



**Tower and Infrastructure
Providers Association**

03rd April 2017

Shri U.K. Srivastava,

Principal Advisor – NSL

Telecom Regulatory Authority of India (TRAI)

Government of India

Subject: TAIPA Submission on TRAI Consultation Paper on Approach towards Sustainable Telecommunications

Respected sir,

Tower and Infrastructure Providers Association (**TAIPA**) is registered under the Societies Registration Act and has been formed as the industry's representative body by the telecom infrastructure providers (IP-Is) to expedite the success of the Telecom revolution and increase tele-density. TAIPA members include ATC Tower Co, Bharti Infratel, GTL Infrastructure, Indus Towers, and Tower Vision India.

This is with reference to TRAI consultation paper on 'Approach towards Sustainable Telecommunications' dated 16 January 2017. TAIPA submission on the said consultation paper is enclosed for your consideration.





Thanks & Regards

Tilak Raj Dua

Director General – TAIPA

98101 50000

Tower and Infrastructure Providers Association

2nd & 3rd Floor, 7, Bhai Veer Singh Marg, Gole Market, New Delhi-110001 (Opp. St. Columbas School),
Tel: 91-11-23348835-37 • Fax : +91-11-23348838 • Website : www.taipa.in

TAIPA Response to TRAI Consultation Paper on ‘Approach towards Sustainable Telecommunications’

Preamble

1. The consultation paper titled ‘Approach towards Sustainable Telecommunications’ is released as fresh recommendations were sought by Department of Telecommunications (DoT) from the Telecom Regulatory Authority of India (TRAI). The recommendations were sought on the methodology for measuring carbon footprints and calibration of Directives issued by DoT in 2012 and approach for implementation.
2. The significance of energy efficiency in modern telecommunication networks and directions for optimizing network performance in terms of energy demands have been outlined in the consultation paper. It aims to address the critical issue of climate change and how the telecommunication sector is contributing towards it.
3. Telecom sector is a key driving force for the socio-economic development of the nation. The telecom sector has witnessed substantial growth in the number of subscribers during the year 2015-16 with the subscriber base touching 1151.78 million as of December 2016.
4. With the growing telecom market in India, the telecom towers are required to be operational 24x7 to provide uninterrupted quality services to the consumers for which continuous power supply is required. Telecom industry faces issues because of uncertain and no or limited electricity available in rural as well as urban parts of India. The use of diesel therefore becomes a compulsion to the telecom tower companies rather than a choice. Thus, in order to provide continuous connectivity to mobile towers, the telecom industry has to install alternative means for powering up telecom networks vide Diesel Gensets and battery banks amongst others.
5. Mobile Towers are among the sectors that consume the least amount of diesel (1.54%)¹.

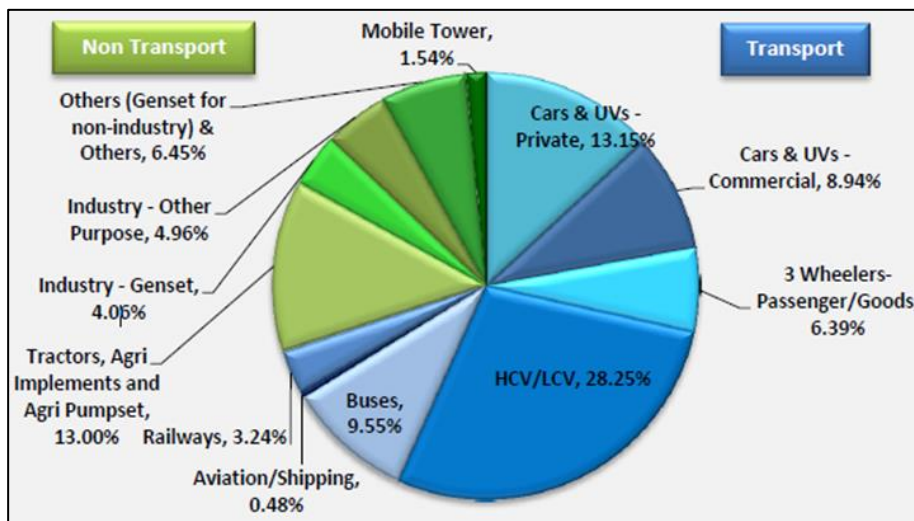


Figure: All India End-use Share (%) of Diesel in Retail and Direct Sales Combined

¹ PPAC Neilson Study – All India Study on Sectoral Demand on Petrol and Diesel (2013)

The industry have taken several suo-moto initiatives for alleviating or mitigating the diesel consumption thereby reducing GHG emissions and carbon footprints of the telecom networks. The key initiatives include

- a. Diesel free sites: Industry have installed nearly 90,000 diesel free sites, i.e., sites which consumes approximately a litre of diesel a day
 - b. Efficient energy storage solutions to optimize energy usage. The industry have installed high efficiency batteries such as Li-ion, advanced VRLA batteries, etc. at a number of sites
 - c. The industry have converted significant number of indoor sites to outdoor sites saving sufficient amount of energy and diesel consumption
6. The Telecom sector contributes minimally to the GHG emissions and it should not be singled out and enforced with any targets for deploying Renewable Energy Technologies (RETs). It may please be noted that MNRE, the nodal ministry for RET implementation in the country, is already implementing various projects focussed around these aspects including energy storage solutions which are widely used by Telecom Sector. Creation of any additional layer other than MNRE therefore may not be required.
 7. Further, it is imperative that deployment of RETs should be non-discriminatory and encompass all sectors. Any directive being issued for installation of RET should be issued by the nodal ministry rather than individual ministries and should be applicable across sectors for a worthwhile end result
 8. India is a growing economy and energy is central to achieving its development ambitions. Independent power companies can play a crucial role meeting in power requirements from grid as well as renewable energy/power. The concept of RESCO (Renewable Energy Service Companies) should be encouraged for distribution of electricity in the rural and remote areas. RESCO is an off grid decentralized energy based power generation and distribution model. RESCO model provides an approach to integrate the demands for rural electrification to the needs of the telecom towers segment of meeting the grid deficit. The telecom tower companies can be a consumer of the RESCOs for powering up the telecom towers using renewable energy.
 9. The energy cost accounts for a substantial amount of total network operations cost. TRAI has discussed demand management (reducing consumption) activities, supply-side management activities and renewable energy solutions to reduce the carbon emissions and achieve energy efficiency. Industry has been taking several initiatives to minimize diesel consumption including steps initiated by operators in deploying more and more energy efficient equipment Deploying RET like solar, wind, fuel cells, etc. is still not a feasible solution for operating a telecom tower site considering its distributed nature and small capacity at a point location. Constraints like inadequate and variable power output of various RETs, space availability and seasonal variances etc. further impact the feasibility. Growing urbanization also results in imparting shadow on the solar PV panels post its installation impacting its power output and making it unviable. Key barriers for installation for RET are –

| Green Choice | Resource potential | Barriers for adoption | Risks of adoption |
|--------------|--------------------|---|---|
| Solar | High | <ol style="list-style-type: none"> 1. High initial CAPEX 2. Space requirements 3. Scarcity of external funding | <ol style="list-style-type: none"> 1. Operational risk in terms of local challenges in theft and breaking of solar panels 2. Reliability issues due to variation in weather |
| Wind | Coastal Regions | <ol style="list-style-type: none"> 1. Reliability of power generation 2. Low scalability 3. High investment | <ol style="list-style-type: none"> 1. Operational risk in terms of variability in wind speeds and unreliable power generation characteristics |
| Biomass | Medium | <ol style="list-style-type: none"> 1. Operational complexity 2. Supply challenges 3. Pre-pilot stage and unproven operational feasibility | <ol style="list-style-type: none"> 1. Biomass supply and sustainability 2. Reliability issues due to breakage in supply links |
| Fuel Cell | Medium | <ol style="list-style-type: none"> 1. High initial CAPEX 2. Hydrogen fuel supply 3. OPEX Savings not yet established | <ol style="list-style-type: none"> 1. High replacement cost of fuel cells 2. Reliability of fuel supply |
| Pico-Hydro | Untested | <ol style="list-style-type: none"> 1. Low market awareness 2. Availability of water body close to tower locations 3. Cost of technology 4. Regulatory clearance | <ol style="list-style-type: none"> 1. Operational risks associated with limited knowledge and readiness |

Source: PWC study

10. Going forward, telecom services will be penetrating rural areas where the availability of electricity through grid needs to be improved, this should be pushed through Ministry of Power. On the same lines, necessary instructions may be disseminated for ensuring prioritized electrification of telecom towers. Further, being telecom experts and not energy experts it becomes difficult to meet the grid deficit in the absence of viable grid electricity. Owing to the aforementioned challenges in the installation of RETs, these are still not a viable solution for the industry. The industry have taken various suo-moto initiatives to reduce its reliance on diesel and power telecom networks to provide uninterrupted services to the consumers. Therefore, the industry should not be singled out and enforced with any targets rather it should be incentivized for implementing advanced energy efficient and renewable energy solutions. Further, a directive from the nodal ministry encompassing all sectors rather than individual ministries would further accelerate the deployment of energy efficient solutions thereby contributing to the requirement of reducing GHG and lowering the Carbon footprint.

Issues for Consultation

Methodology for Calculation of Carbon Footprint

1. What accuracy level may be set for collecting the data and also, what should be the basis for arriving at this threshold level? Please comment with justification

The accuracy level shall depend in the manner the data is being collected and the way emissions are arrived at. Factors like Diesel being filled, DG run hours, units generated by DG, its efficiency are tedious to collect and erroneous. Thus, we should only opt for procured diesel as it covers any pilferage, any erroneous run hours, faulty meters, etc. which may otherwise go unaccounted. The accuracy and threshold level should take into account the current practices that are being implemented by the industry. In such a scenario, the accuracy level shall be as per the procurement invoices which are precise in nature and audited as well. The accuracy shall be further defined by the accuracy of emission factor being used.

2. Is there a need for auditing the carbon footprint of a telecom network by a third party auditor? If yes what is the mechanism proposed? Please comment with justification

The industry has been self-regulating its operations and is deeply committed towards the environment. The auditing factor gets nullified as the invoices regarding data of diesel purchased are generally third party audited. Further auditing the same shall lead to duplicity and may not be desired.

Therefore, we submit that there is no need for auditing the carbon footprint of telecom networks by a third party auditing mechanism.

3. Do you agree with the given approach for calculating the carbon footprint? If not, then please comment with justification.

We agree that methodology should be defined with clear scope and boundary, which should be common across the industry. While calculating the carbon footprint for the sector, only 'Scope 1' emissions should be considered which accounts for emissions from diesel procured by the telecom network. The emissions from the electricity generated (at grids' power generating stations) is beyond the control of telecom sector, hence it should be kept out for calculation of carbon footprint of the telecom networks.

New Formulae for calculations of Carbon footprint of Telecom network

4. Whether the existing formulae for calculation of Carbon footprints from Grid (given in paras 1.16, 1.17 and 1.1.8) of Chapter I need to be modified? If so, please comment with justification.

There are multiple sources for generation of electricity being injected into the grid. While some like RET, Hydro have almost negligible emissions, the ones fuelled with coal etc. have very high emissions. It is difficult to analyse the right emission factor for the power being consumed at telecom locations from the grid. The several emission factors mentioned in the consultation paper are based on various

assumptions and averages. The emissions from EB generating sources, as well as the hours of availability, both are beyond the control of telecom sector. Hence, emissions from the use of purchase of electricity are beyond imagination and control of telecom segment.

Accordingly, it is suggested to avoid calculation of Carbon footprints from Grid.

5. Which emission factors as mentioned in the Table 1.2 of Chapter I need to be used for the calculation (Average/ OM/ BM/ CM)? Is there any other factor(s) needs to be considered in the calculation? Please comment with justification.

Please refer to the answer for question no. 4

The emission factors of the grid are under the purview of Power Ministry and are based on various assumptions. They have been averaged across various power generating stations and are not in control of telecom sector at all. Hence, these factors need not be used.

We would like to submit that only Direct Emissions or 'Scope 1' emissions should be considered for the calculation of carbon footprints. Therefore, we would like to submit that consideration of emissions from the grid should be avoided in case of telecom sector.

6. Is the formula mentioned in para 1.22 of Chapter I suitable for calculation of Carbon footprints from Grid supply? Please comment with justification.

Considering the response for Question 4 and 5, this should be avoided.

We would like to reiterate that 'Scope 1' carbon emissions should be only considered for calculation of carbon emissions.

7. Which of the formula, (i) or (ii) as given in 1.23 of Chapter I is to be used for the calculation of carbon footprints from the Diesel generator along with views on possible values of ψ and η ? Please comment with justification.

The formula utilizing quantity of diesel purchased appears more suitable and should only be utilized for calculating carbon footprints. The other formula depends on multiple factors (such as DG run hours, units generated by the DG, varying load, its efficiency, variance from rated capacity etc.) defined earlier, which keep on varying, are difficult as well as erroneous to capture and calculate and therefore should not be used for any calculations.

8. For calculation of average carbon footprint, which of the options mentioned in para 1.25 of Chapter I is to be used? Please comment with justification

Option 3 (considering traffic) appears most suitable for measuring diesel related carbon emission, as the amount of traffic reflects the growth most closely and directly. Hence, monitoring Diesel consumption per GB data would provide a more representative assessment.

Energy efficiency in Telecom networks

9. What are the options available for renewable energy solutions which may be harnessed to their maximum potential to power the telecom sector? Please comment with justification.

The technological landscape has evolved over the years. However, deploying RET like solar, wind, fuel cells, etc. is still not a feasible solution for operating a telecom tower site considering its distributed nature and small capacity at a point location. Constraints like inadequate and variable power output of various RETs, space availability, seasonal variances, etc. further impacts the feasibility. Growing urbanization also results in imparting shadow on the solar PV panels post its installation impacting its power output and making it unviable. This necessitates the need of DG/Batteries and other energy efficient solutions in case of grid shutdown/power outage and the same has been experienced by the industry while deploying various RET and energy efficiency solutions.

The operators have the obligation of operating the telecom networks 24x7 and reliance on a single source leads to issues regarding QoS (Quality of Service) and network uptime. Given the distributed nature of tower sites and its power requirement, there is an imminent need of having energy efficient equipment/solutions and energy storage solutions. In light of technological advances, feasibility of renewable energy technologies needs to be compared with the latest technologies providing energy efficiency and efficient energy storage solutions. Therefore, energy efficiency initiatives, advance energy storage solutions and renewable energy technologies should be considered contributing towards the common cause of sustainable telecom.

Renewable Energy targets for Telecom networks

10. If electricity generated by a RET project (funded/maintained by TSP) is also used for community, should it be subtracted from overall carbon emission of a TSP? Please comment with justification.

The emissions avoided on account of telecom initiatives should be given the due weightage, as it ultimately results in avoiding the emissions to that extent. Further, considering the nascent stage of such concepts and non-availability of mature ecosystem emphasis on the same should be avoided.

11. If the RET project is funded/maintained by other agency, should that emission be counted? Please comment with justification.

A RET project, whether paid upfront by the user or in instalments post installation through various instruments or methodologies, need to be considered and the emissions avoided on account of it should be counted.

12. Please comment with justification on the approach suggested by the DoT committee

The third point in the Clause 4, i.e., 'Approach', regarding non-EB sites & sites having grid power availability upto 8 hours, needs discussion as this remains beyond the control of telecom sector. The DG life is mainly dependent on its run hours and the surrounding environment. Linking it with '5 years old' etc. may at times be misleading. Considering the technological advances and experience it needs

to be acknowledged that no RET can replace DG. Remaining part under the Clause 4, i.e., 'Approach' section appears appropriate.

Further, following may also be considered:

- The industry should be given a voluntary approach and should be incentivized for implementation of RET/ energy efficient solutions like diesel free sites, energy efficiency and advance storage solutions.
- The overall objective should be carbon reduction from diesel only.
- The approach should be self – regulation and self – monitoring instead monitoring through TERM cells/centralized monitoring system.

13. For effective implementation of RET/Energy efficient solutions in telecom sector, how can the industry be supported? Should incentives be provided to licensees (TSPs)? If yes, what should be the milestone? Please comment with justification.

We agree that incentives should be provided to licensees (TSPs) in order to support maximisation of energy efficient solutions/ RET in telecom sectors. . We seek support in the form of financial and non-financial incentives like VGF, Tax Holidays, and Subsidies on Storage solutions, etc.

The recommendation of the committee for a rebate of 1%, 2% and 3% in license fees appears a good measure and should be implemented.

14. What methodology can be proposed for setting new Renewable energy targets in the telecom sector? What should be the timeframe for achieving these targets? Please comment with justification.

The industry should be given a voluntary approach and should be incentivized for implementation of RET/ energy efficient solutions like diesel free sites, energy efficiency and advance storage solutions.

Thus, the industry should not be enforced with any targets for implementing RET rather it should be voluntary, being enabled through suitable incentives.

It is worthwhile to note that the industry has taken several suo-moto initiatives for deployment of energy efficiency solutions such as -

- **Diesel Free Sites** – While focussing towards green telecom, IPs continuously strive to reduce diesel consumption at sites. In pursuit of the same, the industry has made several sites as diesel free, i.e., sites that consumes approximately 1 litre of diesel per day thereby reducing usage of diesel at sites.
- **Efficient Energy Storage** – To reduce diesel usage at sites with intermittent and low power availability, efficient storage solutions are being deployed at tower sites such as Li-ion batteries, advanced VRLA batteries, etc. at a number of sites.
- **Indoor to Outdoor Sites** – Air Conditioners consumes a significant portion of the total energy used at an indoor site. After a detailed analysis, it has been found that there is a significant scope of reducing energy consumption by removing ACs without compromising the BTS ambient requirement. Accordingly, technologies such as Free Cooling Units (FCUs), etc. were developed, essentially converting an indoor site into an outdoor one. This brings in significant energy demand reduction at

the site. The industry has converted a significant number of indoor sites to outdoor sites saving sufficient amount of energy. Moreover opcos have also contributed by increasingly deploying their energy efficient and outdoor telecom equipment thereby bypassing the usage of Aircon and reducing power consumption.

Conclusion

- Telecom industry, under its obligation to power telecom networks 24x7, is forced to use diesel as an alternate source of electricity. In order to mitigate and alleviate use of diesel in powering telecom networks, the industry has taken several suo-moto initiatives such as diesel free sites, energy efficient storage solutions, energy efficient equipment, conversion of indoor sites to outdoor sites, and deployment of renewable energy solutions wherever feasible.
- The telecom industry should be incentivized for installing renewable energy solutions and not singled out and enforced with stringent targets. Any mandate for deployment of energy efficient and renewable energy solutions should be issued by the nodal ministry, i.e., MNRE rather than individual ministries. This will accelerate the overall achievement of implementing renewable energy solutions to combat climate change.
- Calculating the carbon footprints of telecom networks should be based only on scope 1 carbon emissions. The emissions from EB generating sources, as well as the hours of availability, both are in the scope of Power Ministry. The telecom sector shall utilise the grid wherever available.
- No third party auditing should be required as the industry has been self-regulating and the bills for procured diesel are already audited. Also, overall reduction in carbon footprint should be from diesel only. Also, emissions from diesel in telecom sector needs to be viewed as a proportion of the traffic (in GB).
- Feasibility of renewable energy technologies (RET) need to be compared with the latest technologies providing energy efficiency and efficient energy storage solutions etc. Therefore, energy efficiency initiatives, advance energy storage solutions and renewable energy technologies should be considered as contribution towards the common cause of sustainable telecom.
- Further, the sector is already self-regulated and taking several suo-moto initiatives. There is no need to impose any target for implementing RET on the sector. Also, support in the form of financial and non-financial incentives like VGF, tax holidays, and subsidies on storage solutions etc. should be extended for maximization of energy efficient solutions/ RET in the sector.