

To,

**The Secretary,**

Maharashtra Electricity Regulatory Commission,  
13<sup>th</sup> Floor, Centre No.1, World Trade Centre,  
Cuffe Parade, Mumbai – 400 005

**Sub:** MSEDCL comments on proposed Draft Maharashtra Electricity Regulatory Commission (Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019.  
**Ref:** MERC Notification on Draft(Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019 dated 26.10.2019.

Respected Sir,

The Hon'ble Commission has come out with the Draft(Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019. Hon'ble Commission has invited Comments/Suggestions on the draft regulations on or before 25<sup>th</sup> November 2019. In response to the same, MSEDCL is submitting its comments/suggestions in the following paragraphs:

## I. Background & Status

### 1. Introduction:

The key objective of introducing Net Metering in power sector is to bring awareness among the consumers for promoting the harnessing of renewable energy (especially solar) on roof top basis by way of distributed generation so that the energy generated shall be consumed in the same premises to reduce the infrastructure cost.

The Hon'ble Commission had earlier notified the MERC (Net Metering for Roof-top Solar Photo Voltaic Systems Regulations), 2015 to meet policy objective of promotion of RE which were applicable for all the consumers including industrial and commercial installing a Roof-top Solar PV system from 1 kW to 1 MW generation from roof top. Subsequently, the Hon'ble Commission issued the 1<sup>st</sup> Amendment to the Net Metering Regulations 2015 on 21<sup>st</sup> July 2017 encompassing all approved RE sources including a combination thereof i.e. hybrid systems for all categories of consumers.

Now, after implementation of net-metering regulations for around four years and fulfillment of objectives of bringing awareness among consumers regarding development of RE (Solar) on roof top, now the Hon'ble Commission on 26.10.2019, has come out with new draft Regulations namely: Draft (Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019. The salient features of these draft regulations are:

- Net Metering arrangement is allowed only for Residential category upto 300 units.
- Net Billing arrangement introduced and allowed for all other category of consumers and capacity limit of 1 MW for RE generator has been removed.

## 2. National Scenario of rooftop system:

A brief comparative chart of the major states wherein Rooftop regulations have been devised is given below:

Particulars	Maharashtra (2015)	Rajasthan (2015)	Gujarat (2016)	Telangana (2016)	Haryana (2019)	U.P (2019)
Metering	Net metering	Net metering	Net metering	Net/Gross Metering	Net Metering	Net/Gross Metering
Consumer Categories allowed	All Categories	All Categories	All Categories	All Categories	All categories, but not to OA consumers	<b>Net/gross metering:</b> LMV (low and medium voltage) 5 (agriculture) LMV 1 (residential)
RE installed Capacity allowed	less than 1 MW but upto Contract Demand or Sanctioned load of Consumer	Not less than 1 kW and not exceeding 1 MW but upto 80% of Contract Demand or Sanctioned load of the consumer	Not less than 1 kW and shall not exceed 1 MW but upto 50% of consumer's sanctioned load/contract demand of consumer; for Residential Consumers, no restriction	Not less than 1 kW and shall not exceed 1 MW but upto 80% of consumer's sanctioned load/contract demand of consumer; for Residential Consumers-100%	Less than 2 MW but upto the connected load/contract demand of the consumer. Upto 500 MW maximum capacity in each license area.	Not less than 1 kW and shall not exceed 2 MW but upto 100% of Contract Demand or Sanctioned load of Consumer
Banking	Yearly basis	One billing cycle with a cap of less than 50 units.	one billing cycle of the consumer	6 months	Yearly basis	One billing period
Others	DT capacity shall not exceed 40% of its rated capacity	DT. capacity shall not exceed 30% of its rated capacity	DT Capacity shall not exceed 65% of its rated capacity	DT Capacity shall not exceed 50% of its rated capacity	DT Capacity shall not exceed 30 % of its rated capacity	DT Capacity shall not exceed 75% of its rated capacity

From the above, it is very clear that right from the beginning, Gujarat has allowed the consumer to install rooftop capacity only upto 50% of sanctioned load/ contract demand with monthly banking arrangement. On similar line, the state of Rajasthan allows roof top installation for a consumer only upto 80% of his Contract Demand and banking within one billing cycle with a cap of less than 50 Units. Further, Uttar Pradesh also allows banking within one billing period only and has made only residential and agriculture consumers, eligible for net metering.

### **3. International Scenario of rooftop system:**

Following paragraphs describe in brief, net-metering/net billing arrangement in few of the pioneer countries like Germany and Japan:

#### **a. Germany:**

In Germany feed in tariff system is adopted for rooftop solar PV system. In 2012, the government introduced 'Floating Cap' system in which the Feed in Tariff rate was reduced for small rooftop Solar PV systems by almost 20%. In order to alleviate the adverse impact of rooftop solar PV system on the network, the Government, again further introduced a 'Cap' in capacity addition which was limited to 2.5 to 3.5 GW per year. In addition to yearly 'Caps' there was an 'Absolute cap' of 52 GW for the total installed capacity of Solar in Germany.

Thereafter in the year 2014, Germany withdrew the government support wherein in rooftop solar PV installations beyond the target of 52 GW would not receive any funding through Feed in Tariff rate payments.

#### **b. Japan:**

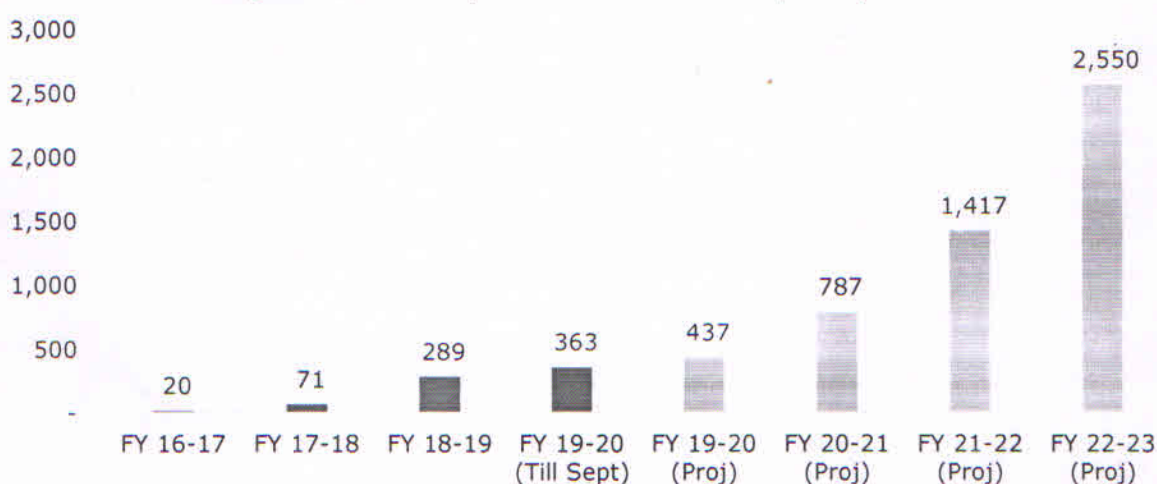
In Japan also feed in tariff system is adopted for rooftop solar PV system , As the rooftop solar PV capacity installation observed an exponential growth in the country, the Government introduced a 'National FIT' program in which the focus shifted from the traditional residential segment to non-residential by providing incentives to the latter. The Government was making several efforts to alleviate the adverse technical impact of rooftop solar PV systems on the distribution network.

From the aforementioned international scenario, it can be concluded that in the developed countries also, the roof top solar plants are being developed through Feed-in tariff mechanism only. Also, to limit the impact of roof top system on the grid, ceiling in the capacity addition/ installed capacity was also introduced by such countries.

#### 4. Status of implementation of Rooftop in Maharashtra

The state of Maharashtra has the highest rooftop capacity of 363 MW till Sep-19 in the country. An exponential growth has been witnessed in Rooftop Solar PV installations in MSEDCL License area with the cumulative capacity installation rising 10 times i.e. from 20.44 MW (1074 net metering connections) in FY2016-17 to 288.80 MW (14392 net metering connections) in FY 2018-19. Also, only for the six month period (Apr-Sep) in FY 2019-20, the capacity has risen to 363.03 MW (20072 net metering connections) resulting in CAGR of 178%. Even considering the growth rate of 80% YoY, the roof top capacity is expected to reach beyond 2,500 MW by FY 2022-23 as depicted in the graph given below:

**Projected Rooftop PV Cumulative Capacity in MW**



Consumer category wise Installed Capacity and Energy Generation is provided tabulated below:

Financial Year	Tariff Category	Nos (Cumulative)	Solar Capacity (Cumulative) (MW)	Solar generation (MU)
<b>FY 2016-17</b>				
HT	Industrial	39	10.59	1.25
	Commercial	19	1.97	0.27
	Group Housing Society	-	-	-
	Others	20	2.15	0.18
	<b>Total</b>	<b>78</b>	<b>14.71</b>	<b>1.70</b>
LT	Industrial	613	1.81	0.83
	Commercial	216	1.85	0.75
	Residential	67	0.97	0.12
	Others	100	1.10	0.36
	<b>Total</b>	<b>996</b>	<b>5.73</b>	<b>2.06</b>
<b>Grand Total</b>		<b>1,074</b>	<b>20.44</b>	<b>3.76</b>
<b>FY 2017-18</b>				

Financial Year	Tariff Category	Nos (Cumulative)	Solar Capacity (Cumulative) (MW)	Solar generation (MU)
HT	Industrial	133	20.26	46.94
	Commercial	54	6.53	7.42
	Group Housing Society	4	0.92	2.37
	Others	63	6.21	9.62
	<b>Total</b>	<b>254</b>	<b>33.92</b>	<b>66.35</b>
LT	Industrial	3,498	16.89	9.55
	Commercial	870	11.22	10.53
	Residential	158	3.45	1.71
	Others	362	5.66	0.00
	<b>Total</b>	<b>4,888</b>	<b>37.21</b>	<b>21.79</b>
<b>Grand Total</b>		<b>5,142</b>	<b>71.13</b>	<b>88.14</b>
<b>FY 2018-19</b>				
HT	Industrial	352	96.97	117.57
	Commercial	155	23.36	18.80
	Group Housing Society	21	4.00	4.16
	Others	172	31.23	43.69
	<b>Total</b>	<b>700</b>	<b>155.56</b>	<b>184.22</b>
LT	Industrial	9,820	66.85	27.59
	Commercial	2,392	35.68	22.55
	Residential	423	11.13	6.28
	Others	1,057	19.58	12.85
	<b>Total</b>	<b>13,692</b>	<b>133.24</b>	<b>69.28</b>
<b>Grand Total</b>		<b>14,392</b>	<b>288.80</b>	<b>253.50</b>

The above figures shows that out of the total installed rooftop solar capacity of 288 MW as on 31<sup>st</sup> March 2019, only 11.13 MW, i.e. 4% of the total capacity is installed by residential consumers and more than 96% of the roof top capacity is installed by other subsidizing consumers. Currently, only subsidizing consumers, particularly Commercial and Industrial consumers are aggressively installing roof top solar plants, taking advantage of high tariff difference on account of cross subsidies.

## 5. Analysis of addition of Solar Capacity through net metering

### a. Effect on Tariff Structure

It is observed that the Net Metering facility is being utilized mostly by high end LT/ HT consumers which are subsidizing consumers and in event of any decrease in consumption by these high end consumers will have a direct impact on additional burden by way of very steep increase in tariff of subsidized consumers, mostly Agriculture, 0-100 unit Residential consumers. After installing renewable roof top power projects, there is decrease in consumption by such high end consumers which is nothing but reduction in subsidizing sales. This is adversely impacting the tariff of other subsidizing and subsidized consumers of

MSEDCL who do not have rooftop RE systems. Thus, more and more consumers are **becoming subsidized consumers** instead of being **the subsidizing consumers**. MSEDCL further submits that it has made an effort to calculate the impact on tariff because of the implementation of Net Metering Regulations till 31<sup>st</sup> March 2019, which comes out to be around Rs. 224 Cr. which will result into rise in tariff on the balance consumers of MSEDCL. The details of the same is provided in Annexure I. If the same is continued to be allowed then considering the exponential rise it will destroy the delicate tariff structure designed in line with the Electricity Act and National Tariff Policy with the provision of Cross subsidy mechanism for giving supply to poor consumers and agricultural consumers at low tariff. Thus, the cross subsidy balance inbuilt in the tariff structure will get disturbed

**b. Inadvertent financial gain**

MSEDCL further submits that in the case of rooftop mechanism, the Net Metering Regulations is not creating a level playing field to all consumers. The roof top systems on net metering basis provides discriminated benefit to different consumers even if they install roof top system of same capacity and generate same quantum of electricity, resulting in different RoE for different consumers. It has been observed that the Return on Equity for high tariff consumers such as Industrial and Commercial is in the range of 40% which itself is too high as compared to the maximum Return on Equity possible for a generation company which is a regulated business as per the Electricity Act 2003. In current MERC Tariff Regulations 2019, the Hon'ble Commission has provided the Return of Equity (RoE) of 14% in Generation Business.

**c. Recovery of Infrastructure cost**

Infrastructure is created to feed total demand of consumer in terms of capacity i.e. kW/MW/KVA. The cost is recovered through wheeling charges on per unit basis. The solar energy is generated during daytime and consumed by the consumer and the balance energy is feed into the grid due to which the utility needs to back down its thermal generation and pay the fixed cost to them without drawing the energy from such generators. When there is no Solar Generation (evening), the consumer draws full power as required by him from the grid and utility has to keep network and generators on bar ready to feed this demand. The consumer is using the grid as a storage system for his solar rooftop arrangement under net metering and at the same time loading all the balancing costs of solar power on other consumers of the distribution utility like generators fixed cost, infrastructure cost recovery etc. Thus, the burden of such unrecovered expenses of net metering networks is passed on to other consumers of MSEDCL.

#### **d. Technical impact**

Rooftop generating systems are distributed type of generation system. With large number of rooftop renewable energy generating systems, it will become difficult for utilities to monitor the stability of the grid. Utilities have to maintain the distribution voltage and frequency within specified limits to provide reliable power to their consumers. However, conventional grids are not designed considering the rooftop renewable power systems and other characteristics of RE power such as intermittent output and safety-triggered circuit tripping. Such typical characteristics of RE power have aggravated the issue of voltage instability and creation of harmonics in the Grid.

#### **6. Solar Capacity Addition Program**

MSEDCL submits that in order to promote renewable energy, sustainable clean environment and to fulfill the RPO Obligations, MSEDCL is always been on forefront in planning prospective power purchase from renewable energy sources. Also, as per the draft RPO Regulations, issued by MERC on 26<sup>th</sup> October 2019, MSEDCL is required to procure atleast 25% of power from Renewable Sources by FY 2024-25 which includes 13.5% of Solar and 11.5% of Non-Solar power. Keeping up pace with the RPO requirement, MSEDCL has tied up total 10,795 MW capacity of Renewable Energy as on 31<sup>st</sup> October 2019 of which 7,654 MW capacity is commissioned. This includes Wind Generation of 3,999 MW, Solar of 4017 MW, Bagasse based cogeneration of 2,406 MW, Biomass capacity of 236 MW, Small Hydro of 121 MW & Municipal solid waste of 16 MW capacity. Further, by the end of FY 2024-25 to meet the RPO target, MSEDCL has planned to increase the solar capacity to 12,500 MW.

Thus, MSEDCL is in consonance with the RPO targets set by MERC and Govt. of India's target to reach 175 GW of RE capacity by 2022. MERC is fully committed to fulfill RPO target by developing RE Projects through centralized inter/ intra state grid connected projects as well as 2-10 MW decentralized solar projects to be developed within 5 km radius of distribution s/s, directly connected to 11 kV bus of substation under Mukhyamantri Saur Krushi Pump Yojana through competitive bidding. Thus MSEDCL has taken proactive measures to promote the growth and development of Renewable Energy in the state.

## **II. Comments on draft regulation**

At present only high end consumers are opting for Rooftop RE through net metering arrangement and although, it is beneficial for such consumer, it reduces the ability of the Distribution Licensee to subsidize low end consumers. The same may destroy the delicate

Cross Subsidy balance mechanism provided in the Electricity Act 2003 and will push the rate of electricity to small and poorer consumers very near to Average Cost of Supply.

RE Net metering arrangement was primarily introduced for promotion of distributed RE generation and bringing awareness among consumers regarding solar generation through roof top arrangement. Moreover the existing Regulations which enabled net metering arrangement has created sufficient awareness amongst the consumers. Already, sufficient leverage has been provided to RE consumers through policy and regulatory measures, but now the time is ripe to strengthen the regulatory provisions so that the interests of both the common consumers as well as RE consumers are safeguarded. The power sector is a regulated sector and Hon'ble Commission has already fixed the RoE in Generation, Distribution and Transmission Sector. Further under net billing system, the Hon'ble Commission has considered the tariff of Rs. 3.79 per unit (As per Generic Tariff Order for RE for FY 2019-20) for Solar Generator considering the RoE which Roof Top RE owner will get. Further net billing is a level playing field in which both subsidized and subsidizing consumers will get same return on equity on installed RE Rooftop. Issuance of Draft Grid Interactive Rooftop Renewable Energy Regulations is the first step in the right direction by Hon'ble Commission.

Also, many other States have catered to the issues raised hereinabove and have provided for more balanced Regulations. Key Provisions under the Rooftop Solar Regulation in other states are as under:

- The state of Rajasthan since 2015 has allowed the roof top solar capacity of not less than 1 kWp and not exceeding 1 MW upto 80% of Contract Demand of the consumer. Also, the banking of energy is allowed only within one billing cycle of the consumer with a cap of 50 units.
- The state of Gujarat, since inception of Rooftop Regulation, i.e. 2016, has capped the individual capacity to 50% of consumer's sanctioned load/ contract demand with monthly banking of surplus units.
- In Madhya Pradesh, the net metering shall be provided to the eligible consumer upto such extent that the cumulative capacity (in MW) does not exceed the target capacity of 10 MW.
- In Uttar Pradesh, after issuance of recent regulations of 2019, only residential and agriculture consumers are eligible for net metering.



Moreover, Forum of Regulators (FoR) has also recommended to change the existing net metering system to net billing considering the adverse financial impact of net metering arrangement on other subsidizing and subsidized consumers.

Already Maharashtra has the highest installed rooftop capacity of 363 MW as on 30<sup>th</sup> September 2019. However, it is also the need of the hour that a balance be maintained so that the rich and subsidizing consumers are not benefitted at the expense of other common consumers who would have to bear the tariff shock.

With reference to the above, MSEDCL agrees with the steps rightfully taken by the Hon'ble Commission towards modifications in the Rooftop Regulations and is submitting herewith comments/ suggestions on the following Clauses of the MERC Draft (Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019. The key comments of MSEDCL on the Draft Regulations are as follows:

**1. Net Metering for only Residential category with netting of only first 300 units**

MSEDCL submits that although the Hon'ble Commission is allowing net metering for residential consumers only with netting off for first 300 units would still have impact on the cross subsidy structure and is not in line with developed countries where for all consumers solar rooftop installation is done through feed-in tariff structure only. The representative computations in this regard is presented below:

Roof Top RE Consumer		A	B	C
Total Consumption in a month (Unit)		1100	550	400
Generation from Roof Top Systems (Units)		300	300	300
Net Consumption to be billed (Units)		800	250	100
Without considering Net Metering	Revenue Billed(Rs.)	12,083	4,954	3,197
	Highest Tariff Slab charged to consumer	Above 1000 Units	501 to 1000 Units	301 to 500 Units
After considering Net Metering	Revenue billed (Rs.)	8,149	1,668	433
	Highest Tariff Slab charged to consumer	501 to 1000 Units	101 to 300 Units	0 to 100 Units
<b>Reduction in Energy Bill (Rs.)</b>		<b>3,934</b>	<b>3,287</b>	<b>2,764</b>
<b>Loss of Cross Subsidy (Rs.)</b>		<b>799</b>	<b>693</b>	<b>605</b>

Thus, as can be seen from the computations exhibited in the aforementioned table, roof top systems on net metering basis provides discriminated benefit to different consumers even if they install roof top system of same capacity and generate same quantum of electricity, resulting in different RoE for different consumers. The same also results in loss of Cross subsidy which in turn results into tariff rise for other common consumers of MSEDCL. In view of the same, it is prudent that the Roof Top system on Gross Metering or net billing basis may be implemented for residential consumers also as the same provides same RoE for all consumers irrespective of the tariff slabs in which they fall.

**2. RE Generation capacity should be limited to 50% of the Connected Load/Contract Demand.**

MSEDCL submits that the RE Generation capacity should be limited up to 50% of the Connected Load/Contract Demand of the consumer under Grid Interactive Rooftop Renewable Energy Generating Systems Regulations instead of Net Billing arrangement with no limit. This will ensure that the power generated under this regulation will be consumed within the same premise only and is not injected into the grid at LT or HT level which otherwise would result into the wheeling losses of 12% or 9%, respectively. The same has been introduced by Gujarat wherein the Cap on individual capacity is 50% of consumer's sanctioned load/contract demand.

**3. Applicability of Wheeling Charges & Loss on the energy injected by Net Metering Consumers in the grid and introduction of additional charges for meeting the infrastructure cost.**

MSEDCL submits that while planning and creating the distribution infrastructure, the load of the consumers availing net metering is automatically considered. MSEDCL further submits that the installation of rooftop facility on a net metering basis reduces the utilization of distribution network and thereby such consumer pay much lower charges for the network, which is setup for it. As a result, the burden of unrecovered expenses of net metering networks is passed on to other consumers of MSEDCL.

Thus in order to prevent the burden to be passed on to other consumers, it is prudent to levy wheeling charges as well as additional charges on the offset units with consumers consumption so that the uncovered portion of the fixed cost be completely recovered from wheeling and additional charges. MSEDCL further submits that the distribution licensee is required to wheel the energy for compensating the units banked by the Net Metering Consumers through its distribution infrastructure. As such banking mechanism involves wheeling of power; therefore Wheeling Charges & Loss should also

be made applicable on the Net Metering Consumers on the total banked units for recovery of distribution infrastructure cost.

A sample computation of determination of fixed cost based on actual data of FY 2018-19 for a 11 kV consumers is represented below:

<b>Particulars</b>	<b>Values</b>
Actual FC Recovery Required (Rs./Unit)	3.41
Approved Recovery as per MTR Order (Rs./Unit)	0.65
Unrecovered FC through energy charges towards wheeling and offset units (Rs./kWh) to be recovered from wheeling and additional charges	2.76
Wheeling Charges as per Tariff Order (195 of 2017)	0.78
Additional Charges recoverable	1.98

**4. Real time visibility of Roof top RE power injected into the grid**

As the RE generation is distributed generation and there is an enormous growth happening in roof top capacity addition, it is necessary to have a robust system to ensure the real-time visibility and monitoring of Roof Top system in order to ensure grid stability and power planning by distribution licensee.

**5. Applicability of regulations for the RE Generating Systems already commissioned**

The draft Regulations state that that Renewable Energy Generating Systems commissioned during the applicability of the Maharashtra Electricity Regulatory Commission (Net Metering for Rooftop Solar Photo Voltaic Systems) Regulations, 2015, shall continue to be governed by the aforesaid Regulations till validity of the Agreement signed under the aforesaid Regulations.

In this regard MSEDCL submits that considering the fact that, the consumer is able to recover the investment within a period of 3-4 years, the provisions of the existing MERC Net Metering Regulations, 2015 shall be applicable only for a period of 3 years from the date of applicability of new MERC Grid Interactive Rooftop Renewable Energy Generating Systems Regulations, 2019. Further after 3 years, the regulation prevailing at that point of time shall be applicable to such consumers. Also, 3-4 years is sufficient time for the consumers to make necessary arrangement for migrating to new Rooftop RE Regulations.

MSEDCL further submits that in case of enhancement of RE system already installed by Eligible Consumer under MERC Net Metering Regulations 2015, the provisions of new

MERC Grid Interactive Rooftop Renewable Energy Generating Systems Regulations shall be applicable.

The detail comments on proposed MERC Draft (Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019 are enclosed herewith.

It is requested that the comments/suggestions submitted by MSEDCL may please be considered while finalizing MERC Draft (Grid Interactive Rooftop Renewable Energy Generating Systems) Regulations, 2019.

Thanking you,

**Encl: AA**

Yours faithfully,



(Satish Chavan)

**Director (Commercial)**

**Copy s.w.r. to:**

The Chairman & Managing Director, MSEDCL, Mumbai.

## Annexure I

### (Impact of Roof top generation on other consumers)

Financial Year	Tariff Category	Solar generation (MU)	Energy Charge (Rs/unit)	Marginal Power Cost (Rs/KWh)	Cross Subsidy (Rs/kWh)	Impact in Rs. Cr.
<b>Category Wise Impact (HT Consumers)</b>						
2016-17	HT AG Others - 33 kV	0.00	4.44	2.80	1.64	0.00
	HT Commercial - 11/22 kV	0.27	12.17	2.80	9.37	0.26
	HT Industry - 11/22/33 kV	1.25	7.95	2.80	5.15	0.64
	HT Public Service Others - 11/22	0.16	9.82	2.80	7.02	0.11
	HT Seasonal - 11/ 22 KV	0.00	8.65	2.80	5.85	0.00
	LT-I (Billed in HT Billing System)	0.01	6.64	2.80	3.84	0.00
	<b>Total</b>		<b>1.70</b>			
2017-18	HT AG/ SP AG/Poultry	2.07	4.65	2.80	1.85	0.38
	HT Commercial - 11/22 kV	7.42	12.23	2.80	9.43	7.00
	HT Group Housing (RES) 11/22KV	2.37	6.65	2.80	3.85	0.91
	HT Industry - 11/22 kV	46.94	7.90	2.80	5.10	23.94
	HT Public Service Others 11/22	6.43	9.93	2.80	7.13	4.58
	HT Seasonal - 11/ 22 KV	1.12	8.50	2.80	5.70	0.64
	LT-I (Billed in HT Billing System)	-	-	-	-	-
<b>Total</b>		<b>66.35</b>				<b>37.45</b>
2018-19	HT Residential	4.16	6.51	2.80	3.71	1.54
	HT Commercial	18.80	12.28	2.80	9.48	17.82
	HT Industrial	117.57	7.88	2.80	5.08	59.72
	HT Agriculture	2.06	4.46	2.80	1.66	0.34
	HT Public Service	41.36	10.43	2.80	7.63	31.56
	HT Railway/Metro/Mono 11/22/33KV	0.27	7.78	2.80	4.98	0.14
	<b>Total</b>		<b>184.22</b>			
<b>Total revenue loss under HT category</b>						<b>149.59</b>
<b>Category Wise Impact (LT Consumers)</b>						
2016-17	Residential	0.83	12.35	2.80	9.55	0.80
	Commercial	0.75	11.17	2.80	8.37	0.62
	Industrial	0.12	7.68	2.80	4.88	0.06
	Public Services	0.36	8.09	2.80	5.29	0.19
	<b>Total</b>		<b>2.06</b>			
2017-18	Residential	9.55	12.41	2.80	9.61	9.18
	Commercial	10.53	11.19	2.80	8.39	8.83
	Industrial	1.71	7.60	2.80	4.80	0.82
	Street Light	0.00	6.60	2.80	3.80	0.00
	Poultry - Cold storage	-	4.30	2.80	1.50	-
	Temporary	-	13.68	2.80	10.88	-
	Public Services	5.85	8.11	2.80	5.31	3.11
	Powerloom	-	-	-	-	-
<b>Total</b>		<b>27.64</b>				<b>21.94</b>
2018-19	Residential	27.59	11.80	2.80	9.00	24.83
	Commercial	22.55	10.60	2.80	7.80	17.59
	Industrial	6.28	6.93	2.80	4.13	2.59
	Street Light	-	6.98	2.80	4.18	-

Financial Year	Tariff Category	Solar generation (MU)	Energy Charge (Rs/unit)	Marginal Power Cost (Rs/KWh)	Cross Subsidy (Rs/kWh)	Impact in Rs. Cr.
	Poultry - Cold storage	-	4.56	2.80	1.76	-
	Temporary	-	13.63	2.80	10.83	-
	Public Services	12.85	8.15	2.80	5.35	6.88
	Powerloom	-	7.15	2.80	4.35	-
	Public Water Works	-	4.80	2.80	2.00	-
	Others	-		2.80		-
	Agriculture	-	3.23	2.80	0.43	-
	<b>Total</b>	<b>69.28</b>				<b>51.89</b>
	<b>Total revenue loss under LT category</b>					<b>74.55</b>
	<b>Total Loss of Revenue</b>					<b>224.14</b>

**COMMENTS ON DRAFT GRID INTERACTIVE ROOFTOP RENEWABLE ENERGY GENERATING SYSTEMS REGULATIONS 2019**

Draft Regulation No.	Details	Comments/ Suggestions
2.0  2.1(i)	<p><b>Definitions</b></p> <p>“Eligible Consumer” means a consumer of electricity in the area of supply of the Distribution Licensee who uses or intends to use a Renewable Energy Generating System having a capacity less than 1 MW, installed on a roof-top or any other mounting structure in his premises, to meet all or part or no part of his own electricity requirement, and includes a Consumer catering to a common load such as a Housing Society:</p> <p>....Provided further that in case of Net Billing Arrangement, the capacity limit of 1 MW shall not apply;</p>	<ul style="list-style-type: none"> <li>• “his Premises” shall be clearly defined as the premises where Renewable Energy Generating System for a given consumer is installed &amp; Energy generated is consumed in same premises for same connection.</li> <li>• In case of Net Billing Arrangement the maximum capacity limit shall be 50% of the Contact Demand (KVA) / Sanction Load (KW), as allowed in some States like Gujarat (Gujarat Solar Power Policy 2015).</li> <li>• MSEDCL submits that the RE Generation capacity should be limited up to 50% of the Connected Load/Contract Demand of the consumer under Grid Interactive Rooftop Renewable Energy Generating Systems Regulations instead of Net Billing arrangement with no limit. This will ensure that the power generated under this regulation will be consumed within the same premise only and is not injected into the grid at LT or HT level which otherwise would result into the wheeling losses of</li> </ul>

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		<p>12% or 9%, respectively. The same has been introduced by Gujarat wherein the Cap on individual capacity is 50% of consumer's sanctioned load/contract demand.</p>															
2.1(w)	<p>2.1 (w) "Renewable Energy Generation Meter" means an energy meter used for measuring the energy generated by the RE Generating System for the purpose of accounting and billing:</p> <p>Provided that a separate Renewable Energy Generation Meter shall be installed for each source of Renewable Energy in case of hybrid or combination of such sources;</p>	<ul style="list-style-type: none"> <li>It is observed that, in the last three years there is an exponential growth in Rooftop RE Generation as shown below: <table border="1" data-bbox="711 1256 964 1865"> <thead> <tr> <th>Year</th> <th>No of Rooftop RE Consumers</th> <th>Capacity in MW</th> </tr> </thead> <tbody> <tr> <td>FY 16-17</td> <td>1074</td> <td>20.44</td> </tr> <tr> <td>FY 17-18</td> <td>5142</td> <td>71.13</td> </tr> <tr> <td>FY 18-19</td> <td>14392</td> <td>288.8</td> </tr> <tr> <td>FY 19-20 (Apr-Sept)</td> <td>20072</td> <td>363.03</td> </tr> </tbody> </table> </li> <li>As the RE generation is distributed generation and there is an enormous growth happening in roof top capacity addition, it is necessary to have a robust system to ensure the real-time visibility and monitoring of Roof Top system in order to ensure grid stability and power planning by distribution licensee.</li> </ul>	Year	No of Rooftop RE Consumers	Capacity in MW	FY 16-17	1074	20.44	FY 17-18	5142	71.13	FY 18-19	14392	288.8	FY 19-20 (Apr-Sept)	20072	363.03
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4.0	<p><b>General Conditions of Net Metering Arrangement and Net Billing Arrangement</b></p>	<ul style="list-style-type: none"> <li>MSEDCL submits that although the Hon'ble Commission is allowing net metering for residential consumers only with netting off for first 300 units would still have impact on the cross subsidy structure and is not in line with developed</li> </ul>															
4.2	<p>The Eligible Consumer of the Residential category may set up the Renewable Energy Generating System under the Net Metering Arrangement.</p>																



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		<p>countries where for all consumers solar rooftop installation is done through feed-in tariff structure only.</p> <ul style="list-style-type: none"> <li>• Roof top systems on net metering basis provides discriminated benefit to different consumers even if they install roof top system of same capacity and generate same quantum of electricity, resulting in different ROE for different consumers. The same also results in loss of Cross subsidy which in turn results into tariff rise for other common consumers of MSEDCL. In view of the same, it is prudent that the Roof Top system on Gross Metering or net billing basis may be implemented for residential consumers also as the same provides same ROE for all consumers irrespective of the tariff slabs in which they fall.</li> </ul>
7.0	<p><b>Inter-connection with the Distribution Network / Grid, Standards and Safety</b></p>	
7.3	<p>The Eligible Consumer shall be responsible for the safe operation, maintenance and rectification of any defect in the Renewable Energy Generating System <b>up to the point of Net Meter or Renewable Energy Generation Meter</b>, beyond which point such responsibility, including in respect of the Net Meter, shall be that of the Distribution Licensee: Provided further that the Renewable Energy Generation Meter shall be maintained by the Distribution Licensee.</p>	<ul style="list-style-type: none"> <li>• The eligible consumer shall be responsible for the operation, maintenance and rectification of any defect in the RE Generating system including Net meter and RE Generation meter up to the point of Net meter beyond which point, such responsibility shall be that of Distribution Licensee. In case of defect in Net meter or RE Generation meter, it shall be procured/maintained by the Eligible Consumer and shall be tested and installed by the Distribution Licensee.</li> </ul>
7.5	<p>The Renewable Energy Generating System must have <b>anti-islanding protection</b> to prevent any feeding into the grid in case of failure of supply or</p>	<ul style="list-style-type: none"> <li>• Whether it should be islanding <b>protection</b> or <b>anti-islanding protection</b> may please be confirmed.</li> </ul>

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	<p>grid:            Provided that applicable IEC/IEEE Technical Standards shall be followed to test islanding prevention measure for grid connected inverters.</p>	
7.10	<p>Renewable Energy Generating Systems connected behind the Consumer's meter shall be allowed only after prior intimation to the respective Distribution Licensee:</p> <p>.....Provided further that the Commission may determine additional Fixed Charges or Demand Charges and any other Charges for such systems, in the retail Tariff Order, if Distribution Licensee proposes such additional Fixed Charges or Demand Charges and any other Charges for such systems, in its retail supply Tariff Petition, supported by adequate justification:</p>	<ul style="list-style-type: none"> <li>• In case, the RE Generating system is installed and synchronized without the permission of Licensee, provision for disconnection of such RE Generating Systems shall be incorporated.</li> <li>• These charges if determined by Commission shall also be applicable to those Systems which have been installed without giving intimation to Licensee prior to the finalization of these Regulations, retrospectively.</li> </ul>
8.0	<p><b>Metering Infrastructure</b></p>	
8.2	<p>All meters shall have Advanced Metering Infrastructure (AMI) facility with RS 485 (or higher) communication port.</p>	<ul style="list-style-type: none"> <li>• The responsibility to maintain the AMI Meter including MODEM shall be with the Eligible Consumer and condition for maintaining it for 5 years shall be obtained from vendor.</li> </ul>
8.8	<p>The Renewable Energy Generation Meter shall be maintained by the Distribution Licensee.</p>	<ul style="list-style-type: none"> <li>• In case of defect in RE Generation meter, it shall be procured / maintained by the Eligible Consumer and shall be tested and installed by the Distribution Licensee.</li> </ul>

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10.0	<p><b>Connection Agreement</b></p> <p>The Connection Agreement shall remain in force for twenty years:</p>	<ul style="list-style-type: none"> <li>The connection agreement shall be as per Renewable Energy Regulations i.e. up to the recovery of cost of installation of the RE Generating System.</li> </ul>
10.5	<p>Provided that the Eligible Consumer may terminate the Agreement at any time by giving <b>90 days' notice</b> to the Distribution Licensee:</p>	<ul style="list-style-type: none"> <li>The RPO Planning of Licensee also include the quantum of Energy Generated through the RE Generating Systems under these Regulations. Termination of agreement by Eligible Consumer by giving 90 days' notice may affect RPO Planning of Licensee. Hence, the period of notice shall be reviewed and shall be at least one year in advance.</li> </ul>
11.0	<p><b>Net Metering (for Residential Category only) - Energy Accounting and Settlement</b></p>	<ul style="list-style-type: none"> <li>If there is no generation in considerable period, it disturbs the RPO planning of Distribution Licensee; the provision of penalty to such Eligible Consumer in such case shall be incorporated.</li> </ul>
11.6	<p>In case the Eligible Consumer leaves the system or changes the Supply Licensee, the excess electricity shall be considered as inadvertent injection and shall not be paid for by the Distribution Licensee.</p>	<ul style="list-style-type: none"> <li>If the Eligible Consumer leaves the system, the Net metering shall be stopped and the system shall be disconnected.</li> </ul>
11.7	<p>The Renewable Energy Generating System installed under these Regulations shall be exempted from levy of wheeling charges, Banking Charges, cross-subsidy surcharge, transmission charges and surcharges.</p>	<ul style="list-style-type: none"> <li>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. Also, as the distribution infrastructure is created for the consumers considering their</li> </ul>

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12.0	<p><b>Net Billing - Energy Accounting and Settlement</b></p>	
12.1	<p>Net billing is the arrangement where the Renewable Energy Generating Station is:</p> <p>a) Installed to serve a specific consumer,</p> <p>b) Connected on the Distribution Licensee side or consumer side of the consumer meter,</p>	<ul style="list-style-type: none"> <li>• Therefore MSEDCL submits to the Hon'ble Commission to make Wheeling Charges and Losses applicable on the Net Metering Consumers on the total banked units which will be adjusted against consumption by Eligible Consumer from grid.</li> <li>• MSEDCL also submits that in order to prevent the burden to be passed on to other consumers, it is prudent to levy wheeling charges as well as additional charges on the offset units with consumers consumption so that the uncovered portion of the fixed cost be completely recovered from wheeling and additional charges.</li> </ul>

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	<p>c) Selling entire power generated to a Distribution Licensee under Power Purchase Agreement:</p> <p>Provided that if the Renewable Energy Generating Station is connected on the consumer side of the consumer meter, then the consumer shall have to replace the consumer meter with a Net Meter.</p>	<p>In case of Net Billing arrangement, if RE generating system is installed on the consumer side of the consumer meter, the illustration of units to be billed on retail tariff of Licensee shall be incorporated to clarify internal consumption from the generated units so as to avoid any confusion of the billed units by Licensee.</p> <p><b>(Example :</b></p> <p><i>Generation -50 units</i></p> <p><i>Internal consumption- 40 units</i></p> <p><i>Import by consumer from grid-60 units</i></p> <p><i>Total Consumption-100 units</i></p> <p><i>Export to grid- 10 units</i></p> <p><i>Consumer has to be billed at retail tariff- 60+40=100 units.</i></p> <p><i>Units to be purchased by Licensee at Generic Tariff=50 Units.)</i></p> <ul style="list-style-type: none"> <li>• In case of RE generating systems connected on the consumer side of the Eligible Consumermeter, the Electrical Inspector shall intimate Licensee about such systems.</li> </ul>

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13.0	<p><b>Energy Accounting during meter defect/failure/burnt</b></p>	
13.1	<p>In case of defective/failure/burnt condition of any meter, the Distribution Licensee shall replace the meter as specified in the Electricity Supply Code.</p>	<ul style="list-style-type: none"> <li>In case of faulty or burnt meter the same shall be procured by Eligible Consumer for replacement and tested and installed by Distribution Licensee.</li> </ul>
20.0	<p><b>Repeal and Savings</b></p> <p>.....Provided that Renewable Energy Generating Systems commissioned during the applicability of the Maharashtra Electricity Regulatory Commission (Net Metering for Rooftop Solar Photo Voltaic Systems) Regulations, 2015, shall continue to be governed by the aforesaid Regulations till validity of the Agreement signed under the aforesaid Regulations. Thereafter, provisions of these Regulations shall be applicable.</p>	<ul style="list-style-type: none"> <li>MSEDCL proposes that Renewable Energy Generating Systems, which were commissioned during the applicability of the Maharashtra Electricity Regulatory Commission (Net Metering for Rooftop Solar Photo Voltaic Systems) Regulations, 2015, shall be continued to be governed by the aforesaid Regulations only upto a period of 3 years from the date of applicability of new regulations and not till the validity of agreement.</li> <li>This is considering the fact that 3-4 years is sufficient time for the consumers to make necessary arrangement for migrating to new Rooftop RE Regulations. This will also enable the consumer to recover the returns within a period 3-4 years. Thus, after 3 years, the regulation prevailing at that point of time shall be applicable to such consumers. Also, 3-4 years is sufficient time for the consumers to make necessary arrangement for migrating to new Rooftop RE Regulations.</li> </ul>

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Anne-2	Model Application Form for installation of Renewable Energy Generating System under Net Metering Arrangement or Net Billing Arrangement.	<ul style="list-style-type: none"> <li>• Also, in case of enhancement of RE system already installed by Eligible Consumer under MERC Net Metering Regulations 2015, the provisions of new Regulations shall be applicable.</li> <li>• Modifications needed in the application form are enclosed separately.</li> </ul>

**Model Application Form for installation of Renewable Energy Generating System under Net Metering Arrangement or Net Billing Arrangement**

Name of Distribution Licensee [ \_\_\_\_\_ ]

Name of Administrative Office [ \_\_\_\_\_ ]

Application. No. \_\_\_\_\_

Date of Receipt \_\_\_\_\_

(To be filled by the Applicant in block letters)

1 Applicant's Full Name

2 Address of the premises at which Renewable Energy Generating System is to be installed

3 Mobile Number

4 E-mail ID

5 Alternate Address for communication (if any)

6 Category of existing electricity connection

7 Consumer Number

8 Sanctioned Load / Contract Demand (in kW /kVA/ HP)

9 Voltage at which existing supply has been given (in volts)

10 Renewable Energy Generating System Connection Required- Net Metering / Net Billing.

11 Proposed AC capacity of Renewable Energy Generating System to be installed (in kW)-

Type Of Renewable Energy Generators	Voltage at Output of Renewable Energy Generating System (Volts)	Proposed AC Capacity of Renewable Energy Generating System (KW)
Solar		
Wind		



Hydro		
Biomass		
Bio-Fuel Solid Waste		
		Total Capacity(KW)

*\*Total Capacity shall not exceed sanctioned Capacity at Sr. No. 08*

12 Details of Registration Fee paid: (System generated reference number only)

Date: \_\_\_\_\_

Signature of Applicant

List of documents attached with Application Form (To be uploaded – No physical copies)

1. Copy of the latest paid electricity bill.
2. General Power of Attorney in favour of signatory in case of Partnership Firms; certified true copy of the Resolution, authorizing the signatory to deal with the concerned Distribution Licensee, passed by the Board of Directors in case of Companies (as applicable).
3. Technical details of Renewable Energy Generating Station, Inverter and other equipment of System proposed to be installed.
4. *Electrical Inspector Permission (For systems 200KW and above)*
5. Proof of payment of Registration Fee.