Operators are pursuing sustainability targets by moving from legacy networks and adopting AI/ML solutions

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Sustainability continues to be a leading concern in the telecoms industry in 2023. Analysys Mason recently attended the **RCR: Live** and **FutureNet** conferences in London, where the subject of sustainability was a significant topic. Operators including **Deutsche Telekom**, **Orange** and **Swisscom** outlined their latest energy-saving results and sustainability programmes. These programmes are motivated by a combination of ethical-based concerns about climate change and economic concerns due to rising energy costs.

Operators are focusing on two areas in their sustainability efforts: a move away from inefficient and power-draining legacy networks and transport systems, and the adoption of artificial intelligence (AI) and machine learning (ML) solutions to automate networks to reduce inefficiencies and improve network performance.

Operators outlined numerous sustainability projects that are driven by a combination of ethical and economic concerns

Numerous operators and vendors used RCR: Live and FutureNet to outline their approach to sustainability, including their successes so far and their long-term targets. Some notable examples include the following.

- **Elisa** claims to have reduced electricity consumption on the mobile side of its business by around 80% since 2016 and is targeting a further 20% reduction by 2024.
- **Swisscom** says it has reduced energy consumption by 80% in the last two decades and is targeting an additional 10% by 2025. It also claims to use 100% renewable energy.
- **Orange** reported that it is on track to record a 30% reduction in scope 1 and scope 2 emissions from 2015 levels by 2025. **Orange** aims to reduce scope 1, 2 and 3 emissions by 45% between 2020 and 2023, and is aiming for a net-zero target for carbon emissions by 2040.
- **Deutsche Telekom** is aiming to keep energy consumption at 2020 levels, despite expecting the volume of data to double.

Operators and vendors have two main motivations for pursuing sustainability-related strategies. The first is based on concerns about the ever-developing climate emergency. A growing number of operators and vendors acknowledge that as essential service providers, the telecoms industry has an ethical responsibility to become more sustainable. These ethical strategies are also driven by operators' wishes to address the concerns of shareholders and customers. The second motivation relates to economic concerns about rising energy costs and economic uncertainty in Europe. By pursuing sustainability projects that reduce energy consumption, operators can cut rising energy bills. **Vodafone** and Hutchison 3G UK (**Three UK**) acknowledged that ethical and economic considerations are key drivers of sustainability, and that both factors contribute to the industry's growing interest in sustainability.

Operators will pursue sustainability by decommissioning legacy networks and transport systems to reduce energy consumption

One of the central focuses of operators' sustainability plans is a move away from legacy networks and equipment. Legacy networks such as 2G and 3G are inefficient and have high levels of energy consumption despite low customer usage, with most customers now connected to 4G and 5G services. Analysys Mason estimates that early decommissioning of 3G can reduce mobile energy consumption by around 10%. At FutureNet, **Vodafone** announced that it would begin to switch off its 3G network in June 2023 (Figure 1), and other operators such as **BT** and **Orange** similarly announced their intention to decommission legacy networks.

Figure 1: Examples of planned and completed decommissioned 2G and 3G networks, worldwide

Operators	Decommissioned networks
AT&T (USA)	2G: January 2017 3G: March 2022
Bell (Canada)	2G: June 2018 3G: planned for December 2025
Cosmote (Greece)	3G: March 2022
Deutsche Telekom (Germany)	3G: June 2021
Elisa (Finland)	3G: planned for 2023
NTT Docomo (Japan)	2G: March 2011 3G: planned for March 2026
SK Telekom (South Korea)	2G: July 2020
Swisscom (Switzerland)	2G: April 2021
Telstra (Australia)	2G: December 2016 3G: planned for June 2024
TIM (Italy)	2G: planned for 2029 3G: December 2022
Two degrees (New Zealand)	2G: March 2018
Vodafone (UK)	3G: planned for June 2023

Source: Analysys Mason

Operators mentioned other initiatives to modernise different aspects of legacy networks and transport systems. For example, **Vodafone** mentioned moving towards software-defined networks and several operators, including **BT,** committed to moving from non-standalone 5G networks to standalone (SA) 5G. 5G SA is expected to be more sustainable because its cloud-based core will allow increased scalability and controlled consumption of energy, minimising energy waste. Additional options for operators include the move from inefficient copper to fibre fixed services, as mentioned by **Orange** and **Telefónica. Telefónica** plans to have achieved this in Spain by April 2024, but these transformations are typically hindered by regulation. **Swisscom** also discussed a potential transition from air-cooled to liquid-cooled base stations, although this is constrained by technological complexity. While operators and vendors are attempting to make their networks more energy efficient, there are still numerous issues including cost, regulation and complexity that constrain widespread adoption of more sustainable technologies.

AI, ML and automation within networks can improve efficiency and performance to improve the sustainability of operators

The first step in the adoption and use of AI and ML to improve the efficiency of networks is effective data collection and monitoring, as acknowledged by **Deutsche Telekom** and **Swisscom** at FutureNet. **Swisscom** introduced data monitoring in its data centres in 4Q 2022 to measure efficiency, while **Deutsche Telekom** is similarly focusing on collecting the correct type of data to fully inform AI and ML analysis. This analysis will allow **Deutsche Telekom** to plan its capacity and architecture before optimising network operations to become more efficient and sustainable. **Nokia**, **Picocom** and **Vodafone** discussed similar use-cases for AI- and ML-based traffic management within the RAN to increase efficiency and network performance.

Sustainability continues to be a key focus of operators in 2023, as they begin to move away from legacy networks and equipment and increasingly automate their networks with AI and ML. At present, discussions around sustainability seem to be a central part of long-term planning in the telecoms industry. It will be interesting to observe whether this focus will remain when energy prices and the world economy begins to stabilise, and the economic, cost-saving motivations behind sustainability begin to diminish.