



**Maharashtra State Electricity Distribution Co. Ltd.**

(A Govt. of Maharashtra Undertaking)

**CIN : U40109MH2005SGC153645**

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Ref. No: SE/TRC/

No 1 4 8 0 9

Date:

17 JUN 2017

To,

The Secretary,

Maharashtra Electricity Regulatory Commission,

13<sup>th</sup> Floor, World Trade Center,

Cuffe Parade, Colaba, Mumbai-400005

**Subject:** Comments on proposed amendment of the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015

**Reference:** MERC Public Notice dated 25.05.2017

Sir,

Hon'ble Commission vide Public Notice dated 25.05.2017 has invited Comments, Suggestions and Objections on Draft MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) (First Amendment) Regulations, 2017 in which amendment to definitions in Regulation 2.1 and 2.2 of the Principal Regulations is proposed.

However, MSEDCL is submitting that there are certain key issues in the Principal Regulations which also need to be considered while amending the Regulations. Therefore, MSEDCL is submitting its comments on the key issues in Principal Regulations as well as on the proposed Amendment.

#### **A. Key Issues in Principal Regulations**

##### **1. Shifting on Gross Metering**

- As provided in the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations 2015, MSEDCL has been allowing the Net Metering in its area of supply to the eligible consumers.
- The Net Metering is preferred by consumers whose consumption falls in higher tariff bracket such as Residential and Industrial etc. (subsidizing consumers). Installations of solar roof top by them bring them to lower consumption bracket and in subsidized tariff category; thereby killing MSEDCL's revenue as more and more consumers

would become subsidized instead of subsidizing. As of now around 65% of residential consumption is in 0-100 units bracket which is subsidized (for FY 17-18 : ABR-Rs.4.87 per unit, ACOS: Rs.6.63 per unit) and with Net metering it will further increase.

- This will result into loss of the Cross Subsidy which will be passed on to the other consumers of MSEDCL increasing the retail tariff.
- However, with Gross metering there would not be any reduction in sales of the subsidising consumers and therefore MSEDCL would not lose the revenue as well as cross subsidy provided by these subsidising consumers. As a result, there will not be any impact on the consumer tariffs. Further, the energy injected by rooftop systems will be utilized for meeting the RPO. Thus Gross Metering will keep the Utility sales intact alongwith the requirement of cross subsidy.
- Tariff 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 in reaching them.
- In FY 16-17 (up to Feb-17) due to Net Metering, MSEDCL has lost is losing revenue of **Rs.53.44 Lakhs** on account of reduction in sales and subsequently cross subsidy on this reduced sales. Gross Impact from the reduced consumption which MSEDCL lost because of net metering considering the net reduction in Power Purchase is given in **Annexure 1** of this submission.
- Andhra Pradesh and Uttar Pradesh have provided an option of Gross Metering to the consumers whereas in Karnataka residential, schools and hospitals can opt for Gross Metering whereby the energy generated through roof top system is exported to the Grid.
- Germany is the most well-known example of a successful propagation of the gross metering concept. The recent trend in Japan is to move progressively towards a gross metering model with Feed in Tariff (FiT) mechanism.
- Therefore, Hon'ble Commission needs to consider providing Gross Metering arrangement over Net Metering Arrangement in view of the Distribution Company Tariff and Revenue neutrality for promotion of Renewable Energy (RE).

## 2. Visibility of Roof Top RE Installation

- MNRE has set an ambitious target of addition of 4700 MW for Grid Connected Solar Rooftop Systems for Maharashtra. Considering the proposed quantum of Solar Rooftop Capacity, it is required to have visibility system for planning load-generation balance in real time operations to MSEDCL. Without Visibility, it will be difficult to forecast the generation from these sources and balance the load generation.

- In order to match the demand supply, a common visibility of the distributed RE sources needs to be made mandatory. Hence, SLDC or MEDA needs to be entrusted responsibility of devising a common platform for visibility of the generation from Solar Rooftop Systems right from beginning.

### 3. Grid penetration Quantum

- It is necessary to limit the capacity addition in relation to the total Distribution Transformer capacity. The Forum of Regulators (FoR) in its Draft Model Regulations as well as MERC Draft Net Metering Regulations had provided that the cumulative capacity to be allowed at a particular distribution transformer shall not exceed 15% of the peak capacity of the distribution transformer.
- In the present MERC Net Metering Regulations, the eligible consumer is allowed to install Roof-top system up to its Contract Demand (in kVA) or Sanctioned load (in kW) and there is ceiling of 40% of rated capacity of Distribution Transformer which is on higher side.
- Accordingly, MSEDCL suggests that the cumulative capacity to be allowed at a particular distribution transformer shall not exceed 15% of the peak capacity of the distribution transformer instead of present 40% and maximum capacity limit of 50% of consumer's sanctioned load/contract demand for individual roof top installation need to be added in the Principal Regulations.
- MSEDCL suggests that the electricity generated from a solar rooftop system shall be capped cumulatively at 90% of the electricity consumption by the eligible consumer at the end of the relevant financial year.
- There shall be no carry forward to the next financial year and at the beginning of each settlement period, cumulative carried over injected electricity should be reset to zero.
- There are various restrictions provided by various SERCs for operationalizing Net Metering as summarized below:

Sr. No	Sate	Provision
1	Tamil Nadu	Max. allowable capacity for PV installation on Distribution Transformer: 30% of the Distribution Transformer capacity Cap on generation: 90% of the electricity consumption.
2	Rajasthan	Max. allowable capacity for PV installation on Distribution Transformer: 30% of the Distribution Transformer capacity Cap on individual capacity: 80% of consumer's sanctioned load/contract demand.
3	Haryana	Max. allowable capacity for PV installation on Distribution Transformer: 30% of the Distribution Transformer capacity The maximum installed capacity (Roof top PV) is restricted to

		200 MW in the area of supply of each licensee.
4	Gujarat	Max. allowable capacity for PV installation on Distribution Transformer: 65% of the Distribution Transformer capacity Cap on individual capacity: 50% of consumer's sanctioned load/contract demand.

#### 4. Technical Issues

- As per clause 6.1 of the MERC Net Metering Regulations, Licensee has to ensure interconnection. Accordingly, the Distribution Licensee needs to ensure that the inter-connection of the Roof-top Solar System with its Network conforms to the specifications, standards and other provisions specified in the applicable CEA Regulations, and State Grid Code Regulations, 2006, or as may be specified in future.
- However as per State Grid Code / SoP Regulations, the obligation of Licensee is upto point of connection i.e. metering point only and therefore the related specifications and standards regarding Solar Installations beyond the point of supply of connection are beyond the purview of Utility. Being nodal agency, Maharashtra Energy Development Agency (MEDA) may be entrusted the responsibility of specifications and standards regarding Solar Installations beyond the point of supply of connection. Hon'ble Commission may bring in some clarity on this aspect.

**5. Solar Generation Meter:** As per Principal Regulations, generation from PV is considered for RPO compliance of Discom with the consent of consumer and when the Solar Generation meter is fixed by Discom. MSEDCL suggest that the consent provision needs to be excluded from principal Regulations.

#### 6. Definition of Premises

- Definition of Premises may be expanded to bring in the more clarity. Consumer needs to consume electricity in the same premises where Net Metering Arrangement is set up. The definition of premises may include words such as generation and consumption must be in same premises.
- Further, the setting up of RE System should be ancillary to the purpose of the Premises and not the primary activity of the Premises.

#### 7. Stranded Distribution Capacity

- The RE generation is infirm in nature and intermittent. Due to which the distribution capacity gets underutilized and may remain stranded.
- Due to net metering, MSEDCL loses wheeling charges and the deficit in ARR of wheeling business gets spread on the remaining consumers of MSEDCL. Therefore,

Hon'ble Commission to provide a suitable mechanism for recovery of loss of wheeling charges.

#### **8. Applicable Charges**

- Loss of cross subsidy due to net metering needs to be compensated by way of suitable charge. Hon'ble Commission is requested to provide for such charge.
- Considering the fact it is a sort of Open Access for below 1 MVA contract demand consumer, the additional surcharge may be made applicable to all Net Metering Transactions.
- Also net metering based systems owing to their connectivity to grid and banking of electricity, come under the purview of banking and wheeling charges etc. which need to be compensated by way of suitable charge.

#### **9. Clarity with respect to applicability of Regulations & metering needs to be provided:**

- MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015 are applicable to consumers installing Roof top PV Solar Generation facilities below 1 MW. Thus net metering is based on the Generation capacity whereas MERC (Distribution Open Access) Regulations, 2016 are applicable to a Consumer having Contract Demand of 1 MW & above with a Distribution Licensee. In case of Open Access consumer opting for Net Metering clarity needs to be provided with respect to billing, commercial settlement, scheduling of power etc. MSEDCL requests Hon'ble Commission that adverse financial impact on MSEDCL & its Common consumers, arising out of such arrangements should be avoided.
- As per the existing Net Metering Regulations, an Open Access consumer can fulfill its RPO target through solar net metering. All Open Access consumers are required to install Special Energy Meter (SEM). The existing Net Metering Regulation mentions about ToD compatible meters but doesn't recognize Open Access regime.
- It is therefore suggested that ABT compatible metering need to be compulsorily adopted for Industrial and Commercial consumers as adopted in Gujarat Solar Power Policy-2015.
- It is also suggested that the banking facility need not be allowed for the CPP and OA consumers installing RE system under these Regulations for fulfillment of their RPO target as the segregation of energy injected into the Grid through same meter is not possible. For such cases, the energy exported to Grid shall be treated as lapsed.

#### **10. Solar rooftop experience in USA:**

- Solar Rooftop is being largely promoted in developed countries like USA since last 4 years targeting household and commercial customers by providing various facilities such as net-metering, purchase of surplus power by utility etc. Therefore, it is pertinent to study their experiences of solar roof top. Many issues are being faced by

the utilities there and consequently they have taken various steps to restrict solar rooftop. It is not out of place to share some of the experiences of US utilities in this context. (The following information is obtained from internet).

*A spokesperson of Arizona Public Service—the state's largest utility called the growth of rooftop solar in Arizona "explosive," but out of sync with how people consume energy. They get the credit for the solar they overproduced that went on to a system that is super saturated with excess generation. Solar 'overproduces' during the midday when it is churning out the most power, but that's not when the utilities and their customers need it. Energy use peaks in the evening as people come home. When the solar is not producing, they have been allowed to bank the credit for their excess generation, however useful or useless it was. According to many utilities, this amounts to a subsidy, which shifts the costs onto all the other ratepayers.*

*Several utilities, including Arizona Public Service and Denver-based Xcel Energy, have asked their state regulators to reduce incentives or impose charges on customers who install rooftop solar.*

*Duke Energy, the largest utility in the U.S., has so far succeeded in keeping third-party solar illegal in North Carolina. Duke Energy has claimed that rooftop solar hurts the poor by causing rate increases. The company opposed the Energy Freedom Act, a bipartisan bill to legalize third-party solar. At least four states—Florida, Kentucky, Oklahoma and North Carolina—currently ban third-party sales of solar energy.*

**The Nevada decision:**

*Nevada State has the highest percentage of solar energy in the union. On December 23, 2015, the Nevada State Legislature passed Senate Bill 374, following which the state Public Utilities Commission cut the rate payable to owners of domestic solar installations who sell surplus power to Nevada Energy. The rationale was that intermittent solar power sold to the NV Energy grid "differs from" the dispatchable power the grid sells back and that domestic solar owners were getting paid too much for the former and not paying enough for the latter: The state regulators levied \$126 million in exit fees on three casinos seeking to negotiate their own direct power purchases. Then gave Nevada Energy an enormous increase in residential rooftop solar fees, while drastically cutting what the utility pays those customers when they feed electrons back into the grid. These changes were initially retroactive to some 10,000+ Nevada households who had already leased solar and were stuck with the costs. Effectively the new rules make rooftop solar no longer competitive in Nevada.*

**Key observations:**

**Financial Barriers:**

**Net Metering:** *Typical net metering rate structures made it impossible for electricity providers (utilities) to recover their costs in markets with a large penetration of rooftop solar.*

*Customers with solar panels buy less energy from the grid, operated by the utilities. Utilities often have to pay owners of home solar installations for the surplus energy their panels return to the grid.*

*Generally utilities operate with a mismatch between fixed and variable costs versus fixed and variable revenues. Policies that reduce electricity sales, such as net-metering, can prevent a utility from recovering its costs, which are largely fixed. Such net-metering policies are eating into the cost recovery for the assets and thus rooftop solar can actually ruin the balance sheet of an electric utility.*

**Technical Barriers:**

*Large amounts of rooftop solar make it difficult for utilities to maintain the stability of the local grid.*

*Utilities have to maintain the distribution voltage within specified limits to provide reliable power to their customers. However, conventional grids were not designed with solar in mind and some solar generation characteristics, such as intermittent output and safety-triggered circuit trips, aggravate voltage instability.*

- Thus, it can be seen that excessive growth of rooftop solar can severely affect the finances of host Discom on one hand and can affect the Grid stability due to voltage fluctuations on the other hand. Therefore, US utilities have taken various steps to restrict solar rooftop such as capping of net metering capacity, ban on third party solar, increase in grid access fees / exit fees, reduction in net metering rates etc.

In view of the above, MSEDCL submits that all these issues need to be scrutinized and conscious decision needs to be taken.

**B. Comments on Proposed Amendments in Principal Regulations**

The MSEDCL's comments on proposed amendments in Principal Regulations are as under.

**1. Inclusion of all RE Sources**

- The proposed amendment intends to enlarge the ambit of existing MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015 by encompassing all approved RE sources and a combination thereof i.e. hybrid systems.
- As per proposed amendment Renewable energy means the grid quality electricity generated from Renewable Energy Sources, including a combination of such sources. In view of above, following needs to be considered:
  - Net Metering is allowed only for Solar PV Systems as the basic intention was to promote rooftop Solar systems as envisaged in National Tariff Policy. However the expansion of such facilities to all the renewable Energy sources needs to be

cautiously considered. Each RE generation has its unique characteristics and system requirement. Traditionally distribution system has been evolved by considering unidirectional power flows. At present Roof top solar PV penetration in local grid is in nascent stage and MSEDCL needs to be allowed to gain experience of handling bi directional flows.

- MSEDCL suggests that the firm RE power sources shall not be brought under the ambit of Net Metering. Net Metering is enabling provision by which RE source which is infirm in nature by virtue of grid connectivity banks energy during surplus generation and uses it when required. As consumer with firm sources has certainty in generation, firm Power sources do not require such privileged meant for infirm sources.
- Schedulable RE power shall not be brought under the ambit of Net Metering Regulations. Further it is necessary that fossil fuel viz. coal, gas, lignite, oil, naphtha etc. shall not be allowed.

## **2. Hybrid Systems:**

- The Net Metering facility is extended to the consumers having generation in its premises with a capacity less than 1 MW. Only Solar and Wind generation at most satisfy the above condition.
- After enabling combination of RE Technologies, the metering issues need to be elaborated further. The Hon'ble Commission has specified separate targets for the Solar and Non-Solar energy sources. In such condition, the Hybrid energy banked into the Grid cannot be segregated and therefore, it will be difficult to consider solar and Non-Solar target separately. MSEDCL requests the Hon'ble Commission to devise a separate mechanism for billing of such consumers or merge solar and non-solar RPO targets as has been requested by MSEDCL to the Hon'ble Commission vide its Petition dated 8<sup>th</sup> August 2016 bearing Case No. 108 of 2016.

## **3. Ensuring quality of RE Systems:**

- It is very necessary to ensure quality of RE power technology commissioned under this regulation. Technology standards for roof top RE generation and mechanism to ensure sticking to such standards are not yet defined, in absence of standardization, opening up segment under net metering to all RE will be detrimental to system.
- It is suggested that only new plant and machinery shall be eligible for installation under these Regulations. After commissioning of project the installation shall not be allowed to be transferred inter se or from one location to another.
- A unit certificate regarding conformity with all requirements needs to be mandatory. For grid connected utility grade RE systems, MEDA is nodal agency which ensures technology related aspects. On the similar lines MEDA needs to be vested with power to ensure quality of RE systems being installed.



- In Gujarat, registration with Gujarat Energy Development Agency (GEDA) is mandatory. Further, all installations wiring and earthing diagram, single line diagram and wiring diagram require approval of Chief Electrical Inspector.

#### 4. Other Challenges:

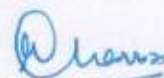
- The RE penetration in the grid poses new challenges and problems to the network operators as these can have a significant impact on the system and equipment operations in terms of steady-state operation, dynamic operation, reliability, power quality, stability and safety for both customers and electricity suppliers.
- Distributed generation of different voltage levels when connected to the power system network could influence the voltage regulation, sustained interruptions, harmonics, sags, swells, etc. Power quality issues pose serious problems such as neutral heating, high neutral currents, overheated transformers, voltage flickering etc.
- With proliferation of RE Generators on LT level, operational challenges such as demand balancing, variability etc. will come in picture.

#### 5. Reactive Energy Charges

- Wind Power generators are Induction generators which absorb reactive energy during operation. Hence the Hon'ble Commission is requested to provide suitable mechanism for billing of reactive energy.

MSEDCL requests the Hon'ble Commission to consider the aforementioned comments while finalization of MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) (First Amendment) Regulations, 2017 and to take on record.

Yours Sincerely,



(Satish Chavan)

Executive Director (Commercial)

**Annexure 1**

Category	Sanctioned Load (Kw)	Consumer (Nos)	Solar Rooftop Capacity (Kw)	Net Billed Units (Mus)	Net Billed Amount (Rs) (Y)	ABR (Rs/Unit)	Solar Offset Units (Mus)	Total Units (Mus)	Energy charges for Total Units (X)	Gross Impact up to Feb'17 (X-Y) (Rs Lakhs)	Corresponding PP cost at Marginal variable cost (Rs)	Net Impact up to Feb'17 (Rs Lakhs)
HT INDUSTRY 33 KV	21587	9	5411	4.17	294.60	7.09	0.47	4.63	327.96	33.37	12.06	21.31
HT COMMERCIAL 11 OR 22 KV	5965	16	1847	1.36	151.25	11.24	0.16	1.52	168.84	17.59	4.02	13.57
HT INDUSTRY 11 OR 22 KV	12071	24	4473	7.26	511.97	7.06	0.22	7.48	527.28	15.32	5.62	9.70
HT PUBLIC SERVICE OTHERS 11/22	5145	14	1819	1.71	149.87	8.87	0.13	1.84	161.09	11.23	3.31	7.92
GOVT.-ZP-ESIS ( B.P)	310	2	70	0.03	3.79	11.38	0.01	0.04	4.76	0.98	0.22	0.75
HT SEASONAL 11 OR 22 KV	105	1	40	0.04	3.12	7.83	0.00	0.04	3.41	0.29	0.10	0.20
<b>TOTAL</b>	<b>45183</b>	<b>66</b>	<b>13660</b>	<b>14.57</b>	<b>1114.59</b>	<b>8.6</b>	<b>0.99</b>	<b>15.55</b>	<b>1193.36</b>	<b>78.77</b>	<b>25.33</b>	<b>53.44</b>



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Date: **20 JUN 2017**

To,  
Secretary,  
Maharashtra Electricity Regulatory Commission,  
13<sup>th</sup> Floor, World Trade Center,  
Cuffe Parade, Colaba, Mumbai-400005

**Subject:** Proposed amendment of the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) Regulations, 2015 – Additional Comments thereof

**Reference:** i. MERC Public Notice dated 25.05.2017

ii. MSEDCL letter No. SE/TRC/No.14809 dated 17<sup>th</sup> June 2017

Sir,

MSEDCL vide its Letter No. SE/TRC/No.14809 dated 17<sup>th</sup> June 2017 has submitted its comments on the key issues in the Principal Regulations as well as on the proposed amendments. MSEDCL feels there are certain more issues which needs immediate attention of Hon'ble MERC. Therefore, MSEDCL is hereby submitthe additional commentsregarding the same before the Hon'ble Commission as below:

**1. Energy Accounting and Settlement - APPC**

Regulation 10.3 of the Principal Regulations provides that the unadjusted net credited Units of electricity as at the end of each financial year shall be purchased by the Distribution Licensee at its Average Cost of Power Purchase as approved by the Commission for that year. MSEDCL submits that the APPC is bound to change year on year and with such uncertainty, it will be difficult for MSEDCL to assess the impact of such purchase on its overall cost. The rate for purchase of unadjusted net credited Units of electricity should be constant throughout the life of the project. Hence, MSEDCL suggests that the unadjusted

net credited Units of electricity as at the end of each financial year shall be purchased by the Distribution Licensee at APPC rate determined by the Commission for the year in which the Rooftop Solar PV System is commissioned. Accordingly, the said APPC rate shall be fixed for entire project life. This is in line with the Feed-in Tariffs approved by Hon'ble Commission applicable to RE projects commissioned during the year. The Feed in Tariff approved for that year is constant for the period of agreement.

## **2. Energy Accounting and Settlement – billing of net units on monthly basis**

Regulation 10.2 of the principal regulation provides that for each Billing Period, Distribution Licensee shall show separately the net quantum of electricity Units carried over to the next Billing Period.

MSEDCL submits that there should be monthly settlement of electricity units both at the net energy consumption and net energy generation by the net metering consumer. This means that the unadjusted net credited units of electricity as at the end of each billing period shall be purchased by the Distribution Licensee at its Average Cost of Power Purchase as approved by the Commission for that year in the next billing period. Provided that, at the beginning of each Settlement Period, the cumulative quantum of injected electricity carried forward will be re-set to zero.

Previously, in its comments submitted vide letter dated June 17, 2017, MSEDCL has suggested that the electricity generated from a Solar Rooftop system shall be capped cumulatively at 90% of electricity consumption by the eligible consumer at the end of the relevant financial year. MSEDCL suggests a revision in the above said comment and suggests the following:

The electricity generated from a Solar Rooftop system shall be capped at 90% of electricity consumption by the eligible consumer at the end of the relevant billing period. At the beginning of each Settlement Period, the quantum of injected electricity carried forward will be re-set to zero.

## **3. ABT Compatible Meters**

MSEDCL submits that for Industrial and Commercial category consumers utilizing the energy generated from for Rooftop Systems for RPO, use of ABT compliant meter must be made mandatory. For energy accounting and settlement purpose, the net electricity exported/imported during the billing period shall be adjusted in 15 minutes timeblock.

For rooftop installations having capacity more than 20kW, the main Solar Meters 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 Systems having capacity more than 20 kW. Similar provisions are available in GERC Regulations for Net Metering Rooftop Solar PV Grid Interactive Systems, 2016. The cost of new/additional meter (s) shall be borne by the Eligible Consumer and such meter shall be tested and installed by the distribution licensee

**4. Testing of Installation:**

MSEDCL suggests that the tests as per EN 50160 and as per distribution licensee's standards shall be carried out by the Chief Electrical Inspector to ensure the quality of power generated from the Rooftop Solar PV System.

MSEDCL requests the Hon'ble Commission to consider the aforementioned comments while finalization of MERC (Net Metering for Roof-top Solar Photo Voltaic Systems) (First Amendment) Regulations, 2017 and to take on record.

Yours Sincerely,



(Satish Chavan)

Executive Director (Commercial)