

# CEEAMA E-NEWS

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Electrical Consultants' Newsletter

April 2019

## From the Secretary's Desk



Dear All,

Greeting's from Suhas

As you are all aware, CEEAMA was founded in 2004 on the auspicious day of Gudi Padwa. This year CEEAMA completed its 15th Year of existence successfully. Looking back there are some facts about CEEAMA

- On the foundation day 15 nos of LFM and 5 nos of Associate members were enrolled. This gives total no as 20 at that time.
- In 15 years CEEAMA membership has grown from 15 nos LFM to more than 250 nos of LFM + Patron Member.
- In 15 years CEEAMA associate members has grown from 5 nos to more than 125 nos.
- CEEAMA has conducted more than 90 product introduction seminars for the benefit of participating members.
- CEEAMA has conducted more than 40 no of knowledge sharing and up gradation programs for its members.
- CEEAMA has arranged 50 factory visits with the help of associate members to view the manufacturing facilities and testing of the products for use in industry.
- Initially CEEAMA activities were limited to Pune and Mumbai, In last 10 years it has spread its wings to Nasik, Kolhapur, Sangli, Aurangabad, Nagpur, Bangalore, Baroda etc.
- CEEAMA is governed by Governing council (GC) elected from the members. Total no of GC members are 11. GC member elects the President, Secretary and Treasurer.
- CEEAMA organizes the one day conference and 3 day exhibition for the benefit of members, associate members, and all electrical and related field personnel.
- Through this CEEAMA generates funds to be spent on programmes related to electrical safety and security, new energy sources and adoption of the same, up gradation of consultants and personnel working with the consultant.

There are so many activities carried out by CEEAMA I will write the same in due course of time. I request all of you to make only one new member in this year and help CEEAMA to grow.

Thanks With warm regards,

**Suhas Kesar**

Hon. Secretary

**CEEAMA**

## What is New?

### High efficiency deep ultraviolet LEDs

AlGaIn-based DUV-LEDs are receiving much research attention due to their potential use in sterilization, water purification, phototherapy, and sunlight-independent high-speed optical communication. Scientists are investigating ways to improve their efficiency in converting electrical energy into optical energy.

Kazunobu Kojima of Tohoku University specializes in quantum optoelectronics, which studies the quantum effects of light on solid-state semiconductor materials. He and colleagues in Japan used a variety of specialized microscopic techniques to understand how the structure of AlGaIn-based LEDs affects their efficiency.

They fabricated an AlGaIn-based LED by growing a layer of aluminium nitride on top of a sapphire substrate with a very small one degree off-angle. Next, they grew a cladding layer of AlGaIn with silicon impurities on top of the aluminium nitride layer. Three AlGaIn 'quantum wells' were then grown on top of this. Quantum wells are very thin layers that confine subatomic particles called electrons and holes within the dimension that is perpendicular to the layers' surface, without restricting their movement in the other dimensions. The top quantum well was finally covered with an electron-blocking layer formed of aluminium nitride and AlGaIn with magnesium impurities.

The microscopic investigations revealed that terraced steps form between the bottom aluminium nitride and AlGaIn layers. These steps affect the shapes of the quantum well layers above them. Gallium-rich stripes form that connect the bottom steps to the small distortions they cause in the upper quantum well layers. These stripes represent micropaths of electric current in the AlGaIn cladding layer. These micropaths, together with a strong localization of movement of electrons and holes within the quantum well layers, appears to increase the LEDs' efficiency in converting electrical energy to optical energy, the researchers say.



Source: <https://www.sciencedaily.com/releases/2019/02/19022101245.htm>

Contributed By Mangesh Shirgaonkar

*What is New? : High efficiency deep ultraviolet LEDs*

*Activity: Siemens Factory visit on 22nd March 2019*

Before the  
**MAHARASHTRA ELECTRICITY REGULATORY COMMISSION**  
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**Case No. 20 of 2019**

**Case of Maharashtra State Electricity Distribution Co. Limited seeking Removal of Difficulties in implementation of MERC (Net Metering for Roof-Top Solar Photo Voltaic Systems) Regulations, 2015**

**Coram**

**Anand B. Kulkarni, Chairperson  
Mukesh Khullar, Member**

Maharashtra State Electricity Distribution Company Limited (**MSEDCL**)..... Petitioner

**Appearance**

For MSEDCL

.....Shri Ashish Singh

**ORDER**

**Date: 7 March, 2019**

1. MSEDCL has filed this Case on 21 January, 2019 for seeking relief under Removal of Difficulties clause in implementation of MERC (Net Metering for Roof-Top Solar Photo Voltaic Systems) Regulations, 2015.
2. **MSEDCL's main prayers are as follows:**
  - a. *To provide necessary amendment in the Net Metering Regulations 2015 by replacement of Net Metering with Gross Metering system for the consumers to safeguard any additional burden on the consumers.*
  - b. *To make applicable the wheeling charges and losses on the banked units of Energy by Net Metering Consumers for recovery of distribution infrastructure cost.*
  - c. *To make a mandatory provision for installation of ABT compatible meters for Industrial and Commercial Category consumers.*
  - d. *To include the provision in the Regulations for non-applicability of net metering Regulations to the consumers whose arrears are pending*

### 3. MSEDCL in its Petition has stated as follows:

- 3.1. Net Metering is growing rapidly as a large number of consumers (Residential, Commercial, Industrial, etc.) are installing rooftop renewable energy systems. Further, the primary objective of Net Metering is to harness renewable energy (especially solar) by way of captive generation and the primary philosophy is to incentivize consumers. Also, Net metering is a tool that has been used to meet various policy objectives such as Promoting distributed generation energy and Promoting solar and/or other renewable source of energy.
- 3.2. The increasing number of prosumers (consumers that both produce and consume electricity) with solar photovoltaic (PV) generation combined with net-metering results in reduced revenue and impacting cross subsidy for many Distribution Licensee worldwide. Consequently, this pushes utilities to increase tariff in order to recover costs. For non-PV owners, this could result into inequality issues due to the fact that non-PV owners also have to pay higher charges for their electricity consumed to make up for netted costs of PV-owners. This Petition is filed to highlight the inequality issues caused by net-metering and the effects on cross-subsidies.
- 3.3. An exponential growth has been witnessed in Rooftop Solar PV installations in Maharashtra with the cumulative capacity installation rising 10 times i.e. from 20.44 MW (1074 net metering connections) in FY 2016-17 to 207.49 MW (10570 net metering connections) till October,19 in just 3 years, resulting in CAGR of 376%. Even if it is considered that such growth may not be witnessed in future, but still considering the lower growth rate of say 100%, the expected MW which will be converted under such Net Metering Regulations will be around 4645 MW in FY 2022-23. This will have a major impact on the Grid as well as financial stability of the Distribution Licensee and in turn additionally burden other consumers.
- 3.4. Considering the current situation, around 100 MU is being generated through rooftop solar PV systems. Out of these, maximum energy is consumed by HT Consumers who are subsidising consumers. Any decrease in such sales of Distribution Licensee to these consumers will have a direct impact on cross-subsidy available for lowering tariff of Subsidised consumers. Under LT segment also, usually the high end residential consumers opt for Solar Roof-top which results in lower consumption from grid and getting into the subsidised rate of bill for such lower power consumed as the telescopic impact gets reduced. This results in injustice to the low-end residential consumers as the subsidised rate benefit is also been availed by high end Residential consumers. Accordingly, if distribution licensee increases rates to cover such shortfalls due to loss of cross subsidy, consumers without solar system, end up paying more while solar owners continue to get offset through net-metering.
- 3.5. Envisaging such huge growth in the Solar Rooftop installation, the impact on the cross subsidy and direct burden on the end subsidised consumers will be huge. Net Metering of rooftop solar PV generation is severely impacting the financial position of MSEDCL

since a major component of the total costs that need to be recovered by Distribution Utilities from consumers through tariffs is the fixed cost. Net metering consumers buy less power from the distribution utilities since part of the consumer's demand is met through the energy generated from their solar PV systems and therefore they contribute less towards recovery of MSEDCL's fixed costs as these fixed costs are part of the marginal charge for the electricity they buy. This has led to utilities increasing their tariff rates to cover this shortfall and eventually the consumers without rooftop solar PV end up paying more whereas the consumers with rooftop solar PV continue to offset their expenses through net-metering. Considering the exponential growth of rooftop solar PV systems and the projected rooftop solar capacity till FY 2022-23 the impact of net metering on distribution utility will be appalling along with various technical problems.

- 3.6. MSEDCL has tentatively calculated the loss of cross subsidy from the date of the implementation of Net Metering Regulations and the resultant impact of such on the balance consumers of MSEDCL. Distribution cost being obligatory cost which is already being incurred or have to incur irrespective of the load / demand, the basic premise on which the cross subsidy loss is calculated is based on the additional revenue foregone against the incremental marginal power cost to be incurred. Therefore, the Cross subsidy has been calculated considering the Revenue loss with respect to energy charges (as the capacity charges will still be recovered) against the expected marginal power purchase cost which is considered @ Rs. 2.80 per unit. The impact of the loss of cross subsidy from FY 2015-16 onwards is highlighted in the following table:

**Impact on cross subsidy on consumers of Distribution Licensee**

Financial Year	Tariff Category	Solar generation (MU)	Energy Charges (Rs/kWh)	Marginal Power Purchase (Rs/kWh)	Cross Subsidy (Rs/kWh)	Impact in Rs. Cr.
CATEGORY WISE IMPACT - HT CONSUMERS						
2016-17	HT_COMMERCIAL	0.27	12.17	2.80	9.37	0.26
	HT_INDUSTRIAL	0.32	7.95	2.80	5.15	0.16
	HT PUBLIC SERVICE OTHERS	0.93	9.82	2.80	7.02	0.65
	HT SEASONAL	0.16	8.65	2.80	5.85	0.09
	Total	1.68				1.17
2017-18	HT AG/ SP AG/POULTRY	2.07	5.39	2.80	2.59	0.54
	HT COMMERCIAL	7.42	12.23	2.80	9.43	7.00
	HT GROUP HOUSING (RES)	2.37	6.65	2.80	3.85	0.91
	HT INDUSTRIAL	46.94	7.90	2.80	5.10	23.94
	HT PUBLIC SERVICE OTHERS	6.43	9.93	2.80	7.13	4.58
	HT SEASONAL	1.12	8.50	2.80	5.70	0.64
	Total	66.35			-	37.61
	Total Revenue Loss under HT Category					38.78
CATEGORY WISE IMPACT - LT CONSUMERS						
2016-17	RESI	0.83	12.35	2.80	9.55	0.80
	COMMR	0.75	11.17	2.80	8.37	0.62



Financial Year	Tariff Category	Solar generation (MU)	Energy Charges (Rs/kWh)	Marginal Power Purchase (Rs/kWh)	Cross Subsidy (Rs/kWh)	Impact in Rs. Cr.
	Industrial	0.12	7.68	2.80	4.88	0.06
	PUBLIC SERVICES - Others	0.36	8.09	2.80	5.29	0.19
	<b>Total</b>	<b>2.06</b>				<b>0.72</b>
2017-18	RESI	9.62	12.41	2.80	9.61	9.24
	COMMR	11.97	11.19	2.80	8.39	10.04
	Industrial	1.75	7.60	2.80	4.80	0.84
	STR LIGHT	0.00	6.60	2.80	3.80	0.00
	PUBLIC SERVICES - Others	19.90	8.11	2.80	5.31	10.56
	<b>Total</b>	<b>43.23</b>				<b>30.69</b>
<b>Total Revenue Loss under LT Category</b>						<b>31.41</b>
<b>Total Loss of Incremental Revenue</b>						<b>70.19</b>

\* - Energy Charges considered from 3<sup>rd</sup> November 2016 Tariff Order whereby Energy charges considered are:

- For LT Residential – consumption slab of 500 and 1000 consumption
- For LT II Commercial - LT II (B) > 20 kW and ≤ 50 kW
- For LT V (B) Industrial - Above 20 kW
- For HT Category Energy Charges for 22 KV is taken in consideration

3.7. Thus, within 2 years, MSEDCL has already lost the revenue of Rs. 70.19 Crore which will be passed on to the balance consumers of Distribution Licensee by way of additional tariff burden. Considering the enormous growth in the Solar Rooftop Installation, the additional burden can be gigantic and may result in tariff shock for the consumers. This will be right point of time to switch over from Net Metering to Gross Metering which ensures consumers with offset of units injected into the grid at APPC rate and also ensure Distribution Licensee to bill consumer in line with the tariff schedule which prevents any revenue loss.

3.8. The difference between consumer tariff and levelised cost of energy generated is major driving factor for adoption of Net Metering. As retail tariff for low end residential and agricultural consumers is low, there is no incentive for them to opt for Net Metering. Gross Metering provides level playing field to all consumers for installation of roof top systems and since more than 80% consumers are subsidised, gross metering will help reaching them.

3.9. The commercial interests of some consumers and third party service providers through various models is completely defeating the very objective of net metering as Consumers with rooftop solar power projects generate energy far more than is required for their own consumption (captive consumption). Consumers prima-facie seem to opt for Net Metering in order to fulfill their commercial interests by generating energy more than their captive requirement and selling such surplus energy to the distribution utilities at APPC Rate which is much higher than the installation cost. The summary of the consumers whose export is higher than the consumption is highlighted below:

### Details of Consumers exporting power more than Consumption

Details of LT Consumers			
	No. of Consumers		
% Range of Export higher than consumption	FY 16-17	FY 17-18	FY 18-19
0%-30%	60 (6%)	375 (7%)	794 (8%)
30%-60%	101 (10%)	673 (12%)	1253 (12%)
>60%	472 (48%)	2737 (50%)	4493 (45%)
<b>Total Consumers Exporting higher than consumption</b>	<b>633</b>	<b>3785</b>	<b>6540</b>
<b>Total Consumers</b>	<b>987</b>	<b>5522</b>	<b>10061</b>
<b>% of Consumers availing benefit</b>	<b>64%</b>	<b>69%</b>	<b>65%</b>
Details of HT Consumers			
	No. of Consumers		
% Range of Export higher than consumption	FY 16-17	FY 17-18	FY 18-19 (Till Oct 2018)
0%-30%	1 (1%)	9 (3%)	11 (2%)
30%-60%	1 (1%)	14 (4%)	17 (3%)
>60%	4 (5%)	12 (4%)	28 (6%)
<b>Total Consumers Exporting higher than consumption</b>	<b>6</b>	<b>35</b>	<b>56</b>
<b>Total Consumers</b>	<b>74</b>	<b>318</b>	<b>505</b>
<b>% of Consumers availing benefit</b>	<b>8%</b>	<b>11%</b>	<b>11%</b>

3.10. From the above table it is observed that ~65% of LT consumers and 11% of HT Consumers are availing the commercial benefit of Net Metering which predominantly defeats the objective. Such installation though needs to be for captive consumption, the consumers are availing this benefit for commercial interest by exporting more power at APPC rate.

3.11. Therefore, this practice has led to exploitation of net metering concept for commercial interests and eventually defeating the whole idea of harnessing solar power and also promoting rooftop solar projects in order to meet the captive demand. This is not only adversely impacting the Distribution Licensee financially but technically also (disturbance in Distribution Network).

3.12. Rate of Return depends on the risk i.e. higher the risk, higher is the rate of return and vice versa. Usually the rate of return depends on the risk-free return plus the risk within the business. Accordingly, the Commission has provided the Return of Equity (RoE) of 17.5% for supply business compare to 15.5% in Generation, Transmission and Distribution business as the risk in supply business is on the higher side. However, it is submitted that the 15.5% and 17.5% RoE for any unregulated business may be on a

higher side considering the competition in the market as well as the economic situation. In the case of net metering, whereby the consumer install the solar rooftop in their own premises and earn credit on the same, the risk of such business model is relatively nil or low and therefore on the principle of equality and natural justice, the reward for such consumers needs to be within the limit of Risk Free Return i.e. ~8% (Government based bond) plus certain premium. However, it has been observed that due to net metering regulations, the return for such consumers is higher than 25% which itself is too high and at present is not availed by any business in this country. The same is highlighted in the table below:

#### Net Saving to Consumers due to Net Metering

Category of Consumers	Capacity as on Oct 2018	Solar Offset units	Bill Before Net Metering	Bill Post Net Metering	Benefit		Cost of Solar Generation *	Banked Units	Surplus units Purchased	Net Saving	
	MW	MUs	Rs. Crore			%	Rs. Crore	MUS	Rs. Crore		%
LT	94.29	39.83	136.51	88.36	48.15	35%	14.60	1.871	0.67	34.23	25.1%

\* - Cost of solar Generation considered @Rs. 3.5/kwh

- 3.13. Considering the above return at the cost of the other consumers of Distribution Licensee, MSEDCL proposes to introduce the Gross Metering Regulations whereby Consumer who implement Solar Rooftop is also rewarded with the returns by saving in their bill by way of reimbursement of the cost of power injected in the grid and also the consumers of Distribution Licensee is not affected by loss of cross subsidy.
- 3.14. Andhra Pradesh have provided an option of Gross Metering to the consumers, In Karnataka residential, schools and hospitals can opt for Gross Metering whereby the energy generated through roof top system is exported to the Grid. In Uttar Pradesh, for third-party owners entering into a commercial agreement for the rooftop in the premises of the consumers will have to go via a gross-metering method with the DISCOM. Also, Delhi has provided an option of Gross Metering in their Draft Regulations.
- 3.15. Germany is the most well-known example of a successful propagation of the gross metering concept. The recent trend in Japan has been to progressively move towards a gross metering model with Feed in Tariff (FiT) mechanism.
- 3.16. MSEDCL has proposed to introduce Gross Metering in the State wherein all the electricity generated by the Rooftop RE System shall be exported to the grid and all the electricity required for consumption by the consumer shall be continued to be imported from the grid as earlier and the consumers are paid a Feed-in-Tariff (FiT) for the electricity exported to the grid.
- 3.17. At present the consumers with rooftop RE systems i.e. the consumers under Net Metering have been exempted from the application of Wheeling Charges and Losses.

However, the Commission in its practice directions dated 30th September 2016 has recognized the impact of wheeling charges and the same has been reproduced below:

*“The Supply Licensee shall pay the Wheeling Charges, as approved by the Commission for a particular financial year and corresponding to the unadjusted net credited Units of electricity at the end of that year, to the Wires Licensee.”*

- 3.18. MSEDCL being both the wire and supply licensee, it needs to recover such wheeling charges from its consumers. As the Wheeling Charges are determined based on the sales recorded at different voltage levels i.e. energy sales to consumers at various voltage levels, the sales under Net Metering are not reflected in the total Sales thereby resulting in higher Wheeling Charges. Hence the consumers not availing Net Metering are therefore paying such increased wheeling charges. Therefore, it has requested Wheeling Charges and Losses applicable on the total consumption of power.
- 3.19. Since the distribution infrastructure is created for the consumers considering their connected load, the load of the consumers availing net metering is automatically considered while planning and creating the distribution infrastructure. Therefore the wheeling charges and losses shall be made applicable to consumers availing net metering for recovery of distribution infrastructure cost.
- 3.20. Additionally, the distribution licensee is required to wheel the energy for compensating the units banked by the Net Metering Consumers. As such banking mechanism involves wheeling of power. Therefore Wheeling Charges and Loss should be made applicable on the Net Metering Consumers on the total banked units for recovery of distribution infrastructure cost.
- 3.21. With large number of rooftop solar power systems, it has become difficult for distribution utilities to maintain the stability of the local grid as Utilities have to maintain the distribution voltage within specified limits to provide reliable power to their consumers. However, conventional grids were not designed considering the rooftop solar power systems and other characteristics of RE power such as intermittent output and safety-triggered circuit trips. Such typical characteristics of RE power have aggravated the issue of voltage instability in the Grid. Further, there are a number of technical barriers due to Net Metering which results into more operation & maintenance and augmentation of the distribution system. Some of the common technical challenges faced due to net metering have been listed below:
- a) Fluctuation and Imbalance in voltage
  - b) Electrical disturbance by loads
  - c) Transmission of unwanted current in the Grid
  - d) Unintentional islanding
  - e) Reverse Power Flow



3.22. Due to the above technical barriers, the cost of O&M and system augmentation has also increased which is adversely impacting the financial position of MSEDCL.

3.23. Considering all the above submissions, it requested to make Wheeling Charges and Losses applicable on the total consumption of power / Banked Units by Net Metering Consumers for recovery of distribution infrastructure cost and such increased system O&M and augmentation cost.

3.24. Also, considering the enormous growth of Solar Rooftop installation and envisaging its impact on the distribution network, many States in India such as Madhya Pradesh and Haryana and also internationally some of the countries like Germany and UK has proposed a cap on cumulative capacity of Solar PV systems in area of distribution licensee which is highlighted as below:

- Madhya Pradesh – The Distribution Licensee shall provide to the Eligible Consumer net metering for such period that the cumulative capacity (in MW) does not exceed the target capacity of 10 MW
- Haryana – The maximum installed capacity (Roof top PV) is restricted to 200 MW in the area of supply of each licensee.
- Punjab –The distribution licensee shall provide net metering arrangement to eligible consumers as long as the total capacity (in MW) of rooftop solar systems does not exceed the target capacity determined by the Commission.
- Germany –Target of 52 GW for whole country
- UK –The FiT rate for various categories changes as often as every 3 months depending on the achievement in capacity addition.

3.25. MSEDCL has also referred to various international studies / experiences relating to installation of Solar PV. While referring case of Germany, MSEDCL has stated that Germany which has witnessed exponential growth in solar PV systems including rooftop systems, the government had to gradually withdraw its support to solar PV systems in the form of incentives and rebates in order to control the solar PV installation in the country which was not only adversely affecting the distribution utilities but also affected the network grid technically. Maharashtra has also witnessed a similar exponential growth in the rooftop solar PV installations in the last few years. While referring to experience of California, it stated that rooftop solar PV systems have significantly impacted the grid and some grid areas have displayed increased wear on tap changing transformers, indicating frequent switching operations to be necessary for voltage control. The issues encountered by Californian distribution grid operators included load imbalances due to the primarily single phase connections of load and PV generation and protection issues caused by reverse power flows, which should also be considered in Indian grid. Recently, California introduced Time of Day (ToD) rate i.e. variable pricing for residential customers, where rates are lower during times of high supply and low demand, and vice versa. Such measures taken by the government

clearly indicate that rooftop solar PV systems have grown rapidly in the state and are significantly impacting network components and its operations. Further, there is a 'Net Metering Cap' in California in which the net metering program allows a maximum of 5% of peak electricity demand (the net metering "cap") to come from solar panels.

- 3.26. It is further stated that ABT compliant meters should be mandatorily used for Industrial and Commercial category consumers utilizing the energy generated from Rooftop RE Systems towards fulfilling their RPO targets. Further, for the purpose of energy accounting and settlement, the net electricity exported/imported during the billing period shall be adjusted in 15 minutes time block.
- 3.27. The rooftop installations having capacity more than 20KW, the main meter shall be of 0.2s class accuracy and with facility for recording meter readings using Meter Reading Instrument (MRI) or wireless equipment. Further, the check meters must be mandatory for Rooftop RE systems having capacity more than 20 KW. Similar provisions are also available in GERC Regulations for Net Metering Rooftop Solar PV Grid Interactive system, 2016. The cost of new/additional meter(s) shall be borne by the eligible net metering consumers and such meter(s) shall be tested and installed by the Distribution Licensee.
- 3.28. The MERC (Net Metering for Roof-Top Solar Photo Voltaic Systems) Regulations, 2015 is silent on the provisions in relations to approval of Net Metering Connection to the consumers whose arrears are still pending with the Distribution Licensee. It is submitted that certain cases have been experienced whereby consumers are applying for net metering, even when the arrears are pending. The Regulations need to be amended for allowing the implementation of Net Metering arrangement only if the arrears with the Distribution Licensee have been paid.
- 3.29. The tests as per EN 50160 and as per distribution licensee's standard shall be carried out by the Chief Electrical Inspector to ensure the quality of power generated from the Rooftop RE System.
- 3.30. Many other States have catered to the above issues raised and have provided for a more balanced Regulations. Provisions under the Rooftop Solar Regulation in other States are as under:

Sate	Provision
Gujarat	<ul style="list-style-type: none"> <li>Cap on individual capacity (except Residential Consumers): 50% of consumer's sanctioned load/contract demand; Provided that the installed capacity shall not be less than 1 kW and shall not exceed 1 MW.</li> <li>Banking of energy shall be allowed within one billing cycle of the consumer (For Industrial, Commercial and Other Consumers except Residential and Government)</li> <li>For Industrial, Commercial &amp; Other (Other than Residential &amp; Government) using energy attribute for RPO compliance, Excess energy</li> </ul>

Sate	Provision
	<p>injected during the billing period after adjustment of consumption in 15Min time block is purchased by Distribution Licensee at the APPC rate determined by the Commission.</p> <ul style="list-style-type: none"> <li>For Industrial, Commercial and Other Consumers utilizing the 'energy attribute' and utilizing the 'renewable attribute' for REC. - Excess energy injected during the billing period after adjustment of consumption in 15Min time block is purchased by Distribution Licensee at the 85% APPC rate determined by the Commission.</li> </ul>
Madhya Pradesh	<ul style="list-style-type: none"> <li>The Distribution Licensee shall provide to the Eligible Consumer net metering for such period that the cumulative capacity (in MW) does not exceed the target capacity of 10 MW</li> </ul>
Karnataka	<ul style="list-style-type: none"> <li>Option for Gross metering is provided.</li> <li>For Gross Metering- Exclusive line to be laid from Solar Plant to Distribution System for which cost to be borne by consumer.</li> <li>For Gross Metering, if import energy is recorded, it will be charged at higher rate out of a) Tariff agreed in to PPA approved by commission or b) Prevailing retail supply tariff.</li> </ul>
Telangana	<ul style="list-style-type: none"> <li>Option for Gross metering is provided.</li> <li>Gross metering &amp; Net metering is not allowed in same premises.</li> <li>Option to choose Gross metering at 11KV &amp; Above at average rate or price from latest Solar PPA by Distribution licensee approved by commission.</li> </ul>
Haryana	<ul style="list-style-type: none"> <li>The maximum installed capacity (Roof top PV) is restricted to 200 MW in the area of supply of each licensee.</li> </ul>

4. The proceedings of the hearing were held on 22 February, 2019:

4.1. Azure Power filed its submission at hearing for intervention in the instant proceeding stating that it has set up three Rooftop projects in Maharashtra and any amendment to the existing Regulations shall have directly impact on it. Further, it is stated that amendments to the existing Net Metering Regulations cannot be done by way of filing a Petition, any amendment shall be done through public consultation process only.

4.2. The representative of MSEDCL reiterated its submission as made in its Petition and stated that the Commission may follow the due public consultation process for amendment of Net Metering Regulations as contemplated in the Act.

### Commission's Analysis and Rulings

5. The Commission notes that MSEDCL has filed this Petition to highlight adverse implication of Net Metering Regulations that can occur if exponential growth in consumers opting for Solar Rooftop PV under net metering arrangement continues in

coming years. MSEDCL in its Petition has not only highlighted financial implications but has also mentioned technical issues relating to Grid Operations on account of increased penetration of Solar Rooftop PV. On the technical issues, MSEDCL has mentioned generally about the adverse impact without giving any details in technical terminologies and the numbers. Also, MSEDCL has mentioned about the requirement of large funds to offset the adverse technical impact due to penetration of Solar Rooftop but has not given any details as to what measures were implemented till now and what was the costing involved for the same.

6. In addition to details of its own experience with existing Solar Rooftop PV consumers, MSEDCL has submitted international studies / experiences to support its request of amendment of MERC Net Metering Regulations and introduction of Gross Metering concept as against existing Net Metering arrangement. MSEDCL has also requested to make other amendments in existing Net Metering Regulations such as applicability of Wheeling Charge and Losses, installation of ABT meter, condition of no-arrears for availing net-metering arrangement etc.
7. The Commission had notified the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015 on 10 September, 2015. This Regulation has enabled net metering arrangement to the consumers who want to harness Renewable Energy by installing Solar Rooftop PV. This Regulation was part of efforts to create awareness amongst the consumers so as to achieve 40 GW target for Solar Rooftop PV set by the Government of India. Although, during the initial years there were few consumers opting for Rooftop PV, with rationalisation/ reduction in cost of PV panel / module in recent years coupled with technological developments, more consumers are now opting for Rooftop PV under net Metering Regulations. This Regulations was amended vide notification dated 21 July, 2017, for expanding scope of net metering arrangement from Rooftop PV to combination of Renewable Energy Sources.
8. Commission notes that at present only high end consumers are opting for Rooftop PV through net metering arrangement so as to reduce their electricity bill. Although, it is beneficial for such consumer availing net metering arrangement, it reduces the ability of the Distribution Licensee to subsidise low end consumers. With increasing number of high end consumers opting for Rooftop PV through net metering arrangement, this issue may adversely affect the delicate Cross Subsidy balance. Forum of Regulators (FoR) has also initiated the Study on 'Gap assessment for comprehensive metering and accounting framework for Grid connected Solar Rooftop PV in India'. This study has also taken into account the concerns which have been raised by MSEDCL in this petition. As a part of this study, model Regulations has been prepared. The FoR in its Meeting held on 13 November, 2018, has deliberated the Model Regulations / Report and recommended as follows:

*“After deliberations, the Forum endorsed the Model Regulations and Report subject to the following modifications in the Report and Regulations:*

- a. *Focus should be on Roof Top installations and their treatment.*
- b. *Net billing concept will be adopted for the Roof top.*
- c. *The treatment of Distributed Energy Resources (other than rooftop) should be studied further and presented to the FOR.”*

Thus, FoR has also recommended to change the existing net metering system to net billing.

9. In view of the above, the Commission is of the opinion that existing Regulations which enabled net metering arrangement has created sufficient awareness amongst the consumers. Though there is merit in the submissions of MSEDCL, balance has to be maintained while promoting Renewable Energy including PV Rooftop Solar and addressing the key concerns including the technical concerns raised by MSEDCL.
10. Also, since the present Net Metering Regulations are in force, any amendments to the same can be taken up through a Consultative Public Process only. The Commission shall initiate a Consultative Public Process in respect of amending the Net Metering Regulations, 2015 / framing new Regulations for dealing with issues related to Grid connected Renewable Energy Sources. Hence, the following Order:

### **ORDER**

**The Case No. 20 of 2019 is partly allowed in terms of Para 10 above.**

**Sd/-  
(Mukesh Khullar)  
Member**

**Sd/-  
(Anand B. Kulkarni)  
Chairperson**

 <b>(Abhijit Deshpande) Secretary</b>	
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## CEEAMA ACTIVITY

### Siemens Factory visit on 22nd March 2019

19 CEEAMA members visited Siemens MV Switchgear factory at Kalwa for whole day. The visit included product presentation of MV Switchgear, protection relays, Fire alarm system with question and answer session and visit to ACB, MV Switchgear assembly area.

