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Maximizing Energy Performance in Your 5G Network

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The demand for 5G is only growing. As communications service providers (CSPs) work to roll out the next generation of cellular technology, they face the challenge of doing so without energy use—and costs—skyrocketing. If 5G is deployed in the same way as 3G and 4G, energy of mobile networks would increase dramatically. In fact, some providers have estimated that their energy consumption will double to meet increasing traffic demands. Because over 90 percent of network operating costs are spent on energy needs, an energy spike like that is not sustainable from either a cost or environmental standpoint.

The idea of quadrupling data traffic without increasing energy consumption might sound like a pipe dream. But the good news is that thanks to the energy efficiency built into the 5G standard and evolving innovations in hardware and software, it is entirely possible to manage energy consumption as 5G deploys—and ICT industry players have a responsibility to do so.

As the most energy-aware standard, 5G will allow CSPs to use smart sleep modes more effectively and extend coverage by using lower frequency bands, while increasing capacity and speed with carrier aggregation. And fast, effective data transmission enables networks to return to a low-load state faster.

As mobile networks evolve, we must not only consider things like speed, throughput, and latency, but also energy efficiency as we create the network infrastructure of the future. By taking a holistic approach and working with customers to evaluate and evolve solutions to address energy

challenges, it is possible to avoid repeating the energy use spikes that have historically accompanied each new generation of mobile wireless and break the energy curve.

As 5G deployments continue, there are a few steps service providers should take to reduce mobile energy use, including preparing the network, activating energy-saving software, building with precision, and operating site infrastructure intelligently.

Prepare the network

In the past, new generations of cellular technology have typically been deployed by adding some new equipment while keeping existing network assets. As we head into the future, this practice needs to change.

Modernizing the network with the latest technology and replacing old equipment allows businesses to embrace new opportunities while seeing significant energy savings. And in low-traffic areas, modernization can yield a payback period of less than three years for energy savings alone, making it a worthwhile investment.

Every service provider has a different starting point—and a different set of priorities—when it comes to their network evolution. Network modernization should encompass every aspect of site equipment, along with the core transport and radio access equipment.

For example, upgrading from air-conditioned shelter sites to modern site cabinets that feature passive cooling, where ambient airflow rather than fans removes the heat from the radios, will significantly reduce energy consumption. Another way to cut back is by implementing solutions that allow 4G and 5G to run simultaneously without the need to add new energy-consuming hardware.

Keeping equipment on such a platform ensures the network can migrate to the most efficient technology as soon as its available.

While it might seem like it makes sense short-term to simply replace equipment piece by piece, modernizing the entire network with new equipment pays off big time down the line and is ultimately a more sustainable and cost-effective approach—and there are plenty of tools to help service providers prepare their networks for the next “G.”

Activate energy-saving software

Networks across the world have shown that one of the biggest opportunities to save energy is by using software that turns off unneeded equipment when traffic is low. And the best part is that this software does not require additional hardware investments. Most energy is consumed in the RAN, so enabling service providers to automatically

deactivate unnecessary equipment during low-traffic periods is essential. Such features can reduce radio equipment energy consumption by up to 15 percent without affecting the user experience, making them key components to a more sustainable operation.

Measuring energy consumption to see how it relates to other aspects of network performance is crucial for proactive decision-making. It helps to have a bird's-eye view of energy use so it's easier to assess possible energy savings across the network. Network management platform solutions can offer insights to help service providers understand, diagnose, and identify opportunities to improve network energy performance.

Build 5G with precision

Having the right equipment in the right place is key to deploying a new standard. Building with precision means creating a network with the optimal radio solution for every site type. When introducing 5G, it is crucial to decide what, where and when to deploy new equipment on 5G frequency bands. This way, service providers can see network-wide power savings and reduce the total cost of ownership (TCO).

A swift rollout of 5G without dramatically increasing power consumption is entirely possible. Ultimately, using the right equipment in the right place is crucial for efficiently introducing 5G while still meeting customer data speed and coverage expectations—and with the right equipment, service providers can see massive energy savings.

Operate site infrastructure intelligently

By using AI, service providers can operate site infrastructure more proactively. Tools that help control passive equipment and enable predictive maintenance and no-touch problem-solving to reduce costs, site energy usage and site visits make all the difference. In fact, Ericsson customer cases show that service providers have reduced site energy consumption by up to 15 percent through intelligent site control solutions.

Site traffic capacity growth demands more equipment to be hosted and integrated. Available site power budget and space are often limited and require solutions to be both compact and energy efficient. With increasing onsite demand and complexity, service providers face substantial challenges, including decreasing operational efficiencies, fragmented data from "passive" site systems, and a lack of a holistic view of all sites.

AI technologies that enable smart site energy management through accessibility from either the Network Operations Center (NOC) or on a tablet, smartphone, or laptop in the field can make a huge difference to a provider's overall energy use. Using 24/7 data points, service providers can benefit from predictive maintenance and lower operations and maintenance (O&M) costs, carbon emissions, and site power consumption.

Integrating site elements with digital tools can help service providers monitor site equipment, enable remote control, and fully digitalize their sites. By combining various measurements and

alarms from passive infrastructure and the active data into one O&M tool, service providers can more efficiently manage the network through real-time insights and control. The result is a drastic reduction in lifecycle costs, site visits and energy consumption, along with improved network quality.

A holistic approach to energy consumption will pay dividends for CSPs

As the industry focuses on rolling out 5G, it is critical to navigate the shift differently this time around. The solution lies in taking a holistic approach to create a comprehensive plan to reduce energy use. By modernizing the network with the latest technology, activating energy-saving software, building 5G with precision and using AI to operate site infrastructure, service providers can deploy 5G seamlessly—without the energy spikes seen in the past. Together, these four elements can allow service providers to reduce costs, manage traffic growth, reduce their environmental footprints, act as leaders in the space, and, above all, break the energy curve.