

Increase speed, reduce energy consumption - is it possible with 5G?

By [Ayub Osman](#)

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From self-driving cars, which communicate with one another; remote healthcare, which treats patients from the comfort of their homes; to an immersive virtual and augmented reality, which lets users experience learning and gaming in an entirely new way, 5G comes with a promise to create a never-before-seen world for people and businesses.



Image: Ericsson

While the promise of 5G will transform the world as we know it, a big question that the industry experts currently grapple with is 5G's rollout and its subsequent energy consumption.

Today, from both cost and carbon footprint perspectives, energy is one of the telecommunication industry's biggest challenges. Ericsson estimates the annual global energy cost for running mobile networks to be about \$25bn. If 5G is deployed in the same way as its previous generations to meet increasing traffic demands, then energy consumption in mobile networks will increase dramatically. This is unsustainable in terms of cost as well as environmental impact.

Historically, the launch of each successive generation of mobile technology came with new services that required extended coverage for more people and places. At the same time, building networks that supported the demand for new services has resulted in a corresponding rise in energy consumption. As we continue to deploy 5G, there is a pressing need to secure the network's total energy performance as it expands on new capabilities like increased gigabit speeds and low latency.

So, can we rollout 5G while reducing energy consumption? The answer is yes. Today, it is truly possible to lower total mobile network energy consumption while meeting the massive traffic growth challenge.

In our report, [Breaking the energy curve](#), we highlight the savings that can be achieved through a new innovative approach. To break the energy curve, it is necessary to address all different parts of the network holistically. Communication service providers can start their energy savings by taking the first step towards engraining energy performance targets into their organisation and processes. The use of innovative solutions to address the energy and carbon emissions challenge will enable them to meet current and future network demands.

Network hardware modernisation with 5G

Energy performance is one of the key requirements for 5G, with the 5G network being up to 10 times faster than 4G. By modernising the network with the latest technology and replacing old equipment, it is possible to realise new business opportunities and, at the same time, create significant energy savings. Bearing this in mind, the 5G standard now includes ultra-lean design and Massive MIMO which are critical technical enablers for better energy performance.

The ultra-lean design leverages smart-sleep mode technology to ensure that radio frequency signals are transmitted by the radio hardware only when necessary. Massive MIMO increases network coverage and provides higher capacity. These enhancements provide extended network coverage in a sustainable and resource-efficient way, reducing the total cost of ownership for service providers.

Up to 15% energy savings with software features

Today, a major part of energy consumption in mobile networks comes from the radio access network (RAN) and radio base station sites. With 5G gradually rolling out around the world, it becomes important to focus on RAN energy performance improvements to be able to limit the increase and break the increase of energy consumption. Energy saving software implemented in RAN hold great potential towards reducing energy consumption, and our energy-saving features and functionalities have greatly demonstrated this. Switching sites from "always on" to "always available" state improve network energy efficiency and sustainability performance.

It is also essential to prepare the network by modernising sites to make room for the additional energy consumption coming from the 5G deployment. By using the right equipment for the right traffic situation, we've observed that large energy savings can be made. Furthermore, with AI, service providers can operate 5G site infrastructure more proactively. Studies have shown that service providers have reduced site energy consumption by up to 15% through intelligent site control solutions.

An industry responsibility

Within Middle East and North Africa, mobile data traffic is expected to rise sharply. With the average data per smartphone expected to reach 41GB per month by 2027, the network energy usage and costs are expected to increase significantly as well.

Addressing the network energy consumption and carbon emissions challenge requires an integrated approach that looks beyond individual product performance and addresses the whole network. We see this as an opportunity to rethink how to build, operate, and manage networks more smartly and more strategically. It is not an option, but an industry responsibility to find a holistic solution that breaks the energy curve through innovation. Only in doing so can we reduce energy

consumption while ensuring everyone is able to reap the benefits of global 5G rollouts.

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