



Carbon Footprint and Carbon Neutrality

Chintan Shah

Climate Change India, 2008

23 April 2008

Le Meridien, Pune

Global Ecological Footprints

- Our combined global footprint (gha) requires the resources of 1.23 Earths, (23%) overuse.
- Mankind is currently running out of balance with the earth's global resources. (23% deficit & increasing)

Ecological Global Footprint per country

www.footprintnetwork.org

America	9.5 gha	(5.2 E)
Australia	7.7 gha	(4.2 E)
United Kingdom	5.4 gha	(3.0 E)
New Zealand	5.5 gha	(3.0 E)
Germany	4.5 gha	(2.5 E)
China	1.7 gha	(.97 E)
India	.79 gha	(.44 E)

Carbon Footprint

A carbon footprint is a "measure of the impact human activities have on the environment in terms of the amount of green house gases produced, measured in units of carbon dioxide".



Assessing Carbon Footprint

- The carbon footprint is a measure of the exclusive global amount of carbon dioxide (CO₂) and other greenhouse gases emitted by a human activity or accumulated over the full life cycle of a product or service.
- The life cycle concept of the carbon footprint means that it is all-encompassing and includes all possible causes that give rise to carbon emissions. In other words, all direct (on-site, internal) and indirect emissions (off-site, external, embodied, upstream, downstream) need to be taken into account .
- Carbon footprints can be calculated using a Life Cycle Assessment (LCA) method, or can be restricted to the immediately attributable emissions from energy use of fossil fuels.

Carbon footprint of Christmas : An example

- An analysis of the carbon footprint of Christmas in the UK shows that consumption of items such as food, travel, lighting and gifts at Christmas produces as much as 650 kg of carbon dioxide (CO₂) emissions per person - equal to 5.5% of the UK annual carbon footprint.
- Over Christmas, the average person could produce as much as:
 - 26 kg of CO₂ from Christmas food
 - 96 kg of CO₂ from Christmas Car travel
 - 218 kg of CO₂ from extravagant lighting displays
 - 310 kg of CO₂ on Christmas Shopping
- Christmas carbon emissions could be reduced by up to 60 per cent to about 250 kg

Reducing a carbon footprint

- The carbon footprint can be efficiently and effectively reduced by applying the following steps:
 - Life Cycle Assessment (LCA) to accurately determine the current carbon footprint
 - Identification of hot-spots in terms of energy consumption and associated CO₂-emissions
 - Optimisation of energy efficiency and, thus, reduction of CO₂-emissions and reduction of other GHG emissions contributed from production processes
 - Identification of solutions to neutralise the CO₂ emissions that cannot be eliminated by energy saving measures.
- The last step includes carbon offsetting; investment in projects that aim at the reducing CO₂ emissions, for instance in any mitigation technologies (renewable energy, energy efficiency/DSM, sequestration)



Life Cycle Assessment (LCA)

- LCA is an internationally standardized method (ISO 14040, ISO 14044) for the evaluation of the environmental burdens and resources consumed along the life cycle of products; from the extraction of raw materials, the manufacture of goods, their use by final consumers or for the provision of a service, recycling, energy recovery and ultimate disposal.
- *One of the key impact categories considered in an LCA is climate change, typically using the IPCC characterization factors for CO₂ equivalents.*

Species	Chemical formula	GWP ₁₀₀
Carbon dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous oxide	N ₂ O	298
HFCs	-	124 - 14800
Sulphur hexafluoride	SF ₆	22800
PFCs	-	7390 - 10200

Carbon Footprint and Management

Calculating a carbon footprint is only the beginning of carbon management. There is little point in establishing a carbon footprint unless the organisation then acts to reduce emissions and improve efficiency.



What is Carbon Neutral?

- When an organisation, event or individual, has reduced its net emissions to Zero.

Carbon footprint = 655 tonnes CO₂-e/
Carbon reductions & offsets = $\frac{655 \text{ tonnes CO}_2\text{-e}}{1.0}$

- Carbon neutrality is achieved when emissions from a product, activity or a whole organisation are netted off, either through the purchase of an equivalent number of offsets or through a combination of emissions reduction and offsetting
- The concept is easy to understand but difficult to implement
- Carbon neutrality is a dynamic state where year-on-year emissions need to be netted off.

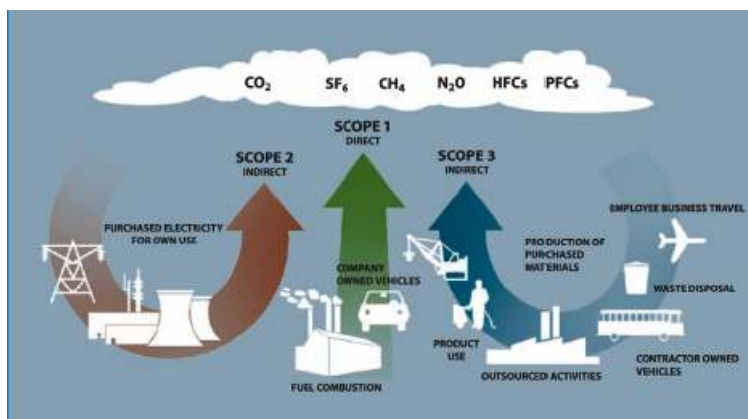
How to Achieve Carbon Neutrality

1. Calculate Footprint using an approved, independent, audit methodology.
2. Develop Carbon Emissions Inventory
- 3 Reduce your emissions
4. Offset the residual amount
5. Be Transparency: Publicly substantiate your claim

Methodologies & Factors

- GHG Protocol: A Corporate Accounting & Reporting Standard (WRI & WBCSD)
- ISO Standards 14064 & 14065
- AGO Factors & Methods Workbook 2006
- Offsets: AGO Approved / Gold Standard Offsets
- Publicly substantiate your claim to avoid Greenwash.

GHG Protocol: Scopes 1, 2 & 3



Scope 1	Direct	(Fuel Combustion)
Scope 2	Direct	(Purchased electricity)
Scope 3	Indirect	(3rd party emissions on your behalf)

How to achieve carbon neutrality

- Three Step Process

1. First, focus on reducing direct emissions - implementing all cost-effective energy efficiency measures and, where cost effective, reducing the carbon intensity of energy supply by generating low-carbon heat or electricity.
2. Secondly, look at opportunities to reduce indirect emissions — working with other organisations to reduce emissions and cut costs up and down the supply chain, and to look for new revenue opportunities such as developing new low-carbon products.
3. Then, if appropriate, consider the option of developing an offset strategy for those emissions that cannot be avoided.

Reduce Direct Emissions



Reduce Indirect Emissions



Develop Offset Strategy

How to achieve carbon neutrality

Stage 1:
Direct emissions reduction

- › Calculate emissions
- › Look for internal abatement opportunities
- › Develop an emissions reduction/carbon management plan

Stage 2:
Indirect emissions reduction

- › Map supply chain process and establish carbon footprint
- › Identify opportunities for emissions reduction
- › Develop an implementation plan across the supply chain
- › Bring new low-carbon products to market

Stage 3 (optional):
Offsetting

- › Establish reasons for buying offsets
- › Define type of offsets to be bought
- › Carry out due diligence on robustness of offsets

Stage 1: Focus on direct emissions reduction

- There are a number of benefits to doing this, including:
 - Cost savings —reducing energy bills as well as leading to savings on transport, waste and other operating costs
 - Operational efficiency — as a side benefit of improving energy and carbon efficiency
 - Mitigation of regulatory risks — including Climate Change
 - Levy (CCL), Energy Performance of Buildings Directive (EPBD), EU Emissions Trading Scheme (EU ETS) or any future legislation
 - Corporate Social Responsibility and reputation

Stage 2: Look at opportunities to reduce indirect emissions

- Once an organisation has its house in order and has developed an emissions reduction plan, the next stage is to look at opportunities to reduce indirect emissions by working with organizations across the supply chain
- By considering all of the raw materials and processes required to get a product to market, it allows the carbon footprint of the final product to be calculated
- This can be used to identify opportunities to make significant cuts in emissions and energy costs across the supply chain

Stage 3 (optional): Develop an offsetting strategy

- After looking at the direct and indirect emissions, some companies may decide to include offsetting as part of their overall carbon management strategy.
- Organisations might want to offset their emissions:
 - As part of an environmental strategy that includes offsetting emissions which are not cost effective or feasible to reduce in the previous stages
 - As part of a carbon neutral strategy driven by CSR reasons or brand positioning
 - As a way to anticipate future legislation or to gain experience in the carbon market.

Criticism of Carbon Footprint

- Criticism of the concept of a carbon footprint is generally based on disagreement with one or more of the following assumptions usually underlying the calculation of a carbon footprint:
 - That carbon emissions are a significant cause of global warming.
 - That human activity is a significant cause of these emissions.
 - That it is possible to attribute all or most emissions to particular individuals.
 - That individual initiative is necessary because market forces or legislation will not be powerful and timely enough.
 - That each individual should therefore calculate and attempt to reduce his share of carbon emissions.
 - Sometimes, that each person should be given as a target an equal share of emissions, or some other share.

Tackling Climate Change & Benefiting

- Conduct an approved audit
- Use approved Carbon Offsets
- Promote your Carbon Neutral status
- Promote to customers & agents
- Be transparent & substantiate your claim.
- Do business with other Carbon Neutral businesses



Climate Change

***Is your business part of the solution,
or part of the problem?***



Thank you