# CHAPTER – 4

# Modified Annual Revenue Requirement for FY-2022

# (3nd year of 5th Control period)

**The Commission vide Tariff Order dated 30th May 2019, approved the Annual Revenue Requirement for the 5th control period commencing from FY-20 to FY-22.**

FY-18 is the base years for the 5th control period. There is variation in the actual energy requirement, power purchase cost and asset base compared to the approved level. This variation in the power procurement plan and costs warrants for seeking modification for Annual Revenue Requirement for FY-22 i.e., 3rd year of 5th control period. Further, the COVID-19 pandemic has reduced the energy consumption of BESCOM during the months from April-20 to September-20. The energy consumption for FY-21 (upto September-20) is 12340 MU as against previous year FY-19 (upto September-19) consumption of 14548 MU. The energy consumption reduction is 2208 MU i.e. 15.18% decrease.

As per 2.8.2 of the MYT regulations-2006, The Distribution Licensee may, as a result of additional information not previously known or available to him at the time of forecast under the MYT framework for the Control Period, apply for modification of the ARR and ERC for the remainder of the control period.

Based on the above Principles, BESCOM seeks modification for FY-22 as under:

**Power Purchase Cost:**

###### PROJECTED ENERGY AVAILABILITY & COST FOR FINANCIAL YEAR 2021-22:

1. The energy required by ESCOMs of Karnataka for the Financial Year 2021-22 is 67919.26 MUs considering STU loss of 3.10%. The ESCOM wise energy requirement is shown in as **Table-4.1.**

**Table-4.1**

|  |  |
| --- | --- |
| **ESCOMs** | **Energy requirement in MUs** |
| BESCOM | 29955.95 |
| GESCOM | 8911.00 |
| HESCOM including Hukkeri Society & AEQUS | 14491.67 |
| MESCOM Including MSEZ | 6499.74 |
| CESC, Mysore | 8060.89 |
| **Total** | **67919.26** |

1. Energy being purchased by ESCOMs from different sources viz., KPCL Hydel, KPCL Thermal & Gas based power Projects, Central Generating Stations, DVC, Priyadarshini Jurala Hydro Electric scheme, IPPs and Non-Conventional Energy source including solar projects.

**Hydro and Thermal Stations of KPCL**

The Energy availability of Hydel and Thermal stations of State Owned Power plants are considered as per the details furnished by KPCL in its email dated 18.11.2020 including Yaramarus Thermal Power Project. The energy projected by KPCL in respect of hydro stations is based on average energy generated in last 10 years with a 1% auxiliary consumption as per PPA. Energy availability in respect of Thermal Stations is as per the targeted availability defined in the PPA/Regulations wherever applicable and less by applicable auxiliary consumption of each station. The KPCL has projected the Yelahanka Combined Cycle power projects is available from FY July 2021.

During the year 2021-22, Energy availability from different sources is more than the quantum required by ESCOMs, considering the following factors;

1. The energy availability from KPCL stations including RPCL and KSPDCL as per the details furnished by Generating Stations.
2. Energy availability from CGS stations viz., NTPC, NLC, Nuclear Power Corporation as per the as per LGBR of the year 2020-21 is considered.
3. The energy availability of DVC stations as per the data furnished by DVC for the year 2020-21 in the email dated 5.11.2019 is considered
4. 85% of the 90% of the installed capacity has been considered for UPCL project
5. In respect of NCE projects, energy actual supplied during year 2020-21 upto Sep-2020 and actual NCE energy purchased for the period from Oct-2019 to March 2020 has been considered for 2021-22.
6. Solar projects selected through bidding route for which cumulative utilization factor as per the PPA is considered.
7. In respect of Taluka wise, 1 to 3 MW farmers category, energy actual supplied during year 2020-21 upto Sep-2020 and actual NCE energy purchased for the period from Oct-2019 to March 2020 has been considered for 2021-22.
8. The actual energy drawal from Jurala Priyadarshini and TBHE for the year 2019-20 has been considered for the year 2021-22.

**Table 4.2**

|  |  |  |
| --- | --- | --- |
| **Generating Stations** | **Energy in Mus** | **Source** |
| KPCL Hydro | 11396.97 | KPCL |
| KPCL Thermal: |  |  |
| RTPS -1 & 7 | 8666.46 | KPCL |
| RTPS 8 | 1601.15 | KPCL |
| BTPS | 0.00 |  |
| Unit I | 3241.20 | KPCL |
| Unit II | 3499.62 | KPCL |
| Unit III | 4899.47 | KPCL |
| Yelahanka Combined Cycle gas Power projects | 1878.37 | KPCL |
| Yermarus TPS - 1& 2 | 11198.78 | KPCL |
| CGS | 15297.45 | LGBR of SRPC for 2020-21 |
| Kudigi | 9373.59 | LGBR of SRPC for 2020-21 |
| DVC | 2577.11 | As per DVC |
| UPCL | 7482.78 | 90% of 85% installed capacity |
| NCE Projects | 20911.73 | Actuals of ESCOMs for the FY 2020-21( upto Sep-2020) and Oct-2019 to march-2020 is considered for 2021-22 |
| TBHE & Jurala projects | 189.17 | Actuals of 19-20 is considered for 2021-22 |
| **Total** | **102213.86** |  |

The availability of energy from different sources is more than quantum required by ESCOMs and hence available quantum from different sources have been reduced on the basis of Merit Order Despatch is as detailed below;

**Table 4.3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sources** | **Available quantum in Mus** | **Quantum offtake by ESCOMs in Mus** | **Difference in Mus** | **Justification** |
| RTPS 8 | 1601.15 | 632.72 | 968.42 | Due to higher variable cost and requirement of ESCOMs is lower. Hence, Offtake of power from these power plants is reduced. The full Fixed cost is considered for tariff filing. |
| BTPS Unit-1 | 3241.20 | 1210.64 | 2030.56 |
| BTPS Unit-2 | 3499.62 | 1307.16 | 2192.46 |
| BTPS Unit-3 | 4899.47 | 1830.03 | 3069.44 |
| RTPS Unit 1 to 7 | 8666.46 | 3401.27 | 5265.19 |
| Yelahanka Combined Cycle gas Power projects | 1878.37 | 207.37 | 1670.99 | Plant is expected to available during the month of July-2021 and offtake power from the plant is around 6 hours ie peak period |
| Yermarus TPS - 1 & 2 | 11198.78 | 5129.79 | 6068.99 | The capacity charges considered for full. However energy considered for 16 hours |
| Kudigi Units 1,2& 3 | 9373.59 | 2185.95 | 7187.64 | Due to higher variable cost and requirement of ESCOMs is lower. Hence, Offtake of power from these power plants is reduced. The full Fixed cost is considered for tariff filing. |
| NTPL | 1189.69 | 371.60 | 818.08 |
| DVC-Mejia | 1145.38 | 409.42 | 735.96 |
| Simhadri station II | 917.56 | 441.39 | 476.17 |
| Vallur | 806.86 | 229.50 | 577.37 |
| UPCL | 7482.78 | 4346.16 | 3136.62 | Due to higher variable cost and requirement of ESCOMs is lower. Hence, Offtake of power from these power plants is reduced. The full Fixed cost is considered for tariff filing. |
| **Total** | **55900.92** | **21703.04** | **34197.88** |  |

**3.1** The availability of Energy from Hydel & Thermal Power Station’s details furnished by KPCL is shown in **Table 4.4 & 4.5**.

**Table 4.4**

**HYDEL ENERGY**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Generating Source** | **Energy in MUs** |
| 1 | Sharavathy valley project(Sharavathy, Linganamakki & Chakra Projects) | 4850.46 |
| 2 | Kali Valley projects (Nagajari & Supa Projects) | 3203.48 |
| 3 | Varahi Valley projects (Varahi & Mani Projects) | 1051.28 |
| 4 | Bhadra & Bhadra Right Bank | 49.47 |
| 5 | Ghataprabha (GDPH) | 63.65 |
| 6 | Mallapur & Others | 0 |
| 7 | Kadra Dam | 325.40 |
| 8 | Kodasalli Dam | 315.13 |
| 9 | Gerusoppa/STRP | 483.64 |
| 10 | Almatti Dam Power House | 441.73 |
| 12 | Shiva & Shimsa | 278.28 |
| 13 | Munirabad | 80.82 |
| 14 | MGHE-Jog | 253.63 |
|  | **Total KPCL Hydel** | **11396.97** |

**Table-4.5**

**THERMAL POWER STATIONS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Stations** | **Installed Capacity in MW** | **Net generation in MUs** |
| 1 | RTPS I &7 | 1470 | 3401.27 |
| 2 | RTPS Unit 8 | 250 | 632.72 |
| 3 | BTPS Unit I | 500 | 1210.64 |
| 4 | BTPS Unit II | 500 | 1307.16 |
| 5 | BTPS UNIT-III | 700 | 1830.03 |
| 6 | Yelahanka Combined Cycle | 370 | 207.37 |
| 7 | Yermarus TPS - 1 & 2 | 1600 | 5129.79 |
| **Total** | | | **13719.00** |
|

**3.2** Total Hydel generation would be 11396.97 MUs and energy from Thermal plants would be scheduled is around 13719 MUs for 2021-22, totalling to 25115.97 MUs from KPCL Station and Raichur Power Corporation Ltd.

1. **Projection of cost - KPCL Hydel and Thermal Stations:**

**Hydel Stations:**

The tariff rates worked out by KPCL based on KERC order dated 03.08.2009 for hydel stations except for Shivasamudram, Shimsha, Munirabad & MGHE. The tariff for the hydel stations is based on the design energy. The over and above the design energy paid at 15 paise per kwh or 3% of the ROE whichever is less. The Hon’ble Commission vide order dated 25.02.2015 determined the tariff for KPCL Hydro Stations of Shiva and Shimsha, Munirabad & MGHE upto2019. The tariff proposed by KPCL in its email dated 18.11.2020 is considered for above hydro stations. The rate details furnished by the KPCL is as shown in Table-4.6.

**Table-4.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Source** | **Design energy in MUs** | **Paise per Unit** |
| **A** | **KPCL – Hydel** |  |  |
| 1 | Sharavathy valley project ( Sharavathy, Linganamakki & Chakra Projects) | 3737.95 | 77.80 |
| 2 | Kali Valley projects | 2058.77 | 125.37 |
| 3 | Varahi Valley projects ( Varahi & Mani Projects) | 848.69 | 182.40 |
| 4 | Varahi 3 & 4 | 848.69 | 182.40 |
| 5 | Bhadra & Bhadra Right Bank | 50.49 | 29.61 |
| 6 | Ghataprabha (GDPH) | 84.97 | 578.50 |
| 7 | Mallapur & Others |  | 0.00 |
| 8 | Kadra Dam | 419.9 | 258.59 |
| 9 | Kodasalli Dam | 372.48 | 186.50 |
| 11 | Gerusoppa/STRP | 442.62 | 214.03 |
| 12 | Almatti | 384 | 301.82 |
| 13 | Shiva & Shimsa | 252 | 164.44 |
| 14 | Munirabad | 65 | 138.43 |
| 15 | MGHE-Jog | 119 | 102.08 |

**Note: Paise 20 as royalty charges is considered for the actual generation in respect of all Hydro stations except for the Almatti Dam Power House (Paise 100 /unit)**

**KPCL Thermal Stations:**

The tariff rates worked out by KPCL based on various parameters of tariff orders in respect of thermal stations RTPS units 1 to 7, RTPS-8, BTPS unit-I, II & III is considered. The Yelahanka Combined Cycle Power Plant is yet to be declared commercial operation by KPCL and tariff is to be determined by KERC and hence the tariff proposed in its email dated 18.11.2020 is considered. The KERC in its order dated 25.02.2015 determined capacity charges in respect of BTPS unit 2 and RTPS Unit-8 from the date of commission to end of 31.03.2019. Hence, tariff proposed in the letter dated 18.11.2020 by KPCL is considered for the following units;

**Table-4.7**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Stations** | **Capacity charges applicable for 2021-22 (Amount in Rs. crore** |
| 1 | BTPS Unit-2 | 463.39 |
| 2 | RTPS Unit-8 | 248.30 |

The average variable cost for the year 2021-22 projected by KPCL is considered:

**Table-4.8**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. no.** | **Stations** | **2020-21** | |
| **Fixed cost Rs in Crores** | **Variable cost Paise per Kwh** |
| 1 | RTPS unit 1 to 7 | 941.99 | 300.00 |
| 2 | RTPS unit-8 | 248.30 | 280.00 |
| 3 | BTPS unit-1 | 323.78 | 295.00 |
| 4 | BTPS unit-II | 463.39 | 294.00 |
| 5 | BTPS Unit-III | 990.43 | 299.00 |
| 6 | Yelahanka Combined Cycle | 356.08 | 320.00 |
| 7 | Yermarus TPS - 1 & 2 | 2269.10 | 290.00 |
|

The average cost of hydel stations works out to 132.28 Paise per unit and thermal units is around 715.37 paise per unit. The Income tax proposed by KPCL in email dated 18.11.2020 has been shown separately.

1. **Central Generating Stations:**

**4.1** ESCOMs have a share in Central Generating station of NTPC, Neyveli Lignite Corporation (NLC), Nuclear power stations and other Joint Venture Projects. The allocation of capacity entitlement from these stations includes both firm and unallocated share. The unallocated share is vary depending upon the allocation issued by Ministry of Power, GoI.

**4.2.** The energy available to ESCOMs depends on the scheduled generation and share in a month and other parameters such as availability and outages (forced and planned). The net energy available at ex-bus generation in the LGBR prepared by SRPC for the year 2020-21 is considered for 2021-22. Out of the total month wise energy available at Ex-bus, the share of Karnataka including unallocated share for the month of October 2020 is taken to arrive the energy available to Karnataka for FY 2021-22. In order to arrive energy available at Karnataka Periphery, all India Transmission loss for the week from 16.11.2020 to 22.11.2020 as notified by the NLDC is taken. The scheduled energy available at ex-bus and share of Karnataka is shown in **Table-4.8** and net energy available at KPTCL periphery after considering the POC losses is shown in **Table-4.9**.

The second unit from new NLC Thermal Power Project of 1000 MW is expected to available from Sept 2021. Out of 1000 MW installed capacity Karnataka, having a share of 74 MW.

**Table-4.8**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl. No.** | **Stations** | **Total Energy scheduled at EX-bus  in MUs** | **Share of Karnataka in %** | **Karnataka Share in MUs** |
| 1 | RSTP-I&II | 12131 | 18.90 | 2292.15 |
| 2 | RSTP-III | 2951 | 20.02 | 590.70 |
| 3 | RSTP-Talcher | 12376 | 18.33 | 2268.77 |
| 4 | Simhadri station II | 5088 | 18.72 | 441.39 |
| 5 | Vallur unit-I & II | 7379 | 11.35 | 229.50 |
| 6 | NLC II Stage-1 | 3372 | 23.32 | 786.42 |
| 7 | NLC II Stage-2 | 4625 | 23.53 | 1088.12 |
| 8 | NLC expansion I | 2702 | 25.93 | 700.66 |
| 9 | NLC expansion Stage II | 2567 | 7.42 | 664.01 |
| 10 | New NLC Thermal power project | 4218 | 25.87 | 313.06 |
| 11 | NTPL-2X 500 MW | 5749 | 21.48 | 409.42 |
| 12 | MAPS | 2018 | 8.50 | 169.92 |
| 13 | Kaiga Unit-1& 2 | 2737 | 30.80 | 843.00 |
| 14 | Kaiga Unit-3&4 | 2603 | 33.33 | 867.58 |
| 15 | Kudamkulam Unit-1 | 4838 | 23.50 | 1136.93 |
| 16 | Kudamkulam Unit-2 | 5122 | 22.11 | 1132.47 |
| 17 | Kudigi Station(3X800 MW) | 18194 | 53.48 | 2185.95 |
| 18 | DVC- Maija ( unit 7 &8 ) | 5944 | 20.00 | 409.42 |
| 19 | DVC- Koderma (unit 1 & 2) | 5944 | 25.00 | 1486.12 |
|  | **Total** |  |  | **18015.60** |

**Table-4.9**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stations** | **Energy scheduled @ generators Ex-bus in MUs** | **All India avg losses** | **Losses in Mus** | **Energy scheduled at KPTCL periphery** |
| N.T.P.C-RSTP-I&II | 2292.15 | 3.66 | 83.89 | 2208.26 |
| NTPC-III | 590.70 | 3.66 | 21.62 | 569.08 |
| NTPC-Talcher | 2268.77 | 3.66 | 83.04 | 2185.73 |
| NLC TPS2-Stage 1 | 786.42 | 3.66 | 28.78 | 757.63 |
| NLC TPS2-Stage 2 | 1088.12 | 3.66 | 39.83 | 1048.30 |
| NLC TPS1-Expn | 700.66 | 3.66 | 25.64 | 675.01 |
| NLC II expansion I | 664.01 | 3.66 | 24.30 | 639.70 |
| New NLC Thermal Projects | 313.06 | 3.66 | 11.46 | 301.61 |
| MAPS | 169.92 | 3.66 | 6.22 | 163.70 |
| Kaiga Unit 1&2 | 843.00 | 3.66 | 30.85 | 812.14 |
| Kaiga Unit 3 &4 | 867.58 | 3.66 | 31.75 | 835.83 |
| Simhadri Unit -1 &2 | 441.39 | 3.66 | 16.16 | 425.24 |
| NTPLUnit-2X 500 MW | 409.42 | 3.66 | 14.98 | 394.44 |
| KudamKulam | 1136.93 | 3.66 | 41.61 | 1095.32 |
| KudamKulam | 1132.47 | 3.66 | 41.45 | 1091.03 |
| Vallur TPS Sg I ,2 &3 | 229.50 | 3.66 | 8.40 | 221.10 |
| Kudigi(3X800 MW) | 2185.95 | 3.66 | 80.01 | 2105.95 |
| DVC - Mejja thermal Power Station | 409.42 | 3.66 | 14.98 | 394.44 |
| DVC - Koderma Thermal Power Station | 1486.12 | 3.66 | 54.39 | 1431.73 |
| **Total** | **18015.60** |  |  | **17356.23** |

**4.3.** The power drawl from the Central Sector Generating Stations either through the PGCIL lines or any lines constructed by developer selected through competitive bidding route from the generating plants. ESCOMs will pay POC (Transmission charges) to PGCIL/Independent Power Transmission Utility for Transmitting the CGS power and other states power. The New CERC (Sharing of Inter State Transmission Charges and Loss) Regulation, 2020 has come into force with effect from 1.11.2020. With the change in the methodology of calculation, the PoC charges payable by ESCOMs of Karnataka for the month of November 2020 will be ascertained after 25th December 2020 only. Hence, the POC charge as per RTA for the month of October-2020 is considered for FY 2021-2022 which includes POC, Reliability Support Charges and HVDC Charges. Considering the POC of October 2020, the total POC payable by ESCOMs for the year 2021-22 is works out to be Rs.2813.31 Crores.

**Table-4.10**

|  |  |
| --- | --- |
| **ESCOMs** | **POC Charges Rs.Crs.** |
| BESCOM | 1478.98 |
| GESCOM | 351.86 |
| HESCOM | 461.94 |
| MESCOM | 254.57 |
| CESC | 265.97 |
| **Total** | **2813.31** |

The new Regulation does not specify the POC charges applicable for Karnataka State. Any changes in the existing POC charges, the same will intimated to Hon’ble Commission after notified the charges applicable for Karnataka State from November 2020 onwards.

* 1. The CERC yet to be determined POSOCO-SRLDC charges for the control period 2019 to 2024. However, charges in the CERC order dated 29.12.2016, 10.6.2019, 27.06.2019 and 28.06.2019 has been considered. The applicable charges considering the above orders, the share of Karnataka works out to be Rs. 3.19 Crores.

* 1. The Tariff in respect of Central Generating Stations like NTPC, NLC and DVC stations for the Control period 2019 to 2024 is yet to determine by CERC for the stations belonging to Generators, Similarly, Transmission Charges of PGCIL owned transmission lines for the next control period is also to be determined by the CERC. Under the above circumstances, the Capacity charges billed by generator to ESCOMs of Karnataka for the year 2020-21 is considered for the FY 2021-22. The capacity charge considered based on various orders are as detailed below;

**Table-4.11**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Stations** | **Date of order/as per claims** | **Capacity charges applicable for 2021-22 (Amount in Rs. Crore)** |
| 1 | RSTP-I&II | As per bill | 1057.68 |
| 2 | RSTP-III | As per bill | 268.05 |
| 3 | RSTP-Talcher | As per bill | 996.95 |
| 4 | Simhadri station II | As per bill | 1066.71 |
| 5 | Vallur unit-I & II | 11.7.2017 | 1858.96 |
| 6 | NLC II Stage-1 | 12.6.2017 | 299.80 |
| 7 | NLC II Stage-2 | 12.06.2017 | 414.29 |
| 8 | NLC expansion I | 18.10.2016 | 276.18 |
| 9 | NLC expansion Stage II (U-1) | 24.7.2017 | 728.06 |
| 10 | New NLC Thermal projects | 29.1.2020 | 996.25 |
| 11 | NTPL-2X 500 MW | 11.7.2017 | 1090.17 |
| 12 | Kudigi | As per the bill | 2795.24 |
| 13 | DVC-Mejia | 3.10.2016 | 1019.21 |
| 14 | DVC-Koderma | 28.2.17 | 1175.74 |

The average variable cost for the month of Aug-2020, Sep-2020 and Oct-2020 is considered for energy charges for FY 2021-2022. In respect of MAPS, Kaiga, and Kundamkulam power station the average rate per unit for the months of Aug-2020, Sep-2020 and October -2020 is considered.

**Table-4.12**  (Rs./unit)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Particulars** | **MAPS** | **Kaiga Units 1 to 4** | **Kudamkulam Unit -1** | **Kudamkulam Unit -2** |
| Base Price | **2.427** | **3.270** | **3.545** | **3.545** |
| Heavy Water adjustment charges | **0.002** | **0.000** | **0.379** | **0.379** |
| Heavy Water lease adjustment charges | **0.000** | **0.015** | **0.000** | **0.000** |
| Insurance | **0.100** | **0.062** | **0.042** | **0.042** |
| Decommissiong Levy | **0.020** | **0.020** | **0.020** | **0.020** |
| Forex Variation Adjustment Charges | **0.050** | **0.050** | **0.053** | **0.053** |
| Nuclear Liability & Forex adjustment | **0.000** | **0.000** | **0.050** | **0.050** |
| Others |  |  | **0.000** | **0.000** |
| Total tariff | **2.599** | **3.417** | **4.090** | **4.090** |

* 1. The capacity charges (Fixed Cost) and variable cost considered for 2021-22 is shown in Table-4.13.

**Table-4.13**

|  |  |  |
| --- | --- | --- |
| **Central Projects** | **Fixed Cost**  **(Rs in Cr)** | **Variable Cost (Paise per Kwh)** |
| N.T.P.C-Ramagundam | 199.85 | 241.27 |
| NTPC-VII | 53.66 | 237.87 |
| NTPC-Talcher | 182.76 | 208.77 |
| NLC TPS2-Stage 1 | 69.92 | 268.57 |
| NLC TPS2-Stage 2 | 97.47 | 277.17 |
| NLC TPS1-Expn | 71.62 | 255.20 |
| NLC II Expansion-1 | 188.33 | 262.47 |
| New NLC Thermal Power project | 73.94 | 234.40 |
| MAPS | 0.00 | 259.88 |
| Kaiga unit I &II | 0.00 | 341.67 |
| Kaiga Unit 3 &4 | 0.00 | 341.67 |
| Simhadri Unit -1 &2 | 199.68 | 296.43 |
| Vallur TPS Stage I &2 &3 | 210.99 | 314.80 |
| NTPL | 234.17 | 288.43 |
| KudamKulam Unit1 | 0.00 | 408.95 |
| KudamKulam Unit2 | 0.00 | 408.95 |
| Kudigi | 1494.87 | 346.40 |
| DVC- Mejia thermal Power Station | 203.84 | 273.37 |
| DVC Kodemma thermal Power Station | 293.93 | 247.63 |
|

**4.7** Income tax for the CGS station included in the capacity charges payment on normative basis by grossing up of RoE with effective tax rate of the respective financial year of the generating company. Income tax is included as a part of capacity charges and not payable separately and hence not considered.

1. **Independent Power Producers**

5.1. The generation of 1200 MW of UPCL Unit -1 & Unit-2 taken at 85% of 90% installed capacity as per PPA/ approval given by Government. Tariff in respect of control period 2019-20 to 2023-24 is yet to be determined by CERC and hence the auxiliary consumption of 5.75% as per CERC Regulation 2019 and additional auxiliary consumption 1.2% allowed by CERC vide order dated 20.02.2014 and 10.07.2015 is taken. The capacity charges determined by CERC in the order dated 22.01.2020 applicable for FY 2018-19 is considered for FY 2021-22. M/s. UPCL has entered into coal supply agreement with PAN Asia Trading PTC Ltd., the cost of the coal (FoB) has quoted by the bidder, the variation link to the CERC Composite Index. UPCL proposed the variable cost with the new coal cost with indexation is around Rs. 2.74/unit is considered for FY 2021-22.

**Table-4.14**

|  |  |  |  |
| --- | --- | --- | --- |
| **Stations** | **Energy (in Mus)** | **Fixed cost (Rs in Cr)** | **Variable cost (Paise per Kwh)** |
| UPCL | **4346.16** | 1091.48 | 274.00 |

1. **Non-conventional Energy Source (NCE source)**
   1. The actual generation of NCE projects for the year 2020-21 (upto Sept-2020) and actual generation of NCE project for the period October 2019 to March 2020 has been considered for 2021-22 including Solar, Co-generation, Bio-mass, Wind Mills and Mini Hydel projects.
   2. Ministry of power allocated un allocated power of coal based NTPC stations for bundling with solar power in ratio of 1.2 (unallocated power: Solar power) as envisaged under National Solar Mission Phase–II, Batch-II Tranche-I. Accordingly, Ministry of Power, GOI, allocated 300 MW to Karnataka from unallocated power of coal based NTPC stations of Eastern Region and Western Region. The expected energy from bundled power of coal is around 2015.75 MUs ( 300 MW @85% PLF after considering the losses)

6.3 ESCOM wise NCE energy projected for FY 2021-22 is shown in **Table 4.15.**

**Table-4.15 Energy in Mus**



6.4 The average cost of the year 2020-21 is considered for Hydro , wind, Solar, Co-generation and bundled power.

1. **Jurala Project**

The ESCOMs having a share of 50% from Jurala Priyadarshni Hydro Electric Projects ie 117 MW. The net energy exported to Karnataka from Jural Priyadarshni Hydro Electric Projects for the year 2019-20 is considered for 2020-21. The TSERC vide tariff order dated 06.07.2017 determined the capacity charges for the project for the control period from 01.04.2014 to 31.03.2019. The 50% of the capacity charges applicable for the financial year 2018-19 is considered. The capacity Charges for the next control period is yet to be determined by TSERC hence capacity charges applicable for the year 2018-19 is considered for the year 2021-22 also.

**Table-4.16**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Apr-18** | **May-18** | **Jun-18** | **Jul-18** | **Aug-18** | **Sep-18** | **Oct-18** | **Nov-18** | **Dec-18** | **Jan-19** | **Feb-19** | **Mar-19** | **Total** |
| Energy in Mus | -0.08 | -0.096 | -0.08 | 1.744 | 28.992 | 52.688 | 41.552 | 32.256 | -0.224 | -0.048 | 0 | 0 | 156.704 |
| Amount in Rs Cr | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 4.89 | 58.66 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |

1. The energy from T. B. Dam power is shared between AP/Telangana and Karnataka. The 1/5th share of revenue expenditure and energy has been shared between two states. The actual cost and energy supplied for the FY 2019-20 are considered for 2021-22. The power purchase cost and energy from T. B. Dam has been estimated to 27.05 MUs and Rs. 3.04 crore.

**Table-4.17**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Apr-20** | **May-20** | **Jun-20** | **Jul-20** | **Aug-20** | **Sep-20** | **Oct-20** | **Nov-20** | **Dec-20** | **Jan-21** | **Feb-21** | **Mar-21** | **Total** |
| Energy in Mus | -0.07 | -0.20 | -0.35 | 2.91 | 9.38 | 5.28 | 4.31 | 0.42 | 1.84 | 1.69 | 0.38 | 1.46 | 27.05 |
| Amount in Rs crore | 1.04 | 0.33 | 0.09 | 0.15 | 0.16 | 0.12 | 0.14 | 0.09 | 0.10 | 0.09 | 0.10 | 0.64 | 3.04 |

1. The projected energy and cost allocated among the ESCOMs is as per GoK order dated 08.05.2020 except NCE projects.
2. The ESCOMs wise energy and cost projected for the financial year 2021-22 is as below:

**Table-4.18**

|  |  |  |  |
| --- | --- | --- | --- |
| **ESCOMs** | **Energy requirement in MUs** | **Power Purchase cost (Rs/Crores)** | **Average cost (Rs. /unit)** |
| BESCOM | 29955.95 | 15210.12 | 5.08 |
| GESCOM | 8911.00 | 4136.44 | 4.64 |
| HESCOM including Hukkeri Society & AEQUS | 14491.67 | 6973.27 | 4.81 |
| MESCOM Including MSEZ | 6499.74 | 3195.87 | 4.92 |
| CESC, Mysore | 8060.89 | 3714.04 | 4.61 |
| **Total** | **67919.26** | **33229.74** | 4.89 |

**Sales and Distribution Loss for FY-22 (3rd year of 5th control period):**

Category wise sales and number of installations for FY-22 as approved in the Commission’s order dated 30th May 2019 is as under:

**Table 4.19 (In MU)**

|  |  |  |
| --- | --- | --- |
| **Category** | **FY-22** | |
| **Approved Nos.** | **Approved Sales** |
| LT-2a\* | 92,71,066 | 8,459.97 |
| LT-2b | 13761 | 62.16 |
| LT-3 | 1309132 | 2560.96 |
| LT-4 (b) | 454 | 1.73 |
| LT-4 (c) | 1974 | 4.57 |
| LT-5 | 241599 | 1310.72 |
| LT-6 WS | 102298 | 1902.57 |
| LT-6 SL | 71943 | 570.05 |
| LT-7 | 977607 | 145.85 |
| HT-1 | 303 | 794.66 |
| HT-2 (a) | 7907 | 4916.14 |
| HT-2 (b) | 7731 | 2979.49 |
| HT2C | 1069 | 486.57 |
| HT-3(a)& (b) | 78 | 66.03 |
| HT-4 | 232 | 70.38 |
| HT-5 | 2925 | 91.36 |
| **Sub-Total other than BJ/KJ and IP sets** | **12010078** | **24423.22** |
| BJ/KJ | 801031 | 137.9 |
| IP Sets | 975047 | 6988.09 |
| **Sub Total BJ/KJ and IP sets** | **1776078** | **7125.99** |
| **Total** | **13786156** | **31549.21** |

The actual category wise sales for 2019-20 are 27834.60 MU as against the approved sales of 28858.33 MU. There is a reduction of sales to an extent of 1023.73 MU against the approved level. Based on the actuals of FY-20 and half yearly sales of FY-21 (Upto Sept-20), category wise sales for FY-22 are modified.

**Projection of Energy Sales in MU:**

The projections of sales for second half of FY-21 is projected based on the previous half yearly data and for FY-22, sales are computed based on Compounded Annual Growth Rate Method.

The category wise half yearly sales for each of the financial year from FY-15 to FY-20 are depicted in the table below.

**Table 4.20**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Tariff** | **Apr-14 to Sept-14** | **Oct-14 to Mar-15** | **Apr-15 to Sept-15** | **Oct-15 to Mar-16** | **Apr-16 to Sept-16** | **Oct-16 to Mar-17** | **Apr-17 to Sept-17** | **Oct-17 to Mar-18** | **Apr-18 to Sept-18** | **Oct-18 to Mar-19** | **Apr-19 to Sept-19** | **Oct-19 to Mar-20** |
|
| HT-2a | 0.54 | 0.46 | 0.51 | 0.49 | 0.53 | 0.47 | 0.50 | 0.50 | 0.54 | 0.46 | 0.52 | 0.48 |
| HT-2b | 0.54 | 0.46 | 0.53 | 0.47 | 0.54 | 0.46 | 0.53 | 0.47 | 0.56 | 0.44 | 0.52 | 0.48 |
| HT-2c | 0.44 | 0.56 | 0.51 | 0.49 | 0.51 | 0.49 | 0.52 | 0.48 | 0.53 | 0.47 | 0.52 | 0.48 |
| HT-3 | 0.20 | 0.80 | 0.47 | 0.53 | 0.30 | 0.70 | 0.13 | 0.87 | 0.30 | 0.70 | 0.27 | 0.73 |
| HT-4 | 0.60 | 0.40 | 0.53 | 0.47 | 0.59 | 0.41 | 0.52 | 0.48 | 0.50 | 0.50 | 0.50 | 0.50 |
| HT-5 | 0.88 | 0.12 | 0.49 | 0.51 | 0.45 | 0.55 | 0.50 | 0.50 | 0.50 | 0.50 | 0.51 | 0.49 |
| **HT total** | **0.55** | **0.45** | **0.51** | **0.49** | **0.53** | **0.47** | **0.51** | **0.49** | **0.54** | **0.46** | **0.51** | **0.49** |
| LT-1 | 0.51 | 0.49 | 0.51 | 0.49 | 0.51 | 0.49 | 0.46 | 0.54 | 0.51 | 0.49 | 0.51 | 0.49 |
| LT-2 | 0.51 | 0.49 | 0.51 | 0.49 | 0.52 | 0.48 | 0.52 | 0.48 | 0.51 | 0.49 | 0.52 | 0.48 |
| LT-3 | 0.51 | 0.49 | 0.52 | 0.48 | 0.52 | 0.48 | 0.53 | 0.47 | 0.51 | 0.49 | 0.53 | 0.47 |
| LT-4 | 0.45 | 0.55 | 0.52 | 0.48 | 0.44 | 0.56 | 0.48 | 0.52 | 0.48 | 0.52 | 0.54 | 0.46 |
| LT-5 | 0.50 | 0.50 | 0.51 | 0.49 | 0.51 | 0.49 | 0.50 | 0.50 | 0.50 | 0.50 | 0.51 | 0.49 |
| LT-6a [WS] | 0.53 | 0.47 | 0.51 | 0.49 | 0.41 | 0.59 | 0.44 | 0.56 | 0.47 | 0.53 | 0.52 | 0.48 |
| LT-6b [SL] | 0.48 | 0.52 | 0.50 | 0.50 | 0.47 | 0.53 | 0.47 | 0.53 | 0.49 | 0.51 | 0.50 | 0.50 |
| LT-7 | 0.51 | 0.49 | 0.51 | 0.49 | 0.49 | 0.51 | 0.51 | 0.49 | 0.51 | 0.49 | 0.47 | 0.53 |
| **LT total** | **0.49** | **0.51** | **0.51** | **0.49** | **0.48** | **0.52** | **0.50** | **0.50** | **0.50** | **0.50** | **0.53** | **0.47** |
| **Total** | **0.51** | **0.49** | **0.51** | **0.49** | **0.50** | **0.50** | **0.50** | **0.50** | **0.51** | **0.49** | **0.52** | **0.48** |

First half year category wise sales ratio for Apr-20 to Sept-20 are computed by considering the average of the first half years sales ratio of the financial year from FY-15 to FY-20. Similarly, second half year category wise sales ratio is computed as depicted in the table below:

**Table 4.21**

|  |  |  |
| --- | --- | --- |
| **Tariff** | **Avg. 1st half year** | **Avg. 2nd half year** |
|
| HT-2a | 0.52 | 0.48 |
| HT-2b | 0.54 | 0.46 |
| HT-2c | 0.51 | 0.49 |
| HT-3 | 0.28 | 0.72 |
| HT-4 | 0.54 | 0.46 |
| HT-5 | 0.56 | 0.44 |
| **HT total** | **0.53** | **0.47** |
| LT-1 | 0.50 | 0.50 |
| LT-2 | 0.52 | 0.48 |
| LT-3 | 0.52 | 0.48 |
| LT-4 | 0.48 | 0.52 |
| LT-5 | 0.51 | 0.49 |
| LT-6a [WS] | 0.48 | 0.52 |
| LT-6b [SL] | 0.48 | 0.52 |
| LT-7 | 0.50 | 0.50 |
| **LT total** | **0.50** | **0.50** |
| **Total** | **0.51** | **0.49** |

The actual sales recorded for FY-21 half year (April- 20 to Sept-20) is 12340.04 MU. HT sales recorded for FY-21 half year is 2890.58 MU. There is a drastic fall down of HT sales compared to FY-20 half year (4035.0 MU) due to Covid-19 pandemic situation.

Based on the half yearly growth, the total estimated sales for FY-21 is 24485.64 MU.

LT-4(a) consumption for FY-21 is computed as 6864.78 MU based on the consideration, half yearly sales and half yearly installations.

The monthly average sales /IP for FY-21 (upto Sept-20) is computed as 593.23 units/IP/month rounded off to 600 units/IP/month from the half yearly installations of FY-21(upto Sept-20) i.e. 938441 the disconnected installations of 6531 as per GPS survey is deducted to arrive at the monthly average sales/IP for FY-21(upto Sept-20). The specific consumption for FY-21 is computed by multiplying the monthly average sales/IP with 12 months i.e. 7200 units/IP/annum is arrived. The specific consumption of 7200 units/IP/annum is multiplied with FY-21 estimated installations to arrive consumption for FY-21 i.e. 6864.78 MU.

**Sales projection for FY-22:**

The compound annual growth rate (CAGR) is the [mean](https://www.investopedia.com/terms/m/mean.asp) [annual](https://www.investopedia.com/terms/a/annual.asp) [growth rate](https://www.investopedia.com/terms/g/growthrates.asp) over a specified period of time longer than one year. This method is used to compute the consumption pattern of BESCOM over the years.

This method is [geometric progression](https://en.wikipedia.org/wiki/Geometric_progression) ratio that provides a constant rate of return over the time period, which drive the demand for electricity, are expected to follow the same trend as in the past and hence the forecast for electricity is also based on the assumption that the past trend in consumption of electricity will continue in the future.

The strength of this method, when used with balanced judgment, lies in its ability to reflect recent changes and therefore is probably best suited for a short-term projection as used for the ARR/ Tariff filing.

However, the CAGR-based approach has to be adjusted for judgment on the characteristics of the specific consumer groups/ categories. For example, while this method may provide a better estimate of consumption by the domestic and commercial categories of consumers, it may not be very suitable for the Irrigation Pump sets, BJ/KJ, and categories with negative growth because of the high dependence of demand on the end-use.

In any case, the forecasts arrived at by using the CAGR method need to be modified for impact of any other considerations like specific consumption for IP sets, negative growth due to Open Access etc. The historical data for past years is available. The CAGR for 10 yrs, 9yrs, 8yrs, 7yrs, 6 yrs, 5 yrs, 4 yrs, 3 yrs, 2 yrs and one year growth is computed. Accordingly, 10 scenarios of projections are obtained. An empirical formula is made use of.

The minima and maxima and most likely of all the CAGR years are worked out - minima is considered as pessimistic and maxima is considered as optimistic, the average of the rest is considered as most likely.

Statistical empirical formula is applied for all the scenarios

Average = (Optimistic+Pessimistic+4X Most Likely)

6

With this statistical formula, One year growth rate of FY-21 over FY-20 is also considered.

For most of the categories growth rate as per empirical formula is considered, wherever there is a negative growth the sales of FY-21 is retained.

HT sales are considered based on growth rate empirical formula.

CAGR upto 10 years are computed, maximum, minimum and average CAGR are calculated. Using an empirical formula growth rates are arrived as shown in the table below:

**Table 4.22**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Tariff category** | **CAGR 10yrs** | **CAGR 9yrs** | **CAGR 8yrs** | **CAGR 7yrs** | **CAGR 6yrs** | **CAGR 5yrs** | **CAGR 4yrs** | **CAGR 3yrs** | **CAGR 2yrs** | **CAGR 1yr** | **Max** | **Min** | **Avg** | **Formula** |
| LT-1 | 7% | 17% | 19% | 20% | 28% | 33% | 41% | 60% | 11% | 4% | 60% | 4% | 22% | 25% |
| LT-2(a) | 8% | 6% | 6% | 6% | 6% | 5% | 5% | 4% | 5% | 5% | 8% | 4% | 5% | 6% |
| LT-2(b) | 8% | 8% | 4% | 7% | 8% | 7% | 7% | 7% | 7% | 10% | 10% | 4% | 7% | 7% |
| LT-3 | 8% | 7% | 7% | 6% | 6% | 6% | 6% | 6% | 6% | 8% | 8% | 6% | 7% | 7% |
| LT-4(a) | 5% | 5% | 3% | 3% | 5% | 4% | 3% | -2% | 5% | -4% | 5% | -4% | 3% | 2% |
| LT-4(b) | -12% | -16% | -18% | -19% | -19% | -6% | -21% | -13% | 19% | -12% | 19% | -21% | -14% | -10% |
| LT-4(c) | 7% | 7% | 5% | 3% | 8% | -3% | 5% | 4% | 12% | 12% | 12% | -3% | 6% | 6% |
| LT-5 | 3% | 2% | 2% | 1% | 2% | 1% | 1% | 2% | 1% | -2% | 3% | -2% | 2% | 1% |
| LT-6a | 14% | 14% | 14% | 16% | 19% | 25% | 34% | 31% | 27% | 10% | 34% | 10% | 20% | 21% |
| LT-6b | 6% | 4% | 3% | 4% | 5% | 6% | 9% | 11% | 7% | 5% | 11% | 3% | 6% | 6% |
| LT-7 | 8% | 9% | 6% | 6% | 6% | 1% | 5% | 9% | 14% | 52% | 52% | 1% | 8% | 14% |
| **LT Total** | **7%** | **6%** | **5%** | **5%** | **6%** | **5%** | **5%** | **4%** | **6%** | **2%** | **7%** | **2%** | **5%** | **5%** |
| HT-1 | 5% | 5% | 6% | 6% | 4% | 3% | 3% | 4% | 6% | 5% | 6% | 3% | 5% | 4% |
| HT-2(a) | 2% | 1% | -1% | -2% | -3% | -3% | -2% | -2% | -3% | -8% | 2% | -8% | -2% | -2% |
| HT-2(b) | 1% | 0% | -1% | -3% | -3% | -3% | -3% | -4% | -4% | -4% | 1% | -4% | -3% | -2% |
| HT-2(c) |  |  |  |  | 24% | 12% | 9% | 7% | 3% | 3% | 24% | 3% | 4% | 7% |
| HT-3(a) | 45% | 48% | 32% | 26% | 36% | 26% | 0% | 58% | 48% | 28% | 58% | 0% | 36% | 34% |
| HT-3(b) | 10% | 29% | 20% | 32% | 51% | 34% | 64% | 27% | 37% | 23% | 64% | 10% | 32% | 33% |
| HT-4 | -2% | -3% | -5% | -6% | -5% | -9% | -5% | -10% | 7% | 12% | 12% | -10% | -4% | -2% |
| HT-5 |  |  |  | 24% | 11% | -21% | 5% | 3% | 3% | 4% | 24% | -21% | 3% | 3% |
| **HT TOTAL** | **2%** | **1%** | **0%** | **-1%** | **-2%** | **-2%** | **-2%** | **-2%** | **-2%** | **-5%** | **2%** | **-5%** | **-1%** | **-1%** |
| **TOTAL** | **5%** | **5%** | **4%** | **3%** | **3%** | **3%** | **3%** | **2%** | **4%** | **0%** | **5%** | **0%** | **3%** | **3%** |

Hence, estimation of energy sales for FY-22 is prepared with a few modifications such as,

Actual category wise sales for FY-20 is considered for arriving at the CAGR.

Half yearly sales i.e. cumulative DCB of Sept 2020 is considered.

In respect of BJ/KJ, no new schemes are announced by GoK. Hence the estimated consumption for FY-21 based on half yearly sales is retained for FY-22.

IP sales:- Specific Consumption for FY-21 computed (7200 units/IP/annum) is multiplied with FY-22 estimated installations to arrive consumption for FY-22 i.e. 7044.78 MU.

In respect of LT-4(b), HT-2(a), HT-2(b) and HT-4 the growth rate is negative. Hence, the estimated sales for FY-21 are considered.

The category wise sales projected for the FY-21 and FY-22 are shown in the table below:

**Table 4.23 (Sales in MU)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tariff category** | **FY-20 (Actuals)** | **FY-21**  **(Apr-20 to Sep-20) (Actuals)** | **FY-21 Estimation** | **FY-22 Estimation** |
| LT-1 | 224.43 | 138.06 | 275.19 | 275.19 |
| LT-2(a) | 7285.82 | 3797.85 | 7356.73 | 7766.09 |
| LT-2(b) | 56.57 | 15.84 | 30.70 | 32.90 |
| LT-3 | 2240.82 | 801.27 | 1548.62 | 1652.25 |
| LT-4(a) | 6916.36 | 3311.03 | 6864.78 | 7044.78 |
| LT-4( b ) | 1.35 | 0.75 | 1.51 | 1.51 |
| LT-4(c) | 5.67 | 2.82 | 5.83 | 6.16 |
| LT-5 | 1217.67 | 434.34 | 854.79 | 865.14 |
| LT-6a(i)WR | 1317.38 | 621.41 | 1292.37 | 1561.55 |
| LT-6a(ii)SL | 524.64 | 239.33 | 496.06 | 526.86 |
| LT-6© EV |  | 0.0011 | 0.0023 | 0.0023 |
| LT-7 | 205.45 | 86.75 | 173.32 | 197.90 |
| **LT Total** | **19996.16** | **9449.46** | **18899.91** | **19930.34** |
| HT-1 | 762.04 | 395.55 | 799.28 | 835.16 |
| HT-2(a) | 4173.06 | 1509.50 | 2877.50 | 2877.50 |
| HT-2(b) | 2345.62 | 747.73 | 1391.24 | 1391.24 |
| HT-2© | 331.52 | 121.54 | 240.43 | 257.68 |
| HT-3(a) | 57.09 | 36.61 | 130.73 | 174.91 |
| HT3 (b) | 1.33 | 0.73 | 2.60 | 3.46 |
| HT-4 | 78.30 | 40.77 | 75.43 | 75.43 |
| HT-5 | 89.48 | 38.16 | 68.52 | 70.35 |
| **HT TOTAL** | **7838.44** | **2890.58** | **5585.73** | **5685.74** |
| **TOTAL** | **27834.6** | **12340.04** | **24485.64** | **25616.07** |

**Projection of Installations:**

Estimation of number of consumers for FY-21 is computed by adding the half yearly growth of consumers to the first half of FY-21. For FY-22, one year CAGR is considered more appropriate.

Estimation of installations is prepared with a few modifications such as,

* BJ/KJ: The number of installations based on DCB figures for Sept-20 (First Half year figures of FY-21) is 843409. Same numbers of consumers are retained for FY-21 & FY-22.
* LT-4(b): CAGR values are negative; FY-21 numbers of consumers are retained.
* HT-4: 1 year CAGR is 63% which is exorbitant. Hence, 3 year CAGR growth rate of 23% is considered for FY-22.

The CAGR for 5 years, 4 years, 3 years, 2 years and one year is computed as shown in the below table:

**Table 4.24**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Consumer Category** | **One year growth rate** | **CAGR 5 years** | **CAGR 4 years** | **CAGR 3 years** | **CAGR 2 years** | **CAGR 1 year** |
| LT-1(a) | 0% | 2% | 2% | 2% | 0% | 0% |
| LT-2(a) | 3% | 5% | 5% | 5% | 5% | 5% |
| LT-2(b) | 2% | 4% | 2% | 3% | 3% | 3% |
| LT-3 | 3% | 6% | 5% | 5% | 5% | 4% |
| LT-4(a) | 2% | 4% | 4% | 4% | 3% | 3% |
| LT-4(b) | -10% | -17% | -23% | -11% | -25% | -17% |
| LT-4(c) | 5% | 6% | 5% | 7% | 6% | 6% |
| LT-5 | 3% | 5% | 4% | 4% | 4% | 4% |
| LT-6WS | 4% | 8% | 8% | 8% | 6% | 6% |
| LT-6SL | 3% | 3% | 3% | 4% | 4% | 4% |
| LT-7 | 6% | 17% | 12% | 11% | 11% | 11% |
| **LT TOTAL** | **3%** | **6%** | **5%** | **5%** | **5%** | **5%** |
| HT-1 | 4% | 8% | 8% | 10% | 7% | 8% |
| HT-2(a) | 3% | 7% | 4% | 6% | 6% | 5% |
| HT-2(b) | 4% | 9% | 7% | 10% | 11% | 11% |
| HT-2(c) | 6% | 17% | 12% | 11% | 11% | 10% |
| HT-3(a) | 9% | 10% | 17% | 17% | 18% | 13% |
| HT-3(b) | -13% | 52% | 10% | 13% | 11% | 14% |
| HT-4 | 12% | 14% | 11% | 23% | 37% | 63% |
| HT-5 | 17% | 37% | 31% | 23% | 22% | 20% |
| **HT TOTAL** | **5%** | **9%** | **7%** | **9%** | **10%** | **10%** |
| **TOTAL** | **3%** | **6%** | **5%** | **5%** | **5%** | **5%** |

The below table depicts the projected number of consumers for FY-21 and FY-22.

**Table 4.25**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Consumer Category** | **As on 31/03/20 (Actuals)** | **As on 30/09/20 (Actuals)** | **As on 31/03/21** | **As on 31/03/22** |
| LT-1(a) | 844227 | 843409 | 843409 | 843409 |
| LT-2(a) | 8273592 | 8416216 | 8558840 | 8977192 |
| LT-2(b) | 12377 | 12471 | 12565 | 12937 |
| LT-3 | 1143767 | 1158942 | 1174117 | 1226590 |
| LT-4(a) | 933908 | 938441 | 953441 | 978441 |
| LT-4(b) | 255 | 230 | 230 | 230 |
| LT-4(c) | 1756 | 1800 | 1844 | 1961 |
| LT-5 | 218866 | 221783 | 224700 | 233573 |
| LT-6WS | 84209 | 85978 | 87747 | 93153 |
| LT-6SL | 68016 | 68873 | 69730 | 72813 |
| LT-6EV |  | 27 | 54 | 100 |
| LT-7 | 766515 | 790525 | 814535 | 900462 |
| **LT TOTAL** | **12347488** | **12538695** | **12741212** | **13340861** |
| HT-1 | 268 | 274 | 280 | 303 |
| HT-2(a) | 7419 | 7542 | 7665 | 8056 |
| HT-2(b) | 7521 | 7690 | 7859 | 8709 |
| HT-2(c) | 833 | 858 | 883 | 970 |
| HT-3(a) | 43 | 45 | 47 | 53 |
| HT-3(b) | 16 | 15 | 14 | 16 |
| HT-4 | 412 | 437 | 462 | 567 |
| HT-5 | 1413 | 1534 | 1655 | 1982 |
| **HT TOTAL** | **17925** | **18395** | **18865** | **20656** |
| **TOTAL** | **12365413** | **12557090** | **12760077** | **13361517** |

#### Capital Investment Plan:

Capital Investment plans, Capitalization of the past six years are tabulated below:

**Table 4. 26 Amount in Rs. Crs**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl.No.** | **Year** | **FY-14** | **FY-15** | **FY-16** | **FY-17** | **FY-18** | **FY-19** | **FY-20** |
| **1** | Capital Investment Approved | 848.00 | 763.00 | 1374.31 | 2000.00 | 3272.32 | 2836.44 | 2165.58 |
| **2** | Capital Deployed | 1057.00 | 1495.00 | 1374.32 | 1318.25 | 1979.01 | 2869.37 | 2522.48 |
| **3** | Assets Categorized | 812.00 | 743.00 | 1770.27 | 1370.03 | 1522.66 | 2729.00 | 2904.08 |
| **4** | **% of Deployment over approved capital Investment** | **125%** | **196%** | **100%** | **66%** | **60%** | **101%** | **116%** |
| **5** | **% of Assets categorized over Capital Deployed** | **77%** | **97%** | **129%** | **69%** | **47%** | **96%** | **134%** |

From the above table, capital investment plan has increased from FY-16 onwards. This is due to technology upgradations and some approved projects of Government of India/Karnataka.

BESCOM has significant capital expenditure plans with respect to investments for infrastructure improvement, feeder separation program, village and household electrification etc.

The need to extend and expand our networks is driven by increases in electricity demand. Bangalore is the most densely populated and expensive part of the State. We also face additional operational challenges from the urban environment. Our urban customers are typically more sensitive to power cuts and require us to do more of our work out-of-hours or at weekends - fitting this in between high profile public events.

We also have to deal with congestion under pavements and roads due to road widening, metro works, White topping roads, etc., which increases the complexity of what we do. We also regularly have to put our equipment into small spaces and often underground to minimize how much land we use. This leads to higher costs to install and maintain our equipment. We are also aware of our responsibility to ensure that BESCOM’s electricity network is fit for purpose and comparable to other urban cities in terms of resilience, quality of supply, and the ability to deliver new connections. In order to ensure this, our Capital Investment plan proposes Rs. 2500 Crores and Rs. 3598 Crores of strategic investment including capex for Conversion of Overhead to UG/AB cable for FY-21 and FY-22 respectively as shown below:

**Table 4.27 Amount in Rs. Crs.**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Particular of the works under Major/ Minor heads** | **FY 20-21** |
| 1 | Ganga kalyana Works | 43.80 |
| 2 | Service connection works | 52.00 |
| 3 | Water Works | 15.51 |
| **4** | **Planned works Total** | **111.31** |
| 5 | 11 KV Evacuation line | 99.00 |
| 6 | Providing Additional DTC's /Enhancement of DTCs | 36.50 |
| 7 | Reconductoring of HT lines in No.s/Circuit kms | 96.00 |
| 8 | Reconductoring of LT lines in No.s/circuit kms | 66.00 |
| 9 | Local planning, Safety works, Emergency / Calamity Works | 49.44 |
| **10** | **Non-Planned works Total** | **346.94** |
| 11 | Meters | 60.00 |
| 12 | Providing Infrastructure to Un authorised IP sets | 173.25 |
| 13 | NJY | 38.35 |
| 14 | HVDS | 66.60 |
| 15 | DDUGJY | 39.90 |
| 16 | IPDS (Projects) | 26.00 |
| 17 | IPDS (ICT&MIS) | 100.00 |
| 18 | DAS | 15.80 |
| 19 | DSM | 1.51 |
| 20 | Civil Engineering Works | 75.00 |
| 21 | IT initiative | 24.57 |
| 22 | TIC | 6.60 |
| 23 | Auto reclosure | 46.75 |
| 24 | Replacement of faulty transformer | 35.00 |
| 25 | Model Sub division | 57.90 |
| 26 | Smart City | 35.00 |
| 27 | Model village | 5.50 |
| 28 | System improvement works of Indiranagar division | 15.00 |
| 29 | Conversion of OH line into UG/AB cable | 1135.00 |
| 30 | Corporate office reserve fund | 84.02 |
| **31** | **Project total** | **2041.75** |
| **32** | **Grand Total** | **2500.00** |

**Table 4.28 Amount in Rs. Crs.**

|  |  |  |
| --- | --- | --- |
| **Sl. No.** | **Particular of the works under Major/ Minor heads** | **FY 21-22** |
| 1 | Ganga kalyana Works | 125 |
| 2 | Service connection works | 100 |
| 3 | Water Works | 25 |
| 4 | 11 KV Evacuation line | 200 |
| 5 | Providing Additional DTC's /Enhancement of DTCs | 100 |
| 6 | Strengthening of HT network including OH/UG cable, Covered conductor and AB cable | 250 |
| 7 | Strengthening of LT network including OH/UG cable, Covered conductor and AB cable | 250 |
| 8 | Local planning, Safety works, Emergency / Calamity Works | 100 |
| **9** | **E&I Total** | **1150** |
| 10 | NJY | 0 |
| 11 | DDUGJY | 83 |
| 12 | IPDS | 138 |
| 13 | Civil | 50 |
| 14 | IT initiative | 50 |
| 15 | Meters and Commercial (with relavent accessories) and Smart grid & EV | 100 |
| 16 | DSM | 0 |
| 17 | UNIP | 30 |
| 18 | HVDS | 0 |
| 19 | Erection of distribution transformer centers using 11 mts Spun poles | 0 |
| 20 | Model Sub division and System improvement works of Indiranagar division | 62 |
| 21 | Conversion of overhead lines into UG/AB cable | 2000 |
| 22 | Technology Innovative Center | 30 |
| 23 | Corporate reserve fund | 150 |
| 24 | Auto reclosure and sectionalizer | 0 |
| 25 | Model Village | 0 |
| 26 | Smart city | 0 |
| 27 | DAS | 0 |
| 28 | Replacement of faulty Transformer | 35 |
| **29** | **Projects Total** | **2728** |
| **30** | **Grand Total (A+B)** | **3878** |

**Note:**

* If any new projects/proposals are approved by GOK/GOI then anticipated budget will be increased accordingly.
* GOK will be releasing grants every financial year for Special Development Program.
* No. of works proposed to be taken in each of the year for the controlling period cannot be ascertained. Generally, the no. of works under different head of accounts will be planned on priority based on the then field conditions/requirements/new projects.

**Proposed Schemes to be taken up during FY-22 are as follows:**

1. **Planned works-**

* SDP, SCP & TSP Government sponsored schemes.
* Service connection & Drinking water supply works.

1. **Non-planned works (for reduction of distribution loss):**

* 11 KV Evacuation /Link line works.
* Additional Distribution Transformer Centres/ Enhancement of Transformers.
* Strengthening of HT/LT network including OH/UG cable, AB cable, Covered conductor, RMU, LTFPB and other works for minimising the electrical accidents in hazardous locations and theft prone areas for reducing commercial losses and theft.

1. **Projects:**
2. **REGULARISATION OF UNAUTHORISED IP SETS:**

* ***Ongoing project:***

GOK Orders: EN09 PSR 2004, dated 15.03.2005

GOK Order: EN09 PSR 2011, dated 11.03.2011

GOK Order: EN09 PSR 2014, dated 14.07.2014

GOK Order: EN 41 VSC 2014/P1 dated 14.07.14, 23.07.14, 28.02.15 and 07.11.2016.

This scheme was **started during FY-11 in BESCOM.**

* ***Objectives:***
* Arranging power supply to the unauthorized IP sets for regularization.
* For those unauthorised IP set consumers, who have registered their application as on 31-07-2012 and have not paid Rs 10,000/- and other deposits, the infrastructure will be created on a Seniority basis in a phased manner, only after making the above payments.
* The unauthorized IP sets consumers registered after 31-07-2012 and all new IP set applicants, can register by making payment of Rs 10,000/- and other deposits. The infrastructure will be provided on Seniority basis., where there is no LT extension is required.
* Under ***Tatkal Scheme, a***s per GOK Order No EN 41 VSC 2014/P1 dated 14.07.14, 23.07.14 and 28.02.15, on request by the applicant the infrastructure shall be created of their own under self execution with making payment of Rs 10,000/- and other deposits.
* Under this scheme there is exemption to pay Supervision charges, if required transformer will be provided by BESCOM.
* On request of the applicant, if transformer is also provided by consumer then Rs. 10,000/- paid towards self-execution charges will be refunded.
* ***Scope of Work:***

Providing electrical infrastructure to regularized Un authorized IP sets by extending 11KV HT lines, erection of 25KVA 3 star rated Distribution Transformers and extension of LT line 3phase 4 wire on Total Turnkey basis under Rate contract for a period of TWO years in 14 Divisions of BESCOM area on PERCENTAGE BASIS QUOTING.

* ***Benefits***
* Reduces the T&D loss and A T&C Losses
* Improves the voltage.
* Reduces the Transformers failure.
* Reduces interruptions to the farmers
* Reduces the electrical accidents by removing lengthy service mains.
* Total Financial Cumulative Expenditure: Rs. 65937.93/- Lakhs.

1. **MODEL SUB DIVISIONS:**

* ***Ongoing project***

This scheme was **started during FY 17-18.**

* ***Objective:***

The BESCOM has taken upgradation of its distribution network in BMAZ with objectives of providing reliable and quality power supply, reduce distribution system losses.

* ***Scope of works:***
* 11kV New link lines/New feeders
* Conversion of overheads by UG cables - 11 KV Feeders
* Conversion of overheads by UG cables – LT
* Conversion of overheads by UG - Service Mains.
* Providing DAS compatible RMUs
* LT AB Cable in Hazardous Location
* Refurbishment of Existing DTC/ Providing 5 star rated Distribution Transformers.
* Providing Additional Transformers and compact substations.
* The time target fixed for completion of the project is 2 years from the date of issue of Rate Contract.
* ***Benefits:***
* Quality and reliable power supply
* Technical losses less than 6%
* Zero interruption
* 100% billing, collection
* Consumer satisfaction
* Adoption of latest IT infrastructure

1. **CONVERSION OF 11KV OH LINE INTO UG AND LT OH LINE INTO UG/AB CABLE SYSTEM IN THE JURISDICTION OF BMAZ AREA, BESCOM**

* ***Ongoing project***
* ***About the Project:***

The Govt. of Karnataka has announced the said project during the Annual Budget programme for the financial year 2018-19 and accorded approval for the said project & guaranteed for ADB Sovereign loan of Rs. 700 Crores (100M$). Central Electricity Authority (CEA) has accorded approval for said project on 08.03.2019. The proposal was discussed in the 92nd screening committee meeting held on 12.02.2019. Accordingly approval was accorded by MoP/GoI on 25.03.2019.

Hon’ble KERC has accorded in-principle approval on 01.02.2019.

During the 95th BOD meeting held on 01.03.2019 accorded approval for implementation of said project under Phase-I, II & III for an amount of Rs. 2897.49 Crores.

This scheme was **started during ­­­­­­FY 20**.

* ***Scope of the Work:***
* Conversion of HT Overhead lines by UG cable & providing RMUs in 52 sub divisions out of 63 sub divisions in BMAZ area at a total cost of Rs. 5325.22 Crores (UG/AB cable works cost of Rs. 4590.71 Crores & Rs. 734.51 Crores for providing Optical Fibre cable)
* Running of New 11kV line by UG cable for bifurcation of load on the existing overloaded feeder.
* Conversion of LT Overhead lines by Under Ground (UG)/Aerial Bunched (AB) cable.
* Laying of OFC along with UG cable.
* Laying of LT UG cable & termination at Consumer premises.
* Conversion of DP/TP structure into Spun pole for erection of existing Transformers.
* Releasing of Overhead lines & DP structures.
* Returning of released materials to BESCOM stores.
* ***Benefits:***
* Better quality and reliability of power supply to consumers.
* Reduction in T & D and AT & C losses & improved load management.
* Reduction in the failure rate of distribution transformers due to LT line short circuit.
* Reduction in Unauthorized connections by tampering.
* The fatal accidents due to snapping of OH line conductors & inadequate OH line to ground clearances due to conductor sagging can be completely prevented.
* Reduction in number and duration of interruptions.
* Lower maintenance costs, smaller voltage drops and lower chances of developing faults.
* To improve the aesthetic view of Bangalore city.
* Revenue generation - The additional Optic Fibres can be leased out to other department and agencies
* ***Financial Tie-Up:***
* M/s KUIDFC –INR 400 Cr. (Sanctioned) -6.5% per annual/Loan term- 10 years.
* M/s ADB –INR 700 Cr. under Sovereign (In process)- Approx. 3% per annual /Loan term- 15 years.
* M/s ADB –INR 630 Cr. under Non-Sovereign (In process) - Approx.8% per annual /Loan term- 15 years.
* M/s SBI – INR 1892.06 Cr. (In process) -8.25% per annual/Loan term- 15 years.
* M/s UBI– INR 668.10 Cr. (In process) -8.10% per annual/Loan term- 15 years.

1. **DEENDAYAL UPADHAYA GRAM JYOTHI YOJANA (DDUGJY):**

* ***Ongoing project***

This scheme was **started during ­­­­­­FY 17**.

* ***Objective:***

Central government has introduced new scheme DDUGJY for rural electrification. The main objective of the scheme is as follows:

* Providing access to all (Electricity).
* 24x7 power to all.
* AT & C loss reduction as per trajectory finalized by MoP.
* ***Scope of works:***
* Strengthening of sub-transmission and distribution system
* Rural electrification - Already sanctioned projects under RGGVY 12th plan to be completed and balance works are to be taken up under DDUGJY.
* All the works under Sansad Adarsh Grama Yojana (SAGY).
* Metering works.
* The time target fixed is 24 months from the date of issue of DWA M/s REC, has given extension of time for completion of works up to **MARCH-2020** and all the works have been completed.
* ***Project Financing:***
* The central Government is funding 60% of the total sanctioned project cost as grant and remaining 40% amount has to be borne by the utility/ESCOMs.
* Additional Grants of 15% from GOI on achievement of prescribed milestones.

1. **INTEGRATED POWER DEVELOPMENT SCHEME (IPDS):**

* ***Ongoing project***

1. ***Strengthening of Distribution Network:***

Government of India, Ministry of Power, have sanctioned for implementation of IPDS towards strengthening of Distribution Network in the interest of supplying good quality Power to the consumers of urban area

This scheme was **started during FY 17**.

* ***Objectives:***
* Providing reliable and quality power supply in an efficient manner in urban areas.
* Efficient management of Distribution sector with adequate metering arrangements in urban areas.
* AT & C loss reduction as per trajectory finalized by MOP.
* ***Scope of works:***
* Strengthening of distribution networks in the urban areas.
* Metering of feeders, DTC & all category consumers in the urban areas.
* Providing Solar roof top on the Government buildings.
* Time target fixed is 24 months from the date of issue of Detailed Work Award.
* ***Project Financing:***

The Government of India is funding 60% of the total sanctioned project cost as grant through M/s. PFC New Delhi, 30% of the total sanctioned cost as loan from financial Institutions like REC/FIs/ Banks and remaining 10% of the total sanctioned cost from BESCOM own funds.

Additional Grants of 15% from Government of India on achievement of prescribed following milestones,

* Timely completion of the scheme as per laid down milestones.
* Reduction in AT&C losses as per trajectory finalized by MOP in consultation with state Governments(Discom-wise)
* Upfront release of admissible revenue subsidy by state Govt. based on metered consumption.

1. ***IPDS IT Phase-II :***

* ***Ongoing project***

This scheme was **started during ­­­­­­FY-19**.

* ***Objective:***

MoP under Govt. of India has launched Integrated Power Development Scheme (IPDS) for the urban areas having population more than 5000. R-APDRP will get subsumed in this scheme and continued as a separate component of IPDS. Power Finance Corporation (PFC) is the nodal agency for IPDS IT Enablement. Total 124 towns in Karnataka are covered under the project.

* ***Scope of works:***
* Procurement, supply and installation of entire IT infrastructure in Data centre including servers, networking, load balancers, security equipment and other related IT infra required for operations of the System.
* The existing Software solution of RAPDRP, involving 17 integrated modules will be replaced with new solution covering 98 RAPDRP towns and 124 IPDS towns in all ESCOMs.
* Hosting Disaster RecoveryCentre(DRC) on Cloud (MEITY Empanelled)
* Facility Management Services(FMS) for 5 years after Successful Go live
* Annual Maintenance Cost (AMC) & Annual Technical Support(ATS)for 5 years after the expiry of the warranty/support
* GIS based Asset Mapping, Survey and Digitization and Integration of Consumer Indexing data under IPDS IT Phase-II implementation across all ESCOMs of Karnataka
* Supply and fixing Modems in IPDS towns across all ESCOMs of Karnataka
* Supply and installation of IT infrastructure in the IPDS towns across all ESCOMs of Karnataka

BESCOM had invited tender for implementation IPDS IT Phase-II in different packages as below:

**Table 4.29**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No** | **Package** | **DWA issued on** | **Capex budget required for FY 2020-21**  **(Rs. in Lakhs)** |
| 1 | DC-DRC Hardware and Software refresh across all ESCOMs of Karnataka and Hosting DRC on cloud | 26.03.2020 | 4372 |
| 2 | IPDS towns GIS survey | 26.03.2020 | 30 |
| 3 | Fixing of Modems to IPDS towns for ESCOMs | Only for other ESCOMs | |
| 4 | IPDS towns IT infrastructure | To be retendered | 1700 |
| 5 | Storage | 30.10.2018 | 23 |
| 6 | Network infrastructure | 30.03.2020 | 700 |

1. **METERS AND COMMERCIAL:**

BESCOM has taken the initiative for replacement of electromechanical Meters by static meters for effective arresting of commercial Losses and better assessment of Technical losses Improve cash collection and reducing consumer grievances on accuracy of meters.

1. ***New Works:***

***Scope of the Work:***

* Boundary Metering
* Procurement of Accuchecks
* Procurement of meters under Fast Track
* For metering of Street Lights and Water Supply
* Automatic Power Factor Correctors
* Software development and deployment for management of EV charging Stations
* Providing IP Cameras for EV charging Stations

1. ***Automatic Power Factor Correctors:***

***About APFC:***

* APFCs are used where the power factor in the distribution network is varying dynamically and it is difficult to maintain consistent power factor by using a fixed power factor compensation.
* APFCs provide the facility of automatically varying the compensation to suit the load requirements. It also avoids the leading power factors.
* In line with the CEA regulation BESCOM desires to provide the Automatic Power Factor Correctors (APFCs) at DTC level in Peenya Divisional Limits on pilot basis.
* The jurisdiction of Peenya Division comprises mainly of industries having majority of inductive loads where there is necessity of pf correction.
* It is opined to consider feeders with total 150 DTCs where the reactive power & harmonics is dominant.

1. ***Software development and deployment for management of EV charging Stations:***

***About EV Charging Station:***

* BESCOM has installed and commissioned 126 Nos. of Electric Vehicle Charging equipment’s at various locations in Bengaluru.
* These are open to public and shall be on chargeable basis for usage.
* As payments for the charging sessions shall be on cashless mode it is essential to have suitable Software solution for only for the payment collection activity but also for overall management of EV charging stations.
* In view of this, “Software development and deployment for management of EV charging Stations” is required.

1. ***Providing IP Cameras for EV charging Stations:***

* BESCOM has installed and commissioned 126Nos. of Electric Vehicle Charging Stations in Bengaluru City.
* These will be open for public for usage upon operational of EV charging stations.
* These stations are located at various places in Bengaluru. In view of security issues, EV charging stations have to be monitored.
* Hence, IP cameras are required to be provided for viewing/monitoring of all EV charging Stations.

1. ***Ongoing Works***
   * + - ***Prepaid Metering System:***

BESCOM has implemented pre-paid meters using **keypad Technology** along with the vending system for Temporary installations in BESCOM (other than Indiranagar Divisions) on DBFOT (Design Build Finance Operate and Transfer) basis for 5 years for a total quantity of 80,000 nos.

* + - * ***Purpose:***

Avoidance of spot meter reading, bill delivery and advance realization of revenue, thus avoiding accumulation of arrears.

* + - * ***Benefits:***

The major benefits of prepaid meters to consumers as well as Utilities are listed below:

* + - * ***To consumers:***
* Top-up the currency any time, any where
* Apply for “n” no. of day’s upto 2years.
* Flexibility in payment
* No worries about disconnection on account of non-payment.
* Relief from standing in long queues for bill payment.
* Less possibility of incorrect bills
* Saving in time as there is no need to visit the concerned office.
  + - * ***To Utility:***
* Automatic disconnection/reconnection
* Less Manpower required
* No outstanding arrears
* Power theft is avoided and in turn reduced loss of revenue
* No hassles of reading meters, delivering bills and collecting revenue
  + - * ***Development and Deployment of GPS based Vehicle Tracking System***

Development and Deployment of GPS based Vehicle Tracking System for 750 Nos. vehicles in BESCOM and integration of GPS VMS with PGRS application. Scope of the project includes:- Live vehicle tracking, vehicle movement history, 2 way communication, All Docket Push to Vehicles, Complaint Resolution Vehicle Tracking, MIS reports.

The supply and installation of GPS tracker to Vehicles and related IT Hardware are completed. Integration with PGRS is in progress.

For the projects DDUGJY and IPDS, 60% of the funds will be released from Government of India, 100% of fund to SDP and partial subsidy for GK, Water supply and UNIP will be released by Government of Karnataka.

Note: If any new projects/proposals are approved by GOK/GOI then anticipated budget will be increased accordingly

Capex to be carried out utilising GoK and GoI grants/equity

**Table 4.30**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| DDUGY (60% grants) | 23.94 | 49.50 |
| IPDS (60% grants) | 75.60 | 82.50 |
| Ganga Kalyana works (20%) | 8.76 | 25.00 |
| Water supply works (20%) | 3.10 | 5.00 |
| UNIP (20%) | 34.65 | 6.00 |
| **Total** | **146.05** | **168.00** |

#### Distribution loss for FY-22:

Approved distribution loss for FY-22 as per the Tariff order dated 30th May 2019 is as follows;

#### Approved Distribution Losses for FY 22:

**Table 4.31 Figures in % Losses**

|  |  |
| --- | --- |
| **Particulars** | **FY-22** |
| Upper limit | 12.00 |
| **Average** | **11.75** |
| Lower limit | 11.50 |

Target fixed by the Commission will be achieved and no modification is proposed for the distribution loss.

#### Operation and Maintenance expenses:

BESCOM is computing O&M expenses as per the norms prescribed by the Commission in its MYT regulations-2006:

**“2.5.1 a)** *The Operation and Maintenance (O&M) costs which include employee-related costs, repairs & maintenance costs and administrative & general costs, estimated for the Base Year and the actual for the previous two years prior to the Base Year in complete detail, together with the forecast for each year of the Control Period based on the norms proposed by the Distribution Licensee including indexation and other appropriate mechanisms;“*

Clause 3.10 of 2nd amendment to KERC (Terms and Conditions for Determination of Tariff for Distribution and Retail Sale of Electricity) Regulations, 2015, is reiterated:

***“3.10 Operation and Maintenance expenses:***

*Operation and Maintenance expenses shall be computed in the following manner:*

1. *The Distribution licensee in its first or subsequent filings shall submit the consolidated O&M expenses comprising of Employee Cost, Repair and Maintenance and Administrative and General expenses, excluding contributions towards pension and gratuity, Newly defined Contributory Pension Scheme and leave encashment if any, for the Base Year of the control period and for two years preceding the Base year.*
2. *The O&M expenses for the Base Year of the control period shall be computed based on the latest audited accounts, best estimates of Licensee of the actual O&M expenses for relevant years and other factors considered relevant.*
3. *The O&M expenses for each financial year of the control period shall be computed/projected considering the O&M expenses reckoned for the Base Year excluding uncontrollable employee cost duly considering the growth in the number of consumers, inflation and efficiency factors for each distribution licensee as follows:*

*Formula: (1+ consumer growth rate +inflation rate-efficiency factor)\* O&M expenses for the base year*

1. *The contribution towards pension and gratuity, newly defined Contributory Pension Scheme and leave encashment if any, shall be accounted separately as uncontrollable O&M expenses computed on the basis of latest actuarial valuation report.*
2. *Employee cost proposed to be incurred on accounting of wage revision, if any, and proposed recruitments during the control period shall be factored in separately as addition of O&M expenses.*

The Commission in its Tariff Order dated 11.01.2008 approved the following formula for approval of O&M expenses.

**O&M Cost t = O&M Cost t-1 \* (1 + WII + CGI – X)**

Where,

‘O&M Cost t’ is the normative O&M cost approved by the Commission for the financial year.

‘WII’ is the weighted inflation index of CPI and WPI (CPI 70% WPI 30%) based on the contribution of employee cost, R&M and A&G towards the total O&M cost.

‘CGI’ is the Consumer growth index, which is linked to increase (CAGR) in no of consumers.

‘X’ is the efficiency factor. For BESCOM the Commission fixes the same as 1%.

Actual Operation and Maintenance expenses (O&M) expenses (net off Capitalization) for the FY 2019-20 as per regulatory formats are as follows:

**Table 4.32**

|  |  |
| --- | --- |
| **Particulars** | **Actual (FY-20)** |
| Other operating (Repair & Maintenance) expenses excluding Rs. 4.23 Crs towards material cost variance | 109.60 |
| Employee Benefits Expense excluding expense capitalised of Rs.5.27 Crs. | 1518.68 |
| Other expenses excluding expense capitalised of Rs.0.64 Crs. | 372.24 |
| **Total** | **2000.53** |

Estimation of O&M expenses as per Commission approved formula is under:

Central Electricity Regulatory Commission (CERC) vide notification dated 27.03.2020 notified the escalation rates 2020 for (i) annual escalation rate for escalable transmission charges for the purpose of evaluation; (ii) discount rate for computation of levelized transmission charges for evaluation; and (iii) annual inflation rate for escalable transmission charges for the purpose of payment by arriving composite series of CPI at 55% and WPI at 45%.

Weighted Inflation index is to be computed taking the Consumer Price Index (CPI (IW)) as weight age of employee cost to the total O&M expense and Whole Sale Price index (WPI) as weight age of R&M and A&G expenses to the total O&M expenses.

Further, Commission in its Tariff Order-2019 dated 30.05.2019 approved O&M expenses by considering the wholesale price index (WPI) as per the data of Ministry of Commerce & Industry, Government of India and Consumer Price Index (CPI) as per the data of Labour Bureau, Government of India and adopted the methodology followed by CERC with CPI and WPI in a ratio of 80:20.

In line with the methodology followed by the Commission, the estimated annual escalation rate for FY-22 is computed as follows:

Composite Series are tabulated considering actual of CPI and WPI for the years 2008 to 2019 as considered by CERC. For calendar year 2020 to 2021, it is based on the 6 years moving average. Tabulations are as follows:

**Table 4.33**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | **WPI** | **CPI** | **20% of WPI** | **80%of CPI** | **Composite series** |
| **1** | **2** | **3** | **4=20% of (2)** | **5=80% of (3)** | **6=(4+5)** |
| 2008 | 80 | 141.7 | 16 | 113.34 | 129.34 |
| 2009 | 81.9 | 157.1 | 16.38 | 125.67 | 142.05 |
| 2010 | 89.7 | 176 | 17.94 | 140.76 | 158.7 |
| 2011 | 98.2 | 191.5 | 19.64 | 153.22 | 172.86 |
| 2012 | 105.7 | 209.3 | 21.14 | 167.44 | 188.58 |
| 2013 | 111.1 | 232.2 | 22.22 | 185.74 | 207.96 |
| 2014 | 114.8 | 246.9 | 22.96 | 197.52 | 220.48 |
| 2015 | 110.3 | 261.4 | 22.06 | 209.12 | 231.18 |
| 2016 | 110.3 | 274.3 | 22.06 | 219.47 | 241.53 |
| 2017 | 114.1 | 281.2 | 22.82 | 224.92 | 247.74 |
| 2018 | 118.9 | 294.8 | 23.78 | 235.84 | 259.62 |
| 2019 | 121.2 | 317.4 | 24.24 | 253.92 | 278.16 |
| 2020 | 122.3 | 329.2 | 24.45 | 263.32 | 287.77 |
| 2021 | 124.3 | 340.4 | 24.85 | 272.35 | 297.21 |

Weighted Inflation Index is calculated considering the 12 years data and tabulated below:

**Table 4.34**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Composite series** | **YT/Y1=Rt** | **Ln Rt** | **Year-1 (t-1)** | **Product [(t-1) x (Ln Rt)** | **YT/Y1=Rt** | **Ln Rt** | **Year-1 (t-1)** | **Product [(t-1) x (Ln Rt)** |
| 2008 | 129.34 |  |  |  |  |  |  |  |  |
| 2009 | 142.05 |  |  |  |  |  |  |  |  |
| 2010 | 158.70 | 1.12 | 0.11 | 1 | 0.11 |  |  |  |  |
| 2011 | 172.86 | 1.22 | 0.20 | 2 | 0.39 | 1.09 | 0.09 | 1 | 0.09 |
| 2012 | 188.58 | 1.33 | 0.28 | 3 | 0.85 | 1.19 | 0.17 | 2 | 0.35 |
| 2013 | 207.96 | 1.46 | 0.38 | 4 | 1.52 | 1.31 | 0.27 | 3 | 0.81 |
| 2014 | 220.48 | 1.55 | 0.44 | 5 | 2.20 | 1.39 | 0.33 | 4 | 1.32 |
| 2015 | 231.18 | 1.63 | 0.49 | 6 | 2.92 | 1.46 | 0.38 | 5 | 1.88 |
| 2016 | 241.53 | 1.70 | 0.53 | 7 | 3.72 | 1.52 | 0.42 | 6 | 2.52 |
| 2017 | 247.74 | 1.74 | 0.56 | 8 | 4.45 | 1.56 | 0.45 | 7 | 3.12 |
| 2018 | 259.62 | 1.83 | 0.60 | 9 | 5.43 | 1.64 | 0.49 | 8 | 3.94 |
| 2019 | 278.16 | 1.96 | 0.67 | 10 | 6.72 | 1.75 | 0.56 | 9 | 5.05 |
| 2020 | 287.77 | 2.03 | 0.71 | 11 | 7.77 | 1.81 | 0.60 | 10 | 5.95 |
| 2021 | 297.21 |  |  |  |  | 1.87 | 0.63 | 11 | 6.90 |
|  |  |  |  |  |  |  |  |  |  |
| A = Sum of "product" |  |  |  |  | 36.08 |  |  |  | 31.92 |
| B= 6 times (6 x A) |  |  |  |  | 216.46 |  |  |  | 191.50 |
| C= (n-1) x n x (2n-1); n = No. of Years of data = 12 |  |  |  |  | 3036 |  |  |  | 3036 |
| D = B/C |  |  |  |  | 0.07 |  |  |  | 0.06 |
| g (Exponential Factor) = Exponential (D) -1 |  |  |  |  | 0.07 |  |  |  | 0.07 |
| e = Annual Escalation Rate (%) = g x100 |  |  |  |  | 7.39 |  |  |  | 6.51 |

Thus estimated Weighted Inflation Index (WII) for FY-21, FY-22 will be 7.39%, 6.51% respectively.

**Consumer growth index (CGI):**

To compute the consumer growth rate, 3 year Compounded Annual Growth (CAGR) is worked out.

**Table 4.35**

|  |  |  |  |
| --- | --- | --- | --- |
| **Y-21** | | **FY-22** | |
| **Particulars** | **Numbers** | **Particulars** | **Numbers** |
| Consumers as on 31.03.2018 (As per Accounts) | 11244760 | Consumers as on 31.03.2019 (As per Accounts) | 11810529 |
| Consumer as on 31.03.2021 | 12760077 | Consumer as on 31.03.2022 | 13361517 |
| **Annual Growth rate** | **4.3%** | **Annual Growth rate** | **4.2%** |

For the purpose of determining the normative O&M expenses for FY-21 and FY-22, BESCOM has considered the following:

* 1. The O&M expenses incurred as per the truing up for FY-20 inclusive of contribution to Pension and Gratuity Trust is used to determine the O&M expenses for FY-21 and FY-22.
  2. The three year compounded annual growth rate (CAGR) of the number of installations considering the actual number of installations as per audited accounts upto FY-20 and as projected by BESCOM for FY-21 and FY-22.
  3. The estimated Weighted Inflation Index (WII) for FY-21, FY-22 will be 7.39%, 6.51% respectively as computed above.
  4. Efficiency factor at 1% as considered by the Commission.

Considering the above indices, an estimated O&M charge for FY-21 and FY-22 on normative basis is computed as under:

**Table 4.36**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Particulars** | **FY-21** | **FY-22** |
| **1** | Inflation index in % | 7.39 | 6.51 |
| **2** | Consumer Growth Index in % | 4.30 | 4.20 |
| **3** | BESCOM efficiency in % | 1 | 1 |
| **4** | Base year O&M Cost (t-1) | 2095.97 | 2320.11 |
| **5** | **O&M expenses t-year= 0&M (t-1)\*(1+WII+CGI-X)** | **2320.11** | **2545.38** |

Further, the recruitment of 105 Assistant Engineer, 106 Junior Engineers, 18 junior personal assistants and 250 junior assistant is under process.

**Table 4.37**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of the post** | **Nos.** | **Avg. Salary per employee (Rs.)** | **Total Employees cost in Crs.** |
| Asst. Engineer (Ele/Civil) | 105 | 74034 | 9.33 |
| Junior Engineer(Ele) | 106 | 47286 | 6.01 |
| Junior Personal Assistant | 18 | 41256 | 0.89 |
| Junior Assistant | 250 | 36396 | 10.92 |
| **Total** | **479** |  | **27.15** |

In order to ensure the quality of service and to cope with the increasing consumers in BESCOM, new workforce needs to be added which will result in increase in employees cost. It is prayed before the Commission to allow the expenses that may arise on account of new recruitment and further reform process, which are uncontrollable.

Since the Employee cost works out to 76% of O&M cost, R&M and A&G expenditure is apportioned at the rate of 6% and 18% respectively.

**Table 4.38**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Other operating (Repair & Maintenance) expenses | 140.13 | 153.73 |
| Employee Benefits Expense | 1768.66 | 1940.39 |
| Other expenses(A&G) | 411.33 | 451.26 |
| **Total** | **2320.11** | **2545.38** |

It is prayed before the Commission to allow the above O&M expenses for FY-22

**Depreciation:**

Commission in its Tariff Order 2019, dtd: 30.05.2019 has approved the depreciation for FY-22, based on the gross block of opening and closing balance of fixed assets, as per the audited accounts for FY-18 and estimation of FY-19 based on the approved Capex plan of FY-19 to FY-22.

**Approved depreciation for FY-22:**

**Table 4.39**

|  |  |
| --- | --- |
| **Particulars** | **FY-22** |
| Buildings | 12.30 |
| Civil | 0.37 |
| Other Civil | 0.12 |
| Plant & M/c | 209.19 |
| Line, Cable Network | 620.15 |
| Vehicles | 1.97 |
| Furniture | 1.13 |
| Office Equipment’s | 0.97 |
| Released Assets Re used | 3.04 |
| **Sub Total** | **849.24** |
| Depreciation Withdrawn AS12 Land & Rights | -212.31 |
| **Total** | **636.93** |

For the purpose of projected depreciation computation for FY-22 following assumptions are considered:

1. Actual closing Gross Fixed Assets (GFA) as per audited accounts of FY-20(awaiting Board approval).
2. Estimated Retirement of assets for FY-21 and for FY-22 are based on the average for the past three years.
3. Since, the Capital Investment Plan comprises of the spill over works of the past years, 75% of the capex envisaged during each year is booked on that year and 90% of the booked cost will be capitalized, same is considered for estimation of addition of assets for FY-21 and FY-22.
4. Capital work in progress at the end of previous year will be categorized in the succeeding year.
5. Depreciation rates as specified by CERC is applied on 90% of the Closing Gross fixed Asset of each year of the control period.
6. Ministry of Corporate Affairs (MCA) has issued Indian Accounting Standards (IND AS), which is applicable to BESCOM from FY-17 with comparative period of one year. In pursuance with Ind AS 20, Government Grants/subsidies received from the Government or other authorities towards capital expenditure as well as consumer’s contribution to capital works are treated initially under deferred income and taken to fixed assets based on commissioning of the assets and depreciation is charged in accordance with the class of assets it belongs.

Capital Expenditure (CAPEX) envisaged for FY-21 and FY-22 are tabulated below:

**Table 4.40 Amount in Crs.**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Capital Expenditure (Capex) envisaged | **2500.00** | **3878.00** |
| Estimated Booking Cost at (75% of the capex + prev. year 25%) | **2505.62** | **3533.50** |
| Assets categorized ( 90% of booking Cost) | **2255.05** | **3180.15** |

Depreciation envisaged for FY-21 and FY-22, considering average depreciation rate of 5.28%.

**Table 4.41 Amount in Crs**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Opening Gross Fixed Asset (GFA) | 18228.49 | 20628.42 |
| Add: Additions during the year | 2255.05 | 3180.15 |
| Less: Retirement | 270.04 | 284.27 |
| Add. Consumer Contribution | 414.91 | 434.91 |
| Closing GFA | 20628.42 | 23959.22 |
| 90% of GFA | 18565.58 | 21563.29 |
| Average Dep. Rate (In %) | 5.28% | 5.28% |
| Depreciation | 980.26 | 1138.54 |
| Less: Depreciation with drawn from Consumer contribution/ subsidies plus withdrawal of depreciation | 202.43 | 223.10 |
| Depreciation charged to the Tariff | 777.83 | 915.45 |

#### Interest and finance charges:

Interest and finance charges includes following costs.

* Interest on loan capital
* Interest on Working Capital
* Interest payable in consumer Security Deposit/ Meter Security Deposit.
* Other interest and Finance charges

**Interest on loan capital:**

Commission approved the interest on long term loan for FY 20-22 considering interest rate at 11% for new long term loans and considering opening balance at Rs. 4741.54 Crs for the long term loan.

**Approved Interest on Loans for FY 20-22:**

**Table 4.42 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Particulars** | **FY-20** | **FY-21** | **FY-22** |
| **Opening Balance long term loans** | **4742** | **5292** | **5602** |
| Add new Loans | 900 | 700 | 700 |
| Less: Repayments of loan | -350 | -390 | -430 |
| Total loan at the end of the year | 5291.6 | 5601.6 | 5871.6 |
| **Average Loan** | **5017** | **5447** | **5737** |
| Interest on long term loans | 430.91 | 476.29 | 509.54 |
| Weighted average rate of interest in % | 8.59% | 8.74% | 8.88% |

**Modified Interest on loan Capital:**

BESCOM is computing the interest on loan capital as per the norms prescribed by the Commission in its MYT regulations-2006 and its amendments.

Modified interest for FY-22 is on the following basis:

* Loan outstanding as on 31.03.2020 as per audited accounts duly considering the rate of interest, and terms of repayment
* For FY-21, loan existing as on 30.09.2019 and the estimation for the next half year is considered for computation of interest.
* For financing of future capital cost of projects, a Debt: Equity ratio of 70:30 is adopted as per the norms framed by the Commission under 3.7.1 of MYT regulations.

**Loan for FY-21:**

For FY-21 up to Sept-20, Rs.613.56 Crs. has been booked towards Capex through long term loans. BESCOM seeks out loans to an extent of Rs 862.44 Crs. Thus it is estimated that total borrowings for FY-21 may be Rs.1476 Crs.

**Interest on new loan capital:**

Capex envisaged for each year is as under:

**Table 4.43 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Capital Expenditure (Capex) envisaged | 2500.0 | 3878.0 |
| Estimated Booking Cost at (75% of the capex + prev. year 25%) | 2505.6 | 3533.5 |
| Assets categorized (90% of booking Cost) | 2255.1 | 3012.0 |
| Internal Resource | 633.0 | 904.0 |
| Borrowings | 1476.0 | 2109.0 |
| Equity Ratio | 30% | 30% |
| Debt Ratio | 70% | 70% |

For financing of future capital cost of projects, a Debt: Equity ratio of 70:30 should be adopted is the norms fixed by the Commission.

The share of equity i.e., 30% of the future capital cost will be met through:

* Equity contribution for planned Capital Works GoK
* Consumer Security deposit
* Return earned on equity for each of the control period.

The following assumptions are considered for projecting the interest.

* 3 years moratorium period for repayment of loan
* Term loan be 10 years and repayment is on quarterly basis
* Reserve Bank of India Base rate at 7.40% to 9.00% plus 200 basis points

1. **Means of Finance:**

Internal resources generated though collection of Government of Karnataka (GoK) Loan, MMD, Addl. MMD, and Return on Equity is considered as the internal resources for the capex plan.

1. **Debt Equity ratio:**

**Table 4.44 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Loan Capital** | **FY-21** | **FY-22** |
| Capex after removing GoK/GoI grants | 2109 | 3012 |
| Internal Resource | 633 | 904 |
| Borrowings | 1476 | 2109 |
| Debt Ratio | 70% | 70% |
| Equity Ratio | 30% | 30% |

1. **Borrowings:**

Interests on the existing loans are computed taking the repayment schedule into consideration. Weighted average rate of interest paid for FY-20 is calculated based on the actual interest paid to the closing balance. The arrived average rate of interest for FY-20 is applied for the future years.

The new loan drawl for the first year will be spread over to the whole year; hence interest is computed for 50% of the borrowings of that particular year. For subsequent years, 50% of the loan drawn for the current year and 100% of the previous years is reckoned for computation of interest.

Loan repayment schedule for the loan outstanding and as per the existing commitments and fresh borrowing as per Capital investments is as follows.

**Table 4.45 (Amount in Crs)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl. No.** | **Interest on capital loans** | **FY-20** | **FY-21** | **FY-22** |
| 1 | Opening balance of capital loans | 4356.18 | 5,494 | 8,629 |
| 2 | less: Repayments | 624.87 | 709 | 596.63 |
| 3 | Closing balance(1-2) | 3731.31 | 4785 | 8033 |
| 4 | New Borrowings (inclusive of liquidation of power purchase dues of Rs.1925Crs.) | 1762 | 3401 | 2109 |
| 5 | Closing balance(3+4) | 5494 | 8186 | 9698 |

As a part of measures to combat COVID -19, Government of India announced Special Economic Package on 13th May 2020 to provide financial assistance under the liquidity injection package for Distribution Companies (DISCOMs) in power sector for clearance of outstanding dues of CPSU GENCOs/TRANSCOs, IPPs and RE generators as on 31st March 2020.

The outstanding dues of CPSU GENCOs/TRANSCOs, IPPs and RE generators as on 31st March 2020 and the loan requirement of BESCOM was **Rs.1925 Crs**. Due to severe financial crisis and also due to non-receipt of outstanding electricity charges ESCOMs were not in a position to make timely payment to the Power Generating Companies and Transmission Companies within the stipulated time.

As per the Power Purchase Agreement with GENCOs, the ESCOMs have to bear the additional burden of interest due to non-payment of power purchase bills in time.

In this regard, a Government of Karnataka, Energy Department Order No. Energy 308 PSR 2020, dated 01.10.2020 was issued wherein the GoK had accorded approval for availing Special Long term Loan of Rs.1925 Crs. for BESCOM from nationalized banks. State Bank of India has offered term loan of Rs.875 Crores at present MCLR rate of 7.5% and Canara Bank has offered Rs.1050 Crs. term loan at 7.45% rate of interest at present with annual reset. The proceedings and G.O Order are below:

|  |
| --- |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\1.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\2.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\3.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\4.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\5.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\6.png |
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| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\8.png |
| D:\Kala\ERC\ERC FY-21\Chapter-4_Modified ARR\9.png |

The amount of Rs.1925 Crs. is included under long term loan of Rs.3401 Crs. for FY-21.

Computation of interest on existing loans for FY-21 and FY-22

**Table 4.46 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Particulars** | **FY-20** | **FY-21** | **FY-22** |
| Opening balance of capital loans | 4356 | 5494 | 8186 |
| Average Repayments | 625 | 709 | 597 |
| Closing balance as at the end of the year | 3731 | 4785 | 7589 |
| **Interest** | **489** | **475** | **754** |
| **Rate of interest** | **9.93%** | **9.93%** | **9.93%** |

Computation of interest on fresh loan for control period:

**Table 4.47 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Particulars** | **FY-20** | **FY-21** | **FY-22** |
| Fresh borrowings envisaged | 1762.30 | 3401.3 | 2108.5 |
| 50% of the borrowings | 881.15 | 1700.65 | 1054.25 |
| Borrowings considered for interest computation | 881.15 | 1700.65 | 2754.90 |
| Interest (RBI declared interest rate 9.0+200 base points) |  | **187.07** | **303.04** |
|  |  | 11.00% | 11.00% |

**Abstract of interest on Loan capital:**

**Table 4.48 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Interest on existing loan capital | 475.11 | 753.61 |
| Interest on new loan capital | 187.07 | 303.04 |
| **Total** | **662.18** | **1056.65** |

**Interest on working capital:**

Approved Interest on Working Capital for FY-22:

**Table 4.49 (Amount in Crs.)**

|  |  |
| --- | --- |
| **Particulars** | **FY 22** |
| One-twelfth of the amount of O&M Expenses | 199.61 |
| Opening Gross Fixed Assets (GFA) | 16064.23 |
| Stores, materials and supplies 1% of Opening balance of GFA | 160.64 |
| One-sixth of the Revenue | 3876.27 |
| Total Working Capital | 4236.52 |
| Rate of Interest (% p.a.) | 11.00% |
| **Interest on Working Capital** | **466.02** |

Norms fixed by the Commission for the purpose of computation of interest on working capital as per MYT regulations are as under:

Working capital shall cover:

1. Operation and maintenance expenses for one month;
2. Maintenance spares @ 1% of the historical cost of assets at the beginning of the year and
3. Receivables equivalent to two month’s average revenue.

The Commission for the purpose of ARR, shall consider the allowable interest on working capital calculated on normative basis at the rate of interest as per the latest available base rate as notified by RBI plus 250 basis points or the weighted average rate of interest on working capital proposed by the distribution licensee, whichever is lower.

Provided that, during annual performance review, the Commission shall consider the allowable interest on working capital calculated on normative basis at the allowable base rate of interest as on 1st April of the financial year as notified by the RBI plus 250 basis points. If the actual expenditure is less than the normative amount, the allowable interest on working capital shall be limited to actual expenditure plus 50% of the difference between the actual expenditure and the amount as calculated on normative basis. Provided further that, during the APR, if the actual expenditure exceeds the normative amount calculated above, the total amount of allowable interest on working capital shall be limited to the amount as calculated on the normative basis.

Interest on working capital is modified taking into consideration of modified GFA, 1 month O&M Expenditure and 2 months receivable and considering the interest on working capital at prime lending rate of RBI. Modified calculations are as under.

**Table 4.50 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| 1/12th Operation and Maintenance | 193.34 | 212.12 |
| 1% of Gross fixed assets at the beginning of the year | 182.28 | 206.09 |
| 2 months Receivables | 3227.91 | 3484.29 |
| Estimated Working Capital | 3603.54 | 3902.69 |
| Rate of Interest (9%+250) | 11.50% | 11.50% |
| RBI base rate as on Oct-2020 is between 7.4 to 9.0 plus 200 basis points | 414.41 | 448.81 |

#### Interest on Consumer security deposit:

Commissions vide Order dated 30.05.2019, approved the interest on Consumer security deposit for FY-22 as follows:

#### Approved Interest on Consumer Security Deposits for FY-22:

**Table 4.51 (Amount in Crs))**

|  |  |
| --- | --- |
| **Particulars** | **FY-22** |
| Opening balance of consumer security deposits | 4705.9 |
| Interest on consumer security deposits as filed | 330 |
| Rate of Interest as filed | 6.75% |
| Rate of Interest at bank rate to be allowed as per Regulations | 6.50% |
| **Approved Interest on average Consumer Security Deposit** | **315.6** |

As per the final accounts, closing balance of consumer security deposit is Rs. 4179.81 Crs.

Reserve Bank of India, Bank rate at 5.70 per cent per annum as on 3rd April 20 is considered for the future years for computing the interest on security deposit

Considering the above factors modified Interest on consumer security deposit worked out as under:

**Table 4.52 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Opening balance of consumer security deposits | 4479.81 | 4779.81 |
| Interest on security deposit proposed in Crs. | 255.35 | 272.45 |
| Rate of interest paid | 5.70% | 5.70% |

**Other interest and Finance charges:**

BESCOM had claimed an amount of Rs.20 Crs. towards other interest and Finance charges for each year of the control period FY 20-22. The Commission decided to allow an amount of Rs. 4 Crs. for each year of the control period.

For FY-20, the other interest and finance charges is Rs.22.29 Crs., BESCOM has modified the other interest and Finance charges to Rs.22 Crs. for FY-21 and FY-22.

**Expenses capitalized:**

The modified expenses capitalized for FY-21 and FY-22 based on FY-20 capitalisation of expenses are shown in the table below:

**Table 4.53 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-20** | **FY-21** |
| Interest & other expenses capitalized | 223.01 | 234.16 |

#### Modified Interest and finance charges:

Consolidated Interest and finance charges for FY-21 and FY-22 are tabulated as under:

**Table 4.54 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Interest on Loan Capital | 662.18 | 1056.65 |
| Interest on Working Capital | 414.41 | 448.81 |
| Interest on Consumer Security Deposit | 255.35 | 272.45 |
| Other Interest & Finance Charges | 22.00 | 22.00 |
| Less: Expense capitalised | 223.01 | 234.16 |
| **Total** | **1130.93** | **1565.75** |

#### Other Debits and Prior period Credits:

The Commission has not been considering the projections for other debits and Prior period Credits for the reason that, the same cannot be estimated beforehand. Hence, the same is not estimated. However, the Commission is requested to allow these amounts based on actual.

#### Return on Equity:

Commission approved the return on equity as Rs.193.59 Cr. details are as under:

#### Approved Return on Equity for FY-21:

**Table 4.55 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY 21** | **FY 22** |
| Opening Balance of Paid Up Share Capital | 546.92 | 546.92 |
| Share Deposit | 738.69 | 738.69 |
| Reserves and Surplus | -205.79 | -205.79 |
| Less Recapitalized Security Deposit | -100 | -100 |
| Total Equity | 979.82 | 979.82 |
| **Approved Return on Equity with MAT** | **193.59** | **193.59** |

BESCOM is computing modified RoE as per MYT regulations 2006 and its amendments. As per Regulation 3.5 on Capital Investment read with Regulation 3.9.1 on Return on Equity, Distribution Licensee has to consider the normative allowable equity base at 30% on the Gross Fixed Assets excluding assets created out of consumer contribution.

**Table 4.56 (Amount in Crs)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Particulars** | **GFA** | **Debt** | **Equity** | **Normative Debt @70% of GFA** | **Normative Equity @30% of GFA** | **% of actual debt on GFA** | **% of actual equity on GFA** |
| FY-21 | Opening Balance | 18228 | 5494 | 1414 | 12760 | 5469 | 30% | 8% |
| Closing Balance | 20628 | 8629 | 1763 | 14440 | 6189 | 42% | 9% |
| FY-22 | Opening Balance | 20628 | 8629 | 1763 | 14440 | 6189 | 42% | 9% |
| Closing Balance | 23751 | 9613 | 2049 | 16625 | 7125 | 40% | 9% |

From the above table it is seen that the estimated amounts of debt and equity are within the normative levels with reference to the opening and closing balance for FY-21 and FY-22

Accordingly, the Return on Equity for FY-21 and FY-22 are computed as follows:

**Table 4.57 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **FY-21** | **FY-22** |
| Opening balance of paid up share capital | 546.92 | 546.92 |
| Share deposit | 1069.86 | 1271.62 |
| Average Equity addition during the year | 201.76 | 201.76 |
| Reserve and Surplus | -1.16 | 83.61 |
| Less: Meter Security Deposit capitalised | -54.81 | -54.81 |
| Profit for the year | 84.77 | 84.77 |
| Total Equity | 1762.57 | 2049.10 |
| **Return on Equity @ 15.5%** | **273.20** | **317.61** |

#### Income tax:

The Hon’ble Commission is requested to allow Income tax as per actuals

#### Other Income:

Other income includes following items.

* Interest Income
* Profit on sale of Stores
* Rental from Staff quarters
* Value of materials found excess during physical verification
* Rebate for collection of Electricity duty
* Interest subsidy received under National Electricity Fund scheme
* Misc. Recoveries
* Incentives received

Actuals of Other income and modified for FY-21 and FY-22 are as under:

**Table 4.58 (Amount in Crs)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Particulars** | **FY-18** | **FY-19** | **FY-20** | **FY-21** | **FY-22** |
| Interest on Income | 6.73 | 7.97 | 9.17 | 9.17 | 9.17 |
| Profit on sale of Stores | -3.07 | 0.00 | 0.26 | 0.00 | 0.00 |
| Loss/gains relating to fixed deposits | -7.25 | -4.05 | -11.01 | 0 | 0 |
| Rental from Staff quarters | 2.04 | 3.36 | 3.19 | 3.26 | 3.32 |
| Value of materials found excess during physical verification | 0.04 | 0.12 | 0.14 | 0.14 | 0.14 |
| Rebate for collection of Electricity duty\* | 3.69 | 6.35 | 7.05 | 6.90 | 7.20 |
| Incentives received | 96.27 | 104.68 | 61.18 | 108.2 | 102.7 |
| Subsidy |  |  |  |  |  |
| Miscellaneous recoveries | 100.35 | 165.69 | 148.66 | 138.23 | 150.86 |
| Interest subsidy received under National Electricity Fund scheme | 21.87 | 30.82 |  |  |  |
| Revenue from sale of power through Indian Energy Exchange (IEX) |  | 165.04 | 200.41 | 182.72 | 182.72 |
| **Total** | **220.67** | **479.97** | **419.05** | **448.64** | **456.12** |

#### Fund towards Consumer Relations /Consumer Education:

Commission approved funds towards consumer relations/consumer education to an extent of Rs.1 Cr for FY-21 and FY-22 BESCOM is not proposing any modification on this expenditure.

#### Regulatory Asset with carrying cost:

The Hon’ble Commission in its Tariff Order 2020, dated 04.11.2020 has carried the unrecovered potion of the revenue gap of seven months amounting to Rs.698.85 Crores of FY-21 as regulatory asset to be recovered in the tariff over the next two years i.e. FY-22 and FY-23. Further, the Commission has also allowed carrying cost at 10% per annum on the amount of Regulatory Asset. BESCOM has considered Rs. 349 Crs as regulatory asset for FY-22 along with 10% carrying cost, amounting to Rs.384.4 Crs. for FY-22.

#### Abstract of Approved and Modified ARR for FY-21 and FY-22 is shown in the table below:

**Table 4.59 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Particulars** | **FY-21** | **FY-22** |
| 1 | **Revenue at existing tariff in Rs. Crs.** |  |  |
| 2 | Revenue from tariff and Misc. Charges | 16494.30 | 17769.60 |
| 3 | Tariff Subsidy from BJ/KJ | 160.55 | 177.32 |
|  | Tariff Subsidy from IP | 2712.64 | 2958.81 |
|  | **Total Revenue** | **19367.49** | **20905.72** |
| 4 | **Expenditure in Rs. Crs.** |  |  |
| 5 | Power Purchase Cost | 13085.92 | 13731.14 |
| 6 | Transmission charges of KPTCL | 1940.60 | 2400.45 |
| 7 | Transmission charges of PGCIL | 1666.86 | 1478.98 |
|  | SLDC Charges | **19.38** | **19.00** |
| **8** | **Power Purchase Cost including cost of transmission** | **16705.95** | **17629.57** |
| 9 | Employee Cost | 1768.66 | 1940.39 |
| 10 | Repairs and Maintenance | 140.13 | 153.73 |
|  | Admin & General Expenses | 411.33 | 451.26 |
| **11** | **Total O&M Cost** | **2320.11** | **2545.38** |
|  | Depreciation | **777.83** | **915.45** |
| **12** | **Interest & Finance Charges** |  |  |
| 13 | Interest on Loans | 662.18 | 1,056.65 |
| 14 | Interest on Working capital | 414.41 | 448.81 |
| 15 | Interest on consumer deposits | 255.35 | 272.45 |
| 16 | Other Interest & Finance charges | 22.00 | 22.00 |
|  | **Less: interest & other expenses capitalized** | **223.01** | **234.16** |
| **17** | **Total Interest and Finance charges** | **1131** | **1565.8** |
| 18 | Other debits |  |  |
| 19 | Net Prior period debit/credits |  |  |
| 20 | Return on Equity | 273.20 | 317.61 |
| 21 | Funds towards Consumer Relations/Consumer | 1 | 1 |
| 22 | Income tax |  |  |
| 23 | Other Income | 448.64 | 456.12 |
| 24 | Regulatory Asset with carrying cost |  | **384.37** |
|  | Incentive for decreasing distribution loss |  |  |
|  | **ARR** | 20760.38 | 22903.00 |
|  | **GAP** | **-1392.89** | **-1997.28** |
|  | Sales | 24485.64 | 25616.07 |
|  | **Average cost of supply** | **8.48** | **8.94** |

#### Segregation of ARR into Distribution and Retail Supply Business:

The Consolidated ARR has been segregated into ARR for Distribution Business and ARR for Retail Supply Business based on the Commission’s existing ratio of segregation of ARR as detailed below:

**Table 4.60 (Amount in Crs)**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Distribution Business** | **Retail Supply Business** |
| Power purchase cost |  | 100% |
| R&M Expenses | 56% | 44% |
| Employee Expenses | 56% | 44% |
| A&G Expenses | 56% | 44% |
| Depreciation | 88% | 12% |
| Interest on Loans | 100% | 0% |
| Interest on consumer deposits | 53% | 47% |
| Interest on Working Capital | 12% | 88% |
| Other Income | 19% | 81% |
| ROE | 50% | 50% |
| Regulatory Asset | 50% | 50% |

Accordingly, the following are the ARR for the Distribution Business and the Retail Supply Business:

#### ARR for Distribution Business – FY-22:

**Table 4.61 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No.** | **Particulars** | **FY-21** | **FY-22** |
| 1 | Power purchase cost inclusive of transmission charges and SLDC Charges |  |  |
| 2 | R&M Expenses | 78.47 | 86.09 |
| 3 | Employee Expenses | 990.45 | 1086.62 |
| 4 | A&G Expenses | 230.34 | 252.71 |
| 5 | Depreciation | 684.49 | 805.59 |
| 6 | Interest on Loans | 662.18 | 1056.65 |
| 7 | Interest on Working Capital | 49.73 | 53.86 |
| 8 | Interest on consumer deposits | 135.34 | 144.40 |
| 10 | Other interest & finance charges | 22.00 | 22.00 |
| 11 | Less: interest & other expenses capitalised | 223.01 | 234.16 |
|  | **Total** | **2629.99** | **3273.76** |
| 12 | RoE | 136.60 | 158.81 |
| 13 | Other Income | 85.24 | 86.66 |
|  | Regulatory Asset with carrying cost | 0.00 | 192.18 |
|  | **NET ARR** | **2681.35** | **3538.08** |

#### ARR for Retail Supply Business – FY-22:

**Table 4.62 (Amount in Crs)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl. No**. | **Particulars** | **FY-21** | **FY-22** |
| 1 | Power purchase cost inclusive of transmission charges and SLDC Charges | 16705.95 | 17629.57 |
| 2 | R&M Expenses | 61.66 | 67.64 |
| 3 | Employee Expenses | 778.21 | 853.77 |
| 4 | A&G Expenses | 180.98 | 198.56 |
| 5 | Depreciation | 93.34 | 109.85 |
| 6 | Interest on Loans | 0.00 | 0.00 |
| 7 | Interest on Working Capital | 364.68 | 394.95 |
| 8 | Interest on consumer deposits | 120.01 | 128.05 |
| 9 | Other interest & finance charges | 0 | 0 |
| 10 | Less: interest & other expenses capitalised | 0 | 0 |
|  | **Total** | **18304.83** | **19382.39** |
| 11 | Other Income | 363.40 | 369.46 |
| 12 | RoE | 136.60 | 158.81 |
| 13 | Fund towards Consumer Relations / Consumer Education | 1.00 | 1.00 |
| 14 | Regulatory Asset with carrying cost | 0.00 | 192.18 |
|  | **NET ARR** | **18079.03** | **19364.92** |

#### Gap in Revenue for FY-22:

**Table 4.63 (Amount in Crs)**

|  |  |
| --- | --- |
| **Particulars** | **FY-22** |
| NET ARR (including Regulatory Asset) | 22903.00 |
| Revenue from Sale of power | 20905.72 |
| Revenue Gap | -1997.28 |
| Revenue Gap carried forward from FY-20 | -1559.37 |
| Energy Sales for FY-22 (MU) | 25616.07 |
| Total revenue gap | -3556.64 |
| **Tariff hike (Rs per Unit)** | **1.39** |