COAI

DG/COAI/2023/041
January 30, 2023

TSERC HYDERABAD
DESPATCHED
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No. Sign

To

**Hon'ble Shri Tanneru Sriranga Rao,**
**Chairman**
Telangana Electricity Regulatory Commission (TSERC)
Email : chairman@tserc.gov.in

**Subject: Request to Put Telecom Services in Industrial /Domestic/ special Tariff Category for Telecom Industry.**

**Reference** --Retail Supply Business and Tariff proposal for the entire control period i.e., for the period FY2019-20 to FY2023-24: and, G.O.Ms.No. 32 , Dated: 21-12-2022

**Respected Sir,**

1. At the outset, we would like to introduce ourselves as COAI (Cellular Operators Association of India), a non-profit and non-governmental body with the vision to establish and sustain a world-class telecom infrastructure and facilitate affordable mobile communication services in India. The association's main objective, among others, is to assist the government in promoting the growth of Cellular Mobile Services in the country.

2. Apropos the above references, wherein TSERC has asked for comments of stakeholders on electricity tariffs for FY 2023-24, we wish to thank you for giving us the opportunity to raise our request on electricity tariffs for the telecom industry. **Presently, the telecom industry is being charged commercial rates as against industrial rates, resulting in undue financial burden on the telecom industry which works round the clock like any other industry**.

3. We submit that telecom is well recognized as a public utility service and growth engine for socio-economic development of the country. It is a well-established fact that telecom penetration has a multiplier effect on the nation's GDP growth. Mobile connectivity brings multifarious benefits and is a critical factor in the growth and

**14, Bhai Veer Singh Marg, New Delhi – 110 001**
tel: +91-11-23349275 fax: +91-11-23349276 email: contact@coai.in

development of the nation. It is pertinent to note that services like, telephones

(Mobile & Broadband services), hospitals, delivery of essential services including Emergency services (Police/Ambulance/Fire etc.) are essential and must be available 24x7 without interruption. Telecommunications has now become a National Priority. Widespread adoption of data services via telecom has enabled inclusion, empowerment and socio-economic progress of the Indian citizens, while also contributing substantially to the GDP of the country.

4. Further, with the launch of 5G, we are at the cusp of embracing the next stage of digital revolution. Considering the strategic importance of 5G for the citizens, society and Industries, the Central Government has already taken various initiatives, such as issuance of Indian Telegraph Right of Way (Amendment) Rules, 2022 (dated 17th Aug 2022), to ease the deployment of 5G infrastructure across the country**. Early deployment of 5G in the States will lead to multiple new sources of revenue generation for local bodies, State Governments, Start-ups, existing Businesses, and most importantly, benefits for the citizens**. For this massive deployment of small cells (5G), there will be need for high number of EB connections across the state.

5. High electricity tariffs are one of the biggest challenges faced by the rapidly growing telecom tower industry in India. It is estimated that almost 30 percent of the tower's OPEX accounted for are related to electricity tariffs, which is a significant amount.

6. It is submitted that the Telecom Regulatory Authority of India (TRAI) in its report titled, "Recommendations on Use of Street Furniture for Small Cell and Aerial Fiber Deployment" dated 29.11.2022, after careful examination of the functioning of the telecom sector and after having considered the vital role being played by the telecommunication and broadband service sector in the economic growth of connected areas and the charges currently raised for providing electricity to telecom sites being very high, has also recommended that it is justified that telecom sites be provided electricity connection at industrial/utility tariffs. Copy of the report is attached (kindly refer to Chapter 3, Summary of Recommendations, E. Power related issues and solutions, 3.24, viii).

7. Further, we like to bring to the notice of the Hon'ble Commission that as part of the additional Recommendations (clause iii) of the working group to the Forum of Indian Regulators (FOIR) on "Cross Sector Collaborative Regulation Between Telecom Regulators and Electricity Regulators" (Copy Enclosed) it is stated that

"**Telecom sites should be provided electricity connection under Utility /Industrial / tariff. SERCs may be requested to incorporate the same in their tariff orders**."

8. It may kindly be noted that the Government of Maharashtra, as part of their IT/ITES policy notified the applicability of industrial tariff to the telecommunication towers instead of commercial tariff. The Maharashtra State Electricity Regulatory Commission, after taking into consideration the IT/ITeS policy of the Government of Maharashtra, specifically categorized Telecommunication Towers in the Industry Tariff vide its order dated 30.03.2020 in Case No. 322 of 2019. In furtherance to the same, the Maharashtra State Electricity Distribution Company Ltd. vide Commercial Circular No. 323 dated 03.04.2020, revised the electricity tariff for telecommunication towers by placing them in the Industrial Category. Kindly find attached copy of the said circular, please refer under section LT V: LT-Industry, pages 26, 27.

9. In view of the above, **we earnestly request that in the State EB Tariff Orders, Telecom Industry electricity tariff may kindly be placed under Industrial/Utility / Special rates rather than the commercial rates.**

10. We believe that enabling industrial rates for the telecom industry in Telangana will help propel telecom and data services in the progressive State, whereby crucial services such as m-governance, m-banking, m-health, m-education and the likes could be delivered, while facilitating the march towards the vision of achieving a Digital Telangana.

We trust our submission will merit your kind consideration and look forward to the valued support of your good office in this important matter.

Thanking you in anticipation.

Sincere regards,

**Lt. Gen. Dr. SP Kochhar**
**Director General**

**Email id: dg@coai.in**
**Mobile No.: +91 9871554400**

Encl – a/a

**Shri G. Raghuma Reddy**
Chairman & Managing Director
Southern Power Distribution Company of Telangana
(TSSPDCL)
Email : cmd@tssouthernpower.com

**Shri A. Gopal Rao**
Chairman & Managing Director
The Northern Power Distribution Company of Telangana Limited
(TSNPDCL)
Email : cmd@tsnpdcl.in

**14, Bhai Veer Singh Marg, New Delhi – 110 001**
tel: +91-11-23349275 fax: +91-11-23349276 email: contact@coai.in

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.

**MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.**

**(A Govt. of Maharashtra Undertaking)**
CIN : U40109MH20005SGC153645
**Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051**
**Website: www.mahadiscom.in**

No. CE/COMM/Tariff/MYT20-25/9061 Date: 03/04/2020

# COMMERCIAL CIRCULAR NO.323

**Subject:** **Revision in Electricity Tariff w.e.f. 1st April 2020 and implementation thereof. [For Control Period FY 2020-21 to FY 2024-25]**

**Ref:** **MERC Order in Case No. 322 of 2019 dated 30 March 2020.**

The Maharashtra Electricity Regulatory Commission, in exercise of the powers vested in it under Sections 61, 62 and 86 of the Electricity Act, 2003 (EA, 2003) and all other powers enabling it in this behalf, and after taking into consideration all the submissions made by MSEDCL and in the public consultation process, and all other relevant material, has approved the Truing-up of ARR for FY 2017-18 and FY 2018-19, Provisional Truing-up of ARR for FY 2019-20 and ARR and Tariff of Control Period FY 2020-21 to FY 2024-25 vide **Order in Case No. 322 of 2019 dated 30 March 2020.**

Accordingly, the guidelines as under are issued for implementation of the said Order of the Hon'ble Commission without prejudice to the right of MSEDCL to take any action as provided in the law.

**1. Applicability of Tariffs**

a) The revised Tariff as per this Order shall be applicable from 1 April, 2020 and will be continue to be in force till further Orders.

b) Where the billing cycle of a consumer is different from the date of applicability of the revised tariffs, the tariffs should be applicable for the consumption on pro-rat basis. The bills for the respective periods as per the existing and revised tariffs shall be calculated based on the pro rata consumptions (units consumed during the respective periods arrived on the basis of average unit consumption per day multiplied with number of days in the respective period falling under the billing cycle).

**2. Special Interim Dispensation in view of epidemic Covid19:**

To mitigate to some extent the difficulties being faced by the Electricity consumers of Maharashtra and all out efforts to contain the spread of Corona Pandemic;

a) Commission issued a practice direction on 26/3/2020 whereby meter reading and physical bill distribution work was suspended and utilities were asked to issue bills on average usage basis till the current crisis gets subsided.

b) To put a moratorium on payment of fixed charges of the electricity bill by consumers under Industrial and Commercial category for next three billing cycles beginning from the lockdown date of 25/3/2020.

**3. kVAh Based Billing:**

a) Hon'ble Commission allows MSEDCL to implement kVAh based billing for HT Consumers at present. The same shall be effective from 1 April, 2020.

b) As regards, the LT consumers above 20 kW load, the Commission directs MSEDCL to complete its meter conversion process alongwith other system modifications for such consumer categories and shall target to implement the same at the time of MTR i.e. by 1 April, 2023.

c) For implementation of kVAh based billing for the remaining LT consumer categories below 20 kW, a comprehensive study will have to be undertaken based on experience gained through introduction of kVAh billing for more than 20 kW category, to assess pros/cons of introduction for below 20 kW alongwith implementation aspects etc. MSEDCL should evaluate the same and process for introduction of kVAh billing for such below 20 kW consumers can be undertaken in the 5th Control Period in a phased manner, if found feasible.

d) However, with implementation of kVAh billing, any adverse impact due to poor PF will be recorded in increased consumption in kVAh and Consumer will not be aware of actual PF for the month unless it is being recorded and monitored separately. For smooth transition to new billing system and to keep Consumer aware at all times, the Commission directs MSEDCL to display PF (computed by considering leading and lagging RkVAh) recorded during the month in the bill of all the Consumer categories till further directions. Further, such PF can be used for converting kVAh into kWh for arriving at payment to be made towards taxes / duties imposed by the GoM, if applicable.

e) For the HT Consumer category will now have been determined in term of Rs./kVAh in case of HT consumer category where kVAh billing has been introduced:

- Energy Charges
- Wheeling Charges
- Transmission Charges
- ToD Charges
- Cross-Subsidy Surcharge
- Additional Surcharge

f) In case of Energy Balance, the utility shall always maintain sale in kWh only. Tax on Sale of Electricity and Electricity duty shall be converted from kVAh to kWh. All the OA transactions will be maintained in kWh sale only, kVAh based sales shall be converted in kWh based on the Power Factor for the month provided in the Energy Bills.

**4. Fixed Charges**

**a) Fixed Charges for Residential consumers**

i. A Fixed Charge of Rs. 135 per month will be levied on Residential consumers availing 3-phase supply. An Additional Fixed Charge of Rs.135 per 10 kW load or part thereof above 10 kW load shall also be payable for FY 2020-21. This amount will increase to Rs. 140 per month and per 10 KW, respectively, in FY 2021-22, and to Rs. 145 per month and per 10 KW, respectively, in FY 2022-23, and Rs. 155 per month and per 10 KW, respectively, in FY 2023-24, and Rs. 165 per month and per 10 KW, respectively, in FY 2024-25

ii. In view of Differentiation between Urban and Rural Areas in terms of investment in capex schemes and delays in accruing benefit of higher capitalization scheme in rural areas as compared to urban areas and distinction in performance standards for Class-I cities, Urban Areas and Rural Areas as per SOP Regulations the Commission has introduced Additional Fixed Charge of Rs 10 per connection per month to be applicable for LT-Domestic category consumers in Urban Divisions of MSEDCL.

**b) Demand Charges for Steel Plant operating with electric arc furnaces.**

i. Demand Charge shall be applicable at 75% of the rates applicable to HT I Industry for Steel Plant operating with electric arc furnaces.

**c) Discount in Demand Charges for Single Shift operation of HT-Industry.**

i. In case of industrial consumer under HT-Industry with single shift operation, Demand Charges at the rate of 60% of Applicable Demand Charges as per Tariff Schedule shall be levied, subject to following conditions;

a. Single shift operation means running of operations at a stretch for maximum 10 Hrs. For illustration, a consumer running 4hrs.in one stretch and 6hrs.in another stretch cannot be considered as running in a single shift. However, a maximum of three instances of running beyond 10hrs up to 12hrs is permitted in a billing cycle.

b. Consumer must declare in advance about one shift operation. In absence of such declaration, it shall be billed as per the applicable demand charges.

c. Billing will be done based on MRI/AMR Data.

**5. Wheeling charges on account of Infrastructure limitations**

a) Wherein the load is required to be availed at lower voltage due to non availability of the requisite voltage level in such cases only (non availability of EHV or requisite voltage level), the wheeling charges to the consumer shall be applicable as per the Billing Demand recorded. To avoid misuse of this concession, the applicability shall be subject to MSEDCL internally certifying the non availability of the requisite voltage level and further that the billing demand shall be as per the requisite voltage level is met by the consumer for at least 9 months in a financial year.

**6. ToD features in three phase meters**

a) The Commission also suggested to include ToD features in three phase meters so that all new connection would have these facilities and need not be replaced if in future, depending upon feasibility, it is decided to introduce ToD tariff structure to 10 kW and above consumers.

**7. Tariff Categorisation**

a) **Independent R&D Units:** Presently categorised under Commercial Category. In order to promote Research and Development, the Commission has categorised Independent R&D Units under Industrial Category.

b) **IT and ITeS Units:** Under existing tariff structure, IT and ITeS units having registration certificate under GoM's IT and ITeS Policy are categorised under Industrial Category. The APTEL in its Judgment dated 12 February, 2020 in Appeal No. 337 of 2016 & Others has ruled that tariff categorisation cannot be based on any certification under Policy and it should be based on criteria specified under Section 62 (3) of the Act. Accordingly, the Commission has removed the requirement of having certification under GoM Policy for claiming Industrial Tariff for IT and ITeS Units

c) **Hostels:** Presently all Student Hostels are covered under Residential Category. All Education Institutes are covered under Public Service category. Hence, it would be appropriate to categories Hostels into Public Service Category. This will avoid subjecting these Hostels at high tariff rate on account of telescopic tariff structure in Residential Category.

d) **Tabela:** The Commission has noted the submissions of stakeholders, where dairy or cattle farming is dependent and related to agricultural sector. Thus, the Commission has decided to classify Tabela under Consumer Category under LT IV (C) Agriculture (Others) so long as no associated industrial or commercial activity of milk processing or

Dairy/Chilling plant are undertaken, which are separately covered under LT-Industrial (General) or activities of milk collection centres, which are covered under LT-Commercial.

e) **Temporary Supply (Religious) and Temporary Supply (Others):** In an effort to rationalise the tariff categories, the Commission has done away with Temporary tariff category and merged Temporary Supply (Religious) with domestic category with benefit of telescopic slab and Temporary Supply (others) have been merged with Commercial category.

f) **Public Sanitary Convenience:** The Commission has decided to classify these activities for purpose of tariff applicability under LT - Public Service (Govt), category and expand the scope of applicability of tariff under this category to cover such public sanitation and public convenience facilities, which would benefit consumers/consumption for these categories.

8. **Powerloom industry**:

a) The Commission has merged LT-Industry(General) and LT-Industry (Powerloom) sub-categories, however, lower tariff (discount/rebate) of (2.5%) shall be available in Energy Charge Component (including FAC, if applicable)of Tariff for both slabs (<20 kW and > 20 kW) for Powerloom as against approved Energy Charge Component of Tariff applicable for respective slabs under LT-Industry.

**9. Merging or elimination of existing consumer categories**

a) Merging or elimination of existing consumer categories can be done considering the End Use, Energy Consumption, Socio-Economic Profile, Consumption Pattern/ Loan Factor etc. These factors have been examined by the Commission while deciding on merging of categories.

i. Merging of HT VIII (B) – Temporary Supply Others into HT II – Commercial However, in order to maintain difference in rate on account of nature of supply i.e. temporary vs permanent supply, temporary supply consumer shall pay 1.5 times fixed charges and 1.25 times energy charge applicable for the category.

ii. Merging of LT VIII – Advertisement & Hoardings into LT II – Commercial

iii. Merging of LT VII (A) – Temporary Supply (Religious) into LT I (B) – Residential in order to maintain difference in rate on account of nature of supply i.e. temporary vs permanent supply, temporary supply consumer shall pay 1.5 times fixed charges.

iv. Merging of LT VII (B) – Temporary Supply (Others) into LT II – Commercial in order to maintain difference in rate on account of nature of supply i.e. temporary vs permanent supply, temporary supply consumer shall pay 1.5 times fixed charges and 1.25 time energy charge applicable for the category.

b) Based on the above changes, the summary of the categories merged by the Commission is given below:

| Existing Category | Merged in Category |
|---|---|
| HT VIII(B) - Temporary Supply (others) | HT – Commercial |
| LT V - Advertisement and Hoardings | LT - Non-Residential or Commercial |
| LT VII - Temporary Supply (Religious) | LT – Residential |
| LT VII - Temporary Supply (Others) | LT - Non-Residential or Commercial |
| LT VIII - Crematoriums and Burial Grounds | LT – Residential |
| HT VIII (A) HT – Temporary Supply Religious | LT – Residential |
| LT-V(A) – Power Loom and LT-V(B) - Industry (General) | LT-Industry |

**10. Cold Storages:**

a) To clarify the scope of the term 'agriculture products processed or otherwise', to remove any ambiguity or interpretation with reference to 'Agriculture produce as defined under APMC Act, 1963 – processed or otherwise'. The Commission has accepted the suggestion and the applicability conditions under Tariff Schedule has been modified accordingly.

**11. Revision in Load Factor Formula**

b) The Commission after understanding the above illustration provided by MSEDCL finds it evident that, the removal of '60 Hours' from LF formula and using actual hours of interruptions will provide the correct estimation of LF and the proposal of correcting LF formula has been accepted by the Commission.

c) In addition, with AMR/MRI enabled meters being installed to all HT consumers, actual hours of interruptions are recorded in meter and are readily available at the time of processing of monthly bill. Hence, in order to compute correct Load Factor, the Commission has modified the formula and has included the actual interruptions hours recorded in the meter instead of provision for 60 hours. In case of faulty meter where interruptions hours are not recorded in the meter, the interruptions hours recorded on feeder meter shall be considered for calculation of Load Factor Incentive for the individual consumer

**12. Rebate for Incremental Consumption**

a) Detailed modalities for operationalization of rebate for incremental consumption alongwith relevant conditions for applicable consumer categories and eligible consumers shall be governed as per following conditions:

i. The rebate for incremental consumption shall be applicable for HT industries, HT commercial, HT public services, HT-PWW, HT Railways/Metro/Mono and HT-Group Housing Society (Residential).

ii. The rebate shall be given to eligible consumers including partial open access consumers falling under above consumer categories to the extent of procurement from MSEDCL.

iii. The rebate shall be for a period of 3 years subject to reconsideration during the MTR.

iv. The rebate shall be allowed to eligible consumers who consume power above threshold limit.

v. The 3-year average monthly consumption by consumer from FY 2017-18 to FY 2019-20 shall be considered as baseline consumption (or monthly threshold consumption) for determination of incremental consumption by such eligible consumers.

vi. In case of a consumer registered into system for duration lower than 3 years, such consumer shall be eligible for availing incremental rebate from the next billing cycle upon completion of 3-year period and average monthly consumption for past three years shall be considered as its baseline consumption (or monthly threshold consumption) in such cases for determination of their incremental consumption for the purpose of rebate.

vii. For the purpose of determination of Incremental consumption post MTR period of 4th Control Period, (i.e. for FY 2023-24 and FY 2024-25), baseline consumption (or monthly threshold consumption) shall be reset based on 3-year average from FY 2020-21 to FY 2022-23.

viii. The billing at the reduced rates after allowing the rebate shall be done on monthly basis subject to condition that net entitlement for the rebate under this head of incremental consumption shall be determined on annual basis (April to March) equal to energy units consumption in excess of baseline consumption (i.e. annual threshold consumption). The adjustment for shortfall/excess in case cumulative monthly consumption for the yearly consumption vis-à-vis its baseline consumption (i.e. annual threshold

consumption) shall be effected in the last monthly (for March) billing period. No carry-forward of shortfall/excess shall be allowed from one year to next year.

ix. Provided that such adjustment of rebate for yearly incremental consumption vis-à-vis baseline consumption (i.e. annual threshold consumption) shall be undertaken from FY 2021-22 onwards and no such adjustment shall be undertaken for FY 2020-21 wherein monthly rebate shall continue considering emergent situation arising in FY 2020-21 due to global pendemic of COVID-19 and its possible fall out on annual electricity consumption by industry and society at large.

x. For example, If a consumer's 3-year average annual consumption in was 12,000 units, the consumer shall be entitled for the rebate of Rs.0.75/kVAh for consumption exceeding its monthly threshold consumption (not below the baseline consumption of 1,000 units per month) in FY 2021-22 onwards. However, in case its cumulative monthly consumption for the yearly period falls short of annual threshold consumption of 12,000 units then, consumer shall not be entitled for incremental consumption rebate for that financial year and shortfall (or rebate already availed by consumer in earlier months, if any) shall be adjusted for recovery in monthly billing period for March.

xi. The Commission has not considered isolated cases which may become Permanently Disconnected during the year in which a rebate has been availed for some months. The details of such cases, if any will be dealt based on the data as may be submitted by MSEDCL during MTR.

xii. The rebate shall be over and above the existing rebates subject to the fact that the consumer's total variable charges should not be less than Rs.4/ kVAh after accounting for all applicable rebates.

xiii. The rebates would also be applicable to Open Access consumers, subject to conditions outlined above.

**13. Rebate for Bulk Consumption**

a) The Commission has decided to introduce "Bulk Consumption" rebate in a reverse telescopic manner for HT-Industrial consumers in following manner:

a) For monthly consumption (> 1 Lakh units to 1 MU) per month: 2%

b) For monthly consumption (> 1 MU to 5 MU) per month: 1.5%

c) For monthly consumption (> 5 MU) per month: 1%

b) Bulk Consumption Rebate shall be applicable on the Energy Charge component including FAC of the Bill excluding taxes and duty.

**Illustration:**

Say a consumer consumes 15 MU during month then, its consumption more than 1 Lakh units upto 1 MU units rebate will be 2%/unit, for next 4 MU (i.e. upto consumption of 5 MU) rebate will be 1.5%/unit and for consumption in excess of 5 MU upto 15 MU, rebate will be 1%/unit.

**14. Payment discipline:**

a) Commission has introduced consistent payment rebate of 1% to the consumers in these three categories LT-AG, LT-PWW and LT-Streetlight for consistently making payments within due date.

b) Such rebate would be monitored and offered on quarterly basis to only those consumers upon maintaining regular payment track record with the Utility. For example, if consumer makes regular payment of its monthly within due date during previous quarter then, such consumer shall be entitled to a rebate of 1% in its next monthly bill amount (excluding taxes and duties) for the subsequent quarter. In case of any default or non-adherence to bill payment within due date in previous quarter, such benefit of rebate shall be withdrawn for the full next billing quarter.

However, the consumer shall be entitled to rebate in subsequent quarters in case it maintains payment track record within due date in the previous quarter. In case of consumer having quarterly billing, such scheme shall be monitored on six monthly basis and rebate shall be given in next quarterly bill.

**15. Prepaid Meter**

a) The Commission directed that all the HVDS connections shall be released through prepaid meters only. Also, HVDS Ag connections released earlier should also be converted into prepaid meters within 6 months. Also, in case of non-availability of prepaid meters, the released connections should be converted to prepaid meters within 6/12 months.

b) **Rebate for consumers with Prepaid connections** : Consumers with prepaid metered connections shall be entitled for rebate of 5% in the Energy Charge Rate (incl FAC) applicable for the consumer category.

**16. Open Access Charges**

**a. Cross Subsidy Surcharge**

With the rationalisation effected by the Distribution Open Access Regulations, 2016 and its First amendment thereof, adoption of the CSS formulae in accordance with the Tariff Policy and the preferential tariff approved for purchase from RE sources, no concession would be provided to the RE sector in terms of discounted CSS levy. Thus, from the date of applicability of this Order, in case of an OA consumer purchases power from a RE source, the full CSS as determined as below shall be payable.

The CSS so approved as below shall be applicable on the energy actually consumed by the OA consumer, i.e., on the metered consumption.

| Consumer Category | FY 2020-21 | FY 2021-22 | FY 2022-23 | FY 2023-24 | FY 2024-25 |
|---|---|---|---|---|---|
| **HT Category - EHV (66kV and Above)** | | | | | |
| HT I (A) (i): HT - Industry | 1.67 | 1.67 | 1.68 | 1.60 | 1.60 |
| HT I (B): HT - Industry (Seasonal) | 2.20 | 2.23 | 2.26 | 2.66 | 2.75 |
| HT II (A): HT – Commercial | 2.92 | 2.89 | 2.88 | 2.83 | 2.82 |
| HT III (A): HT - Railways/Metro/Monorail Traction | 1.42 | 1.44 | 1.44 | 1.50 | 1.48 |
| HT IV: HT - Public Water Works (PWW) | 1.33 | 1.37 | 1.38 | 1.34 | 1.36 |
| HT V(A): HT - Agriculture Pumpsets | - | - | - | - | - |
| HT VI: HT - Group Housing Societies (Residential) | 0.73 | 0.74 | 0.75 | 0.26 | 0.27 |
| HT IX(B): HT - Public Services-Others | 2.03 | 1.98 | 1.94 | 1.70 | 1.62 |
| **HT Category - HT (33kV, 22kV and 11 kV)** | | | | | |
| HT I (A) (i): HT – Industry | 1.71 | 1.71 | 1.70 | 1.72 | 1.72 |
| HT I (B): HT - Industry (Seasonal) | 2.04 | 2.06 | 2.07 | 2.29 | 2.34 |
| HT II (A): HT – Commercial | 2.69 | 2.65 | 2.61 | 2.57 | 2.52 |

| | | | | | |
|---|---|---|---|---|---|
| HT III (A): HT - Railways/Metro/Monorail Traction | 1.68 | 1.71 | 1.72 | 1.72 | 1.71 |
| HT IV: HT - Public Water Works (PWW) | 1.48 | 1.51 | 1.53 | 1.56 | 1.60 |
| HT V(A): HT - Agriculture Pumpsets | - | - | - | - | - |
| HT V(B): HT - Agriculture Others | 0.14 | 0.05 | 0.07 | 0.13 | 0.16 |
| HT VI: HT - Group Housing Societies (Residential) | 1.40 | 1.46 | 1.47 | 1.49 | 1.52 |
| HT VIII(B): HT - Temporary Supply Others (TSO) | 2.86 | 2.83 | 2.81 | 2.65 | 2.59 |
| HT IX(A): HT - Public Services-Govt. Edu. Institutions and Hospitals | 1.86 | 1.87 | 1.87 | 1.88 | 1.90 |
| HT IX(B): HT - Public Services-Others | 1.86 | 1.87 | 1.87 | 1.88 | 1.90 |
| HT X: HT – Electric Vehicle Charging Station | 1.66 | 1.67 | 1.68 | 1.52 | 1.56 |

**b. Additional Surcharge**

Additional Surcharge shall be applicable to Captive Users of Group Captive Power Plants, in addition to Open Access consumers

| Particulars | FY 2020-21 | FY 2021-22 | FY 2022-23 | FY 2023-24 | FY 2024-25 |
|---|---|---|---|---|---|
| Per Unit Additional Surcharge (to be applicable on OA Consumers) **Rs/kWh** | 1.31 | 1.29 | 1.27 | 1.23 | 1.20 |
| Per Unit Additional Surcharge (to be applicable on OA Consumers) **Rs/Kvah** | 1.28 | 1.26 | 1.24 | 1.20 | 1.18 |

**c. Wheeling Charges and Wheeling Losses for HT**

| Particulars | FY 2020-21 | FY 2021-22 | FY 2022-23 | FY 2023-24 | FY 2024-25 |
|---|---|---|---|---|---|
| **Wheeling Charge – LT (Rs/kWh)** | 1.45 | 1.38 | 1.35 | 1.30 | 1.26 |
| **Wheeling Charges - HT (Rs/Kwh)** | 0.58 | 0.57 | 0.57 | 0.55 | 0.54 |
| **Wheeling Charges - HT (Rs/Kvah)** | 0.57 | 0.56 | 0.55 | 0.54 | 0.53 |
| **Wheeling loss – LT** | 12 % | | | | |
| **Wheeling loss – HT** | 7.5 % | | | | |

**d. Transmission Loss & Transmission Charges**

MERC Order in Case No 327 of 2019 filed by Maharashtra State Electricity Transmission Company Limited for determination of Multi-Year Tariff for Intra-Sate Transmission System for the 4th MYT Control Period from FY 2020-21 to FY 2024-25, dated 30.3.2020 has determined the Transmission Charges and Transmission loss as below.

**i) Transmission Charges:-**

| Particulars | FY 2020-21 | FY 2021-22 | FY 2022-23 | FY 2023-24 | FY 2024-25 |
|---|---|---|---|---|---|
| Transmission Tariff (Short term/Short term Collective/ Renewable Energy (**Rs/Kwh)** | 0.41 | 0.41 | 0.41 | 0.40 | 0.39 |
| Transmission Tariff (Short term/Short term Collective/ Renewable Energy **(Rs/Kvah)** | 0.40 | 0.40 | 0.40 | 0.39 | 0.38 |
| Transmission Tariff (Long term/Medium Term) **Rs/KW/Month** | 266 | 263 | 260 | 256 | 250 |

**ii) Transmission Loss:-**

| Particulars | FY 2020-21 | FY 2021-22 | FY 2022-23 | FY 2023-24 | FY 2024-25 |
|---|---|---|---|---|---|
| Intra-State Transmission Loss (%) | 3.18 | 3.18 | 3.18 | 3.18 | 3.18 |

**e. Processing and operating charges**

| Load Requisitioned | Processing fee per application (Rs.) | Operating Charges per month (Rs.) |
|---|---|---|
| Upto 1 MW | 14,500 | 14,500 |
| More than 1 MW and up to 5 MW | 22,000 | |
| More than 5 MW and up to 20 MW | 44,000 | 28,000 |
| More than 20 MW and up to 50 MW | 75,000 | |
| More than 50 MW | | |

**17. Grid Support Charges for Rooftop Net Metering Arrangements**

a. To incentivize installation of RTPV, the Commission has decided not to impose any Grid Support Charge on RTPV under net-metering arrangement till cumulative installed capacity of RTPV in the State reaches 2000 MW. Subsequent to that Commission will reconsider option of imposing Grid Support Charge as provided under the Regulations

b. However till the Grid Support Charges as envisaged in the Regulations stay exempted, in order to enable MSEDCL to at least recover cost of banking service, the Commission has decided to levy banking charge. For this purpose, the Commission has linked such Banking Charge to Wheeling Loss allowed in this Order i.e. 7.5% for HT and 12% to LT. Accordingly, for RTPV connected on HT network, from the energy injected into the grid, 7.5% energy will be deducted by MSEDCL as a Banking Charge. Similarly, for RTPV connected on LT side such deduction of energy would be 12%.

c. **Applicability of Banking Charges for future installations of rooftop systems under net metering arrangement:** In pursuance of the principles specified under Net Metering Regulations, 2019 and in view of the foregoing, the Banking Charges shall be applicable to all categories of consumers for future installations

of rooftop systems under net metering arrangement to be commissioned from the date of issuance of this Order in MSEDCL area, except for the following:

i. All Categories having Sanctioned Load up to 10 kW shall be exempted from payment of Grid Support Charges or Banking Charges for Net Metering systems
ii. Roof top PV systems under Net Billing arrangement and
iii. Rooftop PV systems installations Behind the Consumer's meter not availing Net Metering or Net Billing arrangement

**ACTION PLAN:**

For proper implementation of the revised Tariff Order, Billing & Revenue, IT Department and All Filed Offices shall follow guidelines given below;

1. The revised Tariff as per this Order shall be applicable from 1 April, 2020 and will be in continuation till issuance of further Orders.
2. The approved HT and LT Tariff for FY 2020-21 to FY 2024-25, as indicated in **Annexure I.** All field Officers are requested to download the same from MSEDCL's website www.mahadiscom.in and adequate copies of these booklets should be printed and made available upto Section Lever and also make available to outsider / Consumer at the rate of Rs.50 per booklet.
3. The field Officers are directed to ensure that wherever the tariff category is redefined or newly created by the Hon'ble Commission the existing / prospective consumers should be properly categorized by actual field inspection immediately and data to be immediately updated in IT base data.
4. All field Officers shall sensitize staff about the various aspects of the Tariff Order and give proper guidelines to all the Officers and the Staff members working under them.
5. These are only the important guidelines for actual implementation of the Tariff Order, the field Officers are requested to refer the detail MERC Tariff Order in Case No. 322 of 2019 dated 30 March 2020. All the stipulations and provisions are to be strictly followed.

All field Officers are therefore requested to take due note of the revised tariff and should follow the same hereafter.

**Encl.**1. Annexure I: Tariff Schedule for FY 2020-21 to FY 2024-25.
2. Annexure II: Tariff Applicable to AG & Powerloom.

**Sd/-**

**Chief Engineer (Commercial)**

**Copy to:** As per mailing list.

**ANNEXURE –I TARIFF SCHEDULE FOR FY 2020-21 to FY 2024-25**

**MAHARASHTRA STATE ELECTRICITY DISTRIBUTION CO. LTD.**

**APPROVED TARIFF SCHEDULE**
**(With effect from 1 April, 2020)**

Maharashtra Electricity Regulatory Commission, in exercise of the powers vested in it under Sections 61 and 62 of the Electricity Act, 2003 and all other powers enabling it in this behalf, has determined, by its Multi Year Tariff Order dated **_March, 2020** in Case No. 322 of 2019, the Tariff for supply of electricity by the Distribution Licensee, Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) to various classes of consumers as applicable from **_March, 2020**

## General

1. These tariffs supersede all tariffs so far in force.

2. The Tariffs are subject to revision and/or surcharge that may be levied by the Distribution Licensee from time to time as per the directives of the Commission.

3. The tariffs are exclusive of the separate Electricity Duty, Tax on Sale of Electricity and other levies by the Government or other competent authorities, which will be payable by consumers over and above the tariffs.

4. The tariffs are applicable for supply at one point only.

5. The Distribution Licensee may measure the Maximum Demand for any period shorter than 30 minutes of maximum use, subject to conformity with the Commission's Electricity Supply Code Regulations, where it considers that there are considerable load fluctuations in operation.

6. The tariffs are subject to the provisions of the applicable Regulations and any directions that may be issued by the Commission from time to time.

7. Unless specifically stated to the contrary, the figures of Energy Charge and Wheeling Charge are denominated in Rupees per unit (kWh or kVAh as case may be) for the energy consumed during the month.

8. Fuel Adjustment Charge (FAC) computed in accordance with provisions of MYT Regulations, 2019 and Commission's directions in this regard from time to time shall be applicable to all categories of consumers, and will be charged over and above the base tariff..

# LOW TENSION (LT) TARIFF

## LT I (A): LT – Residential (BPL)

Applicability:

This Below Poverty Line (BPL) tariff category is applicable to Residential consumers who have a Sanctioned Load upto 0.25 kW and who have consumed upto 360 units per annum in the previous financial year. The eligibility of such consumers will be reassessed at the end of each financial year. If more than 360 units have been consumed in the previous financial year, the LTI (B) - Residential tariff shall thereafter be applicable, and such consumer cannot revert thereafter to the BPL category irrespective of his future consumption level.

The categorisation of BPL consumers will be reassessed at the end of the financial year on a pro rata basis if there has been consumption for only a part of the year. The categorisation of BPL consumers who have been added during the previous year would be assessed on a pro rata basis, i.e., 30 units per month.

This BPL category will also be applicable to all new consumers subsequently added in any month with a Sanctioned Load of upto 0.25 kW and consumption between 1 to 30 units (on pro rata basis of 1 unit/day) in the first billing month.

The BPL tariff is applicable only to individuals and not to institutions.

### Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab | Fixed/Demand Charges (Rs. /Month) | Energy Charges (Rs. /kWh) | Wheeling Charges (Rs. /kWh) |
|---|---|---|---|
| BPL Category | 26.00 | 1.12 | - |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab | Fixed/Demand Charges (Rs. /Month) | Energy Charges (Rs. /kWh) | Wheeling Charges (Rs. /kWh) |
|---|---|---|---|
| BPL Category | 27.00 | 1.14 | - |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab | Fixed/Demand Charges (Rs. /Month) | Energy Charges (Rs. /kWh) | Wheeling Charges (Rs. /kWh) |
|---|---|---|---|
| BPL Category | 28.00 | 1.16 | - |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab | Fixed/Demand Charges (Rs. /Month) | Energy Charges (Rs. /kWh) | Wheeling Charges (Rs. /kWh) |
|---|---|---|---|
| BPL Category | 29.00 | 1.18 | - |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab | Fixed/Demand Charges (Rs. /Month) | Energy Charges (Rs. /kWh) | Wheeling Charges (Rs. /kWh) |
|---|---|---|---|
| BPL Category | 30.00 | 1.18 | - |

**LT I (B): LT – Residential**

Applicability:

This tariff category is applicable for electricity used at Low/Medium Voltage for operating various appliances used for purposes such as lighting, heating, cooling, cooking, washing/cleaning, entertainment/leisure, water pumping in the following premises:

a. Private residential premises, Government/semi-Government residential quarters;

b. Premises used exclusively for worship, such as temples, gurudwaras, churches, mosques, etc.; provided that halls, gardens or any other part of such premises that may be let out for a consideration or used for commercial activities would be charged at the applicable LT-II tariff;

c. Government / Private / Co-operative Housing Colonies/complexes (where electricity is used exclusively for domestic purposes) only for common facilities such as Water Pumping / Street and other common area Lighting / Lifts /Parking Lots/ Fire-fighting Pumps and other equipment, etc.;

d. Sports Clubs or facilities / Health Clubs or facilities / Gymnasium / Swimming Pool / Community Hall of Government / Private / Co-operative Housing Colonies/complexes - provided that they are situated in the same premises, and are for the exclusive use of the members and employees of such Housing Colonies/complexes;

e. Telephone booths owned/operated by Persons with Disabilities/Handicapped persons;

f. Residential premises used by professionals like Lawyers, Doctors, Engineers, Chartered Accountants, etc., in furtherance of their professional activities, but not including Nursing Homes and Surgical Wards or Hospitals;

g. Single-phase household Flour Mills (Ghar-ghanti) used only for captive purposes;

h. A residential LT consumer with consumption up to 500 units per month (current month of supply) who undertakes construction or renovation activity in his existing premises: such consumer shall not require a separate temporary connection, and would be billed at this Residential tariff rate;

***Note:***

*This tariff category shall also be applicable to consumers who are supplied power at High Voltage for any of the purposes (a) to (h) above.*

i. Consumers undertaking business or commercial / industrial / non-residential activities from a part of their residence, whose monthly consumption is up to 300 units a month and annual consumption in the previous financial year was up to 3600 units. The applicability of this tariff to such consumers will be assessed at the end of each financial year. In case consumption has exceeded 3600 units in the previous financial year, the consumer will thereafter not be eligible for the tariff under this category but be charged at the tariff otherwise applicable for such consumption, with prior intimation to him.

j. Entities supplied electricity at a single point at Low/Medium Voltage for residential purposes, in accordance with the Electricity (Removal of Difficulties) Eighth Order, 2005, in the following cases:

k. a Co-operative Group Housing Society which owns the premises, for making electricity available to the members of such Society residing in the same premises for residential purposes; and

l. a person, for making electricity available to its employees residing in the same premises for residential purposes.

m. Crematoriums and Burial Grounds for all purposes, including lighting.

n. Temporary purposes for public religious functions like Ganesh Utsav, Navaratri, Eid, Moharrum, Ram Lila, Diwali, Christmas, Guru Nanak Jayanti, etc., and for areas where community prayers are held; and for functions to commemorate anniversaries of personalities and National or State events for which Public Holidays have been declared, such as Gandhi Jayanti, Ambedkar Jayanti, Chhatrapati Shivaji Jayanti, Republic Day, Independence Day, etc.

Provided that such temporary connection shall be subjected to 1.5 times of fixed charges.

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/Demand Charge (Rs. per month) #(ref. note (o)) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 0-100 units | Single Phase: Rs. 100.00 per month Three Phase - Rs. 340.00 per month[$$] | 1.45 | 3.46 |
| 101 – 300 units | | 1.45 | 7.43 |
| 301 – 500 units | | 1.45 | 10.32 |
| Above 500 Units (Balance Units) | | 1.45 | 11.71 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/Demand Charge (Rs. per month) #(ref. note (o)) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 0-100 units | Single Phase: Rs.102.00 per month Three Phase - Rs. 340.00 per month[$$] | 1.38 | 3.44 |
| 101 – 300 units | | 1.38 | 7.34 |
| 301 – 500 units | | 1.38 | 10.36 |
| Above 500 Units (Balance Units) | | 1.38 | 11.82 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/Demand Charge (Rs. per month) #(ref. note (o)) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 0-100 units | Single Phase: Rs. 105.00 per month Three Phase - Rs. 350.00 per month[$$] | 1.35 | 3.36 |
| 101 – 300 units | | 1.35 | 7.34 |
| 301 – 500 units | | 1.35 | 10.37 |
| Above 500 Units (Balance Units) | | 1.35 | 11.86 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/Demand Charge (Rs. per month) #(ref. note (o)) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 0-100 units | Single Phase: Rs. 107.00 per month Three Phase - Rs. 357.00 per month[$$] | 1.30 | 3.28 |
| 101 – 300 units | | 1.30 | 7.34 |
| 301 – 500 units | | 1.30 | 10.38 |
| Above 500 Units (Balance Units) | | 1.30 | 11.90 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/Demand Charge (Rs. per month) #(ref. note (o)) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 0-100 units | Single Phase: Rs. 109.00 per month Three Phase - Rs. 364.00 per month[$$] | 1.26 | 3.28 |
| 101 – 300 units | | 1.26 | 7.34 |
| 301 – 500 units | | 1.26 | 10.38 |
| Above 500 Units (Balance Units) | | 1.26 | 11.90 |

***Note:***

o. [$$]The above Fixed Charges are for single-phase connections. A Fixed Charge of Rs. 135 per month will be levied on Residential consumers availing 3-phase supply. An

Additional Fixed Charge of Rs.135 per 10 kW load or part thereof above 10 kW load shall also be payable for FY 2020-21. This amount will increase to Rs. 140 per month and per 10 KW, respectively, in FY 2021-22, and to Rs. 145 per month and per 10 KW, respectively, in FY 2022-23, and Rs. 155 per month and per 10 KW, respectively, in FY 2023-24, and Rs. 165 per month and per 10 KW, respectively, in FY 2024-25

p. Professionals like Lawyers, Doctors, Professional Engineers, Chartered Accountants, etc., occupying premises exclusively for conducting their profession, shall not be eligible for this Tariff, and will be charged at the Tariff applicable to the respective categories.

q. Additional Fixed Charge of Rs 10 per connection per month shall be applicable for LT-Domestic category consumers in Urban Divisions of MSEDCL.

**LT II: LT – Non-Residential or Commercial**

Applicability:

This tariff category is applicable for electricity used at Low/Medium voltage in non-residential, non-industrial and/or commercial premises for commercial consumption meant for operating various appliances used for purposes such as lighting, heating, cooling, cooking, washing/cleaning, entertainment/ leisure and water pumping in, but not limited to, the following premises:

a. Non-Residential, Commercial and Business premises, including Shopping Malls and Showrooms;

b. Combined lighting and power supply for facilities relating to Entertainment, including film studios, cinemas and theatres (including multiplexes), Hospitality, Leisure, Meeting/Town Halls, and places of Recreation and Public Entertainment; Offices, including Commercial Establishments; Marriage Halls, Hotels / Restaurants, Ice-cream parlours, Coffee Shops, Guest Houses, Internet / Cyber Cafes, Telephone Booths not covered under the LT I category, and Fax / Photocopy shops;

c. Automobile and all other types of repairs, servicing and maintenance centres (unless specifically covered under another tariff category); Retail Gas Filling Stations, Petrol Pumps and Service Stations, including Garages;

d. Tailoring Shops, Computer Training Institutes, Typing Institutes, Photo Laboratories, Laundries, Beauty Parlours and Saloons;

e. Banks and ATM centres, Telephone Exchanges, TV Stations, Microwave Stations, Radio Stations;

f. Common facilities, like Water Pumping / Lifts / Fire-Fighting Pumps and other equipment / Street and other common area Lighting, etc., in Commercial Complexes;

g. Sports Clubs/facilities, Health Clubs/facilities, Gymnasiums, Swimming Pools not covered under any other category;

h. External illumination of monuments/ historical/ heritage buildings approved by Maharashtra Tourism Development Corporation (MTDC) or the concerned Local Authority;

i. Construction of all types of structures/ infrastructures such as buildings, bridges, fly-overs, dams, Power Stations, roads, Aerodromes, tunnels for laying of pipelines for all purposes;

***Note:***

*Residential LT consumers with consumption above 500 units per month (current month of supply) and who undertake construction or renovation activity in their existing premises shall not require a separate Temporary category connection, and shall be billed at the LT-II Commercial Tariff rate;*

j. Milk Collection Centres;

k. Sewage Treatment Plants/ Common Effluent Treatment Plants for Commercial Complexes not covered under the LT – Public Water Works or LT – Industry categories.

l. Advertisements, hoardings (including hoardings fixed on lamp posts/installed along roadsides), and other commercial illumination such as external flood-lights, displays, neon signs at departmental stores, malls, multiplexes, theatres, clubs, hotels and other such establishments.

m. Temporary supply for any of the activity not covered under Residential category

Provided that Temporary supply consumer shall pay 1.5 time applicable fixed/demand charges and 1.25 time applicable energy charge.

Provided further that temporary supply for operating Fire-Fighting pumps and equipment in residential or other premises shall be charged as per the Tariff category applicable to such premises.

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT II (A) 0-20 kW | Rs. 403.00 per Month | 1.45 | 7.36 |
| LT II (B) > 20 kW and ≤ 50 kW | Rs. 403.00 per kW per Month | 1.45 | 10.72 |
| LT II (C) > 50 kW | Rs. 403.00 per kW per Month | 1.45 | 12.83 |
| **TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT II (A) 0-20 kW | Rs. 415.00 per Month | 1.38 | 7.18 |
| LT II (B) > 20 kW and ≤ 50 kW | Rs 415.00 per kW per Month | 1.38 | 10.79 |
| LT II (C) > 50 kW | Rs 415.00 per kW per Month | 1.38 | 12.95 |
| **TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT II (A) 0-20 kW | Rs. 427.00 per Month | 1.35 | 7.07 |
| LT II (B) > 20 kW and ≤ 50 kW | Rs. 427.00 per kW per Month | 1.35 | 10.79 |
| LT II (C) > 50 kW | Rs. 427.00 per kW per Month | 1.35 | 12.76 |
| **TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT II (A) 0-20 kW | Rs. 436.00 per Month | 1.30 | 7.01 |
| LT II (B) > 20 kW and ≤ 50 kW | Rs. 436.00 per kW per Month | 1.30 | 10.84 |
| LT II (C) > 50 kW | Rs. 436.00 per kW per Month | 1.30 | 12.62 |

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| **TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT II (A) 0-20 kW | Rs. 445.00 per Month | 1.26 | 7.01 |
| LT II (B) > 20 kW and ≤ 50 kW | Rs. 445.00 per kW per Month | 1.26 | 10.84 |
| LT II (C) > 50 kW | Rs. 445.00 per kW per Month | 1.26 | 12.62 |
| **TOD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

***Note:*** *The ToD tariff is applicable to the LT-II (B) and (C) categories, and optionally available to LT- II (A) category consumers having ToD meter installed.*

**LT III: LT-Public Water Works (PWW) and Sewage Treatment Plants**

Applicability:

This tariff category is applicable for electricity / power supply at Low / Medium Voltage for pumping of water, purification of water and allied activities relating to Public Water Supply Schemes, Sewage Treatment Plants and Waste Processing Units, provided they are owned or operated or managed by Local Self-Government Bodies (Gram Panchayats, Panchayat Samitis, Zilla Parishads, Municipal Councils and Corporations, etc.), or by Maharashtra Jeevan Pradhikaran (MJP), Maharashtra Industries Development Corporation (MIDC), Cantonment Boards and Housing Societies/complexes.

All other Public Water Supply Schemes and Sewage Treatment Plants (including allied activities) shall be billed under the LT II or LT V category tariff, as the case may be.

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| LT III(A): 0-20 kW | Rs. 100.00 per Month | 1.45 | 2.40 |
| LT III(B): >20 kW and ≤40 kW | Rs. 121.00 per kW per Month | 1.45 | 3.78 |
| LT III(C): >40 kW | Rs. 150.00 per kW per Month | 1.45 | 5.11 |
| **ToD tariff (in addition to above base tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| **LT III(A): 0-20 kW** | Rs. 103.00 per Month | 1.38 | 2.46 |
| **LT III(B): >20 kW and ≤40 kW** | Rs. 125.00 per kW per Month | 1.38 | 3.82 |
| **LT III(C): >40 kW** | Rs. 155.00 per kW per Month | 1.38 | 5.12 |
| **ToD tariff (in addition to above base tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| **LT III(A): 0-20 kW** | Rs. 106.00 per Month | 1.35 | 2.48 |
| **LT III(B): >20 kW and ≤40 kW** | Rs. 129.00 per kW per Month | 1.35 | 3.84 |
| **LT III(C): >40 kW** | Rs. 160.00 per kW per Month | 1.35 | 5.09 |
| **ToD tariff (in addition to above base tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| **LT III(A): 0-20 kW** | Rs.108.00 per Month | 1.30 | 2.52 |
| **LT III(B): >20 kW and ≤40 kW** | Rs.132.00 per kW per Month | 1.30 | 3.86 |
| **LT III(C): >40 kW** | Rs.163.00 per kW per Month | 1.30 | 5.19 |
| **ToD tariff (in addition to above base tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charges | Wheeling Charges (Rs. /kWh) | Energy Charge (Rs. /kWh) |
|---|---|---|---|
| **LT III(A): 0-20 kW** | Rs. 110.00 per Month | 1.26 | 2.52 |
| **LT III(B): >20 kW and ≤40 kW** | Rs 135.00 per kW per Month | 1.26 | 3.86 |
| **LT III(C): >40 kW** | Rs. 166.00 per kW per Month | 1.26 | 5.19 |
| **ToD tariff (in addition to above base tariffs) (Rs/kWh)** | | | |
| 2200 Hrs - 0600 Hrs | | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | | 0.00 |
| 0900 Hrs - 1200 Hrs | | | 0.80 |
| 1800 Hrs - 2200 Hrs | | | 1.10 |

## LT IV: Agriculture

### LT IV (A): LT - Agriculture Un-metered - Pumpsets

Applicability:

This tariff category is applicable for motive power supplied for Agriculture metered pumping loads, and for one lamp of wattage up to 40 Watt to be connected to the motive power circuit for use in pump-houses at Low/Medium Voltage.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT IV (A): LT - Agriculture Un-metered Tariff - Pumpsets** | | | |

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| Category 1 Zones* | | | |
| (a) 0-5 HP | 334.00 | 145.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 360.00 | 145.00 | - |
| (c) > 7.5 HP | 405.00 | 145.00 | - |
| Category 2 Zones # | | | |
| (a) 0-5 HP | 258.00 | 145.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 282.00 | 145.00 | - |
| (c) > 7.5 HP | 327.00 | 145.00 | - |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT IV (A): LT - Agriculture Un-metered Tariff – Pumpsets** | | | |
| Category 1 Zones* | | | |
| (a) 0-5 HP | 349.00 | 138.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 376.00 | 138.00 | - |
| (c) > 7.5 HP | 422.00 | 138.00 | - |
| Category 2 Zones # | | | |
| (a) 0-5 HP | 269.00 | 138.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 295.00 | 138.00 | - |
| (c) > 7.5 HP | 342.00 | 138.00 | - |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT IV (A): LT - Agriculture Un-metered Tariff - Pumpsets** | | | |
| Category 1 Zones* | | | |
| (a) 0-5 HP | 359.00 | 135.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 387.00 | 135.00 | - |
| (c) > 7.5 HP | 435.00 | 135.00 | |
| Category 2 Zones # | | | |
| (a) 0-5 HP | 277.00 | 135.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 304.00 | 135.00 | - |
| (c) > 7.5 HP | 352.00 | 135.00 | |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT IV (A): LT - Agriculture Un-metered Tariff - Pumpsets** | | | |

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| Category 1 Zones* | | | |
| (a) 0-5 HP | 366.00 | 130.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 395.00 | 130.00 | - |
| (c) > 7.5 HP | 444.00 | 130.00 | - |
| Category 2 Zones # | | | |
| (a) 0-5 HP | 283.00 | 130.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 310.00 | 130.00 | - |
| (c) > 7.5 HP | 359.00 | 130.00 | - |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumer Category | Fixed / Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/HP/Month) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT IV (A): LT - Agriculture Un-metered Tariff - Pumpsets** | | | |
| Category 1 Zones* | | | |
| (a) 0-5 HP | 373.00 | 126.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 403.00 | 126.00 | - |
| (c) > 7.5 HP | 453.00 | 126.00 | - |
| Category 2 Zones # | | | |
| (a) 0-5 HP | 289.00 | 126.00 | - |
| (b) > 5 HP and ≤ 7.5 HP | 316.00 | 126.00 | - |
| (c) > 7.5 HP | 366.00 | 126.00 | - |

| ***Category 1 Zones (with consumption norm above 1,318 hours/HP/year)** | | |
|---|---|---|
| 1) Bhandup (U) | 2) Pune | 3) Nashik |
| 4) Baramati | 5) Jalgaon | |
| **#Category 2 Zones (with consumption norm below 1,318 hours/HP/year)** | | |
| 1) Amravati | 2) Aurangabad | 3) Kalyan |
| 4) Konkan | 5) Kolhapur | 6) Latur |
| 7) Nagpur (U) | 8) Chandrapur | 9) Gondia |
| 10) Nanded | 11) Akola | |

***Note:***

i. *The Flat Rate Tariff as above will remain in force only till meters are installed; once meter is installed, the consumer will be billed as per the Tariff applicable to metered agricultural consumers.*

ii. *The list of Category 1 Zones (with consumption norm above 1318 hours/ HP/year) and Category 2 Zones (with consumption norm below 1318 hours/HP/year) is given above.*

iii. *Supply under this Tariff will be given for a minimum load of 2 HP. If any consumer requires any load less than 2 HP for agricultural purposes, he shall be required to pay the Fixed Charge/Energy Charge on this basis as if a load of 2 HP is connected.*

## LT IV (B): LT – Agriculture metered - Pumpsets

Applicability:

This tariff category is applicable for motive power supplied for Agriculture metered pumping loads, and for one lamp of wattage up to 40 Watt to be connected to the motive power circuit for use in pump-houses at Low/Medium Voltage.

It is also applicable for power supply for cane crushers and/or fodder cutters for self-use for agricultural processing operations, but not for operating a flour mill, oil mill or expeller in the same premises, either operated by a separate motor or a change of belt drive.

This Tariff is also applicable to Feeder Input based Group Metering wherein Input recorded on 11/22 kV Feeder minus Technical Loss of that particular feeder is billed to the consumers connected on that Feeder in proportionate to the sanctioned load of pump.

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 41.00 | 1.45 | 1.85 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 42.00 | 1.38 | 1.91 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 43.00 | 1.35 | 1.95 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 44.00 | 1.30 | 1.99 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ HP/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 45.00 | 1.26 | 1.99 |

## LT IV (C): LT – Agriculture – Others

Applicability:

This tariff category is applicable for use of electricity / power supply at Low / Medium Voltage for:

a. Pre-cooling plants and cold storage units for Agricultural Products as defined under APMC Act, 1963 – processed or otherwise;

b. Poultries exclusively undertaking layer and broiler activities, including Hatcheries;

c. High-Technology Agriculture (i.e. Tissue Culture, Green House, Mushroom cultivation activities), provided the power supply is exclusively utilized for purposes directly concerned with the crop cultivation process, and not for any engineering or industrial process;

d. Floriculture, Horticulture, Nurseries, Plantations, Aquaculture, Sericulture, Cattle Breeding Farms, etc;

e. Tabela, which involves no associated industrial/commercial activity of milk processing or Dairy/Chilling plant are undertaken, which are separately covered under LT-Industrial/ Commercial .

### Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ kW/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 111.00 | 1.45 | 3.34 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ kW/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 114.00 | 1.38 | 3.23 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ kW/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 117.00 | 1.35 | 3.29 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ kW/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 119.00 | 1.30 | 3.36 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs/ kW/ month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| All Units | 121.00 | 1.26 | 3.36 |

## LT V: LT- Industry:

Applicability:

This tariff category is applicable for electricity for Industrial use, at Low/Medium Voltage, for purposes of manufacturing and processing, including electricity used within such premises for general lighting, heating/cooling, etc.

It is also applicable for use of electricity / power supply for Administrative Offices / Canteens, Recreation Hall / Sports Club or facilities / Health Club or facilities/ Gymnasium / Swimming Pool exclusively meant for employees of the industry; lifts, water pumps, fire-fighting pumps and equipment, street and common area lighting; Research and Development units, dhobi/laundry etc. -

Provided that all such facilities are situated within the same industrial premises and supplied power from the same point of supply;

This tariff category shall also be applicable for use of electricity / power supply by an Information Technology (IT) or IT-enabled Services (ITeS) Unit as defined in the applicable IT/ITeS Policy of Government of Maharashtra.

It shall also be applicable for use of electricity / power supply for (but not limited to) the following purposes:

a. Flour Mill, Dal Mill, Rice Mill, Poha Mill, Masala Mill, Saw Mill;

b. Ice Factory, Ice-cream manufacturing units, Milk Processing / Chilling Plants (Dairy);

c. Engineering Workshops, Engineering Goods Manufacturing units; Printing Presses; Transformer Repair Workshops; Tyre Remoulding/Rethreading units; and Vulcanizing units;

d. Mining, Quarrying and Stone Crushing units;

e. Garment Manufacturing units;

f. LPG/CNG bottling plants, etc.;

g. Sewage Treatment Plant/ Common Effluent Treatment Plant for industries, and not covered under the LT – Public Water Works category

h. Start-up power for Generating Plants, i.e. the power required for trial run of a Power Plant during commissioning of the Unit and its Auxiliaries, and for its start-up after planned or forced outage (but not for construction);

i. Brick Kiln (Bhatti);

j. Biotechnology Industries covered under the Biotechnology Policy of Government of Maharashtra;

k. Cold Storages not covered under LT IV (C) – Agriculture (Others);

l. Food (including seafood and meat) Processing units;

m. Stand-alone Research and Development units;

n. Telecommunications Towers

o. Powerlooms including other allied activities like, Warping, Doubling, Twisting, etc., connected at Low/Medium Tension only.

Provided that for Powerlooms, 3% discount on Energy Charge (including FAC) shall be applicable.

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| **LT-V: LT – Industry*** | | | |
| (i) 0-20 kW | Rs. 454.00/month | 1.45 | 5.21 |
| (ii) Above 20 kW | Rs.303.00/kW/month | 1.45 | 6.11 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs. | | | -1.50 |
| 0600 Hrs-0900 Hrs. & 1200 Hrs-1800 Hrs. | | | 0.00 |
| 0900 Hrs-1200 Hrs. | | | 0.80 |
| 1800 Hrs-2200 Hrs. | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| **LT-V: LT – Industry*** | | | |
| (i) 0-20 kW | Rs .468.00/month | 1.38 | 5.01 |
| (ii) Above 20 kW | Rs. 312.00/kW/month | 1.38 | 5.93 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs. | | | -1.50 |
| 0600 Hrs-0900 Hrs. & 1200 Hrs-1800 Hrs. | | | 0.00 |
| 0900 Hrs-1200 Hrs. | | | 0.80 |
| 1800 Hrs-2200 Hrs. | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| **LT-V: LT – Industry*** | | | |
| (i) 0-20 kW | Rs .482.00/month | 1.35 | 5.11 |
| (ii) Above 20 kW | Rs 321.00/kW/month | 1.35 | 6.05 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs. | | | -1.50 |
| 0600 Hrs-0900 Hrs. & 1200 Hrs-1800 Hrs. | | | 0.00 |
| 0900 Hrs-1200 Hrs. | | | 0.80 |
| 1800 Hrs-2200 Hrs. | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| **LT-V: LT – Industry*** | | | |
| (i) 0-20 kW | Rs. 492.00/month | 1.30 | 5.21 |
| (ii) Above 20 kW | Rs. 327.00/kW/month | 1.30 | 6.17 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs. | | | -1.50 |
| 0600 Hrs-0900 Hrs. & 1200 Hrs-1800 Hrs. | | | 0.00 |
| 0900 Hrs-1200 Hrs. | | | 0.80 |

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| 1800 Hrs-2200 Hrs. | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumer Category | Fixed/Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| **LT-V: LT – Industry*** | | | |
| (i) 0-20 kW | Rs. 502.00/ month | 1.26 | 5.21 |
| (ii) Above 20 kW | Rs 334.00/kW/month | 1.26 | 6.17 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs. | | | -1.50 |
| 0600 Hrs-0900 Hrs. & 1200 Hrs-1800 Hrs. | | | 0.00 |
| 0900 Hrs-1200 Hrs. | | | 0.80 |
| 1800 Hrs-2200 Hrs. | | | 1.10 |

***Note:*** *The ToD Tariff is compulsorily applicable for LT V (ii) (i.e., above 20 kW), and optionally available to LT- V (i) (i.e., up to 20 kW) having ToD meter installed.*

**Lower tariff (discount/rebate) of (2.5%) shall be available in Energy Charge Component (including FAC, if applicable)of Tariff for both slabs (<20 kW and > 20 kW) for LT – Industry (Powerloom) as against approved Energy Charge Component of Tariff applicable for respective slabs under LT-Industry.*

## LT VI: LT – Street Light

Applicability:

This tariff category is applicable for the electricity used for lighting of public streets/ thoroughfares which are open for use by the general public, at Low / Medium Voltage, and at High Voltage.

Street-lights in residential complexes, commercial complexes, industrial premises, etc. will be billed at the tariff of the respective applicable categories.

This category is also applicable for use of electricity / power supply at Low / Medium Voltage or at High Voltage for (but not limited to) the following purposes, irrespective of who owns, operates or maintains these facilities:

a. Lighting in Public Gardens (i.e. which are open to the general public free of charge);

b. Traffic Signals and Traffic Islands;

c. Public Water Fountains; and

d. Such other public places open to the general public free of charge.

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumer Category | Fixed/Demand Charge (Rs/kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VI: LT – Street Light** | | | |
| (A) Gram Panchayat, A, B & C Class Municipal Councils | 111.00 | 1.45 | 4.90 |
| (B) Municipal Corporation Areas | 111.00 | 1.45 | 5.97 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumer Category | Fixed/Demand Charge (Rs/kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VI: LT – Street Light** | | | |
| (A) Gram Panchayat, A, B & C Class Municipal Councils | 114.00 | 1.38 | 5.00 |
| (B) Municipal Corporation Areas | 114.00 | 1.38 | 6.09 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumer Category | Fixed/Demand Charge (Rs/kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VI: LT – Street Light** | | | |
| (A) Gram Panchayat, A, B & C Class Municipal Councils | 117.00 | 1.35 | 5.10 |
| (B) Municipal Corporation Areas | 117.00 | 1.35 | 6.21 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumer Category | Fixed/Demand Charge (Rs/kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VI: LT – Street Light** | | | |
| (A) Gram Panchayat, A, B & C Class Municipal Councils | 119.00 | 1.30 | 5.20 |
| (B) Municipal Corporation Areas | 119.00 | 1.30 | 6.33 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumer Category | Fixed/Demand Charge (Rs/kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VI: LT – Street Light** | | | |
| (A) Gram Panchayat, A, B & C Class Municipal Councils | 121.00 | 1.26 | 5.20 |
| (B) Municipal Corporation Areas | 121.00 | 1.26 | 6.33 |

***Note:***

*The above street and other lighting facilities having 'Automatic Timers' for switching On/Off would be levied Demand Charges on the lower of the following–*

*i) 50 percent of 'Contract Demand' or*

*ii) Actual 'Recorded Demand'.*

**LT VII: LT - Public Services**

**LT VII (A): LT - Government Educational Institutions and Hospitals**

Applicability:

This tariff category is applicable for electricity supply at Low/Medium Voltage for Educational Institutions, such as Schools and Colleges; Health Care facilities, such as Hospitals, Dispensaries, Clinics, Primary Health Care Centres, Diagnostic Centres, Blood Bank and Pathology Laboratories; Libraries and public reading rooms - of the State or Central Government or Local Self-Government bodies such as Municipalities, Zilla Parishads, Panchayat Samitis, Gram Panchayats, etc;

It shall also be applicable for electricity used for Hostels/ Sports Clubs and facilities / Health Clubs and facilities / Gymnasium / Swimming Pools attached to such Educational Institutions / Hospitals, provided that they are situated in the same premises and are meant primarily for their students / faculty/ employees/ patients.

This Tariff is also applicable for electricity supply at Public Sanitary Conveniences;

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (A): LT - Public Services –Government Educational Institutions and Hospitals** | | | |
| (i) < 20 kW | Rs. 333.00/Month | 1.45 | 3.31 |

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| (ii) >20 - ≤ 50 kW | Rs.333.00/kW/Month | 1.45 | 4.89 |
| (iii) > 50 kW | Rs.333.00/kW/Month | 1.45 | 6.01 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (A): LT - Public Services –Government Educational Institutions and Hospitals** | | | |
| (i) < 20 kW | Rs. 343.00/Month | 1.38 | 3.12 |
| (ii) >20 - ≤ 50 kW | Rs. 343.00/kW/Month | 1.38 | 4.48 |
| (iii) > 50 kW | Rs. 343.00/kW/Month | 1.38 | 5.62 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (A): LT - Public Services –Government Educational Institutions and Hospitals** | | | |
| (i) < 20 kW | Rs.353.00 /Month | 1.35 | 3.18 |
| (ii) >20 - ≤ 50 kW | Rs.353.00/kW/Month | 1.35 | 4.57 |
| (iii) > 50 kW | Rs.353.00/kW/Month | 1.35 | 5.73 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (A): LT - Public Services –Government Educational Institutions and Hospitals** | | | |
| (i) < 20 kW | Rs 360.00/Month | 1.30 | 3.24 |
| (ii) >20 - ≤ 50 kW | Rs. 360.00/kW/Month | 1.30 | 4.66 |
| (iii) > 50 kW | Rs. 360.00/kW/Month | 1.30 | 5.84 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (A): LT - Public Services –Government Educational Institutions and Hospitals** | | | |
| (i) < 20 kW | Rs. 367.00/Month | 1.26 | 3.24 |
| (ii) >20 - ≤ 50 kW | Rs. 367.00/kW/Month | 1.26 | 4.66 |
| (iii) > 50 kW | Rs.367.00/kW/Month | 1.26 | 5.84 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

***Note:*** *The ToD Tariff is applicable for LT-VII (A) (ii) and LT-VII (A) (iii) (i.e., above 20 kW) and optionally available to LT- VII (A) (i) (i.e., up to 20 kW) having ToD meter installed.*

**LT VII (B): LT - Public Services - Others**

Applicability:

This tariff category is applicable for electricity supply at Low/Medium Voltage for:

a. Educational Institutions, such as Schools and Colleges; Health Care facilities, such as Hospitals, Dispensaries, Clinics, Primary Health Care Centres, Diagnostic Centres, Blood Banks, Laboratories; Libraries and public reading rooms - other than those of the State or Central Government or Local Self-Government bodies such as Municipalities, Zilla Parishads, Panchayat Samitis, Gram Panchayats, etc.

b. Sports Clubs and facilities / Health Clubs and facilities / Gymnasium / Swimming Pools attached to such Educational Institutions /Health Care facilities, provided that they are situated in the same premises and are meant primarily for their students / faculty/ employees/ patients;

c. all offices of Government and Municipal/ Local Authorities/ Local Self-Government bodies, such as Municipalities, Zilla Parishads, Panchayat Samitis, Gram Panchayats; Police Stations and Police Chowkies; Post Offices; Armed Forces/Defence and Para-Military establishments;

d. Service-oriented Spiritual Organisations;

e. State or Municipal/Local Authority Transport establishments, including their Workshops

f. Fire Service Stations; Jails, Prisons; Courts;

g. Airports;

h. Ports and Jetties;

i. Railway/Metro/Monorail Stations, including Shops, Workshops, Yards, etc, if the supply is at Low/ Medium Voltage.

j. Waste processing units not covered under LT PWW category

k. All Students Hostels affiliated to Educational Institutions not covered under LT Public Service - Government;

l. All other Students' or Working Men/Women's Hostels;

m. Other types of Homes/Hostels, such as (i) Homes/Hostels for Destitutes, Disabled Persons (physically or mentally handicapped persons, etc.) and mentally ill persons (ii) Remand Homes (iii) Dharamshalas, (iv) Rescue Homes, (v) Orphanages - subject to verification and confirmation by the Distribution Licensee's concerned Zonal Chief Engineer or equivalent;

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (B): LT - Public Services – Others** | | | |
| (i) < 20 kW | Rs. 362.00/Month | 1.45 | 4.86 |
| (ii) >20 - ≤ 50 kW | Rs.362.00/kW/Month | 1.45 | 7.44 |
| (iii) > 50 kW | Rs.362.00/kW/Month | 1.45 | 7.84 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (B): LT - Public Services – Others** | | | |
| (i) < 20 kW | Rs. 373.00/Month | 1.38 | 4.68 |
| (ii) >20 - ≤ 50 kW | Rs. 373.00/kW/Month | 1.38 | 7.28 |
| (iii) > 50 kW | Rs. 373.00/kW/Month | 1.38 | 7.49 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (B): LT - Public Services – Others** | | | |
| (i) < 20 kW | Rs 384.00Month | 1.35 | 4.57 |
| (ii) >20 - ≤ 50 kW | Rs.384.00/kW/Month | 1.35 | 7.23 |

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| (iii) > 50 kW | Rs. 384.00/kW/Month | 1.35 | 7.49 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (B): LT - Public Services – Others** | | | |
| (i) < 20 kW | Rs 392.00/Month | 1.30 | 4.56 |
| (ii) >20 - ≤ 50 kW | Rs. 392.00/kW/Month | 1.30 | 7.27 |
| (iii) > 50 kW | Rs. 392.00/kW/Month | 1.30 | 7.54 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| **LT VII (B): LT - Public Services – Others** | | | |
| (i) < 20 kW | Rs. 400.00/Month | 1.26 | 4.56 |
| (ii) >20 - ≤ 50 kW | Rs. 400.00/kW/Month | 1.26 | 7.27 |
| (iii) > 50 kW | Rs. 400.00/kW/Month | 1.26 | 7.54 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |

| Consumption Slab (kWh) | Fixed/ Demand Charge | Wheeling Charge (Rs/kWh) | Energy Charge (Rs/kWh) |
|---|---|---|---|
| 1800 Hrs-2200 Hrs | | | 1.10 |

***Note:*** *The ToD Tariff is applicable for LT-VII (B) (ii) and LT-VII (B) (iii) (i.e., above 20 kW) and optionally available to LT- VII (B) (i) (i.e., up to 20 kW) having ToD meter installed.*

**LT VIII: LT – Electric Vehicle (EV) Charging Stations**

Applicability:

This Tariff category is applicable for Electric Vehicle Charging Station including battery swapping station for electric vehicle.

In case the consumer uses the electricity supply for charging his own electric vehicle at his premises, the tariff applicable shall be as per the category of such premises.

Electricity consumption for other facilities at Charging Station such as restaurant, rest rooms, convenience stores, etc., shall be charged at tariff applicable to Commercial Category.

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs./kVA/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| All Units | 70.00 | 1.45 | 4.05 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs./kVA/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| All Units | 70.00 | 1.38 | 4.12 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs./kVA/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| All Units | 70.00 | 1.35 | 4.15 |
| **ToD Tariffs (in addition to above base Tariffs) (Rs/kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs./kVA/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| All Units | 70.00 | 1.30 | 4.20 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab (kWh) | Fixed/ Demand Charge (Rs./kW/Month) | Wheeling Charge (Rs/kWh) | Energy Charge (Rs./kWh) |
|---|---|---|---|
| All Units | 70.00 | 1.26 | 4.24 |
| **ToD Tariffs (in addition to above base Tariffs) (kWh)** | | | |
| 2200 Hrs-0600 Hrs | | | -1.50 |
| 0600 Hrs-0900 Hrs & 1200 Hrs-1800 Hrs | | | 0.00 |
| 0900 Hrs-1200 Hrs | | | 0.80 |
| 1800 Hrs-2200 Hrs | | | 1.10 |

# HIGH TENSION (HT) TARIFF

## HT I: HT – Industry

### HT I (A): Industry – General

Applicability:

This tariff category is applicable for electricity for Industrial use at High Voltage for purposes of manufacturing and processing, including electricity used within such premises for general lighting, heating/cooling, etc.

It is also applicable for use of electricity / power supply for Administrative Offices / Canteen, Recreation Hall / Sports Club or facilities / Health Club or facilities/ Gymnasium / Swimming Pool exclusively meant for employees of the industry; lifts, water pumps, fire-fighting pumps and equipment, street and common area lighting; Research and Development units, etc. -

Provided that all such facilities are situated within the same industrial premises and supplied power from the same point of supply.

This tariff category shall be applicable for use of electricity / power supply by an Information Technology (IT) or IT-enabled Services (ITeS) Unit as defined in the applicable IT/ITeS Policy of Government of Maharashtra.

It shall also be applicable for use of electricity / power supply for (but not limited to) the following purposes:

a. Flour Mills, Dal Mills, Rice Mills, Poha Mills, Masala Mills, Saw Mills;

b. Ice Factories, Ice-cream manufacturing units, Milk Processing / Chilling Plants (Dairy);

c. Engineering Workshops, Engineering Goods manufacturing units; Printing Presses; Transformer Repair Workshops; Tyre Remoulding/Rethreading units, and Vulcanizing units;

d. Mining, Quarrying and Stone Crushing units;

e. Garment Manufacturing units

f. LPG/CNG bottling plants, etc.;

g. Sewage Treatment Plant/ Common Effluent Treatment Plant for industries, and not covered under the HT – PWW category

h. Start-up power for Generating Plants, i.e., the power required for trial run of a Power Plant during commissioning of the Unit and its Auxiliaries, and for its start-up after planned or forced outage (but not for construction);

i. Brick Kiln (Bhatti);

j. Biotechnology Industries covered under the Biotechnology Policy of Government of Maharashtra;

k. Cold Storages not covered under HT – Agriculture (Others);

l. Food (including Seafood and meat) Processing units.

m. Stand-alone Research and Development units.

n. Seed manufacturing.

o. Dedicated Water Supply Schemes to Power Plants

p. Auxiliary Power Supply to EHV/Distribution Substations (but not for construction)

q. Telecommunications Towers

**HT I (B): Industry - Seasonal**

**Applicability:**

Applicable to Seasonal consumers, who are defined as those who normally work during a part of the year up to a maximum of 9 months, such as Cotton Ginning Factories, Cotton Seed Oil Mills, Cotton Pressing Factories, Salt Manufacturers, Khandsari/Jaggery Manufacturing Units, excluding Sugar Factories or such other consumers who opt for a seasonal pattern of consumption, such that the electricity requirement is seasonal in nature.

Provided that the period of operation of in a financial year should be limited upto 9 months, and the category should be opted for by the consumer within first quarter of the financial year.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT I: HT - Industry** | | |
| HT I(A): HT - Industry - General | 411.00 | 7.02 |
| HT I(B): HT - Industry - Seasonal | 411.00 | 7.28 |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT I: HT - Industry** | | |
| HT I(A): HT - Industry - General | 432.00 | 6.96 |
| HT I(B): HT - Industry - Seasonal | 432.00 | 7.22 |
| **ToD tariff (in addition to above base tariffs)(Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT I: HT – Industry** | | |
| HT I(A): HT - Industry - General | 454.00 | 6.89 |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| HT I(B): HT - Industry - Seasonal | 454.00 | 7.15 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT I: HT - Industry** | | |
| HT I(A): HT - Industry - General | 463.00 | 6.85 |
| HT I(B): HT - Industry - Seasonal | 463.00 | 7.11 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT I: HT – Industry** | | |
| HT I(A): HT - Industry - General | 472.00 | 6.73 |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| HT I(B): HT - Industry - Seasonal | 472.00 | 6.99 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Note:**

i. High Tension Industrial consumers having captive generation facility synchronised with the grid may opt for Standby Capacity at rate of 25% of applicable Demand Charges.

ii. Demand Charge shall be applicable at 25% of the above rates on the start-up demand contracted by the Power Plant (as referred to at (h) above) with the Distribution Licensee.

iii. Demand Charge shall be applicable at 75% of the above rates for Steel Plant operating with electric arc furnaces.

**HT II: HT- Commercial**

**Applicability:**

This tariff category is applicable for electricity used at High Voltage in non-residential, non-industrial and/or commercial premises for commercial consumption meant for operating various appliances used for purposes such as lighting, heating, cooling, cooking, washing/cleaning, entertainment/ leisure and water pumping in, but not limited to, the following premises:

Non-Residential, Commercial and Business premises, including Shopping Malls and Showrooms;

a. Combined lighting and power services for facilities relating to Entertainment, including film studios, cinemas and theatres (including multiplexes), Hospitality, Leisure, Meeting/Town Halls, and places of Recreation and Public Entertainment;

b. Offices, including Commercial Establishments;

c. Marriage Halls, Hotels / Restaurants, Ice-cream parlours, Coffee Shops, Guest Houses, Internet / Cyber Cafes, Telephone Booths and Fax / Photocopy shops;

d. Automobile and all other types of repairs, servicing and maintenance centres (unless specifically covered under another tariff category); Retail Gas Filling Stations, Petrol Pumps & Service Stations, including Garages; -

e. Tailoring Shops, Computer Training Institutes, Typing Institutes, Photo Laboratories, Laundries, Beauty Parlours and Saloons;

f. Banks and ATM centres, Telephone Exchanges, TV Stations, Micro Wave Stations, Radio Stations;

g. Common facilities, like Water Pumping / Lifts / Fire-Fighting Pumps and other equipment / Street and other common area Lighting, etc., in Commercial Complexes;

h. Sports Clubs/facilities, Health Clubs/facilities, Gymnasiums, Swimming Pools not covered under any other category;

i. External illumination of monuments/ historical/heritage buildings approved by Maharashtra Tourism Development Corporation (MTDC) or the concerned Local Authority;

j. Construction of all types of structures/ infrastructures such as buildings, bridges, flyovers, dams, Power Stations, roads, Aerodromes, tunnels for laying of pipelines for all purposes;

k. Milk Collection Centres;

l. Sewage Treatment Plant/ Common Effluent Treatment Plant for Commercial Complexes, not covered under the HT- PWW category or HT I –– Industry

m. Advertisements, hoardings (including hoardings fixed on lamp posts/installed along roadsides), and other commercial illumination such as external flood-lights, displays, neon signs at departmental stores, malls, multiplexes, theatres, clubs, hotels and other such establishments

n. Temporary supply for any of the activity not covered under any other HT category

Provided that Temporary supply consumer shall pay 1.5 time applicable fixed/demand charges and 1.25 time applicable energy charge.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 411.00 | 11.47 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 432.00 | 11.20 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 454.00 | 10.95 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 463.00 | 9.75 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 472.00 | 9.30 |
| **ToD tariff (in addition to above base tariffs) (Rs/kVAh)** | | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| 1800 Hrs - 2200 Hrs | | 1.10 |

***Note:*** *A consumer in the HT II category requiring single-point supply for the purpose of downstream consumption by separately identifiable entities shall have to operate as a Franchisee authorised as such by the Distribution Licensee; or such downstream entities shall be required to take separate individual connections and be charged under the tariff category applicable to them.*

**HT III - Railways/Metro/Monorail**

**Applicability:**

This tariff category is applicable to power supply at High Voltage for Railways, Metro and Monorail, including Stations and Shops, Workshops, Yards, etc.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) | Wheeling Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 411.00 | 6.76 | - |
| HT | 411.00 | 6.76 | 0.57 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) | Wheeling Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 432.00 | 6.86 | - |
| HT | 432.00 | 6.86 | 0.56 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) | Wheeling Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 454.00 | 6.86 | - |
| HT | 454.00 | 6.86 | 0.55 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) | Wheeling Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 463.00 | 5.56 | - |
| HT | 463.00 | 5.56 | 0.54 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) | Wheeling Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 472.00 | 5.31 | - |
| HT | 472.00 | 5.31 | 0.53 |

## HT IV: HT - Public Water Works (PWW) and Sewage Treatment Plants

### Applicability:

This tariff category is applicable for electricity / power supply at High Voltage for pumping of water, purification of water and allied activities relating to Public Water Supply Schemes, Sewage Treatment Plants and waste processing units, provided they are owned or operated or managed by Local Self-Government Bodies (Gram Panchayats, Panchayat Samitis, Zilla Parishads, Municipal Councils and Corporations, etc.), or by Maharashtra Jeevan Pradhikaran (MJP), Maharashtra Industries Development Corporation (MIDC), Cantonment Boards and Housing Societies/complexes.

All other Public Water Supply Schemes and Sewage Treatment Plants (including allied activities) shall not be eligible under this tariff category but be billed at the tariff applicable to the HT I or HT II categories, as the case may be.

### Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 411.00 | 6.07 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 432.00 | 6.17 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 454.00 | 6.17 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 463.00 | 6.17 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 472.00 | 6.17 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**HT V: HT – Agriculture**

**HT V(A) : HT – Agriculture Pumpsets**

Applicability:

This category shall be applicable for Electricity / Power Supply at High Tension for pumping of water exclusively for the purpose of Agriculture / cultivation of crops including HT Lift Irrigation Schemes (LIS) irrespective of ownership.

It is also applicable for power supply for cane crushers and/or fodder cutters for self-use for agricultural processing operations, but not for operating a flour mill, oil mill or expeller in the same premises, either operated by a separate motor or a change of belt drive

## HT V(B) : HT – Agriculture Others

Applicability:

a. This tariff category is applicable for use of electricity / power supply at High Voltage for:

b. Pre-cooling plants and cold storage units for Agriculture Products as defined under APMC Act 1963 – processed or otherwise;

c. Poultries exclusively undertaking layer and broiler activities, including Hatcheries;

d. High-Technology Agriculture (i.e. Tissue Culture, Green House, Mushroom cultivation activities), provided the power supply is exclusively utilized for purposes directly concerned with the crop cultivation process, and not for any engineering or industrial process;

e. Floriculture, Horticulture, Nurseries, Plantations, Aquaculture, Sericulture, Cattle Breeding Farms, etc;

### Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT V: HT Agriculture** | | |
| HT V (A): HT Agriculture Pumpsets | 72.00 | 3.79 |
| HT V (B): HT Agriculture Others | 72.00 | 5.20 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT V: HT Agriculture** | | |
| HT V (A): HT Agriculture Pumpsets | 76.00 | 3.69 |
| HT V (B): HT Agriculture Others | 76.00 | 5.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT V: HT Agriculture** | | |
| HT V (A): HT Agriculture Pumpsets | 80.00 | 3.69 |
| HT V (B): HT Agriculture Others | 80.00 | 5.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT V: HT Agriculture** | | |
| HT V (A): HT Agriculture Pumpsets | 82.00 | 3.69 |
| HT V (B): HT Agriculture Others | 82.00 | 5.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| **HT V: HT Agriculture** | | |
| HT V (A): HT Agriculture Pumpsets | 84.00 | 3.69 |
| HT V (B): HT Agriculture Others | 84.00 | 5.10 |

## HT VI: HT - Group Housing Society (Residential)

Applicability:

Entities supplied electricity at a single point at High Voltage for residential purposes in accordance with the Electricity (Removal of Difficulties) Eighth Order, 2005, in the following cases:

a. Co-operative Group Housing Society which owns the premises, for making electricity available to the members of such Society residing in the same premises for residential purposes; and

b. a person, for making electricity available to its employees residing in the same premises for residential purposes.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Wheeling Charges (Rs. /kVAh) | Energy Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 329.00 | - | 5.70 |
| HT | 329.00 | 0.57 | 5.70 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Wheeling Charges (Rs. /kVAh) | Energy Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 345.00 | - | 5.70 |
| HT | 345.00 | 0.56 | 5.70 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Wheeling Charges (Rs. /kVAh) | Energy Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 362.00 | - | 5.70 |
| HT | 362.00 | 0.55 | 5.70 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Wheeling Charges (Rs. /kVAh) | Energy Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 369.00 | - | 5.20 |
| HT | 369.00 | 0.54 | 5.20 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Consumption Slab | Demand Charges (Rs. /kVA/month) | Wheeling Charges (Rs. /kVAh) | Energy Charges (Rs. /kVAh) |
|---|---|---|---|
| EHV | 376.00 | - | 5.20 |
| HT | 376.00 | 0.53 | 5.20 |

**HT VIII: HT Public Services**

**HT VIII – (A): HT - Government Educational Institutions and Hospitals**

Applicability:

This tariff category is applicable for electricity supply at High Voltage for Educational Institutions, such as Schools and Colleges; Health Care facilities, such as Hospitals, Dispensaries, Clinics, Primary Health Care Centres, Diagnostic Centres, Blood Banks and Pathology Laboratories; Libraries and public reading rooms - of the State or Central Government, Local Self-Government bodies such as Municipalities, Zilla Parishads, Panchayat Samitis, Gram Panchayats, etc;

It shall also be applicable for electricity used for Hostels/Sports Clubs and facilities / Health Clubs and facilities / Gymnasium / Swimming Pools attached to such Educational Institutions / Health Care facilities, provided that they are situated in the same premises and are meant

primarily for the students / faculty/ employees/ patients of such Educational Institutions and Hospitals.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 411.00 | 7.74 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 432.00 | 7.74 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 454.00 | 7.74 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 463.00 | 7.24 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 472.00 | 7.24 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**HT VIII - (B): Public Service - Others**

Applicability:

This tariff category is applicable for electricity supply at High Voltage for:

a. Educational Institutions, such as Schools and Colleges; Health Care facilities, such as Hospitals, Dispensaries, Clinics, Primary Health Care Centres, Diagnostic Centres, **Blood Banks** and Pathology Laboratories; Libraries and public reading rooms - other than those of the State or Central Government, Local Self-Government bodies such as Municipalities, Zilla Parishads, Panchayat Samities, Gram Panchayats, etc.

b. Sports Clubs and facilities / Health Clubs and facilities / Gymnasium / Swimming Pools attached to such Educational Institutions / Health Care facilities, provided that they are situated in the same premises and are meant primarily for their students / faculty/ employees/ patients;

c. all offices of Government and Municipal/ Local Authorities/ Local Self-Government bodies, such as Municipalities, Zilla Parishads, Panchayat Samitis, Gram Panchayats; Police Stations and Police Chowkies; Post Offices; Armed Forces/Defence and Para-Military establishments;

d. Service-oriented Spiritual Organisations;

e. State or Municipal/Local Authority Transport establishments, including their Workshops;

f. Fire Service Stations; Jails, Prisons; Courts.

g. Airports

h. Ports and Jetties

i. Waste processing units not covered under HT IV category

## Rate Schedule

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 411.00 | 9.48 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 432.00 | 9.21 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 454.00 | 8.96 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 463.00 | 7.76 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 472.00 | 7.31 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**HT IX: HT – Electric Vehicle (EV) Charging Stations**

Applicability:

This Tariff category is applicable for Electric Vehicle Charging Station including battery swapping station for Electric Vehicle

In case the consumer uses the electricity supply for charging his own electric vehicle at his premises, the tariff applicable shall be as per the category of such premises.

Electricity consumption for other facilities at Charging Station such as restaurant, rest rooms, convenience stores, etc., shall be charged at tariff applicable to Commercial Category.

**Rate Schedule**

**Tariff w.e.f. 1 April, 2020 to 31 March, 2021**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.57 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 70.00 | 4.93 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2021 to 31 March, 2022**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.56 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 70.00 | 4.94 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2022 to 31 March, 2023**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.55 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 70.00 | 4.95 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs & 1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2023 to 31 March, 2024**

| Supply Voltage Level | Wheeling Charges (Rs. /kVAh) |
|---|---|
| EHV | - |
| HT | 0.54 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 70.00 | 4.96 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

**Tariff w.e.f. 1 April, 2024 to 31 March, 2025**

| Supply Voltage Level | Wheeling Charges (Rs. /kWh) |
|---|---|
| EHV | - |
| HT | 0.53 |

**PLUS**

**Demand/Fixed Charge and Energy Charge (for all Supply Voltage Levels)**

| Consumer Category | Demand Charges (Rs. /kVA/month) | Energy Charges (Rs. /kVAh) |
|---|---|---|
| All Units | 70.00 | 4.97 |
| **ToD tariff (in addition to above base tariffs)** | **(Rs/kVAh)** | |
| 2200 Hrs - 0600 Hrs | | -1.50 |
| 0600 Hrs - 0900 Hrs &<br>1200 Hrs - 1800 Hrs | | 0.00 |
| 0900 Hrs - 1200 Hrs | | 0.80 |
| 1800 Hrs - 2200 Hrs | | 1.10 |

## MISCELLANEOUS AND GENERAL CHARGES

### Fuel Adjustment Charge (FAC) Component of Z-factor Charge

The Fuel Adjustment Charge (FAC) component of the Z-factor Charge will be determined in accordance with the formula specified in the relevant Multi Year Tariff Regulations and any directions that may be given by the Commission from time to time, and will be applicable to all consumer categories for their entire consumption.

In case of any variation in the fuel prices and power purchase prices, the Distribution Licensee shall pass on the adjustments through the FAC component of the Z-factor Charge accordingly.

The details of the applicable $Z_{FAC}$ for each month shall be available on the Distribution Licensee's website www.mahadiscom.in.

### Electricity Duty and Tax on Sale of Electricity

Electricity Duty and Tax on Sale of Electricity shall be levied in addition to the tariffs approved by the Commission, and in accordance with the Government of Maharashtra stipulations from time to time. The rate and the reference number of the Government Resolution/ Order under which the Electricity Duty and Tax on Sale of Electricity are applied shall be stated in the consumers' energy bills. A copy of such Resolution / Order shall be provided on the Distribution Licensee's website www.mahadiscom.in

### Power Factor Computation

Where the average Power Factor measurement is not possible through the installed meter, the following formula for calculating the average Power Factor during the billing period shall be applied:

$$\textit{Average Power Factor} = \frac{\textit{Total (kWh)}}{\textit{Total (kVAh)}}$$

$$\textit{Wherein the kVAh is} = \sqrt{\sum(\text{KWh})^2 + \sum(\text{RkVAh Lag} + \text{RkVAh Lead})^2}$$

Further, average PF so computed can be considered as leading or lagging based on the following test:

If "RkVAh lead" > "RkVAh lag" then "Average P.F." is to be treated as "Lead P.F."

If "RkVAh lead" = < "RkVAh lag" then "Average P.F." is to be treated as "Lag P.F."

### Power Factor Incentive

1. Applicable for LT Non-Residential / Commercial [LT: II (B) , LT II (C)] , LT III: Public Water Works [LT: III (B) , LT III (C)], LT V (A) (ii): Industry - Power Looms (above 20 kW) , LT V (B) (ii): Industry - General (above 20 kW), LT VII (A) Public Services - Government Owned Educational Institutes and Hospitals [LT VII (A) (ii) and LT VII (A) (iii)] , LT VII (B) Public Services - Others [LT VII (B) (ii) and LT VII (B) (iii)] and LT VIII – Electric Vehicle Charging Station having Contract Demand/Sanctioned Load above 20 kW.

2. Whenever the average Power Factor is more than 0.95 (lag or lead) and upto 1, an incentive shall be given at the rate of the following percentages of the amount of the monthly electricity bill, excluding Taxes and Duties:

| Sr. No. | Range of Power Factor | Power Factor Level | Incentive |
|---|---|---|---|
| 1 | 0.951 to 0.954 | 0.95 | 0% |
| 2 | 0.955 to 0.964 | 0.96 | 0.5% |
| 3 | 0.965 to 0.974 | 0.97 | 1.0% |
| 4 | 0.975 to 0.984 | 0.98 | 1.5% |
| 5 | 0.985 to 0.994 | 0.99 | 2.5% |
| 6 | 0.995 to 1.000 | 1.00 | 3.5% |

***Note:*** *Power Factor shall be measured/computed upto 3 decimals, after universal rounding off.*

**Power Factor Penalty**

3. Applicable for LT Non-Residential / Commercial [LT: II (B) , LT II (C)] , LT III: Public Water Works [LT: III (B) , LT III (C)], LT V (A) (ii): Industry - Power Looms (above 20 kW) , LT V (B) (ii): Industry - General (above 20 kW), LT VII (A) Public Services - Government Owned Educational Institutes and Hospitals [LT VII (A) (ii) and LT VII (A) (iii)] , LT VII (B) Public Services - Others [LT VII (B) (ii) and LT VII (B) (iii)] and LT VIII – Electric Vehicle Charging Station having Contract Demand/Sanctioned Load above 20 kW.

2. Whenever the average PF is less than 0.9 (lag or lead), penal charges shall be levied at the rate of the following percentages of the amount of the monthly electricity bill, excluding Taxes and Duties:

| SSlr. No.. | Range of Power Factor | Power Factor Level | Penalty |
|---|---|---|---|
| 1 | 0.895 to 0.900 | 0.90 | 0% |
| 2 | 0.885 to 0.894 | 0.89 | 1.0% |
| 3 | 0.875 to 0.884 | 0.88 | 1.5% |
| 4 | 0.865 to 0.874 | 0.87 | 2.0% |
| 5 | 0.855 to 0.864 | 0.86 | 2.5% |
| 6 | 0.845 to 0.854 | 0.85 | 3.0% |
| 7 | 0.835 to 0.844 | 0.84 | 3.5% |
| 8 | 0.825 to 0.834 | 0.83 | 4.0% |
| 9 | 0.815 to 0.824 | 0.82 | 4.5% |

| SSlr. No.. | Range of Power Factor | Power Factor Level | Penalty |
|---|---|---|---|
| 10 | 0.805 to 0.814 | 0.81 | 5.0% |
| ... | ... | ... | ... |

***Note**: Power Factor shall be measured/computed upto 3 decimals, after universal rounding off.*

**Prompt Payment Discount**

A prompt payment discount of one percent of the monthly bill (excluding Taxes and Duties) shall be provided to consumers for payment of electricity bills within 7 days from the date of their issue.

**Delayed Payment Charges**

In case the electricity bill is not paid within the due date mentioned on the bill, delayed payment charges on the billed amount, including the taxes, cess, duties, etc., shall be levied on simple interest basis at the rate of 1.25% on the billed amount for the first month of delay.

**Discount for digital payment**

A discount of 0.25% of the monthly bill (excluding taxes and duties), subject to a cap of Rs. 500/-, shall be provided to LT category consumers for payment of electricity bills through various modes of digital payment such as credit cards, debit cards, UPI, BHIM, internet banking, mobile banking, mobile wallets etc.

**Rate of Interest on Arrears**

The rate of interest chargeable on the arrears of payment of billed dues shall be as given below:

| Sr. No. | Delay in Payment (months) | Interest Rate per annum (%) |
|---|---|---|
| 1 | Payment made after 60 days and before 90 days from the date of billing | 12% |
| 2 | Payment made after 90 days | 15% |

**Rebate for On-time regular payment for LT-AG, LT-PWW and LT**-Streetlight

Rebate of 1% for On-time regular payment before due date shall be available for consumers under LT-AG, LT-PWW and LT-Streetlight categories and the same shall be governed as per following conditions:

a. Consumers under LT-AG, LT-PWW and LT-Streetlight shall be eligible for consistent payment rebate of 1% for consistently making payments within due date.

b. Such rebate would be monitored and offered on quarterly basis to only those consumers upon maintaining regular payment track record with the Utility.

c. For example, if consumer makes regular payment of its monthly within due date during previous quarter then, such consumer shall be entitled to a rebate of 1% in its next monthly bill amount (excluding taxes and duties) for the subsequent quarter.

d. In case of any default or non-adherence to bill payment within due date in previous quarter, such benefit of rebate shall be withdrawn for the full next billing quarter.

e. However, the consumer shall be entitled to rebate in subsequent quarters in case it maintains payment track record within due date in the previous quarter. In case of consumer having quarterly billing, such scheme shall be monitored on six monthly basis and rebate shall be given in next quarterly bill.

**Rebate for consumers with Prepaid connections**

Consumers with prepaid metered connections shall be entitled for rebate of 5% in the Energy Charge Rate (incl FAC) applicable for the consumer category.

**Rebate on Incremental Consumption**

Rebate for incremental consumption for applicable consumer categories and eligible consumers shall be governed as per following conditions:

a. The rebate for incremental consumption shall be allowed at the rate of Rs 0.75/KVAh for incremental consumption

b. The rebate for incremental consumption shall be applicable for HT industries, HT commercial, HT public services, HT-PWW, HT Railways/Metro/Mono and HT-Group Housing Society (Residential).

c. The rebate shall be given to eligible consumers including open access consumers falling under above consumer categories to the extent of procurement from MSEDCL.

d. The rebate shall be for a period of 3 years subject to reconsideration during the MTR.

e. The rebate shall be allowed to eligible consumers who consume power above threshold limit.

f. The 3-year average monthly consumption by consumer from FY 2017-18 to FY 2019-20 shall be considered as baseline consumption (or monthly threshold consumption) for determination of incremental consumption by such eligible consumers.

g. In case of a consumer registered into system for duration lower than 3 years, such consumer shall be eligible for availing incremental rebate from the next billing cycle upon completion of 3-year period and average monthly consumption for past three years shall

be considered as its baseline consumption (or monthly threshold consumption) in such cases for determination of their incremental consumption for the purpose of rebate.

h. For the purpose of determination of Incremental consumption post MTR period of 4th Control Period, (i.e. for FY 2023-24 and FY 2024-25), baseline consumption (or monthly threshold consumption) shall be reset based on 3-year average from FY 2020-21 to FY 2022-23.

i. The billing at the reduced rates after allowing the rebate shall be done on monthly basis subject to condition that net entitlement for the rebate under this head of incremental consumption shall be determined on annual basis (April to March) equal to energy units consumption in excess of baseline consumption (i.e. annual threshold consumption). The adjustment for shortfall/excess in case cumulative monthly consumption for the yearly consumption vis-à-vis its baseline consumption (i.e. annual threshold consumption) shall be effected in the last monthly (for March) billing period. No carry-forward of shortfall/excess shall be allowed from one year to next year.

j. For example, If a consumer's 3-year average annual consumption was 12,000 units, the consumer shall be entitled for the rebate of Rs.0.75/kVAh for consumption exceeding its monthly threshold consumption (not below the baseline consumption of 1,000 units per month) in FY 2020-21 onwards. However, in case its cumulative monthly consumption for the yearly period falls short of annual threshold consumption of 12,000 units then, consumer shall not be entitled for incremental consumption rebate for that financial year and adjustment for shortfall (or rebate already availed by consumer in earlier months, if any) shall be adjusted for recovery in monthly billing period for March.

k. The Commission has not considered isolated cases which may become Permanently Disconnected during the year in which a rebate has been availed for some months. The details of such cases, if any will be dealt based on the data as may be submitted by MSEDCL during MTR.

l. The rebate shall be over and above the existing rebates subject to the fact that the consumer's total variable charges should not be less than Rs.4/ kVAh after accounting all applicable rebates.

m. The rebates would also be applicable to Open Access consumers, subject to conditions outlined above.

**Rebate on Bulk Consumption**

Rebate for Bulk consumption for eligible consumers within HT-Industrial category shall be governed as per following conditions:

a. All HT-Industrial consumers with monthly consumption in excess of 1 lakh units per month (0.1 MU per month) shall be eligible to avail Rebate on Bulk Consumption with a reverse telescopic slab structure as outlined below: Thus, the Commission has decided

to introduce "Bulk Consumption" rebate in a reverse telescopic manner for HT-Industrial consumers in following manner:

I. For monthly consumption (> 1 Lakh units to 1 MU) per month: 2%

II. For monthly consumption (> 1 MU to 5 MU) per month: 1.5%

III. For monthly consumption (> 5 MU) per month: 1%

*(Note – Units referred are in kVAh such as Lakh kVAh or Million kVAh)*

b. Bulk Consumption Rebate shall be applicable on the Energy Charge component including FAC of the Bill excluding taxes and duty.

Illustration:

Say a consumer consumes 15 MU during month then, its consumption more than 1 Lakh units upto 1 MU units rebate will be 2%/unit, for next 4 MU (i.e. upto consumption of 5 MU) rebate will be 1.5%/unit and for consumption in excess of 5 MU upto 15 MU, rebate will be 1%/unit.

**Discount in Demand Charges for Single Shift operation of HT-Indusry**

In case of industrial consumer under HT-Industry with single shift operation, Demand Charges at the rate of 60% of Applicable Demand Charges as per Tariff Schedule shall be levied, subject to following conditions:

a. Single shift operation means running of operations at a stretch for maximum 10 Hrs. For illustration, a consumer running 4hrs.in one stretch and 6hrs.in another stretch cannot be considered as running in a single shift. However, a maximum of three instances of running beyond 10hrs up to 12hrs is permitted in a billing cycle.

b. Consumer must declare in advance about one shift operation. In absence of such declaration, it shall be billed as per the applicable demand charges.

c. Billing will be done based on MRI/AMR Data.

**Load Factor Incentive**

a. Consumers having Load Factor above 75% and upto 85% will be entitled to an incentive in the form of a rebate of 0.75% on the Energy Charges for every percentage point increase in Load Factor from 75% to 85%. Consumers having a Load Factor above 85 % will be entitled to a rebate of 1% on the Energy Charges for every percentage point increase in Load Factor from 85%. The total rebate will be subject to a ceiling of 15% of the Energy Charges applicable to the consumer.

b. This incentive is applicable only to consumers in the tariff categories HT I: Industry, HT II: Commercial and HT VIII: Public Services – HT VIII (A) and HT VIII (B) only.`

c. The Load Factor incentive will be available only if the consumer has no arrears with the Distribution Licensee, and payment is made within seven days from the date of the electricity bill. However, it will be available to consumers in whose case payment of arrears in instalments has been allowed by the Distribution Licensee, and such payment is being made as scheduled. The Distribution Licensee shall take a commercial decision on the schedule for such payments.

1. The Load Factor is to be computed as follows:

$$\text{Load Factor} = \frac{\text{Consumption during the month in MU}}{\text{Maximum Consumption Possible during the month in MU}}$$

**Maximum consumption possible** = Contract Demand (kVA) x Unity Power Factor

x (Total no. of hours during the month, less actual interruptions hours recorded on meter for billing period)

In case the consumer exceeds its Contract Demand (including during the non-peak hours, i.e., 22:00 hrs to 06:00 hrs.) in any particular month, the Load Factor Incentive will not be payable to the consumer in that month

**Penalty for exceeding Contract Demand**

In case a consumer (availing Demand-based Tariff) exceeds his Contract Demand, he will be billed at the applicable Demand Charge rate for the Demand actually recorded, and also be charged an additional amount at the rate of 150% of the applicable Demand Charge (only for the Demand in excess of the Contract Demand).

In case a LT consumer with a sanction demand/ contract demand less than 20 kW records actual contract demand above 20 kW, he will be billed at the tariff applicable for the respective load slab approved by the Commission, in which recorded demand falls for that billing cycle only and also be charged an additional amount at the rate of 150% of the applicable charge for the Demand in excess of the Contract Demand.

Further Distribution licensee can enhance the Contract Demand of the consumer when the consumers exceeds the Contract Demand on more than three occasions during a calendar year, irrespective whether the Consumer submits an application for the same or otherwise. However, before such revision of Contact Demand, Distribution Licensee must give 15 days' notice to

such consumer. Also, the Consumer is liable to pay necessary charges as may be stipulated in the approved Schedule of Charges for the revised Contract Demand.

Under these circumstances, the consumer shall not be liable for any other action under Section 126 of the EA, 2003, since the penal additional Demand Charge provides for the penalty that the consumer is liable to pay for exceeding his Contract Demand. In case a consumer exceeds his Contract Demand on more than three occasions in a calendar year, the action to be taken would be governed by the provisions of the Supply Code Regulations.

**Additional Demand Charges for Consumers having Captive Power Plant**

Consumers having a Captive Power Plant can opt for Standby Demand and Additional Demand Charges for such Standby Demand will be as follows:

a. 25% of the Applicable Demand Charges for months when standby capacity is not utilized

b. Demand Charges at the rate of 100% of Applicable Demand Charges for months when standby capacity is used under planned or un-planned shutdown of CPP

c. In case recorded Demand exceeds Contract Demand + Standby Capacity, then applicable Demand Charge for the Demand actually recorded, and an additional amount at the rate of 150% of the applicable Demand Charge (only for the Demand in excess of the Contract Demand + Standby Capacity)

d. In case no Standby capacity has been opted by consumer having CPP, then additional amount for exceeding Contract Demand be charged at 200% of applicable Demand Change (only for demand excess of Contracted Demand)

**Consumers' Security Deposit**

1) Subject to the provisions of Section 47(5) of the Electricity Act, 2003, the Distribution Licensee shall require any person to whom supply of electricity has been sanctioned to deposit an amount as security in accordance with the provisions of Section 47(1) (a).

2) The amount of the Security Deposit shall be equal to the average of three months of billing or the billing cycle period, whichever is lesser. For determining the average billing, the average of the billing to the consumer for the last twelve months or, where supply has been provided for a shorter period, the average of the billing of such shorter period, shall be considered

3) Where the Distribution Licensee requires security from a consumer at the time of commencement of service, the amount of such security shall be estimated based on the tariff category and Contract Demand/Sanctioned Load, Load Factor, diversity factor and number of working shifts of the consumer.

4) MSEDCL shall re-calculate the amount of Security Deposit payable, based on the actual billing of the consumer, once in each financial year.

5) Where the amount of Security Deposit maintained by the consumer is higher than the security required to be maintained under the Supply Code Regulations, the Distribution Licensee shall refund the excess amount to the consumer in a single instalment.

6) Such refund shall be made upon a request of the person who gave the security, and with intimation to the consumer if different from such person; and shall be made, at the option of such person, by way of adjustment in the next bill or by way of a separate cheque payment within 30 days from the receipt of such request;

7) No refund shall be required to be made where the amount of refund does not exceed 10% of the amount of the Security Deposit required to be maintained by the consumer or Rs 300/-, whichever is higher.

8) Where the amount of security re-assessed as above is higher than the Security Deposit of the consumer, the Distribution Licensee shall be entitled to raise a demand for additional security deposit. The consumer shall be given not less than 30 days to deposit the additional security pursuant to such demand.

9) Upon termination of supply, the Distribution Licensee shall, after recovery of all amounts due, refund the remaining amount of security to the person who deposited it, with intimation to the consumer if different from such person.

10) A consumer - (i) with a consumption of electricity of not less than one lakh kilo-Watt hours per month; and (ii) with no undisputed sums payable to the Distribution Licensee under Section 56 of the Electricity Act, 2003 may, at the option of such consumer, deposit security by way of cash, irrevocable letter of credit or unconditional Bank Guarantee issued by a scheduled commercial Bank.

11) The Distribution Licensee shall pay interest on the amount of Security Deposit in cash (including by cheque or demand draft) at the Bank Rate of Reserve Bank of India as on 1st April of the financial year for which the interest is payable, plus 150 basis points, provided that the amount of such cash Deposit maintained by the consumer is at least Rs. 50/-.

12) Interest on the Security Deposit made in cash shall be payable from the date of its deposit by the consumer till the date of dispatch of the refund by the Distribution Licensee.

**Definitions**

**Maximum Demand**

Maximum Demand in kilo-Watts or kilo-Volt Amperes, in relation to any period shall, unless otherwise provided in any general or specific Order of the Commission, mean twice the highest number of kilo-watt-hours or kilo-Volt Ampere hours supplied and taken during any consecutive thirty minute blocks in that period.

**Contract Demand**

Contract Demand means the demand in kilo-Watt (kW) or kilo–Volt Amperes (kVA), mutually agreed between the Distribution Licensee and the consumer as entered into in the agreement or agreed through other written communication. (For conversion of kW into kVA, the Power Factor of 0.80 shall be applied.)

**Sanctioned Load**

Sanctioned Load means the load in kW mutually agreed between the Distribution Licensee and the consumer.

In case the meter is installed on the LV/MV side, the methodology to be followed for billing purpose is as follows

2% to be added to MV demand reading, to determine the kW or kVA billing demand, and

'X' units to the MVA reading to determine the total energy compensation to compensate the transformation losses, where is calculated as follows

'X' = (730 * kVA rating of transformer)/500 Units/month, to compensate for the iron losses, plus one percent of units registered on the LT side for copper losses.

**Billing Demand - LT tariff categories**

Billing Demand for LT Non-Residential / Commercial [LT: II (B) , LT II (C)] , LT III: Public Water Works [LT: III (B) , LT III (C)], LT V (A) (ii): Industry - Power Looms (above 20 kW) , LT V (B) (ii): Industry - General (above 20 kW), LT VII (A) Public Services - Government Owned Educational Institutes and Hospitals [LT VII (A) (ii) and LT VII (A) (iii)] , LT VII (B) Public Services - Others [LT VII (B) (ii) and LT VII (B) (iii)] and LT VIII – Electric Vehicle Charging Station categories having MD based Tariff:-

Monthly Billing Demand will be the higher of the following:

a) 65% of the actual Maximum Demand recorded in the month during 0600 hours to 2200 hours;
b) 40% of the Contract Demand.

*Note:*

- *Only the Demand registered during the period 0600 to 2200 Hrs. will be considered for determination of the Billing Demand.*

- *In case of a change in Contract Demand, the above period will be reckoned from the month following the month in which the change in Contract Demand is effected.*

**Billing Demand - HT tariff categories**

Billing Demand for HT I: Industry, HT II: Commercial, HT III Railway/Metro/Monorail, HT IV: Public Water Works, HT V: Agriculture, HT VI: Group Housing Society (Residential), HT VIII: Public Services and HT IX: HT – Electric Vehicle Charging Station

Monthly Billing Demand will be the higher of the following:

a. Actual Maximum Demand recorded in the month during 0600 hours to 2200 hours;

b. 75% of the highest Billing Demand recorded during the preceding eleven months, subject to the limit of Contract Demand;

c. 55% of the Contract Demand.*

**For FY 2020-21: 55%, FY 2021-22: 60%, FY 2022-23: 65%, FY 2023-24: 70%, FY 2024-25: 75%*

***Note:***

- *Only the Demand registered during the period 0600 to 2200 Hrs. will be considered for determination of the Billing Demand.*

- *In case of a change in Contract Demand, the above period will be reckoned from the month following the month in which the change of Contract Demand is effected.*

**HT Seasonal Category (HT I)**

During Declared Season, Monthly Billing Demand will be the higher of the following:

i. Actual Maximum Demand recorded in the month during 0600 hours to 2200 hours

ii. 75% of the Contract Demand

iii. 50 kVA.

During Declared Off-season, Monthly Billing Demand will be the following:

i. Actual Maximum Demand recorded in the month during 0600 hours to 2200 hours

The Billing Demand for the consumers with CPP will be governed as per the CPP Order in Case No. 55 and 56 of 2003.

## ANNEXURE II: AG & POWERLOOM TARIFF APPLICABLE FOR FY 2020-21

**A) AGRICULTURE CATEGORY**

| TYPE | Category | Apr-20 to Mar-21 | | | | | |
|---|---|---|---|---|---|---|---|
| | | MERC RATE | | CONSUMER PAY RATE | | GOM SUBSIDY RATE | |
| | | DC+WC | EC | DC+WC | EC | DC+WC | EC |
| | | Rs/HP/ Month | Rs/Unit | Rs/HP/ Month | Rs/Unit | Rs/HP/ Month | Rs/Unit |
| | | Order No.322/2019 dt.30.03.2020 Rate w.e.f.01.04.2020 | | Rate w.e.f. 01.04.2020 to 31.03.2021 | | As per GoM Letter dt.31.05.2017 | |
| LT | **LOW TENSION (UNMETERED)** | | | | | | |
| | 0 to 3HP | | | | | | |
| | Cate, I | 479 | | 220 | | 259 | |
| | Cate. II | 403 | | 221 | | 182 | |
| | | | | | | | |
| | 3 to 5 HP | | | | | | |
| | Cate, I | 479 | | 236 | | 243 | |
| | Cate. II | 403 | | 237 | | 166 | |
| | | | | | | | |
| | 5 to 7.5 HP | | | | | | |
| | Cate, I | 505 | | 251 | | 254 | |
| | Cate. II | 427 | | 254 | | 173 | |
| | | | | | | | |
| | More than 7.5 HP | | | | | | |
| | Cate, I | 550 | | 296 | | 254 | |
| | Cate. II | 472 | | 299 | | 173 | |
| | | | | | | | |
| | **LT Unmetered** | **DC** | **EC+WC** | **DC** | **EC+WC** | **DC** | **EC+WC** |
| | **LOW TENSION (METERED)** | **Rs/HP/ Month** | **Rs/Unit** | **Rs/HP/ Month** | **Rs/Unit** | **Rs/HP/ Month** | **Rs/Unit** |
| | 0 to 3HP | 41 | 3.30 | 26 | 1.27 | 15 | 2.03 |
| | 3 HP to 5 HP | 41 | 3.30 | 26 | 1.57 | 15 | 1.73 |
| | 5 HP to 7.5 HP | 41 | 3.30 | 26 | 1.57 | 15 | 1.73 |
| | More than 7.5 HP | 41 | 3.30 | 26 | 1.57 | 15 | 1.73 |
| | **LT LIS** | 41 | 3.30 | 26 | 1.36 | 15 | 1.94 |
| | | | | | | | |
| HT | **Category** | **MERC RATE** | | **CONSUMER PAY RATE** | | **GOM SUBSIDY RATE** | |
| | | **DC** | **EC+WC** | **DC** | **EC+WC** | **DC** | **EC+WC** |
| | | **Rs/kVA/ Month** | **Rs/kVAh** | **Rs/kVA/ Month** | **Rs/kVAh** | **Rs/kVA/ Month** | **Rs/kVAh** |
| | **HIGH TENSION (METERED)** | | | | | | |
| | **LIS consumers** | | | | | | |
| | 66KV and above | 72 | 3.79 | 47 | 1.16 | 25 | 2.63 |
| | 33 KV | 72 | 4.36 | 47 | 1.16 | 25 | 3.20 |
| | 22KV | 72 | 4.36 | 47 | 1.16 | 25 | 3.20 |
| | 11KV | 72 | 4.36 | 47 | 1.16 | 25 | 3.20 |
| | | | | | | | |
| | **Individual consumers (NON LIS)** | | | | | | |
| | 66KV and above | 72 | 3.79 | 47 | 1.83 | 25 | 1.96 |
| | 33 KV | 72 | 4.36 | 47 | 2.40 | 25 | 1.96 |
| | 22KV | 72 | 4.36 | 47 | 2.40 | 25 | 1.96 |
| | 11KV | 72 | 4.36 | 47 | 2.40 | 25 | 1.96 |

**Note -** 1) Energy Charges is inclusive of Wheeling Charges

2) In case of LT-Unmetereed AG-Pumpset Demand Charges is inclusive of Wheeling Charges

**B) POWERLOOM / TEXTILE CATEGORY RATES**

| | Category | Apr-20 to Mar-21 | | | | | |
|---|---|---|---|---|---|---|---|
| | | MERC RATE | | CONSUMER PAY RATE | | GOM SUBSIDY RATE | |
| | | DC | EC+WC | DC | EC+WC | DC | EC+WC |
| LT | **LT Powerloom** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA / Month** | **Rs/Unit** |
| | 0-20 kW | Rs. 454/Connection | 6.53 | 304 | 2.76 | 150 | 3.77 |
| | Above 20 kW | 303 | 7.41 | 203 | 3.26 | 100 | 4.15 |
| | | | | | | | |
| | **LT Knitting, Hosiery & Garments** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA / Month** | **Rs/Unit** |
| | 0-20 kW | Rs. 454/Connection | 6.66 | 304 | 2.89 | 150 | 3.77 |
| | Above 20 kW | 303 | 7.56 | 203 | 3.41 | 100 | 4.15 |
| | | | | | | | |
| | **LT Co-Op Soot Girni** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA / Month** | **Rs/Unit** |
| | 0-20 kW | Rs. 454/Connection | 6.66 | Rs. 454/Connection | 2.89 | 0.00 | 3.77 |
| | Above 20 kW | 303 | 7.56 | 303 | 3.41 | 0.00 | 4.15 |
| | | | | | | | |
| | **LT Non Co-Op Soot Girni** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA / Month** | **Rs/Unit** |
| | 0-20 kW | Rs. 454/Connection | 6.66 | Rs. 454/Connection | 4.66 | 0.00 | 2.00 |
| | Above 20 kW | 303 | 7.56 | 303 | 5.56 | 0.00 | 2.00 |
| | | | | | | | |
| | **LT Process Industry & All Other Textile Units (Having load above 107 HP)** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA/ Month** | **Rs/Unit** | **Rs/kVA / Month** | **Rs/Unit** |
| | b) Above 107 HP | 303 | 7.56 | 303 | 5.56 | 0.00 | 2.00 |
| HT | **HT Powerloom, Non Co-Op Soot Girni, Knitting, Hosiery & Garments, Process Industry & All Other Textile Units** | **Rs/kVA/ Month** | **Rs/kVAh** | **Rs/kVA/ Month** | **Rs/kVA h** | **Rs/kVA / Month** | **Rs/kVAh** |
| | 66 KV & Above | 411 | 7.02 | 411 | 5.02 | 0.00 | 2.00 |
| | 33 KV | 411 | 7.59 | 411 | 5.59 | 0.00 | 2.00 |
| | 22 KV | 411 | 7.59 | 411 | 5.59 | 0.00 | 2.00 |
| | 11 KV | 411 | 7.59 | 411 | 5.59 | 0.00 | 2.00 |
| | | | | | | | |
| | **HT Co-Op Soot Girni** | **Rs/kVA/ Month** | **Rs/kVAh** | **Rs/kVA/ Month** | **Rs/kVA h** | **Rs/kVA / Month** | **RskVAh** |
| | 66 KV & Above | 411 | 7.02 | 411 | 4.02 | 0.00 | 3.00 |
| | 33 KV | 411 | 7.59 | 411 | 4.59 | 0.00 | 3.00 |
| | 22 KV | 411 | 7.59 | 411 | 4.59 | 0.00 | 3.00 |
| | 11 KV | 411 | 7.59 | 411 | 4.59 | 0.00 | 3.00 |

**Note -**

1) Energy Charges is inclusive of Wheeling Charges

2) Demand Charges for LT Powerloom for slab upto 20 kW is charged Rs./Connection/Month and for demand based tariff is charged Rs/KVA/month.

3) Lower tariff (discount/rebate) of (2.5%) shall be available in Energy Charge Component (including FAC, if applicable) of Tariff for both slabs (<20 kW and > 20 kW) for LT – Industry (Powerloom).

DC - Demand Charges EC- Energy Charges WC-Wheeling Charges

**Telecom Regulatory Authority of India**

# Recommendations

# on

# USE OF STREET FURNITURE FOR SMALL CELL AND AERIAL FIBER DEPLOYMENT

New Delhi, India

29.11.2022

Mahanagar Door Sanchar Bhawan,

Jawahar Lal Nehru Marg,

New Delhi – 110002

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## ANNEXURES

# CHAPTER 1
# INTRODUCTION

1.1 The consumer demand for smarter devices like mobile phones, pads, tablets, smart watches, and gaming consoles that support smart applications is rising immensely. With the Covid pandemic, the digital landscape has further changed. There is insistence on the quality of data usage and the need for the swift adoption of next generation communication services to support work, entertainment and learning from anywhere. A large ecosystem of application vendors reliant on high speed, low-latency and ubiquitous wireless connectivity has also emerged. Over 812 million internet wireless internet subscribers in India, consuming about 17.68 Gb average data per subscriber per month[1] is a testimony to the changing digital landscape in India.

1.2 Data consumption will further increase with rollout of next generation technologies as 5G is expected to better support new services and advanced technologies such as IoT, Artificial Intelligence (AI), Virtual Reality (VR) etc. It is imperative that the 5G networks are designed to keep up with the changing demands of citizens, industries, and cities. New age requirements are forcing the use of higher frequency bands to ensure support for ultra-high speeds. However, the use of higher frequency bands for 5G rollout poses the downside of shorter coverage and lower cell radii which in turn forces the need for densification of the network to ensure consistent coverage. Densification of the network means Telecom Service Providers (TSPs) must install a greater number of radio equipment and associated infrastructure. This poses a major economic and operational challenge for them. To handle this densification challenge, they need to have equipment that is small enough to be mounted on any structure, yet capable of supporting new age applications. The financial viability will also be kept in mind. Supplementing macro cells with a large number of small cells due to its

[1] July 2022 TRAI internal data analysis reports

portable and easy to deploy nature makes it a promising solution to achieve network densification.

1.3 Small cells are low-powered radio access nodes or base stations (BS) operating in licensed or unlicensed spectrum that have a coverage range from a few meters up to a few hundred meters[2]. The attributes of small cells (radio, antenna) are compressed such that they are portable and easy to deploy. Small cells intend to provide localized coverage in households and hotspot services especially in areas like city centres and transport hubs. Small cells provide coverage only for a very short distance and therefore they are installed in a dense or hyper dense manner, i.e., a very large number (even more than 200 per square kilometer) for good geographical coverage to provide highly reliable and high-capacity broadband. Due to its lower level of radiation, small cells require less stringent security and installation practices so easy to install and operate. Also, there are suitable to be mounted on any existing street furniture like poles, bus stands, traffic lights, buildings, etc. Despite being low on physical footprint these radio units provide huge data capacities to their users.

1.4 The Small Cell Forum (SCF), through its Market Forecast Report 2022[3] predicts that there will be steady growth in small cell deployment between 2020 and 2027. Figure 1.1 displays the forecasted growth of small cells in enterprises, urban areas, rural and remote areas for the whole global market. The sharpest growth is expected to take place till 2024 as major rollouts will be completed and much of this growth is driven by an uptick in deployment of urban small cells. Figure 1.2 represents the forecasted deployment growth of small cells in regional terms. The Asia-Pacific region is expected to become the chief deployment engine owing to the large-scale rollout in China, South

[2] https://www.gsma.com/publicpolicy/wp-content/uploads/2016/12/GSMA_Small_Cell_Deployment_Booklet.pdf

[3] https://scf.io/en/documents/050_-_Small_cells_market_forecast.php

Korea, Japan including India with its growing investment in 5G small cells.

**Figure 1.1: Forecasted trends of deployment of small cells at the Global level**

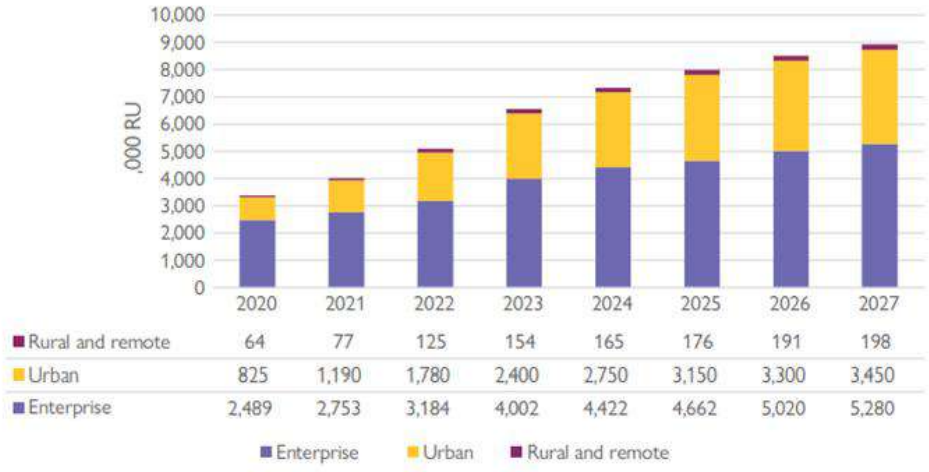



Figure 1-1. New deployments and upgrades of small cells and DAS by environment 2020-27 (by numbers of radio units deployed or upgraded)[3]

*(Source: Small cell Forum market forecast, July 2022)*

**Figure 1.2: Region wise comparison of forecasted trends of deployment of small cells**

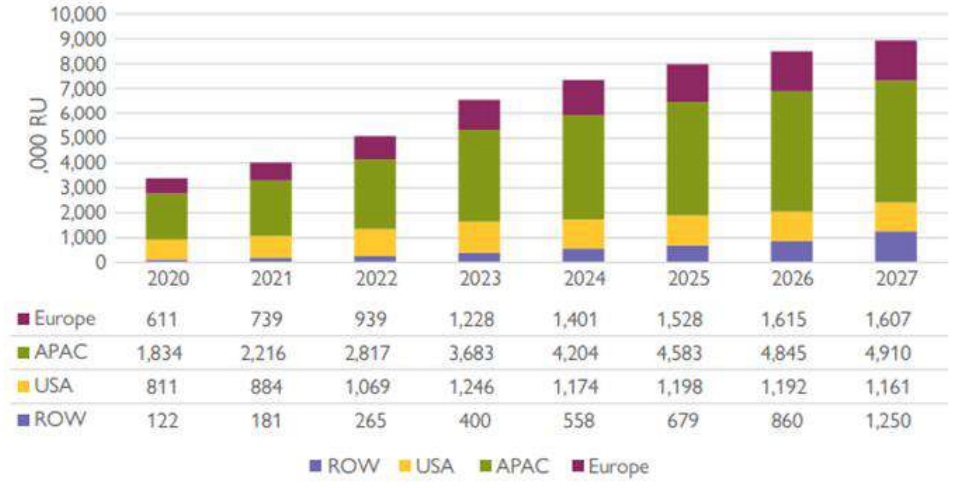



Figure 1-2. New deployments and upgrades of small cells and DAS by region 2020-27 (by numbers of radio units deployed or upgraded)

*APAC – Asia –Pacific, ROW- Rest of World*
*(Source: Small cell Forum market forecast, July 2022)*

1.5 For densification of the 5G network infrastructure, making use of the wide variety of Street Furniture (SF) (publicly owned structures like

utility poles, billboards, lamp posts, traffic signals, and public structures like gazebos, bus stops, etc.) to place small cell and aerial fiber equipment can act as the most economically feasible and sustainable mechanism for large-scale deployment of small cells. It can provide a win-win situation to the public and the authorities owning the street structures as they can benefit and gain from 5G use cases. On the other hand, TSPs can benefit from lower deployment costs.

1.6 This potential solution of making use of street furniture for small cell and aerial fiber deployment has its own challenges. These include regulatory and public concerns such as that related to local approval, Right of Way access, aesthetics and safety, availability of backhaul and power at SF. Collaboration between several stakeholders like administrators, local/municipal councils, power sector entities, service providers, infrastructure providers, vendors shall be essential to the success of this deployment model.

1.7 In the telecom sector, collaboration is not a new phenomenon. It has proven its worth when the need of more towers to provide 3G services and increasing pressure on the bottom-line, the TSPs started collaborating within the sector for infrastructure co-creation and sharing. Independent infrastructure providers (IP-I) created towers and ducts that were shared and used by multiple TSPs. Now the outlook needs to shift from within the sector to collaboration with cross-sectoral partners like Smart Cities, City Municipalities, Airport/Port owners, DISCOMs etc. to use their street furniture for network deployment.

1.8 Internationally there are many lessons which can be studied and used to develop India specific deployment models. Several countries have adopted different mechanisms to tackle various regulatory and technical challenges. USA has adopted stipulated timelines for review and acceptance of permits and specification of the types of fees that can be collected for small cell deployment. EU is one of the first regions to have clearly defined the permit free physical and technical characteristics of

small cells and adopted the installation classes as per the International Electrotechnical Commission (IEC).

1.9 While 5G rollout can certainly keep up with the promises of a reliable and high-speed connectivity to support the upcoming technologies, bringing in a structured pathway to achieve large scale densification for 5G rollout seems to be the first and foremost step. The Authority realized the importance of small cells in 5G network rollouts and in its broadband recommendations dated 31st August 2021, the Authority had mentioned that there is a need to evolve a regulatory framework regarding the use of public places and street furniture that is fair, transparent, and effective, ensuring standardized guidelines to make street furniture ready to deploy small cells. In view of the deliberation in the broadband recommendations dated 31st August 2021, the Authority released a Consultation Paper on the topic "Use of Street Furniture for Small Cell and Aerial Fiber Deployment" on 23rd March 2022. This is hereinafter referred to as CP in these recommendations.

1.10 During consultation process, the Authority sought inputs from the stakeholders on issues like RoW, power, permit exemption, challenges of commercial deployment, sharing of street furniture and the need to define and adopt a regulatory and legal framework for the use of street furniture for small cells and aerial fiber deployment for the successful rollout of next generation networks in the country. In response to the CP, TRAI received 17 comments and 2 counter comments from stakeholders. These were placed on TRAI's website: www.trai.gov.in. Open house discussion (OHD) with stakeholders in respect of the CP was organized on 24.08.2022.

1.11 In addition to floating of the Consultation Paper, TRAI has simultaneously initiated pilots at Bhopal Smart City, GMR International Airport New Delhi, Deendayal Port Kandla and Namma Metro Bengaluru on use of street furniture for Small Cells and aerial fiber deployment. Major Telecom Service Providers and Infrastructure Providers like Bharti

Airtel, Reliance Jio, Vodafone-Idea and BSNL are participating in these Pilots at different locations.

1.12 The objective of these pilot projects was to understand and analyze the technical and logistical challenges in future deployment of small cells over street furniture and to ensure complete synergy among all stakeholders. For each Pilot, a working group has been constituted by TRAI. Significant progress has been achieved in the Pilots in a short time with the active support from working groups included officers from TRAI Regional Offices, BMRCL, Deendayal Port Authority, Bhopal Smart City, GMR, Ministry of Housing & Urban Affairs (MoHUA), Department of Telecommunications, Telecom Service Providers (TSP) and Infrastructure Providers (IPs).

1.13 These pilots were designed to explore challenges in using brownfield infrastructure created by entities belonging to sectors other than telecom like electricity poles owned by DISCOMs, traffic lights owned by traffic police, etc. These pilots, which were in the spirit of the objectives of the PM GatiShakti programme, were thus expected to help develop a suggestive cross-sector participative framework particularly for the use of street furniture for deployment of small cells on it. While finalizing these recommendations, the Authority has also taken into consideration the practical on-ground difficulties faced and the learnings from these pilots.

1.14 After analyzing the various issues involved and considering the comments received from stakeholders from written responses and OHD and in consideration of the learnings from the pilot, the Authority has finalized these recommendations.

1.15 The objective of these recommendations is to develop and recommend a structured and uniform system to the Government for deployment of small cells and aerial fiber using SF. A well-streamlined approval process inculcated in the legal framework, along with properly defined physical and technical characteristics for equipment usage and EMF emissions

will simplify the administrative process and reduce the time to market of the TSPs/IPs and optimize resource utilization for the 5G rollout.

1.16 Therefore, the recommendations intend to pave a path on the subject while taking into consideration the regulatory and technical concerns of multiple stakeholders like the Administrators, TSPs, ISPs, IPs, OEMs, street structure owners and citizens of the country at the same time. Appreciating that the policy measures suggested in these recommendations are linked to each other and all together form a coordinated approach, an integrated approach wherein all these recommendations are considered in their entirety would be best to ensure a positive result in the deployment of small cells using street furniture.

1.17 These recommendations are broadly categorized into following:

A. Right of Way (RoW) Issues and adequacy of current provisions in ROW rules 2016
B. Infrastructure sharing by the Controlling Administrative Authorities (CAA) with TSPs and IP1s
C. Street furniture and small cell sharing among TSPs and IP-Is
D. Process Simplification, Permission Exemption for small cells and standardization of small cells and installation practices
E. Power related issues and solutions
F. Institutional mechanism for enabling Collaboration between Controlling Administrative Authorities and TSPs/IP-Is

1.18 Chapter 1 introduces the background and objective of the recommendations. Chapter 2 discusses the issues related to the deployment of small cells and aerial fiber on street furniture, comments of the stakeholders and recommendations of Authority based on the analysis and learnings from the pilots. Finally, Chapter 3 summarizes the various recommendations.

# CHAPTER 2

# USE OF STREET FURNITURE FOR SMALL CELL AND AERIAL FIBER DEPLOYMENT

2.1 The CP released on 23rd March 2022 discussed the potential challenges for the use of street furniture for small cells and aerial fiber deployment in the country. Questions were raised to seek inputs from the stakeholders on several important issues. These issues, comments of stakeholders, analysis of these comments, and the views of the Authority are presented in the following sections.

## A. Right of Way (RoW) Issues and Adequacy of current provisions in RoW Rules 2016

2.2 The RoW permissions are governed by the Indian Telegraph Act, 1885 and rules made thereunder. With an objective to ensure uniform adoption of RoW rules across all the states and streamlining the process of RoW approvals, the Indian Telegraph RoW rules were notified in 2016. These RoW rules were further amended in 2021 to facilitate laying aerial optical fiber cables[4]. After issuing this Consultation Paper, DoT had come out with another amendment to RoW rules in August 2022 that addresses some of the issues that were flagged in TRAI's CP. This amendment to Right of Way Rules had made the charges for RoW permissions reasonable and a ceiling for RoW charges for installation of 5G small cells and optical fiber cable on street furniture has been fixed. These amendments will facilitate deployment of 5G small cells on existing street infrastructure.

2.3 Rollout of 5G network will require increasing number of radio and backhaul equipment that will need to be installed on street furniture infrastructure that are under the control of multiple authorities. These Controlling Administrative Authorities (CAAs) have their different RoW

[4] https://dot.gov.in/sites/default/files/Gazette%20Notification%20dated%2021

policies. In addition to varying RoW policy framework at State/UT level, another issue is of different policies being followed by central departments for granting RoW permissions. Absence of specific provisions for seeking permissions for deployment of small cells is another issue. In the CP, the Authority has discussed the issues related to provisions related to the use of street furniture for small cell deployment, uniform definition, fees, and timelines. The Authority has raised the following questions for seeking the response from the stakeholders:

i) *Is there a requirement for any modification in existing RoW Rules as notified by DoT to accommodate small cell deployment on street furniture? If yes, please provide the changes required.*

ii) *Are the amendments issued to RoW rules able to take care of the needs of aerial fiber deployment? If not, what further amendments are suggested? Please provide the exact text with justification.*

iii) *What are the suggestions of stakeholders for aligning RoW policies issued by various other Central Government Bodies with existing DoT RoW policy?*

**Comments of Stakeholders on modification in RoW rules to accommodate small cell deployment on street furniture**

On modification in Indian Telegraph RoW Rules, stakeholders have submitted the following –

2.4 Inclusion of specific definition for Small Cells and Street Furniture - Most of the stakeholders said that the present RoW rules are more aligned towards overground mobile towers and underground fiber deployment. These rules are silent on small cell deployment and access to street furniture. So, the details about small cells should be explicitly captured in a technology neutral way as part of overground (OG) infrastructure besides mobile towers and telegraph lines, in the opening paragraph of the rules. Inclusion of a dedicated section for street furniture use with enforceable provisions is another suggestion that has been put forward for the same. On the contrary, some stakeholders are

also of the view that there is no requirement for any modification as the existing RoW policy provides sufficient directions to enable telecom operators to execute all telecom infra projects.

2.5 Provision of single Online RoW portal – Several stakeholders have opined that for RoW clearances, a single pan India portal should be developed by the Central Government. State Governments and all appropriate authorities under the Central Government should be encouraged to join the portal rather than having portals for each authority or state separately. The portal should implement features like:

a. a user-friendly 'end-to-end digitized process'.

b. the concept of deemed approval.

c. Single window clearance within 30 days.

d. Empowered centralized coordinating agencies can be established to fast-track and smoothen the process of permissions for usage and upgradation of existing SF in the portal.

e. Submission of RoW applications for approvals (including suitable alerts/notifications/notices to users, receipts, acknowledgement, Service-level agreements (SLAs), contact details of relevant technical officials and 1st/2nd level of escalations).

f. Display of stages of approvals and status of a particular application.

g. Clearly defined roles for central, state, and local authorities.

h. The portal should cater to all aspects of the approvals including fiber, power, and access to street furniture.

i. The list of applicable street furniture shall be maintained by the CAAs on the portal with defined uniform norms, terms, and rate schedule along with relevant details like height, design, weight bearing capacity, location coordinates etc.

j. Creation of a national GIS (Geographical Information System) by the DoT which could be used by all the common agencies to coordinate for issuing RoW permissions. It should comprise State/UT wise GIS data for the applicant.

k. The applicant should be required to submit to the Authority a self-declared intimation on the portal for the usage of street furniture.

l. Provision to issue notices through digitized process on RoW portal before taking any adverse action like fiber cutting.

m. The details of authorized structural engineers shall be made available on a portal attesting to the structural safety of the street furniture where the small cells are proposed to be deployed. However, some stakeholders have suggested that provisions of the structural stability certificates should not be made applicable for the small cells.

2.6 Streamlining of RoW charges and authorization procedures - One of the biggest bottlenecks for speedy rollout of telecom infra, as pointed out by the stakeholders, is high RoW charges. In the opinion of a stakeholder, existing RoW charges are unreasonable and not based on the actual work done principle. It was added by the stakeholder that there are certain states like Odisha which have prescribed forward looking and technology supportive charges for utilization of street furniture, but majority of the states and municipal bodies treat RoW permissions as a "cash cow". Few stakeholders have put forward request that no application fee or compensation should be levied for installing the poles for providing support to over-ground telecom lines over the immovable property of the Local/ Government Authority. For establishment of poles over private land and buildings, it was suggested that application fee and one-time charge should not exceed Rs. 100. One of the service providers has submitted that the compensation for usage of immovable property for establishment of telecom infrastructure should be fixed for a minimum period of five years irrespective of whether the ownership of

the land resides with Central or State Government. One stakeholder was of the opinion that the fee of Rs.1000 per application as per the RoW rules of DoT should be further rationalized. Another stakeholder has submitted that in cases any agency like a CPSE/private distribution company desires a fee, the fee charged should be nominal (not more than Rs. 100/annum). A couple of stakeholders said that the charging schedule should be fixed based on defined area and street furniture category. Another stakeholder suggested that the Authority can recommend slabs based on the number of small cells deployed on the street furniture.

2.7 There is a submission that seeking Bank Guarantees (BGs) should not be insisted on for small cell deployment since this will result in blocking huge working capital and impacting TSPs financially and operationally.

2.8 Other suggestions –

- Stakeholders have suggested including instant or fast one-time bulk RoW permissions at zero cost.
- One service provider suggested that the respective authority/agency/ department should request for the removal of small cells only by giving a 30-day notice and providing an alternative location for re-installation.
- Compliance with RoW Rules and mandatory access to small cells for mounting telecom infra should be a precondition while issuing permissions to erect street furniture.

**Comments on provisions of RoW Rules (Amendment) 2021, related to aerial fiber**

2.9 In response to the query on whether the 2021 RoW amendment has been able to address various aerial fiber deployment issues, few stakeholders have opined that the 2021 amendments had the right intent to address the issues of aerial fiber proliferation, however, it is the lack of enforceability provisions that have impacted the effectiveness of the

rules as all the states are yet to incorporate the same in their policies. To tackle the issue of enforceability, some stakeholders have suggested that the amendments must be brought as a parliamentary law, so that they may be made mandatorily applicable to every central/state/local agency. Another stakeholder has suggested the inclusion of key Government agencies like Railways, Defense, Gas pipeline network, forests, ports etc. under the DoT RoW rules.

2.10 Stakeholders have suggested that the annual compensation for using existing poles to establish an OFC should not exceed Rs. 100 and Rs. 50 per pole in urban and non-urban areas, respectively. CAAs should be restricted from charging any additional fee other than that prescribed in DoT RoW rules schedule. In line with no RoW charge for BharatNet, the same must also be applied to the rollout of aerial fiber for any telecom infra project.

2.11 A few stakeholders have suggested that a list of street furniture which can be used for deployment of aerial fiber can be uploaded on the respective State's RoW Portal/Central Authority's portal by the CAAs. One stakeholder has proposed that all state electricity poles, municipal poles can be allowed for laying of aerial fiber. The use of existing billboards, metro pillars, gas pipelines etc., for lightweight aerial fiber, clamped with the right accessories, can also be permitted. Mandating/encouraging the sharing of aerial fiber as much as possible was suggested by a few stakeholders. The need to define rules by the local authority to maintain aesthetics of the area was another suggestion.

**Comments on Alignment of Central RoW rules across states/local bodies/ agencies**

2.12 Several stakeholders have made suggestions to bring consistency in RoW related procedures and general principles related to RoW permission, fees, compensation, charges etc. The basis of some of the suggestions is that 'telecom' is a central subject, and that the Center has

exclusive privilege to provide for guiding principles in relation to establishment of telecom infrastructure in the country. One of the stakeholders has stated that the Central Government can exercise their powers and mandate adoption of RoW rules by the central government bodies and states in their respective policies/ by-laws.

2.13 A stakeholder has suggested that the term 'Central Government Authorities' should be expanded to include any central agency, department, ministry, and their assets. Many stakeholders have suggested that all central government bodies, agencies, ministries, departments, and the authorities under these CPSEs, PSUs falling under the Union ministries/departments, Airports should operate under DoT RoW Rules. Any Smart City, municipality, state body getting financial support through Union Government funding must also facilitate deployment of Small Cells and telecom infrastructure by way of suitable amendments in their respective policies.

**Analysis of the issues and views of the Authority**

2.14 The Department of Telecom (DoT) notified the Indian Telegraph RoW Rules[5] on 15th November 2016 to ensure uniform adoption and streamlining of the process of RoW approvals across all the states. The Authority recognizes that the issue of RoW permissions can potentially hamper the proliferation of small cells in India. The adequacy of provisions of existing RoW rules needs to be ascertained for the use of street furniture for deployment of small cells and telecom infrastructure. Given the important role that small cells will play in enhancement of coverage and capacity, it needs to be ensured that the RoW permissions for small cells are not affected due to tedious application processes, delayed/denied permissions by the authorities, site restrictions, and arbitrary charges.

2.15 After this Consultation Paper was issued, DoT had come out with another amendment to RoW rules on 17.08.2022 that addressed some

[5] https://dot.gov.in/actrules/indian-telegraph-row-rules-2016

of the issues that were flagged in TRAI's CP. This amendment to Right of Way Rules has made the charges for RoW permissions reasonable and a ceiling for RoW charges for installation of 5G small cells and optical fiber cable on street furniture has been fixed. These amendments will facilitate deployment of 5G small cells on existing street infrastructure.

2.16 After analyzing the comments, the major concerns related to RoW provisions and views of the Authority are as follows:

i) **Inclusion of definition for small cell and street furniture in RoW Rules**

2.17 When the Indian Telegraph Right of Way (RoW) Rules 2016 were first notified on 15th November 2016, the opening paragraph mentioned that:

> *"In exercise of the powers conferred by sub-section (1) and clause (e) of sub-section (2) of section 7 read with sections 10, 12 and 15 of the Indian Telegraph Act, 1885 (13 of 1885), the Central Government hereby makes the following rules to regulate underground infrastructure (optical fiber) and overground infrastructure (mobile towers), namely……"*

2.18 The rules did not have a definition of underground infrastructure and overground infrastructure. The Rules rather had definition for "underground telegraph infrastructure[6]" and "overground telegraph infrastructure[7]" which was quite wide and inclusive definition. However, the G.S.R part of the RoW, 2016 rules included just optical fiber as part of the underground infrastructure and mobile towers alone as part of the overground infrastructure. This created a confusion amongst stakeholders and Appropriate Authorities. The Authority thus felt that amending the G.S.R part would broaden the scope of the rules for

[6] "Underground telegraph infrastructure" means a telegraph line laid under the ground and includes manholes, marker stones, appliances, and apparatus for the purposes of establishment or maintenance of the telegraph line.

[7] "Overground telegraph infrastructure" means a telegraph or a telegraph line established over the ground and includes posts or other above ground contrivances, appliances and apparatus for the purpose of establishment or maintenance of the telegraph or the telegraph line.

inclusion of aerial fiber on poles and installation of small cells on street furniture for rollout of emerging technologies i.e., 5G. In TRAI's Response dated 25.07.2022 to DoT back reference on Recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed', the Authority therefore recommended amending the opening paragraph of Indian Telegraph Right of Way Rules, 2016 as follows:

> *"G.S.R. 1070(E). —In exercise of the powers conferred by subsection (1) and clause (e) of sub-section (2) of section 7 read with sections 10, 12 and 15 of the Indian Telegraph Act, 1885(13 of 1885), the Central Government hereby makes the following rules to regulate underground telegraph infrastructure and overground telegraph infrastructure, namely"*

2.19 DoT has recently amended the ROW Rules 2016 on 17.08.2022 and have incorporated provisions for faster processing of RoW permissions, predetermined charges for granting RoW permissions for installation of 5G small cells and optical fiber cable on street furniture, etc. In this amendment, DoT has omitted the brackets and words (optical fiber) and (mobile towers and telegraph line) from the opening paragraph. Subsequent to the amendment, the opening paragraph of Indian Telegraph Right of Way Rules, 2016 reads as follows:

> *"G.S.R. 1070(E). — In exercise of the powers conferred by sub-section (1) and clause (e) of sub-section (2) of section 7 read with sections 10, 12 and 15 of the Indian Telegraph Act, 1885(13 of 1885), the Central Government hereby makes the following rules to regulate underground infrastructure and overground infrastructure, namely"*

2.20 Thus, DoT has already modified the opening G.S.R part to broaden the scope of the rules. This has dealt the issue of otherwise restrictive interpretation that someone could have made and has removed any

scope for confusion for inclusion of aerial fiber on poles and installation of small cells on street furniture for rollout of emerging technologies.

2.21 In the opinion of Authority, the definition of "overground telegraph infrastructure" in the Indian Telegraph Right of Way Rules as *'a telegraph or a telegraph line established over the ground and includes posts or other above ground contrivances, appliances and apparatus for the purpose of establishment or maintenance of the telegraph or the telegraph line;'* is wide enough and sufficiently covers various telegraph infrastructure like small cells and aerial optical fiber cable. Any further inclusion of definition or clarification was not required.

2.22 However, Authority has noted that vide Indian Telegraph Right of Way (Amendment) Rules, 2022, following definitions have been added in Sub-rule (5) in Rule 10 of Chapter III:

> (5) For the purposes of this rule, and rule 10B and the Schedule, the expression,
>
> (a) "mobile tower" means any above-ground contrivance for carrying, suspending or supporting a telegraph and does not include pole;
>
> (b) "pole" means any above-ground contrivance of height not exceeding eight meters for carrying, suspending or supporting a telegraph and does not include mobile tower;
>
> (c) "small cell" means a low powered cellular radio access node that has a coverage of distance from ten meters to two kilometers.

2.23 Further, DoT vide letter (attached as **Annexure I**) dated 26th October 2022 has clarified that the term "Street furniture" mentioned in the Right of Way (Amendment) Rules, 2022 includes "post/pole used for electricity, streetlight, traffic light, traffic sign, bus stop, tram stop, taxi stand, public lavatory. memorial, public sculpture, utility pole or any other structure or contrivance of such nature established over the property of an appropriate authority". This has obviated the need for a

further definition/clarification. But the Authority is of the opinion that this clarification should be subsequently made part of the RoW rules through an amendment in relevant Gazette Notification.

2.24 **Therefore, the Authority recommends that the DoT clarification dated 26.10.2022 on Indian Telegraph RoW rules 2016 regarding the term "street furniture", should be made part of the Indian Telegraph RoW rules through a suitable amendment in a relevant Gazette Notification.**

### ii) Online Central RoW portal

2.25 For a faster and efficient deployment of 5G in the country, a single-window clearance through online application process for all RoW proposals at the level of the states/UTs as well as in the Central Government/Departments can avoid administrative hindrances like multiple applications, different rules by different departments, permission delays etc. The Authority agrees with the industry inputs on the importance of a National RoW portal. In its recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021, the Authority has emphasized for creation of National Portal for RoW permissions to facilitate expeditious rollout of telecom and other essential utilities infrastructure.

2.26 Various appropriate authorities like those dealing with Irrigation, PWD, Forest, Railways, Defense Estate, Power, National Highways, State Highways, and other bigger entities having land parcels under their control like Universities, Industrial Park, Logistic Parks, Ports, Airports etc., have already instituted mechanisms for granting RoWs permission to service providers and infrastructure providers for Telegraph Services. Some of these entities are using their own portals for giving such permissions. Recognizing that multiplicity of portals at several levels can further increase the complexity rather than reduce it, in the 31st August 2021 recommendations, the Authority had also recommended that

"*wherever Appropriate Authorities, i.e. different Central Government Departments, States, Union Territories, Local Authorities and their agencies, have already established the web based portals for grant of RoW permissions, the same should be integrated with the proposed national portal for RoW permissions."*

2.27 The Authority is happy to note that in sync with its thought process, the Sub-rule (2) of Rule 4 of the RoW rules 2016 has been amended as follows in the RoW (Amendment) Rules 2022:

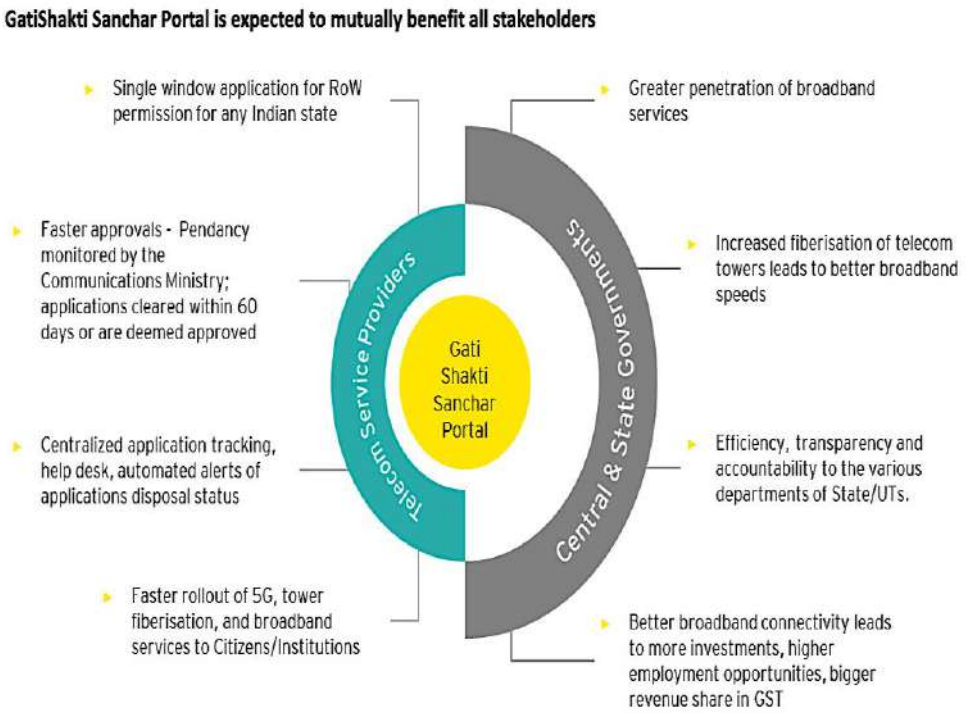
> ***4. Nodal officer to be designated by local authority, etc.-***
>
> *(1) Every appropriate authority shall designate a nodal officer for the purposes of these rules.*
>
> *(2) Every application for permission under these rules shall be made by the licensee on an electronic portal developed by the Central Government.*

2.28 The above amendment is an important initiation to integrate the central/state/local level applications on a single portal. The IT systems of all States/UTs and major infrastructure central ministries such as Railway, Highways have been integrated with the portal to make India ready for 5G launch. This can aid the State Governments & Union Territories in RoW policy alignment and can greatly reduce the complexity of multiple permissions. In addition to the above, the launch of a new 5G RoW application 'form' on GatiShakti Sanchar Portal in August 2022 is another big leap to enable faster 5G rollout in India.

2.29 For making the PM GatiShakti initiative successful, it is necessary that right of way permission needs to be approached in a holistic manner. Given the complexity of the numerous NOC's, physical documents, and permissions that would increase with the use of small cells, the establishment of the portal will act as a single window clearance is a need of the hour. The Authority appreciates the efforts of DoT launching the **"GatiShakti Sanchar Portal" (https://sugamsanchar.gov.in/)** in May 2022, in line with Hon'ble PM's vision of development of

infrastructure services in an integrated manner. This is a collaborative institutional mechanism between all stakeholders including Central and State/UT Government(s), Local bodies, and Service Providers to facilitate the Right of Way (RoW) Application Process through a single interface. This portal envisages bringing transparency, accountability and responsiveness to all stakeholders while processing the application. This is also a giant leap towards "Ease of Doing Business" as this can take care of the delay in the application process for installation of Digital Connectivity Infrastructure (DCI) due to inconsistency and uncertainty of policy through the maintenance of a fast-tracking application process. Figure 2.1 shows the various provisions of the portal and the benefits it can provide for both TSPs and the Government.

**Figure 2.1: Provisions in the GatiShakti Sanchar portal**




2.30 Power sector contributes to majority of accessible street furniture like electric poles/lines/supply pillars/cabinets/posts, which can be utilized by the telecom operators for the deployment of 5G Small cells. Appreciating that a huge number of applications for power connection at several poles/SF shall also be an integral part of the deployment

process, the Authority had previously recommended the following in its 31.08.2022 recommendations.

> 7.14. National RoW Portal
>
> (iii) *In order to facilitate cross-sector collaboration for RoW permissions with other utility providers like water, electricity, gas etc. and co-deployment of telegraph lines with other utility infrastructure creation, at later date, it should be possible to expand the scope of the proposed national portal to grant RoW permissions to other utility providers also.*

2.31 Currently the "GatiShakti Sanchar Portal" does not have a provision for power related applications and permissions. Considering the above;

2.32 **The Authority reiterates its earlier recommendations issued in the context of Broadband Recommendations dated 31.08.2022 vide Para 7.14.iii that the scope of the proposed national portal should be expanded to grant RoW permissions from utility providers like water, electricity, gas etc. also. More specifically, since most of the SF assets are under the control of the power sector, the portal shall also include a facility to process RoW falling under the jurisdiction of power sector including DISCOMS.**

### iii) Provision of Bulk approval for small cells:

2.33 The Sub-rule (1) of Rule 10A under 'Application by a licensee for Establishment Of Overground Telegraph Infrastructure' provisions that *"A licensee shall for the purpose of installation of small cell and telegraph line submit an application, along with details of street furniture and a copy of certification by a structural engineer authorized by appropriate authority, attesting to the structural safety of the street furniture where installation of small cells and telegraph line is proposed to be deployed, to the appropriate authority for permission to use street furniture for*

*installation of small cells and telegraph line."* The Authority feels that adding a provision for bulk approval and bulk processing for small cell applications along with the above rule would be required to serve the needs of the licensees who want to establish small cells in large numbers. Some countries don't require approvals in the first place. For instance, in Australia, only a consultation with the councils is required. But currently in the context of India and in view of avoiding administrative delays, the Authority supports the idea of batch processing for groups of small cells.

2.34 Considering the above, **the Authority recommends the following amendments to the Indian Telegraph Right of Way (Amendment) Rules, 2022:**

**Sub-rule (1) of Rule 10A of the Indian Telegraph Right of Way (Amendment) Rules, 2022 should be amended as:**

**A licensee shall for the purpose of installation of small cell and telegraph line submit an application, along with details of street furniture and a copy of certification by a structural engineer authorized by appropriate authority, attesting to the structural safety of the street furniture where installation of small cells and telegraph line is proposed to be deployed, to the appropriate authority for permission to use street furniture for installation of small cells and telegraph lines.**

**Provided that licensee may have option to submit single application for multiple sites and appropriate authority shall make due provisions for accepting such applications and issuing single permission for multiple sites accordingly for establishment of small Cells.**

2.35 **The Authority also recommends that DoT should make provision in the GatiShakti Sanchar Portal for accepting single application for bulk processing of sites for granting various permissions, including RoW and power connection.**

### iv) Cataloguing street furniture and GIS Mapping

2.36 GIS mapping is one of the crucial instruments to monitor and assess the infrastructure deployment and utilization. GIS is prevalent in several nations for ICT development. Availability of details of the street furniture and all the passive infra that individual TSP/ISP/IP-I intends to offer for sharing along with its location on common GIS platform will help in bridging the information gap. To facilitate sharing of passive infrastructure such as ducts, optical fibers, posts, etc., the Authority had earlier recommended cataloguing of telegraph related passive infrastructure, establishment of an e-marketplace and suggested that the available passive infra can be mapped by each TSP/ISP/IP-I using a common GIS platform which should be maintained by the Government. The relevant extracts of the recommendations dated 31.08.2021 are as follows:

*7.31 To facilitate the sharing of passive infrastructure such as ducts, optical fibers, posts etc. the Authority recommends that:*

*In order to ensure common standards for mapping of available passive infrastructure using the Geographic Information System (GIS), Telecom Engineering Centre (TEC) should notify the standards for this purpose.*

*The passive infrastructure available in the country should be mapped by each service provider and infrastructure provider using the GIS standardized by TEC.*

*After mapping of the passive infrastructure details by individual service provider and infrastructure provider, the same should be aggregated on the common GIS, which should be maintained by the Central Government or the Regulator. Passive infrastructure of individual service provider and infrastructure provider which is available for sharing and selling should be clearly delineated on this system.*

*To facilitate leasing and trading of passive infrastructure in an efficient manner, the Central Government should enable establishment of e-marketplace(s) for this purpose. Such e-marketplace should be able to access the details of the passive infrastructure of individual service provider and infrastructure provider which is delineated for sharing and selling on the common GIS platform.*

2.37 PM GatiShakti National Master Plan has been developed as a Digital Master Planning tool by Logistics Division, Ministry of Commerce. The plan has been prepared in a dynamic GIS platform wherein data on specific action plan of various Ministries/Departments have been incorporated within a comprehensive database. Dynamic mapping of all infrastructure projects with real-time updation will be provided by way of a map developed by BISAG-N. The map is built on open-source technologies and hosted securely on Meghraj (Government of India's cloud service). It will also use Satellite imagery available from ISRO and base maps from Survey of India. Once the individual Ministries update their data in the software using its separate user identification, all the data will be integrated in one platform which will be available for planning, review, and monitoring. The Logistics Division, Ministry of Commerce will further assist all the stakeholders through BISAG-N, in creating and updating their required layers in the system and update their database through Application Programming Interface (APIs). Analysis by providing the entire data at one place with GIS based spatial planning and analytical tools having large number of layers like land

use, existing structures (e.g., bridge, railway crossing, culvert), soil quality, infrastructure (Road, Rail, Waterway etc.), elevation data/3D (contour and gradient), habitation sprawl etc. enabling better visibility to the executing agency.

2.38 The Department for Promotion of Industry and Internal trade (DPIIT) has requested the states and UTs for integration of various data layers related to different infrastructure assets on State Master Plan portal. Subsequently, in a significant move, the DPIIT vide letter (attached as **Annexure II**) dated 24th June 2022 has further requested the states to map additional data layers namely electric poles, traffic light poles, bus terminal / bus shelters and Government buildings (State Govt/Central Govt, PSU) which are thought to be used for mounting 5G small cells. This is an important initiative for creating the infrastructure suitable for supporting the 5G rollout in the country.

2.39 Using the data being collected in the master plan, if the Government can facilitate a platform dedicated for street furniture, the TSP/ISP/IP-I's will be able to immediately know the availability of SF at a location where they intend to deploy small cells. Both the SF provider and seeker will be benefitted by the existence of such an e-marketplace/ GIS platform. This can facilitate faster small cell and 5G network rollouts. The Authority feels that cataloguing and maintaining a list of applicable street furniture on the national RoW portal as suggested by most stakeholders, can add to expanding the scope of the portal multifold. The list can be uploaded by the CAAs with terms of sharing and rate schedule along with relevant details like height, design, weight bearing capacity, location coordinates etc.

2.40 There are immense benefits for street furniture owning agencies to do GIS mapping of their assets. This will enable them to offer their assets for utilization by TSPs and other third parties on digital platforms in the most efficient and cost-effective manner. Cost savings resulting from greater efficiency, better decision making, better geographic information recordkeeping etc. can be other advantages. This will go a long way in

improving the penetration of 5G and its technologies, thereby benefiting the economy as a whole. Further, the development of 5G for their citizens, enterprises, and city governance, could be possible by transforming the city's DCI. Use of drones for GIS mapping of large terrain is commercially viable and now being used widely by various industries of geotagging of their critical assets. These 5G enabled drones can go beyond visual range and can collect huge amounts of vital data about the subjects of interest in most efficient and cost-effective manner.

2.41 **The Authority recommends that a Catalogue of GIS mapped Street furniture assets in the National RoW portal should be created with the following specifications:**

a) **Height, load bearing, and wind load capability of structure**
b) **Wattage, type of power (AC/DC), voltage etc. if power is available.**
c) **Picture of SF**
d) **Non-discriminatory terms and conditions offered for hiring**
e) **Contact details (Mobile number, landline number and email ID) of the nodal person for the particular Street Furniture.**

2.42 **The Authority also recommends that use of Drone based mapping in the GIS system should be considered for quick assessment of the location of small cell infrastructure and for the creation of the street furniture catalogue.**

v) **Safety of equipment:**

2.43 As stated by the stakeholders, vandalism of the communications infrastructure is a prevalent problem that requires immediate attention The cases of vandalism can take many forms including siphoning of fuel from the generators, stealing of back-up batteries solar panels, and

lightning arrestors, fiber cable cuts (deliberate or otherwise), stealing of copper rods from masts. In certain cases, communications infrastructure is vandalized accidentally during excavations, road repairs and constructions. Since vandalism increases the operational and maintenance costs and may discourage prospective investors, it is important that legal provisions regarding vandalism of telecom equipment shall be put in place.

2.44 The recently released Draft Telecommunications Bill 2022 has tried to address the security of Telecommunications Assets through the provision imbued under clauses of Chapter 10 and Chapter 11 as follows:

*38. Civil liability*

*The Central Government may prescribe civil liabilities, including compensation payable by any person causing damage to telecommunication network or telecommunication infrastructure, to the licensee or registered entity, as the case may be, and the applicable penalties.*

*47. General provisions related to offences*

*(1) Any person or entity committing any offence listed in Schedule 3 shall be punished with fine or imprisonment, or through suspension of telecommunication service, or through a combination thereof, as specified in Schedule 3. The provisions of Schedule 3 shall apply to the abetment of, or attempt to commit, an offence as they apply to the offence.*

**Schedule – 3: Offences and Penalties**

| S. No | Offence under the Act | Penalty | Cognizable or Non-cognizable | Compoundable or Non-compoundable |
|---|---|---|---|---|
| 5 | Willfully removing or tampering with or causing damage to telecommunication infrastructure or telecommunication network. | Imprisonment for a term which may extend to one year, or with fine up to rupees one crore, or both. | Cognizable | Compoundable |
| 6 | Causing damage through negligence to telecommunication infrastructure or telecommunication network. | Fine up to rupees fifty lakhs | Non-cognizable | Compoundable |

The Authority is of the opinion that the provisions of the draft bill can take care of the issues of vandalism once it is passed as an act by the Parliament. However, the Authority is of the opinion that till the bill becomes a law, the Government should specifically monitor action taken by the state police (in collaboration with MHA) through a joint committee to address the security of Telecommunications Assets.

2.45 **The Authority recommends that till the Draft Telecommunications Bill 2022 is passed as a law, the Government should specifically monitor action taken by the state police, for security of Telecommunications Asset, through a DoT and MHA joint committee.**

### vi) **Access to use of private and public infrastructure for small cell and aerial fiber deployment**

2.46 In the absence of a holistic policy framework between and within states, the deployment progress of small cells may vary from city to city. A streamlined policy on access to use of private and public infrastructure for small cell and aerial fiber deployment and rationalized uniform charges are important to ensure a level playing field and equitable development across the nation. Many stakeholders have commented that small cell installation on government owned structures and street furniture should be allowed at no cost. For privately owned infrastructure, this access should be allowed at a reasonable fixed cost.

2.47 The Authority has noted that the RoW (amendment) rules 2022 has included two new sections (10A and 10B). The sub-rules 3 of rule 10A provisions the following:

> *"(5) The appropriate central authority may permit installation of small cells on their buildings and structures.*
>
> *(6) For the purposes of sub-rule (5), the "appropriate central authority" means the Central Government or the authority, body, company or institution, incorporated or established by the Central Government, in respect of property, under, over, along, across, in or upon which underground or overground telegraph infrastructure, is to be established or maintained, vested in, or under, the control or management of such Government, authority, body, company or institution."*

2.48 The Authority is of the opinion that the term "appropriate central authority" defined as above will help in specifying the role of central bodies different from state authorities which are included as per the definition of "appropriate authority" laid in clause (e) of rule 2. The amendment to Rules has thus taken care of installations of small cells on central government buildings and structures.

2.49 As far as access to private owned infrastructure is concerned, the following has been provisioned as per the new rule 10B in the RoW (amendment) rules 2022:

> *"10B. Establishment of telegraph infrastructure over private property. – Where the licensee proposes the establishment of overground telegraph infrastructure over any private property, the licensee shall not require any permission from the appropriate authority:*
>
> *Provided that in case of establishment of mobile tower or pole over a private building or structure, the licensee shall submit an intimation, in writing, to the appropriate authority, prior to commencement of such establishment:*
>
> *Provided further that along with the intimation, he shall also submit the details of the building or structure, where the establishment of mobile tower or pole is proposed, and a copy of certification by a structural engineer, authorized by the appropriate authority, attesting to the structural safety of the building or structure, where the mobile tower or pole is proposed to be established."*

2.50 Subsequent to these amendments to RoW rules by the DoT, the Authority is of the opinion that new rules 10A and 10B are expected to ensure equitable access at reasonable cost to the operators. As far as access within the buildings is concerned, the Authority is handling the issue separately and has floated a Consultation Paper on "Rating of Buildings or Areas for Digital Connectivity" dated 25th March 2022.

### vii) **Rationalizing fees and charges**

2.51 Complicated and time-consuming processes and excessive charges for RoW can result in delays in network rollouts. The Authority agrees with the stakeholders that high RoW charges levied for the street furniture will make the rollout of 5G small cells un-viable and hence will become the biggest roadblock in early deployment of 5G in the country, if not resolved timely. Indian states, cities and towns cannot afford to lose the

benefits of 5G accruing to their people and enterprises because of deployment delays. The Authority also agree with the viewpoint that CAAs should look at ROW permissions for DCI creation from the perspective of essential service delivery and overall economic development rather than considering it as a source of revenue generation.

2.52 The Authority has noted that DoT, vide the latest amendments to RoW rules, has already introduced provisions to rationalize the charges for RoW permissions across the country. A schedule has been added to the rules defining the fee, charges for restoration, and compensation for different items. The following table represents the schedule as provided in the RoW (amendment) rules 2022.

**Table 2.1: The Schedule provided in the RoW Amendment rules 2022**

| Rule | Item | Amount |
|---|---|---|
| **Part-I FEE** | | |
| 5(3) | For establishment of overground telegraph infrastructure | One thousand rupees per kilometer. |
| 9(3) | For establishment of overground telegraph infrastructure | (i)Ten thousand rupees for establishment of mobile towers<br>(ii)One thousand rupees per kilometer for establishment of overground telegraph line.<br>(iii) Nil for establishment of poles, for installation of small cells and telegraph line, on the immovable property vested in, or under control or management of appropriate central authority<br>(iv)One thousand rupees per pole for establishment of poles, for installation of small cells and telegraph line, on the immovable property vested in, or under control or management of appropriate authority, other than appropriate central authority. |
| 10A(2) | For installation of small cells and telegraph line using the street furniture | Nil. |

| Rule | Item | Amount |
|---|---|---|
| **Part-II Charges for restoration** | | |
| 6(2)(a) | Establishment of underground telegraph infrastructure where undertaking is not given by the licensee to discharge the responsibility to restore the damages | Sum required to restore immovable property as per the rate prescribed by central public works department for that area or as per the rate prescribed by state public works department for that area, if no rate has been prescribed by central public works department for that area. |
| 6(3) | Bank guarantee as security for performance in case of establishment of underground telegraph infrastructure where undertaking is given by the licensee to discharge the responsibility to restore the damages | 20% of the sum required to restore immovable property as per the rate prescribed by central public works department for that area or as per the rate prescribed by state public works department for that area, if no rate has been prescribed by central public works department for that area. |
| 10(3)(a) | Establishment of overground telegraph infrastructure | Sum required to restore immovable property as per the rate prescribed by central public works department for that area or as per the rate prescribed by state public works department for that area, if no rate has been prescribed by central public works department for that area. Further, licensee shall restore the damage incurred in case of establishment of poles for installation of Small Cells and telegraph line. |

| Rule | Item | Amount |
|---|---|---|
| **Part-III Compensation** | | |
| 6(1)(B) | Establishment of underground telegraph infrastructure | Nil. |
| 10(2) | Establishment of poles for installation of small cells and telegraph line | Nil. |
| 10A(4) | Usage of street furniture for installation of small cells and telegraph line | (i)For installation of small cells: Three hundred rupees per annum for urban area and one hundred and fifty rupees per annum for rural areas per street |

| | | |
|---|---|---|
| | | furniture.<br>(ii)For installation of telegraph line: One hundred rupees per annum per street furniture. |

2.53 Regarding the application for the establishment of overground telegraph line, sub-rule 3 of rule 9 of the amendment rules 2022 provides the following:

> *"Every application under sub-rule (1) shall be accompanied with such fee to meet administrative expenses for examination of the application and the proposed work as the appropriate authority may, by general order, deem fit:*
> *Provided that the one-time fee, to meet administrative expenses, accompanying every application shall not exceed the amount specified in Part-I of the Schedule."*

2.54 As can be observed from part I of the schedule, the one-time fee for establishment of poles, for installation of small cells and telegraph line, on the immovable property vested in, or under control or management of appropriate central authority has been prescribed to be Nil and for establishment of poles for installation of small cells and telegraph line, on the immovable property vested in, or under control or management of appropriate authority, other than appropriate central authority has been specified to be Rs. 1000per pole.

2.55 Besides the one-time charges, the following amendment of sub-rule (2) of rule 10 is another also rationalizes and uniformizes the compensation for use of infrastructure

> *"10. Grant of permission by appropriate authority. -(1) The appropriate authority shall examine the application with respect to the following parameters, namely: -*
>
> *.....*

*(2) Where the establishment of the overground telegraph infrastructure renders the immoveable property, vested in the control or management of any appropriate authority over which such overground telegraph infrastructure is established, unlikely to be used for any other purpose, the appropriate authority shall be entitled to compensation for the value of the immoveable property, either once or annually, assessed on such rates as that appropriate authority may, by general order, specify.*

*Provided that the compensation payable for the immovable property for the establishment of poles for installation of small cells and telegraph line shall not exceed the amount specified in Part-III of the Schedule."*

2.56 For charges related to restoration, the clause a of sub-rule (3) of rule 10 has been amended as follows:

*"(3) The appropriate authority shall, within a period not exceeding sixty days from the date of application made under rule 9 -*
*(a) grant permission on such conditions including, but not limited to, the time, mode of execution, measures to mitigate public inconvenience or enhance public safety or structural safety and payment of restoration charge, not exceeding the amount specified in Part-II of the Schedule, or compensation, as specified in sub-rule (2); or*
*(b) reject the application for reasons to be recorded in writing:"*

2.57 Further, while the ceiling of the fee to be collected from the licensee was limited to establishing overground telegraph infrastructure in RoW rules 2016, in the latest amendment, the scope has been expanded to include maintaining, working, repairing, transferring, or shifting overground telegraph infrastructure as can be seen from following proviso:

*"10. Grant of permission by appropriate authority.*
*(4) The appropriate authority shall not charge any fee and compensation other than those mentioned under sub-rule (3) of rule*

*9, sub-rule (2) and clause (a) of sub-rule (3) from the licensee for establishing, maintaining, working, repairing, transferring, or shifting overground telegraph infrastructure."*

2.58 The Authority applauds the efforts of DoT in significantly rationalizing various ROW related charges. The Authority feels that no further intervention is required in this regard currently.

viii) **Aerial fiber related amendments**

2.59 Aerial fiber is a widely used, quick and easy backhauling solution. It plays an important role in meeting the requirement of exponential data growth. But the extensive approval process and the large number of document submissions demanded by the authorities for grant for permission has been hindering the high-speed deployment of aerial fiber. Even with the RoW amendment of 2021 which intended to address the issue of laying aerial optical fiber cables, majority of the stakeholders are of the opinion that these set of guidelines have not pervasively covered the issues of aerial fiber deployment.

2.60 The RoW Amendment rules 2022 through rule 9 has provisioned–the following

**9. Application by a licensee. —**

…….

*Provided that the documents mentioned in clauses (ii), (iii), (v) (ix), (x) and (xi) shall not be required in case of application made for establishment of overground telegraph line—:*

**10. Grant of permission by appropriate authority. –**

…..

*Provided that the parameters mentioned in clauses (a), (b), (c), (g) and (h) shall not be necessary for examination of the application made for establishment of overground telegraph line:*

2.61 With the above provisions in place, issues like longer timeframe, involvement of large number of authorities, and higher costs for aerial fiber deployment, have been addressed. The approval process has been simplified to a large extent because a lot of steps that were previously applicable in the 2016 RoW rules have been reduced to just the examination of the route plan of the overground telegraph line by the appropriate authority. Therefore, the Authority is of the opinion that no further intervention is required regarding simplification of the procedures involved in approval for the installation of the overground telegraph line.

2.62 Apart from the permission process, in the absence of a holistic policy framework earlier, aerial fiber charges also varied from state to state. Some states are taking a one-time charge, some recurring and some both. The basis of charging is also not explained or unclear. The high fragmentation and in some cases, exorbitant state wise RoW charges for small cells and aerial fiber can end up becoming a significant input cost towards digital connectivity. This may lead to a situation where the TSPs may not be able to deliver services to their full potential and create gaps between the network connectivity achieved among different states and between rural and urban areas, thereby widening the digital divide.

2.63 DoT through the RoW (amendment) rules 2022 has tried to resolve the above issue through specification of one-time fee, restoration charges and compensation charges that can be levied for the establishment and usage of telegraph infrastructure. Sub rule 3 of Rule 9 has specified the upper limit for the one-time fee for establishment of overground telegraph line. The restoration charge for establishment of over ground telegraph infrastructure has been specified in Part II of the schedule as per Rule 10(3)(a). The compensation for the establishment of poles for installation of small cells and telegraph line has been specified to be Nil and usage of street furniture for installation of telegraph line has been rationalized as per rules 10(2) and 10(A)(4) respectively. With this amendment in place, the charges fixed thereof will reduce the state-wise

disparity. Therefore, the Authority is of the view that no further intervention is required in this regard at this stage.

## B. Infrastructure sharing by the Controlling Administrative Authorities with TSPs and IPs

2.64 To improve quality of service, ensure availability of services from multiple TSPs, and reduce the cost of infrastructure creation/usage, it is important that infrastructure sharing policies be encouraged. It is equally important to provide access to telecom infrastructure at all locations including airports, metro hubs, railway stations, ports, residential buildings etc. for service providers in a non-discriminatory manner. This will require the creation of standardized guidelines mandating access, regulating access, and sharing of telecom infrastructure. In this context, following questions were raised in the CP regarding creating a framework related to encouraging and provisioning asset sharing:

*iv) Whether it should be mandated that certain public infrastructure (municipality buildings, post offices, bus, and railway stations, etc.) be earmarked to have dedicated spaces that allow service providers to deploy macro/small cells? If yes, what can be the possibilities and under what legal framework this can be done? What should be the terms and conditions of use of such infrastructure? Please provide detailed inputs.*

*v) Can some of the street furniture like traffic lights, metro pillars etc. be earmarked for mandatory sharing between controlling administrative authority and Telecom Service/Infrastructure providers for deployment of small cells and aerial fiber? Does the existing legal framework support such mandating? What should be the terms and conditions of such sharing? Please provide details.*

*vi) How can infrastructure mutualization and infrastructure collaboration be ensured to avoid exclusive right of ways? What legal provisions can support mandating these? Provide full details.*

**Comments on mandating earmarking of dedicated spaces for provisioning of telecom infra on public land/other infrastructure**

2.65 Majority of stakeholders have put forward that there is an immediate need to design a legal framework to mandate certain public infrastructure to have dedicated spaces to deploy small cells, through suitable insertions in RoW rules. But there are a few other stakeholders who have proposed that this should be facilitated through a mutual agreement. One stakeholder has submitted that all private and Government utility providers while putting up new assets such as gas pipelines, HT power lines, streetlights etc. should be required to create corridors for accommodating telecom infrastructure.

2.66 A couple of associations have suggested that standard designed cabinets of specific dimensions on street light poles/traffic lights along with 24x7 power availability can be made available as dedicated space. Availability of reliable AC power and feasible space for battery backup, security for the protection of the installed equipment, and accessibility for maintenance on 24x7 basis are some of the primary requirements suggested for identifying dedicated spaces. Two of the stakeholders, after their assessments, have specifically provided that the required space for pole and infra (SMPS & Battery Bank) may be 1.5 x 1.5 meter to accommodate power, antenna and associated cabling equipment.

2.67 Following are the other suggestions prescribing terms and conditions for earmarking and use of dedicated spaces on public land/other infra:

- General terms and conditions need to be worked out by DoT so that certain minimum fees for using dedicated spaces may be prescribed.
- Proper advanced notification by TSPs indicating their network plan and timeline to CAAs.
- Guidelines containing rules related to the size and number of small cells that can be deployed on any single piece of street furniture may be prepared.

2.68 Common Telecom Infrastructure (CTI): One of the most common suggestions that has been put forth by most stakeholders is to amend the National Building Code. Ensuring compliance of provision of DAS/IBS and CTI for telecom services in all upcoming complexes should be a condition for grant of Building Completion certificate. One stakeholder suggested that TRAI may recommend the Government to form an expert group under TEC to design standards/guidelines for IBS.

**Comments on mandating sharing of SF with TSPs/IPs for deployment of small cells**

2.69 Majority of the stakeholders have suggested that all government owned SF shall be extended for deployment of small cells on a non-discriminatory, non-exclusive basis. One of them suggested that suitable amendments should be made in the current RoW Rules to mandate SF sharing.

2.70 To ensure easy access, stakeholders are of the opinion that the CAAs should be encouraged to come up with their own guidelines providing for SF infrastructures free of cost or bare minimum charges. Some stakeholders have pointed out the necessity of assessing the structural fitness of the structures prior to sharing.

2.71 Many stakeholders have proposed that CAAs can be incentivized to encourage them to share their assets with the operators. One of the associations has stated that CAAs can be incentivized by providing complimentary services for them through small cell networks deployed on their SF assets (like installation of surveillance cameras). Another service provider has put forth that the traffic light poles could be changed to smart connected traffic light poles (with a provision for mounting small cells) as a part of smart city initiative.

2.72 Regarding mandating of sharing of SF by the CAAs, a few terms and conditions have been suggested by the stakeholders:

- Green field Street furniture can have inbuilt provision for mounting small cells/Aerial fiber. However, if brownfield street furniture is

utilized, then TRAI can issue regulations and guidelines for mounting the small cells and aerial fiber on it.

- The list of street furniture can be cataloged in the centralized online portal with info about wind load and structural stability. There should be no requirement to take separate individual permissions for use of spaces of cataloged SF, only intimation may be required.
- A long lease option with bare minimum recurring charges for space usage can be prescribed. Simple, nominal, uniform charges depending on the number/ size/weight of equipment and per km in case of fiber needs to be fixed and charges should not be benchmarked with local area land rates/ commercial rates.
- Equitable access to SF with a spirit of accommodating all operators may be followed.

**Comments on Infrastructure Mutualization and Collaboration**

2.73 Most stakeholders are of the opinion that infrastructure mutualization must be made mandatory and exclusive RoW should not be given to anyone. This is to avoid any market distortions, monopoly on street furniture assets and to optimize the utilization of such street furniture across multiple TSPs. As per an association, in order to ensure co-existing ownership rights, service providers should be allowed to erect street furniture in collaboration with administrative authority.

2.74 Few of the service providers have provided a detailed interpretation of the two concepts of infrastructure mutualization and collaboration –

a. Infrastructure mutualization strategy will operate successfully when a common infrastructure is built, operated, and maintained by an infrastructure provider, and jointly used by TSPs, with each leasing a portion of the mutualized infrastructure and paying for it at a wholesale price.
b. Infrastructure collaboration/cooperation occurs when utility operators share RoW with broadband operators, or when telecom operators that provide different services share the same physical infrastructure. Cooperation differs from mutualization because

agents are not competing in the same market and, as a result, are more willing to share.

2.75 Few other stakeholders are of the opinion that the state of infrastructure in an urban area should be the factor considered to decide whether infrastructure mutualization is a suitable model to infrastructure collaboration. For instance, PPP model of infrastructure mutualization will be more useful for already built cities where the common infrastructure upgrade has been completed, whereas infrastructure collaboration will be a more suitable model for cities which are undertaking infrastructure upgrade projects or upcoming smart city projects. One of the smart cities corporations is of the view that in either of the scenarios, there should be a legal binding agreement on the shared infrastructure and the way it is being used. This is to monitor multiple agencies from the point of view of operation and maintenance.

2.76 To prevent exclusivity and ensure transparency of approvals, the following were suggested by one of the service providers:

- Suitable terms and conditions should be introduced in the Unified license and IP-I registrations, mandating the licensee/registration holder not to get into an exclusive tie-up for taking rights over street furniture.
- Fees must be publicly disclosed, competitively neutral, technology neutral, and based on actual and direct costs.
- Permits must be approved or denied on publicly available criteria that are reasonable, objective, and non-discriminatory.

**Analysis of the issues and views of the Authority**

2.77 The Authority is of the view that mandating dedicated spaces at public infrastructure and sharing of street furniture by CAAs can significantly speed up 5G network rollouts, particularly considering that India has a high density of street furniture structures. With such mandating, existing government structures (with or without minor modification or upgradation) can be used for rolling out 5G services. This would slash

the outlays required for building new structures and lower the costs. The Authority is of the view that Central and State Government authorities, statutory bodies, defense/cantonment areas, PSUs, educational institutes, public infrastructure project area which are developed in PPP model such as airports, seaports, metro rail, highways etc. should also permit the deployment of DCI like small/macro cells on government buildings and structures. Further, mandating provision of government spaces for DCI would save huge time and efforts of TSPs that might go in negotiating with the owners or CAAs.

2.78 The biggest beneficiaries of these small cell deployments would be administrative units which control critical infrastructure like ports, airports, metro trains and smart cities. One of the major benefits to these administrative units would come from immensely improved coverage in these areas where due to many technical and other reasons establishing big mobile towers has some limitations and patchy mobile coverage cost them in terms of customer experience and competitiveness. 5G small cell deployment can overcome these limitations.

2.79 Another big advantage for these administrative units is that small cells network, will transform their enterprise communication landscape in a big way. They stand to benefit from deployment of 5G small cells as the same will enable them to deploy various enterprise level applications which will enhance efficiency of their operations, reduce turnaround time of their critical operational activities, thereby reducing costs and increasing their profitability. This will also give them a huge competitive advantage over other competitors. 5G small cells will enable those Industry 4.0 technologies like Industrial Internet of Things (IIoT), Automation, Artificial intelligence, Digital Twining, Robotics, Edge Computing etc. which in coming years will become bedrock of next industrial transformation. Apart from Industry 4.0 applications, some of the use cases which are going to be enabled by these technologies are assistive driving, public safety and surveillance, emergency response and smart ambulances.

2.80 Among others one of the biggest beneficiaries of 5G small Cells will be the large number of Smart Cities across the country. The purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life by harnessing technology. 5G networks in general and small cells in particular will play a pivotal role in Smart Cities development, due to its capacity to offer next generation solutions to meet the needs of Smart City dwellers. A 5G network with Small Cells can transport data from a massive number of small IoT devices embedded in roads and pavements to City Control Center which will result in better traffic management by reducing the idling time at traffic lights. There is a need for high bandwidth and a secure and dependable data flow for provision of smart services like public safety even in hard-to-reach locations such as underground car parks or pavements. The 5G use cases that smart cities can implement, will help them in adopting innovative approach to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.

2.81 Some countries like UK, Singapore, US have already provisioned for such sharing or access to street furniture structures through state laws/codes. The German Telecommunications Act[8] entitles operators of public telecom to use trafficways free of charge. Further, under the Act, the owner of a property cannot prohibit the setting up, operation and renewal of telecommunications lines on his property subject to certain conditions. Japan Government has allowed its service providers to set up 5G base stations on traffic signals, hoping to reduce the cost and time it takes to roll out the ultrafast networks[9]. Roughly 200,000 traffic signals administered by local governments can be used. For incentivizing the local authorities, they have been allowed to use the networks for self-driving vehicle projects and emergency communications in natural disasters. It is also expected that the cost of

[8] https://rm.coe.int/16806af19e

[9] https://asia.nikkei.com/Spotlight/5G-networks/Japan-to-greenlight-5G-base-stations-on-200-000-traffic-signals

using the traffic signals would be split with the local governments. The Punjab draft policy for small cells has provisions for infrastructure sharing to all mobile network operators on an open access basis.

2.82 Town and Country Planning Organization under Ministry of Housing and Urban Affairs has issued guidelines, through addendum to Model Building Byelaws, 2016[10], to mandate charging infrastructure provisions in various buildings. Based on the occupancy pattern and the total parking provisions in the premises of the various building types, charging infrastructures is to be provided for electric vehicles, which is currently assumed to be 20% of all 'vehicle holding capacity' at the premises. Additionally, the building premises must have an additional power load, equivalent to the power of all the charging points operated simultaneously. The Authority is of the view that in a similar way provisions can be made in different acts so that buildings, public spaces, etc. can be mandated to have dedicated spaces earmarked for placement of DCI like small cells.

2.83 One of the most common suggestions given by stakeholders is regarding provision of DAS/IBS and Common DCI for telecom services in all upcoming complexes. As mentioned in the CP, the Authority is handling the issue of inbuilding access through a separate consultation paper on "Rating of Buildings or Areas for Digital Connectivity" that has been released on 25th March 2022. Keeping in mind the exponential growth in communication network expansion and introduction of new technologies especially in the wireless segment, this Consultation Paper discusses the importance of creating a well-defined system to ensure availability of reliable and robust digital connectivity infrastructure in every building.

2.84 The Authority agrees with the view of stakeholders, that for faster deployment of small cells certain street furniture should be mandated for use for small cell deployment as has been done in Japan. This will

[10] https://archive.pib.gov.in/documents/rlink/2019/feb/p201921501.pdf

ensure the available infrastructure is readily available for deploying small cells and will reduce the hassle of getting ROW permissions. Therefore, the Authority feels that if CAAs can be mandated to (a) share certain street furniture and (b) earmark certain dedicated spaces in government buildings, this can help in the rollout of 5G services at much lower costs. The CAAs in turn will be benefited by availability of 5G networks and services.

2.85 In view of the above, **the Authority recommends that:**

i **DoT should issue advisory guidelines to States for mandating CAAs that own/control traffic lights to share these assets with TSPs/IP-Is for deployment of small cells subject to structural stability.**

ii **All Central Government entities should earmark dedicated spaces in their existing and planned buildings/structures for installing DCI including small and macro cells. Dedicated spaces on rooftops should be identified for deploying small/macro cells. All such spaces should be GIS mapped and made available on GatiShakti Sanchar portal for charge free use by TSPs/IP-Is on non-discriminatory basis.**

iii **Advisory guidelines should also be issued to State Governments for similar action by their entities and local bodies. DoT should also follow up with State Government for implementing the guidelines.**

2.86 In the Pilot project conducted by TRAI at Bhopal Smart city, some of the identified street furniture such as electricity pole, metro pillar and overhead water tanks could not be used for small cell deployment due to feasibility issues. For example, some of the electric poles could not be used for deploying small cells because of safety concerns and unavailability of sufficient space at desired height for antenna and RF module. Similarly, overhead tanks were not found suitable due to

unavailability of mounting provisions at required height. Since there are lot of variations in the specifications of street furniture across locations, GIS mapping, image of street furniture and cataloging the street furniture online along with their specifications can serve as an effective and simpler process to know about availability and suitability of street furniture. The Authority is in sync with the stakeholders' suggestion that the list of suitable street furniture can be shared in the centralized online portal after assessing their structural stability (for weight and wind load) and availability of power supply. Recommendations in this regard have already been made above.

2.87 As far as infrastructure mutualization and collaboration is concerned, the Authority has always advocated infrastructure sharing for the sector's growth. Infrastructure sharing enables economies of scale, improves affordability, and avoids duplication of networks where possible. It allows faster rollout of networks and services. World Bank has also advocated that for governments, sharing is an opportunity to expand the knowledge society faster and at lower costs[11]. The Authority in its recommendation on "Infrastructure sharing" dated 11th April 2007 had advocated for sharing of passive and active infrastructure. TRAI has also recommended that infrastructure providers (IP-I) should be allowed provisioning of various active network elements. These recommendations have been made through the recommendations on 'Enhancement of Scope of Infrastructure Providers Category-I (IP-I) Registration' dated 13th March 2020 and reiterated through Recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31st August 2021. Recently, TRAI vide letter (attached as **Annexure III**) to the DoT dated 1st February 2022 had pointed out that infrastructure sharing provisions in Unified License mentioned in the chapters related to generic conditions and authorization specific chapters are at contradiction. Thereby it was

11 https://thedocs.worldbank.org/en/doc/5332/original/WDR16BPInfrastructureMutualisationGarcia.pdf

requested that the DoT should bring clarity on the provisions of sharing of infrastructure under different licenses.

2.88 Infrastructure sharing in the telecom sector has sometimes led to exclusive arrangements entered into by stakeholders. Therefore, apart from mandating sharing of SF, it is also important to ensure equality and non-discrimination in sharing. Exclusive arrangements in the infrastructure sharing needs to be avoided for a level playing field. This would go a long way in ensuring optimum uptake of street furniture for small cell deployment, thereby helping in densification of networks.

2.89 The Authority agrees with the stakeholders' opinion that in case of limited SF availability against demand, equitable distribution with a spirit of accommodating all operators should be followed. When any asset controlling authority is offering their infrastructure, sharing by all possible candidates should be ensured to the extent possible. The Authority therefore feels that apart from cataloguing the available street furniture for sharing, respective CAAs should also ensure that such SF is made available on a shareable and non-exclusive basis. The Authority firmly believes that no exclusive rights of street furniture be given to any TSP.

2.90 **The Authority therefore recommends that enabling provisions or suitable terms and conditions shall be introduced in all telecom licenses and IP-I registration agreement prohibiting the TSPs/IP-I providers from entering into any exclusive contract or right of ways with infrastructure owners/CAAs or any other authority.**

2.91 **The Authority also recommends that DoT should include the following in their advisory guidelines to States:**

**i All CAAs or asset controlling authorities should prohibit entering into exclusive rights/exclusive tie-up with any**

**licensee/registration holder. SF infrastructure should be offered in a non-exclusive and non-discriminatory manner.**

ii **In future, tenders for setting up new SF structures by the appropriate authorities, the possibility of sharing of SF on non-exclusive basis, for hosting DCI like small cells and aerial fiber should be kept in mind. The terms and conditions for offering all assets that are catalogued and uploaded on GIS portal, should have a mention that the SF is being offered on non-exclusive basis and will be shared with other eligible entities.**

iii **In line with GatiShakti initiative, in all future projects of utility providers that are partially or fully funded by government to put-up new assets (such as gas pipelines, HT power lines, streetlights) or expand existing assets, provisions to host/support DCI such as small cells, towers, and aerial fiber should be in-built.**

2.92 **The Authority also recommends that DoT should immediately act on TRAI's letter dated 1st February 2022 (attached as Annexure III) and bring clarity on the provisions of sharing of infrastructure under different licenses to remove the ambiguity in infrastructure sharing provisions in Unified License mentioned in the Chapters related to generic conditions and authorization specific chapters.**

2.93 The Authority as per its Recommendations on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed dated 31st August 2021 had suggested the formation of an agency for undertaking the planning and development of common ducts and posts infrastructure across the country on a non-exclusive basis as below:

*7.23 For planning and development of common ducts and posts infrastructure across the country, a central entity, namely*

*'Common Ducts and Posts Development Agency (CDPDA)', on nonexclusive basis, should be established by the Central Government with the following functions: —*

i. *Planning, development, and management of sharable common ducts for laying underground optical fiber cables;*
ii. *Planning, development, and management of sharable common posts for laying overground aerial optical fiber cables and hosting of small cells equipment;*
iii. *Coordinate with Appropriate Authorities to identify an exclusive strip of land of about 0.5 Meter width along public pathways for laying common ducts;*
iv. *Formulating and implementing schemes, including in Public-Private Partnership (PPP) mode, for development of sharable common ducts and posts;*
v. *Coordinate with Appropriate Authorities to exempt RoW charges for development of sharable common ducts and posts;*
vi. *Cross-sector collaboration with other utility providers i.e., roadways, railways, water, electricity, gas etc. for co-deployment of common ducts;*
vii. *Declare terms and conditions of sale/ leasing of common ducts and posts in non-discriminatory manner to service providers and infrastructure providers;*
viii. *Developing and providing consultancy and construction services for common ducts and posts on a national and international level.*

2.94 'Common Ducts and Posts Development Agency' (CDPDA), is expected to coordinate and collaborate with providers as well as seekers of common ducts and posts for creation of common ducts in the country. The back-reference dated 28th June 2022, received from DoT on TRAI's recommendations on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed", had suggested that the co-deployment of common telecom duct may be managed by the proposed National Fiber Authority (NFA). TRAI had agreed to the same through its response dated 25th July 2022, thereby replacing CDPDA with NFA. Regarding the above

recommendation, the Authority is of the opinion that the scope of the NFA should be expanded beyond common ducts and telegraph posts, to undertake responsibilities related to above-ground contrivances, appliances, and apparatus. Further, the agency should also be given the responsibility of ensuring that CAAs share street furniture assets on a non-exclusive basis to the extent possible.

2.95 The Authority has observed that the Hong Kong Authority Guidelines[12] on the use of public payphone kiosks/bus stops for the installation of Radio Base Stations (RBSs) for provision of Public Mobile Services, provision has been made for that in case more than one MNOs have made requests to use the same structure and there is insufficient space available to meet the demands of all the MNOs concerned, the Bus company/kiosk owner (CAAs) advises the mobile network operator (MNO) that they should coordinate among themselves to work out a technically feasible solution for the shared use of the structure for the installation of RBSs. In case the MNOs concerned fail to reach agreement for the shared use of a specific structure, they should accept the decision of the CAA which may use a fair and reasonable method to determine the MNO(s) selected to make use of the structure for installation of RBSs.

2.96 The Authority in its earlier recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021 vide para 7.11, *inter alia*, has emphasized that the Central Government in coordination with the State Governments should consider constitution of a National RoW Council so that in timebound manner the policy and legal framework for RoW permissions could be put-in-place.

The Authority is of the opinion that the proposed council can oversee the RoW matters concerning access to street furniture as well for small cell deployment. Now that the latest RoW Amendment Rules 2022 have included specific provisions for access to street furniture for small cell

[12] https://www.coms-auth.hk/filemanager/statement/en/upload/567/gn122021.pdf

deployment, the proposed council can monitor the implementation of these rules.

2.97 Considering the above, **the Authority reiterates that its earlier recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021 (para 7.23) may be implemented at the earliest. National Fiber Authority (NFA) should be formed in priority to undertake the planning and development of common duct and posts infrastructure. The scope of the agency should be expanded beyond common ducts and telegraph posts, to undertake responsibilities related to above-ground contrivances, appliances, and apparatus. Further, NFA should also be given responsibility of ensuring, in consultation with State Governments that CAAs share street furniture assets on non-discriminatory, transparent, and non-exclusive basis.**

2.98 **The Authority also recommends that in case more than one TSP makes requests to use the same SF and there is insufficient space available to meet the demands of all the requesting TSPs, they should coordinate among themselves to work out a technically feasible solution for shared use of the structure for the installation of equipment. In case the TSPs fail to reach an agreement, they should accept the decision of the CAA which may use a fair and reasonable method to select the TSP(s) who will use the SF**

**The above provision should be made part of the Indian Telegraph Right of Way Rules, 2016 through a suitable amendment by issuing a Gazette notification.**

2.99 **The Authority reiterates its earlier recommendation on 'Roadmap to Promote Broadband Connectivity and Enhanced**

**Broadband Speed' dated 31.08.2021 (para 7.11) for formation of a National RoW Council. All the RoW matters related to street furniture should also be placed before this council.**

## C. Street furniture and small cell sharing among TSPs and IP-Is

2.100 Infrastructure sharing is critical for small cell networks due to the required density of deployment[13]. In absence of appropriate framework to promote sharing amongst TSPs, it will be difficult to achieve the required small cell densities. SF sharing practices will help India's small cell deployment scenario in terms of enabling economies of scale and affordability. In the discussions related to sharing of street furniture and also active infrastructure through the possibility of a MO-RAN model, the following question was raised in the CP to solicit the opinion of the stakeholders.

*vii) How can sharing street furniture for small cell deployment be mandated or incentivized? What operational, regulatory, and licensing related issues are expected to be involved in sharing of small cells through various techniques in the Indian context and what are the suggested measures to deal with the same?*

**Comments on sharing of street furniture and small cells among TSPs/IPs**

Sharing of street furniture

2.101 A couple of stakeholders have suggested that sharing of street furniture should be mandated/incentivized through insertions of suitable clauses in the tenders for all the PPP projects. One stakeholder suggested that the scope of IP should be enhanced and TSPs should be asked to avail the facility provided by the IPs instead of developing their own system.

[13] https://ec.europa.eu/downloadPublic?documentIds=PPGMS

This will reduce the cost, enhance the utility of small cells, ease the maintenance of networks at street furniture, thus leading to a full expansion of 5G services and fair competition between TSPs. An association had added that IP-Is should be the first one to be offered development of common infrastructure. Exclusive rights of laying infrastructure should be given to ensure some long-term business viability

2.102 In order to encourage sharing of street furniture, a few incentivization strategies were shared by the stakeholders. One suggestion was on providing financial incentives in payment of Spectrum usage charges (SUC)/License fee (LF). Another suggestion was that there should be both fiscal and non-fiscal incentives for the operators. A stakeholder suggested that wherever suitable, sharing should be incentivized and any revenue from such sharing should be allowed to be deducted from Gross Revenue while calculating the AGR/ApGR. Currently IP-Is who provide overground infrastructure already follow a mechanism of subsidizing the fees based on the number of tenants on a particular site. A similar process could be adopted for incentivizing the services providers while sharing the street furniture. The application of the Plan Build Operate (PBO) model which provides land use rights to TSPs/IPs to create and share the infrastructure among themselves was another suggestion put forward by a service provider.

2.103 One of the service providers is against mandating sharing of street furniture because sharing of the same structure by multiple TSPs would make the individual site bulky and it will be difficult to maintain the aesthetic appeal. Further, the current stringent EMF requirements, if unchanged for small cells, would be a massive deterrent for small cell sites to be co-located. Further, it might be difficult to accommodate all the independent requirements of TSPs at a single location. The following alternate solutions were provided to tackle the same:

i. TSPs to deploy at alternate site locations rather than co-locating at a single location.

ii. Smart Poles can be deployed by the TSPs which will cater to all the TSPs and city requirements which can be incentivized by offering OFC RoW and waiver of some fees.

Sharing of small cells

2.104 Stakeholders have expressed varied opinions regarding small cell sharing. As per majority of the comments, sharing of small cells among telecom licensees should be left to mutual negotiations, and no regulatory intervention is required. Out of those in favor of small cell sharing, two of them are of the opinion that there is no issue in such sharing since it does not entail spectrum sharing and hence no licensing or regulatory hurdle is envisaged for a telecom licensee. Some stakeholders have suggested encouraging MO-RAN based sharing as discussed in the CP. It has been suggested that the capital cost involved in installation of network shall be borne by all TSPs equally, but operational cost may be apportioned amongst TSPs according to the share of total traffic by each TSP.

**Analysis of the issues and views of the Authority**

2.105 In a pilot study conducted at Amsterdam, a TSP collaborated with a global leading company which owns over 100,000 street furniture assets in the Netherlands. The SF owning company had existing agreements with the local authorities, with contracts of 10-20 years already in place. By leveraging these existing permits, the said TSP and other operators were able to significantly speed up their small cell rollouts. The street furniture used included facilities for powering the small cells and terminating fibers that were laid on the street, thus eliminating or reducing the need for additional civil works and providing future-proofed high-speed backhauling capable of supporting upgrades to 5G. One additional major benefit of the same was that it enabled multi-operator passive sharing (MO-RAN) by accommodating up to four separate small cells within the same street furniture asset. This is an example of how

street furniture sharing, and small cell sharing can speed up the deployment.

2.106 Some stakeholders have suggested adoption of MO-RAN model in case small cell sharing is to be done. For this, the Authority points out that the DoT has already enabled sharing of radio elements for Access and ISP authorizations under the UL and UL-VNO licenses 2022, in Operating conditions for 'Sharing of Infrastructure' stated as under:

> *Sharing of Active infrastructure amongst Service Providers based on the mutual agreements entered amongst them is permitted. Active infrastructure sharing will be limited to antenna, feeder cable, Node B, Radio Access Network (RAN) and transmission system only. Sharing of infrastructure related to Wi-Fi equipment such as Wi-Fi router, Access Point etc. is allowed. Sharing of backhaul is also permitted.*

The Authority opines that MO-RAN sharing can be adopted on a mutually agreed basis by licensees as per their license terms and conditions and no additional action or separate provision for small cells radio equipment is required at this moment.

2.107 The Authority is of the view that actual deployment scenarios for small cells scenarios are still emerging. The involved cost structures in different deployment scenarios are still uncertain. This also came out from the pilot study conducted by TRAI. Sharing will happen only in such deployment scenarios where cost savings are substantial. The Authority agrees with submissions of stakeholders that sharing of small cells should be left to mutual negotiations for the time being and that no regulatory intervention for sharing of small cell radio equipment is required at this stage. This may however be later reviewed when clear deployment scenarios emerge and there is better understanding of costs involved in different deployment scenarios.

2.108 The Authority agrees with stakeholders that sharing telecom infrastructure helps in expanding network coverage, reducing CAPEX

and OPEX and minimizing duplication of infrastructure. The possibility that sharing can be mediated by a neutral third party (e.g., IP-I companies), which serve multiple service providers in each site, even as their individual networks remain competitively independent of each other, makes sharing an interesting option. Currently IP-Is who provide overground infrastructure already follow a mechanism of subsidizing the fees based on the number of tenants on a particular site. Thus, sharing has an inherent incentivization mechanism whereby the participating entities gain through reduced costs. Despite that, the Authority has observed during the four Pilot projects that TSPs were not very keen on adopting to sharing. The Authority is of the opinion that in a market where there are large number of players, the inherent or inbuilt incentives of cost reductions can promote infrastructure sharing. However, in a market which has only a few players, some players may look at building exclusive networks to gain competitive advantage. This may not be in the overall interest of the country where large investments are still required to build DCI in every nook and corner of the country. The Authority thus feels that there is a need for a nudge intervention whereby there should be incentives for those Telecom Service Providers who build infrastructure and come forward to share it with others. TSPs who lease their infrastructure for sharing (lessor) should get some incentives. One of the ways of offering them an incentive is by way of allowing deduction of revenues earned by the lessor TSP by way of the payments received from the lessee (the other TSP who seeks to use the infrastructure of lessor TSPs for sharing) from their Gross Revenues (GR) for arriving at Applicable Gross Revenues (ApGR).

2.109 IP-Is are the main players to be offered development of common sharing infrastructure, as their business model is based on sharing on a non-discriminatory manner. The revised guidelines[14] for registration of IP-I, 2021 provisions that the registration of IP-I shall be on a non-exclusive

[14] https://dot.gov.in/sites/default/files/RevisedIP-1Guidlines22122021.pdf?download=1

basis without any restriction on the number of tenants and shall provide for the use of infrastructure in a non-discriminatory manner.

2.110 The following are the relevant extracts from the IP-I registration guidelines:

*"The Infrastructure Providers Category-I are those Infrastructure Providers who provide assets such as dark fibers, Right of Way, duct space & tower.*

*.....*

*8. The IP-I registered company shall provide dark fibers, Right of Way, duct space, towers on lease / rent out / sale basis to the licensees of telecom services on mutually agreed terms and conditions."*

*.....*

2.111 The following are the relevant extracts from the IP-I registration certificate

*"This is to certify that M/s ----------with registered office at ---------- is registered as Infrastructure Provider Category I (IP-I) to establish and maintain the assets such as Dark Fibers, Right of Way, Duct Space and Tower for the purpose to grant on lease/rent/sale basis to the licensees of Telecom Services licensed under Section 4 of Indian Telegraph Act, 1885 on mutually agreed terms and conditions."*

2.112 The existing guidelines as quoted above are focused on macro cells. With the evolution of 5G services, the Authority is of the opinion that these guidelines should be modified to include the term 'poles' as defined in the RoW-2016 rules, (as amended in 17.08.2022).

2.113 **In view of the aforesaid, the Authority recommends that charges paid by lessee TSP to lessor TSP for use of shared infrastructure should be reduced from the Gross Revenues of**

**the lessor TSP to arrive at Applicable Gross Revenue (ApGR) of such Lessor TSP. To implement this, a new item named as "Revenue earned from other licensed TSPs from sharing/leasing of infrastructure" should be inserted under existing license condition named as "List of other items to be excluded from GR to arrive at ApGR". This modification may be carried out in UL, UL(VNO) and ISP licenses. Also, the information collected in the "Format of Statement of Revenue and License Fee" that is attached with each authorization chapter in UL, UL(VNO) and with ISP licenses needs to be modified to capture information from such revenues under a separate head.**

2.114 **The Authority also recommends that the guidelines and registration agreement of IP-I providers should be modified to exclusively mention the term 'poles' in their scope of work.**

## D. Process Simplification, Permission Exemption, Standardization of small cells and Installation practices

2.115 The use of higher frequency bands, lower penetration of those frequencies, large bandwidth and low latency requirements of 5G use cases will require thousands of small cells in an area. Accordingly, the EU Staff Commission document, 2020 states that "If the current rules on deployment of macro-cells remain applicable also to small cells, without exceptions, this would have a multiplicative effect on the administrative effort to request, assess and grant individual permits. The resource burden both on the operators' side and on the public administrations' side would become excessive and thus cause long delays and finally stifle investment". The importance of adopting a system where approvals are provided at a national level using generic

declarations and standardized classes in order to evolve towards a system of simplified, standardized, and repeatable set of processes was covered in the CP. The Authority had taken up the subject in detail and studied the best practices being followed by various countries.

2.116 Comments relating to the need for standard documentation and adoption of international standards for permit exemption, were solicited from the stakeholders through the following questions. A question related to the need for standardization of small cell equipment or installation practices was also posed alongside.

*viii) Should there be permission exemption for deploying certain categories of small cells at all places or all categories of small cells at certain places (Like apartments etc.)? What legal framework will support such exemptions?*

*ix) What should be the criterion/ conditions (like power, height etc.) and administrative procedure for implementing such exemptions? Please provide exact text with detailed justifications.*

*x) For Small Cells that do not fall under the exemption category, should there be a simplified administrative approval process (like bulk approvals etc.) for deployment? If yes, what should be the suggested process? If not, what should be the alternative approach?*

*xi) Is there a need for standardizing the equipment or installation practices for next generation small cell deployment on street furniture? If yes, what are the suggested standards and what should be the institutional mechanisms for defining, and complying to them?*

**Comments on permit exemption and criteria for exemption for installation of small cells**

2.117 Broadly, most of the stakeholders opined on adopting the concept of permission exemption for small cells. But their views diverge on the location and type of small cells that can be exempted. Stakeholders have

suggested a) exemption from paying user charges, b) exemption from building permits, and c) exemption from frequency exposure certification for small cells. Regarding the questions on the two types of exemption posed in the CP, few of them have suggested that all categories of small cells can be exempted at certain places. Few of the others suggested that only certain categories of small cells need to be exempted at all places or certain places. The suggested areas for exemption include common areas in apartment complexes/buildings, privately owned commercial places like shopping malls/complexes and Government or PSU buildings. Small cell infrastructure to be installed within such existing buildings can be exempted from specific notification or other permission requirements.

2.118 A few stakeholders have suggested that wall mount outdoor small cells and those small cells with an EIRP less than 10W can be exempted from permissions. Along with small cells, it was also suggested that Micro-Communication equipment, supporting telecom infra like in-building fiber laying, installing termination boxes, putting OLTs, laying ODN should also be exempted from formal permissions. One service provider has stated that there should be no restriction on the type of small cells installed as long as it meets the EMF radiation norms of DoT. Another suggestion was that safety and structural capacity of the infrastructure should be the only consideration for deciding small cell installations and no other permissions should be required.

2.119 One of the stakeholders had suggested that for small cells working at the same EIRP, the exemption process should be decided separately for rural and urban areas, and indoor vs outdoor installations. Another stakeholder suggested that different slabs of technical specifications based on the size, shape, area of coverage can be defined and within those slabs, certain categories could be exempted from the permissions. The building code should also be modified to provide for identified space for these exemption category small cells in the building.

2.120 Majority of the stakeholders have proposed that criteria based on power emitted and deployment heights needs to be adopted and a general declaration and certification of the equipment at a national/regional/local level can be made. It was also suggested by a stakeholder that either the DoT in consultation with the operators or TEC in conjunction with TRAI, should have a detailed discussion with TSPs and Original Equipment Manufacturers (OEMs) to decide on the permit exemption mechanism and criteria. A suggestion to consider additional factors such as maximum radiated power, minimum loss between transmitter and passing people, and network performance was also put forward by one of the associations for prescribing necessary exemptions. It was put forward by one of the Smart cities that TRAI should develop standards and guidelines similar to Europe's EECC for public and privately owned buildings by incorporating permissible criteria on the power, antenna position, etc. A few of the stakeholders opined that India should adopt installation classes IEC 62232 and ITU-T K10032 similar to those adopted by the EU as discussed in detail in the CP. Some other ranges of factors have been suggested for consideration including area, volume and radio characteristics. An association has cited the example of the USA that has adopted rules exempting small cells from environmental assessments that meet certain limitations on size and visibility. The following table summarizes some of the submissions of stakeholders on exemption criteria for small cells.

**Table 2.2: Suggestions of small cell and site wise permit exemption criteria**

| | Stakeholder 1 | Stakeholder 2 | Stakeholder 3 | Stakeholder 4 |
|---|---|---|---|---|
| Output power | 4*5W | 1.2- 1.5 KW | 38dBm | <10W |
| Duplexing | 4*4 MIMO | | | |
| Permissible deployment height | >3m | 6 m | >=10m | > 9m |
| EMF Applicable | >1000W | | | |

| | | | | |
|---|---|---|---|---|
| Power | 3KW | | | |
| Power backup | 4hrs | | | |
| Weight of equipment | | 100 to 150 KG (3 Small Cells + power back up + FDB with fiber) | | |

2.121 A couple of the stakeholders have stated that the RF-EMF compliance boundaries typically evaluated based on peak transmit powers create overly conservative RF-EMF limits that constrain the density of small cell deployments. For facilitating network densification, they suggest that the EMF exposure levels should be reviewed, and the recent guidelines issued by ICNIRP in 2020 be adopted in India also.

**Comments on Simplified administrative approval process for Small Cells installation that do not fall under the exemption category**

2.122 For those small cells that do not fall under the exemption criteria, most stakeholders have unanimously proposed for the implementation of a one-time bulk approval/intimation route through simple online process/digital tools. Another suggestion put forward by the majority was around reducing the approval timelines to 15-30 days with automatic deemed approval after 30 days through online portals. In contrast to the suggestion of bulk approval, one of the stakeholders has stated that administrative approval may be necessary and should be decided case to case, instead of bulk approval.

2.123 It was proposed by a service provider that the small cells not falling under the exemption category should be kept under a much-simplified administrative self-certification based deemed approval process. Since the output power of small cells is much less compared to macro cells, small cells can be installed at lower height as it emits lower power, hence a generic declaration conforming to the maximum allowable power under the small cells category should be sufficient without any additional document process. The documentation requirement can be

simplified through this self-certification mechanism with a minimum one-time fee covering all types of costs for such small cells.

**Comments on Standardization of small cell equipment or Installation practices**

Standardization of small cell equipment

2.124 Since standardization of small cell equipment might have both pros and cons on the deployment of small cells, a few stakeholders are in favor while a few are against standardization. A stakeholder has suggested that the standards of equipment and installation practices may be fixed so that new street furniture may conform to it, and existing street furniture may adapt. Another stakeholder has added that manufacturers of small cell equipment must ensure that they conform to relevant technical standards and to any essential requirements in terms of health and safety. A suggestion provided is that TEC in consultation with TSPs can come up with broad guidelines for design specifications through a separate activity and that no other local agency/body/authority should prescribe any requirements. It has also been suggested that standardization should be market driven.

2.125 Two stakeholders have commented that the size of small cell equipment (cabinet, holding box, device dimensions, etc.) should be standard, be modular in nature for installation and deinstallation needs and that there should not be any additional requirement for wiring. As per another stakeholder, similar to BIS, IEC, ARAI etc. standard creating bodies, the Government shall entrust public bodies to verify and provide approvals based on relevant parameters of the equipment and installation process. Another suggestion was that the equipment should comply with TEC standard TEC 13019:2021, as may be amended from time to time. One stakeholder suggested that configurations such as RF frequencies, backhaul connectivity (OFC, microwave etc.), wind speed/load, noise (not greater than 65 dBA measured at 25 feet), and structural integrity can be considered for equipment standardization. An

association has suggested exploring and standardizing convergence of fiber and power connectivity and giving emphasis on new OFC technologies such as Ribbon technologies. Further it was suggested that telecom infrastructure deployed under the National Building Code (NBC) /within any premises must comply with fire safety requirements like the CPR rating in European countries. In contrast to the above, a few of the stakeholders believe that an immediate need for this standardization may not be prudent and may even be counterproductive at this stage. Therefore, they proposed that standardization needs to be done only for structures, poles and other street furniture that will be developed in the future.

Standardization of installation practices

2.126 A few stakeholders state that the deployment templates will emerge under the market-based evolution, therefore standardization of installation practices is not prudent currently. Contrarily, one of the service providers opines that depending on the street furniture category, deployment and installation guidelines can be specified to minimize visual impact and ensure positive opinion from the public. Another stakeholder adds that TEC can issue guidelines in respect of the structural safety of the SF for installation of small cells. A stakeholder has suggested detailed characteristics of installation for outdoor small cells which is as follows: The power of the small cell should be between 1.2 to 1.5 KW and the antenna should be placed at a height of six meters. Given that the pole can usually sustain up to 100 to 150 kg, it can accommodate three small cells, power backup and FDB with fiber. Clamps should be made available in the SF for mounting small cell and the SF shall be able to withstand a predefined applicable wind velocity in that area under maximum permissible loading

**Analysis of the issues and views of the Authority**

2.127 The Authority recognizes that the issuance of individual permissions for small cells at the state, regional or local level can make it difficult for

operators to keep track of the variety of rules and processes that will be followed by each authority. To deal with the humongous volume of small cell installation permissions continuing with the existing process may become difficult not only for telcos but also for permission processing authorities. Process complexity and also resource bottlenecks will result in delays as the number of applications increases. The Authority feels that introducing a permit-exempt regime can aid in minimizing such delays and will help in quick modernization and upgradation of the networks. A permit-exempt regime will help in ease of doing business for service providers thus resulting in quicker rollout of the next generation network. At the same time, there is need to keep in mind that public health is protected, and visual landscape remains coherent. Therefore, the most important factor for creating an exemption regime is the selection and specification of characteristics that serve balanced interests of various stakeholders, generate public acceptance as well as improve network rollout significantly.

2.128 As far as the radio frequency related monitoring is concerned, in India, the Department of Telecommunications (DoT) gives guidance on the EMF exposure assessment, providing various categories based on the reference from several ITU recommendations and international standards. The TEC report on "Test Procedure for Measurement of Electromagnetic Fields from Base Station Antenna, No: Tec 13019: 202" has released a test procedure to ensure that the EMF exposure from cellular base station installations conform to the exposure limits prescribed by DoT.

2.129 TEC has also provided for the audit requirement of base stations in line with the introduction of Low Power Base Transceiver Station (LPBTS) (having EIRP limited to 100 W) in the Indian telecom market. Simplified Assessment Procedure criteria based on mounting height, main lobe direction and distance to other ambient sources as EMF evaluation techniques has been adopted as per the ITU-T Recommendation K.100. Out of the three classes of base stations defined by the TEC, the

Inherently compliant category includes base stations with EIRP <=2W where no assessment procedure is required, only self-certification is needed. The normally compliant class includes those base stations with EIRP > 2 and ≤ 100 Watts. For this class, a report is to be filed proving that compliance as per Simplified Assessment Criteria (SAC) (as per Table 2.3) is exhibited. The Provisionally compliant class that includes base stations with EIRP >100 Watts EIRP shall be subjected to LSA Units audit by measurement of EMF exposure levels using Broadband / Frequency selective measurement procedures.

**Table 2.3: Simplified assessment criteria as per No: Tec 13019: 202**

**Restriction on minimum height of lowest radiating part of antenna and minimum distance to areas accessible to general public in the main lobe direction for Low Power Base Station (EIRP <100 W)**

Table 1: For base stations with Frequency of operation between 400 MHz to 2000 MHz

| Sr. No. | EIRP (in Watts) | Minimum Height(in metres) as per different antenna tilts in degrees | | | | Minimum distance (in metres) for publically accessible area in the main lobe direction | Minimum distance (in metres) for other emitters (≥ 10 W) in the main lobe direction |
|---|---|---|---|---|---|---|---|
| | | 0° | 5° | 10° | 15° | | |
| 1 | ≤2 | No specific criteria. According to [ITU-T K.52] emitters with a maximum EIRP of 2 W or less are inherently compliant | | | | | |
| 2 | ≤10 | 2.5 | 2.7 | 2.8 | 3.0 | 1.9 | 9 |
| 3 | ≤20 | 2.8 | 3.0 | 3.2 | 3.4 | 2.6 | 13 |
| 4 | ≤30 | 2.9 | 3.2 | 3.5 | 3.7 | 3.2 | 16 |
| 5 | ≤40 | 3.1 | 3.4 | 3.7 | 4.0 | 3.7 | 19 |
| 6 | ≤50 | 3.2 | 3.5 | 3.9 | 4.2 | 4.2 | 21 |
| 7 | ≤60 | 3.3 | 3.7 | 4.1 | 4.4 | 4.6 | 23 |
| 8 | ≤70 | 3.4 | 3.8 | 4.2 | 4.6 | 4.9 | 25 |
| 9 | ≤80 | 3.5 | 4.0 | 4.4 | 4.8 | 5.3 | 26 |
| 10 | ≤90 | 3.6 | 4.1 | 4.5 | 4.9 | 5.6 | 28 |
| 11 | ≤100 | 3.7 | 4.2 | 4.7 | 5.1 | 5.9 | 29 |

Table 2: For base stations with Frequency of operation between 2000 MHz to 40000 MHz

| Sr. No. | EIRP (in Watts) | Minimum Height(in metres) as per different antenna tilts in degrees | | | | Minimum distance (in metres) for publically accessible area in the main lobe direction | Minimum distance (in metres) for other emitters (≥ 10 W) in the main lobe direction |
|---|---|---|---|---|---|---|---|
| | | 0° | 5° | 10° | 15° | | |
| 1 | ≤2 | No specific criteria. According to [ITU-T K.52] emitters with a maximum EIRP of 2 W or less are inherently compliant | | | | | |
| 2 | ≤10 | 2.5 | 2.6 | 2.8 | 2.9 | 1.8 | 9 |
| 3 | ≤20 | 2.7 | 2.9 | 3.1 | 3.3 | 2.5 | 13 |
| 4 | ≤30 | 2.9 | 3.1 | 3.4 | 3.6 | 3.1 | 16 |
| 5 | ≤40 | 3.0 | 3.3 | 3.6 | 3.8 | 3.6 | 18 |
| 6 | ≤50 | 3.1 | 3.5 | 3.8 | 4.1 | 4.0 | 20 |
| 7 | ≤60 | 3.2 | 3.6 | 4.0 | 4.3 | 4.4 | 22 |
| 8 | ≤70 | 3.3 | 3.7 | 4.1 | 4.5 | 4.7 | 24 |
| 9 | ≤80 | 3.4 | 3.9 | 4.3 | 4.7 | 5.0 | 25 |
| 10 | ≤90 | 3.5 | 4.0 | 4.4 | 4.8 | 5.4 | 27 |
| 11 | ≤100 | 3.6 | 4.1 | 4.5 | 5.0 | 5.6 | 28 |

2.130 The guidelines developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) are widely adopted by national authorities around the world. In terms of providing protection for 5G technologies, the latest ICNIRP guidelines in 2020 for limiting exposure to Electromagnetic fields (100 kHz to 300 GHz) has made several changes to ensure that new technologies such as 5G will not be able to cause harm, regardless of our current expectations. Reference levels have been derived to provide an equivalent degree of protection to the basic restrictions, and thus an exposure is taken to be compliant with the guidelines if it is shown to be below either the relevant basic restrictions or relevant reference levels. Table 2.4 presents the latest reference levels for local exposure averaged over six minutes.

**Table 2.4: ICNIRP Reference levels for local exposure, averaged over six min, to electromagnetic fields from 100 kHz to 300 GHz (unperturbed rms values)**

| Exposure scenario | Frequency range | Incident E-field strength; $E_{inc}$ (V m$^{-1}$) | Incident H-field strength; $H_{inc}$ (A m$^{-1}$) | Incident power density; $S_{inc}$ (W m$^{-2}$) |
|---|---|---|---|---|
| Occupational | 0.1 – 30 MHz | $1504/f_M^{0.7}$ | $10.8/f_M$ | NA |
| | >30 – 400 MHz | 139 | 0.36 | 50 |
| | >400 – 2000 MHz | $10.58f_M^{0.43}$ | $0.0274f_M^{0.43}$ | $0.29f_M^{0.86}$ |
| | >2 – 6 GHz | NA | NA | 200 |
| | >6 – <300 GHz | NA | NA | $275/f_G^{0.177}$ |
| | 300 GHz | NA | NA | 100 |
| General public | 0.1 – 30 MHz | $671/f_M^{0.7}$ | $4.9/f_M$ | NA |
| | >30 – 400 MHz | 62 | 0.163 | 10 |
| | >400 – 2000 MHz | $4.72f_M^{0.43}$ | $0.0123f_M^{0.43}$ | $0.058f_M^{0.86}$ |
| | >2 – 6 GHz | NA | NA | 40 |
| | >6 – 300 GHz | NA | NA | $55/f_G^{0.177}$ |
| | 300 GHz | NA | NA | 20 |

[a] Note:
1. "NA" signifies "not applicable" and does not need to be taken into account when determining compliance.
2. $f_M$ is frequency in MHz; $f_G$ is frequency in GHz.

*(Source: ICNIRP EMF guidelines 2020)*

2.131 Several stakeholders through their comments had shared that the EMF exposure levels should be reviewed, and the recent guidelines issued by ICNIRP in 2020 be adopted in India for facilitating the network densification, they suggest. The Malaysian Government is an example of a country that has affected revision of EMF standards in view of the

change in ICNIRP guidelines brought in 2020 and the EU through its Staff Commission working document had also shared that the ICNIRP guidelines 2020 confirm the health safety margin of existing EMF exposure limits at the EU level set out in Recommendation 1999/519/EC. In the revised MS-EMF, the Malaysian Commission decided to follow Table 5 of ICNIRP guidelines for assessment for EMF exposure over the whole body from radio communications infrastructures (RCI).

2.132 Recent actions taken by DoT/TEC to create special EMF compliance dispensation for Small Cells:

a. Vide letter dated 27.08.21, DoT issued revised "TEST PROCEDURE FOR MEASUREMENT OF ELECTROMAGNETIC FIELDS FROM BASE STATION ANTENNA No: TEC 13019: 2021". Vide Para 4.1 of Part A of this document TEC has stated … "*Normally compliant: Normally compliant installations contain sources that produce EMF that can exceed relevant exposure limits. All base stations with EIRP between > 2 and ≤ 100 Watts are considered as normally compliant and >100 Watts EIRP are considered as provisionally compliant. As a result of normal installation practices and the typical use of these sources for communication purposes, the exceedance zone of these sources is not accessible to people under ordinary conditions. Examples include small cells with low transmit power (with EIRP ≤ 100 Watts) and antennas mounted on sufficiently tall towers. Precaution may need to be exercised by maintenance personnel who come into the close vicinity of emitters in certain normally compliant installations.*" So, a Small Cell was defined as equipment radiating EIRP<=100 W. The same Para stated that the LSA Units may conduct only physical audit of base stations covered under Simplified Assessment Criteria for checking compliance to the requirement based on the EIRP declared by the TSP and no measurements need be conducted.

b. DOT vide letter 09.05.22 issued instructions for "Simplification of SACFA siting clearance guidelines- procedure for clearance of Low Power BTS/ small cells i.e., Micro, Pico and Femto cells on existing street furniture/infrastructure and the cases of additional antenna". These instructions inter alia stated *"...it has been further decided that the following guidelines shall be applicable for the SACFA siting clearance for Low Power BTSs (EIRP <=100W) ... The requirement for a formal application for SACFA processing is done away with for such Low Power BTSs..."*

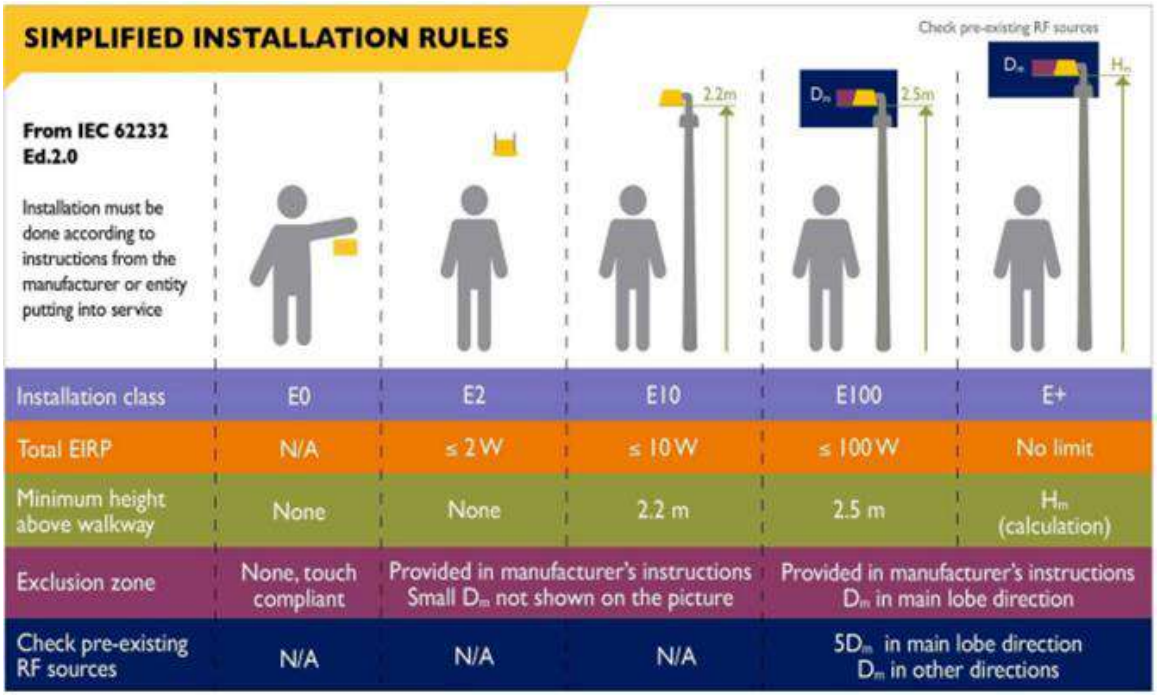
2.133 TRAI conducted four pilots at International Airport (New Delhi), Kandla Port (Gujarat), Bengaluru Namma Metro (Karnataka) and Bhopal Smart City (MP) to understand challenges for using Street Furniture at these places for mounting Small Cells. During these Pilots TSPs used the 5G small Cells of EIRP <= 600W to demonstrate how small cells of these capacities mounted on street furniture can be used to meet coverage and capacity requirements of these places.

2.134 As validated from the responses received, installation procedures for small cells are usually developed and established based on internationally accepted equipment classes and such international reference accepted by the national authorities to enable generic permits for installation and operation. As was elaborated in the CP, a common approach for base station classification is through the basis of installation classes derived from parameters, including transmit power, effective isotropic radiated power (EIRP), antenna installation height and installation location (outdoor or indoor). A number of standards have been specified by various standard developing organizations (SDOs), to reduce inconsistencies in the selection of classification parameters in different regulatory regimes. The current consensus seems to be building around the IEC 62232 Ed.2.0 guidelines as the preferred classification method which uses criteria of EIRP and antenna

installation height but also provides more detailed elaboration on technical rationale and evaluation approaches.

2.135 Several countries across the world have a regime for small cells focused on ensuring aesthetical visual appearance and sufficiently low emission power for building public acceptance and ensuring safety of the public. The current global landscape witness's diversity in parameters and the limits used to qualify sites for exemptions. As discussed in the CP, the EU uses the IEC 62232 guidelines to specify that an overall emission power limit not exceeding 10 W of equivalent isotropic radiated power (EIRP) (applicable to E10) as well as class-dependent requirements as one of the criterions to provide exemption from building permits. Figure 2.2 shows a pictorial representation of the IEC 62232 and ITU K100 simplified installation rules.

**Figure 2.2: Pictorial representation of IEC Simplified Installation Rules**




2.136 A few other countries have used location as the criteria to give exemption. In Cyprus, if the base station is "outside the boundary of urban development" then site permits are not needed when the antenna mast is less than 25 meters tall. Transmitters inside buildings in

Lithuania and transmitters in privately owned buildings of Spain are granted exemption from permits. Based on the power parameter, some countries have provided exemptions. In Belgium, no environmental permit is needed for transmitters with ERP of 2 W or less. In Estonia, no permits or Health Board approval are needed for base stations with ERP ≤100W. For France, no declaration or ANFR (French Regulatory agency for spectrum management) authorization is needed for stations radiating less than 1 W EIRP. Any station operating on an assigned frequency at 1-5 W EIRP, which is their de facto definition of small cells, must notify ANFR and the local governing authority about the station's technical characteristics. In Germany, radio stations with EIRP of 100 mW or less do not need site certificates. BNetzA (Federal Network Agency) must be notified two weeks in advance about the commissioning of new or substantially modified stations whose EIRP is greater than 100 mW, but less than 10 W and civic authorities must be informed at the same time. In certain parts of Italy, for base stations <10 W and surface area <0.5 $m^2$ the local planning authority requires notification but does not have to decide on a permit.

2.137 In Denmark, local permits are not needed for panel antennas for mobile communication with associated radio modules and transmission links in neutral colors, set on existing masts used for public mobile communications when the height of the building is not increased. In Sweden, antennas (and thereby small cells) are exempted from building permits if they do not materially change the appearance of the building. Some municipalities in Amsterdam and Barcelona have been supporting low visual impact installations by conducting public campaigns for encouraging aesthetical designs of SAWAPs. Finland is another country that has initiated the same through a nationwide design competition in Helsinki on "standard model designs" which can smoothly fit a variety of environments and are easily scalable for mass production.

2.138 From the aforesaid, it can be seen that there are diverse practices adopted by countries for exempting different types of permits based on

the location and power parameters used. Some other parameters such as mounting, total size of equipment, mast height, appearance, etc. have also been adopted. Considering that one of the primary factors for exemption adopted commonly by most countries is the EIRP of the small cell equipment, the Authority feels that exempting certain categories of small cells at all places through use of EIRP as an exemption criterion is an approach that can be adopted in the context of India also.

2.139 In the four Pilots that were carried out by TRAI on deployment of small cells and aerial fiber on street furniture, most of the small cells used by TSPs had maximum EIRP between 52 dBm to 57.5 dBm (say up to 600 watts). The Authority has noted that TEC has currently defined Low power Base Station Transmitters (LPBTS) as having EIRP limited to 100 Watts in its TEC Test Procedure No: TEC/TP/EMF/001/02.OCT.2012 on Simplified Assessment Procedure for EMF compliance of Low Power BTS dated 16.11.2015. TEC document acknowledges the fact that such BTSs are small in size and radiate lower power vis-a-vis micro BTS and therefore, they require different treatment from the point of view of audit of EMF radiation limits already laid down by the DoT. The audit requirement for these types of BTS has been accordingly called Simplified Assessment Criteria (SAC). This TEC document details the self-certification requirement from the TSP and audit by TERM Cells under SAC. There are certain concessions given to such LPBTS sites. For example, there is no requirement of signage for the BTS falling under SAC. TERM Cells may conduct physical audit of BTS covered under SAC for checking compliance to the requirement based on the EIRP declared by the TSP and no measurements need be conducted. Any violation of this requirement will be dealt with as per the procedure prescribed by DoT/Licensor. However, while conducting measurement for EMF compliance for BTSs not covered under SAC, the EMF contribution from micro BTS to the total radiation will also be taken into consideration. In such cases, micro BTS radiation must meet the prescribed EMF limit. The format for self-certification of such LPBTS has been provided as follows in Figure 2.3:

**Figure 2.3: Format for self-certification of low power BTS**

**FORMAT FOR SELF CERTIFICATION OF LOW POWER BTS**

**SITE DATA & TECHNICAL PARAMETERS**

**Name of TSP:**

**Name of the BTS :**

| Sr. No. | Item | Units | Site Data |
|---|---|---|---|
| 1 | Site ID | | |
| 2 | Date of Commissioning | | |
| 3 | Address | | |
| 4 | Lat / Long (minimum 5 decimal places) | deg | |
| 5 | Pole/wall Height | (m) | |
| 6 | Height of lowest part of radiating antenna(s) from public accessible area | (m) | |
| 7 | Make and model of Antenna/BTS | | |
| 8 | System Technology (GSM/CDMA/W-CDMA/ OFDM) | | |
| 9 | Base Channel Frequencies ( BCCH/CPICH/PBCH) | (MHz) | |
| 10 | No. of Carriers / Sub-Carriers | | |
| 11 | Antenna Gain | dBi | |
| 12 | Tx Power | (dBm) | |
| 13 | EIRP | (dBm) | |
| 14 | Any radiating element within 14 meters in the main lobe direction & 2.7 meters in any other direction. | Yes/No | |

**It is to certify that above BTS comply with the installation criteria/ technical requirements mentioned in Table-1 of Addendum No. 4 to TEC Test Procedure No: TEC/TP/EMF/001/02.OCT. 2012 , Dated : 16-11-2015**

**Signature of authorised representative of TSP**

2.140 As has been discussed above, TEC has also provided for the audit requirement of base stations in line with the introduction of LPBTS (having EIRP limited to 100 W) in the Indian telecom market. Simplified Assessment Procedure criteria based on mounting height, main lobe direction and distance to other ambient sources as EMF evaluation techniques has been for normally compliant class that includes those base stations with EIRP > 2 and ≤ 100 Watts. Since most of the small cells that are being deployed are having EIRP upto 600 watts, the Authority feels that it would be prudent to revise the EIRP limits for

LPBTS definition upto 600 watts. The normally compliant class should include those base stations with EIRP > 2 and ≤ 600 Watts and TEC should accordingly modify the tables (As provided in Table 2.3) for this class.

2.141 In the matter of conducting EMF audit and providing self-certificates by the licensees, DoT through a notification[15] dated 4th February 2021 has reviewed the biennial submission of self-certificates confirming compliance to the EMF norms as prescribed by the ICNIRP from time to time. The cycle of submission has now been changed from two years (biennial) to three years (triennial). Further, the triennial submission of self-certificate shall not be done if following self-certificates have been submitted by the TSPs during the three-year cycle: -

a) Self-certificates for New BTS

b) Self-certificate for Upgradation of BTS.

c) Self certificate due to upgrade/ addition of BTSs of other/ sharing TSP.

DoTs instructions on the matter have been attached as **Annexure IV**.

2.142 **The Authority, therefore, recommends that Low Power Base Transceiver Stations (LPBTS) should be defined as those BTS that radiate EIRP<=600 W. Such equipment/small cells should be exempted from seeking any kind of permission from any Authority except from the Street Furniture/building owning Agency at all places.**

2.143 **DoT's simplified EMF compliance framework should redefine normally compliant class to include those LPBTS**

[15] https://dot.gov.in/sites/default/files/04-02-2021.pdf?download=1

**with EIRP > 2 and ≤ 600 Watts and TEC should accordingly modify the tables (As provided in Table 2.3) for this class.**

2.144 **Recent actions have been taken by DoT for simplifying the process for SACFA compliance, for low power equipment/small cell radiating EIRP<=100 W. DoT should increase this limit to 600W to cover most of the Small Cells/LPBTSs that are being deployed.**

2.145 **Presently TERM Cell is required to audit 10% of sites for which TSPs have submitted self-certification to their offices. TERM cells for undertaking this exercise depend upon TSPs like providing Testers etc. However, considering the sheer volume of Small Cells, which otherwise may put severe strain on TERM cell and TSPs resources, this audit criteria for Small Cell may be relaxed. DoT should consult the Ministry of Statistics and Programme Implementation (MOSPI) to come up with a scientific sample size for auditing BTS/small cell sites.**

2.146 **Presently TSPs are required to provide self-certification for EMF radiation compliance every three years. However, considering the sheer volume of Small Cells, which otherwise may put severe strain on TSPs resources, self-certification criteria for LPBTS should be relaxed to five years.**

2.147 In addition to the exemptions for those cells that will require permissions for installations, the Authority is of the view that putting in place a

simplified administrative process can reduce time and costs. This will be beneficial for both the Government and the Industry.

2.148 The concept of batched applications for small cells has been provisioned by the FCC in USA. As per the FCC, shot clocks are defined as the time frame within which the authority generally must act on a given wireless application. The code has presented its discussions on whether the batched applications should be subject to either longer or shorter shot clocks than would apply if each component of the batch were submitted separately[16]. Each small cell application will fall within either of the two categories –

i. Review of an application to collocate a Small Wireless Facility using an existing structure: 60 days, or
ii. Review of an application to deploy a Small Wireless Facility using a new structure: 90 days.

2.149 As per the code, if a single application under either of the above categories seeks authorization for multiple deployments, then the reasonable period of time for the application as a whole is equal to that for a single deployment within that category. If a single application seeks authorization for multiple deployments wherein the components are a mix of deployments of the two categories, then the reasonable period for the application as a whole is 90 days.

2.150 At state level, the Punjab Government has come out with a draft policy where they have tried to simplify the administrative process for approval of small cells. It is provided in the draft policy that the telecom service providers/infrastructure providers shall take one time permission from the competent authority through an online application on the Punjab Invest Business First Portal (pbindustries.gov.in). The permission shall be given by the concerned department/corporation/agency within a maximum of 60 days of making the application. To speed up the approval process, for site locations where electricity authorities or any

[16] https://docs.fcc.gov/public/attachments/FCC-18-133A1.pdf

other appropriate authority have permitted the installation of small cells and/or aerial optical fiber, further permission from municipal corporations or local bodies may not be required.

2.151 As far as duration of permission is concerned, the deemed approval for permissions for usage of street furniture for small cell and aerial fiber deployment is 60 days as per sub-rule 3 of 10A in the Amendment rule 2022. Some stakeholders have suggested reducing it to 30 days. As has been discussed above, even FCC process defines 60-day and 90-day timelines for processing the permissions. The Authority feels that a sixty-day deemed approval clause in the rules should serve the purpose for the time being. It is more important to monitor delays and rejections and ensure that flimsy excuses are not given to seek further clarifications as the time period approaches. The Sub-rule (2) of Rule 4 of the RoW rules 2016, as amended, already provides for appointment of Nodal officers. The Authority is of the opinion that a close monitoring at the portal admin level and coordination with Nodal officers will ensure timely processing of application and reduce unwanted rejections.

2.152 In order to manage the large number of small cell applications, a batch processing or bulk processing provision is important for facilitating speedy deployment of small cells. The Authority as per para 2.34 and 2.35 has already recommended the same. Once the bulk approval provision is in place in the RoW rules, the Authority is of the opinion that the concept of bulk approval for small cells can also be incorporated in the National RoW GatiShakti Sanchar Portal.

2.153 Considering the above, **the Authority recommends that DoT should put in place a mechanism for close monitoring of all RoW applications by portal administrators and also coordination with Nodal officers of Appropriate Authorities to ensure timely processing of application and reduce unwanted rejections.**

2.154 **The Authority also recommends that DoT should make necessary provisions in the GatiShakti Sanchar Portal to incorporate bulk application filing and processing for all categories of Small Cells.**

**Standardization of small cell equipment and installation practices**

2.155 The Authority notes that few stakeholders are in favor of standardization of small cell equipment, but they have failed to provide sound justification in favor of their arguments. Most stakeholders have not felt an immediate need for standardization of the equipment as it may be counterproductive at this stage when the 5G ecosystem is still developing. The Authority feels that there is a lot of variation/customization in designs of street furniture itself and every installation may be required to be tailored to meet specific conditions such as quality and design of SF, power related issues etc. The type of small cells expected to deploy varies as per the requirements of service providers and use cases. Not giving vendors the liberty to choose from a wide variety of options would strangle innovation and ingenuity in finding site specific solutions. Also, standard designs for mounting equipment may not be able to accommodate different types of equipment available. Considering the fact that the design of 5G outdoor small cells by service providers are currently under development and the finalization of exact specifications may take time as the current specifications may change (in dimensions and power specs) based on future developments. As time progresses, deployment templates will emerge that can be replicated by TSPs on their own across all similar types of locations. Therefore, the Authority is of the opinion that adoption of standard equipment or installation practices may not help network rollouts at this stage.

## E. Power related issues and solutions

2.156 The Authority through the CP had discussed the importance of continuous and affordable power supply for the efficient functioning of small cells. Though small cells consume much lower power compared to macro base stations given the lower coverage area and the lesser requirement for site support infrastructure (e.g., cooling systems), a continuous power source is nevertheless required at the street furniture for deploying small cells. Discussing various power related challenges for deployment of small cells on street furniture's, following questions were raised in the CP to gather more detailed inputs from the stakeholders:

*xii) What power related problems are envisaged in deploying small cells on street furniture? Please provide full details.*

*xiii) What viable solutions are suggested to address these problems? Please provide full details.*

**Comments on power related issues**

2.157 Getting adequate uninterrupted power to all the telecom infrastructure is an issue pointed out by majority stakeholders. Another issue raised is related to the cumbersome process of getting permission for the electricity meter at every street pole and managing billing of a large number of sites. Some of the DISCOMs are not giving a separate connection for installing electricity meters on SF. Two stakeholders have shared that there is the need for appropriately designing power back up. High commercial tariffs, frequent annual revision in electricity rates and supply at only locations where a connection already exists are some of the other issues shared by stakeholders. One stakeholder has stated that the electrical bill comprises fixed demand charge (on sanctioned load) irrespective of running load drawn, which results in paying huge monthly payments on unutilized sanctioned load. A few stakeholders have also expressed concerns regarding the different rates for commercial, industrial, utility, etc. connections by different SERCs.

**Comments on solutions to power related problems**

2.158 As a solution to the cumbersome process of metering and billing at every pole, most stakeholders have proposed that a system of providing power connections on several poles through the process of single application based bulk approvals should be considered. To resolve the problem of proper physical address at SF locations where power supply is to be provisioned, stakeholders have suggested that DISCOMs should provide power supply on temporary addresses or else give address codes to SF locations. Enabling open access to support the telecom infrastructure by suitable modification and doing away with restrictions of minimum connected load per site is another solution given by a few stakeholders.

2.159 Many stakeholders have stated that back-up battery requirements are a limiting factor in deploying small-cell power systems on street furniture. As per one of the associations, in addition to the conventional AC/DC power supply system, the small cell site should have a fallback mechanism to work on battery backup (preferably Li-Ion)/suitable solar based power solution in the absence of conventional AC supply. Since both Radio and Baseband require DC-48V supply Power-plant will be required to convert from AC supply. A suggestion given is that TSPs/IPs should be allowed to have their own backup suited to the type of small cells. Making available a centralized power source inclusive of back-up (for a cluster of street furniture with a power cut-off mechanism localized at the location) and distribution mechanism have been put forward by a couple of stakeholders.

2.160 One of the associations has proposed the usage of two types of power systems. The first one is miniaturized DC-power systems which are modular designs that offer flexible power-distribution options and can support larger batteries for longer back-up power periods. The second type of unit is the "pole/wall mount" category of all-in-one power systems; however, they usually have less configuration flexibility and more limited back-up battery options. Power conversion efficiency must also be a factor in the design of small-cell power systems. Ensuring

reliable and stable AC/DC power and exploring cost-effective ways such as DC supply through battery banks or through solar panels by way of subsidization by states have been suggested by some stakeholders.

2.161 The adoption of a *'One DISCOM-One Bill-One Payment policy'* by the DISCOMs has been proposed by the majority. A service provider has suggested deployment of meters on 5%-10% of installed small cells base, and the metering for all installations can be done based on this sample. Charging of such sampled meters can be averaged and extrapolated to arrive at the bill. Another service provider has suggested that slab rates can be defined and established based on the power rating of the equipment and that bulk billing as per the cumulative equipment installed can be done at the respective division level by DISCOMs.

2.162 The suggestion that has been proposed by the majority of stakeholders is with regard to lowering the electricity tariff, more specifically based on industrial tariff or utility tariff. Further, provision for priority electricity connection within 15 days at these rates was given by the majority. Imposing minimum requirements, discounted prices, and charges while raising demand notice at the time of EB installation was put forward by one of the associations.

2.163 Granting permissions for digging earth pits or sharing the same among different operators and subletting of electricity from the private entity are some other submissions made by stakeholders. It was also submitted that DISCOMs should not process disconnection in haste on minor complaints of residents and corporations.

**Analysis of the issues and views of the Authority**

2.164 As India walks towards the deployment of next generation technologies, not only is there a paradigm shift in the physical infrastructure requirements, but there is also a vast difference in the powering requirements for 4G and 5G. While 4G powering is mainly characterized by the presence of huge power cabinet to each tower along with renewable energy sources used for backup, 5G requires providing

separate connection from the grid to each of the densely placed small cells although the power required for each of the individual small cell is less than that of macro BTS.

2.165 Power being the lifeline on which telecom network runs, the Authority has already taken an initiative for cross-sectoral collaboration between the Telecom and Power sectors. At the behest of TRAI, Forum of India Regulators (FOIR) had constituted a working group on Cross Sector Collaborative Regulation between the Telecom Regulators and Electricity Regulators. The working group had representation from TRAI, Central Electricity Regulatory Commission (CERC), State Electricity Regulatory Commissions (SERCs), DISCOMs, Infrastructure Providers and has a provision to co-opt experts from other organizations as well. It had identified certain issues and made its recommendations to FOIR (attached as **Annexure V**). Subsequently on some of these issues, TRAI had made a presentation to FOIR in its 49th Meeting of the Governing Body. In the presentation, the Governing Body was briefed on the recommendations of the working group on the following subjects:

- Development of a centralized portal & GIS Mapping of Assets
- Monetizing assets of power utility companies
- Placement of telecom antennas and associated equipment on the transmission towers
- Utilizing transmission assets such as electric substation lands & buildings
- Deployment of small cells and aerial fiber on electric poles

2.166 Based on this meeting, it was noted that the recommendations of the working group should be disseminated among all the DISCOMs, as it would be infrastructure of the DISCOMs which would be used to install the 5G cells and related equipment. It was also decided that the recommendations of the working group will be presented before the Forum of Regulators to sensitize the State Electricity Regulators on the importance and need for sharing infrastructure to enable the implementation of the 5G technology. FOIR vide its letter

dated 27.04.2022 intimated Secretary SERCs/JERCs, of the deliberations during the 49th GB meeting of FOIR and requested them to share the recommendations of the Working Group and the minutes of 49th GB meeting to the DISCOMs under his jurisdiction. Also, basis the decision taken in the FOIR Governing Body meeting; TRAI made a presentation to Chairman of all SERCs/ JERCs in the 79th meeting of the Forum of Regulators (FOR) which was held on 22.04.2022.

2.167 As there will be thousands of small cells deployed on the available street furniture while rolling out 5G in an area, the issue of availability of continuous power supply to the installed equipment in a cost-effective manner needs to be addressed. Usually, distribution licensees only allow one grid connection point for each consumer address. On most street furniture like billboards, bus shelters, traffic lights etc. electric connection is already present. Some DISCOMs do not treat street furniture as a commercial address while some others refuse to provide another connection on the same SF address. Therefore, to enable multiple connections on the same street furniture asset, the Authority is of the view that the distribution licensees should consider small cells as 'consumers' (i.e., end user) of electricity and be entitled to get a separate electricity connection regardless of whether they are using the premises/apparatus of an existing consumer. The best approach can be to share the already available connection on these SFs by putting a sub-meter. Subletting of an existing power connection from one consumer to another by installing sub meters is not allowed under the existing regulatory framework of some DISCOMS. Sharing of power connection is in the domain of electricity regulations and the States where there is an embargo on tapping connection (by putting a sub-meter) from already available connection, the SERCs may have to re-look at the policy.

2.168 The traditional model of powering a cell site — in which the site is powered by the AC power grid, with a backup power source available as a fallback— cannot be applied to small cells, as these sites either do not currently come with power backup or will have very limited backup, and

therefore, would go down during a power outage. The way to fix that would be to have a system that has some level of backup that maintains 24*7 uninterrupted power available in the traditional telecom network. A power hub cabinet that has battery backup distributes that power from a centralized location can be a solution. In Korea, service providers have experimented with small cells that have only radiating antennas at the cell site while the processing and power units are centralized for small area that may have few small cell sites in vicinity. The Authority is of the opinion that such solutions will keep evolving with time and it should be left to market forces to experiment with new emerging solutions.

2.169 Another important concern is that electrical bill comprises of fix demand charge (on Sanctioned load) irrespective of running load drawing, which results into a telecom operator paying huge monthly payments on unutilized sanctioned load as well, leading to huge financial burden. Considering the deployment of huge number of small cells, it is imperative that DISCOMs should consider issuing electricity bill on the basis the running load and not on the sanctioned load. Therefore, the Authority is of the opinion that charging of power should be based on running load, there should not be any charges on the basis of fixed load in order to incentivize the operators.

2.170 Smart meter technologies as being installed under various schemes of Government of India as well as by the State Utilities themselves are designed to accommodate the evolution of communication services over time. Smart meters will provide accurate, not estimated bills and allow suppliers to better predict demand, thus helping to shape energy infrastructure to become more reliable and efficient. According to the National Infrastructure Commission of UK, a complete smart energy grid could save the nation 8 billion pound each year[17]. The Government of India is providing funding to the States for implementation of smart metering under National Smart Grid Mission (NSGM) and Integrated

[17] https://www.yesenergysolutions.co.uk/advice/benefits-of-smart-meters

Power Development Scheme (IPDS)[18]. Further, Revamped Distribution Sector Scheme (RDSS) was launched on 20th July 2021 under which deployment of ~25 crore smart prepaid meters for all domestic consumers have been envisaged till March 2025. The Government has been providing financial assistance under these various schemes (viz. IPDS, NSGM etc.). A sum of Rs. 22,500 crore has been earmarked as Central Government grant for the installation of those 25-crore smart prepaid meters across the country under the RDSS scheme for power distribution entities (DISCOMs) recently approved by the Cabinet[19]. RDSS envisages smart metering on the OPEX mode and provides financial support to DISCOMs opting for prepaid smart metering. Under the scheme, the States which can install smart prepaid meters before December 2023 will also be eligible for an additional incentive of Rs 450 per meter. As small cells will be in thousands, processing and paying individual bills will be tedious for service providers. Pre-paid smart meters can help in releasing funds locked in security deposit for the TSPs/IP-Is. It will also enhance revenue realization for DISCOMS who will benefit by getting all usage paid upfront. Given the benefits of smart metering, the Authority is of the opinion that smart pre-paid electricity meters should be installed in all existing telecom installations on priority and in a time bound manner. Also on all new installations, including those for small cells, DISCOMs should only install smart prepaid electric meters.

2.171 SERCs prescribe different rates for commercial, industrial, utility, billboard etc. connections. The rate for public utilities is Rs 6.25/unit whereas the same for advertisement & hoardings is Rs 8.50/unit, these variations in the tariffs for different street furniture assets can affect the viability of a cell site. As per the Electricity Act 2003, respective SERCs in each state determine the electricity tariff applicable on consumption of electricity by different classes of consumers (such as domestic,

[18] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1797348

[19] https://www.financialexpress.com/govt-earmarks-rs-22500-crore-for-smart-pre-paid-meters--new-discom-scheme/

commercial, industrial etc.). Providing telecommunications is part of service industry. The vital role of telecommunication and broadband service in the economic growth of connected areas justifies that telecom sites should be provided electricity connection at industrial/utility tariffs.

2.172 Given the importance of connectivity in Government service delivery, commerce, education, health and other sectors, the State Government should consider providing electricity to Telecom sites on priority (within 15 days of connections request). Currently the charges raised for providing electricity to telecom sites are very high and dissuade installation of new sites. The State Governments should also consider waiving off last mile installation charges for extending electric connection to telecom sites.

2.173 In the case of mass deployment of small cell equipment across a geography, processing separate applications for each individual electrical connection will be cumbersome. To facilitate faster rollouts, the requirement of taking power connection on several poles or street furniture can be facilitated through the process of bulk approvals. Considering the large number of power supply applications that would follow as part of small cell densification, a provision for bulk processing of applications is also necessary to enhance ease of doing business.

2.174 Thousands of small cells will together consume megawatts of energy. For making sector footprints greener, it is essential to enable green energy access for powering small cells. The Open Access (OA) policy can be very helpful for telecom operators to support the telecom infrastructure and achieve green energy targets. One of the stakeholders has submitted that a major bottleneck in the OA policies is that the buyer must have a minimum 'Connected Load' of typically 1MW, which is being followed by most states. Authority has observed that Ministry of Power has notified Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 on 06.06.2022 with the objective of ensuring access to affordable, reliable, sustainable and green energy for all. These rules

address several issues like reduction of Open Access Transaction limit from 1 MW to 100 kW and have made appropriate provisions for cross-subsidy surcharge, additional surcharge, standby charge. This will incentivize the common consumers to get Green Power at reasonable rates. However, from a TSP/IP-I perspective, these rules may still not be very helpful since individual small cell, or any other telecom site will consume significantly less electricity than 100 KW. This will restrict TSPs from making use of OA policy for renewable sources. However, if the aggregated demand of all sites of a service provider under a DISCOM is considered, it will go in megawatts. Therefore, Authority feels that the OA policy for using solar/renewable energy sources needs to be modified to incorporate provision to aggregate demand from all sites of a TSP/IP-I that are served by a DISCOM.

2.175 **The Authority therefore recommends that DOT should take up the case with Ministry of Power, State governments and SERCs for implementation of following:**

i. **DISCOMs should make provisions to provide connections for telecom sites to TSPs/IP-Is on priority basis. The timelines for providing the connection should be fixed (preferably 15 days) and monitored through portal.**
ii. **Given the importance of DCI for socio-economic development of States, DISCOMs should not charge the TSPs/IP-Is for installation/upgradation of transformer or for pulling the last mile of the electrical connection. If required, states should make necessary provisions for compensating DISCOMs for such waiver of charges.**
iii. **As the power requirements for small cells remain almost flat throughout the day, DISCOMs should charge TSPs/IP-Is on the basis the running load and not on the sanctioned load.**
iv. **All DISCOMs should treat Street Furniture Address as Commercial Address for the purpose of providing a power**

**connection and allow multiple power connections at the same SF commercial address to different commercial entities.**

v. **DISCOMs should allow sub-letting of connections at street furniture locations.**

vi. **Smart pre-paid electricity meters should be installed in all existing telecom installations on priority and in a time bound manner. Also on all new installations, including that for small cells, DISCOMs should only install smart prepaid electric meters.**

vii. **Provision for one application for bulk processing of connection requests for multiple sites should be made available through portals for promoting ease of doing business.**

viii. **Telecom sites should be provided electricity connection under Utility/Industrial tariff.**

ix. **DISCOMs should adopt One DISCOM-One Bill-One Payment policy for all Telecom sector service/infra providers users that use electricity connections at multiple locations.**

x. **OA policy for using solar/renewable energy sources needs to be modified to incorporate provision to aggregate demand from all sites of a TSP/IP-I that are served by a DISCOM.**

xi. **DISCOMs should share their maintenance schedules with TSPs/IPs (site owners) in advance so that site owners can be prepared in the event of power cuts. The actual duration of all power outages should also be made available area wise on their website.**

2.176 The role of power sector in supporting telecom networks is well-known. Similarly, the roll that telecom sector plays in modernizing smart transmission and distribution networks of power sector need not be emphasized. 5G when deployed on DISCOM's infrastructure creates a win-win situation where the distribution companies can benefit from 5G

use cases of smart metering, smart grid monitoring, disaster management, automation, fiber-ready network for power grids, energy management etc. Thus, there are new revenue and cost-saving opportunities for transmission companies and DISCOMs when their infrastructure is utilized for telecom installations. A cross sectoral collaboration between telecom and power sector, in sync with GatiShakti initiative, needs to be further improved. However, there are certain challenges in the same that will need to be addressed.

2.177 The aforementioned FOIR Working Group that was formulated to submit its recommendations on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators" has, in its report mentioned:

> "*Delhi Electricity Regulatory Commission (DERC) has allowed for utilization of distribution assets for Telecom services on revenue sharing basis and same can be adopted by other State Regulators also. However, Municipal Corporation are imposing tax liability in cases where transmission assets i.e., Substation lands & buildings, are shared for cross function use on revenue sharing model. The Working Group recommends that this issue needs to be taken up at appropriate level so that whenever land is provided on favorable terms to utility companies and those utility companies are sharing the same for utilization with other utility company, then terms of use of land should not change.*"

2.178 **In the collaborative spirit of GatiShakti and to promote sharing of infrastructure above, the Authority recommends that DoT should take up the issue with the states that whenever land is provided on favorable terms to utility company and those utility company shares the same for utilization with other utility company, then terms of use of land should not change.**

## F. Institutional mechanism for enabling Collaboration between Controlling Administrative Authorities and TSPs/IP-Is

2.179 To ensure that 5G deployment take place in a coordinated environment and the challenges due to interdependencies on different agencies are addressed, strong collaboration between stakeholders is needed[20]. This will aid the infrastructure creation at a cost efficient and time bound manner and improve the operator's confidence in providing services. Recommendations relating to cross sectoral collaboration for infrastructure creation for provision of shared duct infrastructure in municipalities, rural areas and national highways was provided by the Authority in the prior broadband recommendations dated 31st August 2021. In order to gather further insights on cross sectoral collaboration specific to the use of street furniture, the following questions were raised in the CP:

*xiv) Is there a need for a specific mechanism for collaboration among local bodies / agencies for deployment of small cells and aerial fiber using street furniture? If yes, what mechanisms should be put in place for collaboration among various local bodies/agencies involved in the process of permissions with TSPs/IP-Is and to deal with other aspects of Small Cell deployment?*

*xv) Kindly suggest an enabling Framework that shall include suggestions about the role of various authorities, rules of coordination among them, compliance rules and responsibilities, approval process, levies of fees/penalties, access rules etc.*

*xvi) What should be the commercial arrangements between the TSPs/Infrastructure Providers and street furniture owners for the same?*

*xvii) Whether there should be any specific regulatory and legal framework to enable Small Cell and Aerial Cable deployment on*

[20] https://www3.weforum.org/docs/WEF_The_Impact_of_5G_Report.pdf

*Bus Shelters*

*Billboards*

*Electric/ Smart Poles*

*Traffic lights*

*Any other street furniture*

**Comments on Mechanism for collaboration and Role of various Authorities**

2.180 Various suggestions given by stakeholders for collaborative mechanisms to coordinate and oversee the 5G deployment process are as follows:

a) Coordination Committees: One of the stakeholders has proposed the formation of a three-layer committee with representatives from DoT, Industry experts, and other central PSUs in the field of telecommunication. These committees at the state/district/ local body level would help facilitate the process of approvals.

I. National level committee to suggest overall guidelines for RoW permission, charges and other governing rules.
II. State level committee to coordinate with different state agencies and ensure the implementation at state level. The State Broadband Committee and its Sub Committee (Operational Committee) will be able to bring about necessary coordination wherever there is any problem.
III. Local body at Secondary Switching Service Area (SSA) level, headed by district collector, to take care of single point of contact for roll-out issues.

The requirement of establishing a nodal agency that can be equipped with all the powers under RoW regulations, coordination with all bodies and simplifying the application process was put forward by a few stakeholders. The contact details of nodal officers of local bodies, and the TSPs/IPs should be mandatorily available on the Portals. The appointment of Nodal Officers by every concerned department at State level can add to better coordination. State level/district level

nodal officers may be appointed with delegated power to decide on grant of permission and for resolutions in case of any disputes and responsibility matrix to be published online along with the escalation and grievance redressal process.

b) Use of existing Broadband Committees: Many stakeholders had put forward suggestions on the constitution and role of committees under National Broadband Mission (NBM) and its requirement to be sensitive to the needs of 5G deployment on street furniture. The committees under NBM should function as both knowledge gathering and sharing hubs. It was suggested by a service provider that on lines of State Broadband Committees (SBCs), a Joint committee with Central agencies/departments can be created with sole purpose of expediting RoW permissions. The SBCs can also have districts/towns specific representatives like DMs, Mayors to discuss and facilitate small cells/aerial fiber deployment issues. It should be mandatory for NBM to hold monthly meetings and in that, if possible, members of SERC, DISCOMs and agencies like airport, port trust, metro/railways could be co-opted as members. Besides this it is utmost important to have representations of TSPs and IP-Is also in those committees.

c) National RoW Portal: The Online Central National RoW Portal (GatiShakti Sanchar Portal) should also provide for communication including notices between the concerned stakeholders like TSP/IP-Is and appropriate/administrative/ local authorities. Besides, the role of different stakeholders, rules of compliance, assessments, approvals, etc. can be very well addressed through the portal.

d) Dedicated specialized authority: A special team should be formed which will have the End-to-End responsibility of street furniture deployment and process the applications in a time bound manner. This team should also have the right to publish amendments as required by the specific city to meet its requirement along with the authority to collect fees and levy fines/ penalties.

e) Many of the stakeholders have commented on the role that the PM GatiShakti initiative can play in enhancing collaboration.

f) Setting up a nationwide Small Cell Information Exchange (SCIX), a digital platform that would hold real time information about availability, backhaul connectivity, monthly rent and permit status for infrastructure capable of hosting small cells has been suggested similar to that of the UK.

2.181 The responsibilities of the Central, State, and local authorities have been put forward by the stakeholders. The Central Government can play a role in setting the overall strategy for connectivity, and framing appropriate legal structure, policy, and regulation. Local planning authorities can play a vital role in facilitating network development and in helping to identify the SF suitable for small cells deployment.

**Comments on Commercial Arrangements between CAAs and TSPs/IPs**

2.182 Regarding TSPs/IPs entering into arrangements with CAAs, most of the stakeholders are of the opinion that consistent with the light touch regulatory regime, it should be left to a voluntary arrangement. To this, one of the associations has added that only the time taken to grant permissions and cap on charges to be paid by the IP-Is, should be specified. Few stakeholders have submitted that TSPs/IPs should work out with street furniture owners and submit it to DoT to frame a uniform policy/ standardized agreement format across the country.

2.183 Various commercial arrangements and viable business models suggested for sharing SF are -

a. Revenue sharing models like Public Private Partnership (PPP), Build–operate–transfer (BOT) models.
b. The commercial arrangement should be on a no-profit no-loss basis, through a national rate card for all types of street

furniture. The rate card should be designed on the lines of a classification of circles, i.e., A/B/C circles.

c. Provision of complimentary services by the service providers at designated infra to the local bodies viz., Passenger Feedback Solutions at Railway Station, Bus Stations, Smart Street Light solutions, i.e., a win-win situation is an effective arrangement. Providing free 5G services for smart solutions i.e., IoT/M2M by converting bus shelters to smart bus shelters is an example. The same can be applied for multiple street furniture so that the fixed cost may be avoided.

**Comments on Enabling a framework for specific street furniture structures like Bus Shelters, Billboards, Traffic lights etc.**

2.184 A few stakeholders are in support of bringing a specific regulatory and legal framework for specific SF as it will ensure uniformity in the equipment and installation process. With regard to permissions, it has been proposed by a service provider that SEBs/DISCOMs should be instructed to permit usage of electricity poles; municipal agencies/authorities to permit use of smart poles, streetlights and billboards; and State Road transport authorities/agencies should be instructed to allow the use of Bus Shelters for small cells deployment. A few others are of the opinion that a specific legal framework for each street furniture is not required at this stage.

**Analysis of the issues and views of the Authority**

a) <u>Mechanism for collaboration</u>

2.185 The Authority is of the view that systematic collaboration between the industry stakeholders and governance stakeholders along with coordinated decision making is necessary to aid the infrastructure creation required to achieve large scale deployment. It is understood that the involvement of multiple government bodies or utility service providers i.e., telegraph, electricity, water, gas etc., for the approval of

small cells, necessitates that the process should be considerably simplified and streamlined to avoid unnecessary delays.

2.186 The constitution of the National Broadband Mission (NBM) was envisaged by the National Digital Communication Policy (NDCP) in 2018. NBM aims to operationalize the 'Broadband for All' objective by facilitating the creation of digital communications infrastructure and provisioning of services thereon. Under the NBM, one of the objectives is to enhance cooperation among concerned stakeholders by developing innovative implementation models for RoW. Another objective is to work with States/UTs for having consistent policies pertaining to expansion of DCI including for RoW approvals required for laying of OFC. Thus, streamlining the RoW permission framework is already a part of the responsibility of various setups proposed in NBM such as Governing Council for broadband, Broadband Steering Committee, and the State Broadband Committee. At the Central level the work is carried out by the Broadband Steering Committee, while at the State level the work is carried by the State Broadband Committee. For monitoring at the District/Municipal level, the States/UTs are required to set up a District level Committee. These elaborate institutional arrangements for streamlining RoW permissions were recommended in the Broadband recommendations by the Authority.

**Figure 2.4: Representation of Broadband steering committee under NBM**

| | |
|---|---|
| Secretary, Department of Telecom | Chairperson |
| Administrator, USOF | Member |
| Representatives from (Not below the level of Joint Secretary) | |
| Niti Aayog | Member |
| Department of Economic Affairs | Member |
| MeitY | Member |
| MoRTH | Member |
| Petroleum & Natural Gas | Member |
| Environment & Forest | Member |
| Power | Member |
| Housing & Urban Affairs | Member |
| Department of Space | Member |
| Railway Board | Member |
| Joint Secretary and Mission Director, Department of Telecom | Member Convenor |

2.187 The Authority through its recommendations on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed" had appreciated the role of NBM committees as one of the key collaborative strategies to streamline RoW permissions. Few of the relevant extracts are presented as follows:

*7.13 Following institutional arrangements for streamlining RoW permissions framework should be put in place:*

*i. Under the National Broadband Mission (NBM), the Central Government has put-in-place the institutional mechanism, in form of the Governing Council for Broadband, the Broadband Steering Committee, and the State Broadband Committee, for inter-ministerial coordination at Center and State level. The objective of the Council and the Committees should be broadened to streamline RoW permissions framework for all utilities by inclusion of additional members nominated from other utility departments/ service providers.*

ii. *In the State Broadband Committees, Secretaries in charge of panchayat and local self-governments, and industry departments should also be included. Further, the Chairman of the State Broadband Committees may coopt the state level representative of the central agency(ies) on need basis in the meeting to resolve the RoW issues in time.*

iii. *Additionally, District Level Committees, with District Magistrate as Chairman, a representative from LSA unit of DoT, and Superintendent Engineer (SE) / Executive Engineer (Ex. Eng.) of the Public Works Department (PWD), be set up to streamline the RoW permissions framework at the district level. The District Level Committees could necessarily include representatives from:*

   a. *Irrigation Department,*
   b. *Forest Department,*
   c. *Rural Development Department,*
   d. *Local Bodies like Municipal Corporation, Municipality, etc. and*
   e. *Utility service providers like telegraph, electricity, water, gas etc.*

2.188 Since the SF structures are owned by both State and Central bodies, the Authority deduces that the involvement of both Broadband Steering Committee and State Broadband Committees as institutionalized in the NBM can play a key role in taking care of the needs of 5G deployment. The Authority is of the opinion that the institutional framework has already been put in place in writing under the NBM, so a separate provision is not required at this stage. Further, the Authority has already recommended the expansion of the objective of these entities to include streamlining of RoW permission framework for all utilities. Implementing this on priority will suffice to take care of the needs of both macro cells and small cells.

2.189 Figure 2.4 displays the representations of the various Ministries/ Departments involved in the National Broadband committee. To develop consensus among the stakeholders and ensure ease in collaboration

among sectors, it is important to bring together all those CAAs associated with the deployment of small cells into a common platform. The NBM report states that the Broadband Steering Committee may incorporate representation from other Ministries / Departments and experts as per requirement. With respect to the above statement, the Authority opines that the current representation of the committee shall be expanded to include other relevant departments also. Since some bodies like the Airports, ports etc. can play an important role in the commercial rollout of 5G, the inclusion of these bodies in the State committees shall also be vital to streamline RoW permissions.

2.190 Regarding the above discussion, the Authority recommends the following:

2.191 **In order to evaluate and assess the progress of small cell rollout, the role of Broadband steering committee, State broadband committee and District/ Municipal Monitoring Committee, should be expanded to include continuous monitoring of the issues of small cells at Central, State and District/Municipal levels, respectively.**

2.192 **The representation of the Broadband Steering Committee should be expanded to co-opt other Ministries or Departments like Civil Aviation, Defense, Ports, Shipping and Waterways, Power etc. as per requirement.**

2.193 **For the State broadband committee members from major ports, airports, metro rail and other relevant commercial bodies that are present in the states, should be co-opted.**

2.194 **In cities where street furniture is controlled by multiple agencies, the concerned State/Local government should**

**nominate one of the assets owning agencies as lead/nodal Authority to monitor the permissions related to small cells.**

2.195 **The details of the nodal ministry and nodal officers from each of the states along with the TSPs/IPs and IPs should be included in the Monitoring Dashboard as envisaged in the NBM to track the progress of the small cell deployment across each State and District of the country.**

2.196 **The Authority reiterates that its earlier recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021 (Para 7.14.ii) in the context of defining clear roles for the Central, State, and Local Body authorities in the RoW portal, should be implemented by the Government on priority. The Authority further recommends that these roles should be widened to administer the use of street furniture for small cell and aerial fiber deployment.**

2.197 In response to the suggestion of a few stakeholders on setting up a nationwide Small Cell Information Exchange (SCIX), the Authority agrees that information sharing shall be one of the ways to strengthen collaborations between industry and the Government. The UK government has said that it would invest in piloting the latest innovations in digital asset management platforms, to help local councils share data more easily with network operators. This would help to deal with the difficulties of network operators on getting the required information to verify a structure is suitable, like its location or physical dimensions, proximity to the street, or access to a power source.

2.198 As has been discussed previously, DPIIT has requested the states to map additional data layers namely electric poles, traffic light poles, bus terminal / bus shelters and Government buildings (State Govt/Central Govt, PSU) which are thought to be used for mounting 5G small cells. As part of these recommendations, the Authority in previous sections has already recommended that a catalogue of GIS mapped Street furniture assets in the National RoW portal should be created with the certain specifications. It has also been recommended that dedicated spaces on rooftops should be identified for deploying small/macro cells. All such spaces should be GIS mapped and mad available on GatiShakti Sanchar portal for charge free use by TSPs/IP-Is on non-discriminatory basis.

2.199 The Authority in its recommendation (numbered 7.31) on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband speed" dated 31st August 2021, had recommended the establishment of an e-market place to facilitate leasing and trading of passive infrastructures using a common GIS platform. The relevant extracts of the recommendation have been mentioned under Section A (refer to para 2.36). But the mentioned recommendation was limited to the sharing of information of only passive infrastructure. With the evolution of 5G, an interactive marketplace and online mapping application for small cells built on reliable and trustworthy data is important. This will aggregate and visualize various dimensions for demand-supply management of small cells to enhance the 5G network connectivity. Therefore, the Authority is of the opinion that the e-marketplace enabled through GIS mapping should be expanded for small cells along with the passive infrastructure.

2.200 With regard to the above discussion, **the Authority recommends that the scope of e-marketplace which was recommended by the Authority in para 7.31.iv of its recommendations dated 31.08.2021 on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband speed" to facilitate leasing and trading of passive infrastructures using a common GIS platform should be expanded to include small cells along with the passive infrastructure.**

b) Regulatory framework for specific street furniture

2.201 The Pilot study conducted by TRAI had given insights on how certain street furniture assets are owned and/or controlled by multiple agencies. It was also observed that the feasibility for housing small cell equipment varied across street furniture structures. As the rollout of 5G is at a nascent stage, the designs of infrastructure associated with it are also evolving. Specifying a regulatory framework for each type of street furniture structures can restrain free development of designs and installation practices. In order to arrive at cost effective strategies and practices of small cell deployment in the near future, it is necessary that the market should be left to evolve without major restrictions. Therefore, the Authority is of the opinion that there is no need for defining a specific regulatory framework for different street furniture structure. All assets including streetlights, traffic poles, kiosks, bus shelters etc. that are potentially capable to host small cells, should be made available for use by TSPs for small cell deployment.

c) Commercial arrangements

2.202 The operators/infrastructure providers generally enter arrangements with street furniture owners in the interest of greater accessibility, time and cost savings. But in most cases, it is of concern that the deployment of small cells on the public structures are seen solely as a source of revenue by various local Authorities and Government bodies, instead of understanding the long-term benefits for the economy. Through the RoW

amendment rules (2022), DoT has already specified the compensation for the establishment and usage of poles and street furniture for the deployment of small cells and overground telegraph line. The Authority is of the opinion that the recent amendment to ROW rules has already addressed the issue of charges levied by the appropriate authorities from the applicants (service providers) for deployment of small cells and aerial fiber on street furniture and no further intervention is required at present.

# CHAPTER 3

# SUMMARY OF THE RECOMMENDATIONS

## A. Right of Way (RoW) Issues and adequacy of current provisions in ROW rules 2016

**3.1 The Authority recommends that the DoT clarification dated 26.10.2022 on Indian Telegraph RoW rules 2016 regarding the term "street furniture", should be made part of the Indian Telegraph RoW rules through a suitable amendment in a relevant Gazette Notification.**

**[Para 2.24]**

**3.2 The Authority reiterates its earlier recommendations issued in the context of Broadband Recommendations dated 31.08.2022 vide Para 7.14.iii that the scope of the proposed national portal should be expanded to grant RoW permissions from utility providers like water, electricity, gas etc. also. More specifically, since most of the SF assets are under the control of the power sector, the portal shall also include a facility to process RoW falling under the jurisdiction of power sector including DISCOMs.**

**[Para 2.32]**

**3.3 The Authority recommends the following amendments to the Indian Telegraph Right of Way (Amendment) Rules, 2022:**

**Sub-rule (1) of Rule 10A of the Indian Telegraph Right of Way (Amendment) Rules, 2022 should be amended as:**

**A licensee shall for the purpose of installation of small cell and telegraph line submit an application, along with details of street furniture and a copy of certification by a structural engineer authorized by appropriate authority, attesting to the structural safety of the street furniture where installation of small cells and**

**telegraph line is proposed to be deployed, to the appropriate authority for permission to use street furniture for installation of small cells and telegraph lines.**

**Provided that licensee may have option to submit single application for multiple sites and appropriate authority shall make due provisions for accepting such applications and issuing single permission for multiple sites accordingly for establishment of small Cells.**

**[Para 2.34]**

**3.4 The Authority recommends that DoT should make provision in the GatiShakti Sanchar Portal for accepting single applications for bulk processing of sites for granting various permissions, including RoW and power connection.**

**[Para 2.35]**

**3.5 The Authority recommends that a Catalogue of GIS mapped Street furniture assets in the National RoW portal should be created with the following specifications:**

**a) Height, load bearing, and wind load capability of structure.**

**b) Wattage, type of power (AC/DC), voltage etc. if power is available.**

**c) Picture of SF.**

**d) Non-discriminatory terms and conditions offered for hiring.**

**e) Contact details (Mobile number, landline number and email ID) of the nodal person for the particular Street Furniture.**

**[Para 2.41]**

**3.6 The Authority recommends that use of Drone based mapping in the GIS system should be considered for quick assessment of the location of small cell infrastructure and for the creation of the street furniture catalogue.**

**[Para 2.42]**

**3.7 The Authority recommends that till the Draft Telecommunications Bill 2022 is passed as a law, the Government should specifically monitor action taken by the state police, for security of Telecommunications Asset, through a DoT and MHA joint committee.**

**[Para 2.45]**

## B. Infrastructure sharing by the Controlling Administrative Authorities (CAA) with TSPs and IP-Is

**3.8 The Authority recommends that:**

**i DoT should issue advisory guidelines to States for mandating CAAs that own/control traffic lights to share these assets with TSPs/IP-Is for deployment of small cells subject to structural stability.**

**ii All Central Government entities should earmark dedicated spaces in their existing and planned buildings/structures for installing DCI including small and macro cells. Dedicated spaces on rooftops should be identified for deploying small/macro cells. All such spaces should be GIS mapped and made available on GatiShakti Sanchar portal for charge free use by TSPs/IP-Is on non-discriminatory basis.**

**iii Advisory guidelines should also be issued to State Governments for similar action by their entities and local bodies. DoT should also follow up with State Governments for implementing the guidelines.**

**[Para 2.85]**

**3.9 The Authority recommends that enabling provisions or suitable terms and conditions shall be introduced in all telecom licenses and IP-I registration agreement prohibiting the TSPs/IP-I providers from entering into any exclusive contract or right of ways with infrastructure owners/CAAs or any other authority.**

**[Para 2.90]**

**3.10 The Authority recommends that DoT should include the following in their advisory guidelines to States:**

i **All CAAs or asset controlling authorities should prohibit entering into exclusive rights/exclusive tie-up with any licensee/registration holder. SF infrastructure should be offered in a non-exclusive and non-discriminatory manner.**

ii **In future, tenders for setting up new SF structures by the appropriate authorities, the possibility of sharing of SF on non-exclusive basis, for hosting DCI like small cells and aerial fiber, should be kept in mind. The terms and conditions for offering all assets that are catalogued and uploaded on GIS portal, should have a mention that the SF is being offered on non-exclusive basis and will be shared with other eligible entities.**

iii **In line with GatiShakti initiative, in all future projects of utility providers that are partially or fully funded by government to put-up new assets (such as gas pipelines, HT power lines, streetlights) or expand existing assets, provisions to host/support DCI such as small cells, towers, and aerial fiber should be in-built.**

**[Para 2.91]**

**3.11 The Authority also recommends that DoT should immediately act on TRAI's letter dated 1st February 2022 (attached as Annexure III) and bring clarity on the provisions of sharing of infrastructure under different licenses to remove the ambiguity in infrastructure sharing provisions in Unified License mentioned in the Chapters related to generic conditions and authorization specific chapters.**

**[Para 2.92]**

**3.12 The Authority reiterates that its earlier recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced**

**Broadband Speed' dated 31.08.2021 (para 7.23) may be implemented at the earliest. National Fiber Authority (NFA) should be formed in priority to undertake the planning and development of common duct and posts infrastructure. The scope of the agency should be expanded beyond common ducts and telegraph posts, to undertake responsibilities related to above-ground contrivances, appliances, and apparatus. Further, NFA should also be given responsibility of ensuring, in consultation with State Governments that CAAs share street furniture assets on non-discriminatory, transparent, and non-exclusive basis.**

**[Para 2.97]**

**3.13 The Authority recommends that in case more than one TSP makes requests to use the same SF and there is insufficient space available to meet the demands of all the requesting TSPs, they should coordinate among themselves to work out a technically feasible solution for shared use of the structure for the installation of equipment. In case the TSPs fail to reach an agreement, they should accept the decision of the CAA which may use a fair and reasonable method to select the TSP(s) who will use the SF.**

**The above provision should be made part of the Indian Telegraph Right of Way Rules, 2016 through a suitable amendment by issuing a Gazette notification.**

**[Para 2.98]**

**3.14 The Authority reiterates its earlier recommendation on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021 (para 7.11) for formation of a National RoW Council. All the RoW matters related to street furniture should also be placed before this council.**

**[Para 2.99]**

## C. Street furniture and small cell sharing among TSPs and IP-Is

**3.15 The Authority recommends that charges paid by lessee TSP to lessor TSP for use of shared infrastructure should be reduced from the Gross Revenues of the lessor TSP to arrive at Applicable Gross Revenue (ApGR) of such Lessor TSP. To implement this, a new item named as "Revenue earned from other licensed TSPs from sharing/leasing of infrastructure" should be inserted under existing license condition named as "List of other items to be excluded from GR to arrive at ApGR". This modification may be carried out in UL, UL(VNO) and ISP licenses. Also, the information collected in "Format of Statement of Revenue and License Fee" that is attached with each authorization chapter in UL, UL(VNO) and with ISP licenses needs to be modified to capture information from such revenues under a separate head.**

**[Para 2.113]**

**3.16 The Authority recommends that the guidelines and registration agreement of IP-I providers should be modified to exclusively mention the term 'poles' in their scope of work.**

**[Para 2.114]**

## D. Process Simplification, Permission Exemption, Standardization of small cells and Installation practices

**3.17 The Authority recommends that Low Power Base Transceiver Stations (LPBTS) should be defined as those BTS that radiate EIRP<=600 W. Such equipment/small cells should be exempted from seeking any kind of permission from any Authority except from the Street Furniture/building owning Agency at all places.**

**[Para 2.142]**

**3.18 DoT's simplified EMF compliance framework should redefine normally compliant class to include those LPBTS with EIRP > 2 and ≤ 600 Watt and TEC should accordingly modify the tables (As provided in Table 2.3) for this class.**

**[Para 2.143]**

**3.19 Recent actions have been taken by DoT for simplifying the process for SACFA compliance, for low power equipment/small cell radiating EIRP<=100 W. DoT should increase this limit to 600 W to cover most of the Small Cells/LPBTSs that are being deployed.**

**[Para 2.144]**

**3.20 Presently TERM Cell is required to audit 10% of sites for which TSPs have submitted self-certification to their offices. However, considering the sheer volume of Small Cells, which otherwise may put severe strain on TERM cell and TSPs resources, this audit criteria for Small Cell may be relaxed. DoT should consult Ministry of Statistics and Programme Implementation (MOSPI) to come up with a scientific sample size for auditing BTS/small cell sites.**

**[Para 2.145]**

**3.21 Presently TSPs are required to provide self-certification for EMF radiation compliance every three years. However, considering the sheer volume of Small Cells, which otherwise may put severe strain on TSPs resources, self-certification criteria for LPBTS should be relaxed to five years.**

**[Para 2.146]**

**3.22 The Authority recommends that DoT should put in place a mechanism for close monitoring of all RoW applications by portal administrators and also coordination with Nodal officers of**

**Appropriate Authorities to ensure timely processing of application and reduce unwanted rejections.**

**[Para 2.153]**

**3.23 The Authority recommends that DoT should make necessary provisions in the GatiShakti Sanchar Portal to incorporate bulk application filing and processing for all categories of Small Cells.**

**[Para 2.154]**

## E. Power related issues and solutions

**3.24 The Authority recommends that DOT should take up the case with Ministry of Power, State governments and SERCs for implementation of following:**

**i. DISCOMs should make provisions to provide connections for telecom sites to TSPs/IP-Is on priority basis. The timelines for providing the connection should be fixed (preferably 15 days) and monitored through portal.**

**ii. Given the importance of DCI for socio-economic development of States, DISCOMs should not charge the TSPs/IP-Is for installation/upgradation of transformer or for pulling the last mile of the electrical connection. If required, states should make necessary provisions for compensating DISCOMs for such waiver of charges.**

**iii. As the power requirements for small cells remain almost flat throughout the day, DISCOMs should charge TSPs/IP-Is on the basis the running load and not on the sanctioned load.**

**iv. All DISCOMs should treat Street Furniture Address as Commercial Address for the purpose of providing a power connection and allow multiple power connections at the same SF commercial address to different commercial entities.**

v. **DISCOMs should allow sub-letting of connections at street furniture locations.**

vi. **Smart pre-paid electricity meters should be installed in all existing telecom installations on priority and in a time bound manner. Also on all new installations, including that for small cells, DISCOMs should only install smart prepaid electric meters.**

vii. **Provision for one application for bulk processing of connection requests for multiple sites should be made available through portals for promoting ease of doing business.**

viii. **Telecom sites should be provided electricity connection under Utility/Industrial tariff.**

ix. **DISCOMs should adopt One DISCOM-One Bill-One Payment policy for all Telecom sector service/infra providers users that use electricity connections at multiple locations.**

x. **Open Access policy for using solar/renewable energy sources needs to be modified to incorporate provision to aggregate demand from all sites of a TSP/IP-I that are served by a DISCOM.**

xi. **DISCOMs should share their maintenance schedules with TSPs/IPs (site owners) in advance so that site owners can be prepared in the event of power cuts. The actual duration of all power outages should also be made available area wise on their website.**

**[Para 2.175]**

**3.25 In the collaborative spirit of GatiShakti and to promote sharing of infrastructure above, the Authority recommends that DoT should take up the issue with the states that whenever land is**

**provided on favorable terms to utility company and those utility company shares the same for utilization with other utility company, then terms of use of land should not change.**

**[Para 2.178]**

## F. Institutional mechanism for enabling Collaboration between Controlling Administrative Authorities and TSPs/IP-Is

**3.26 In order to evaluate and assess the progress of small cell rollout, the role of Broadband steering committee, State broadband committee and District/Municipal Monitoring Committee, should be expanded to include continuous monitoring of the issues of small cells at Central, State and District/Municipal levels, respectively.**

**[Para 2.191]**

**3.27 The representation of the Broadband Steering Committee should be expanded to co-opt other Ministries or Departments like Civil Aviation, Defense, Ports, Shipping and Waterways, Power etc. as per requirement.**

**[Para 2.192]**

**3.28 For the State broadband committee members from major ports, airports, metro rail and other relevant commercial bodies that are present in the states, should be co-opted.**

**[Para 2.193]**

**3.29 In cities where street furniture is controlled by multiple agencies, the concerned State/Local government should nominate one of the assets owning agencies as lead/nodal Authority to monitor the permissions related to small cells.**

**[Para 2.194]**

**3.30 The details of the nodal ministry and nodal officers from each of the states along with the TSPs/IPs and IPs should be included in the Monitoring Dashboard as envisaged in the NBM to track the**

**progress of the small cell deployment across each State and District of the country.**

**[Para 2.195]**

**3.31 The Authority reiterates that its earlier recommendations on 'Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed' dated 31.08.2021 (Para 7.14.ii) in the context of defining clear roles for the Central, State, and Local Body authorities in the RoW portal, should be implemented by the Government on priority. The Authority further recommends that these roles should be widened to administer the use of street furniture for small cell and aerial fiber deployment.**

**[Para 2.196]**

**3.32 The Authority recommends that the scope of e-marketplace which was recommended by the Authority in para 7.31.iv of its recommendations dated 31.08.2021 on "Roadmap to Promote Broadband Connectivity and Enhanced Broadband speed" to facilitate leasing and trading of passive infrastructures using a common GIS platform should be expanded to include small cells along with the passive infrastructure.**

**[Para 2.200]**

## ANNEXURE I

## DoT clarification (dated 26.10.2022) on Indian Telegraph RoW rules, 2016

**No.2-10/2022-Policy**
Government of India
Ministry of Communications
Department of Telecommunication
*****

**Sanchar Bhawan, 20, Ashoka Road**
**New Delhi, the 26th October, 2022.**

**OFFICE MEMORANDUM**

**Subject: - Indian Telegraph Right of Way Rules, 2016 (as amended from time to time) – Clarifications - regarding.**

The undersigned is directed to refer to the provisions related to application fee to be paid by the applicants for seeking permission for Right of Way for establishment of telegraph infrastructure and rejection of application [Rule 6(2)(b) and 10(3)(b)] under the Indian Telegraph Right of Way Rules, 2016. In this regard, it is clarified that application fee shall not be deducted (fully or partly) by agencies processing the application, in case of rejection of application on account of deficiency in the documents submitted by the applicants and the application fee paid shall be adjusted on re-submission of application after rectification for the same site.

2. Further, it is also clarified that the term "Street furniture" mentioned in the Indian Telegraph Right of Way (Amendment) Rules, 2022 includes "post/pole used for electricity, street light, traffic light, traffic sign, bus stop, tram stop, taxi stand, public lavatory, memorial, public sculpture, utility pole or any other structure or contrivance of such nature established over the property of an appropriate authority".

3. All concerned Central Ministries/Departments and State Governments/UT Administrations are requested to convey the above clarification to all the agencies who are involved in granting Right of Way permissions for establishment of telegraph infrastructure.

**[Rahul Dwivedi]**
**Under Secretary to the Government of India**
**Tel. No. 011-23713715**

**To**

1. **Secretaries of all concerned Ministries/Departments** (as per list enclosed).
2. **The Chief Secretaries/Administrators of all States/UTs** (as per list enclosed)

**For information to:**

1. **The Director General,** Cellular Operators Association of India(COAI), New Delhi.
2. **The Director General, Digital Infrastructure Providers Association(DIPA),** New Delhi.
3. **The President, Internet Service Providers Association of India,** Nehru Place, New Delhi.

## ANNEXURE II

## DPIIT letter (dated 24th June 2022) instructing to include additional data layers in the State Master plan

No. National Master Plan/Logistics/2021
Government of India
Ministry of Commerce & Industry
Department for Promotion of Industry and Internal Trade
(Logistics Division)
*****

Udhyog Bhawan, New delhi
Dated 24th June 2022

**OFFICE MEMORANDUM**

Subject: PM Gatishakti State Master Plan - Development of State Master Plan
Ref: OM no. National Master Plan/Logistics/2021 dated 3rd March 2022

The undersigned is directed to refer to above mentioned OM wherein States have been requested to update 24 data layers on PM Gatishakti State Master Plan. In this regard a request has been received from Department of Telecommunication(DoT) (Copy enclosed) regarding additional data layers which can be used for deployment of 5G Cell as DoT is planning to roll out 5G mobile network in the country. Therefore, following additional layers are required to be mapped on the State Master Plan.

i. Electric poles
ii. Traffic light poles
iii. Bus terminal and Bus shelters
iv. Government buildings (State Govt/ Central Govt/ PSU)

2. All States are requested to integrate these layers, as far as possible, in their State Master Plan in coordination with BISAG-N.

(Pramod Kumar Verma)
Under Secretary to Govt of India

Encl: As above

To,

i. Chief Secretaries of all States and UTs
ii. PM Gatishakti nodal officers of all States and UTs

Copy for kind information to:

1. Secretary, DPIIT
2. Shri T.P. Singh, Director General, BISAG-N
3. Shri Vinay Thakur, Additional Director General, BISAG-N
4. Shri Neeraj Kumar, DDG(NBM), DoT and Member NPG

**No. 1-1/2021-DGT/NMPPMGatiShakti**
**Government of India**
**Ministry of Communications**
**Department of Telecommunications**
**O/o DG Telecom HQ**
**(Broadband Mission)**

**Dated: 21.06.2022**

To
Special Secretary (Logistics)
Department for Promotion of Industry and Internal Trade
Udyog Bhawan, New Delhi – 110011

**Subject: PM GatiShakti State Master Plan - inclusion of electric poles for 5G rollout**

**Reference:**

1. DPIIT OM No. National Master Plan /Logistics/2021 dated 3rd March,2022 from Under Secretary to Chief Secretaries of all States & UTs.
2. DO.No. 39-1/2020-DGTHQ/3 dated 11th Feb 2022 from Secretary, (Telecom) to all Chief Secretaries (copy attached)

Please refer to DPIIT OM dated 03.03.2022 mentioned above, wherein DPIIT has requested Chief Secretaries of all States & UTs for integration of data layers (in Annex-A of the letter) into the State Master Plan through the assistance of BISAG-N. Out of the 24 layers suggested for mapping by States one of the layers is for mapping of 'Power transmission and distribution'.

2. In this regard it is suggested that DPIIT may specifically ask States to map the location of the electric Poles as part of mapping of 'Power transmission and distribution'. This is necessary, for imminent 5G rollout, as the Telecom Service Providers may need to install 5G cells at very short distances and the electric poles may be one of the most important choices.

3. It may also be conveyed to the States that it will be good if the States can also identify other potential Street furniture viz. traffic light poles, bus shelters, potential sites of Govt. buildings, bus terminals etc. which may be used for deployment of 5G cells, as DoT is targeting 5G rollout in 15 identified cities of the country, which will be followed by full-fledged rollout in the future.

4. In view of the important role of States in supporting the 5G rollout, it is requested to issue another memorandum to Chief Secretaries of all States & UTs with above points.

**(Neeraj Kumar)**
**DDG & Mission Director**
**National Broadband Mission**

## ANNEXURE III

## TRAI letter to DoT (dated 1.02.2022) on Streamlining the guidelines of passive and active infrastructure sharing

भारतीय दूरसंचार विनियामक प्राधिकरण
TELECOM REGULATORY AUTHORITY OF INDIA
भारत सरकार /Government of India
TRAI

File No. M-7/1/6(4)/2022-BBPA

Date :1st February, 2022

To

Shri K. Rajaraman,
Secretary,
Department of Telecommunications,
Ministry of Communications
Sanchar Bhawan,
20, Ashoka Road, New Delhi - 110001

**Subject: Streamlining the guidelines of Passive and Active Infra Sharing as per Authority's Recommendations-Regarding**

This is regarding issue of Active and Passive sharing as authorized under various Access and Internet Service provision Licenses and Authorization. The provisions allowing active and passive infrastructure sharing in the different licenses/authorizations that were issued at different points in time vary, thus dissuading infrastructure sharing and creating issues of level playing field.

2. About Sharing of passive and Active Infrastructure, Authority in its recent recommendations of August 2021 titled "Recommendations on Roadmap to Promote Broadband Connectivity and Enhanced Broadband Speed" vide Para 3.47 said that similar to the Access Service authorization, passive as well as active infrastructure sharing should be allowed under the Internet Service License, and Internet Service authorization under the Unified License (UL) and UL(VNO) licenses." A similar recommendation was made in the context of "Proliferation of Broadband through public Wi-Fi networks" dated 9th March 2017.

3. It may be noted that UL and UL-VNO License agreement, each has two parts. Part-I has seven chapters and specify conditions that are applicable to all Licensees irrespective of the Authorizations. Part-II has different chapters dedicated to each of the Authorizations like Access Service, ISP, NLD, ILD etc and have specific clauses that are applicable to that particular Authorization over and above the general conditions

Contd/-

महानगर दूरसंचार भवन, जवाहर लाल नेहरू मार्ग, Mahanagar Doorsanchar Bhawan, Jawahar Lal Nehru Marg
(पुराना मिन्टो रोड), नई दिल्ली / (Old Minto Road), New Delhi-110002
फैक्स/Fax : +91-11-23213294, ईपीबीएक्स नं0/EPBX No. : +91-11-23664145

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mentioned in Part-I. Presently different clauses for Active/Passive Infra Sharing under Common Conditions (PART-I) and Specific Service Conditions (PART-II) in different authorizations/Licenses are mentioned (compiled as **Annexure-I).** Plain reading of these conditions can be confusing on following grounds :

a) The Conditions mentioned in Part-I are in conflict with conditions mentioned in Part-II. For example, Clause 33.1 of UL License mentions *"Sharing of active/passive infrastructure shall be governed by the terms and conditions of respective service authorization and amendment/guidelines to be issued by the Licensor from time to time."* However, under ISP Authorization chapter there is no mention of any Active Infrastructure sharing.

b) The conditions mentioned for Access and ISP authorization are not similar.

4. In addition, in the Case of ISP licenses issued under 2002 and 2007 guidelines, there is no clarity about passive Infra sharing or sharing of active infrastructure like antenna, feeder cable, and transmission systems.

5. Authority thus feels that terms of Active/Passive Infrastructure Sharing should be similar in all Licenses/authorizations, to the extent possible. The scope of provisions in common conditions (Part-I of UL and UL-VNO) and specific service conditions (Part-II of UL and UL-VNO) should be clearly mentioned as to whether the clauses in part-II are "additional clauses" or "having overriding effect". DoT may accordingly issue clarification/amendment to license conditions so that sharing of active/passive Infra can be further facilitated.

Encl: As above

RAGHUNANDAN VARTHAKAVI

( V. Raghunandan )
Secretary, TRAI

| | Unified License | | | Unified License (VNO) | | | ISP 2002 | ISP 2007 |
|---|---|---|---|---|---|---|---|---|
| | **Provision under common conditions** | **Provision under Access service authorization under UL** | **Provision under ISP Service authorization under UL** | **Provision under common conditions** | **Provision under Access authorization under UL** | **Provision under ISP authorization under UL** | | |
| **Passive Sharing** | | 4.2(i) Sharing of "passive" infrastructure viz., building, tower, dark fiber, duct space, Right of Way etc. with other Licensees. | 2.1(xi)The Licensee may share "passive" infrastructure namely building, tower, dark fiber, duct space, Right of Way owned, established and operated by it under the scope of this Authorization with other Licensees. | 32.1 The terms and conditions of sharing of infrastructure between the NSO(s) and VNO shall be left to the market i.e. on the basis of mutually accepted terms and conditions between the NSO(s) and the VNO. | 4.2(i) Sharing of "passive" infrastructure viz., building, tower, dark fiber, duct space, Right of Way etc. with other Licensees. | 2.1 (vii) The Licensee may share "passive" infrastructure namely building, tower, dark fiber, duct space, Right of Way owned, established and operated by it under the scope of this Authorization with other VNO Licensees. | | |
| **Active Sharing** | 33.1 Sharing of active/passive infrastructure shall be governed by the terms and conditions of respective service authorization and amendment/guidelines to be issued by the Licensor from time to time. | 4.2 The sharing of infrastructure, owned, established and operated by the Licensee under the scope of this Authorization, is permitted as below: (ii) Provision of point to point bandwidth from their own infrastructure within their Service Area to other licensed telecom service providers for their own use. However, the Licensee hiring the bandwidth shall not resell such bandwidth. | | 32.1 The terms and conditions of sharing of infrastructure between the NSO(s) and VNO shall be left to the market i.e. on the basis of mutually accepted terms and conditions between the NSO(s) and the VNO. | 4.2 The sharing of infrastructure, owned, established and operated by the Licensee under the scope of this Authorization, is permitted as below: (ii) Provision of point to point bandwidth from their own infrastructure within their Service Area to other licensed telecom service providers for their own use. However, the Licensee hiring the bandwidth shall not resell such bandwidth. | | Sharing of Active infrastructure amongst Service Providers based on mutual agreements entered amongst them is permitted. Active infrastructure sharing will be limited to WiFi equipment such as Wi-Fi router, Access Point etc. (Inserted in Guideline on 31.03.2021) | Sharing of Active infrastructure amongst Service Providers based on mutual agreements entered amongst them is permitted. Active infrastructure sharing will be limited to WiFi equipment such as Wi-Fi router, Access Point etc. (Inserted in Guideline on 31.03.2021) |
| | 3.2 Sharing of Active infrastructure amongst Service Providers based on the mutual agreements entered amongst them is permitted. Active infrastructure sharing will | 4.3 Further, the Licensee may share its own active and passive infrastructure | | 32.2 Sharing of Active infrastructure amongst Service Providers based on the mutual agreements entered amongst them is permitted. Active | 4.3 Further, the Licensee may share its own active and passive infrastructure for providing other services authorized to it under the license. | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | be limited to antenna, feeder cable, Node B, Radio Access Network (RAN) and transmission system only. (Amended vide DoT's letter no. 20-443/2014 AS-I Pt. dated 11.02.2016) | for providing other services authorized to it under the license. | | infrastructure sharing will be limited to antenna, feeder cable, Node B, Radio Access Network (RAN) and transmission system only. | | | | |
| | Sharing of infrastructure related to Wi-Fi equipment such as Wi-Fi router, Access Point etc. is allowed. Sharing of backhaul is also permitted. (Amended vide DoT's letter no. 20-271/2010 AS-I (Vol.-III) dated 06.04.2021) | 4.4 Moreover, sharing of active infrastructure with other licensees shall be governed by the license conditions/amendments issued by the Licensor from time to time. | | 33.3 The Licensee may share its own active and passive infrastructure for providing other services authorized to it under any other telecom license issued by Licensor. (Amended vide letter no. 20-271/2010 AS-I (Vol.-III) dated 23.09.2021 & 27.09.2021) | 4.4 Moreover, sharing of active infrastructure with other licensees shall be governed by the license conditions/amendments issued by the Licensor from time to time. | | | |
| | 33.3 The Licensee may share its own active and passive infrastructure for providing other services authorized to it under any other telecom license issued by Licensor. (Amended vide letter no. 20-271/2010 AS-I (Vol.-III) dated 23.09.2021 & 27.09.2021) | 2.1(x) Spectrum sharing and trading would be permitted as per guidelines issued by the Government from time to time. (Amended vide DoT letter no 20-271/2010 AS-I dated 03.12.2015) | | 33.4 An authorized Gateway hub operated by the satellite provider itself is permitted to be shared with the satellite bandwidth seeker. (Amended vide letter no. 20-271/2010 AS-I (Vol.-III) dated 23.09.2021 & 27.09.2021) | | | | |
| | 33.4 An authorized Gateway hub operated by the satellite provider itself is permitted to be shared with the satellite bandwidth seeker. (Amended vide letter no. 20- 271/2010 AS-I (Vol.-III) dated 23.09.2021 & 27.09.2021) | | | | | | | |

## ANNEXURE IV

## DOT's Instructions (dated 04.02.2021) on the Review of EMF Audit Biennial Self-certification

**Government of India**
**Ministry of Communications**
**Department of Telecommunications**
**(Access Services Wing)**
**Sanchar Bhawan, 20, Ashoka Road, New Delhi**

**File No.:800-15/2010-VAS (Pt.)** **Date: 04.02.2021**

To,

**All CMTS/UASL/UL (having Access Service Authorization) Licensees**

**Subject: Review of Biennial Self-Certificate submitted by the TSPs.**

This is in reference to Clause 6.1 of letter no. 800-15/2010-VAS dated 20.11.2013 which states that *"In case of all BTSs, except new BTSs commissioned during the cycle, the TSPs are required to submit the self-certificate within the window of 2 years, which is presently from 01.04.2013 to 31.03.2015, subject to a time gap of at least one year in submission of self-certificate in 2 consecutive cycles. In case of upgraded sites, these certificates are to be submitted in addition to revised certificates submitted at the time of site upgradation."*

**2.** The matter has been further examined and the process of submission of Biennial certificates has been modified as below:-

i. The cycle of submission of self-certificates shall be changed from two years (Biennial) to three years (Triennial). The current cycle commences w.e.f 01.04.2019 and ends on 31.03.2022.

ii. The Triennial submission of self-certificates shall not be done in respect of those BTSs for which following self-certificates have been submitted by the TSPs during the three year cycle:-
   - **a)** Self-certificates for New BTS.
   - **b)** Self-certificate for Upgradation of BTS.
   - **c)** Self certificate due to upgrade/addition of BTSs of other/sharing TSP.

**3.** All existing instructions in general and particularly those issued vide letter no. 800-15/2010-VAS dated 20.11.2013 shall remain same.

This is issued with the approval of competent authority.

(Suresh Kumar)
**ADG(AS-II)**

**Copy to:**
1. DG (T), DoT HQ, New Delhi.
2. All Advisor(s)/Sr. DDGs of LSA Units of DoT.
3. COAI.

## ANNEXURE V

### Recommendations of the Working Group to FOIR

# Recommendations of the Working Group to the FOIR on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators"

**Background**

Based on discussions in the 21st Annual General Body Meeting of FOIR, held on 30.09.2020, a Working Group was constituted (**Annexure-I**) to submit its recommendations on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators". The working group was to submit its recommendations within 3 months from the date of its constitution. However, due to the ongoing pandemic and vastness of the subject which necessitated formation of some sub-groups, the recommendations of the Working Group were delayed.

**Meetings of the Working Group**

Meetings of the Working Group took place on **23.11.2020, 27.01.2021, 21.10.2021, 08.11.2021**, and **16.11.2021**. Deliberations/Presentations were made on how telecom sector can utilize available infrastructure in the electricity sector, international case studies, and information and communication technologies (ICTs) requirements of electricity utilities. Bhaskaracharya National Institute for Space Applications and Geo-informatics{BISAG} , an Autonomous Scientific Society registered under the Societies Registration Act, 1860 under the MeitY, Government of India to undertake technology development & management, research & development, facilitate National & International cooperation, capacity building and support technology transfer & entrepreneurship development in area of geo-spatial technology was requested to make a presentation before the Working Group as they have data of various sectors in realtime form, which can be super imposed to know actual availability of Telecom & Discoms Electrical Poles, OFC etc. The presentation was made by DG of BISAG-N on **8.11.2021**

regarding the work they are doing for development of various portals for the Government.

## Constitution of Sub-groups

As the subject was extensive and various aspects were to be studied and analysed in detail, the Working Group decided to further constitute following four sub-groups :

| S.N. | Group & Mandate | Members | TOR |
|---|---|---|---|
| 1 | **Group 1 - Mapping ofavailable infrastructure/assets** | - Shri H.S Kaushal; CTU (POWERGRID)<br>- Shri H C Sharma, TPDDL<br>- Shri M K Singh, Indus Towers | Guidelines to evolve a country wide National Fibre Grid map based on the fibre optic networks of various utilities which can be further utilized for 5G infrastructure. |
| 2 | **Group 2 - Installation practices for small cells** | Shri H C Sharma; TPDDL<br>Shri M K Singh; Indus Towers<br>Er. J. Prabhakaran; TNERC | |
| 3 | **Group 3 - Installation practices for aerial fibre** | Shri H C Sharma; TPDDL<br>Er. J. Prabhakaran; TNERC | |
| 4 | **Group 4 – Legal, regulatory and licensing issues to enable cross sector collaboration** | Shri Manoj Kumar Singh; Indus Towers<br>Shri H.S Kaushal; CTU (POWERGRID)<br>Mr. H C Sharma; TPDDL<br>Shri Sanjay Sharma , Joint Director - DERC<br>Ms Shilpa Agarwal, Joint - Chief (Engg), CERC | To look into the appropriate provisions of the relevant Acts, Regulations etc. in order to have a seamless participation of Power & Telecom sectors for the development of 5G infrastructure in India. appropriate relevant Acts. |

These Sub-Groups held various meetings and submitted their reports. Based on deliberations held in various meetings and the reports of the sub-groups, the recommendations of the Working Group has been framed as follows :

## Recommendations of Working Group

(i) Government has already announced the GatiShakti programme that marks a paradigm shift in decision making to break the silos of departmentalism. The Working Group strongly feels that FOIR platform can be leveraged to make this program a success. A well thought through and effective cross-sector partnership between Telecom and Power sector can benefit both sectors through increased scales, leveraging shared resources, improve reach and amplify overall developmental impact. Figures below depicts some of the possible areas for cross sectoral collaboration that can bring in new revenue opportunities and cost savings for the service/infra providers of both Telecom & Power sector.



While the possibilities for cross-sectoral collaborations are limitless, the Working Group has identified few areas as low hanging fruits that can be picked up easily to start with. The suggested areas of collaborations are:

a. **Cross-sector collaboration for Aerial/underground fiber deployment**

Overhead or Aerial fiber deployment is deployment of optical fiber cables (OFC) using pole or tower infrastructure and in process avoids the need to dig roads to lay cables or to create new ducts/pipelines. Many developed countries like Japan and Europe have rolled out aerial fibers as part of their broadband plans due to their relatively quick and easy installation

characteristics. South Korea, which has one of the highest Fiber-to-the Home (FTTH) penetration, has relied heavily on aerial fiber deployments in initial years. International experience in the telecom sector has proved that collaborative regulations are helping in the speedy deployment of the 5G Networks. For instance, Georgia Power of the US is utilizing its assets to deploy 5G infrastructure by offering 5 lakh outdoor streetlights poles and 90,000 transmission structures to telecom service providers.

With most of the population residing in Tier 2/Tier 3/Rural areas in India, the overhead fibers can be a good option for rolling out the last mile fiber connections for increasing broadband penetration in hard-to-reach areas. Either existing electricity poles or dedicated poles erected overground for this purpose could be used for laying aerial OFC. Access to the utility poles as well as commercial or residential buildings is also required for installing aerial OFC, small cells, and In-building solutions. This can boost the cross-sector infrastructure development and sharing with other utility sectors can provide added cost advantages.

Power transmission companies like PGCIL have laid down and owns around 1 lac kilometers of optical fiber network Pan India and already provided transmission towers for use by the telecom/ internet service providers. Service providers of Telecom and power sectors together own majority of the utility poles/tower infrastructure and cross-sector collaboration between these two sectors can promote aerial OFC proliferation. Service providers thus can have a mix of underground deployment and overhead deployment along transmission or distribution lines, eliminating infrastructure hurdles of digging and Right of Way (RoW) permissions. This can ensure fast and wide-spread OFC deployment across the country on one hand and can also generate additional revenues from existing assets.

**b. Cross-sector collaboration for 5G Small Cells deployment**

Small cells are low-powered radio access nodes or base stations operating in the licensed or unlicensed spectrum that have a coverage range from a few meters upto several hundred meters. They can be deployed to facilitate connectivity, increase the network capacity and coverage in localized areas whether inside buildings or in outdoor spaces. Small cells will be much closer to mobile users and hence can offer better voice quality and data performance. In the 5G technology, the deployment of small cells will increase tremendously. To promote mobile connectivity, street furniture can be a highly effective tool in expanding the coverage of existing 4G as well as upcoming 5G networks. Moreover, there is a close relationship between street furniture access and aerial fiber deployments.

Granting access to public places like Government buildings/railway stations/metro rail stations/airports/ stadiums etc. and street furniture, such as bus stop shelters, utility poles, lamp posts, or traffic lights, owned by municipalities, at reasonable cost could remove a significant hurdle in 5G small cell deployment in the country.

In India, the power sector contributes to accessible street furniture like electric poles/lines/ supply pillars/cabinets/posts. Most of the infrastructure owned by the power sector distribution utilities in cities can be utilized by the telecom operators for the deployment of 5G Small cells. Alliances can be made with power DISCOMs, cable operators, and municipal authorities for using their utility poles and fibers for small cell deployments and for

providing OFC backhaul to these small cells, LT electric poles can be utilised subject to compliance of safety requirements.

c. **Cross-sector collaboration for smart metering, smart grid monitoring etc.**

5G when deployed on DISCOM's infrastructure creates a Win-Win situation where the distribution companies can be benefited from 5G use cases of smart metering, smart grid monitoring, disaster management, automation, fiber-ready network for power grids, energy management etc. Thus, there are new revenue and cost-saving opportunities for transmission companies and DISCOMs when their infrastructure is utilized for telecom installations.

(i) DISCOMs may rapidly facilitate to overlay the 5G infrastructure over Discom infrastructure which will provide seamless and ubiquitous digital connectivity, enabling adoption of emerging technologies e.g. AI, M2M, IoT, VR etc. for modernization/upgradation of DISCOMs infrastructure on mutual terms and conditions.

(ii) Though the above identified collaboration opportunities are win-win for utility service providers of both sectors, the Working Group felt that there are certain bottlenecks that prevent cross sectoral use of assets. The first major bottleneck is the information asymmetry whereby the utility company of one sector does not know which assets of the utility of other sector are available for sharing/use. The Working Group therefore recommends that a portal should be developed where utilities can give details of existing assets and fibers. A format for collection of Fibre Optics/Tower details from various utilities is being recommended (**Annexure-II**). This information will also help in creation of National Fibre Grid map by Department of Telecommunications (DoT) . The Working Group recommends that a

national portal may be created to publish this information on digital maps. The portal should also have provision whereby a utility company can indicate which of its assets are available for sharing and all other stakeholders can convey their response, if interested. Such a portal will thus be able to match demand and supply for sharing of the assets of utility companies of Power and Telecom sector.

(iii) The Working Group has parallelly requested BISAG-N to develop a prototype portal marking assets of Power and Telecom service providers such as for a 2 km x 2 km area in Delhi which will cover data of telecom towers, electric poles and overhead & underground Fibre networks of State Transmission & DISCOMs. However, this may take some time and the utility companies may not respond to the Working Group's request for data. Therefore, without waiting for the outcome of this initiative, the Working Group recommends that FOIR may ask DoT to get the portal developed.

(iv) The Working Group has observed that many utility companies have either laid optical fiber or own OPGW/ADSS, but are not monetizing these assets by renting them out. Utility companies can register as Infrastructure Providers with DoT to lease out dark fiber. Tata Power have in place their guidelines in this regard. The same can be shared with all power sector utility companies to help them in monetizing their dark fiber assets.

(v) Central Electricity Regulatory Commission (CERC) Regulation (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Businesses), 2020 describes the manner of revenue sharing if any transmission licensee engages in telecommunication business (The amount of the sharing is 10% of gross revenue from Telecom business in a financial year). The Working Group recommends that CERC may request FOIR to either issue guidelines to SERCs or frame model regulations for SERCs on similar lines. The same may be suitably modified and adopted by SERCs.

(vi) It was brought to the notice of the Working Group that POWERGRID has developed an innovative solution for utilizing earth wire & transmission tower obviating the need of land acquisition and equipment power supply for Telecom equipment. Full-fledged demo set up was established by POWERGRID at Jhatikara substation on 400kV Jhatikara-Mundka line for tapping the auxiliary power from the earth wire to feed the tower mounted BTS equipment. Approx six kms Earthwire is isolated using arching horns to take care of intended lightening protection. Auxiliary power in the range of 4.1kW was obtained using induced current of the isolated E/W. This auxiliary power is fed to the BTS equipment by using a suitable DCPS convertor. The telecom antennas and the BTS with associated panel, batteries, charger etc were placed on a platform mounted on the transmission tower. A typical installation has been depicted in **Annexure-III**. The set-up has been working satisfactorily since 18.06.2017. The Working Group therefore recommends utilization of the 400kV & 765kV transmission line Towers (and any other suitable ones) located near urban/rural population for placement of Telecom antennas and associated equipment on the towers itself (wherever feasible) to cater to the requirement of telecom towers.

(vii) In the matter of utilisation of Transmission Tower for placement of Telecom equipment and auxiliary power from earth wire, CERC has issued an Order i.r.o POWERGRID petition and has decided for revenue sharing with beneficiaries in ratio of 50:50 for one year and same shall be reviewed after one year. The Working Group recommends that CERC may request FOIR to either issues guidelines to SERCs or frame model regulations for SERCs on revenue sharing model similar to CERC's order w.r.t. POWERGRID petition.

(viii) The Working Group also recommends utilization of transmission assets such as electric substations lands & buildings as location for

placing Telecom sector equipment (wherever feasible) as they are operational on 24x7 power supply.

(ix) Delhi Electricity Regulatory Commission (DERC) has allowed for utilization of distribution assets for Telecom services on revenue sharing basis and same can be adopted by other State Regulators also. However, Municipal Corporation are imposing tax liability in cases where transmission assets i.e. Substation lands & buildings, are shared for cross function use on revenue sharing model. The Working Group recommends that this issue needs to be taken up at appropriate level so that whenever land is provided on favourable terms to utility companies and those utility companies are sharing the same for utilization with other utility company, then terms of use of land should not change.

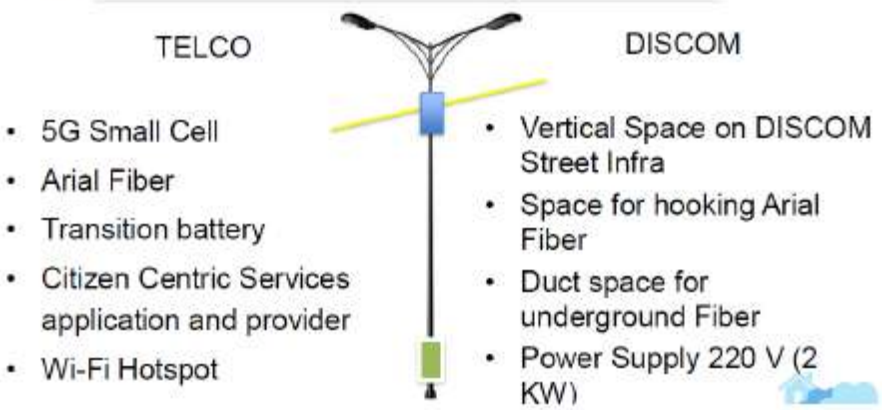
(x) As far as deployment of small cells on electric poles is concerned, the Working Group is of the opinion that Utility Poles would need following retrofit for small Cell Deployment :

a. Mounts for deployment of Small cell / Wi-Fi
b. Electricity Connection : 2KW
c. Outdoor enclosure for hoisting Power / Fiber / Telecom Equipment

As per the information provided to the Working Group, typical requirements of cabinets on utility poles for small cell deployment will be as follows:

| Item | Details |
|---|---|
| Small Cell &Power Enclosure | 1. Cabinet with Power Backup= 300(W)*450(L)*575(H) in MM. Weight= 32Kg ± 2Kg<br>2. Cabinet without Power Backup= 200(W)*275(L)*375(H) in MM. Weight= 22 Kg ± 2Kg<br>3. Only one Cabinet will be installed at one Pole as per requirement.<br>4. Small Cell= 300*300*50 Weight= 14 Kg for 1 unit, 2 Units atone pole.<br>5. Pole Mount Assembly= Weight= 6 kg |

(xi) However, to have full understanding of all the requirements, the Working Group recommends that FOIR can initiate a pilot project to practically show how assets of Telecom and Power sector can be shared as shown below:




For the same, FOIR can identify 2 DISCOMs with 50-100 nos. of locations of street light poles. One or two Infrastructure providers can deploy 5G & Fiber Infra over DISCOM Infra (Indus Tower has already shown interest to work on this pilot). Citizen Centric Service and App provider can be looped in by these players to identify 2-3 use case for DISCOM i.e. Smart Metering, Uptime Management & QoS at user end. The Pilot Project may run for 3 months and detailed report to be submitted.

**Additional recommendations for consideration of FOIR**

The Working Group was also apprised of some issues that if addressed, can help in rapid infrastructure creation and faster rollout of 5G services. The same have been listed below for consideration of FOIR.

(i) A sum of Rs 22,500 crore has been earmarked as Central Government grant for installation of 25 crore smart prepaid meters across the country under the Rs 3-lakh-crore scheme for power distribution entities (DISCOMs) recently approved by the Cabinet. SERCs may direct the DISCOMs to Install Prepaid smart meters at telecom sites on priority.

(ii) As per CBDT Circular dtd. 30th June, 2021, Companies are paying 0.1% TDS over DISCOM bill payments, whereas DISCOMs are yet to upgrade their payment portals to accept bill nett of TDS. Due to this , the industry is burdened with 0.1% of additional out flow (Paying 0.1% TDS & not deducting from the bills). As there is no adverse impact on the DISCOMs , there is reluctance to upgrade their system to accept payments net off TDS. It is recommended that either DISCOMs seek exclusion from CBDT for TDS applicability upon electricity payments or seek some moratorium period to upgrade their system, to stop double payment problem currently faced by Service providers/Infrastructure providers of telecom sector.

(iii) Telecom sites should be provided electricity connection under Utility/Industrial tariff. SERCs may be requested to incorporate the same in their tariff orders.

(iv) Discoms should adopt One Discom-One Bill-One Payment policy for all Business users that use electricity connections at multiple locations including Telecom sector service/infra providers. SERCs may be requested to incorporate the same in their tariff orders.

(v) Electricity consumption at each telecom site may be allowed to be aggregated and offset with green power (solar, wind, hydro etc) generated at distant locations. SERCs may be requested to incorporate same in their regulations.

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**Annexure - I**

**Members of the Working Group**

1. Shri Sanjeev Kumar Sharma, Advisor, TRAI – Chairman of the Working Group
2. Shri J.K. Vaid, Director (Tariff), PSERC- Member
3. Ms. Sujata Das Chakrabarti, Secretary, TERC - Member
4. Shri Sanjay Kumar Sharma, Joint Director ( PS & Engg.), DERC - Member
5. Ms Shilpa Agarwal, Joint Chief (Engg.), CERC - Member
6. Shri S.T.Anada, Joint Director, GERC – Member
7. Er. J.Prabhakaran, Dy.Director/ Engg. (II), TNERC - Member
8. Shri Shouvik Banerjee, SE (E), CPD, WBSETCL – Member
9. Shri Manoj Kumar Singh, Chief of Technology, Indus Towers Limited - Member
10. Shri H.S Kaushal, Senior General Manager, CTU (POWERGRID) – Member & Convenor
11. Ms. Rashmi Somasekharan Nair, Dy. Chief (RA), CERC, FOIR Secretariat

**Special Invitee**

Mr. H C Sharma, GM, TPDDL

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Annexure-II

| Format for Assets Database | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Utility Name (TELCO/POWERTEL/GAIL/RAILTEL/BSNL/MTNL/SEB/Other) - | | | | | | | | | | |
| Sr. No. | Name of link | | | | No. of Fibre (24/48/96) | Possible Fibre Sharing | | Whether Space is available in Node-A for BTS/MTS equipment/ Monitoring Center (Y/N) | Whether Space is available in Node-B for BTS/MTS equipment/ Monitoring Center (Y/N) | Remarks (if any) |
| | From Node-A | | To Node-B | | | Whether Dark fibres Available (Y/N) | Whether Bandwidth Available (Y/N) | | | |
| | Node Name | Co-ordinate | Node Name | Co-ordinate | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |

| Power Distribution Utility (DISCOM) Name- | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl No. | Tower/Pole Details | | | | | | | |
| | Name of city | Details of Towers/Poles for mounting of 5G equipment (Mico Cells) – Height/Weight carrying capacity | Area/ Location of Pole | Latitude | Longitude | Clearance from ground available for mounting equipment | Whether electric connection available | Whether Tower Pole is available for sharing |
| 1 | | | | | | | | |
| 2 | | | | | | | | |

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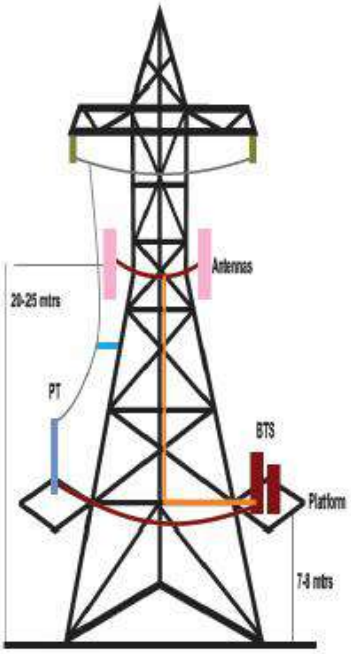
**Annexure-III**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# List of Acronyms

| S. No. | Acronym | Description |
|---|---|---|
| 1 | 3D | Three Dimensional |
| 2 | 3G | Third generation |
| 3 | 4G | Fourth generation |
| 4 | 5G | Fifth generation |
| 5 | AC | Alternating current |
| 6 | AGR | Adjusted Gross Revenue |
| 7 | AI | Artificial Intelligence |
| 8 | ANFR | French Regulatory agency for spectrum management |
| 9 | ApGR | Applicable Gross Revenue |
| 10 | API | Application programming interface |
| 11 | ARAI | Automotive Research Association of India |
| 12 | BG | Bank Guarantee |
| 13 | BIS | Bureau of Indian Standards |
| 14 | BISAG-N | Bhaskaracharya National Institute for Space Applications and Geo-informatics |
| 15 | BMRCL | Bengaluru Metro Rail Corporation |
| 16 | BOT | Build–operate–transfer |
| 17 | BSNL | Bharat Sanchar Nigam Limited |
| 18 | CAAs | Controlling administrative authorities |
| 19 | CAPEX | Capital Expenditure |
| 20 | CDPDA | Common Ducts and Posts Development Agency |
| 21 | CERC | Central Electricity Regulatory Commission |
| 22 | CP | Consultation Paper |
| 23 | CPR | Construction Products Regulation |
| 24 | CPSE | Central Public Sector Enterprises |
| 25 | CTI | Common Telecom Infrastructure |
| 26 | DAS | Distributed antenna systems |
| 27 | dBm | decibel milliwatts |
| 28 | DC | Direct current |
| 29 | DCI | Digital Connectivity Infrastructure |
| 30 | DERC | Delhi Electricity Regulatory Commission |
| 31 | DISCOMs | Distribution Company |
| 32 | DoT | Department of Telecommunications |
| 33 | DPIIT | Department for Promotion of Industry and Internal Trade. |
| 34 | EB | Electricity Board |

| | | |
|---|---|---|
| 35 | EECC | European Electronics Communication Code |
| 36 | EIRP | Effective Isotropic Radiation Power |
| 37 | EMF | Electromagnetic fields |
| 38 | EU | European Union |
| 39 | FCC | Federal Code of Communication |
| 40 | FDB | Fibre Splitter Distribution box |
| 41 | FOIR | Forum of India Regulators |
| 42 | FOR | Forum of Regulators |
| 43 | G.S.R | General Statutory Rules |
| 44 | GB | General Body |
| 45 | GIS | Geographic Information System |
| 46 | HT | High tension |
| 47 | IBS | In-building systems |
| 48 | ICNIRP | International Commission on Non-Ionizing Radiation Protection |
| 49 | ICT | Information and Communication Technology |
| 50 | IEC | International Electrotechnical Commission |
| 51 | IoT | Internet of Things |
| 52 | IP | Infrastructure Provider |
| 53 | IPDS | Integrated Power Development Scheme |
| 54 | IP-I | Infrastructure Provider Category -I |
| 55 | ISP | Internet Service Provider |
| 56 | ISRO | Indian Space Research Organisation |
| 57 | ITU | International Telecommunication Union |
| 58 | JERC | Joint Electricity Regulatory Commission |
| 59 | km | kilometre |
| 60 | LF | License fee |
| 61 | LPBTS | Low power Base Station Transmitters |
| 62 | LSA | Licensed Service Area |
| 63 | M2M | Machine to Machine communications |
| 64 | MIMO | Multiple-Input Multiple-Output |
| 65 | MNO | Mobile Network Operator |
| 66 | MoHUA | Ministry of Housing and Urban Affairs |
| 67 | MO-RAN | Multi-operator Radio Access Network |
| 68 | MOSPI | Ministry of Statistics and Programme Implementation |
| 69 | NBC | National Building Code |
| 70 | NBM | National Broadband Mission |
| 71 | NDCP | National Digital Communications Policy |
| 72 | NFA | National Fiber Authority |
| 73 | NOC | No objection Certificate |

| | | |
|---|---|---|
| 74 | NSGM | National Smart Grid Mission |
| 75 | OA | Open Access |
| 76 | ODN | Optical Distribution Network |
| 77 | OEMs | Original equipment manufacturer |
| 78 | OFC | Optical fibre cables |
| 79 | OG | Overground |
| 80 | OHD | Open House Discussion |
| 81 | OLT | Optical line termination |
| 82 | OPEX | Operational Expenditure |
| 83 | PBO | Plan Build Operate |
| 84 | PM | Prime Minister |
| 85 | PPP | Public Private Partnership |
| 86 | PSU | Public Sector Undertaking |
| 87 | PWD | Public Works Department |
| 88 | RBS | Radio base station |
| 89 | RCI | radio communications infrastructures |
| 90 | RDSS | Revamped Distribution Sector Scheme |
| 91 | RF | Radio frequency |
| 92 | RoW | Right of Way |
| 93 | SAC | Simplified Assessment Criteria |
| 94 | SBC | State Broadband Committees |
| 95 | SCF | Small cell forum |
| 96 | SCIX | Small Cell Information Exchange |
| 97 | SDO | standard developing organizations |
| 98 | SE | Superintend Engineer |
| 99 | SEB | State Electricity Board |
| 100 | SERC | State Electricity Regulatory Commission |
| 101 | SF | Street Furniture |
| 102 | SLAs | Service-level agreements |
| 103 | SMPS | Switched Mode Power Supply |
| 104 | SSA | Secondary Switching Service Area |
| 105 | SUC | Spectrum usage charges |
| 106 | TEC | Telecom Engineering Centre |
| 107 | TP | Test Procedure |
| 108 | TRAI | Telecom Regulatory Authority of India |
| 109 | TSPs | Telecom Service Providers |
| 110 | UK | United Kingdom |
| 111 | UL | Unified license |
| 112 | UL-VNO | Unified license -Virtual Network Operators |
| 113 | US | United States |
| 114 | USA | United States of America |
| 115 | UT | Union Territory |

| | | |
|---|---|---|
| 116 | VR | Virtual Reality |
| 117 | W | Watts |
| 118 | Wi-Fi | Wireless Fidelity |

# Recommendations of the Working Group to the FOIR on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators"

**Background**

Based on discussions in the 21st Annual General Body Meeting of FOIR, held on 30.09.2020, a Working Group was constituted (**Annexure-I**) to submit its recommendations on "Cross Sector Collaborative Regulation between Telecom Regulators and Electricity Regulators". The working group was to submit its recommendations within 3 months from the date of its constitution. However, due to the ongoing pandemic and vastness of the subject which necessitated formation of some sub-groups, the recommendations of the Working Group were delayed.

**Meetings of the Working Group**

Meetings of the Working Group took place on **23.11.2020, 27.01.2021, 21.10.2021, 08.11.2021**, and **16.11.2021**. Deliberations/Presentations were made on how telecom sector can utilize available infrastructure in the electricity sector, international case studies, and information and communication technologies (ICTs) requirements of electricity utilities. Bhaskaracharya National Institute for Space Applications and Geo-informatics{BISAG} , an Autonomous Scientific Society registered under the Societies Registration Act, 1860 under the MeitY, Government of India to undertake technology development & management, research & development, facilitate National & International cooperation, capacity building and support technology transfer & entrepreneurship development in area of geo-spatial technology was requested to make a presentation before the Working Group as they have data of various sectors in realtime form, which can be super imposed to know actual availability of Telecom & Discoms Electrical Poles, OFC etc. The presentation was made by DG of BISAG-N on **8.11.2021**

regarding the work they are doing for development of various portals for the Government.

## Constitution of Sub-groups

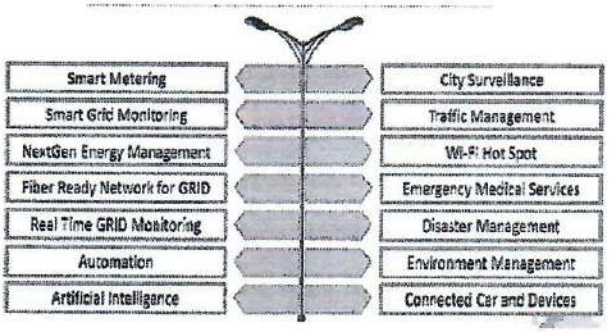
As the subject was extensive and various aspects were to be studied and analysed in detail, the Working Group decided to further constitute following four sub-groups :

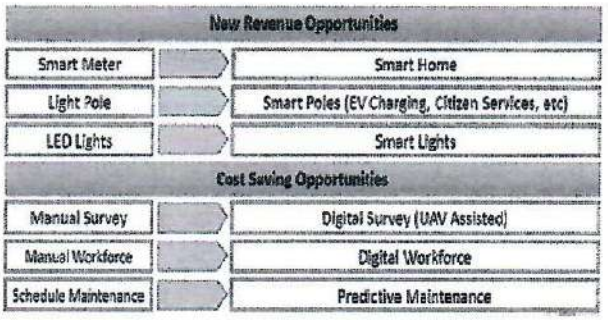
| S.N. | Group & Mandate | Members | TOR |
|---|---|---|---|
| 1 | **Group 1 - Mapping ofavailable infrastructure/assets** | - Shri H.S Kaushal; CTU (POWERGRID)<br>- Shri H C Sharma, TPDDL<br>- Shri M K Singh, Indus Towers | Guidelines to evolve a country wide National Fibre Grid map based on the fibre optic networks of various utilities which can be further utilized for 5G infrastructure. |
| 2 | **Group 2 - Installation practices for small cells** | Shri H C Sharma; TPDDL<br>Shri M K Singh; Indus Towers<br>Er. J. Prabhakaran; TNERC | |
| 3 | **Group 3 - Installation practices for aerial fibre** | Shri H C Sharma; TPDDL<br>Er. J. Prabhakaran; TNERC | |
| 4 | **Group 4 – Legal, regulatory and licensing issues to enable cross sector collaboration** | Shri Manoj Kumar Singh; Indus Towers<br>Shri H.S Kaushal; CTU (POWERGRID)<br>Mr. H C Sharma; TPDDL<br>Shri Sanjay Sharma , Joint Director - DERC<br>Ms Shilpa Agarwal, Joint - Chief (Engg), CERC | To look into the appropriate provisions of the relevant Acts, Regulations etc. in order to have a seamless participation of Power & Telecom sectors for the development of 5G infrastructure in India. appropriate relevant Acts. |

These Sub-Groups held various meetings and submitted their reports. Based on deliberations held in various meetings and the reports of the sub-groups, the recommendations of the Working Group has been framed as follows :

## Recommendations of Working Group

(i) Government has already announced the GatiShakti programme that marks a paradigm shift in decision making to break the silos of departmentalism. The Working Group strongly feels that FOIR platform can be leveraged to make this program a success. A well thought through and effective cross-sector partnership between Telecom and Power sector can benefit both sectors through increased scales, leveraging shared resources, improve reach and amplify overall developmental impact. Figures below depicts some of the possible areas for cross sectoral collaboration that can bring in new revenue opportunities and cost savings for the service/infra providers of both Telecom & Power sector.




While the possibilities for cross-sectoral collaborations are limitless, the Working Group has identified few areas as low hanging fruits that can be picked up easily to start with. The suggested areas of collaborations are:

### a. Cross-sector collaboration for Aerial/underground fiber deployment

Overhead or Aerial fiber deployment is deployment of optical fiber cables (OFC) using pole or tower infrastructure and in process avoids the need to dig roads to lay cables or to create new ducts/pipelines. Many developed countries like Japan and Europe have rolled out aerial fibers as part of their broadband plans due to their relatively quick and easy installation

characteristics. South Korea, which has one of the highest Fiber-to-the Home (FTTH) penetration, has relied heavily on aerial fiber deployments in initial years. International experience in the telecom sector has proved that collaborative regulations are helping in the speedy deployment of the 5G Networks. For instance, Georgia Power of the US is utilizing its assets to deploy 5G infrastructure by offering 5 lakh outdoor streetlights poles and 90,000 transmission structures to telecom service providers.

With most of the population residing in Tier 2/Tier 3/Rural areas in India, the overhead fibers can be a good option for rolling out the last mile fiber connections for increasing broadband penetration in hard-to-reach areas. Either existing electricity poles or dedicated poles erected overground for this purpose could be used for laying aerial OFC. Access to the utility poles as well as commercial or residential buildings is also required for installing aerial OFC, small cells, and In-building solutions. This can boost the cross-sector infrastructure development and sharing with other utility sectors can provide added cost advantages.

Power transmission companies like PGCIL have laid down and owns around 1 lac kilometers of optical fiber network Pan India and already provided transmission towers for use by the telecom/ internet service providers. Service providers of Telecom and power sectors together own majority of the utility poles/tower infrastructure and cross-sector collaboration between these two sectors can promote aerial OFC proliferation. Service providers thus can have a mix of underground deployment and overhead deployment along transmission or distribution lines, eliminating infrastructure hurdles of digging and Right of Way (RoW) permissions. This can ensure fast and wide-spread OFC deployment across the country on one hand and can also generate additional revenues from existing assets.

**b. Cross-sector collaboration for 5G Small Cells deployment**

Small cells are low-powered radio access nodes or base stations operating in the licensed or unlicensed spectrum that have a coverage range from a few meters upto several hundred meters. They can be deployed to facilitate connectivity, increase the network capacity and coverage in localized areas whether inside buildings or in outdoor spaces. Small cells will be much closer to mobile users and hence can offer better voice quality and data performance. In the 5G technology, the deployment of small cells will increase tremendously. To promote mobile connectivity, street furniture can be a highly effective tool in expanding the coverage of existing 4G as well as upcoming 5G networks. Moreover, there is a close relationship between street furniture access and aerial fiber deployments.

Granting access to public places like Government buildings/railway stations/metro rail stations/airports/ stadiums etc. and street furniture, such as bus stop shelters, utility poles, lamp posts, or traffic lights, owned by municipalities, at reasonable cost could remove a significant hurdle in 5G small cell deployment in the country.

In India, the power sector contributes to accessible street furniture like electric poles/lines/ supply pillars/cabinets/posts. Most of the infrastructure owned by the power sector distribution utilities in cities can be utilized by the telecom operators for the deployment of 5G Small cells. Alliances can be made with power DISCOMs, cable operators, and municipal authorities for using their utility poles and fibers for small cell deployments and for

providing OFC backhaul to these small cells, LT electric poles can be utilised subject to compliance of safety requirements.

c. **Cross-sector collaboration for smart metering, smart grid monitoring etc.**

5G when deployed on DISCOM's infrastructure creates a Win-Win situation where the distribution companies can be benefited from 5G use cases of smart metering, smart grid monitoring, disaster management, automation, fiber-ready network for power grids, energy management etc. Thus, there are new revenue and cost-saving opportunities for transmission companies and DISCOMs when their infrastructure is utilized for telecom installations.

(i) DISCOMs may rapidly facilitate to overlay the 5G infrastructure over Discom infrastructure which will provide seamless and ubiquitous digital connectivity, enabling adoption of emerging technologies e.g. AI, M2M, IoT, VR etc. for modernization/upgradation of DISCOMs infrastructure on mutual terms and conditions.

(ii) Though the above identified collaboration opportunities are win-win for utility service providers of both sectors, the Working Group felt that there are certain bottlenecks that prevent cross sectoral use of assets. The first major bottleneck is the information asymmetry whereby the utility company of one sector does not know which assets of the utility of other sector are available for sharing/use. The Working Group therefore recommends that a portal should be developed where utilities can give details of existing assets and fibers. A format for collection of Fibre Optics/Tower details from various utilities is being recommended (**Annexure-II**). This information will also help in creation of National Fibre Grid map by Department of Telecommunications (DoT) . The Working Group recommends that a

national portal may be created to publish this information on digital maps. The portal should also have provision whereby a utility company can indicate which of its assets are available for sharing and all other stakeholders can convey their response, if interested. Such a portal will thus be able to match demand and supply for sharing of the assets of utility companies of Power and Telecom sector.

(iii) The Working Group has parallelly requested BISAG-N to develop a prototype portal marking assets of Power and Telecom service providers such as for a 2 km x 2 km area in Delhi which will cover data of telecom towers, electric poles and overhead & underground Fibre networks of State Transmission & DISCOMs. However, this may take some time and the utility companies may not respond to the Working Group's request for data. Therefore, without waiting for the outcome of this initiative, the Working Group recommends that FOIR may ask DoT to get the portal developed.

(iv) The Working Group has observed that many utility companies have either laid optical fiber or own OPGW/ADSS, but are not monetizing these assets by renting them out. Utility companies can register as Infrastructure Providers with DoT to lease out dark fiber. Tata Power have in place their guidelines in this regard. The same can be shared with all power sector utility companies to help them in monetizing their dark fiber assets.

(v) Central Electricity Regulatory Commission (CERC) Regulation (Sharing of Revenue Derived from Utilization of Transmission Assets for Other Businesses), 2020 describes the manner of revenue sharing if any transmission licensee engages in telecommunication business (The amount of the sharing is 10% of gross revenue from Telecom business in a financial year). The Working Group recommends that CERC may request FOIR to either issue guidelines to SERCs or frame model regulations for SERCs on similar lines. The same may be suitably modified and adopted by SERCs.

(vi) It was brought to the notice of the Working Group that POWERGRID has developed an innovative solution for utilizing earth wire & transmission tower obviating the need of land acquisition and equipment power supply for Telecom equipment. Full-fledged demo set up was established by POWERGRID at Jhatikara substation on 400kV Jhatikara-Mundka line for tapping the auxiliary power from the earth wire to feed the tower mounted BTS equipment. Approx six kms Earthwire is isolated using arching horns to take care of intended lightening protection. Auxiliary power in the range of 4.1kW was obtained using induced current of the isolated E/W. This auxiliary power is fed to the BTS equipment by using a suitable DCPS convertor. The telecom antennas and the BTS with associated panel, batteries, charger etc were placed on a platform mounted on the transmission tower. A typical installation has been depicted in **Annexure-III**. The set-up has been working satisfactorily since 18.06.2017. The Working Group therefore recommends utilization of the 400kV & 765kV transmission line Towers (and any other suitable ones) located near urban/rural population for placement of Telecom antennas and associated equipment on the towers itself (wherever feasible) to cater to the requirement of telecom towers.

(vii) In the matter of utilisation of Transmission Tower for placement of Telecom equipment and auxiliary power from earth wire, CERC has issued an Order i.r.o POWERGRID petition and has decided for revenue sharing with beneficiaries in ratio of 50:50 for one year and same shall be reviewed after one year. The Working Group recommends that CERC may request FOIR to either issues guidelines to SERCs or frame model regulations for SERCs on revenue sharing model similar to CERC's order w.r.t. POWERGRID petition.

(viii) The Working Group also recommends utilization of transmission assets such as electric substations lands & buildings as location for

placing Telecom sector equipment (wherever feasible) as they are operational on 24x7 power supply.

(ix) Delhi Electricity Regulatory Commission (DERC) has allowed for utilization of distribution assets for Telecom services on revenue sharing basis and same can be adopted by other State Regulators also. However, Municipal Corporation are imposing tax liability in cases where transmission assets i.e. Substation lands & buildings, are shared for cross function use on revenue sharing model. The Working Group recommends that this issue needs to be taken up at appropriate level so that whenever land is provided on favourable terms to utility companies and those utility companies are sharing the same for utilization with other utility company, then terms of use of land should not change.

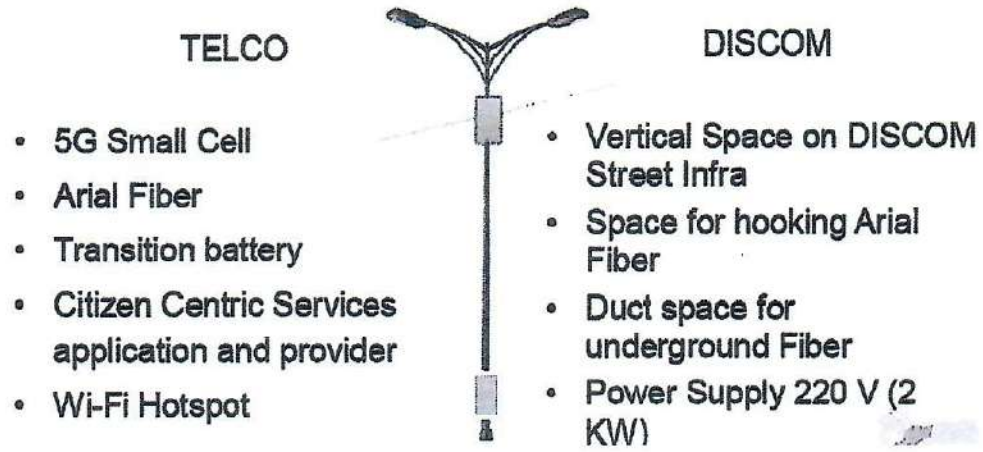
(x) As far as deployment of small cells on electric poles is concerned, the Working Group is of the opinion that Utility Poles would need following retrofit for small Cell Deployment :

a. Mounts for deployment of Small cell / Wi-Fi
b. Electricity Connection : 2KW
c. Outdoor enclosure for hoisting Power / Fiber / Telecom Equipment

As per the information provided to the Working Group, typical requirements of cabinets on utility poles for small cell deployment will be as follows:

| Item | Details |
|---|---|
| Small Cell &Power Enclosure | 1. Cabinet with Power Backup= 300(W)*450(L)*575(H) in MM. Weight= 32Kg ± 2Kg<br>2. Cabinet without Power Backup= 200(W)*275(L)*375(H) in MM. Weight= 22 Kg ± 2Kg<br>3. Only one Cabinet will be installed at one Pole as per requirement.<br>4. Small Cell= 300*300*50 Weight= 14 Kg for 1 unit, 2 Units atone pole.<br>5. Pole Mount Assembly= Weight= 6 kg |

(xi) However, to have full understanding of all the requirements, the Working Group recommends that FOIR can initiate a pilot project to practically show how assets of Telecom and Power sector can be shared as shown below:




For the same, FOIR can identify 2 DISCOMs with 50-100 nos. of locations of street light poles. One or two Infrastructure providers can deploy 5G & Fiber Infra over DISCOM Infra (Indus Tower has already shown interest to work on this pilot). Citizen Centric Service and App provider can be looped in by these players to identify 2-3 use case for DISCOM i.e. Smart Metering, Uptime Management & QoS at user end. The Pilot Project may run for 3 months and detailed report to be submitted.

**Additional recommendations for consideration of FOIR**

The Working Group was also apprised of some issues that if addressed, can help in rapid infrastructure creation and faster rollout of 5G services. The same have been listed below for consideration of FOIR.

(i) A sum of Rs 22,500 crore has been earmarked as Central Government grant for installation of 25 crore smart prepaid meters across the country under the Rs 3-lakh-crore scheme for power distribution entities (DISCOMs) recently approved by the Cabinet. SERCs may direct the DISCOMs to Install Prepaid smart meters at telecom sites on priority.

(ii) As per CBDT Circular dtd. 30th June, 2021, Companies are paying 0.1% TDS over DISCOM bill payments, whereas DISCOMs are yet to upgrade their payment portals to accept bill nett of TDS. Due to this , the industry is burdened with 0.1% of additional out flow (Paying 0.1% TDS & not deducting from the bills). As there is no adverse impact on the DISCOMs , there is reluctance to upgrade their system to accept payments net off TDS. It is recommended that either DISCOMs seek exclusion from CBDT for TDS applicability upon electricity payments or seek some moratorium period to upgrade their system, to stop double payment problem currently faced by Service providers/Infrastructure providers of telecom sector.

(iii) Telecom sites should be provided electricity connection under Utility/Industrial tariff. SERCs may be requested to incorporate the same in their tariff orders.

(iv) Discoms should adopt One Discom-One Bill-One Payment policy for all Business users that use electricity connections at multiple locations including Telecom sector service/infra providers. SERCs may be requested to incorporate the same in their tariff orders.

(v) Electricity consumption at each telecom site may be allowed to be aggregated and offset with green power (solar, wind, hydro etc) generated at distant locations. SERCs may be requested to incorporate same in their regulations.

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**Annexure - I**

## Members of the Working Group

1. Shri Sanjeev Kumar Sharma, Advisor, TRAI – Chairman of the Working Group
2. Shri J.K. Vaid, Director (Tariff), PSERC- Member
3. Ms. Sujata Das Chakrabarti, Secretary, TERC - Member
4. Shri Sanjay Kumar Sharma, Joint Director ( PS & Engg.), DERC - Member
5. Ms Shilpa Agarwal, Joint Chief (Engg.), CERC - Member
6. Shri S.T.Anada, Joint Director, GERC – Member
7. Er. J.Prabhakaran, Dy.Director/ Engg. (II), TNERC - Member
8. Shri Shouvik Banerjee, SE (E), CPD, WBSETCL – Member
9. Shri Manoj Kumar Singh, Chief of Technology, Indus Towers Limited - Member
10. Shri H.S Kaushal, Senior General Manager, CTU (POWERGRID) – Member & Convenor
11. Ms. Rashmi Somasekharan Nair, Dy. Chief (RA), CERC, FOIR Secretariat

**Special Invitee**

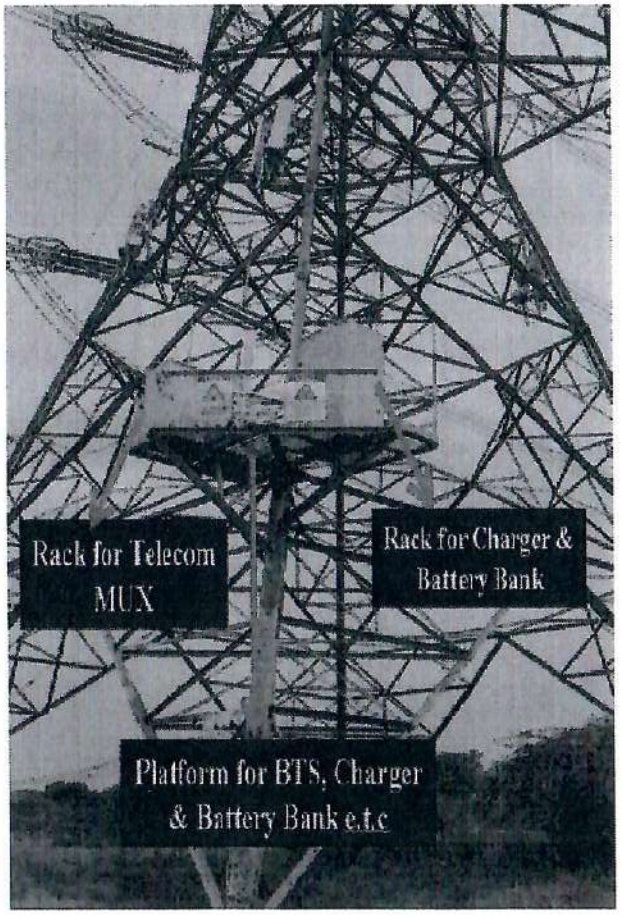
Mr. H C Sharma, GM, TPDDL

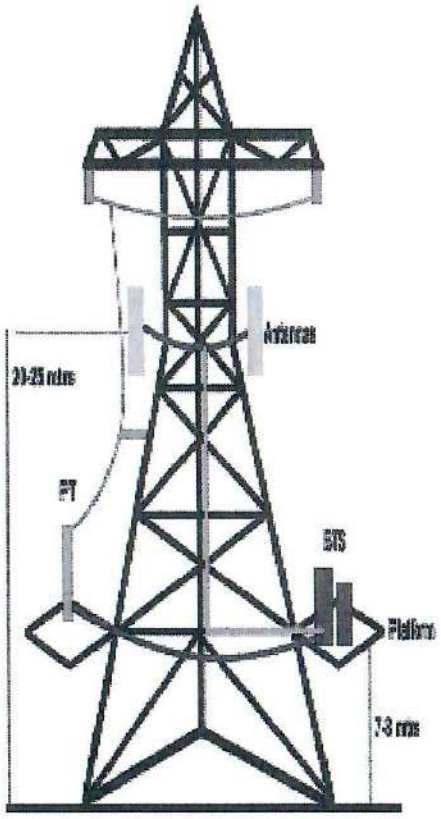
**Annexure-II**

| Format for Assets Database | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Utility Name (TELCO/POWERTEL/GAIL/RAILTEL/BSNL/MTNL/SEB/Other) - | | | | | | | | | | | |
| Sr. No. | Name of link | | | | No. of Fibre (24/48/96) | Possible Fibre Sharing | | Whether Space is available in Node-A for BTS/MTS equipment/ Monitoring Center (Y/N) | Whether Space is available in Node-B for BTS/MTS equipment/ Monitoring Center (Y/N) | Remarks (if any) |
| | From Node-A | | To Node-B | | | Whether Dark fibres Available (Y/N) | Whether Bandwidth Available (Y/N) | | | |
| | Node Name | Co-ordinate | Node Name | Co-ordinate | | | | | | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |

| Power Distribution Utility (DISCOM) Name- | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sl No. | Tower/Pole Details | | | | | | | |
| | Name of city | Details of Towers/Poles for mounting of 5G equipment (Mico Cells) – Height/Weight carrying capacity | Area/ Location of Pole | Latitude | Longitude | Clearance from ground available for mounting equipment | Whether electric connection available | Whether Tower Pole is available for sharing |
| 1 | | | | | | | | |
| 2 | | | | | | | | |

**Annexure-III**



# Telangana's 2nd ICT Policy

2021 -2026

# Table of Contents

**Shri KT Rama Rao**
Minister of Information Technology Electronics and Communication

# Foreword

Information technology has been a major success story in the first 7 years of Telangana. As part of ICT policy 2016-21, we had set a target of doubling the quantum of IT exports in 5 years, and we admirably succeeded in achieving it. Along the way, we set other benchmarks such as encouraging tech innovation and entrepreneurship, providing market-ready tech skills, bringing IT opportunities to Tier-II and Tier-III cities and towns, and delivering technology-led smart governance solutions for the benefits of our citizens.

After 5 years of successful implementation of the first ICT policy, this is a very opportune time to come up with an updated version that is also in tune with the realities we face today. The Covid-19 Pandemic that began in 2020 has brought unparalleled disruption in the world we live in. It is now very clear that post-Covid social and economic recovery will be aided greatly through the process of digitalization. Such a prognosis also provides a tremendous opportunity for the IT ecosystem of Telangana to take a leadership position in the world. Technology companies located in Telangana should become the front-runners with digital tools and solutions relevant to the economic recovery process. Students should have the skills that make them truly ready for the jobs of the future. Young innovators and entrepreneurs should come up with innovative solutions that address the precise pain points that have emerged in the new world order.

The Hon'ble Chief Minister, Mr K Chandrasekhar Rao has always believed that the real test of technology is whether or not it creates a strong public impact.

While the endeavor in the last 6 years has been to become citizen-centric in technology governance, the new policy will go many notches further to benefit the citizens directly through the fruits of technology. The digital divide has become a reality the world over, with those living in rural and remote areas, not having access to devices, and not having a mastery over the English language, repeatedly getting left out. The Covid-19 Pandemic has the potential to further exacerbate this divide. However, as a government, we are very conscious of our responsibility of making the technology world more inclusive. We will strive to ensure the rapid creation of digital infrastructure in every nook and corner of the state, promote digital literacy within every household, and roll out a range of technology interventions that improve the quality of life of every person. Eventually, the goal of the ICT Policy 2021-2026 will be to achieve digital empowerment of every citizen, meaning that every citizen is fully aware of digital opportunities for his needs, and has the wherewithal to access them.

In the past 6 years, Telangana has received many accolades for the adoption of technologies in newer spheres of the public interface and is today recognised as a pioneer in various domains of technology like AI, ML, Blockchain, Data Analytics, Cybersecurity, IMAGE (Animation, Gaming, VFX), Drones, etc. I am confident that we will build upon our successes and continue to be the role-model state for all our stakeholders.


# Vision for
# ITE & C Sector

The Government of Telangana has released the ICT policy of the state in April 2016. The ICT Policy of Telangana was considered as one of the best ICT policies across the country and it led to the launch of several focused sub-sector policies such as Data Center Policy, Open Data policy, AI framework and Electronics policy. The ICT policy has been the guiding document for most of the initiatives, organizations and activities planned by the ITE&C Department, Government of Telangana.

The technology space has transformed considerably over the past five years and even more so in the last year triggered primarily by the pandemic. Considering the below-mentioned factors, we at the ITE&C Department, Government of Telangana feel now is the right time to revamp and launch the new ICT policy.

- The Technology world is dynamic and is constantly evolving and a 5-year period is ideal for us to rejuvenate our goals and approach.
- The Covid-19 pandemic is the new "Y2K" and the digitalisation across sectors driven by the pandemic would accelerate the adoption of technology across sectors.
- The Government of India has launched several schemes and programs aimed at making the country digital and self-reliant. Telangana, as a progressive state, would like to align our efforts and support the nation with these initiatives.
- Benchmarking with the world's leading countries in ICT and adopting from their learnings to leapfrog ahead of competing economies in tech, innovation, and investment attraction.

## Digitally Empowered Citizens

Year after year, Telangana has been adjudged as a leader in promoting tech adoption and providing citizens with the best of digital services. However, the Covid-19 pandemic has given us the opportunity to explore digital solutions to the most critical requirements that the citizens have. With the progress that the world is making on the digital front, it is imperative for the state to prepare citizens for this day and age. Equipping citizens with digital skills and supporting them with the required digital infrastructure is going to be the foundation stone for improving the lives of the citizens. The ITE&C department has strategized a multipronged approach to achieve it.

## Digital Government

No government service that the citizens would intend to avail would mandate in-person presence unless a physical test or inspection is required. Telangana has set benchmarks for citizen services, leveraging technology to provide contactless, paperless and presenceless citizen services. The government will strive to make the digital transformation, and be more accessible, efficient, and accountable. Officials will be digitally upskilled and smart governance tools will be used to optimize the utilization of resources and enhance service delivery. An omnichannel feedback system will be in place to ensure the service delivery is citizen-centric and decision-making is completely data-driven.

## Innovation & Entrepreneurship

Innovation and Entrepreneurship are the backbones for the development of a fast-growing economy like Telangana to increase self-reliability and propel employment generation. Telangana has established world-class infrastructure and organizations over the past 6 years, the prime focus going forward will be to strengthen the ecosystem, develop a skilled talent pool, improve market access, and facilitate a funding environment to make Telangana the hotbed of innovation and start-ups. Hence, Telangana will also have special focus on developing a strong ecosystem for public impact-based start-ups.

## ICT as an Industry

Today, Telangana is one of the fastest-growing states in India in terms of GSDP and is a prime destination for IT and Electronics sector establishments. Going forward, Telangana aims to stay the top choice for IT and Electronics sector investments in the country and generate more jobs for the citizens. Developing IT clusters in Tier-II cities will be the key focus in a bid to decentralize development, create employment, and improve standards of living.

## ICT For Development

We, at the Government of Telangana, believe that technology's most important impact is to solve the problems of society than being a mere enabler. The COVID-19 pandemic has opened up several opportunities and unmasked the ways in which technology can be used to enhance the living conditions of citizens. The state will leverage technology as a lever to address challenges and develop data-driven solutions in the space of social, environmental, health, education, and livelihood among others.

# Focus Areas for 2021-2026

01

IT/ ITeS, Product Development, Engineering and R&D

02

Electronics

03

Innovation & Entrepreneurship

04

Skilling, Upskilling & Reskilling

05

Contactless, Paperless and Presenceless Governance

06

Beyond Digital Infrastructure

07

Beyond Hyderabad

08

Digitally Empowered Citizens

09

Emerging Technologies

10

Cloud-First Policy

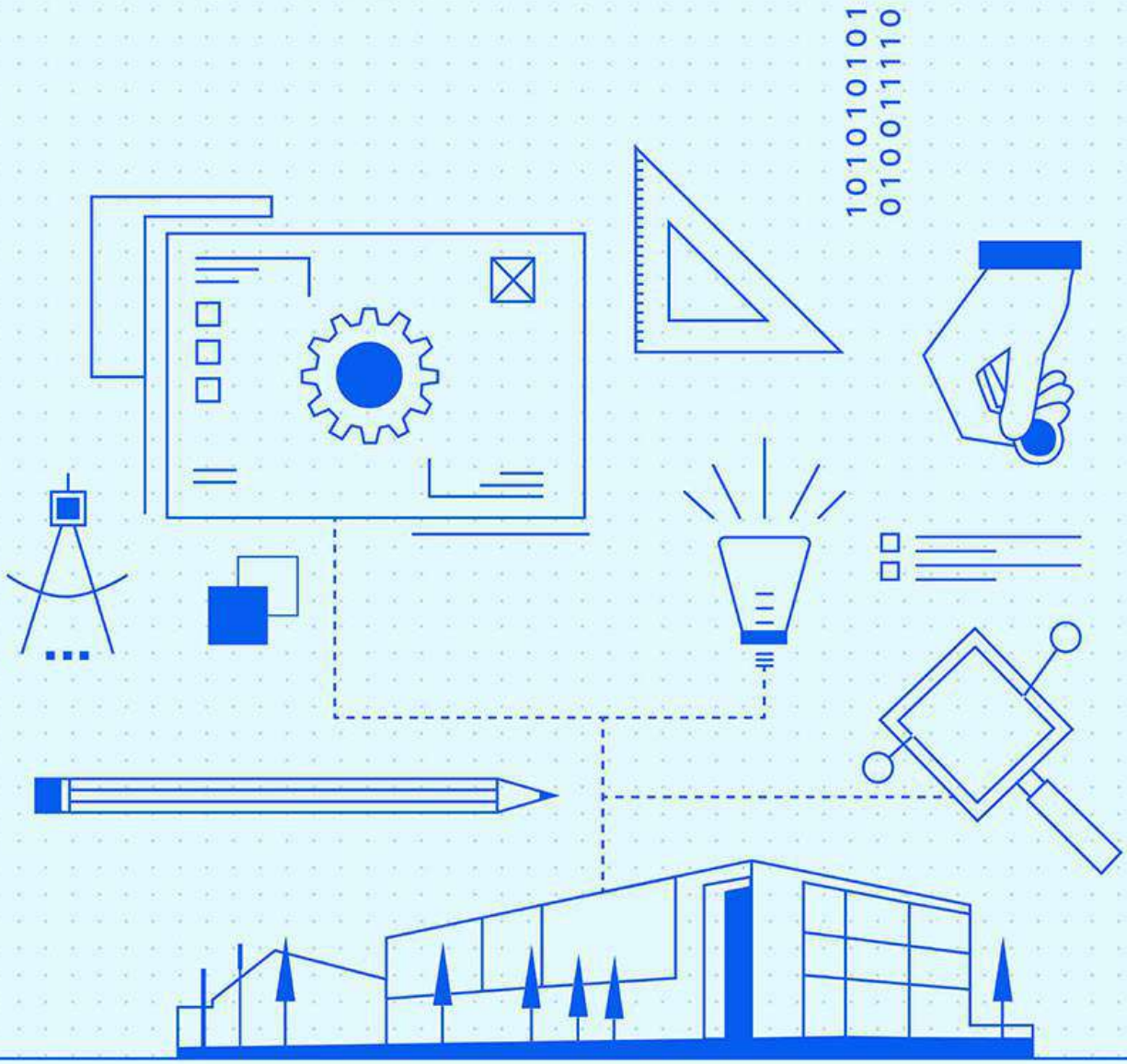
11

Technologies for urban living

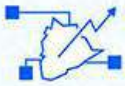
12

ITE&C Department as Tech Enabler

# 01 IT/ITES, PRODUCT DEVELOPMENT, ENGINEERING AND R&D



## TARGETS



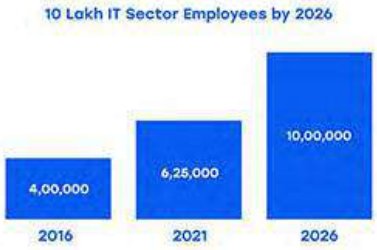
Establish Telangana as the global hub for Product Development, Engineering and R&D

10 Lakh

Increase total direct employment to a 10 Lakh IT Sector jobs by 2026

2x

Double annual IT/ITeS Sector exports to ₹ 3 Lakh Cr. by 2026





## Description of pillar

Telangana has evolved as a leader in IT Exports and has become a prime destination for IT/ITeS companies over the last five years. While the focus on the IT/ITeS remains steadfast, Telangana will aim to differentiate itself from competing states and grow as a global hub for Product Development, Engineering and R&D and sunrise sectors to drive the next phase of IT industry growth. Currently, India only hosts about 25% of the world's top 200 Engineering and R&D investors. Telangana currently holds about 12% of India's Product, Engineering and R&D activities, and we see a great opportunity for improvement. Focus on this sector will also enable the state to achieve a multiplier effect on the ICT Sector as the world moving towards a product-led IT economy.

Telangana will also focus on strengthening its Intellectual property output by focusing on strategic fields of study and facilitating research. SMEs will play an important part in the growth of the state's economy and Telangana will support SMEs with business and development.

## Strategic Areas of Importance (SAI)

### Product Development

Product innovation companies are high-productivity and high-value creators which are critical for any economy in the 21st century. India's product development market is still in a nascent stage despite the availability of low-cost infrastructure and manpower availability. Telangana seeks to be a leader in this space by facilitating IP generation and product development through the initiatives discussed as part of this policy.

### Engineering and R&D

The state understands that there is huge potential in attracting investments and generating jobs through specific focus on the Engineering and R&D sectors. In order to make Telangana a leader in this space, the government shall embark on a journey to improve its competency in the necessary reform areas through policy intervention.

### Global Capability Centers

Telangana has been an attractive destination for GCCs and has attracted several MNCs and domestic companies to set up their capability centres in the state. The government will focus on further increasing its share in the GCCs coming to India through strategically strengthening the ecosystem and easing the process of entry and doing business.

### IT Services

Hyderabad currently has over 6.5 Lakh employees in the IT/ITeS sector, and we would like to sustain the existing base. IT Services is a key component of the existing base. The BPO/KPO segment approximately contributes to 20% of the employee base. While engineering, R&D, product development and GCCs are a focus on expanding the IT sector to new horizons, equal emphasis will be laid upon sustaining the existing base and the IT/ITeS services segment.

The government will facilitate the identified Strategic Areas of Importance through the following initiatives:

**Talent Generation:** The most important resource required for companies looking to invest in the Product, Engineering and R&D sector would be the availability of skilled talent. Telangana already has an immense pool of trained workforce and will now also focus on creating a research-oriented pool of talent working in the deep technology space. The government will continue collaborating with the industry and the top institutes to co-create the curriculum required for talent in Strategic Areas of Importance.

**Promotion of Intellectual Property and Research Output:** The state seeks to emerge as the top destination in India that promotes impactful research output that will help improve the lives of citizens in both the urban and rural areas of the state. Research and development in the areas of growing and impactful technologies shall be facilitated through the establishment of a Telangana Research and Innovation Fund.

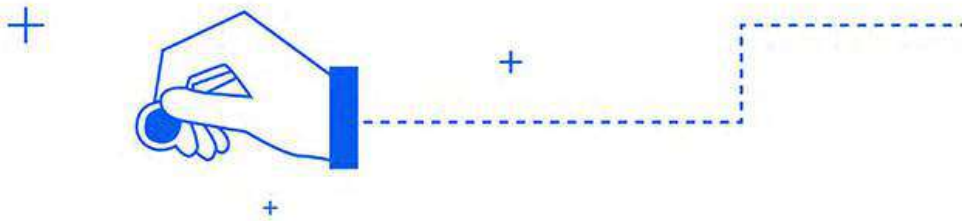
**Financial Support and Visibility:** Along with the availability of talent, the right environment and physical infrastructure is key to attract R&D establishments in the state. To facilitate this, the state will extend support to R&D centers through incentives being provided to IT/ITeS investors. Ecosystem support will also be provided through RICH to connect with academia and the organisations in the industry. Visibility of the R&D output in the state would also be enhanced through "Go and See Centres" or experience centers set up in collaboration with the industry.

**Focus Sectors:** While the state would be encouraging work across sectors in IT/ITeS, we have identified eight Focus Sectors that are expected to grow and adopt digital-based solutions at a rapid pace in the next 5 years. The eight Focus Sectors that would be adopting digital/technology-based solutions the most in the next 5 years are: Life Sciences and Healthcare, BFSI, Computing Systems, Automotive/Mobility, Semiconductors, Energy, Aerospace & Defence, Retail, and Telecom.

### A conducive ecosystem for investors

Over the last 5 years, Telangana has established a strong network of organizations that would assist companies at various stages in setting up operations in the state. The organizations include the Investment promotion cell for any support during the investment process; TASK for skilling, upskilling and finding the right talent; T-Hub, WE Hub, and TSIC for fulfilling innovation-based requirements and RICH for connect with academia and R&D institutions.

Moving forward, the government will strengthen the infrastructure and ecosystem to produce a seamless landing and operating experience for the investors. The above mentioned ecosystem partners of TASK, RICH, T-HUB, WE-HUB, TSIC, CoEs in Emerging Technologies and the Investment Promotions Cell will work in harmony to improve ease of operations and investments in the state.



**Investor Playbook**

Telangana has always strived to simplify and smoothen the investment process for investors and as a result, several reputed IT companies have started operations in Telangana. To further ease the process of investment, the state will develop an Investor Playbook with the guiding principles on what the process of investment is and how the government can provide support. The Investment Playbook will be launched with the following details:

Process flow of all the steps involved as part of setting up an office space in Telangana
List of all the potential organizations that the company can collaborate with, the process of engagement, and their value propositions
Best practices identified as part of several investments over the last 5 years
A list of trusted and empanelled vendors that companies can choose for all the common infrastructure requirements

**Single Point of Contact for Project Management**

Under the ITE&C Department, the Chief Relations Officer will be the single point of contact for any IT/ ITeS entity that wants to establish or expand its presence in the state. The office of the CRO will handhold the investors from registering the company to raising an invoice. The investors will be supported will all the statutory processes and registrations with all the government regulatory bodies and choosing the right facility. The CRO office may provide a dedicated resource for a specific period depending on the complexity and size of the investment.

**The Advisory Committee for ICT Policy and Investments in Telangana**

The Advisory Committee for ICT Policy and Investments in Telangana has been created to oversee the Development of Engineering, R&D, IT and ITeS development across all thrust areas/ focus sectors.

- Global leaders and senior executives from reputed firms across the various sectors have been chosen to be members of the committee.
- The committee will act as the Business Advisory Committee and will enable the growth of ecosystems in each of the focus sectors that the state will promote.
- A Focus group will be created for each of the verticals under focus.
- The Advisory and Focus groups will also assist CCITI in monitoring and administering the incentive requests from investors.

**Special focus on IT SME Sector support**

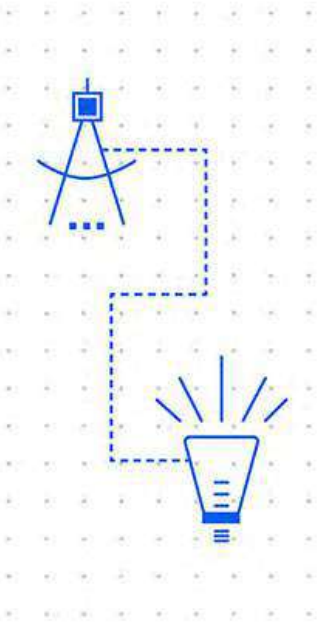
While the IT/ITeS Sector in Telangana has over 6,25,000 employees, it is estimated that over 50% of this employment has been generated by SMEs in the state. Given that SMEs are the backbone for the IT/ITeS sector, it is of paramount importance for us to facilitate their operations.

With the onset of the Covid-19 Pandemic, the SME establishments across the world have taken a major hit. Telangana has provided support for these SMEs to survive the pandemic has also developed mechanisms to keep the support sustained.

1. **Cost Savings:** In order to keep SMEs afloat during the crisis, the government provided financial support to SMEs through rental and talent acquisition subsidies. Space was given in Tier-II and Tier-III cities at no cost for several businesses.
2. **Upskilling Support**: Employees working at SMEs were provided with free upskilling support though TASK during the pandemic to develop the core competencies to improve revenue generation in their sectors.
3. **Government Projects**: Over 20 earmarked Government projects were offered exclusively to SMEs in order to give more business during the dire period when most businesses started facing losses.
4. Global Connect: The Government facilitated the process of finding new customer by connecting SMEs with international trade organisation and embassies. The sector of software exports has especially seen good output in this area.
5. **Digitalisation**: Over a span of a week, more than 1000 kirana stores and SMEs were digitalized in the aspects of internal operations, customer acquisition, payment methodologies and e-commerce capabilities, as an attempt to showcase new opportunities for digitalization.

To guide and coordinate MSME promotion activities in the state, the government of Telangana has already appointed an Advisory Committee on Telangana State IT MSME Promotion with representation from the ITE&C Department and the industry.

The Government has constituted an Advisory Committee on Telangana IT MSME Promotion that will enable experts in the industry to create the required reforms and policy outputs to promote the IT Mimes in the state. The committee will help the growth of Mimes through the following mechanisms:



1. Modify domestic preference guidelines to ensure a majority of the IT projects awarded by the Telangana Government go to Mimes registered in TS. In the case of Large Projects which require multi competency or proportionate financial strength, SME consortiums shall be encouraged to participate.
2. Relax qualification norms around experience, yearly turnover requirement, Ernest Money Deposits (EMD), Performance guarantee etc., and offer suitable Payment Terms for SMEs to promote a level playing field.
3. Create opportunities to increase the visibility of all IT Projects undertaken by the Telangana Government and the SMEs executing them through a dashboard.
4. Improving the government connection with SMEs and enabling proactive solution offerings by SMEs around new technologies like AI-ML/IoT/Cloud/Cyber Security/Computer Vision/AR-VR/ BlockChain & any other latest technologies for the Government departments.

The government will continue to provide support to SMEs through the above-mentioned initiatives along with the utilisation of the Model RFP to increase the service procurement by the Government. The government will also support SMEs and start-ups with the ability to go digital. Access would be given to end-to-end digital solutions created by the government or private organizations. The solutions provided will include back-office operations like finance systems, human resource tracking, accounting, and new-age digital requirements like digital marketing, customer relations management, and cybersecurity.

**IT Park Norms**

1. Landowners and developers will be able to get IT Park status for land parcels for the following 4 categories after producing the required documentation:
    a. A company that has been offered land by the Government
    b. Real estate developers that have bought land through government auctions or private networks
    c. Individual landowners that wish to promote IT sector activity
    d. Third-party developers who wish to apply on behalf of the owner
2. For Industrial Parks converting into IT Parks, a ratio of 60:40 needs to be maintained for IT vs non-IT implementation. For lands allotted by the Government, the ratio of 60:40 holds good for IT vs non-IT unless there are different terms specified in the allotment MOU. In the GRID Corridors, the ratio is 50:50. For private lands, converting into IT Parks, a minimum of 25% needs to be allotted to IT purposes.
3. The parking requirement in the IT Parks for the state currently stands at 66% of built-up space. Going forward, the new parking requirement will be 40% (+4% for guests) of built-up space. This is done to ensure reduced traffic and congestion in the IT Corridors.

*Further details on the regulations will be made available through the Operational Guidelines to be released.*

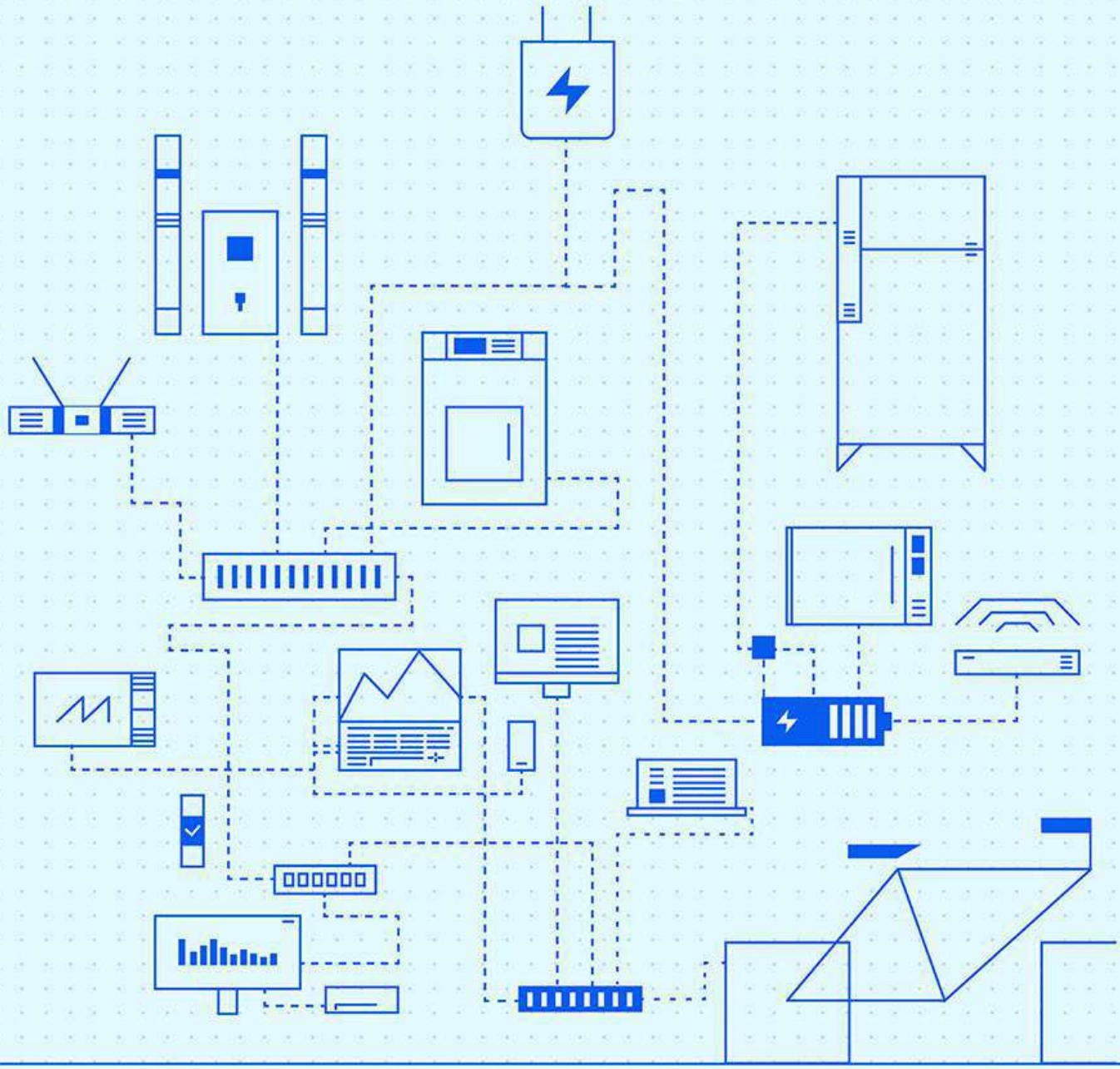
**Incentives Provided to IT/ITeS Companies**

Moving forward, the state will provide incentives to all the companies investing in the state along the incentive categories listed in the following table. Specifically for organizations engaging in product development, ER&D and cutting-edge innovation and for investments in the GRID Locations, additional incentives will be provided over and above the following incentive schemes.

| Incentive Categories | |
|---|---|
| Allotment of Government Land | Power |
| Declaration of IT Park Status | Patent Filing Costs/ Copyright/ Trademark |
| Quality Certification | Recruitment Assistance |
| Exhibition Rental Refund | Subsidy on Investments is Solar Power |
| R & D Grants | Subsidy to Anchor Units |
| Subsidy on Capital Investments | Stamp Duty, Transfer Duty and Registration Fee |
| Training Subsidy | Interest Rate Subsidy |
| Subsidy on Lease Rentals | Rebate on Land Cost |
| Reimbursement of SD and Cost of Tender Document | |

02

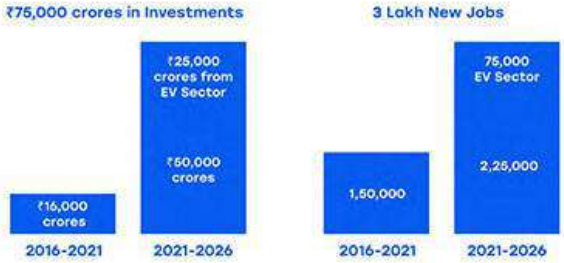
# ELECTRONICS



# TARGETS

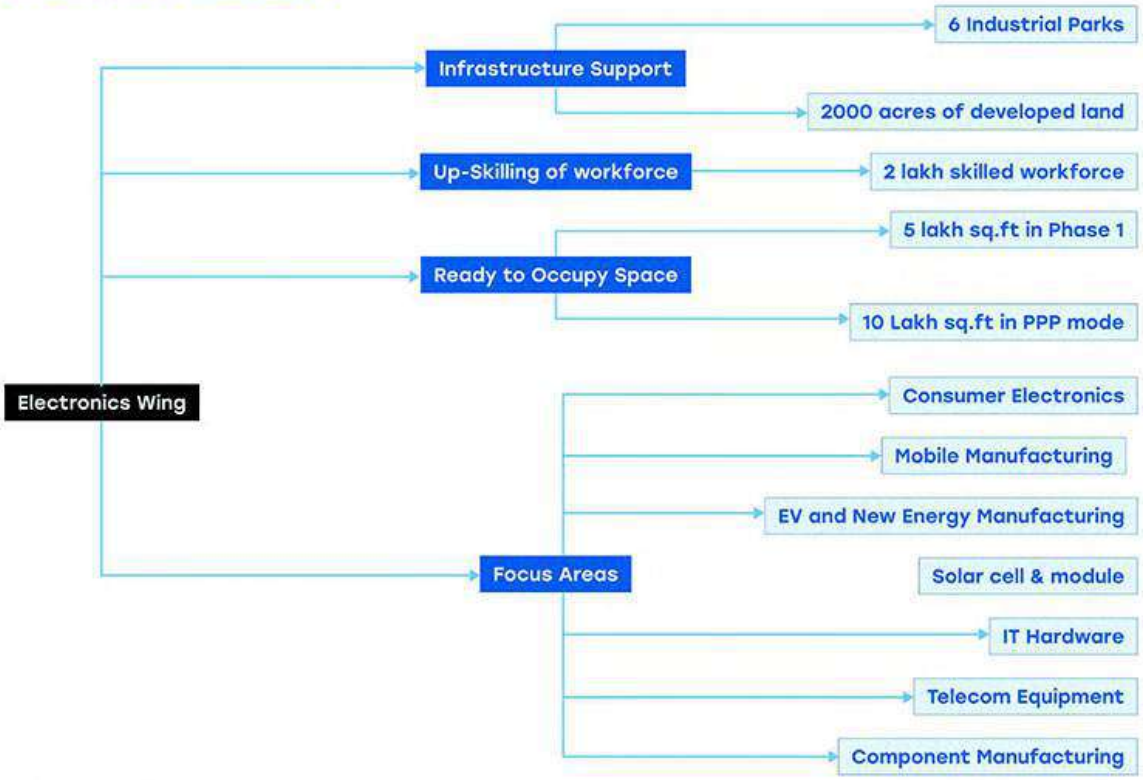
To generate employment of 3 Lakhs by 2026 in the Electronics sector, out of which 75,000 is targeted to be from the EV & ESS sector

To attract ₹75,000 Cr. of total investments in the Electronics sector, of which ₹25,000 Cr. is targeted from the EV & ESS sector




The Government will focus on making the state a top destination for the Electronics sector globally by developing a comprehensive ecosystem which has access to infrastructure, skilled workforce, and effective industry partnerships. The Electronics policy will include the incentives offered to the companies in the Electronics and Allied Sub-sectors.

## Overview of Initiatives




### Industrial Parks

Land, basic infrastructure, and market connect remain the most critical requirements for Electronics companies, and towards this, the State has established 5 Industrial Clusters catering to Electronics and allied sectors. The State is in the process of establishing additional clusters to cater to the increasing demand in Electronics, EV and New Energy sectors. Telangana has two existing Electronics Manufacturing Clusters, covering an extent of 912 acres, situated at close proximity to the International Airport, Outer Ring Road and Hyderabad City.

The State has established three new clusters at Chandanvelli, Divitipally and Shiv Nagar to cater to investments in Electric Vehicles, New Energy Manufacturing and LED Products which would cumulatively span over 1800 acres. The State is in the process of setting up another park exclusively for Consumer Electronics in an extent of 425 acres.

The industrial parks are equipped with all the necessary common infrastructure for Electronics companies such as Power, Water, Roads, etc and Common Effluent Treatment Plants are being established.

### Plug and Play Space for Electronics companies

In order to facilitate small- and large-scale investments and to reduce the time to set up operations, the government has developed plug-and-play spaces in the Industrial Clusters.

The Government has already established 1,80,000 sq. ft. ready to occupy built-up space in E-City EMC and is in the process of establishing a Common Facilities Centre. Additionally, the state targets to create 5 lakh sq. ft. of plug-and-play space in the first phase and an additional 10 lakh sq. ft. of facilities shall be developed through a PPP model. The plug-and-play spaces will have access to all the necessary infrastructure for Electronics companies.

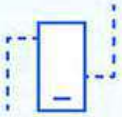
### Skill Development

Telangana Academy of Skill and Knowledge (TASK) will provide skilled workforce for the Industry on a no-cost basis. TASK has trained and deployed over 1,80,000 skilled workforce in the Electronics Industry so far. TASK will develop customised training programs and courses with a focus on emerging sectors, in consultation with the industry and educational institutions.

### New focus areas for development

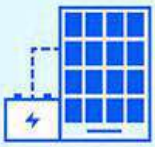
Going forward, the key focus in Electronics would be the following sub sectors

1. **Consumer Electronics:** Consumer Electronics market size was valued at USD 1 Trillion in 2019 and is estimated to grow at a CAGR of over 7% from 2020 to 2026. Large investments in R&D and Manufacturing space for new consumer electronic products such as home appliances, smartphones & smart wearables will drive the growth in this sector.

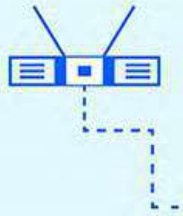


2. **Mobile Manufacturing:** Cellular mobile handset manufacturing has emerged as a flagship sector in India's electronics manufacturing space. India has emerged as the second-largest mobile phone manufacturer in the world with the establishment of more than 200 Mobile Phone Manufacturing units in the last 5 years. Government of India has also launched PLI scheme to promote Mobile Manufacturing with an outlay of ₹40,951 Cr.

3. **EV, New Energy & Energy Storage Systems:** The Indian battery market is expected to grow at a CAGR of more than 15% during 2020-2025. In order to bring down the cost of electric vehicles, local manufacturing of lithium-ion batteries in India is going to be very important, and a lot of companies are expected to start manufacturing units in this space.

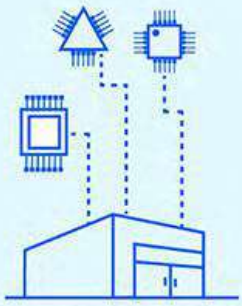


**4. Solar PV Cell and Module Manufacturing:** India has set an ambitious target of setting up 1,75,000 MW capacity of renewable energy by 2022 and 4,50,000 MW by 2030, of which over 60 percent will be catered through Solar Energy. Currently, domestic manufacturing industry has limited operational annual production capacities of around 2,500 MW for solar PV cells and 9,000-10,000 MW for solar PV modules and presents a huge opportunity for investments in the sector. Government of India has also launched PLI for High Efficiency Solar PV Modules to reduce the import dependence and build domestic capabilities.



**5. IT Hardware:** India's Digital Economy is currently valued at USD 200 billion and is slated to grow to USD 1 trillion by 2025. According to IDC, the market size for laptops in India was approximately 75 lakh (7.5 million) units in 2019-20 valued at ₹33,950 Cr. (USD 4.85 billion). Similarly, the market size for tablets was around 24 lakh (2.4 million) units, valued at ₹3,500 Cr. (USD 0.5 billion). The server market stood at 2 lakh (0.2 million) units valued at ₹9,100 Cr. (USD 1.3 billion). Currently, this demand in India is largely met through imports and provides a huge opportunity for attracting investments in this sector.

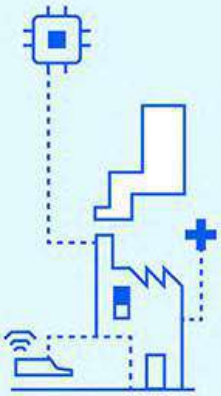
**6. Telecom Equipment:** Globally, Telecom and Networking Products' exports represent a USD 100 billion market opportunity. Currently, India imports 85% of its wireless Telecom equipment and with the support of PLI scheme by GOI, with a budgetary outlay of ₹12,195 Cr., the sector has a huge potential for attracting large investments from global players. Telangana is fast emerging as the Telecom and Networking hub with the presence of players across the manufacturing spectrum. The State is also implementing Telangana Fiber Grid initiative to provide High Speed Broadband connectivity to over 83 lakh households.



**7. Semiconductor Fabrication/ Manufacturing:** Telangana was among the first States in the Country to set up a dedicated park (FAB CITY) for Semiconductor Fabrication. "Photonics Valley", a leading photonics cluster, will be created under the Photonics Valley Corporation to promote the use of this technology within the state through a comprehensive ecosystem. Now, in line with the Government of India's focus for development of Semiconductor Manufacturing facilities in the Country, the Government of Telangana is taking up initiatives to nurture Semiconductor & Photonics FAB Unit Manufacturing in the State, with policy and infrastructure interventions. Hyderabad has a comprehensive R&D Ecosystem in this sector, with a huge talent pool of Engineers, due to the presence of Global firms and Institutes of Excellence catering to VLSI, Embedded Systems, Chip Design & Semiconductor industry. The State is in a power surplus and has abundant availability of water to meet the manufacturing needs of Semiconductor Industry.

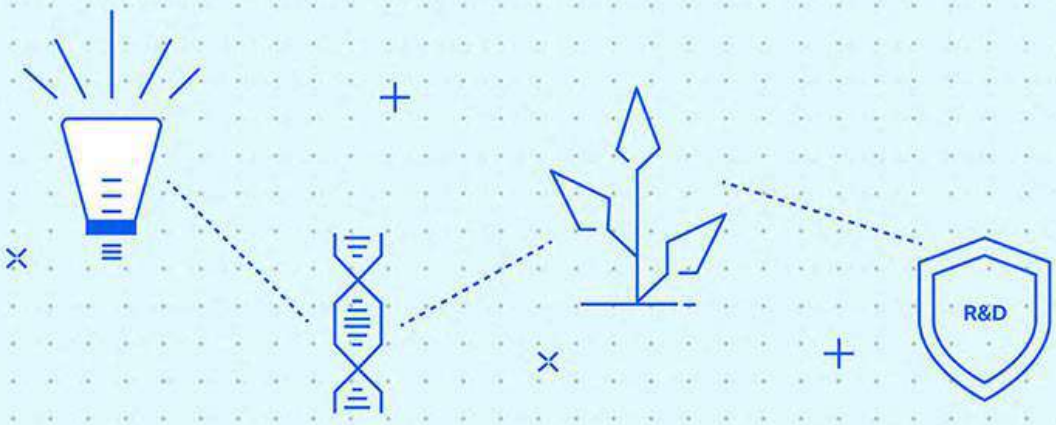
**8. Allied Sectors & Component Manufacturing:**

*1. Medical Devices:* India is among the top global markets for medical devices. While the global market is expected to reach USD 169 billion by 2025, the Indian market is expected to increase at a CAGR of 35.4% to reach USD 50 billion. The government of India has also launched PLIs and 100% FDI applicability for Medical Devices.



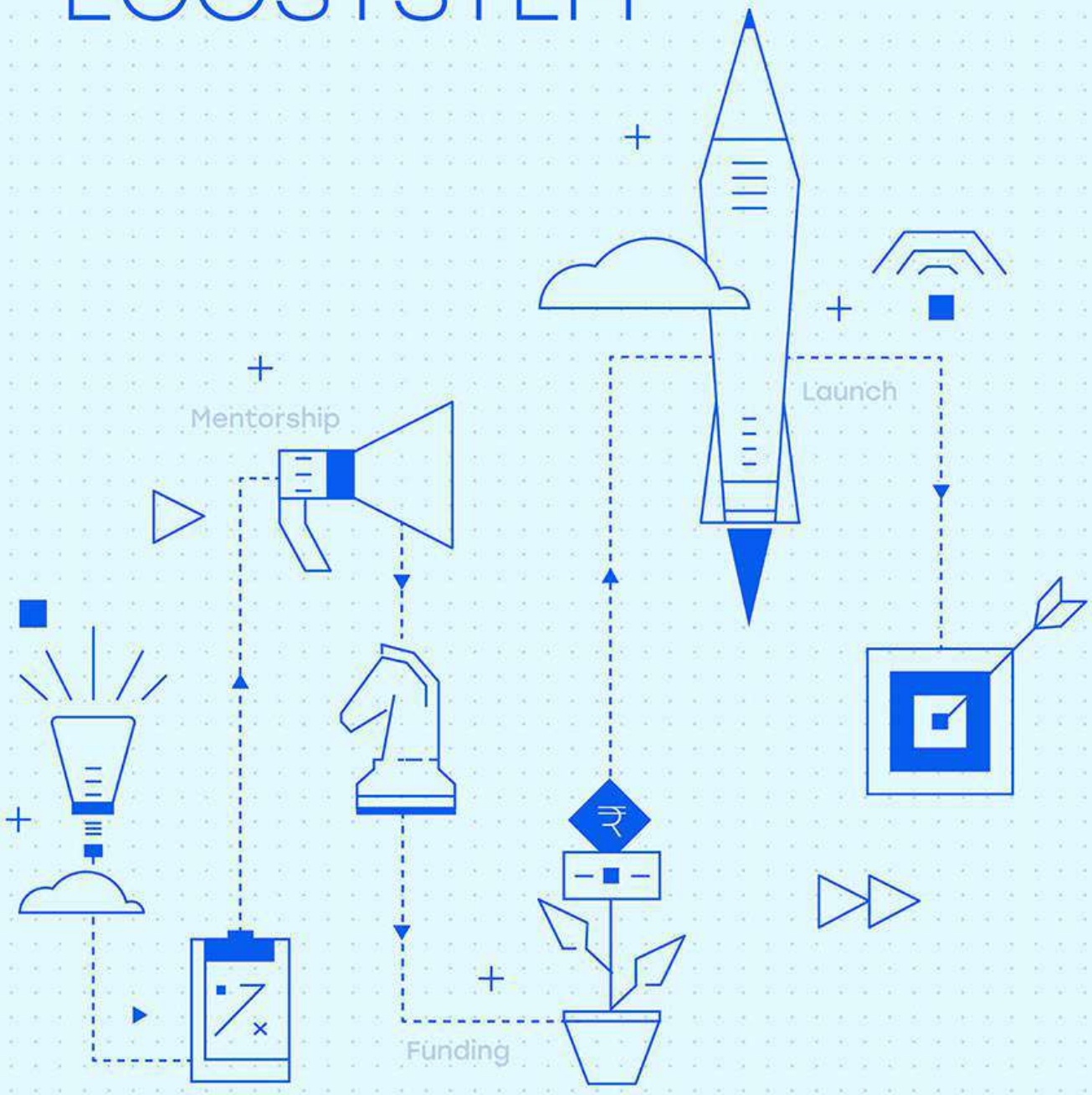
2. ***Automotive and Defence:*** The Global Defence Electronics market is set to reach USD 422 billion by 2032 and India's Ministry of Defence is likely to spend over USD 68 billion. in the same period on electronics. The global Automotive Electronics market is expected to reach USD 645 billion by 2030 with India's share being significant because of the central government mandate of ADAS Systems by 2022. This presents a huge opportunity for investments in this sector.

3. ***Component Manufacturing:*** Electronics Components, Semiconductor, PCB and related manufacturing is important for the overall growth of the Electronics Sector. The establishment of component manufacturing in the State will be encouraged through incentivization.



03

# INNOVATION & ENTREPRENEURSHIP ECOSYSTEM

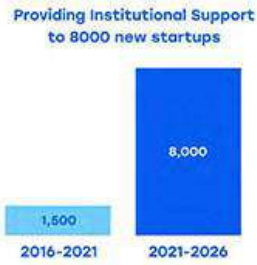


# TARGETS

**8000**
To provide institutional support to over 8000 start-ups.

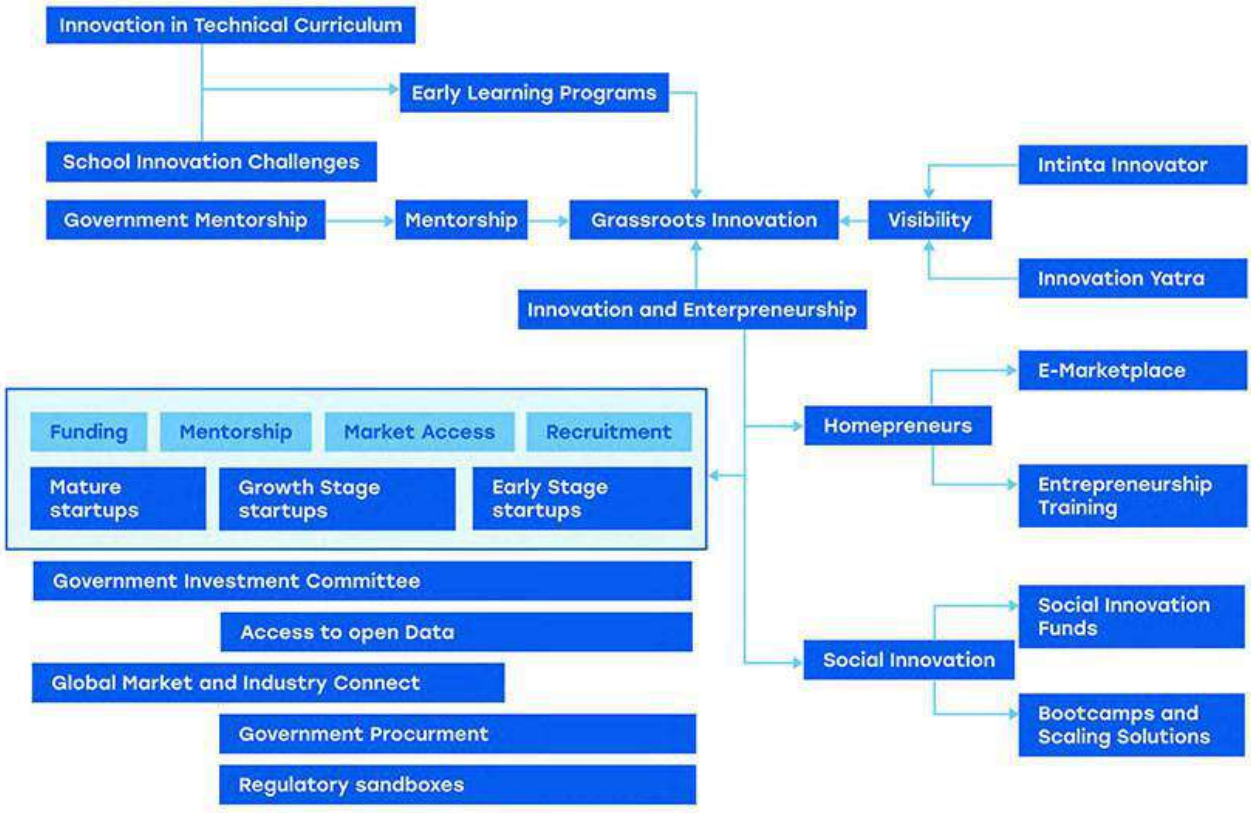
**₹10,000 Cr**
To attract over ₹10000 Cr. in investments for start-ups.

**1300**
To set-up a fund of ₹1300 Cr. for start-ups of which ₹100 Cr. would be for Grassroots Innovation Fund.






The government has set-up T Hub, WE-Hub, TSIC, T Works, TASK and Emerging Technologies Wing to encourage innovation and develop a vibrant start-up ecosystem. The government aims to enhance the start-up ecosystem such that Telangana is the primary choice for entrepreneurs looking to set-up operations with the help of accommodating policy frameworks and ample support across all stages. The government will also focus on grassroots innovations and empower them to transform from ideas to enterprises to create social impact.



## Special Focus Sectors

### Innovation in Multimedia Animation Gaming and Entertainment (IMAGE)

Telangana has extensively focused on developing its base in the Gaming, Animation, VFX, Computer Vision, and AI Startups. The state has collaborated with the Central Government and established the IMAGE CoE to further the development in this sector. Through its accelerator program, IMAGE CoE is supporting startups with mentorship, funding, and training programs. The upcoming IMAGE Tower is an incubator that is a flagship initiative to establish Telangana as the go-to destination for startups in the IMAGE space boasting a built-up area of 16,00,000 sqft.

### Life sciences

Telangana has over 20 Life Sciences incubators which have supported over 200 startups in this space over the last years. The Biopharma Hub (B-Hub) is a flagship initiative for Genome Valley undertaken by the Government of Telangana to strengthen the Biopharma industry and Life Sciences innovation by setting up a Biopharma scale up facility. The facility is being set up in Genome valley with a built-up area of 1,00,000 sqft.

### Agriculture

Telangana boasts over 10 Agri focused incubators supporting over 225 startups over the last few years. The state has over 30 agriculture-focused educational and research institutes. The Government of Telangana itself has focused on several tech-based solutions that will help improve the lives of farmers and has recently unveiled the AgHUB located in PJTSAU with a special focus on Agri-tech startups.

### Defence

A defence accelerator will be established to promote innovation and R&D in the Defence sector in partnership with the Ministry of Defence and DRDO. Telangana previously has hosted several OEM-linked incubation and acceleration programmes along with T-Hub. Continuing on this path, the defence incubator shall handhold start-ups and private Mimes entering the R&D, manufacturing and service segments in the Defence sector and shall work in tandem with the existing state start-up ecosystem.

## End-to-end support providers

The Government of Telangana strives to provide support to start-ups at all stages in the form of requisite infrastructure, funding, mentorship, and ecosystem.

### Early-stage start-ups and innovators

Enabling early-stage innovators and researchers to take the next step in turning their ideas into enterprises will be the main focus. Institutional support in the form of funding, mentorship, testing, and industry connections will be facilitated through the innovation ecosystem partners. The government shall take measures to ease the process of setting up a start-up by providing toolkits for all common operations at the time of setting up a start-up to ensure a smooth start to one's entrepreneurial journey. Regulatory sandboxes shall be developed for focus sectors including fintech, healthcare, and education to facilitate ease of testing.

### Growth stage start-ups

Through the stage of expansion, special support will be provided for raising funds, acquiring customers, hiring human capital, and gaining visibility. In addition to these activities, the government will enable relaxations in procurement criteria, thus government being the first customer for start-ups.

### Mature stage start-ups

Through this stage, the government will ensure the right ecosystem and regulatory framework is maintained for start-ups. Recruitment support will be provided for those seeking high-quality senior management and talent to grow further. Moreover, partnerships will be established with large private firms and global markets to provide access to a larger market for their solutions. A dedicated consulting wing will also be setup by the government to support these start-ups with strategy and expansion.

In addition to the general support, the government will also establish mechanisms to provide corporate services like advocacy, cloud access, cybersecurity, etc. to the start-ups at a subsidized price. Additionally, digitalization support will be provided for back-office requirements.

## New Initiatives

### A Comprehensive Start-up Funding Ecosystem

a. Collaborative initiatives with VCs and Angel Investors to provide funds for start-ups.

b. Government Investment Committee: The Government shall set up a fund for start-ups and a Government Investment Committee shall be formed with experts in the field. Together with renowned VCs and Angel Investors, the Government Investment Committee will form a core component of the funding mechanism in the state. The state will add to the funds generated through partner VCs and Angel Investors.

### Innovation and Model RFP-based procurement

As a progressive state, we strive to give start-ups as much government exposure as possible. The government will connect over 750 start-ups in 5 years with the Government Ecosystem through various programs and facilitate procurement of start-up services in every department. Over 100 start-ups' services and products shall be procured in this period. The Model RFP initiative by MeitY will be used to achieve ease of procurement of services by the government. Additionally, mentorship through the government shall be provided to a minimum of 200 start-ups over 5 years through the Government Mentor Program.

### Homepreneurship

The COVID-19 pandemic has moved digitalization ahead by a few years, several home entrepreneurs have spurred to innovate and sell during this period. The government understands the immense scope of these home entrepreneurs and is looking to develop institutional support mechanisms to further their productivity. To provide visibility to such innovators, the government will also create a secure e-marketplace and connect entrepreneurs to potential customers.

### Social Entrepreneurship

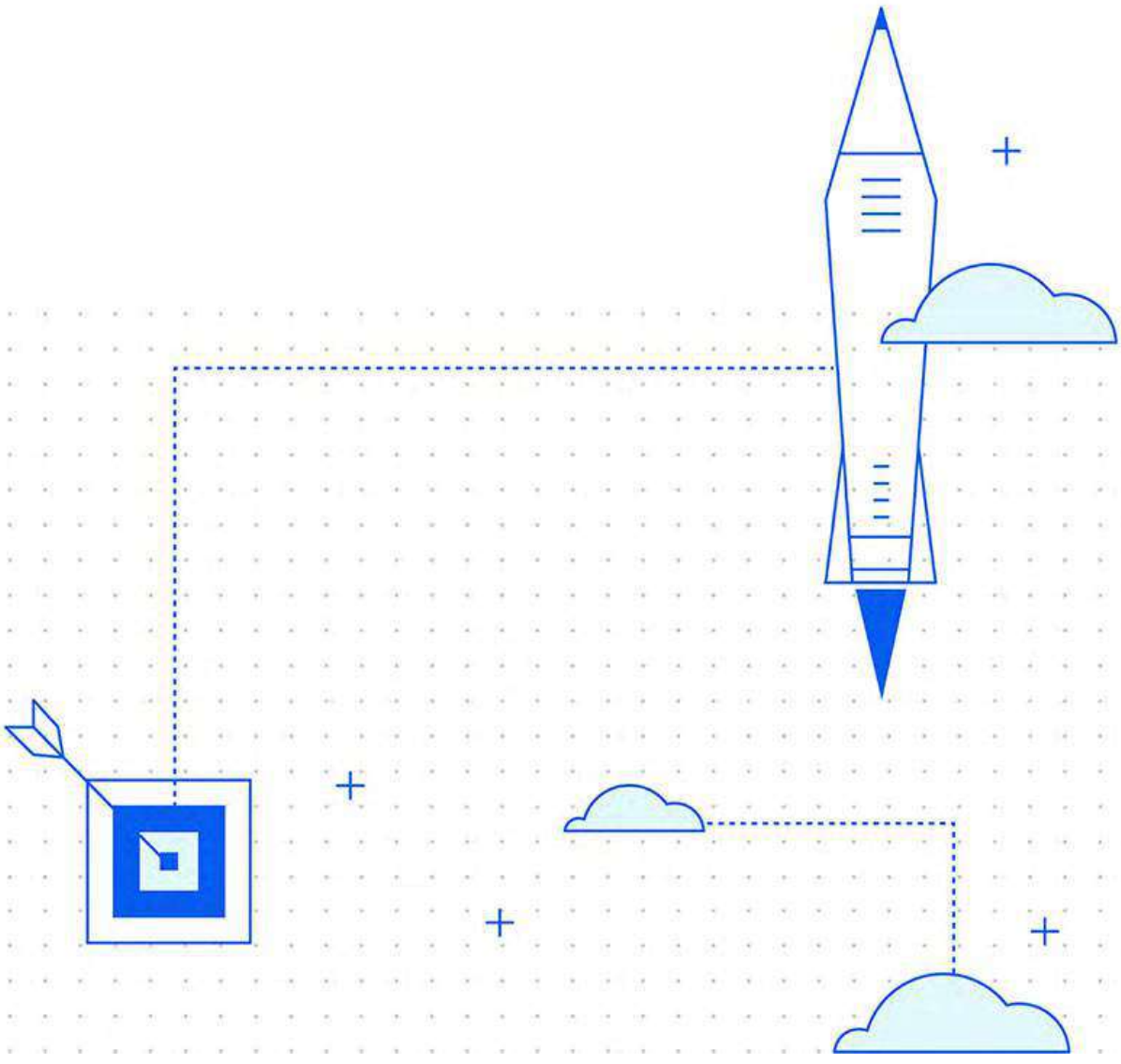
There are hundreds of problems in this world that both urban and rural sections are facing today. Innovation and Entrepreneurship are not only sources of income or employment generation but are also solution providers to some of society's major challenges. The government sees an opportunity in providing innovators in the social entrepreneurship space with a conducive environment to find scalable, implementable solutions that can improve the quality of life in the state.

Through the Social Impact Boot camp conducted in 2020-2021, we have been able to provide institutional support to over 50 start-ups. Looking forward, we aim to facilitate the growth of 5,000 social-impact start-ups over the next 5 years. The government shall allocate ₹100 Cr. for the social impact start-ups and will aim to attract over ₹5000 Cr. of investments from private partners across the world for these start-ups.

### School Innovation

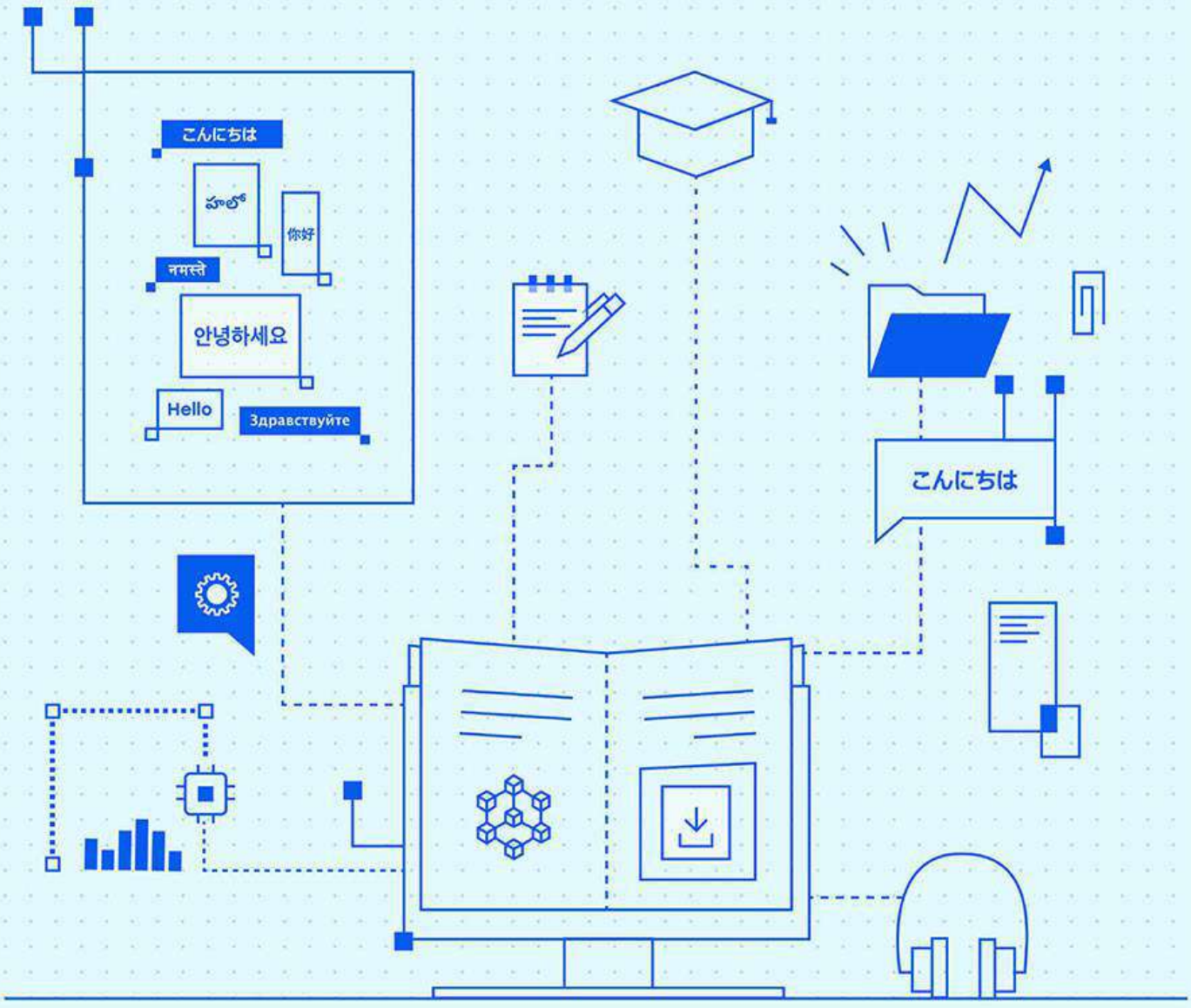
In Telangana, we believe that innovation as a culture has to be inculcated from a young age as the students of today are the entrepreneurs of tomorrow. The government will the school curriculum with special innovation-based courses in order to imbibe critical thinking skills among students at a young age.

The government will sensitize over 25,000 government students to imbibe innovation thinking through School Innovation Challenge across the 33 districts of Telangana. Special design & innovation thinking workshops focused on traditional arts and practices in Telangana will be arranged to further the understanding of the heritage of the state among school students.



04

# SKILLING, UPSKILLING & RESKILLING



## TARGETS

80%

Upskill, reskill or train the citizens of Telangana with a target to achieve 80% of workforce requirement being met through local talent.

50000+

Train 50,000+ students each year.

To develop an industry-ready talent pool, the Telangana Academy for Skill and Knowledge (TASK) was launched in 2014 and has played an important role in making the college graduates employment ready since then. The focus going forward is to not only enhance availability of talented workforce in the state, but to also skill the citizens of the state in basic technologies. This will help the government develop and deploy digital solutions to support the citizens and improve the quality of living from all socioeconomic backgrounds.

### Citizen Digital Skill Enhancement

**Early-stage digital skills**
The government will launch programs to provide digital skills for students through courses on basic technologies, critical thinking, coding, etc. in order to set a strong base for them to explore the digital world.

**Cybersecurity skills**
With the onset of the digital era and growth in the number of internet users, it is imperative that the citizens are made aware of the dangers and risks associated with the internet. Special awareness programs will be undertaken to enable safe access to the internet for citizens.

**Basic Training in Artificial Intelligence**
Considering that AI is going to be an integral part of lives, all students in technology-based courses will be taught the basics of Artificial Intelligence along with skills in programming languages, data annotation, exploratory data analysis and more.

**IT Skills as support for other activities**
Citizens of the state will be equipped with basic digital skills and awareness to use applications and digital solutions to ease their day-to-day activities. Through this, the state aims to improve the quality of living for citizens.

### Reskilling

Re-skilling shall be given special focus to curb unemployment and help citizens who are switching jobs or unemployed get more traction, skills and improve employability. Through partnerships with industry and academia, special courses and certifications will be created to improve hiring chances. Both online and offline media of teaching shall be explored for the citizens.

### Upskilling

The government shall focus on upskilling the citizens who desire to pick up new skills, move to new fields of work, or grow within their respective establishments. The state will focus on upskilling existing workforce to be able to grab opportunities in new and emerging technologies. We will be collaborating with industry and academia in Telangana to design the curriculum for these courses.

## Effective Industry Partnerships

**Foreign Language Training**
Several foreign-native companies require expertise in foreign language in addition to requisite skills. Foreign language training programs will be designed keeping in mind the employment demand from foreign locations. Partnerships shall be made with foreign industries and embassies to facilitate this initiative.

**Early Industry Connect**
Training programs will be introduced to 2nd and 3rd-year students in both technical and non-technical institutes to build employment skills from an early stage. Corporates will be encouraged to take up internships, training programs, and workshops with students.

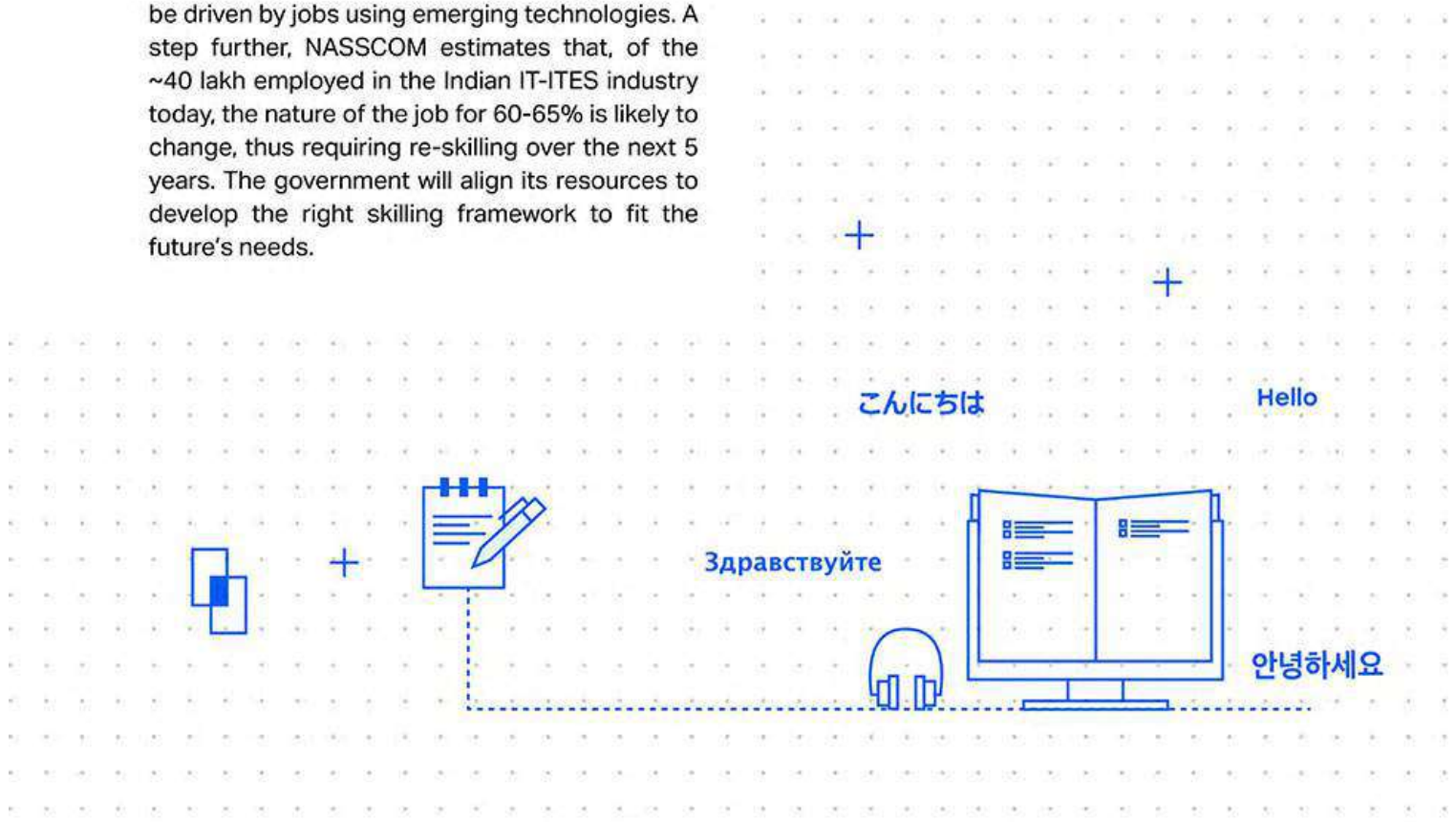
**Online Education providers**
Collaborations with the best online skilling and academic courses will be leveraged to provide various courses and certification at subsidized prices in the state to ease the process of learning for students.

## Emerging Tech. Ready employees

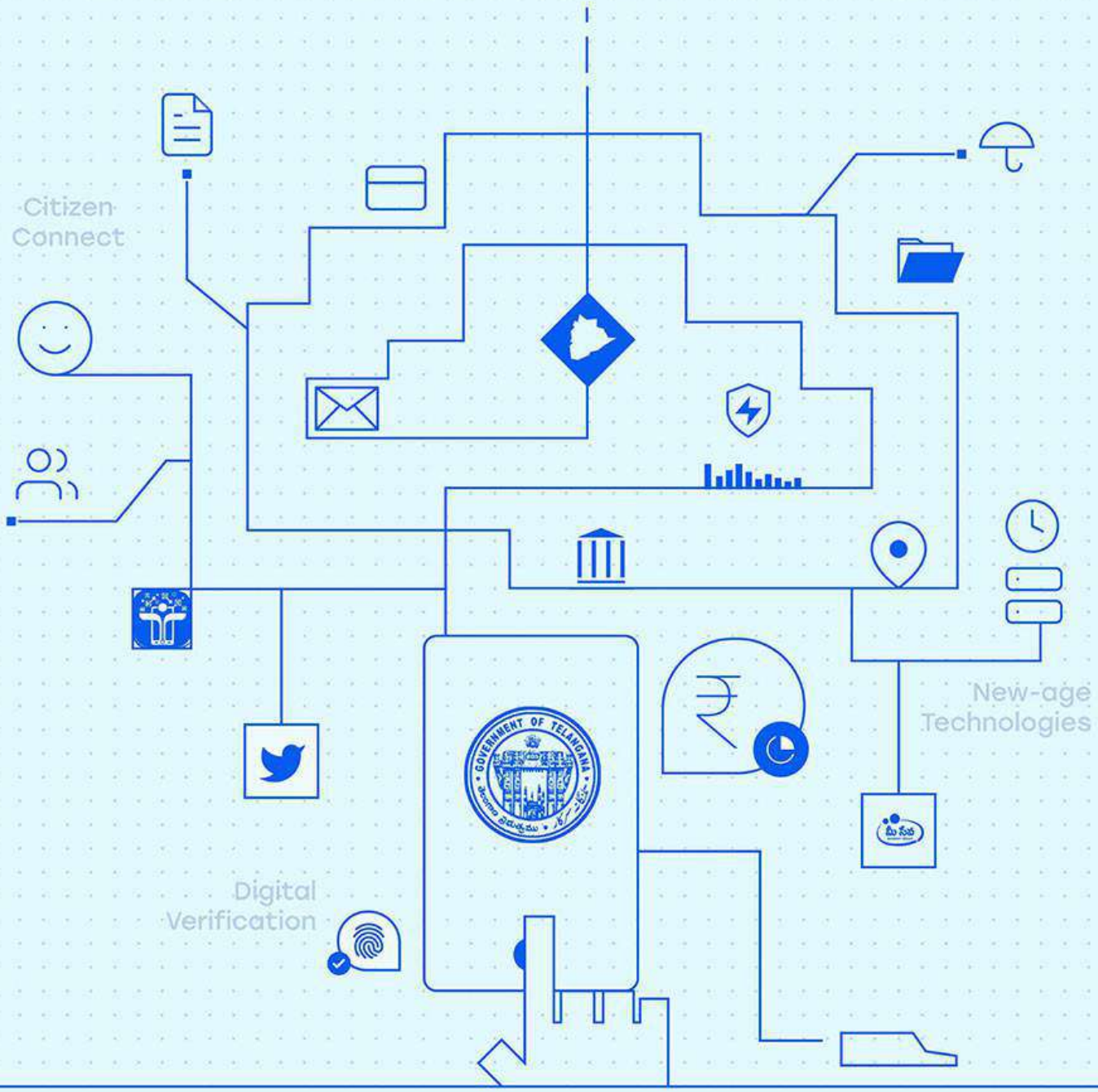
The growth of investments in emerging technologies and solutions that the state will lay focus on will be facilitated through the availability of trained students and professionals ready to pick up the technical and managerial work in these fields. The World Economic Forum expects that by 2025, "increasingly redundant roles will decline from being 15.4% of the workforce to 9%, and that emerging professions in will grow from 7.8% to 13.5%". The increase is expected to be driven by jobs using emerging technologies. A step further, NASSCOM estimates that, of the ~40 lakh employed in the Indian IT-ITES industry today, the nature of the job for 60-65% is likely to change, thus requiring re-skilling over the next 5 years. The government will align its resources to develop the right skilling framework to fit the future's needs.

## Work-Ready Talent

While technical skills are core to employees and employers alike, several companies would have to spend resources to develop the soft skills for their young employees. TASK will develop courses to impart non-technical aspects of employment like soft skills and personality development to improve employability and reduce the burden on corporate partners to build these skills for recruits.



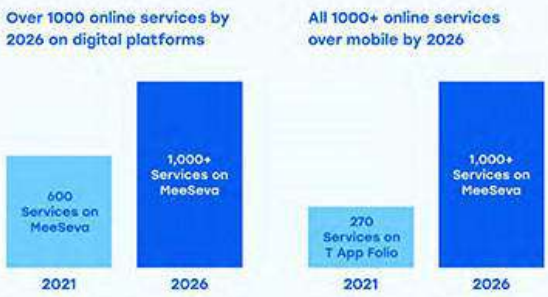
# 05 CONTACTLESS, PAPERLESS & PRESENCELESS GOVERNMENT



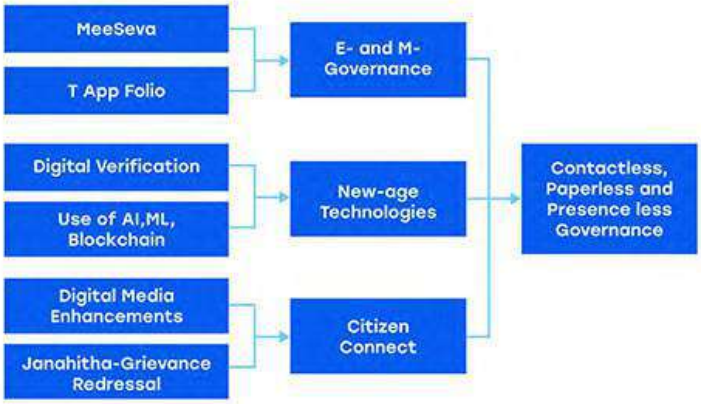
# TARGETS

No G2C service shall mandate physical presence of citizens*: 1000+ G2C services online

All 1000+ online G2C services will be made accessible through a mobile-phones with the help of government's service delivery app — T-App Folio




Through the introduction of MeeSeva 2.0 and T-App Folio, most of the Government Services are available to citizens in the comfort of their homes and mobile phones. In the wake of COVID-19 and the onset of the digital revolution, the state aims to deliver all citizen services digitally and ensure that there are sufficient mechanisms to streamline digital interactions with the government. The government will also focus on streamlining service delivery by combining multiple new-age technologies like AI, ML, blockchain, etc. to provide secure verification and data processing.




## MeeSeva

MeeSeva is the integrated service delivery platform in the state with 600+ G2C and B2C services of 100+ participating departments/agencies through a network of 4500+ centers located across the state. The government of Telangana has completed a comprehensive up-gradation of technological and process aspects of MeeSeva and MeeSeva 2.0. was rolled out in April 2019. During 2020-21, 35 services have been launched with an average roll out time of fewer than 3 days. MeeSeva has been the go-to platform for launching high-priority services such as LRS, GHMC Flood relief, NPB, Sadabainama and Sadarem.

## T App Folio

T App Folio enables delivery of G2C, B2C, VAS, and info services through Smartphones as well as Feature phones (USSD, IVRS, and SMS) and is the only App in India that currently enables application and certificate services to be delivered to citizens. T App Folio has reached over 12+ Lakh downloads and supported 40+ Lakh transactions till March 2021, with onboarding over 270+ services in the same period.

*except incases like drivers license test etc...

## Usage of Emerging Technologies in eGovernance

The Government of Telangana commits to increase the usage of emerging technologies such as AI, ML, Big Data, and Blockchain to create a fast, reliable, and secure e-governance experience for the citizens. A special budget for IT and Emerging technologies shall be allocated by each user department to develop applications that can be used by citizens. Going forward, we will not only develop solutions for the state but will also support other states in India that would require the solutions developed in Telangana to empower them and improve the ease of governance.

### Online Authentication

All government procedures that require verifications will be done online through the use of RTDAI-Realtime Data Authentication of Identity, a safe and secure product developed by the state to ensure reliable and quick verification of citizen identities. This will enable the government to save several hours for verification processes for the citizens. With the increased usage of smartphones across the state, this project would play a critical role in providing digital services in the most remote locations.

### Digital Verification for Beneficiaries

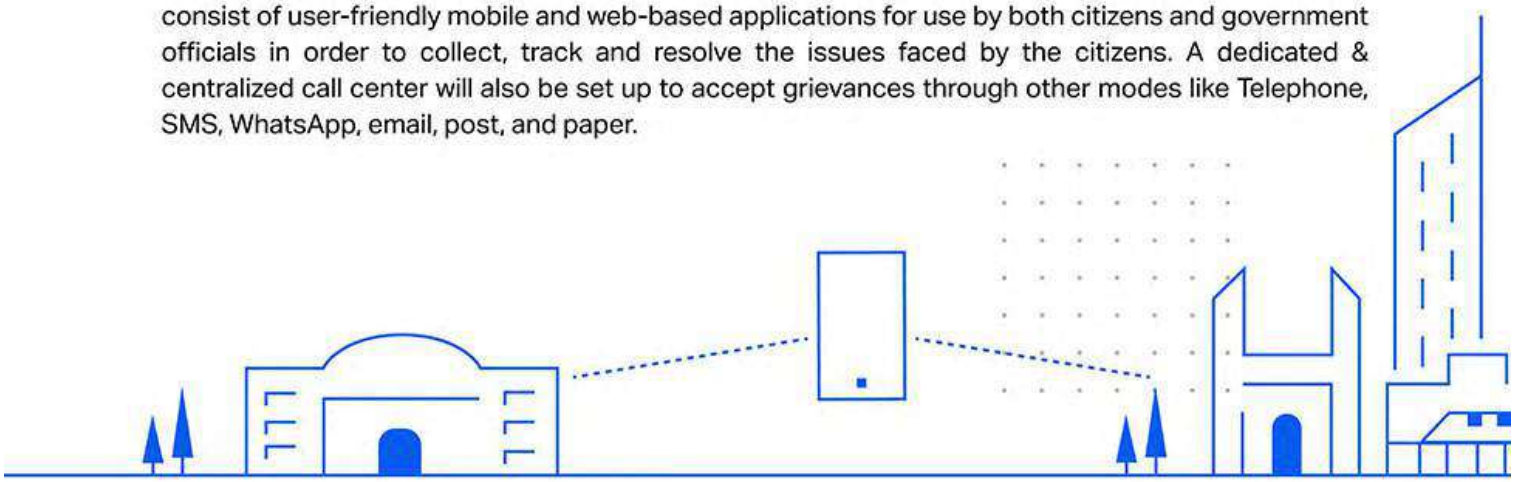
In Telangana, we strongly believe that adopting Emerging Technologies is key to an efficient and accountable Government. To ease the process of verification of details for welfare programs in the state, the digital verification platform developed will use AI, ML, and Big Data analysis methods to study the database of citizen information gathered from departments to assess whether an applicant is truly eligible for a scheme or not. The project has been successfully used for several schemes and has garnered high praise from GoI's Economic Survey (2018-2019) for being a world-class data-based solution.

## Citizen Connect

Given the widespread use of digital media among the citizens in the state, the government shall leverage digital platforms to create an effective communication mechanism with the citizens in the state. New and efficient methods of information transfer shall replace the traditional modes of advertising and outreach. A standardized mechanism shall be developed to ensure the quality of interaction through digital media is retained across all departments in the state.

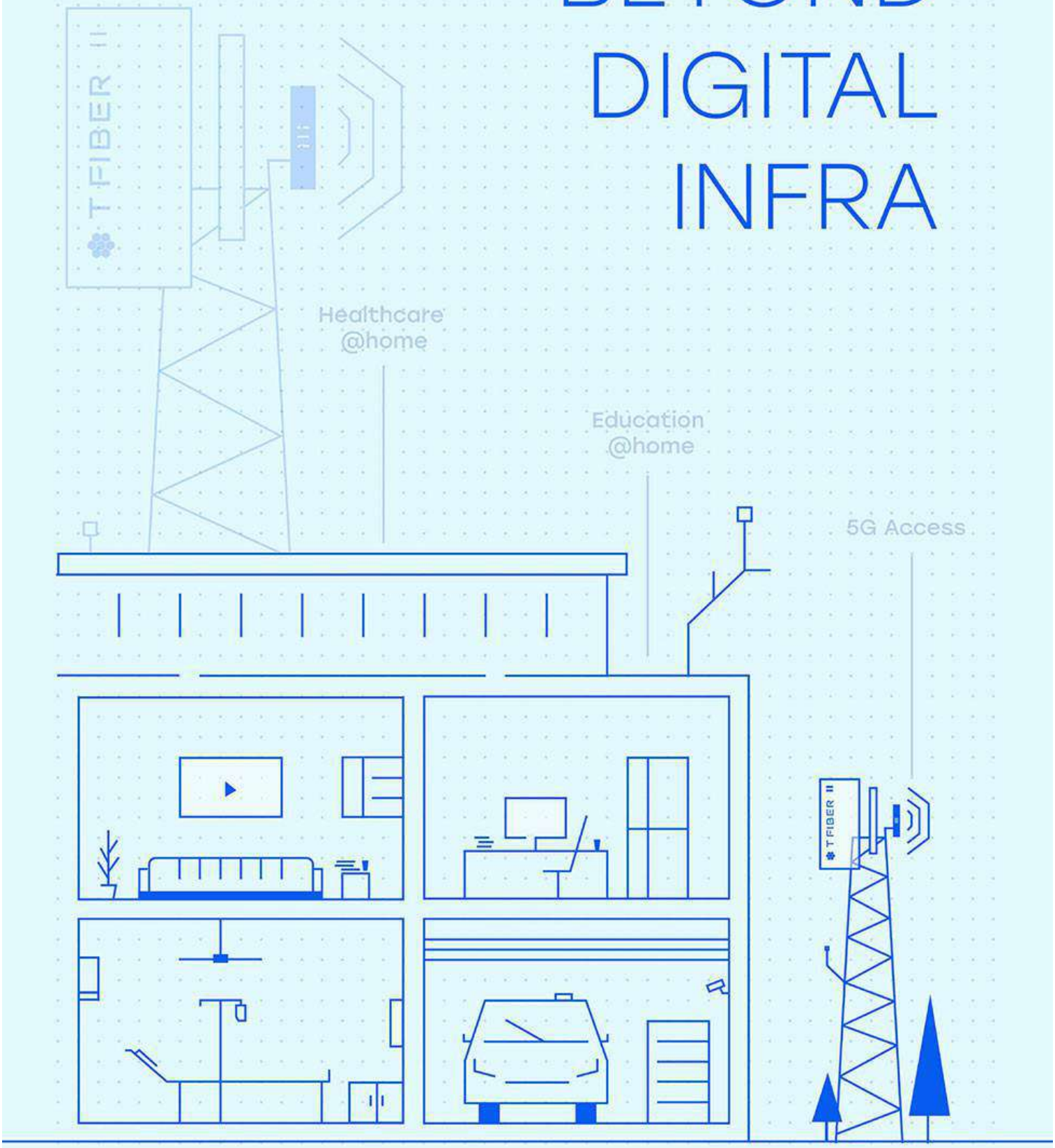
### Janahitha – Citizen Grievance Redressal Platform

To make government services transparent, responsive, and user-friendly to the citizens, the government intends to have a Citizen Grievance Redressal System called Janahitha. Janahitha will consist of user-friendly mobile and web-based applications for use by both citizens and government officials in order to collect, track and resolve the issues faced by the citizens. A dedicated & centralized call center will also be set up to accept grievances through other modes like Telephone, SMS, WhatsApp, email, post, and paper.



06

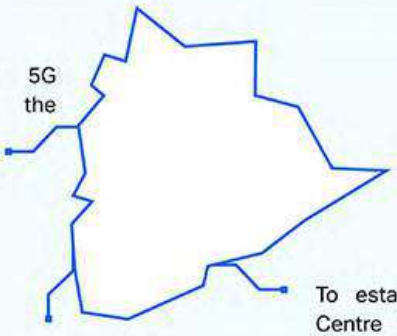
# BEYOND DIGITAL INFRA



## TARGETS

### 5G

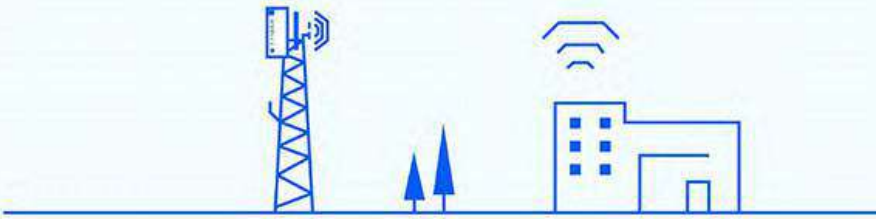
To complete 5G rollout across the state.



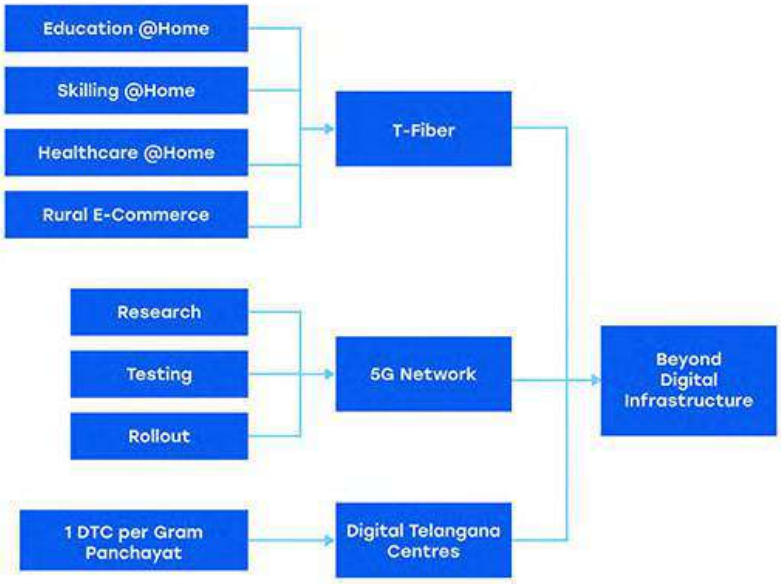
To establish one Digital Telangana Centre in each Gram Panchayat in Telangana

### 100%

To connect 100% of government institutions, rural and urban households to the Internet through T-Fiber by 2026



To enable digitalization across the state, the government will ensure all citizens are provided with access to the required digital infrastructure. The ambitious T-Fiber project will connect all educational institutes, homes, and government offices to high-speed and reliable internet enabling better access to services and digital content even in the most remote locations. Moreover, access to 5G internet across the state will be facilitated with a complete rollout.



## T-Fiber as an enabler

Once established, T-Fiber will be used as the primary source of information and knowledge transfer. All the G2C services that require citizen and other public interactions with the government will be streamlined through the use of T-Fiber. Access to the internet will allow all departments to adapt to and deliver various new-age services at the doorsteps of the citizens.

### Education at home

The government shall put special focus on e-learning and delivery of educational content directly to students' homes. Over-the-top media services shall be utilized for giving students access to the best digital education solutions from primary school to higher education on par with the developed countries of the world. The government shall strive to ensure every student in the state gets equal learning opportunities independent of their socioeconomic background.

### Skilling at home

Through the high-speed internet service available at homes across the rural areas, skilling and training programs shall be carried out through an internet-based solution developed to facilitate ease of skilling. TASK will work with the industry, academic institutions, and professionals to create learning modules and curriculum for citizens of all demographics. Trainings required for various sections of professionals ranging from farmers to fishing to horticulture and several others will be provided through these programs.

### Healthcare at home

Easy access to the internet gives the government new opportunities to meet the healthcare needs of citizens more holistically. The government shall take steps to spread the use of digital health solutions like T-Consult and the central government's National Digital Health Mission direct to home. The government will development new services using emerging technologies like AI, ML, Blockchain, Drones etc. for making activities like testing, basic diagnosis, and medicine delivery more efficient.

### Rural e-commerce

With the growth of e-commerce across the world and increasing access to the internet across rural areas, the government sees a new opportunity to connect citizens with sellers and buyers of products in rural and remote locations. The government shall facilitate this through T-Fiber and a specialized e-marketplace developed to enable secure selling, buying, and payment mechanisms for the users.

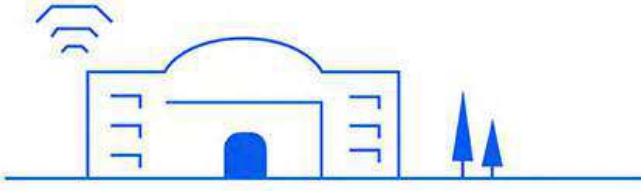
## 5G Expansion

Telangana has been a pioneer at adopting new technologies and providing citizens with access to the latest communication solutions. In line with leading countries in the world, Telangana has begun experimenting with and developing the base for 5G technology.

Hyderabad is one of the first cities in India which has had pilots for 5G communication services done by our telecom partners. Going forward, the state will formulate adequate strategies to enable citizens in both urban and rural locations to use 5G technology. Sufficient relaxations and Right of Way orders will be provided to ease the entry of the telecom service providers.

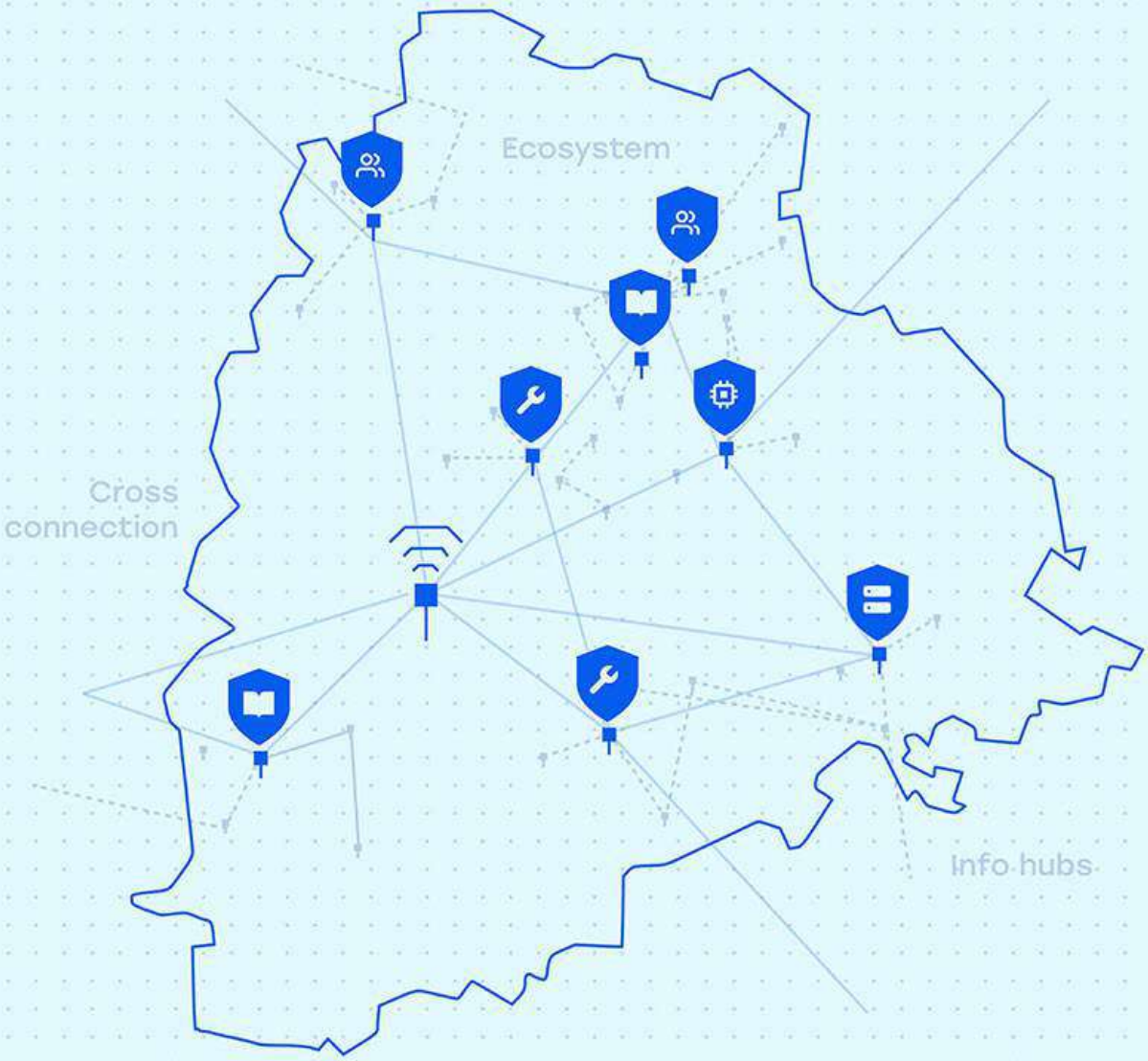
## Digital Telangana Centers

The Government has created over 1000 Digital Telangana Centers at the Panchayat level. Each center is being managed by a trained Village Level Entrepreneur (VLE). The centers provide various digital G2C services like e-panchayat services (property tax, utility payments etc.), financial services, banking services, insurance services and training services. These operations will be scaled up to reach all 12,765 Gram Panchayats in the state.



07

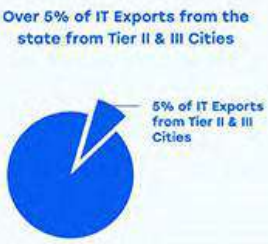
# BEYOND HYDERABAD



## TARGETS

Generate employment of 25,000 in Tier-II & Tier-III cities by 2026

Develop a robust district Innovation Ecosystem in 5 regional centres


The majority of the state's IT/ITeS exports come from Hyderabad, which is a major IT-Hub not only in India but also in the whole world. To generate more employment opportunities in other cities of the state, the government aims to develop Tier-II and Tier-III cities as IT powerhouses and facilitate the growth of a complete ecosystem like Hyderabad in these locations. Cities like Khammam, Karimnagar, Nizamabad, Warangal, etc. have already been established as IT-Hubs. The government shall make efforts to develop these cities into well-established smart cities.

### Ecosystem development

An environment conducive for investors will be developed by establishing government institutions in these cities. Centres for T-HUB, WE-HUB, TASK, and TSIC will be made functional in the Tier II & Tier-III cities like Khammam, Warangal, Karimnagar, Nizamabad, Mahbubnagar, Siddipet, Nalgonda, and Ramagundam. These divisions will work together in each city to develop the infrastructure and government support available for investors and working professionals.

t-hub

TSIC
ఇంటింటా ఇన్నోవేటర్

TASK

WE HUB
Ideate. Implement. Inspire

### College and Industry connect

To improve the learning and skilling outcomes for students and professionals, TASK will work closely with the industry, collect feedback, and improve the employability of citizens in Tier-II and Tier-III cities. Special training programs will be developed for students in collaboration with the industry to begin training from the 2nd and 3rd years of college education to give students more time to learn and a more hands-on training experience.

## Information and Communications Technology Hubs

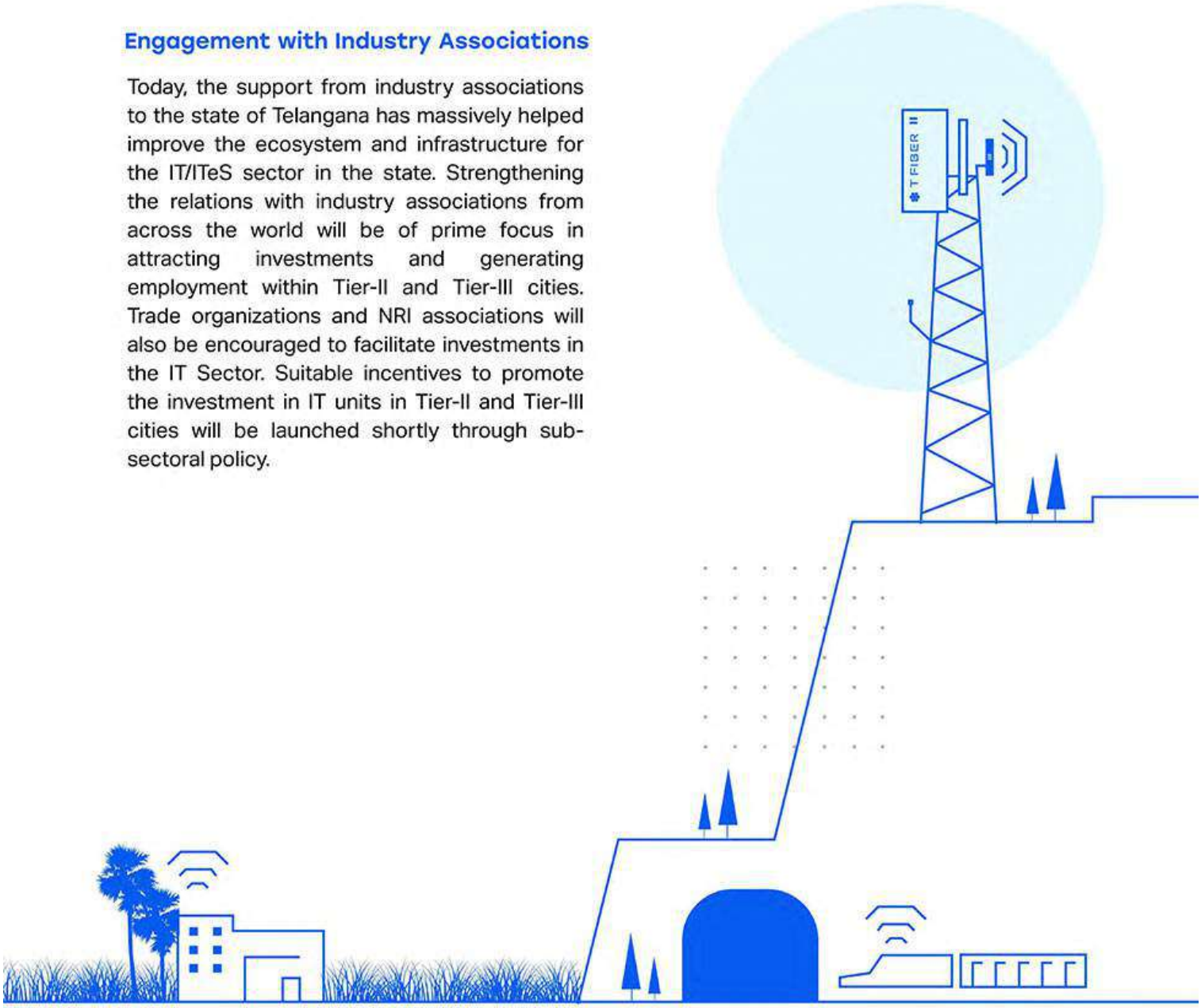
The state has already built over 1,50,000 square feet of ready-to-occupy space in IT-Hubs in Warangal, Khammam, and Karimnagar which are fully occupied by several IT/ITeS investors. New technology centres are currently being developed in the cities of Nizamabad, Mahabubnagar, Siddipet, and Nalgonda. To attract more investors to these cities with a plug-and-play model of IT-Hubs, the Government will incentivize private developers to set up technology centres in Tier II & Tier III locations through a Private-Public Partnership model.

## Happening Telangana

The government will facilitate the all-round development of Tier-II and Tier-III cities by improving the general infrastructure of the locations through the promotion of high-end malls, schools, tourism attractions, and other leisure activities. These cities will also be a major part of the smart cities' initiatives taken up by the state and the quality of living shall be improved to incentivize top talents to stay within the Tier-II and Tier-III cities.

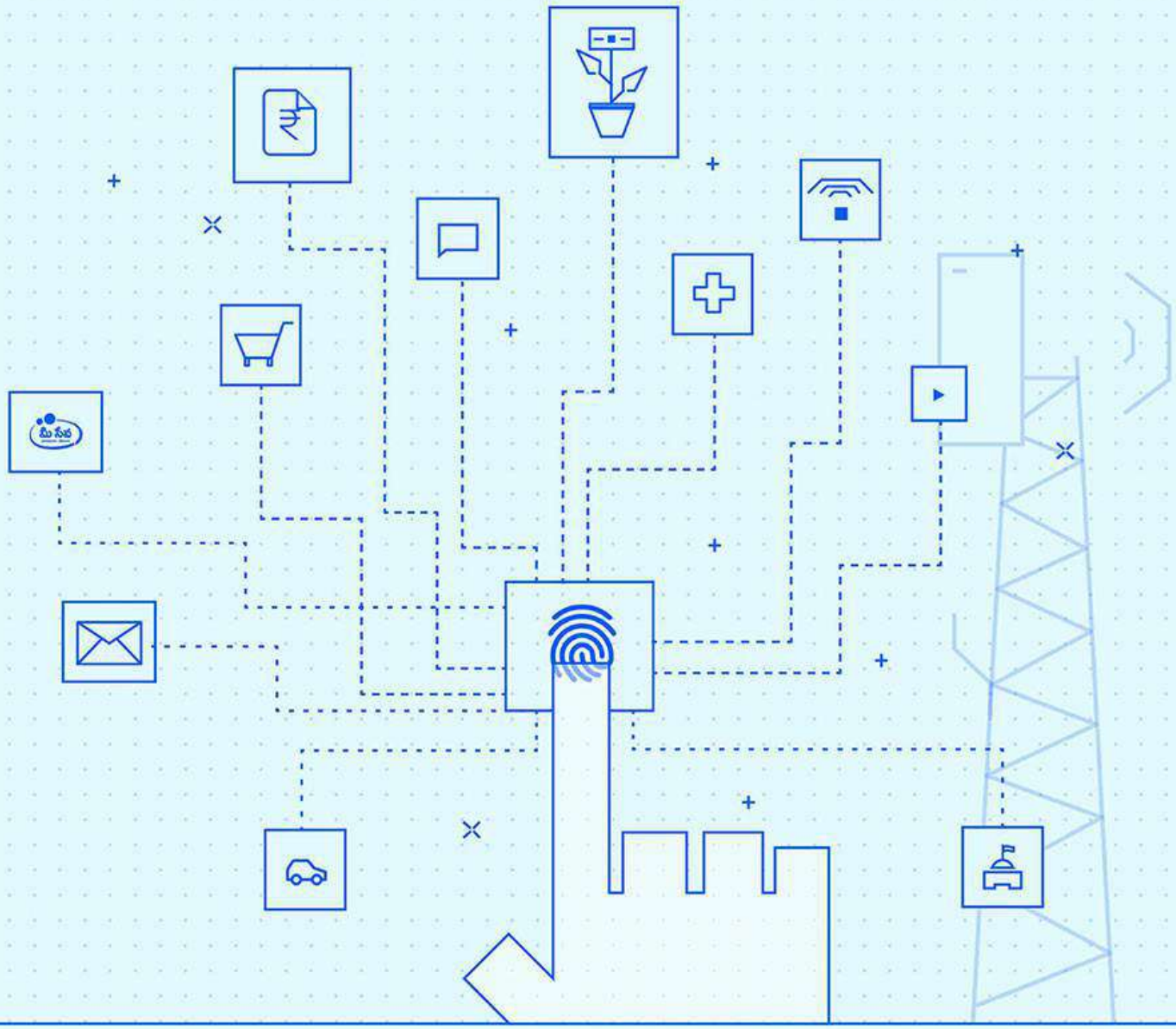
## Engagement with Industry Associations

Today, the support from industry associations to the state of Telangana has massively helped improve the ecosystem and infrastructure for the IT/ITeS sector in the state. Strengthening the relations with industry associations from across the world will be of prime focus in attracting investments and generating employment within Tier-II and Tier-III cities. Trade organizations and NRI associations will also be encouraged to facilitate investments in the IT Sector. Suitable incentives to promote the investment in IT units in Tier-II and Tier-III cities will be launched shortly through sub-sectoral policy.



08

# DIGITALLLY EMPOWERED CITIZENS



## TARGETS

To ensure that at least one individual in each household and SHG is digitally literate and is empowered to take advantage of the digital ecosystem.

One Digitally Literate member per household

One Digitally Capable member per Self Help Group

Right from the start of the digital age, as expected, the digital divide among citizens belonging to different socioeconomic backgrounds has been increasing. It is only imperative for the state to be extremely conscious of this fact and bridge the digital divide. The state will create solutions to give an advantage to the disadvantaged and will ensure that the citizens are sufficiently skilled to embark on the digitalization journey. Focus will also be on ensuring citizens of the state have a safe and secure access to the internet. Cybersecurity and data protection will be key areas of focus in order to protect citizens who will enter the digital world.

### Digital Opportunities

Several requirements/needs of the citizens can be solved efficiently and quickly with the help of digital solutions. The government will focus on creating and deploying citizen-centric digital solutions keeping in mind the requirements of citizens.

### Scalable Solutions

The government has piloted several solutions across sectors like agriculture, education, healthcare, etc. to provide highly capable solutions to the citizens in the state. Going forward, the state will focus on scaling up the solutions to reach each and every corner of the state and ensure the benefits are realized by even the most vulnerable citizens of the society.

### Infrastructure Development

While solutions are being developed at a rapid pace, it is also important to make them accessible to all citizens. The main barriers that must be addressed are:

**Access to the Internet**

T-Fiber, a flagship initiative of the state that will connect all government institutions, urban and rural households is underway and will ensure the entire state has access to the internet in the next few years.

**Digital Connection Points**

To provide the citizens with common service locations in the state, several initiatives to build infrastructure have been taken up. In the case of agriculture, Rythu Vedikas have been built across the state. For education, we have several educational institutions and for citizen services, we have CSCs, MeeSeva centres and Digital Telangana Centers. More such destinations will be created for sector-specific needs like healthcare, SHGs, etc. which will all be connected to T-Fiber.

**Digital Devices**

To reap the full benefits of digital solutions, giving citizens access to end-point devices is important. The government will ensure that digital end-point devices like mobiles, tablets, etc. will be available at all the digital venues mentioned above.

## Support Across Areas

Taking the socioeconomic status of citizens into account, the government will build and offer digital solutions across all the important focus sectors. For example,

T-Consult service which is a telemedicine service will be made available across the state in the coming years. The government is already offering digital classes through T-SAT. These services, solutions will be scaled up and efforts to meet the infrastructural needs of students will be taken up.
Basic agricultural support is being provided at the Rythu Vedika centres in the state. The government will ensure that the farmer have access to new-age technology-based solutions and can learn about them at Rythu Vedika centres.

The effectiveness of projects like Stree Nidhi is enhanced through the use of technologies like blockchain and AI to provide better support to these groups. The government will work towards ensuring that at least one individual in each SHG is digitally literate and is empowered to take advantage of the digital ecosystem.

## Repository of Opportunities

A repository of all the digital solutions developed for various categories of beneficiaries will be created and access to it will be facilitated. The government's focus will be to ensure that beneficiaries are aware of all the solutions that are available to them.

## Improved cybersecurity & awareness for citizens

With the development of digital infrastructure, the digital solutions available to the citizens, and the rapid increase in the number of internet users, developing mechanisms to improve the cyber-readiness of users is key. Cybersecurity for the citizens is now more important than ever, and the government has already launched a cybersecurity policy in this regard. The Government shall design cybersecurity awareness campaigns to increase the cyber-readiness of citizens & government departments.

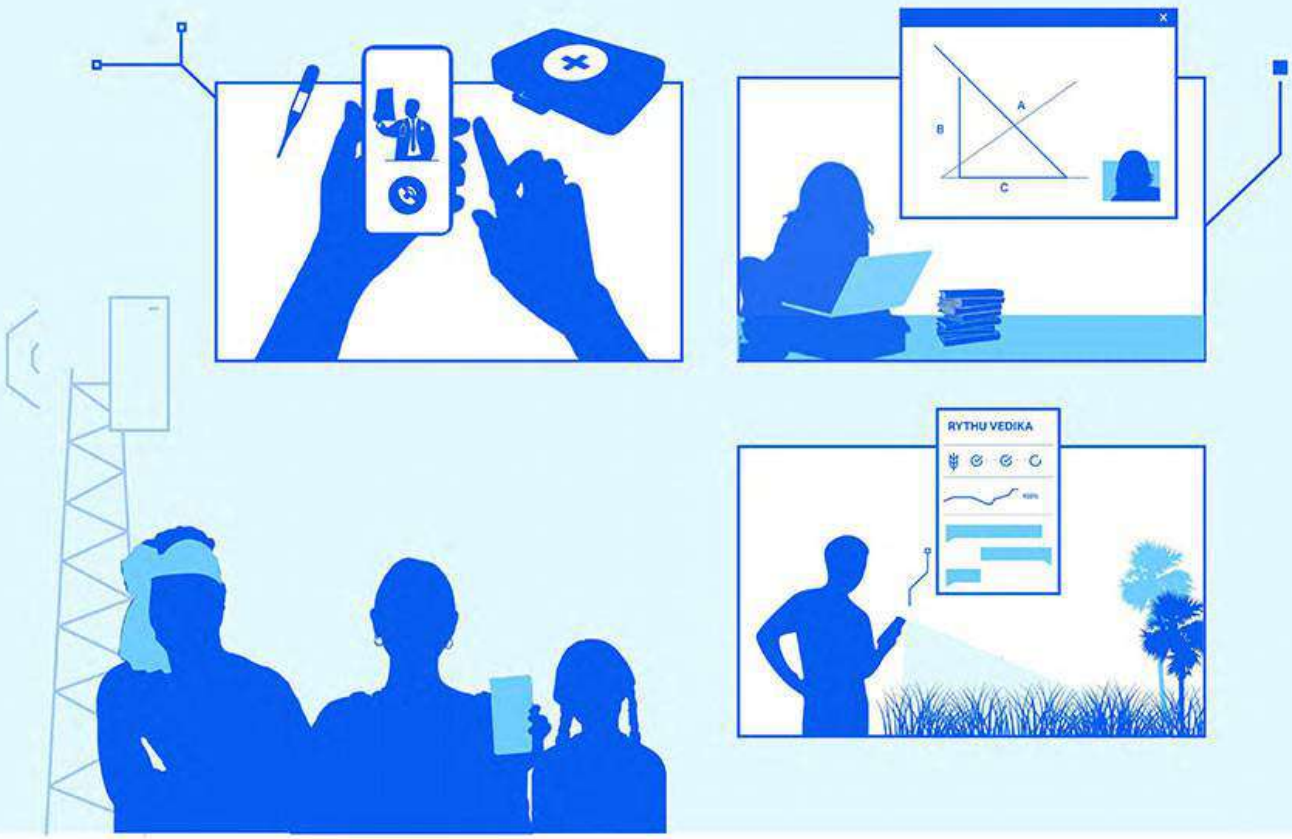
In addition to the preventive measures taken by the government, the Cyber Security Police Force will be strengthened to better address citizen grievances. Child and women safety will be bolstered with focused campaigns and special cybersecurity teams.

## Accelerating PMGDISHA

Basic actions like bill payment, railway reservations, banking services among others are proven to make the citizens' lives hassle-free. The government has supported the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) by Digital India and facilitated the development of over 10 Lakh certified digitally literate citizens. Over the next 5 years, the government aims to increase the number of digitally literate citizens to over 50 Lakhs.

## The Case of Ramana and Deepti

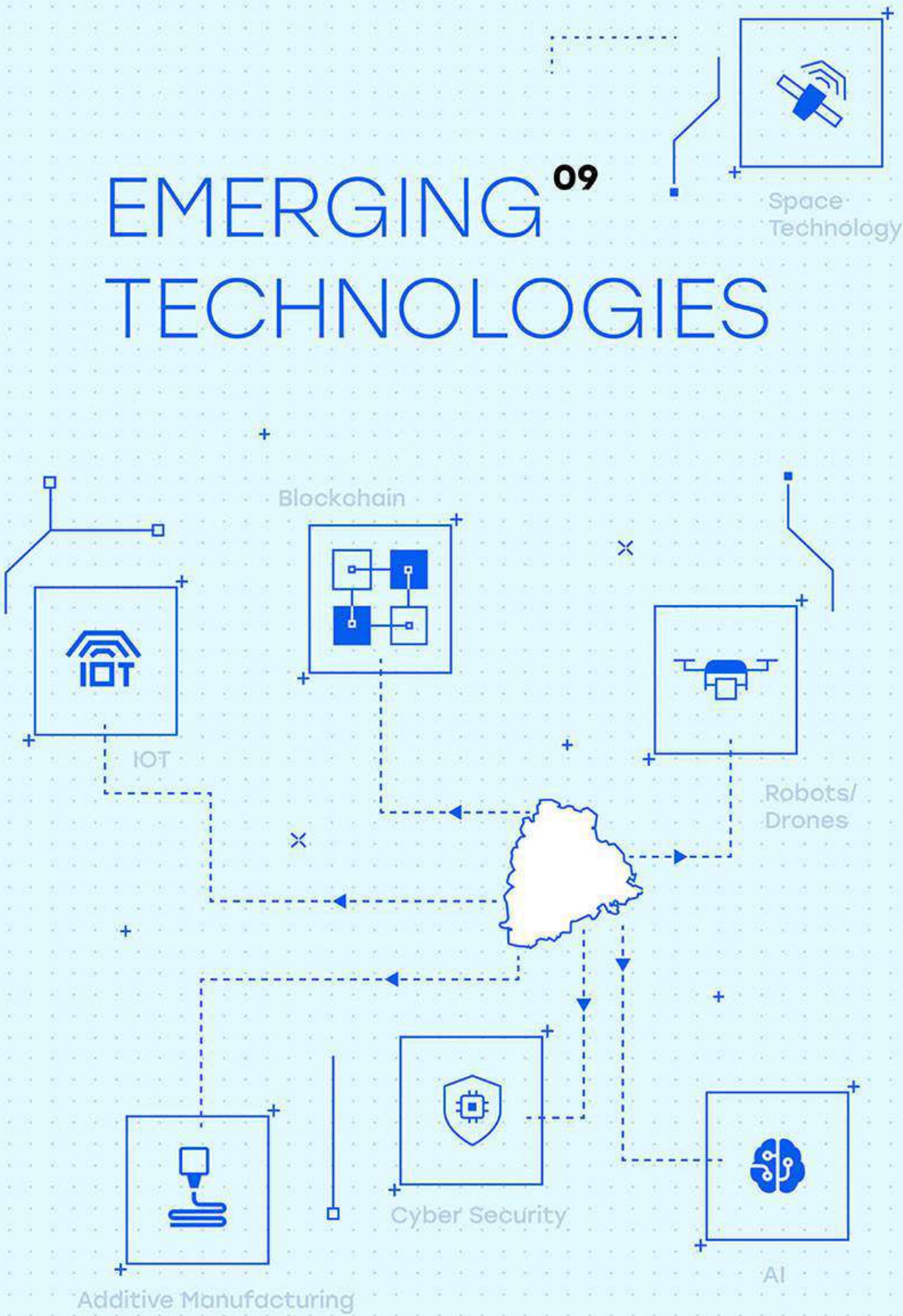
Ramana and Deepti are small families situated in a village in the Bhadradri Kothagudem district of Telangana. Ramana is a farmer who harvests cow gram and Deepti is a housewife. They have one daughter who is 13 years old, and she studies in the local government school. With the implementation of T-Fiber across the State of Telangana, their entire village is well connected and Ramana's family recently began attending the digital literacy online classes being organised by the government. By helping themselves become more digitally literate, Deepti could immediately access teleconsultation services to resolve a major health issue she has been suffering from. However, Ramana has been facing serious challenges with pest control of the crop. He then learnt from his peers about the Rythu Vedika and decided to access it for the benefit of his harvest.




Ramana was asked to click a picture of the present condition of his crop and the pest problem he was facing. On uploading the photograph, he got the required help in resolving this problem. He also got all the necessary support in seeking market prices for his crop in 5 different regions which allowed him to make a sensible and informed decision on his pricing strategy. Ramana greatly benefitted from all the support he got and could finally turn his business around into profits. This also made him realise the importance of not having an information gap with the market.

Due to the pandemic, their daughter has been unable to go to school and even as she has been attending online classes, Deepti was concerned about her daughter developing a good skill set. She was keen on her daughter improving some of her math and problem-solving skills by attending a supplementary course apart from customary coursework. She found out about classes given by professionals on the T-SAT application and ensured her daughter attended them in the evenings. This way, Ramana's entire family is digitally empowered and is secure of their access to infrastructure, necessary resources and required external knowledge.

# EMERGING TECHNOLOGIES 09



## TARGETS

**75**

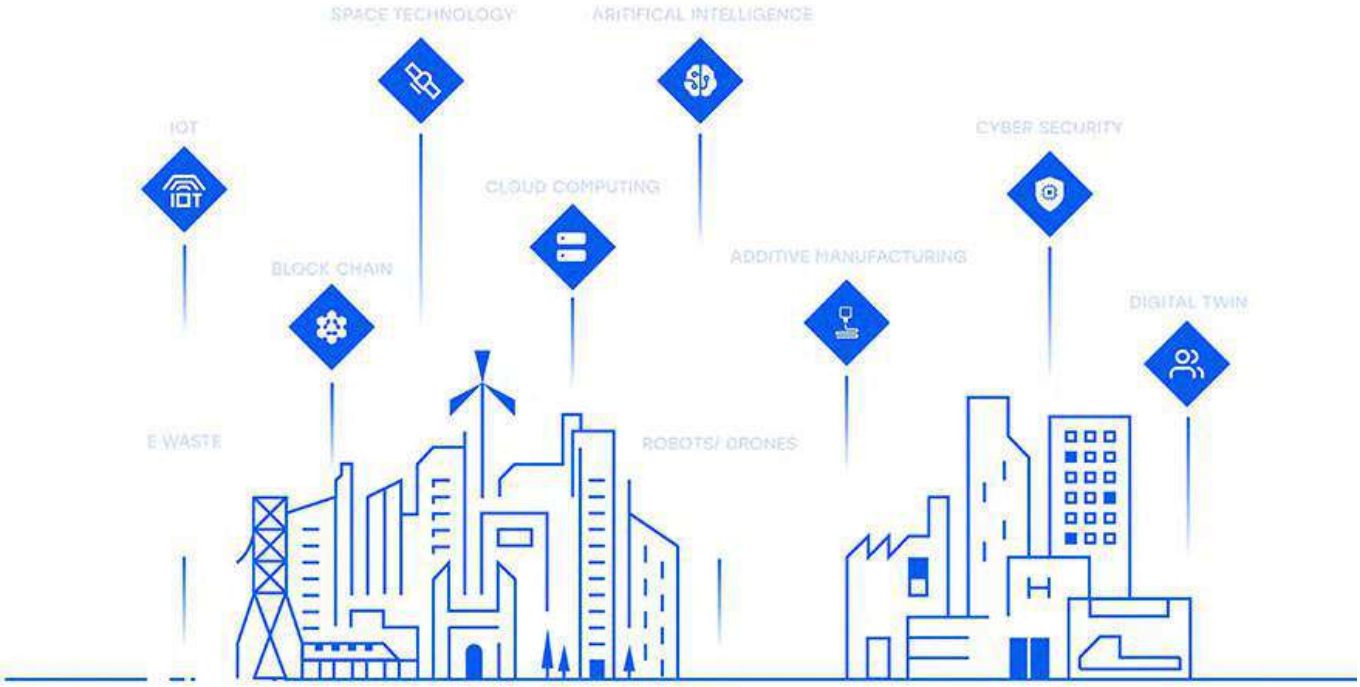
Undertake 75 innovative projects with focus on citizen services

**10**

Establish 10 emerging technologies focused Capability Centers (e.g., CoEs)

**5**

Establish 5 R&D centers to undertake deep research for new products and solutions




**TET CORRIDOR**

Acknowledging the fact that Emerging Technologies are driving disruptive innovations in many sectors, the Telangana State has been proactive at setting up the required institutional support and infrastructure for these technologies. The focus is on two aspects — ecosystem development for these technologies and government adoption to improve service delivery to citizens and businesses. The state has formulated strategy and policy frameworks for emerging technologies such as AI, Cloud Adoption, Blockchain, Drones, Cyber Security, E-waste and IoT. Centre of excellences or CoEs have also been established to drive the implementation of the strategic frameworks such as Telangana AI-Mission (T-AIM), Cyber Security CoE, E-Waste Management CoE, Centre for Responsible Deployment of Emerging Technologies (CRDET). The State envisions to retain its leadership position in emerging technologies.

### Identifying high impact technologies

The government continues to explore the global developments for opportunities around transformative emerging technologies, the ones that have the potential to bring in disruptive innovations in the next three to five years. A few technologies that are showing great potential to be considered in the near term are:

**Additive Manufacturing (AM)**
AM or 3D Printing is transforming businesses with its potential of optimizing material consumption, creating new & complex shapes, and shortening production times. Further, the 'National Strategy for Additive Manufacturing' has been released to boost India's share in the global market projected to be USD 35.6 billion by 2023.

**Space Technology**
It has the potential for global commercialization and huge multiplier effect on the economy. From launch vehicles & satellites enabling indigenization to downstream applications enabling impact on sectors like agriculture, space is the new frontier. Also, there is national impetus to grow the private participation with release of Spacecom Policy, Space RS Policy, National geospatial policy*, etc. and gain share in global market projected to be USD 558 billion by 2026.

**Robotics**
The amalgamation of Computer Vision, AI, and robotics has enabled the development of automated equipment for multitude of tasks across diverse industrial settings. As of 2019, India ranked 10th in annual installations of industrial robots with just ~3% the number of installations compared to country that was ranked 1st, so the potential for growth is huge and the market is expected to reach USD 52 billion by 2026.

**Digital Twins**
Digital twins provide an exact virtual replica of an object (living or non-living), process or system, and even cities in the real world. The combinatorial use of IoT, Big Data and 5G for digital twins has unlocked various applications such as monitoring in construction and energy industry, healthcare by digital twins of patients, and planning, efficiency & traffic management in smart cities.

## Adapting to changing workforce dynamics

The World Economic Forum in its report estimates that globally 850 lakh jobs may be displaced but 970 lakh new roles may emerge by 2025 as a result of emerging technologies. The destruction of jobs is accelerating and to ensure Telangana's workforce is trained for the future, Telangana Academy for Skill and Knowledge (TASK) shall monitor the state's shifting requirements and the skill-demand paradigms to develop a through and dynamic action plan to training for 'jobs of tomorrow'.

## Establish Research & Development Centers

To truly become the hub for emerging technologies, the first link of the value-chain i.e., research is paramount. The government shall actively facilitate deep partnerships between industry, academia, and research institutions to establish R&D centers for developing new products and solutions in emerging technologies.

## Realize the potential of Data Economy

The rise of smartphones, e-commerce, social media and IoT devices has led to generation of huge amount of data. The Internet traffic in India alone is expected to be 78 exabytes in 2021 (1 exabyte = 1 million terabytes). McKinsey estimates that India's core digital sectors have the potential to more than double to USD 435 billion by 2025, and the newly digitizing sectors incl. government applications can create incremental value of up to USD 150 billion in the same period. The data economy benefits the governments, citizens, industry and, academia in various ways ranging from transparency and empowerment of users to economic impact arising from innovation.

Telangana will try to achieve the potential of the data economy by creating a data stack ecosystem in the key sectors such as healthcare, agriculture, education, smart cities, and environment. A data marketplace will be set-up that will help discover and exchange data based on open standards, interoperability, open APIs, security-by-design, privacy-by-design and flexible data governance models.

## Telangana as the Epicentre for GovTech

The state is already at the forefront of adopting innovative solutions developed by start-ups and SMEs. The solutions are being used to improve delivery of citizen services, governance, and process efficiencies. Currently, there are already 40+ ongoing projects using emerging technologies and the state endeavors to ensure full-scale implementations and adoption of such projects in user departments. To accelerate the development of innovative solutions for social good in the areas including but not limited to agriculture, healthcare, education, environment and smart cities, the government shall enable the digital ecosystem by:

**Creating a Data Stack**
A dynamic data stack is required to ensure rapid innovation and product development. So, the state shall create digital assets such as Electronic Health Records (EHR), Electronic Farmer Records (EFR), GIS Maps, etc. A Data Market Place (DMP) shall be established for the innovators to test their solutions in a sandbox using both government and commercial private data. The standards and guidelines for the use of data shall also be clearly defined.

**Ethical and Responsible Deployment of Emerging Technologies**
The state aims to create regulatory frameworks and guidelines that will help in addressing critical issues such as privacy, trust, and ethics ensuring that the transformative potential of emerging technologies is fully leveraged.

**Promoting Digital Public Goods (DPGs)**
The Digital Public Goods Alliance (DPGA), now endorsed by UN Secretary General's Roadmap for Digital Cooperation, is an effort by UNICEF and Govt. of Norway to promote digital public goods as a push to advancing the Sustainable Development Goals (SDGs). Telangana shall endeavor to support the development of citizen facing social good solutions such that they can contribute towards the development of DPGs that can potentially be used worldwide.

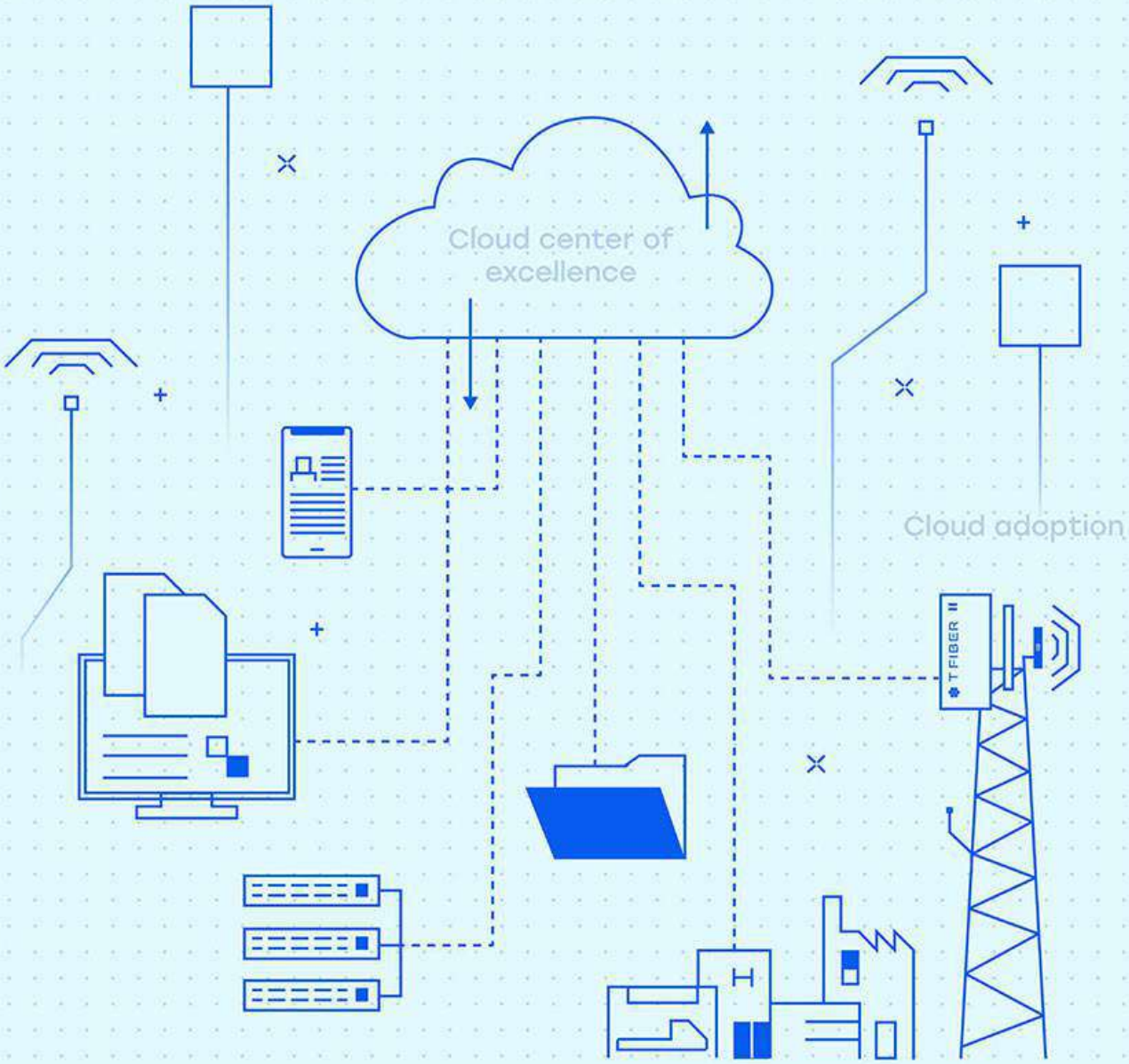
**Easing Procurement**
In addition to existing relaxations for start-ups in such public procurements, the procurement process would be streamlined with a model RFP outlining outcome-based requirements, new revenue models, new payment methods, risk mitigation measures in procuring from start-ups, etc.

**Providing Government Mentorship**
The government shall share problem statements, provide domain expertise, mentorship, and give an opportunity for start-ups to pilot the solutions. It shall also provide guidance for reconfiguring existing solutions to local context such as use of vernacular languages and integration with existing platforms.

## TET (Telangana Emerging Technologies) Corridor

The government has come up with specific policy frameworks in AI, blockchain, Drones, cyber security and established Centres of Excellences to provide a platform for various stakeholders including industry, government, academia, user enterprises, and innovators to collaborate and co-create solutions and products. The CoEs or the technology Centers of Excellences proved to be a powerful economic development tool. Therefore, in order to coalesce the varied efforts and to foster a world-class ecosystem for emerging technologies in Telangana, the government shall set up the Telangana Emerging Technologies (TET) Corridor. The TET Corridor shall act as a "Hub for CoEs or Technology Centers". TET Corridor shall act as a platform for providing institutional support, thought leadership, promoting R&D and innovation, offering incubation, attracting investments, building partnerships, facilitating capacity building and more.

# 10 – CLOUD FIRST POLICY



## TARGETS

100% cloud adoption across government departments

The Government of Telangana has always led the adoption of new technologies through sectoral policies for several technologies like Cyber-Security, e-Waste Management, AI and Blockchain. In line with the Meghraj Policy launched by the Central Government in 2013, Telangana has launched the Cloud Adoption Framework for the state, mandating the use of cloud computing technologies within the government. The usage of such public cloud solutions will make the government solutions more agile and reliable while also providing the freedom to the departments to scale up or develop advanced solutions with ease.

### Government Adoption

While the use of the cloud has been mandated in the state, it is necessary to educate the government departments and help them understand the advantages of using the public cloud over traditional on-site digital infrastructure. Fast becoming the new norm, cloud services provide the state with an opportunity to rethink digital service procurement and citizen service deployment. The Cloud Adoption Framework released by the Government lays out the key principles of cloud services and the methodologies of adopting these services.

### Cloud Center of Excellence

To assist the government in moving towards the cloud, the ITE&C Department is setting up a dedicated team of cloud specialists. This will help us accelerate cloud adoption across Telangana's user departments by propagating the best practices and capacity building across functions. The key functions of the Cloud Centre of Excellence would be:

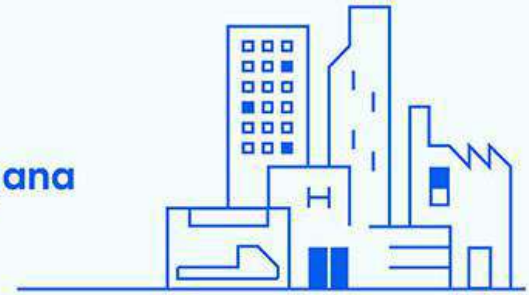
- To assist user departments to comply with Telangana's cloud mandate
- To conduct a series of capacity building sessions for all key government stakeholders
- To provide advisory services around budgeting, evaluation, procurement, and continuous optimization migration plans, to-be architecture, and network & security configurations

### Cloud Service Providers and Data Center Investors

To better promote the use of cloud services and ease the process of cloud procurement, the government will facilitate cloud adoption following the empanelment model of MeitY. A service catalogue will be provided to the government department with empanelled services from cloud service providers after scrutiny of abilities. The catalogue will ease the process of price discovery and will outline a process of procurement that enables the users to make full use of cloud services. More details on the government's cloud adoption would be included in the cloud framework.

# 11 TECHNOLOGIES FOR URBAN LIVING

# 40+ Smart cities and localities in Telangana by 2026



Telangana is one of the most urbanized states in the country with over 40% of the state's population being urban residents. The government aims to convert all cities and major towns in the state into smart cities and facilitate this conversion for rural locations as well.

## Town Domain Services

A multitude of town-specific application services in the domains such as mobility planning, waste management, housing, parking, health, and education facilities will be supported through new technological functionalities.

### Smart Lighting

The use of IoT has greatly improved the scope and potential of Lighting Solutions in cities. LED and IoT-based smart lighting systems will be used to enhance power savings and add additional features to study air quality, noise pollution and pedestrian safety.

### Smart Water

Smart Irrigation and water supply systems will be developed in the upcoming smart cities to study and improve the availability of water, decrease waste and monitor the usage of water better.

### Smart Education

Digital education solutions will help us serve the students of the state better. The ITE&C Department will work with the Education Department and develop state-of-the-art learning solutions and give all students access to the best learning solutions.

### Smart Healthcare

Digital Healthcare is a fast-growing space with innovations taking over the healthcare needs of citizens. Digital consulting, record-keeping, monitoring, and medicine delivery among others will be explored and made standard in the smart cities.

### Smart Mobility

New technologies have the potential to transform to transportation needs of citizens. Projects like smart traffic signals, smart buses tracked public transport solutions will be explored by the government to improve reliability, accountability, and to ease citizens' lives.

### Smart Tourism

With the emergence of technologies like AR and VR, there is a lot of scope to make tourist spots in the state more interactive and attractive for local and international tourists. The government will deploy suitable solutions with an emphasis on cultural showcases.

### Smart Waste Management

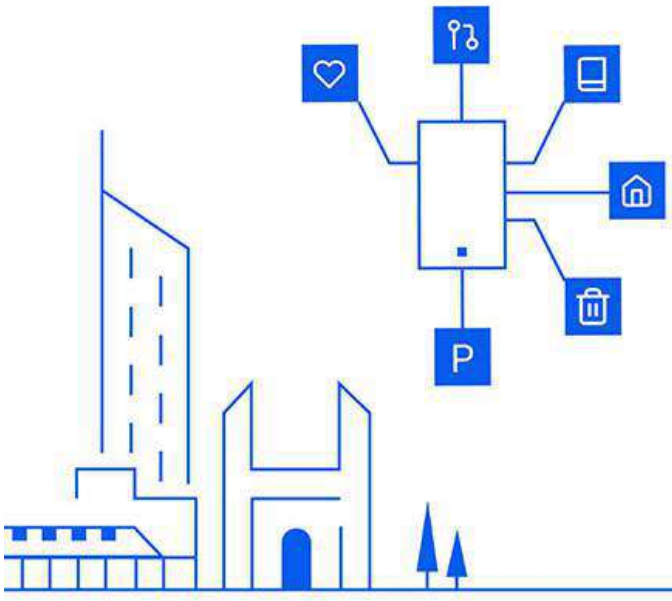
Waste management is a key consideration to designing a well-structured city. Hyderabad already has IoT-based smart waste management systems that help save fuel, time, and other resources. More such solutions will be explored, and more locations will have such smart technologies for waste management.

### Data Driven Administration

Tools for smart administration will be set up in the city to monitor the operations, quality, and flow of elements like water, air, and traffic. The government and citizens will be enabled to get a holistic view of the city's operations and status. In addition, this will also enable data-driven and evidence-based decision-making and planning for the activities in the city.

### Emergency Control

ICT functionalities will be developed in the selected smart localities to control activities and help the town's administrators to carry out operations efficiently during medical emergencies and natural calamities. Facilities along the lines of smart ambulances, smart traffic systems, and early crisis detection will be developed to aid emergency control services.




### Government Services Enablement

Through E-Governance and M-Governance services, the government is en route to enabling a 100% digital service environment. The government will facilitate the setting up of physical infrastructure in the form of MeeSeva centres and T-Fiber to promote accessibility of digital services from the government.

### Safety and Security

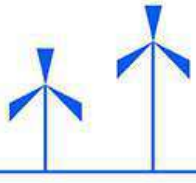
The digital transformation provides us with opportunities to improve the safety and security standards in smart cities. While the risks faced by citizens are both online and physical, through the use of technology, cyber-security police will be facilitated to counter them. There will also be a special focus on developing technological systems to make Telangana the safest state for women and children.

### Employment and Investment Attraction

Data generated will not only allow innovators to provide solutions but will also help the smart cities to track and enhance objective development metrics like the Quality of Living Index, Municipal Performance Index, and ISO indices. These will portray development and attract further investments, jobs, and highly skilled employees to these cities. The Government of Telangana will engage with various private consulting and research organizations, to benchmark itself with the best in the world.

### Safety and Security

The government will set up a dedicated Smart Cities wing equipped with expertise in this space. It will consist of resources from the MA&UD Department and the ITE&C Department that will focus on identifying the ideal solutions, piloting projects, and strategizing the deployment of the projects.



# ITE&C DEPARTMENT AS THE TECH ENABLER

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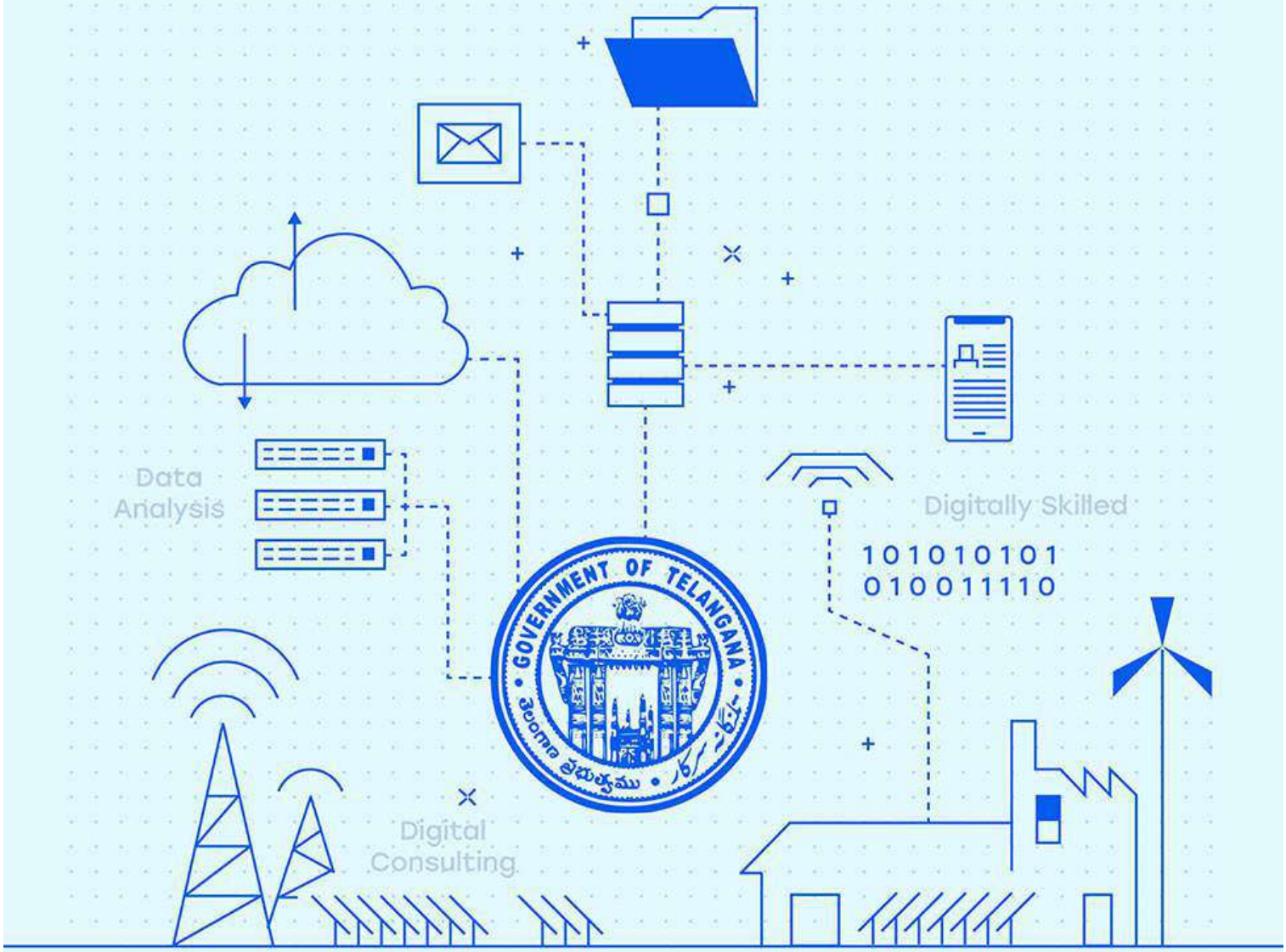


## TARGETS

**50+** Digital Transformation Projects in the Government

**40+** User Department Collaborations

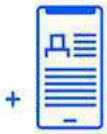
Telangana's journey to being a true digital state requires the government to be at the forefront of innovation and technology. The government will take a citizen-centric and data-driven design approach to develop and deploy solutions. The ITE&C Department will anchor this transition and will provide all the necessary support that government departments need for their digital solutions. Ensuring high quality of digital services and the safety of users will be of key focus moving forward.

### ITE&C as the Technological Advisor

The government has taken steps to facilitate the use of new-generation technologies and digital solutions to serve citizens better. Telangana State Technology Services (TSTS) was established with the aim to provide all government departments with the right skills, guidance, and confidence to go digital.

**Hardware and Software Procurement**

TSTS is the nodal agency for the state departments to get their Hardware and Software requirements fulfilled. A Technical-cum-purchase committee has been created in TSTS to evaluate every request for procurement services. The committee will ensure the services provided to the state have been technically and financially evaluated in order to give the user departments the best services possible.



**Digitally Skilled Workforce**

Digital skills in the government are key to take up any form of digital transition. TSTS has the capability to identify or provide the right workforce required by the departments to carry out their activities. Given TSTS's expertise, it will also assist the government departments in recruiting suitably skilled employees for the state.

**Digital Consultancy**

Expertise in the digital sector is often a necessity to implement a project at scale from the process of planning and procurement. The expertise of TSTS in digital procurement and management will be used to provide the state with IT advisory facilities and to get the best solutions prepared. The government will also set up a dedicated arm in TSTS to support other states in the country with indigenously developed technology.

### The T-WEB Project

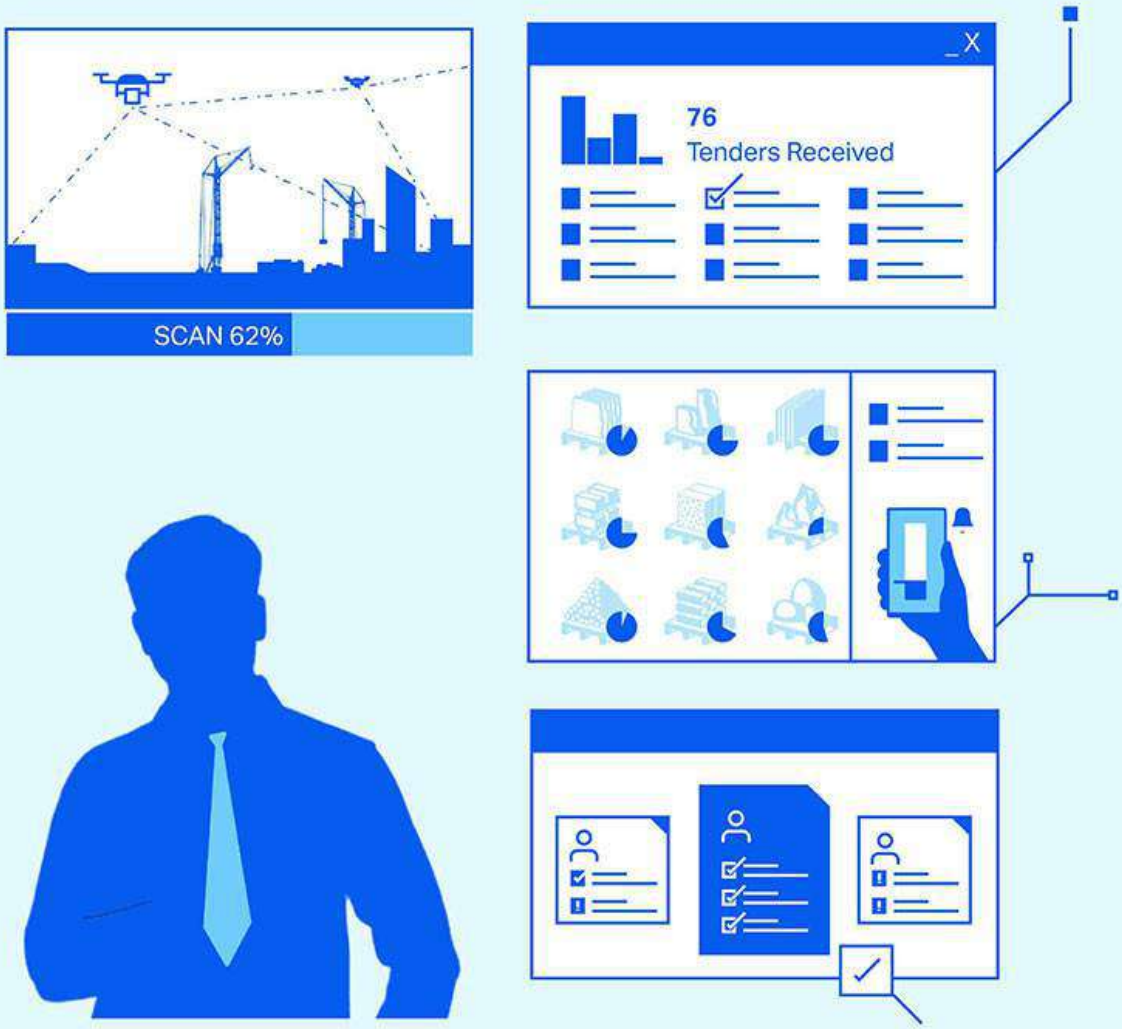
The Government of India through its Ministries, Departments and agencies have come up with guidelines for Websites and e-Governance Services including, but not limited to, Guidelines for Indian Government Websites (GIGW), National eGovernance Service Delivery Assessment (NeSDA). The Government of Telangana has adopted these guidelines and extended its scope to prepare Guidelines for Telangana Government Websites (GTGW) incorporating categories like social media integration, localisation, device-neutral access, and compliance to Aadhaar and RTI Acts.

All these compliance efforts are clubbed together under one umbrella called the T-Web Project. The ITE&C Department shall provide the necessary assistance to all the Government Departments to make their websites and online services comply with the relevant guidelines. The objective of these efforts is to make websites and online services Secure, Usable, User-Centric and Universally Accessible.

### Data Analysis Wing

Understanding the citizens within the state is key to creating an effective digital strategy. To further the citizen-centric service deployment, a data analysis wing will be created within the ITE&C Department to better understand users from the data generated across government departments and to deliver data-driven services for the citizens. This model will not only ease communication and service delivery but will also aid data-driven policy decisions.

## The Case of Srinivas



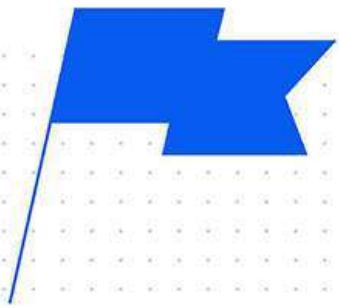

Srinivas is the project manager for the 2BHK dignity housing scheme being implemented by the Government of Telangana looking after all activities of the project in the region of Hyderabad. He made use of survey drones to identify suitable plots of land to commence construction of the project. After identification of the project, he was able to finalize on the construction firms through an e-tendering process led by the procurement portal. All permissions required for the buildings were given to the contractors in a matter of 21 days through the TS-iPASS portal. Once construction commenced, he was able to track the availability of resources by using the resource planner application created for the project. The progress was also tracked on the same project with regular updates from the site all through the use of the application. When several thousands of applications have come in from the public, he used the AI-based Digital Verification Tool available to identify the right beneficiaries and saved several man-hours of work for the same. With some help from the technological solutions developed by the government, Srinivas was able to identify the deserved beneficiaries and help them realize their dream of dignified housing much sooner than expected.

## Looking Ahead

Telangana has been on an incredible journey of excellence since its establishment as a new state in 2014. This has been possible due to the visionary leadership and executional excellence shown by the state's leaders. They set the trajectory for Telangana's growth at its inception and then followed through with flawless execution. From the beginning, it was decided that technology would be the enabler that would help the state reach greatness and all that the state has achieved is because of the dedication to this vision.

However, Telangana is not resting now with the laurels it has accumulated. The state has taken stock of where it can improve and is now gearing towards the next big leap. After benchmarking with the best of economies, the state is looking to double production, productivity, farmers' income and overall, improve the welfare of all sections of society. It also aims at having the most optimum utilization of natural resources, high quality of living and an accountable and citizen-centric government. As has been Telangana's history, technology will play a major role in pursuing all the above goals going forward as well.

To this end, the 2nd ICT Policy will be the instrument that will place IT in the centre stage of fulfilling the vision of Golden Telangana. This policy document will set the path for Telangana to continue achieving greatness and empowering the lives of all its citizens.




Shri Jayesh Ranjan, IAS
Principal Secretary, ITE&C Department,
Government of Telangana

5th Floor, Burgula Rama Krishna Rao
Bhavan, NH 44, Hill Fort, Adarsh Nagar,
Hyderabad, Telangana 500063

**www.it.telangana.gov.in**
**040-23453233**