

At Verizon Wireless, the G in 4G Can Also Mean “Green”



Armed with a new LTE network, Verizon seeks ways to improve energy efficiency.

By Dawn Bushaus

For Verizon Wireless, reducing energy consumption is more than an internal goal. While the company is constantly seeking ways to optimize its energy use, it believes its best chance for influencing global sustainability lies in the services it delivers.

Verizon Wireless customers already use its 3G network for energy-saving applications such as videoconferencing and telecommuting. Its new LTE network delivers speeds that are up to 10 times faster than 3G, with even higher throughput conceivable in future versions of the standard. Those speeds today can enable a wider range of services to help customers reduce their energy consumption.

“Our 3G broadband network enables customers to operate their remote offices independently, untethered from the corporate office, to save on greenhouse gas emissions,” said Rich Craig, Verizon Wireless director of network engineering and operations support. “With 4G, we’re really talking about knocking the lid off the speed. That will enable business applications and opportunities for sustainability that we haven’t even contemplated yet.”

Seeing is Believing

One 4G application with excellent potential is in machine-to-machine communications, the wireless interconnection between devices. Duke Energy is taking advantage of the Verizon Wireless LTE network’s high data speeds to connect

70 buildings in its hometown of Charlotte, N.C. Those buildings include its own, plus those of companies such as Bank of America and Wells Fargo, as well as several city and county buildings. They’re all part of an initiative called “Envision: Charlotte.”

Duke uses LTE to transport real-time energy-consumption data from smart meters to its data center in Charlotte. The information is then aggregated and uploaded via LTE to digital signage in each building’s lobby. Currently available free of charge to building owners, this service enables businesses to see how much energy they consume, said Paige Layne, Duke Energy spokeswoman.

Duke also plans to provide businesses with suggestions for reducing energy consumption. Eventually, Duke could use smart meter technology and Verizon Wireless’ LTE network to turn power off and on automatically to optimize efficiency in the buildings. “Our goal is to reduce energy consumption in the city of Charlotte by about 20% overall,” Layne said.

Leading by Example

Verizon Wireless says it’s too early to quantify how much LTE will improve its network’s energy efficiency, yet the benefits are clear. For starters, LTE base station equipment uses less energy, while moving to Ethernet backhaul and optical core networking further reduces consumption. Tellabs® Optical Solutions, for example, have helped operators reduce their energy consumption in core and backhaul networks by up to 65%. Improving network efficiency is crucial because that equipment represents about 85% of Verizon Wireless’ energy consumption. About 70% of that network energy is consumed at cell sites, primarily because there are so many of them, Craig said.

A telecom network consumes energy in 2 primary ways: with the equipment that transports voice, data and video, and with the cooling systems in the buildings that house that gear. “We are always either trying to reduce the energy that’s spent initially or find a cheaper way to get rid of the heat,” Craig said.

One of the ways Verizon Wireless is reducing energy use is by right-sizing systems such as air conditioning. That process includes ensuring that computing power matches demand and implementing server virtualization in data centers.

“If you’ve heard about something that folks are doing to reduce energy consumption, chances are we are doing it,” Craig said.

In 2007, Verizon Communications worked with vendors to determine a reasonable reduction in power consumption for network equipment. Most agreed that 10% to 15% was a practical goal. Just 2 years later, in an effort to encourage its vendors to be overachievers, Verizon Communications decided to set the bar at 20%. That requirement meant all equipment purchased in 2009 and later had to be at least 20% more efficient than what was already deployed.

Verizon Wireless also is conducting trials of energy management systems that collect and mine usage data. “If you can’t measure energy consumption, it’s pretty hard to influence it,” Craig said.

Its parent company also encourages vendor partners to make their equipment more energy-efficient. In fact, Verizon Communications is responsible for the telecom industry’s first energy efficiency standards for network gear.

“Verizon was the first to adopt these industry-leading standards,” said James Gowen, Verizon Communications chief sustainability officer. “Since then, this aggressive initiative has helped Verizon reduce its energy consumption and improve its overall carbon efficiency by 15% from 2009 to 2010.”

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The carbon-efficiency metric is derived by combining Verizon’s total carbon emissions in metric tons from the electricity, building fuels and vehicle fuels used to run the company’s business. Then that total is divided by the number of terabytes of data that the company transports across its network. The 15% improvement shows that the efficient network equipment, along with Verizon’s other green initiatives, have helped the company handle annual traffic growth without increasing energy consumption by a comparable amount.

Benefits for Customers and the Bottom Line

While reducing internal energy consumption makes Verizon Wireless a better corporate citizen, those initiatives also improve network reliability and help the company’s bottom line, Craig said. “Every dollar we save on energy, we can spend on our wireless network to improve the user experience,” he said. That’s particularly valuable, considering that network quality has been the Verizon Wireless mission and message since the company launched 11 years ago.

Improving energy efficiency naturally increases reliability, Craig said. “Finding energy savings opportunities requires innovative approaches to engineering and operating the network. Our relentless focus on increasing reliability, when combined with our desire to drive energy efficiency, often results in solutions that accomplish both.”

Verizon Wireless is also testing alternative energy solutions such as solar, wind and fuel cells as part of its effort to go green. “We use those solutions where they make sense,” Craig said.

However, alternative power is significantly more expensive, making it unfeasible in many situations. “The cost per kilowatt for solar is still not great from a business perspective across most of the country,” Craig said. “You have to be able to draw a straight line between the cost of the solution, the potential for energy savings, the potential for higher reliability and the potential for simplifying the network.”

Even so, Verizon Wireless constantly looks for improved solutions that will make adopting alternative energy a practical choice. Craig is optimistic about the future. “We’re hearing that solar may see a two-fold increase in efficiency soon,” Craig said. “That could change the business model dramatically.” ■



ENVISION: CHARLOTTE’S goal is to reduce energy usage 20% in 5 years in the Uptown part of the North Carolina city. With the help of Duke Energy and Verizon Wireless, participants can track their building’s energy usage in near real time. Digital signage around Uptown will provide collective usage statistics for area buildings. For more information, visit www.envisioncharlotte.com.

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LTE: Long-Term Evolution