CEET report nails wireless as energy monster

April 13 2013, by Nancy Owano

(Phys.org) —Research from Australia delivers bracing facts about serious demands on power in the coming years. The researchers find that just pinning power-grid drains on the "cloud" is imprecise. The real problem is on the mobile cloud. The researchers zeroed in on energy consumption needed to support cloud services accessed by wireless networks. They found that wireless networking infrastructure worldwide accounts for significantly more power consumption than data centers.

"By 2015, the energy consumption of data centers will be a drop in the ocean compared to wireless networks in delivering cloud services," said Dr Kerry Hinton, Deputy Director, CEET (stands for Center for Energy Efficient Telecommunications). CEET is behind the wake-up report, "The Power of Wireless Cloud." According to CEET, that drop in the ocean is supported by research findings. Wireless networks will use about 90 percent of the energy needed to power the entire wireless cloud services ecosystem in 2015, in contrast with data centers, accounting for nine percent—or less.

While research elsewhere has pointed to data centers as the culprit in threatening energy consumption, loyal users of services from Google, Facebook, Amazon and others, with their portable devices, are the real concern, driving a massive surge in energy consumption.

"The problem is that we're all accessing cloud services – things like webmail, social networking and virtual applications – over wireless networks," said Hinton. "It's the modern way but wireless is an energy monster, it's just inherently inefficient."

A simple takeaway is that "Industry needs to focus on the real issues with wireless network technologies if it wants to solve this problem." All aspects of the cloud ecosystem, according to the researchers, must be looked at, as well as data centers.

"We often think of bandwidth as the barrier to the way online services evolve and improve," said a CEET statement discussing the report, but the "very real message here is that the real bottleneck, looming sooner than we think, may be energy."

One of the more bracing factoids in the report compares wireless cloud energy consumption with putting new cars on the road. "Our energy calculations show that by 2015, wireless cloud will consume up to 43 TWh, compared to only 9.2 TWh in 2012, an increase of 460%. This is an increase in carbon footprint from 6 megatonnes of CO2 in 2012 to up to 30 megatonnes of CO2 in 2015, the equivalent of adding 4.9 million cars to the roads."

The goal of the report is not to suggest that everyone stop swiping and tapping on their smartscreens, however.

"I think it's unlikely people trade away the mobile convenience of these services," said a CEET statement. The report is intended as a guide for finding real solutions. According to CEET, one solution might be to increase the way network resources are shared among users, "but more likely we'll need a radical improvement in the efficiency of the technologies themselves and potentially a fundamental change to the way data is managed across the global network. These are the things we're investigating at CEET."

CEET is a partnership between Alcatel-Lucent Australia, Bell Labs, the University of Melbourne, and the Victorian State Government. Their focus is on energy-efficient telecommunications.

More information: www.ceet.unimelb.edu.au/pdfs/c … r_wireless_cloud.pdf