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GREEN NETWORK

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Monitor

How green is your network?

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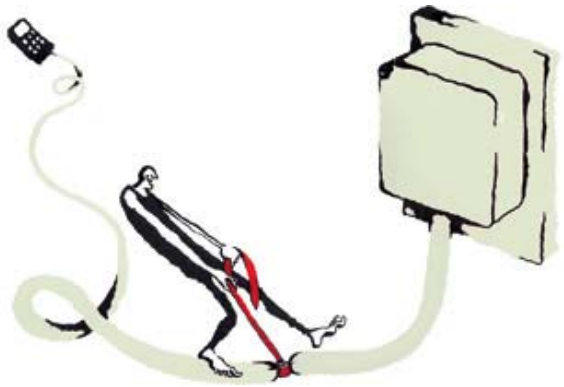
Environment: Telecoms firms are reducing the power consumption of their networks, for economic and environmental reasons

Illustration by Belle Mellor



LIKE many other industries, the telecoms industry is increasingly worried about its energy consumption and the associated carbon footprint. This is not just because rising energy prices have made it more expensive to run telecoms networks; it is also because telecoms networks and devices account for nearly 1% of global greenhouse-gas emissions, and the industry wants to avoid criticism from green campaigners. Unlike many other firms, however, telecoms operators find their carbon footprints quite easy to work out. That is because their footprints are dominated by one thing: running their networks.

For example, Vodafone, a giant European mobile operator, estimates that its network accounts for 80% of its carbon footprint (the remainder is attributed to its offices, shops and vehicles). And three-quarters of the network's contribution is, in turn, associated with powering the base-stations that allow mobile phones to connect to the network.

Typically, around half of the operating expenditure of a network company goes on electricity, according to Ericsson, a leading telecoms-equipment manufacturer. The proportion tends to be higher for operators in the developing world because their base-stations may be in remote areas, and therefore require diesel-fuelled generators. So the recent spike in energy prices has prompted operators to look for ways to cut costs. "The operators are feeling it," says Elaine Weidman, Ericsson's director of corporate responsibility.

Fortunately there are some relatively simple ways to reduce the energy consumption of a base-station. The first is to turn down the air-conditioning. Many mobile operators now run base-stations at a standard temperature of 35ºC, rather than the previous norm of 25-30ºC. Studies show that the higher temperature does not reduce the equipment's reliability or life expectancy. "The biggest restriction is actually our technicians, who do not like going into the hut to work at 35 degrees," says Andy MacLeod, Vodafone's global networks director.

Operating at this temperature means ambient air can be used for cooling, even in hot countries. An

air-filter is installed on one side of the cabin, and a fan is installed on the other, resulting in a steady flow of air. Vodafone plans to replace air-conditioning with this simpler approach, called “freecooling”, in the majority of its base-stations over the next three years, as part of a plan to reduce its carbon footprint by 50% between 2006 and 2020.

Other energy-saving tips are even simpler. In many hot countries, telecoms firms paint the exterior of base-stations white to deflect the sun. Another power-saving measure is to turn off base-stations completely when they are not busy. In densely populated areas, many base-stations are installed to boost the network’s capacity, rather than to provide essential coverage. In quiet periods when there are fewer calls to handle, such as the middle of the night, some base-stations can be turned off. A further trick is to redesign the base-station to make it more energy-efficient. A technique called “remote radio-head” involves shifting radio equipment from the cabin to the top of the mast, where it is cooled naturally.

Efforts are also under way to exploit renewable sources of energy to power telecoms networks. Leading equipment-makers such as Ericsson and Nokia Siemens Networks have installed hundreds of base-stations powered by solar panels, wind turbines or biofuels, mostly in parts of the developing world where there is no electricity grid. The number of renewable-powered base-stations will increase as networks expand into rural areas of the developing world. But so far they make up only a tiny proportion of the total.

There is also scope to reduce the environmental impact in another area: the handsets. Nokia, the world’s biggest handset-maker, has been looking at making mobile phones entirely from recycled materials such as plastics from drinks bottles and old tyres. Sony Ericsson, another handset-maker, recently announced a project called GreenHeart, which proposes various things the company would like to include in future devices, such as bioplastics and recycled materials, a low-power charger and online rather than paper-based user manuals.

The problem for operators is that even as they become more energy-efficient, network expansion and subscriber growth may still increase their overall carbon footprints. The Smart 2020 report, published in June by the Global e-Sustainability Initiative, a partnership of technology firms and industry associations, and the Climate Group, a non-profit environmental club, predicts that global emissions from telecoms networks and handsets will more than double between 2002 and 2020 as adoption increases.

The same problem also affects fixed-line telecoms networks, as broadband infrastructure is upgraded from copper wires to optical fibres and new equipment is installed to handle larger volumes of data. Verizon, a big American operator which is deploying a high-speed fibre network in several regions, has asked equipment-makers to build gear that requires less power. A poll carried out by Verizon found that most of its suppliers thought they would be able to reduce power consumption in new equipment by 10-15% without loss of performance. It has set a goal of 20% for equipment being installed from 2009, says Chuck Graff, Verizon’s director of network technology.

BT, Britain’s biggest fixed-line operator, has set a goal of reducing its emissions by 80% by 2020 by switching to more efficient equipment and sourcing electricity from low-carbon sources such as wind. As with cars and computers, the focus in telecoms is no longer solely on performance, but on efficiency, too.

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