

Dear sir,

I have come across Consultation Paper (no. 02/2017) On Approach towards Sustainable Telecommunications , placed on your web site for comments by 14.3.17. I am submitting my views on some issues for considerations.

Q.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?

2 The contribution of Information and communication technology (ICT) sector worldwide is around 2% of global GHG emissions and around 0.7% of global CO₂ emissions. By 2020, ICT it is expected to grow for about 3% of global GHG emissions worldwide (vide para 4 and 5 of the consultation paper(CP)). On proportionate basis, by 2020, Co₂ emission will be 1.05%. Further as per para 15 / CP , India's share in Global carbon footprint is just 1.43% of the 26% share of Rest of World (i.e. just 0.38%). With such small carbon foot print, 100% audit is not desirable and will be costlier. It would be appropriate to subject a small part (say 1% to 2% of BTS towers) to audit / test check to resolve difficulties and bring uniformity in reporting. Mechanism can be to select randomly the towers of each Telecom service Provider (TSP) and allow them to have from auditor selected out of approved auditor's panel.

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

3. Boundary limit to include the full range of emissions that the telecom service provider controls directly and to include subsidiaries and leased assets (vide para 1.7) and accordingly determine C_{TOTAL} as per formula specified vide para 1.15 is in order. However, in calculating carbon footprint, besides emission from combustion of fossil fuels and usage of purchased electricity, Co₂ emission from burning of hydrocarbon (and not the hydrogen) in fuel cells (vide para 2.6 and 2.9) should be considered but Co₂ produced by bio-mass or biofuels (vide para 2.6 and 2.10) should be excluded (as plants absorbs CO₂ through photosynthesis and use of bio-mass is considered carbon neutral).

4. Carbon footprint's reporting and assessment should be based on measured and verifiable data. The diesel consumption as brought out in consultation paper is not subject to on site measurement and verification to the accuracy with which electricity supply can be. It will be appropriate to prescribe other data from which cross check can be done. For example fuel and electricity bill, which is audited data.

5. Further carbon foot print of diesel generation will be major contributor for BTS tower. This is not wholly controllable by telecom operator. It is dependent on hours for which grid supply is available. Hours of grid supply may vary from state to state. In one state it may be very high of say 16 hours but another year it may be much less say 6 hours. With carbon foot print

methodology as existing and also proposed, a telecom operator having very good performance in one year (due to better grid supply operation) may have very poor in another year (if grid supply is poor). In view of this, although combined carbon foot print vide para 1.23 may be in order to report all India level. It will not be indicative of individual TSP's performance. It would be appropriate to define another index to watch their performance. It can be an index equal to $Cdgset / (1 - Av. \text{ hours of grid supply per day } / 24)$.

Q 4: Whether the existing formulae for calculation of Carbon foot prints from Grid (given in paras 1.16, 1.17 and 1.18) need to be modified? If so, please comment with justification.

6. Both formula (at para 1.17) does not take into consideration the power equipment or DG set not fully loaded and also the variations in load during operation. If X and Y used in the formula are to take these variations into account then X and Y will be determined on some other measurement, if so that measurement should have been considered in the formula. P is electrical energy defined in kWh so it multiplying it with X is not correct. Formula used may give overestimation of carbon foot print.

Question 5: Which emission factors as mentioned in Table 1.2 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.

7. The Central Electricity Authority has determined base line data for emission factor. It has been reported these in "CO2 Baseline Database for the Indian Power Sector User Guide Version 10.0 December 2014 ". Data at table appears to be that for FY13-14 (vide table S-1 in that guide). Subsequently number of high efficiency supercritical boiler power plant have been installed in the country and on this account Co2 emission factor must have been reduced. Not only this, proportion of RE power has increased in recent years. Solar tariff is falling progressively as per competitive biddings and it has attained grid parity. Wind tariff has taken about 15% dip as per competitive bidding recently concluded. RE generation, mainly the solar, is likely to grow much faster. As per draft national electricity plan, published by the Central Electricity Authority, there will be no necessity of addition of thermal generation in next five year plan and only the plants under construction are to be commissioned. On these accounts, in coming years proportion of RE generation in grid supply will increase and consequently emission factor of grid supply will progressively go down. On this account it will not be appropriate to consider fixed value of 0.82 t CO2(e)/MWh for emission factor.

8. Further, with the integration of NEW and SR with more and more tie lines, stronger All India Grid has been created and instead of separate emission factors for NEW region and Southern Region, this data may be reported on all

India basis. On this account, it will not be appropriate to consider the figures given in table 1.2. TRAI may recommend that CEA may publish emission factor (EF) for thermal generation and average for all power stations (i.e. thermal, hydro, nuclear, solar and wind) and Average emission factor as published by CEA to be considered in the formula at 1.17 with modification discussed hereunder for Cdgset.

9. From the explanation of Average, OM, BM and CM, it is evident that average value should be considered as other values are not represents the actuals. It is stated that, OM excludes low cost /must run power stations (hydro and nuclear included), BM is for new power plants only and thus not covers all power plants and CM is mean of OM and BM so all these are not relevant.

10. For CO₂ emission from DGset operation, formula C_{DGSET_b} considers power factor, hours of run and efficiency. Efficiency will vary as per load and considering a single value will be erroneous. Similarly power factor too may vary during operation. Depending on load, consumption of diesel will also vary. On these accounts, these data and hours of run will not give correct value of diesel consumption. In view of these formula B will not be correct. formula C_{DGSET_A} is correct formula provided N (consumption of diesel in litres) can be determined correctly. This may be feasible from fuel bills. Cost of fuel as per fuel bills needs be called in addition C_{DGSET_A} to for co-relation and crosschecking.

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

11. Yes. If Cgridpower is to be used for country as a whole. If Cgridpower is to be used to judge performance of individual TSP in a state then it is not appropriate due to the fact that proportion of mix of thermal power and other power(hydro, nuclear and RE) varies among states. In that case, it will be more appropriate to determine it on state basis. CEA may be requested to publish EF state wise. State wise data will also result in better presentation of DGSET emission.

Question 7: Which of the formulas, (i) or (ii), in para 1.23 is to be used for the calculation of carbon footprints from the Diesel generator along with views on possible values of ϕ and η ? Please comment with justification.

12. Kindly see views on Q.5.

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

13. Prima facie, $C_{\text{TOTAL PER UNIT SUBSCRIBER}}$ appears to be appropriate as N_{SUB} (number of subscriber) can be verified from bills served and paid.

Question 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.

14. The intent has to be to reduce overall carbon footprint to avoid green house gas emission in atmosphere which is not bound by state or national boundaries. As such, solution should not be seen from its applicability at each tower. If each tower is seen then scope is limited to reliable source of supply namely fuel cell and flow batteries. Solar and wind power can not be harnessed at each tower location due to availability of land, solar insolation / wind potential. Theft and tempering etc. Further solar and wind power generation is available only for part of the day and also have seasonal and annual variations. These sources have to be backed by heavy battery to cater for such variations. Cost effective and cleaner alternative will be to generate RE power at most suitable location in the state or country and utilise it at BTS towers on 24 hour basis. This will be feasible by:-

(i) permitting open access to all telecom towers of an area / state considered as group and

(ii) banking the surplus solar / wind power by electricity distribution and supply utility (discom) and supply the banked energy later. In practice, at the instant of generation, Discoms will utilise surplus energy to feed its load and will effect supply of such banked energy to BTS towers during non-sun shine / non windy hours. which in effect, mean Discom effecting supply for more hours to BTS towers and adjusting banked energy in its electricity bills after levying banking charges, transmission and wheeling charges and losses, x-subsidy and additional surcharge, as applicable and fixed by electricity regulatory commission. .

Above mechanism is in vogue in some states for large load of 1 MVA and above but has not been considered for telecom towers, each of which has low load of 8-10 kw). With number of charges, it may appear to be costly but it is not so and may be equal to or less than rate as applicable to grid supply. For hours of supply so ensured will result in lesser or no diesel consumption and lesser battery backup. This mechanism is to be implemented through regulations by Electricity regulatory commission. This process can be facilitated by providing in tariff policy, notified by GOI under sec 3 of the Electricity Act, the open access and banking of RE power for less than 1 MW load for essential services of telecom towers, railways and defence and policy directive of state govt.'s to discoms to effect 24 hours supply for them.

Question 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.

15. This will be equivalent to availing carbon credit for the RE power supplied to community. As reduction of carbon foot print is the objective so it should be permitted provided community service provider does not avail credit for the same in respect of concessions, incentives, Renewable Power purchase obligation (RPO) etc..

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

16. Yes provided it is supplied to telecom service provider.

Yours

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