

Power Consumption and How Carriers Can Use Less

By Tim Young

Communications technology is going to save the planet. A commercial on my television told me so.

There are tales that have been told that once upon a time people would have to travel great distances just to hear each other's voices. To read a message from a far-flung loved one, you would have to wait until a piece of paper containing that love note or family greeting would be carried from one place to another.

These letters and travelers were carried by great smoke-belching trains and airplanes and automobiles.

The flowers wept.

But thanks to technology, messages are carried instantaneously, powered only by the dreams of children.

What's that you say? It's not so simple?

As a matter of fact, telecom does help to ease a great deal of strain on the carbon footprint of the world's massive population in many ways, but we can't forget that networks and devices are hungry, and they require their own supply of power.



According to a presentation by Nokia-Siemens Networks' Hans-Otto Scheck at an ITU Symposium held a few years back, telecom providers burn around 50 megatons of CO₂ annually. That bulk of carbon is roughly equivalent to 100 terawatt hours (TWh) of electrical energy.

That's no small amount.

However, when you compare that amount of energy spent to that of many other industries, of course, it becomes far less deadly-looking. An Ericsson whitepaper on the link between carbon intensity and total cost of ownership (cleverly dubbed TCO₂) notes that the ICT sector, as a whole, is only responsible for around 2% of the world's carbon emissions, and that telecom, specifically, represents only 0.6 percent of the total output.

Not for distribution or reproduction.

SMART BUSINESS. SMART SOLUTIONS.

Customer, Product & Order Lifecycle Solutions

Catalog-Driven Order Fulfillment
with ConceptWave Order Care[®]

Customer-Driven Order Monetization
with ConceptWave Rapid CRM



That's modest compared to transportation or other industries, to be sure. Furthermore, as Scheck noted in that same presentation, ICT can easily help to alleviate at least that amount of environmental strain by removing the need for excessive travel and postal transport.

In addition, this relatively small percentage of total carbon output has been scaled back substantially in the past few decades. BT, for example, made a pledge back in 2008 to reduce its carbon emissions by 80% by 2020. To date, BT has made significant strides toward that goal, and has trimmed its carbon intensity by 60% from 1997 levels.

But not every provider is eager to green its network. In fact, just weeks before I sat down to write this story, Greenpeace activists in New Delhi blockaded Bharti Airtel's headquarters in response to the carrier's reticence to eliminate its use of diesel to power its cell sites and disclose its carbon emissions.

Part of this decrease can be achieved through alternative energy sources, which BT is pursuing with great zeal. The carrier aims to have close to a quarter of its energy needs met by wind farms by 2016.

However, service providers are increasingly taking a hard look at the sources of energy consumption within the network and how unnecessary power use can be curbed.

One leading source of power consumption for many service providers is mobile basestations. According to Peter Grant and Simon Fletcher of [Energy and Technology Magazine](#), an average 3G basestation consumes roughly 4.5MWh of power per year. Considering that China Mobile alone has 500,000 GSM basestations (which are less energy efficient than their 3G counterparts) and 200,000 3G CDMA basestations to serve its 580million subscribers, the power consumption of these installations grows rather rapidly.

And these basestations aren't necessarily powered by juice from the central grid. In fact, the power for many of the more remote stations is coming from diesel generators, which can be a source of both problematic emissions and merciless operating cost fluctuations. Vodafone, for example, uses about a

By 2014, capital investment in green network equipment could reach \$122 Billion: 46% of total spend.

quarter-million gallons of diesel per day to power its remote basestations worldwide, according to Grant and Fletcher. If all of that diesel was being bought at roughly the price paid at the pump in the UK, price fluctuations alone would account for a half-million pound increase in opex between early 2007 and early 2011, with numerous hard-to-predict spikes and lulls along the way.

However, there are efforts underway to increase the sustainability of mobile infrastructure around the world. Pike Research reported last summer that by 2014, some 4.5% of mobile basestations will run on clean, renewable energy. Many of these basestations will be located on the outer reaches of the network, where cell sites were typically run by diesel generators, which are neither clean nor particularly cheap, as fuel costs continue to rise. By using combinations of solar and wind energy to power remotely located basestations, providers can reduce opex while also reducing carbon footprint.

Still, analysts are optimistic about the overall motivation among carriers to create leaner, greener networks. Pike Research, in a separate report, says that by 2014, capital investment in green network equipment could reach \$122 Billion, which amounts to some 46% of total network equipment expenditure.

More than being an indication that more carriers are looking to buy green equipment, this is an indication that a modicum of efficiency is becoming table stakes. Network elements are becoming more efficient by way of evolution, rather than revolution.

Which is not to say that the overall shift to carbon footprint reduction isn't revolutionary. It is. But it also just makes good sense from a cost perspective, from a marketing perspective, and from the perspective of overall efficiency.

According to an [article written by Huawei](#) in one of its in-house publications, "At the heart of an energy-efficient mobile network is good design. This starts with determining coverage, capacity, and quality needs."

This is one area in which OSS solutions are particularly crucial, as network monitoring tools are an important tool in understanding network traffic patterns, allowing for optimum asset placement. Furthermore, network visibility can enable techniques like routing less-time-sensitive packets to lower-load elements or other methods that promote efficient use of less-energy-efficient assets.

Furthermore, the efficiency facilitated by OSS/BSS providers can service providers in reducing carbon footprint across the board. eBilling is one simple component, as the simple act of printing paper copies of information that should be readily available for a connected customer has a massive impact on both the cash and the carbon bottom lines. Fault management solutions can work to fix problems automatically and/or remotely, reducing the need for costly and high-impact truck rolls.

In short, OSS and BSS are systems built around the idea of efficiency maximization. That extends naturally to the realm of carbon reduction and energy efficiency, because these are not exclusively environmental issues. They are smart business issues.

So perhaps communications technology isn't going to make all the trees greener and rivers clearer and skies bluer. However, communications technology greatly reduces the amount of time, money, and environmental impact required for long-distance interaction to take place. It does this while simultaneously doing comparatively little harm to the planet, and is actively working to reduce that impact, as well.

That's no small thing.

BT has already cut its carbon by 60% from 1997 levels, with a target of 80% by 2020.