

Recommendations
of
All India Seminar on “Carbon Foot Prints – Sources, Strategies and Solutions”
at Hyderabad on Nov 13 & 14, 2008.

1. **General:** Carbon Foot Prints (CFP) are generated in every human activity. Sustainability should be the focus in every measure of progress leading to the ‘developed’ status of the country. The Seminar identified Power Generation, Transport and Production Process (including Agriculture), as the major sources of Carbon Foot Prints and Energy Efficiency and Renewable Energy, as the solution providers.
2. **Energy Efficiency:** The fastest gestation source of energy, at the least cost, is Energy Efficiency. Thrust and focus should, therefore, be on the exploitation of the estimated 25% potential in this area.
 - a. Energy Efficiency should be the ‘mantra’ for various sectors undergoing expansion and renovation. The topic should move from Boiler Room to Board Room. Corporates should chalk out their respective road maps. Success is amply exemplified, e.g. ITC.
 - b. Indian Green Buildings Council (IGBC) developed norms for Green Buildings, which save energy and water. Government should declare incentives for Green Buildings to support the Movement launched by IGBC, to promote energy and water savings in the vast Buildings sector.
 - c. Lighting is a major consumer of electricity. Fluorescent and Compact Fluorescent Lights are most energy efficient, as of now. Light Emitting Diodes (LED) are several times more efficient than CFL’s. Government should give incentives to manufacturers of this item to develop affordable lights for domestic and other applications.
 - d. T & D losses in power sector should be brought down to 8-10% on par with any developed country through diligent studies of residual life analyses and energy efficient renovation works by Utilities.
 - e. DSM measures should be incentivised for meticulous implementation. Utilities can fund these incentives through a part of energy savings accruing there from.
 - f. Utilities should constitute Energy Conservation Cells with dedicated Energy Auditors / Managers to catalyse implementation of DSM and SSM

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3. **Renewable Energy:** Future Power Generation Capacity should be raised out of Renewable Sources, such as Solar, Wind, etc, (and not the unsafe & high cost nuclear energy) giving this resource a 25% share in the energy mix by 2020. Priority should be given to solar power, as it is available aplenty all over India. Independent Power Producers (IPP) should be given high incentives, by both State and Central Governments, to generate Renewable Energy.

- a. 1,000 MW Solar Capacity planned by the Planning Commission for 2017 should be increased to 10,000 MW.

- b. The Seminar noted with satisfaction that JSWL has commissioned TERI to prepare the first ever pre-feasibility report for a major Solar Thermal Power Plant in Rajasthan.

4. **Electricity to remote rural population** could be extended economically through some Government support in the following ways.

- a. Low – powered LED lights supported by compact batteries can be structured into portable lanterns and kiosks.
 - b. Biogas Plants can be set up on a cooperative basis to provide clean fuel as well as power.
 - c. Solar – Wind – Battery hybrid plants can be installed to provide 24 hr power supply in rural areas in the form of distributed power generation.

The above measures empower the rural public with the least generation of CFP. These can be implemented through the innovation of **National CDM (Clean Development Mechanism) to be imposed on energy guzzlers among the Corporates**. All stake holders, namely Government, Corporates and NGO's together should be the partners to its implementation.

5. **Fossil fuel based power production:** This is highly prone to generation of CFP. Integrating this with renewable energy sources will reduce its impact on environment.

- a. Energy efficient technologies should be incorporated in all Power Plants coming up in the 11th Five Year Plan, at the design stage itself. Further, it should be made mandatory for these plants to install at least 20% Solar Power Generation Equipment.
 - b. Subject to space availability, all existing fossil fuels based Power Plants should be integrated with solar thermal feed water heating/steam raising equipment through suitable incentives to make it cost effective. By this measure, Co2 emissions could be prevented up to 30%.

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- c. The 140 MW Solar Integrated Combined Cycle Gas Based Power Plant (planned at Mathania, Rajasthan) should be immediately revived. This will be a Role Model Power Plant, if its installation and operation are entrusted to NTPC.

6. Green Power Revolution: To avert the impending energy disaster (and not await its occurrence), government should invest heavily in the area of cost reduction of Solar Power Generation. R&D Labs (such as CSIR) should be set up exclusively for this purpose. This should be done in a spirit of “Green Power Revolution”.

7. Transport System: The mass transport means should be further developed and expanded to make it more attractive and convenient for public use. Also, mass transportation systems of Road should be made more convenient for public to opt for them, in preference to individual fuel guzzlers to reduce CFP.

- a. Rail based transport system is energy efficient mode of public transportation system. All places, where ever it is possible, must be linked by this mode of transport by giving priority;
- b. Inland Water Transportation, which is the most energy efficient and carbon positive, has yet to be developed adequately after fifty years of its feasibility study. Top priority should be given to this area.

8. Production Process: In the area of food and Agriculture the Seminar identified the following major measures for the reduction of Carbon Foot Prints.

- a. Sustainable agriculture can be achieved by replacing high cost & non-environmental friendly chemical based inputs by low cost & environment friendly organic based inputs in a phased manner. In order to achieve this goal, the government must adopt farmer friendly & remunerative support prices;
- b. From centuries animal husbandry linked agriculture was considered as sustainable agriculture and also useful to implement organic farming. It forms a major resource and provides additional income to farmers. It also plays major role in biogas & bio-compost generation also. Adoption of vegetarian diet and consequent reduction in consumption of this resource for food should be considered to conserve the dwindling natural resources and curb adverse impact on environment.
- c. Super Market culture promotes energy-intensive storage of food items and enormous usage of plastics. Use of fresh foods and degradable packing materials should be encouraged to mitigate CFP. Concerned authorities should strictly enforce already existing laws against use of plastic carry bags.

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- d. Organic waste could be converted to manure and reused for food production by Effective Micro-organism method of recycling waste. The ingredients in this

process are cheap. Domestic as well as commercial establishments could use this process.

- 9. Water:** India has 4% of world's drinking water for a 17% population. Conservation of water is, therefore, essential. Rainwater – harvesting and grey water recycling (applicable to Industry / Organizations) combined with water-use efficiency should be strictly practiced in all areas of water consumption. Existing laws should be rigorously enforced by the Concerned Authorities.

10. Summary:

The following measures merit immediate attention and implementation.

- i) Efficiency improvement must be addressed immediately (Issue (capitals) notification under EC ACT – 2001, FRAMES RULES AND INSTITUTE AND IMPLEMENT CONSERVATION AWARDS ON PROFESSIONAL LINES AT STATE LEVEL).
- ii) Use of Star Labeled products must be mandatory in all major energy guzzling sectors (at least 20 major segments by 2015).
- iii) Mass Transportation and Public Transportation must be given highest priority with suitable incentives.
- iv) New Airports for short hauls (less than 400 nautical miles) must be shelved immediately and such funds must be used for building additional Corridors for Train movement for both passenger transportation and Goods movement.
- v) Inland water transport must be given highest priority to harness the water flows.
- vi) Green Power must be made mandatory for all SME's and designated consumers and its share in the energy mix must reach 25% by 2020.
- vii) All water bodies must be protected from encroachment and the original status of 1970 must be resorted. New bodies must be created for local replenishment, mini-hydel generation, ground-water re-charging and prevention of top soil erosion and silting of rivers.
- viii) Rain water harvesting, Solar Water heating and Grey water treatment in industries must be made mandatory by 2010 and appropriate incentives / disincentives implemented.
- ix) Import duty must be waived for LED's, Fuel cells and all other Green products.
- x) Huge investments must be made in Solar Thermal Power Plants, during 12th plan, such that this category reaches 20 % of Installed capacity by 2017. The plan should augur Green Power Revolution in the country.