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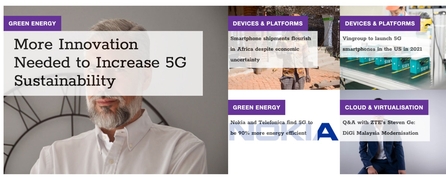

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GREEN ENERGY

More Innovation Needed to Increase 5G Sustainability

JAMES BARTON 10 DECEMBER 2020 629 views

In a recent panel discussion, organized by Developing Telecoms, on Making 5G Sustainable, Enrique Dans argued that more innovation is the key to increasing 5G sustainability.

Dans, a leading proponent of green energy in telecoms, said that while fighting the global corona virus pandemic is currently the focus of attention, climate change is a bigger, more important and longer term challenge for the telecoms industry. However, for operators and vendors to realize the full benefits of 5G in terms of sustainability Dans believes there will need to be more innovation.

5G has demonstrated that the mobile internet is now a basic human need according to Dans, interconnecting us and enabling us to communicate and do business. As a result it is assumed that we need huge bandwidth, low latency, and that everything has to be bigger, better and faster. However, Dans argues it is vital that these and other assumptions about disruptive innovations such as 5G are challenged to ensure that energy use does not increase and the promised benefits are obtained.

The area of energy consumption, key to the sustainability of 5G, is a top priority: "We're deploying the internet of things to connect billions of devices through millimeter waves. These come with their own problems – most obviously, they require more antennas as they can only travel short distances, so we need small cell towers around 250m apart all over the place – rooftops, street lights, telephone poles, trees – in order to ensure comprehensive coverage, particularly in cities.

"This is an issue that has been discussed for some time – the 5G dilemma: whether we can deploy more base stations and antennas, but consume less energy. When you deploy more small cells, the total energy consumption of the network will grow; however, the energy consumption of a small cell is much lower than a conventional cell, so it's not so straightforward."

"MIMO antennas have more hardware components per base stations, and this will increase the total energy consumption of 5G base stations over 4G. We also know that operators will keep 2G, 3G and 4G working alongside 5G antennas."

According to Dans, some innovations are already solving some of these dilemmas. Examples of this include spatial multiplexing, which reduces energy consumption by dividing it between users. Other innovations include ultra-lean design that allows operators to put antennas into sleep mode when there are no active users.

There are some differences in the approach between European and Asian operators and vendors in their approach to the sustainability of 5G networks, but all parties are working hard to improve sustainability.

European operators and vendors, according to Dans, tend to think that the rise in energy usage will be offset by more efficient equipment, and this will result in no net increase in energy usage.

On the other hand Chinese vendors take the view that energy consumption will initially start falling around 2021, but following that 5G traffic will increase dramatically, with more devices connected resulting in more network deployments, and therefore increasing energy usage at a rate of around 5% per year between 2022 and 2025.

To avoid or reduce this relies on breakthroughs in efficient 5G technologies according to Dans: "Any delay to this could see energy usage increase by an increment of 30%".

A further complication is that many mobile operators across the world are in the process of selling off their tower assets, including energy infrastructure, to third parties that will manage them. For a mobile operator, energy amounts to between 20-40% of OPEX.

If they outsource or sell off these operations to energy service companies, energy generation provision can constitute up to 60% of all the annual operating expenses for these operators, providing greater incentives for reduction.

Dans believes there are two major areas operators need to address in the near term to reduce energy consumption. The first is increase the use of alternative energy sources. These are becoming cheaper which creates an opportunity to rethink energy efficiency. "Solar and wind power represent a huge opportunity to mobile operators."

The second innovation possibility is network load optimization. More than 50 operators worldwide have begun disclosing their carbon emissions via the internationally recognized Carbon Disclosure Project (CDP). This commitment to transparency should help to keep these companies accountable for using their carbon footprint. In 2016, the mobile telecom industry set a goal of net zero emissions by 2050.

The alternative to innovation according to some analysts is 'degrowth' - reducing the growth of innovation in technology and going back to how we were doing things before. Dans has little time for this idea: "Covid-19 has shown us what happens if growth suddenly stops – a 'degrowth recession' would be very complicated, as it's very difficult to believe that society is willing to accept degrowth as a concept."

Dans cautions against reliance on plummeting solar, wind and battery costs accelerating our clean energy future so we don't need to reduce ICT growth: "…quite the reverse, we actually need to innovate more to bring energy efficiency to many other industries, including energy, healthcare, manufacturing, transportation and logistics, government, smart cities, etc. These industries need ICT in order to be able to become more efficient and reduce their energy footprint."

In the end Dans accepts that even if ICT equipment consumes more energy, it's a price we have to pay to achieve energy efficiency in many other industries. "In this context, it's not necessarily about what we can learn, but about what we can unlearn with regard to energy efficiency."

Enrique Dans is Professor of Information Systems at IE Business School in Madrid (Spain). He received his Ph. D. from the Anderson School at UCLA, an MBA from the Instituto de Empresa (Madrid, Spain), a B.Sc. from Universidade de Santiago de Compostela and postdoctoral studies at Harvard Business School. His research interests are related to the impact of disruptive technologies at three levels of analysis: individuals, companies and the society as a whole. Professor Dans has been teaching and consulting in the technology arena since 1990, is a frequent contributor and columnist in the business and economic press, participates in several technology startups and writes on a daily basis since 2003 in his page, enriquedans.com, one of the most popular technology blogs in Spanish.

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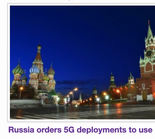
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