

# Environmental Impact of Mobile Communications Networks



The mobile industry is a relatively low energy intensity industry, contributing much more to the economy than its proportion of national energy usage. For example, in the case of the UK the mobile industry is responsible for about 0.3% of greenhouse gas emissions and around 1.8% of gross domestic product (GDP).<sup>1</sup>

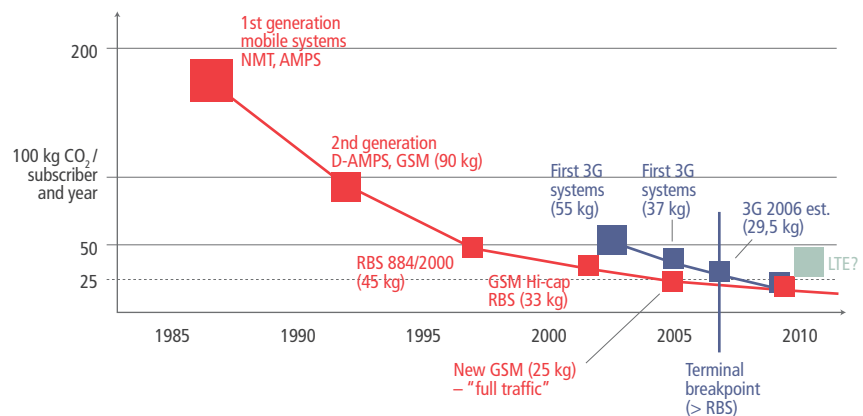
Energy use is growing as subscriber numbers increase. The Global e-Sustainability Initiative estimates that in 2002, the mobile industry composed about 43% of the global information and communications technology (ICT) energy related emissions and this could rise to 51% by 2020.<sup>2</sup>

More than 80% of a typical mobile network operator's energy requirements are associated with operating the network. Technology evolution has delivered greater capacity, about an 8 fold increase between the original analogue services and 3G. This has been accompanied by improvements in equipment efficiency, with a 3 fold increase in the efficiency for 3G base station amplifiers between 2001 and 2007. The typical annual CO<sub>2</sub> emissions per average GSM subscriber is now about 25kg CO<sub>2</sub>, which equates to the same emissions created by driving an average European car on the motorway for around one hour.<sup>3</sup>

However, the mobile industry continues to look for ways to reduce energy needs. Air conditioning is being replaced by fans or passive air flows whenever possible.

There are several industry initiatives evaluating alternative energy options to power base stations and about 1,000 pilot sites are in operation around the world. This is also driven by the demand for new mobile services in areas with no or unreliable grid electricity. Many network upgrade contracts now include take-back provisions for used equipment that may be resold in another market.

**Figure 1. Total CO<sub>2</sub> mobile (r)evolution**  
CO / average subscriber and year, based on LCA results



1 Earth Calling... The Environmental Impacts of the Mobile Telecommunications Industry, Forum for the Future, 2006.

2 SMART 2020: Enabling the low carbon economy in the information age, report by The Climate Group on behalf of the Global e-Sustainability Initiative, 2008.

3 125 km per 10.5 litres of petrol.

4 <http://www.gsmworld.com/developmentfund/>

5 MtCO<sub>2</sub>e = million tonnes of carbon dioxide equivalent. The global warming potential of all greenhouse gases is measured in terms of the equivalent impact of carbon dioxide (CO<sub>2</sub>).

