Building
Greener Radio Networks

e& establishes climate innovation hub and pilots solutions to lower emissions and energy usage

Highlights

- e& is aiming to achieve net zero greenhouse gas emissions[1] by 2030 in its operations in UAE.
- At the EXPO city in Dubai, e& and Huawei have modernised all the base stations to reduce energy usage.
- By using solar panels, smart batteries and advanced wireless products, one of the base stations is avoiding 26 tons of CO_2 emissions per year.
- The results of the EXPO city project will feed into a new GCC telecom operator innovation hub.
- The hub coordinates efforts between solutions providers and operators to curb climate change

Challenge – multiple barriers to reducing emissions and energy usage

Since 2020, the cost of energy has risen significantly, increasing telcos' operating costs, either directly, where they are using generators, or indirectly, where they are using the power grid. At the same time, base stations, which account for most of the energy consumption for a typical mobile network, are increasingly being equipped with 5G radios, which enhance the user experience, but can also consume more power.

Against this backdrop, telecoms operators are trying to reduce greenhouse gas emissions, as well as fuel costs. To do that without impacting their customer experience, they need to maximise the use of renewable energy, such as solar and wind power.

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[1] Scope 1 (direct emissions from owned or controlled sources) and Scope 2 (indirect emissions from the purchase and use of electricity, steam, heating and cooling).

e&, a leading operator in the Middle East, is aiming to achieve net zero greenhouse gas emissions[2] by 2030. As most base stations are located on rooftops in the GCC (Gulf Cooperation Council) region, there generally isn't space to deploy local solar panels or wind turbines. The business case for employing renewable energy is further weakened by the need to install additional infrastructure at base stations to handle any excess power that would be generated by co-located solar panels or a wind turbine.

To complicate matters further, some of the telecom sites are shared between operators. Furthermore, the cost of electricity and fuel in GCC's markets is low compared to other regions, which can make it difficult to justify additional investment to provide green sources for power.

Solutions – a climate innovation hub and energy efficient and net zero sites

To help curb climate change and energy usage, e&, together with 38 operators, including the main operators in the GCC Ooredoo Group, Zain Group, stc Group, du, Omantel and Beyon Group, has set up the Operator Innovation Hub for Power Solutions. Established to develop mechanisms to reduce network power consumption/OPEX and explore better renewable power solutions, the hub is looking for the support of international organisations and international investors in the power sector.

To pilot potential solutions, e& and Huawei have transformed one of the base stations at the EXPO City in Dubai into a net zero site, using solar panels and smart lithium ion batteries. During the daytime, the solar panels charge the batteries and supply

power to the base station. At night, the batteries simply supply power to the base station.

Developed for the *End-to-End Green Zone* pilot project, the solution is managed by NetEco, a network energy management system that can be used to visualise and optimise the site's power consumption. Developed by Huawei, NetEco uses intelligent technology to refine the scheduling of the solar and storage synergy, thereby improving the amount of solar energy that is harvested. The project is also using intelligent software features to adjust the site's power consumption in line with traffic levels.

Furthermore, the net zero site has been modernised with the latest wireless technologies. It employs Huawei's MetaAAU massive MIMO solution, which is designed to provide the same user experience and coverage with lower power consumption, compared to a traditional AAU (active antenna unit). The site's multi-band RRU (remote radio unit) can support 700 MHz/800 MHz/900 MHz or 1800 MHz/2100 MHz frequency bands decreasing the number of RRUs required from 15 to 6 pcs, thus reducing the overall energy consumption. The site also employs a SDIF (signal direct injection feeding) antenna, which adopts new materials and designs to eliminate the feeder cable inside the antenna, thereby improving energy efficiency by 15% compared with traditional antenna, according to Huawei.

Huawei and e& describe the base station as the first 100% off-grid 5G massive MIMO site, intelligent energy management site, and simplified site with high energy efficiency technology in the Middle East.

Although there isn't space to deploy solar panels on other base stations in EXPO City, e& is modernising the hardware and the software at all of its cell sites at the venue (19 outdoor and 40 indoor sites) to improve the energy efficiency of the network. These changes are designed to free up 66% space and improve energy efficiency significantly..

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[2]   Scope 1 (direct emissions from owned or controlled sources) and Scope 2 (indirect emissions from the purchase and use of electricity, steam, heating and cooling).

Impact - lower energy consumption, lower emissions and greater efficiency

The solutions implemented in the *net zero 5G site* in EXPO City in Dubai have reduced the energy consumption of the base station from 136kwh/day to 105-110 kwh/day, improving the energy efficiency by to 20%-25% (assuming the traffic remains the same), according to e&. Those reductions will avoid 26 tons of CO_2 emissions per year.

The combined positive impact of the *End-to-End Green Zone* project and the modernisation across all sites of the EXPO City on the natural environment.

Wider implications - a template for other operators

In the future, e& plans to duplicate the *End to End Green Zone* solution across its whole UAE network, as well as sharing the project through the new telecom operator innovation hub. The innovation hub acts as a single point to coordinate efforts between solutions providers and operators. As well as providing an open network for live testing of new concepts, the hub will share the results of proofs of concept (PoC) with GCC operators. The hub also intends to work with the GSMA and other international organisations to share the results from successful tests with telecom operators outside the GCC.

"Although we are a group companies competing on the ground, we have decided to work together and unify our efforts in order to support a noble cause, which is supporting the United Nations and Paris

Agreement on climate change," says Mohamed Al Marzooqi, SVP Access Network at e&. "The Innovation Hub for Power Solutions has been established with a clear set of objectives aimed at revolutionising the telecom industry's approach to energy consumption and sustainability. The hub will foster a collaborative environment where telecom operators, technology providers, and research institutes can share knowledge, resources, and expertise, driving the development of innovative power solutions tailored to the specific needs of the telecom industry."

Equipped with state-of-the-art facilities for prototyping, testing, and validating innovative power solutions using GCC telecom networks, the hub will accelerate the development cycle and ensure the effective implementation of new technologies within the industry, according to e&. Recognising the importance of skilled professionals in driving innovation, the hub will also offer training programmes and workshops to enhance the competencies of individuals involved in the design, installation, and maintenance of power solutions within the telecom sector.

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Mohamed Al Marzooqi - SVP Access Network at e&

About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

For more information, please visit the GSMA corporate website at gsma.com

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About the GSMA Foundry

The GSMA Foundry is the go-to place for cross-industry collaboration and making positive change happen, supported by leading technology organisations and companies. By bringing together members and key industry players, engaging, and unifying the end-to-end connectivity ecosystem, the GSMA is solving real-world industry challenges.

Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. This enables the mobile industry's mission: to connect everyone and everything to a better future.

Find out more, or submit a new project idea, at gsma.com/Foundry

About Etisalat

e& is one of the leading technology groups in the world. Boasting impressive financial figures for 2022, with consolidated net revenue reaching a staggering AED 52.4 billion and consolidated net profit surging to AED 10 billion, the Group's impeccable credit ratings reflect its strong balance sheet and track record of sustained success.

Founded in Abu Dhabi over 47 years ago, the Group has a rich legacy as the pioneer in telecommunications in the UAE. Today, its footprint spans 16 countries across the Middle East, Asia, and Africa, making it a leading player in the industry.

Innovation is ingrained in e&'s DNA to create an unbreakable bond between communities using cutting-edge digital solutions, smart connectivity and advanced technologies.

The Group has designed five strong business pillars that address various customer segments: etisalat by e&, e& international, e& life, e& enterprise and e& capital. Through these pillars, we strive to revolutionise the way people communicate, work and live by providing unparalleled services and exceptional experiences.

At e&, we are committed to pushing the boundaries of what is possible and delivering measurable results that make a difference in people's lives.

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