on the proposal before 13-07-14 to the Commission. They can also submit their views during the public hearing of ARR and Tariff of KSEB Ltd on 30-06-2014 (Kozhikode), 02-07-2014 (Ernakulam) and 04-07-2014 (Thiruvananthapuram).

Secretary

## **K S E R C DISCUSSION PAPER (24-06-14)**

### **INCENTIVES FOR OFF GRID CAPTIVE SOLAR ENERGY SYSTEMS**

1. Kerala State Electricity Regulatory Commission had published the draft Regulations on the Grid Interactive Distributed Solar Energy Systems on 24<sup>th</sup> January 2014 . The commission invited views of all stake holders on the Regulations and conducted public hearing on 19<sup>th</sup> March 2014. The Regulations were finalized and notified on 10.6.2014. These regulations address the issues such as connectivity of the solar electricity generation by small and medium producers to the grid , net metering , banking of electricity in the Licensees system , drawal and use of such banked energy as the consumer chooses , the settlement of accounts with the Licensee etc. The regulations specify the conditions under which solar power upto 1000 KW can be tied up with the grid.
2. Several consumers in the state have installed solar panels on their premises/roof tops and use solar electricity for their own use after installing storage batteries and inverters which could not be tied up to the grid due to technical reasons. Such solar electricity systems are generally called as off-grid solar systems .More such off-grid-solar plants are expected to be installed by several consumers in the near future. Such consumers have approached the Commission seeking incentives for their own solar generation and consumption.
3. It has generally been accepted that distributed solar electricity generation , both off-grid as well as grid-tied , is suitable for relieving the power shortage in the state to a large extent. As more and more such solar generation comes up in the state and solar generation achieves massive MW scales , dependence of KSEBL on costly power during day time reduces. KSEBL would also be able to back down hydro power during daytime when solar generation is available. But it is clear that distributed solar electricity generation by individual consumer initiatives will come up in large numbers only if appropriate enabling environment is created and sufficient incentives are offered. Hence the commission is keen to provide appropriate enabling environment and incentives for promoting such solar

electricity generation. Therefore certain proposals for providing incentives for off-grid solar generation and consumption are given in this paper for public discussion and feedback.

4. The electricity tariff structure in the state for most of the categories provides for higher 'per unit rates' for higher consumption. As per the existing tariff structure (2013-14) the energy charges of domestic consumers increases from 150 paise per unit to 700 paise per unit as the monthly consumption increases from 40 units to 500 units . Similarly the tariff of commercial consumers increase from 580 paise per unit to 910 paise per unit as the consumption goes up from 100 units to 500 units. When a consumer installs off-grid solar system the drawal and consumption from the grid reduces and hence there is an inbuilt incentive in the tariff structure for such self generation.
5. The Commission proposes to provide Generation-Based-Incentives(GBI) to the solar electricity generated and consumed by any consumer in the state. The incentive shall be at equal 'per unit' rates to all types of consumers.
6. On computation of incentive rates various suggestions have come before the Commission. It has been argued that as the consumers generate their own electricity the Distribution Licensee is relieved of the dependence on costly power to that extent and hence the savings has to be shared with such consumers. This argument assumes that the reduction in drawal of costly power is an automatic and simple process, which is not a fact. Due to operational constraints reduction of drawal of costly power would take place only when solar power is added on massive scales. But the savings in hydro resources is more reasonable factor. Another factor pointed out is the reduction of losses due to distributed generation. So also if the Licensees are allowed to offset the Renewable Purchase Obligation (RPO) as a compensation to the incentive, the Licensee may get considerable savings until RPO is met in a year. But the incentivisation of off-grid solar generation cannot be limited to that level under the existing circumstances of the State.
7. Taking all the above factors into consideration , the Commission proposes to introduce a Generation Based Incentive of one rupee per unit (one

hundred paise per unit) of solar generation by the off-grid solar generation for all consumers from the FY 2014-15 onwards. The incentive will be available for a period of five years from the date on which metering of solar generation has commenced. The incentive system shall be reviewed by the Commission on the solar generation in the State exceeding 75 Mu per annum

8. The incentive for the off-grid solar generation has to be linked to the actual generation of the solar plants. Hence the solar electricity generated by a consumer will be metered by ordinary energy meters of appropriate capacity and accuracy class. The consumer will have to procure energy meters and get it tested and sealed in the Licensees laboratory . The meter has to be installed at a place accessible for the meter reader of the Licensee.
9. Electricity drawn from the grid will be billed at the appropriate slab/tariff levels in the prevailing tariff to compute energy charges payable. In the invoices the off-grid-solar incentive for the solar generation during the billing period will be shown as credit .
10. The off-grid solar facilities should not be connected to the grid . The solar electricity has to be used only for self consumption in the premises of the consumer . In other words the solar generation has to be treated as captive generation by the consumer.
11. Captive RE generation is eligible for REC as per CERC notifications and the consumer will have to surrender this eligibility to the Licensee by a special agreement. The Licensee will be allowed to set off the units generated by such consumers to the RPO in any year as a compensation for the incentives. The solar electricity generated by the consumer will be recorded by the Licensee and aggregated at state level for offsetting against the RPO of the Licensee. The licensee can meet the expenditure on account of incentives to off grid solar generation from the provision for meeting the RPO in their ARR for the year. This will be verified and certified by the State agency appointed by the Commission as per Regulation 5 of the Kerala State Electricity Regulatory Commission (Renewable Purchase Obligation and its Compliance) Regulations, 2010.