



**Response to
TRAI Consultation Paper
on
Approach towards Sustainable Telecommunications
Released on January 16, 2017**

I. Preamble :

A. Growth in the Telecom Industry has been matched by the resultant Infrastructure across the country.

1. The Indian mobile market has developed innovative network sharing solutions and has invested in setting up **over 4.5 lakh towers spread across the country**.
2. Telecom Industry has been able to penetrate, where even the Grid (Electricity Board or E.B power) has not been able to reach in more than half a century.
3. As per license conditions, a telecom operator needs to maintain a network availability higher than 99.5%. Assured 24x7 power supply ranging from the load of 15 KW each is, therefore, a prerequisite for any telecom tower site.
4. One of the biggest challenges faced by Telecom Sector is deficiency of power.
5. Unlike other developed market, India does not offer continuous availability of electricity from the Grid. Therefore, in order to provide uninterrupted telecom services, the Telecom Industry is forced to use Diesel Generator sets (DG sets) at Network sites in addition to other storage devices like batteries.

B. Use of Diesel is a compulsion:

1. It may first be appreciated that **diesel is an expensive fuel, which entails high costs** for both carriage and storage. **Use of diesel is as an option of last resort**, given the lack of continued availability of electricity from the Grid (Electricity Board or E.B power).
2. Wherever possible, rechargeable batteries are preferred. However, use of rechargeable batteries too is largely dependent on electricity supply from the grid which unfortunately is inadequate and erratic, especially in rural areas. It may thus be appreciated that most

often, companies have no choice but to depend on diesel supply in order to ensure uninterrupted service to consumers.

C. There are several constraints in deployment of Renewable energy sources:

1. Options based on Renewable energy solutions have not taken off in a substantial manner. Some of the reasons are :
 - a. High and incremental capex involved as most solutions need to be installed in addition to DG.
 - b. Technical feasibility for most of the solutions is low.
 - c. The capex investment required for the large scale implementation of renewable solution across the telecom networks is prohibitively high for the Industry.

2. Some of the barriers for RET solutions are below:

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 "Technical and Financial Feasibility report" - 2014

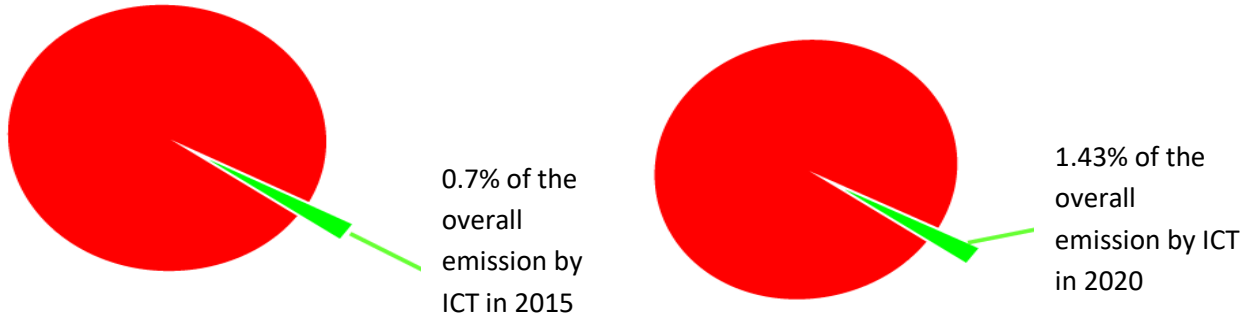
3. It can be seen from above that there exist Technical, Financial and operational barriers for the deployment of various RET solutions. Further, there are several options such as better battery solutions, improving energy efficiency e.g. Free Cooling Unit (FCU) etc. which are better solutions for the reduction of the carbon footprint.
4. **Hence, we request that the target with respect to deployment of RET solutions should not be mandated. The enablers/methods required for the reduction of Carbon footprint should be left to the operators**

D. Any sustainability measures prescribed must be practical and implementable

1. It is thus submitted that **any efforts to introduce sustainable telecom would fail if the measures prescribed are not implementable.**
2. In the absence of this basic assurance/requirement (power through Grid supply on 24x7 basis), it is unjust and unfair to additionally impose on operators the onus of complying with green energy requirements.
3. Further, there are several options such as better battery solutions, improving energy efficiency e.g. Free Cooling Unit (FCU) etc. which are better solutions for the reduction of the carbon footprint.
4. **Thus, we believe that the TRAI in its Recommendations and DoT while laying down guidelines for sustainable telecom must take into account these ground realities and ensure that the measures required to be undertaken are sustainable.**

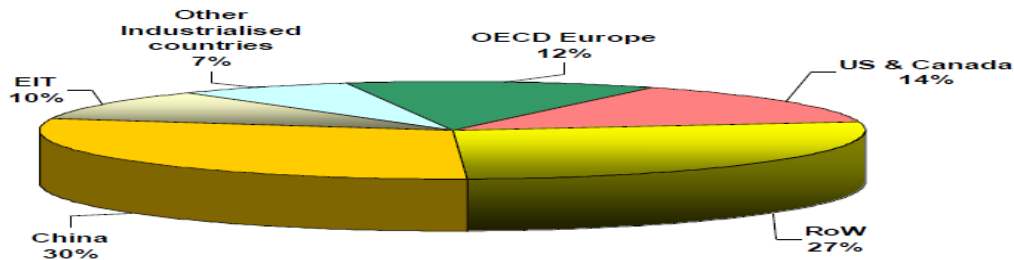
E. Any sustainability measures should be proportionate:

1. We believe that the responsibility for creating a greener environment spans across industries, and any green guidelines covering just the Telecom Industry will not only be discriminatory, but will also be an exercise that will greatly fall short of the result that the nation as a whole desires.
2. It is also important to note that the share of ICT in the total carbon footprint is minimal and has been constant over the years. Globally ICT accounted for only 0.7% of the carbon footprint in 2015 and this will increase marginally to 1.43% of the total carbon footprint by 2020.



Source: Green ICT: India and the World Future Information & Communication Technology” by Om Pal Singh and Pratibha Singh, International journal of emerging Research in Management and Technology, Dec 2015.SMART 2020 report

- Further, India’s share in the Global ICT footprint is much lesser in the 1.43% slice of ICT likely in 2020 as is evident from the graph below:



Source: SMART 2020 report

- Therefore, the Telecom Industry, which accounts for only a fraction of the carbon footprint, should not be singled out for any disproportionate measures in reduction of carbon footprint.
- Thus, it is imperative that the initiative for reduction in the carbon footprint is non-discriminatory and encompass all sectors for a worthwhile end result.**

F. Minimal Regulatory Intervention for Telecom Sector w.r.t Emission Targets

- As highlighted above, Telecom Sector contributes minimally to the GHG emissions/consumption of diesel in the country and hence should be subjected to minimum Policy and Regulatory intervention w.r.t reduction of Carbon Footprint.
- Infrastructure creation requires Grid Power Connectivity. The Government has a duty to provide infrastructure with Grid Power for smooth and efficient expansion of telecom services. This has also been recognized by the TRAI in its recommendations dated 12th April, 2011, where it has treated Telecom infrastructure as essential infrastructure and has recommended that the DoT should address/ ask all State Governments to direct

Power Distribution companies in the States to provide grid power connectivity on priority for telecom tower sites.

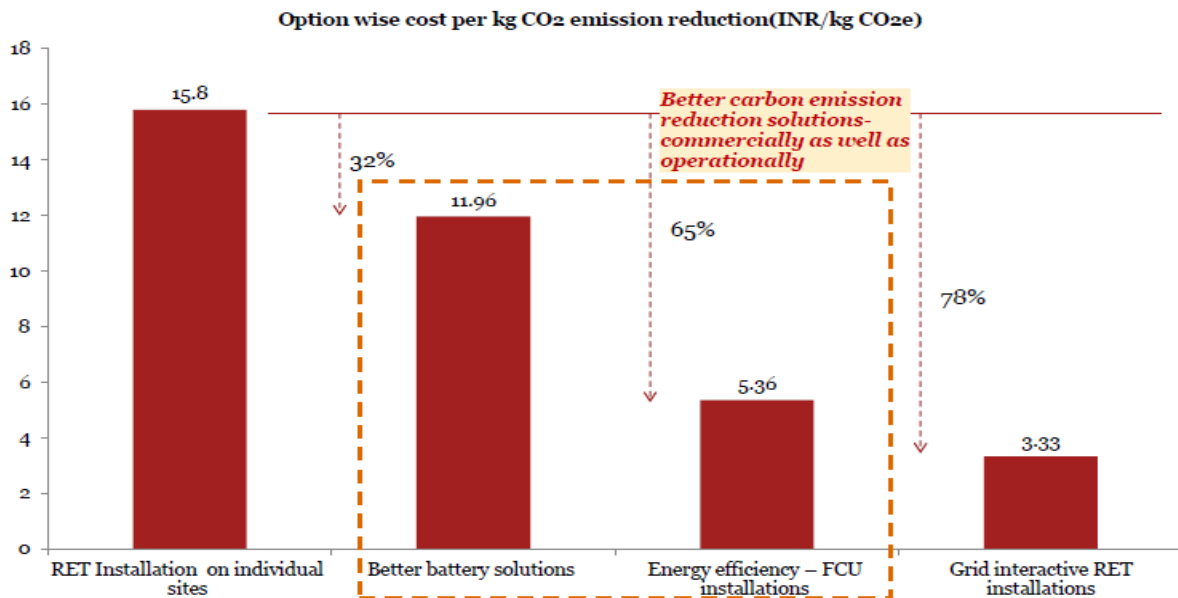
3. Further, in this regard, the Authority would appreciate that the power production is not the area of business for the telecom companies and they do not have any competence w.r.t the same. In spite of this Telecom Industry in India has already taken various measures for the reduction of the carbon footprint and reduction in the diesel consumption as highlighted in point no. F of the response.
4. **Also, Industry has been meeting the Targets for the Carbon Footprint reduction despite having reservation on certain aspects of the current formula used for measurement.**
5. In view of the same, there is no need for separate targets **for deployment of the RETs.**
6. **Therefore, we submit that a necessary modification in the license should be done in order to remove RET deployment Targets and have consolidation of emission reduction targets into a single carbon reduction target.**
7. **We are of the view that the Industry should be allowed to voluntary deploy various solutions for the reduction of carbon footprint and hence no targets should be enforced on the Industry.** Thus, approach should be self - regulation and self – monitoring instead of monitoring through TERM cells/centralized monitoring system.
8. **In case the Government wants to put any targets on the Industry the same should only be the Carbon abatement/ reduction in the Carbon Intensity in percentage terms.**
9. **Also, Government needs to see that the targets which are laid down are achievable in order to meet the required end objectives.**
10. **It should be left to the operators to decide on the enablers/methods for achieving these targets.**

G. Green Telecom Initiatives in India by the operators:

1. Green Initiatives in India by the operator's comes under following categories:
 - a. Reduction in power consumption at network sites - Measures which reduce overall power requirement resulting in lower consumption of primary and back- up power e.g. passive sharing, outdoor BTS, next generation BTS etc.

- b. Improving efficiency of back-up power sources – measures to increase efficiency of power back-up sources (D.G sets & Batteries), resulting in less Diesel consumption e.g. battery improvements, D.G improvements.
- c. Deployment of solutions based on Renewable energy sources – Measures to power the network sites using renewable energy solution, resulting in replacing high carbon emitting back-up power solutions (DG sets) e.g. Solar, wind, Biofuels, Fuel cells etc.

2. Best options for reduction in Carbon Footprint are as given in figure below:



Source: PwC study "Technical and Financial Feasibility report" - 2014

H. Financial and Non Financial incentives useful for supporting operators in reduction in Carbon footprint as given below:

1. We believe that the following financial and non- financial incentives could be useful in supporting the telecom operators in the reduction of the carbon footprint.
 - a. Zero customs and excise duties on various renewable energy components such as solar cells, fuel cells, modules and other raw materials.
 - b. Government should also introduce fuel subsidies for operators either through USOF or any other alternative mechanism as may be deemed appropriate e.g. differential tax structure to the telecom operators to provide telecom services to such areas, till electricity Board connections become available at Industrial rates.

I. Conclusion

1. Telecom Industry accounts for a fraction of the carbon footprint.
2. Industry has been meeting the Targets for the Carbon Footprint reduction.
3. There is no need for the separate target for deployment of the RETs.
4. Necessary modification in the license should be done in order to remove RET deployment Targets.
5. Industry should be allowed to voluntarily deploy various solutions for the reduction of carbon footprint and hence no targets should be enforced on the Industry.
6. In case government wants to impose any targets on the Industry the same should only be the carbon abatement/ reduction in Carbon Intensity in percentage terms.
7. Government needs to see that the targets which are laid down are achievable in order to meet required end objectives.
8. It should be left to the operators to decide on the enablers/methods for achieving these targets.

II. Query wise Response:

Q1. 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.

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Q2. 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.

Comments:

1. Given the fact that the formula is based on certain factors and averages, we believe that auditing may not be practical. It is submitted that for auditing, there will be a need for exact verifiable data, which is not practicable in the current scenario of infrastructure sharing.

Q3. Do you agree with the given approach for calculating the carbon footprint? If not, then please comment with justification.

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Q4. 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.

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Q5. Which emission factors as mentioned in 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.

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Q6. Is the formula mentioned in para 1.22 of Chapter I suitable for calculation of Carbon footprints from Grid supply? Please comment with justification.

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Q7. Which of the formula, (i) or (ii) as given in para 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 Ψ and η ? Please comment with justification.

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Q8. 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.

Comments:

Formulae for calculating Carbon Footprint:

1. In this regard, we would like to submit that the current formulae for determining the carbon footprint are as given below .i.e.

$$CTOTAL = CGRIDPOWER + CDGSET \text{ in tonnes of CO}_2\text{e per year}$$

Where, $CGRIDPOWER = 0.365(0.84 * P * X)$ in tonnes per year,

$CDGSET = 0.365 [(0.528 * Y * Z) / \eta]$ in tonnes per year

P= Power consumption in kWh

X= Average hrs with grid supply per day

Z = Power capacity of DG set in kVA

Y = Running time of the DG set in hours per day

η = efficiency of the generator

2. The telecom service providers are already reporting as per the above formula and meeting targets prescribed by DoT.

Our suggestions:

3. In this regard, we would first like to submit that ideally the calculation methodology should only apply to actual diesel consumption and not include emissions from the grid.
4. However, in the event if TRAI chooses to continue to include Grid emissions in the formula, then the current formulae assuming the grid emission factor at 0.84 needs to be revised and the average Emission factor of electricity grids (in tonnes CO₂e/ MWh) should be considered for calculating the carbon footprint from Grid.
5. Further, we understand that the power sector is targeting to bring in energy efficient technologies for generating power with an intention to reduce their contribution to GHG emission and this Grid Emission Factor will improve/ reduce over a period of time.
6. Thus, we would like to submit that the emission factor should be reviewed downwards on yearly basis in line with Central Electricity Authority decisions.

7. In any situation, this should not be more than the average value of 0.82 mentioned by TRAI in the CP. In case the downward review as suggested above is not possible, we recommend that the usage of Grid Power should not be considered for calculation of carbon footprint.
8. **As regards the formula, we are of the view that both Capacity based and Consumption based methodology has its pros and cons. TRAI may consider adopting any approach.**

Carbon intensity:

9. We believe that given the increased take up of data going forward, it may be logical if the Carbon emission targets were to be based on a “per unit” of traffic carried in the network as opposed to a “per subscriber” basis.
10. Since the networks today carry substantial amount of data apart from voice, the best approach would be to base the measurement on “per MB” of traffic. Voice minutes carried in the network can be converted into an equivalent MB so that both voice and data can be factored into this equation.

Frequency of reporting:

11. We suggest that the frequency of the reporting of the Carbon Intensity should be revised and the same should be required to be reported only **once per year**.

Q9. 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.

Comments:

1. In this regard, we would like to submit that TSPs & IP-1s do not have the necessary expertise and core competencies to handle energy generation
2. Further, as per a detailed analysis carried out by PWC in 2014, every option for renewable energy solutions has its own pros and cons. A tabular analysis of the resource potential, the barriers to adoption and the risks of adoption were tabulated by PWC, the same highlighted in point no. C of the preamble.
3. In addition, there are several technical, commercial feasibility issues in the deployment of RET as brought out in response to Q.10 below. In view of the above, we earnestly submit that there should be no prescriptive approach recommended for deployment of any RET solutions and same be left to the operators to decide based on technical and commercial feasibility and practical implementation.

Q10. 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.

Comments:

1. It is first submitted that as per a PWC study carried out in 2014:
 - a. Out of the total of **5.85 lakh telecom towers in the country, 59,000 towers were found to be technically feasible** for RET implementation.
 - b. From this technically feasible universe, **31,000 telecom towers were estimated to be commercially feasible** for RET implementation. Total upfront **capital investment** for these towers estimated to be close to **INR 1328 Crores**.
 - c. **Rest of the universe that is technically feasible** (remaining 28,000 towers) **would require additional government support** of INR 513 Crores over the initial capital investment of INR 884 Crores for RET conversion.
2. It may be noted that the pilots carried out by BSNL were with support from the USOF and MNRE. The RET Report records BSNL as stating that 100 of its pilots were with 90% subsidy from the MNRE.
3. It is evident from the above that there are severe technical, commercial challenges in the deployment of RET solutions.
4. However, in the event that any TSP chooses to fund /maintain RET project that generates electricity, then, irrespective of whether the electricity generated is used for the community or any other purpose, it can be counted towards the carbon reduction efforts of the said TSP.

Q11. If the RET project is funded/ maintained by other agency, should that emission be counted? Please comment with justification.

Comments:

1. Our suggestion is that Renewable Energy generation should be done through specialized power producers like RECs and IPPs. Carbon emission savings from such deployment contracted for Telecom Network should be counted towards the overall carbon footprint emission reduction of the respective SCOPE 1 owners.

2. The overall objective of a sustainability of Telecom Sector aims at reducing the diesel consumption of the Telecom networks and achieving the overall carbon reduction targets which will be aided by promoting such installations.

Q12. Please comment with justification on the approach suggested by the DoT committee.

Comments:

1. It is first submitted that the Committee's recommendation for recalibration of the DoT Directives is an acknowledgment of the infeasibility of the said directives. Having recommended a recalibration and an alignment with international practices, we believe that the TRAI should approach this issue in a wider manner without pegging the consultation to the approach suggested by the DoT Committee.
2. The deployment of RET admittedly comes with several constrains and hence no prescriptive approach should be advocated with regard to RET deployments.
3. Energy efficient solutions should be encouraged through reductions in taxes and duties. Fuel subsidies from the USO fund may be considered to encourage green initiatives. Reductions in license fee may be considered for achieving any defined objectives to incentivize operators.
4. The Industry should be allowed to voluntary deploy various solutions for the reduction of carbon footprint and hence no targets should be enforced on the Industry.
5. Approach should be self – regulation and self – monitoring instead of monitoring through TERM cells/centralized monitoring system.
6. In case any target is prescribed by Government, then carbon abatement/reduction in Carbon Intensity should be the only target for the Telecom industry.
7. It should be left to the operators to decide on the enablers/methods for achieving the targets.

Q13. 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.

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Q14. 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.

Comments:

1. It is first submitted that there should not be any prescriptive approach recommended for deployment of any RET/Energy efficient solutions in the telecom sector.
2. As pointed out there are several technical, commercial and feasibility issues in the deployment of RET.
3. The TRAI may however recommend an incentive based approach which may include lower taxes and duties on Energy efficient products /solutions, introduction of a fuel subsidy from the USO Fund, etc.
4. Please refer to point F of the preamble for more details
