GOVERNMENT OF DUBAI

Trakhees

Guidelines – Carbon Footprint

Issued by: Inspection Department – Operations Section

1.0 General

The carbon footprint is a measure of the exclusive global amount of carbon dioxide (CO_2) 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, and downstream) need to be taken into account.

Normally, a carbon footprint is expressed as a CO_2 equivalent (usually in kilograms or tons), which accounts for the same global warming effects of different greenhouse gases. 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. In both cases however, as the term usually indicates the amount of emissions generated through the actions of people, what is important is not only the total amount of energy use, but also how the energy was produced in the first place (e.g. from fossil fuels or renewable resources).

An alternative definition of the carbon footprint is the total amount of carbon dioxide attributable to the actions of an individual (which includes emissions through their energy use, but other unforeseen emissions as well) over a period of one year. This definition underlies the personal carbon calculations. The term owes its origins to the idea that a footprint is what has been left behind as a result of the individual's activities. Carbon footprints can either consider only direct emissions (typically from energy used in the home and in transport, including travel by cars, airplanes, rail and other public transport), or can also include indirect emissions (including CO_2 emissions as a result of goods and services consumed). Bottom-up calculations sum attributable CO_2 emissions from individual actions; top-down calculations take total emissions from a country (or other low-level entity) and divide these emissions among the residents (or other participants in that entity).

2.0 Life Cycle Assessment (LCA)

A life cycle assessment (LCA, also known as life cycle analysis, ecobalance, and cradle-to-grave analysis) is the investigation and valuation of the environmental impacts of a given product or service caused or necessitated by its existence.

The goal of LCA is to compare the full range of environmental and social damages assignable to products and services, to be able to choose the least burdensome one. At present it is a way to

دائرة التخطيط والتطوير - تراخيص ، ص.ب 2001 ، دبي، إ.ع.م
Dept of Planning & Development - Trakhees, PO. Box, 2001
Dubai - U.A.E
T. +971 (4) 3636 888.هاتف
F. +971 (4) 3636 860.فاكس
Customer.Relationship@trk.pcfc.ae
www.Trakhees.ae
PCFC

account for the effects of the cascade of technologies responsible for goods and services. It is limited to that, though, because the similar cascade of impacts from the commerce responsible for goods and services is unaccountable because what people do with money is unrecorded. As a consequence LCA succeeds in accurately measuring the impacts of the technology used for delivering products, but the whole impact of making the economic choice of using it.

The term 'life cycle' refers to the notion that a fair, holistic assessment requires the assessment of raw material production, manufacture, distribution, use and disposal including all intervening transportation steps necessary or caused by the product's existence. The sum of all those steps - or phases - is the life cycle of the product. The concept also can be used to optimize the environmental performance of a single product (ecodesign) or to optimize the environmental performance of a company. Common categories of assessed damages are global warming (greenhouse gases), acidification, smog, ozone layer depletion, eutrophication, eco-toxicological and human-toxicological pollutants, habitat destruction, desertification, land use as well as depletion of minerals and fossil fuels.

3.0 Reducing a Carbon Footprint

The carbon footprint can be efficiently and effectively reduced by using a Carbon Diet or applying the following steps:

a. Life Cycle Assessment (LCA) to accurately determine the current carbon footprint;

b. Identification of hot-spots in terms of energy consumption and associated CO_2 emissions;

c. Where possible, changing to another electricity company to switch to buying electricity from renewable sources (from wind turbines, solar panels or hydro electrical plants or from nuclear power plants;

d. Optimization of energy efficiency and, thus, reduction of CO_2 emissions and reduction of other GHG emissions contributed from production processes; and

e. Identification of solutions to neutralize the CO_2 emissions that cannot be eliminated by energy saving measures. This last step includes carbon offsetting; investment in projects that aim at the reducing CO_2 emissions, for instance tree planting.

4.0 Carbon Footprint by Energy Type

The following table compares the carbon footprint of various forms of energy generation, from a study of full life cycle emissions by the Swedish utility Vattenfall of Nuclear, Hydro, Coal, Gas, Solar Cell, Peat and Wind generation technology, from the United States Environmental Protection Agency figures and from various other studies.

Carbon Footprint by Generation Technology

Technology	g / kWh Vattenfall (Sweden)	g /kWh (EPA)	g / kWh (other)
Gas (thermal)	1170		
Coal	980	950	
Oil		900	
Natural gas		600	
Gas (combined cycle)	450		
Solar photovoltaic	50		
Wind	5.5		
Nuclear	6		
Nuclear			3.10 Forsmark Nuclear Power Plant
Nuclear			5.05 Torness Nuclear Power Station
Hydroelectric	3	11	