

CHAPTER-5

ENERGY SALES PROJECTIONS FOR FY-21

5.1 In the Tariff Order-2019, Hon'ble Commission has approved the category wise energy sales and number of installations for 05th control period i.e., for FY-20, FY-21 and FY-22 based on mixed CAGR method. However, as the factors affecting the actual consumption are numerous and often beyond the control of the licensee, it needs to revise the projections considering the actuals of the immediately preceding year. Accordingly, the projections in respect of installations and energy sales are revised for FY-21. Further, since the figures of FY-20 is linearly dependent for the projections of FY-21, the approved projections of installations & energy sales for FY-20 are also revised and compared.

The inputs considered for the estimations / projections are detailed in the foregoing paragraphs.

5.1.1 LT-1: Bhagyajyothi & Kutirajyothi

The category is having two sub categories (i) installations having energy consumption 40 units and below per month (ii) installations having energy consumption above 40 units. Government of Karnataka is subsidizing the consumers of the category for the consumption upto 40 units per month.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations with consumption upto 40 units / month		Installations with consumption above 40 units / month		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	179636	34.21	11526	12.60	191162	46.81
FY-21	179636	34.21	11526	12.60	191162	46.81

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations with consumption upto 40 units / month		Installations with consumption above 40 units / month		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	175524	37.29	12480	12.08	188004	49.37
FY-20 (Actual) (upto Sep)	169521	17.39	17648	7.87	187169	25.26

It is to note that numbers of installations are fluctuating between the sub categories. Hence, MESCOM has retained the number of installations and energy sales of FY-19 for FY-20 and FY-21.

Accordingly, the projections for FY-20 and FY-21, for LT-1 category, would be as below;

Year	Installations with consumption upto 40 units / month		Installations with consumption above 40 units / month		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	175524	37.29	12480	12.08	188004	49.37
FY-21	175524	37.29	12480	12.08	188004	49.37

5.1.2 LT-2a: Lighting/combined lighting, heating & motive power of residential houses.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	1576951	1436.69
FY-21	1625051	1502.36

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	611398	721.91	935899	640.07	1547297	1361.98
FY-20 (Actual) (upto Sep)	629963	402.88	946563	355.61	1576526	758.49

MESCOM has analyzed the CAGRs of the category during the period 'FY-15 to FY-19' and 'FY-17 to FY-19' and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	3.25%	3.21%	3.83%
Energy Sales	3.37%	2.66%	1.74%

It can be noted that the growth rate during the 'FY-17 to FY-19' appears to be consistence for projection for the category. Hence, the same is considered and projections are arrived as below for FY-20 and FY-21 over the actuals of FY-19;

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	3.21%	1596965	2.66%	1398.21
FY-21	3.21%	1648228	2.66%	1435.40

Further, the category is having two sub categories (i) urban (ii) rural. The above projections have been sub divided into sub categories in the proportion of actuals of FY-19, as below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	631023	741.11	965942	657.10	1596965	1398.21
FY-21	651279	760.83	996949	674.57	1648228	1435.40

5.1.3 LT-2b: Private professional and other private educational institutions.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	3715	15.18
FY-21	3845	16.13

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	1681	7.94	1833	5.68	3514	13.62
FY-20 (Actual) (upto Sep)	1709	4.26	1871	2.87	3580	7.13

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	3.00%	2.39%	1.44%
Energy Sales	4.39%	(-)0.73%	(-)1.09%

It can be noted that though the growth rate in respect of energy sales is 4.39% during **'FY-15 to FY-19'**, it is recording a negative trend since FY-17. Further, the growth rate in respect of installations is also reducing drastically. Hence, it is felt appropriate to maintain the proportionate position with reference to the position as at the end of Sep-2019 of FY-20 for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	3580	-	14.24
FY-21	-	3580	-	14.24

Further, the category is having two sub categories (i) urban (ii) rural. The above projections have been sub divided into sub categories in the proportion of actuals of FY-19, as below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	1709	8.52	1871	5.72	3580	14.24
FY-21	1709	8.52	1871	5.72	3580	14.24

5.1.4 LT-3: Commercial Lighting, Heating & Motive Power.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	220378	390.69
FY-21	229478	414.05

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	124208	240.67	88191	129.63	212399	370.30
FY-20 (Actual) (upto Sep)	127644	130.51	88770	69.24	216414	199.75

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	3.90%	3.66%	3.80%
Energy Sales	5.00%	4.00%	2.11%

It can be noted that though the growth rate in respect of energy sales is 5.00% during 'FY-15 to FY-19', the growth rate with reference to immediate previous month is only 2.11%. Hence, it is felt appropriate to consider CAGR of the period 'FY-17 to FY-19' for projection of both installations and energy sales for FY-20 and FY-21 over the actuals of FY-19.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	3.66%	220090	4.00%	385.11
FY-21	3.66%	228145	4.00%	400.52

Further, the category is having two sub categories (i) urban (ii) rural. The above projections have been sub divided into sub categories in the proportion of actuals of FY-19, as below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	128754	250.30	91336	134.81	220090	385.11
FY-21	133466	260.31	94679	140.21	228145	400.52

5.1.5 LT-4a: IP Sets upto & inclusive of 10 HP.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	335901	1669.16
FY-21	350825	1745.01

However, in the years FY-15 to FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)	Mid-year No. of installations	Specific Consumption per IP / Annum (kWh)
FY-15 (Actual)	260399	1086.18	253769	4280
FY-16 (Actual)	278171	1197.43	269285	4447
FY-17 (Actual)	291129	1628.06	284650	5720
FY-18 (Actual)	306053	1661.64	298591	5565
FY-19 (Actual)	326187	1630.90	316120	5159
FY-20 (Actual) (upto Sep)	337140	992.40	-	-

Further, the GPS survey undertaken by MESCOM has indicated the following position;

- In respect of authorized installations number of '**Not in Use**'/ '**Dried-Up**' installations are 17,323 and '**Disconnected**' installation are 1168.

Installations classified as '**Not in Use**' are the seasonal installations using power depending upon the cultivation period. Hence, there is every chance that these installations will use power and as such, have to be considered on par with live installations.

The '**Dried-Up**' status are due to non-availability water and these installations will once again become active whenever the availability of water becomes available and hence, these installations have also to be considered on par with live installations.

- Number of un-authorized connections identified are 1,17,255 installations. Out of these, number of '**Not in Use**'/ '**Dried-Up**' installations are 22,249 and '**Disconnected**' installation are 2599.

In this regard, it is to be submitted that MESCOM has addressed a letter to the energy department (letter No.5876-87 / Dt.24-10-2019) requesting approval to assign RR No.s to the un-authorized connections duly collecting Rs.50/- registration charges. Further, MESCOM will provide required infrastructure to the un-authorized connections after collecting Rs.10,000/- from each of the registered applicant as per GO Circular dated 14-07-2014.

Accordingly, MESCOM has considered the following parameters for projection of energy sales in respect of LT-4a category.

- ✓ Growth rate in respect of number of installations, as per 3 year CAGR from FY-19 to FY-19 i.e. 5.85%. This will result in addition of 19,082 installations for FY-20 and 20,198 for FY-21.
- ✓ MESCOM has expected approval from the energy department to assign RR No.s to the un-authorized connections identified during GPS survey. Hence, for FY-21, 92,407 installations (1,17,255 – 22,249 – 2599) are additionally considered for estimating the energy sales.
- ✓ Specific consumption of FY-19, i.e. 5159 units per IP / annum is considered to estimating the energy sales.
- ✓ The calculations are given in the below table;

	No. of LT-4a installations as at 31-03-2019	326187
ADD:	Proposed additions estimated for FY-20	19082
	Total installations as at 31-03-2020	345269
	Mid-Year no. of installations for FY-20	335728
	Specific consumption per annum / IP for FY-19	5159 units
	Estimated Energy Sales for FY-20	1732.02 MU
	No. of LT-4a installations as at 31-03-2020	345269
ADD:	Proposed additions estimated for FY-21	20198
ADD:	Un-Authorized IP sets as per GPS survey	92407
	Net installations as at 31-03-2021	457874
	Mid-Year no. of installations for FY-21	401572
	Specific consumption per annum / IP for FY-19	5159 units
	Estimated Energy Sales for FY-21	2071.70 MU

5.1.6 LT-4b: IP Sets above 10 HP.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	180	0.93
FY-21	180	0.93

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	162	0.85
FY-20 (Actual) (upto Sep)	165	0.45

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	(-)2.73%	(-)18.68%	(-)10.00%
Energy Sales	(-)8.45%	(-)16.19%	(-)8.60%

It can be noted that in respect of both installations and energy sales the category is recording a negative trend since FY-15. Hence, it is felt appropriate to maintain the proportionate position with reference to the position as at the end of Sep-2019 of FY-20 for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	165	-	0.85
FY-21	-	165	-	0.85

5.1.7 LT-4c(i): Private Horticultural Nurseries, Coffee and Tea plantations of sanctioned load of 10 HP & below.

In the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	3450	3.50
FY-20 (Actual) (upto Sep)	3642	1.87

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	10.96%	8.96%	9.18%
Energy Sales	10.24%	(-)8.60	(-)16.07%

It can be noted that in respect of installations the growth rate is positive whereas in respect of energy sales it is negative. Hence, it is felt appropriate to maintain the proportionate position with reference to the position as at the end of Sep-2019 of FY-20 for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	3642	-	3.50
FY-21	-	3642	-	3.50

5.1.8 LT-4c(ii): Private Horticultural Nurseries, Coffee and Tea plantations of sanctioned load of above 10 HP.

In the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	861	3.41
FY-20 (Actual) (upto Sep)	925	1.94

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	5.81%	5.95%	7.22%
Energy Sales	(-1.35%)	(-9.46%)	(-8.82%)

It can be noted that in respect of installations the growth rate is positive whereas in respect of energy sales it is negative. Hence, it is felt appropriate to maintain the proportionate position with reference to the position as at the end of Sep-2019 of FY-20 for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	925	-	3.41
FY-21	-	925	-	3.41

5.1.9 LT-5: Heating & Motive Power (including lighting) of Industrial Units.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	32594	141.13
FY-21	34222	143.06

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	5400	45.87	25774	88.08	31174	133.95
FY-20 (Actual) (upto Sep)	5480	22.93	26254	44.57	31737	67.50

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	4.75%	4.05%	4.01%
Energy Sales	0.48%	(-)1.04%	(-)2.15%

It can be noted that though the growth rate in respect of installations is having positive growth, growth rate in energy sales is negative. Hence, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of installations only and energy sales of FY-19 is retained for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	4.05%	32437	-	133.95
FY-21	4.05%	33750	-	133.95

Further, the category is having two sub categories (i) urban (ii) rural. The above projections have been sub divided into sub categories in the proportion of actuals of FY-19, as below;

Year	Urban		Rural		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	5619	45.87	26818	88.08	32437	133.95
FY-21	5846	45.87	27904	88.08	33750	133.95

5.1.10 LT-6(a): Water Supply & Sewerage pumping installations.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	16732	126.06
FY-21	17894	131.15

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	15391	123.02
FY-20 (Actual) (upto Sep)	15717	63.60

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	6.02%	6.07%	3.57%
Energy Sales	3.40%	1.03%	3.52%

With careful analysis, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of both installations and energy sales for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	6.07%	16325	1.03%	124.29
FY-21	6.07%	17316	1.03%	125.57

5.1.11 LT-6(b): Public Street Lights.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	23433	72.34
FY-21	25381	75.18

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	21621	69.82
FY-20 (Actual) (upto Sep)	23269	32.45

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	7.59%	4.83%	3.67%
Energy Sales	4.66%	0.32%	2.63%

With careful analysis, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of both installations and energy sales for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	4.83%	22665	0.32%	70.04
FY-21	4.83%	23760	0.32%	70.26

5.1.12 LT-7: Temporary Power Supply of all categories including Hoarding & Advertisement boards.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	16430	20.41
FY-21	16431	20.41

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	LT-7a		LT-7b		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-19 (Actual)	16379	19.56	717	0.85	17096	20.41
FY-20 (Actual) (upto Sep)	15746	9.78	705	0.37	16451	10.15

As can be noted from the above table, being the temporary nature of usage, the growth rate is inconsistent. Hence, it is felt appropriate to retain both installations and energy sales as recorded in FY-19 for FY-20 and FY-21 also.

Year	LT-7a		LT-7b		Total	
	No.s	MU	No.s	MU	No.s	MU
FY-20	16379	19.56	717	0.85	17096	20.41
FY-21	16379	19.56	717	0.85	17096	20.41

5.1.13 HT-1: Water Supply, Drainage / Sewerage water treatment plant and Sewerage pumping installations.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	118	99.38
FY-21	133	102.16

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	104	97.81
FY-20 (Actual) (upto Sep)	109	45.80

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	10.40%	8.71%	4.00%
Energy Sales	4.08%	6.39%	8.03%

With careful analysis, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of both installations and energy sales for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	8.71%	113	6.39%	104.06
FY-21	8.71%	123	6.39%	110.71

5.1.14 HT-2a: Industries.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	943	606.33
FY-21	1007	590.51

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	891	624.76(*)
FY-20 (Actual) (upto Sep)	921	304.88(**)

(*) SEZ Consumption 41.94 MU excluded.

(**)SEZ Consumption 24.06 MU excluded

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	7.75%	6.61%	7.74%
Energy Sales	(-)2.97%	6.75%	4.78%

With careful analysis, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of installations and growth rate of 4.78% in respect of energy sales for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	6.61%	950	4.78%	654.62
FY-21	6.61%	1013	4.78%	685.91

Further, the data in respect of sales to HT-2a category along with the consumption from open access / wheeling during the period from 2016-17 to 2018-19 are furnished below;

Year	Energy Procured from MESCOM	Open Access + Wheeled Energy	Total
FY-17	548.29	241.47	789.76
FY-18	596.27	283.26	879.53
FY-19	624.76	319.96	944.72

5.1.15 HT-2b: Commercial.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	799	207.21
FY-21	858	214.49

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	735	200.43
FY-20 (Actual) (upto Sep)	757	104.90

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	8.06%	8.53%	6.06%
Energy Sales	6.83%	3.79%	3.76%

It can be noted that though the growth in installations and energy sales with reference to immediate preceding year is lesser compared to CAGR of the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'**. Hence, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of both installations and energy sales for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	8.53%	799	3.79%	208.03
FY-21	8.53%	866	3.79%	215.91

Further, the data in respect of sales to HT-2b category along with the consumption from open access / wheeling during the period from 2016-17 to 2018-19 are furnished below;

Year	Energy Procured from MESCOM	Open Access + Wheeled Energy	Total
FY-17	186.06	-	186.06
FY-18	193.17	3.41	196.58
FY-19	200.43	3.82	204.25

5.1.16 HT-2c: Hospitals, Educational Institutions and Hostels.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	307	138.74
FY-21	323	135.65

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	292	144.58
FY-20 (Actual) (upto Sep)	307	73.80

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	6.50%	5.17%	5.42%
Energy Sales	(-)0.35%	(-)3.37%	5.48%

It can be noted that though the growth in installations is positive and energy sales is negative in the period **'FY-15 to FY-19'** and **'FY-17 to FY-19'**. Hence, it is felt appropriate to consider CAGR of the period **'FY-17 to FY-19'** for projection of installations only and for energy sales the actuals of FY-19 is maintained for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	5.17%	307	-	144.58
FY-21	5.17%	323	-	144.58

Further, the data in respect of sales to HT-2c category along with the consumption from open access / wheeling during the period from 2016-17 to 2018-19 are furnished below;

Year	Energy Procured from MESCOM	Open Access + Wheeled Energy	Total
FY-17	154.85	27.12	181.97
FY-18	137.07	47.76	184.83
FY-19	144.58	49.54	194.12

5.1.17 HT-3a&b: Lift Irrigation Schemes / Lift Irrigation Societies.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	29	43.10
FY-21	31	43.33

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	28	41.20
FY-20 (Actual) (upto Sep)	30	16.98

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	3.93%	3.77%	0.00%
Energy Sales	15.41%	60.32%	74.50%

It can be noted that the growth in installations is positive. However, in respect of energy sales the growth appears to be abnormal. Hence, it is felt appropriate to consider number of installations existing as at the end of Sep-2019 and energy sales of FY-19 for FY-20 and FY-21.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	30	-	41.20
FY-21	-	30	-	41.20

5.1.18 HT-4: Residential Apartments & Colonies.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	61	21.59
FY-21	64	23.07

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	55	20.42
FY-20 (Actual) (upto Sep)	60	11.54

MESCOM has analyzed the CAGRs of the category during the period **'FY-15 to FY-19'**, **'FY-17 to FY-19'** and also with reference to immediate preceding year FY-18.

	FY-15 to FY-19	FY-17 to FY-19	w.r.t. FY-18
Installations	5.74%	2.84%	0.00%
Energy Sales	9.12%	4.16%	6.91%

It can be noted that the addition in number of installations during FY-20 (upto Sep-19) is comparatively higher. Hence, it is felt appropriate to maintain the number of installations existing as at the end of Sep-19 for FY-20 and FY-21 and for projection of energy sales CAGR of the period **'FY-17 to FY-19'** is considered.

Year	Installations		Energy Sales	
	CAGR	Nos.	CAGR	MU
FY-20	-	60	4.16%	21.27
FY-21	-	60	4.16%	22.15

5.1.19 HT-5: Temporary Supply.

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the number of installations & energy sales for FY-20 and FY-21 as below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	14	5.96
FY-21	14	5.96

However, in the year FY-19 and FY-20 (upto Sep) the actual position is as indicated below;

Year	Installations (Nos.)	Energy Sales (MU)
FY-19 (Actual)	17	1.73
FY-20 (Actual) (upto Sep)	16	1.45

As can be noted from the above table, being the temporary nature of usage, the growth rate is inconsistent. Hence, it is felt appropriate to retain both installations and energy sales as recorded in FY-19 for FY-20 and FY-21 also.

Year	Installations (Nos.)	Energy Sales (MU)
FY-20	17	1.73
FY-21	17	1.73

5.1.20 Supply to MSEZ:

For the category, in the Tariff Order-2019, Hon'ble Commission has approved the energy sales for FY-20 and FY-21 as below;

Year	Energy Sales (MU)
FY-20	51.13
FY-21	56.86

In the Tariff Order 2018, Hon'ble Commission has approved 45.32 MU of sales in respect of MSEZ installations for FY-19 against which the actual consumption is 41.94 MU. In FY-18 also the consumption was only 39.60 MU. Hence, the energy consumption of FY-19 i.e., 41.94 MU is maintained for FY-20 and FY-21 also.

5.1.21 KPCL and Wheeling Consumption:

In the year FY-19, KPCL consumption is 2.88. The same quantum has been maintained for FY-20 and FY-21 also. Consumption is shown separately but the revenue is included under LT-2a tariff category.

5.1.22 Abstract of projected number of installations for different years.

Tariff Category	FY-19		FY-20	
	Apprd. in T.O. 2018	Actuals	Apprd. in T.O. 2019	Revised Proj.
1	2	3	4	5
LT-1:>40	177457	175524	179636	175524
LT-1:=<40 Units	15915	12480	11526	12480
LT-1 Sub Total:	193372	188004	191162	188004
LT-2a(i) Urban	1544434	611398	1576951	631023
LT-2a(ii) Rural		935899		965942
LT-2a Sub Total:		1547297		1596965
LT-2b(i) Urban	3540	1681	3715	1709
LT-2b(ii) Rural		1833		1871
LT-2b Sub Total:		3514		3580
LT-3(i) Urban	213525	124208	220378	128754
LT-3(ii) Rural		88191		91336
LT-3 Sub Total:		212399		220090
LT-4a	317045	326187	335901	345269
LT-4b	367	162	180	165
LT-4c(i)	4416	3450	4600	3642
LT-4c(ii)		861		925
LT-4c Sub Total:		4311		4567
LT-5a Urban	31403	5400	32594	5619
LT-5b Rural		25774		26818
LT-5 Sub Total:		31174		32437
LT-6a	15512	15391	16732	16325
LT-6b	22808	21621	23433	22665
LT-7	14153	17096	16430	17096
TOTAL- LT	2360575	2367156	2422076	2447163
HT-1	111	104	118	113
HT-2a	905	891	943	950
HT-2b	698	735	799	799
HT-2c	358	292	307	307
HT-3a & b	32	28	29	30
HT-4	62	55	61	60
HT-5	16	17	14	17
TOTAL- HT	2182	2122	2271	2275
TOTAL- LT + HT	2362757	2369278	2424347	2449440

Tariff Category	FY-21	
	Apprd. in T.O. 2019	Revised Proj.
1	4	5
LT-1:>40	179636	175524
LT-1:=<40 Units	11526	12480
LT-1 Sub Total:	191162	188004
LT-2a(i) Urban	1625051	651279
LT-2a(ii) Rural		996949
LT-2a Sub Total:		1648228
LT-2b(i) Urban	3845	1709
LT-2b(ii) Rural		1871
LT-2b Sub Total:		3580
LT-3(i) Urban	229478	133466
LT-3(ii) Rural		94679
LT-3 Sub Total:		228145
LT-4a	350825	457874
LT-4b	180	165
LT-4c(i)	4986	3642
LT-4c(ii)		925
LT-4c Sub Total:		4567
LT-5a Urban	34222	5846
LT-5b Rural		27904
LT-5 Sub Total:		33750
LT-6a	17894	17316
LT-6b	25381	23760
LT-7	16431	17096
TOTAL- LT	2499455	2622485
HT-1	133	123
HT-2a	1007	1013
HT-2b	858	866
HT-2c	323	323
HT-3a & b	31	30
HT-4	64	60
HT-5	14	17
TOTAL- HT	2430	2432
TOTAL- LT + HT	2501885	2624917

5.1.23 Abstract of projected energy sales for different years.

Tariff Category	(MU)			
	FY-19		FY-20	
	Apprd. In T.O. 2018	Actuals	Apprd. In T.O. 2019	Revised Proj.
1	2	3	4	5
LT-1:>40 units	14.08	37.29	34.21	37.29
LT-1:=40 Units	33.23	12.08	12.60	12.08
LT-1 Sub Total:	47.31	49.37	46.81	49.37
LT-2a(i) Urban	1406.98	721.91	1436.69	741.11
LT-2a(ii) Rural		640.07		657.10
LT-2a Sub Total:		1361.98		1398.21
LT-2b(i) Urban	14.80	7.94	15.18	8.52
LT-2b(ii) Rural		5.68		5.72
LT-2b Sub Total:		13.62		14.24
LT-3(i) Urban	375.73	240.67	390.69	250.30
LT-3(ii) Rural		129.63		134.81
LT-3 Sub Total:		370.30		385.11
LT-4a	1381.08	1630.90	1669.16	1732.02
LT-4b	1.81	0.85	0.93	0.85
LT-4c(i)	9.69	3.50	8.81	3.50
LT-4c(ii)		3.41		3.41
LT-4c Sub Total:		6.91		6.91
LT-5a Urban	143.13	45.87	141.13	45.87
LT-5b Rural		88.08		88.08
LT-5 Sub Total:		133.95		133.95
LT-6a	131.39	123.02	126.06	124.29
LT-6b	73.72	69.82	72.34	70.04
LT-7	19.40	20.41	20.41	20.41
TOTAL- LT	3605.04	3781.13	3928.21	3935.40
HT-1	90.54	97.81	99.38	104.06
HT-2a	616.10	624.76	606.33	654.62
HT-2b	198.66	200.43	207.21	208.03
HT-2c	172.35	144.58	138.74	144.58
HT-3a & b	19.93	41.20	43.10	41.20
HT-4	21.11	20.42	21.59	21.27
HT-5	5.50	1.73	5.96	1.73
TOTAL- HT	1124.19	1130.93	1122.31	1175.49
MSEZ Supply	45.32	41.94	51.13	41.94
KPCL Consumption	5.89	2.88	-	2.88
TOTAL- LT + HT	4780.44	4956.88	5101.65	5155.71

Tariff Category	FY-21	
	Apprd. In	Revised

	T.O. 2019	Proj.
1	4	5
LT-1:>40 units	34.21	37.29
LT-1:=40 Units	12.60	12.08
LT-1 Sub Total:	46.81	49.37
LT-2a(i) Urban	1502.36	760.83
LT-2a(ii) Rural		674.57
LT-2a Sub Total:		1435.40
LT-2b(i) Urban	16.13	8.52
LT-2b(ii) Rural		5.72
LT-2b Sub Total:		14.24
LT-3(i) Urban	414.05	260.31
LT-3(ii) Rural		140.21
LT-3 Sub Total:		400.52
LT-4a	1745.01	2071.70
LT-4b	0.93	0.85
LT-4c(i)	9.17	3.50
LT-4c(ii)		3.41
LT-4c Sub Total:		6.91
LT-5a Urban	143.06	45.87
LT-5b Rural		88.08
LT-5 Sub Total:		133.95
LT-6a	131.15	125.57
LT-6b	75.18	70.26
LT-7	20.41	20.41
TOTAL- LT	4104.26	4329.18
HT-1	102.16	110.71
HT-2a	590.51	685.91
HT-2b	214.49	215.91
HT-2c	135.65	144.58
HT-3a & b	43.33	41.20
HT-4	23.07	22.15
HT-5	5.96	1.73
TOTAL- HT	1115.17	1222.19
MSEZ Supply	56.86	41.94
KPCL Consumption	-	2.88
TOTAL- LT + HT	5276.29	5596.19

5.2 ENERGY AT INTERFACE POINT AND GENERATION POINT:

The energy requirement at generation point is arrived at based on the projected transmission & distribution loss. The projected trajectory of distribution losses for different years is as below.

Years	Range ->	Upper limit	Average	Lower limit
FY-19 (Approved)		11.20%	10.95%	10.70%
FY-19 (Actuals)		10.52%		
FY-20 (Approved)		11.25%	11.00%	10.75%
FY-20 (Revised)		10.70%	10.50%	10.30%
FY-21 (Approved)		11.15%	10.90%	10.80%
FY-21 (Revised)		10.68%	10.48%	10.28%

Transmission loss for FY-20 & FY-21, approved in the Tariff Order-2019 are as below;

	<u>FY-20</u>	<u>FY-21</u>
Transmission Loss :	3.162%	3.132%

Particulars	FY-19		FY-20	
	Apprd.	Actuals	Apprd.	Rev.Proj.
Energy Sales (MU)	4735.12	4956.88	5101.65	5155.71
Dist. Loss (%)	10.95%	10.52%	11.00%	10.50%
Energy at IF point (MU)	5317.37	5539.73	5674.74	5760.57
MSEZ Supply (MU)	45.32	41.94	51.13	41.94
Trans. Loss	3.08%	7.39%	3.162%	3.162%
Energy at Gen. point (MU)	5533.27	5981.66	5912.83	5948.67

Particulars	FY-21	
	Apprd.	Rev.Proj.
Energy Sales (MU)	5276.29	5596.19
Dist. Loss (%)	10.90%	10.48%
Energy at IF point (MU)	5857.95	6251.33
MSEZ Supply (MU)	56.86	41.94
Trans. Loss	3.132%	3.132%
Energy at Gen. point (MU)	6106.05	6453.45

5.3 Proposed RPO Compliance for FY-20 & FY-21 (revised):

MESCOM here below proposes Non-Solar and Solar RPO Compliance for the years FY-20 and FY-21.

RPO Compliance projections for FY-20:

a. **Non-solar RPO (Projections for FY-20):**

Sl. No.	Particulars	Quantum In MU	Cost Rs.in Cr
1.	Total power purchase quantum from all sources excluding Hydro-energy	4568.26	2517.92
2.	Non-Solar RE purchased under PPA route at Generic Tariff including Non-Solar RE purchased from KPCL	775.99	291.75
3.	Non-Solar RE purchased at APPC	-	-
4.	Non-Solar RE (Green Energy) sold to consumers	-	-
5.	Non-Solar RE purchased from other ESCOMs	-	-
6.	Non-Solar RE sold to other ESCOMs	-	-
7.	Banked non-solar RE purchased @ 85% of Generic Tariff.	-	-
8.	Total Non-Solar RE Purchased [1+2+3-4+5-6+7]	775.99	291.75
9.	Non-Solar RPO Target (%)	13%	
10.	Proposed Non-Solar RPO Compliance (%)	16.99%	

b. **Solar RPO (Projections for FY-20):**

Sl. No.	Particulars	Quantum In MU	Cost Rs.in Cr
1.	Total power purchase quantum from all sources excluding Hydro-energy	4568.26	2517.92
2.	Solar RE purchased under PPA route at Generic Tariff including Solar RE purchased from KPCL	594.12	293.61
3.	Solar RE purchased at APPC	-	-
4.	Solar RE (Green Energy) sold to consumers	-	-
5.	Solar RE purchased from other ESCOMs	-	-
6.	Solar RE sold to other ESCOMs	-	-
7.	Banked solar RE purchased @ 85% of Generic Tariff.	-	-
8.	Total Solar RE Purchased [1+2+3-4+5-6+7]	594.12	293.61
9.	Solar RPO Target (%)	7.25%	
10.	Proposed Solar RPO Complied (%)	13.01%	

RPO Compliance projections for FY-21:

a. **Non-solar RPO (Projections for FY-21):**

Sl. No.	Particulars	Quantum In MU	Cost Rs.in Cr
1.	Total power purchase quantum from all sources excluding Hydro-energy	4917.72	3071.15
2.	Non-Solar RE purchased under PPA route at Generic Tariff including Non-Solar RE purchased from KPCL	751.68	285.80
3.	Non-Solar RE purchased at APPC	-	-
4.	Non-Solar RE (Green Energy) sold to consumers	-	-
5.	Non-Solar RE purchased from other ESCOMs	-	-
6.	Non-Solar RE sold to other ESCOMs	-	-
7.	Banked non-solar RE purchased @ 85% of Generic Tariff.	-	-
8.	Total Non-Solar RE Purchased [1+2+3-4+5-6+7]	751.68	285.80
9.	Non-Solar RPO Target (%)	13%	
10.	Proposed Non-Solar RPO Compliance (%)	15.29%	

b. **Solar RPO (Projections for FY-21):**

Sl. No.	Particulars	Quantum In MU	Cost Rs.in Cr
1.	Total power purchase quantum from all sources excluding Hydro-energy	4917.72	3071.15
2.	Solar RE purchased under PPA route at Generic Tariff including Solar RE purchased from KPCL	752.63	345.24
3.	Solar RE purchased at APPC	-	-
4.	Solar RE (Green Energy) sold to consumers	-	-
5.	Solar RE purchased from other ESCOMs	-	-
6.	Solar RE sold to other ESCOMs	-	-
7.	Banked solar RE purchased @ 85% of Generic Tariff.	-	-
8.	Total Solar RE Purchased [1+2+3-4+5-6+7]	752.63	345.24
9.	Solar RPO Target (%)	8.50%	
10.	Solar RPO Complied (%)	15.30%	

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