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Reducing the Carbon Footprint of Network Construction

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Navigating competitive markets, tackling interest rates and build costs, and increasing subscriber uptake are some of the key challenges facing network operators and internet service providers (ISPs).

Yet sustainability is rising fast as a priority for many telcos, with many having ambitious targets to decarbonize their operations. Besides their targets, much can still be practically done to cut Scope 3 emissions, which account for the bulk of telecom businesses' carbon output. There's a real business case for this.



Cutting cable waste, for example, can have a knock-on effect on overall costs, the long-term sustainability of network builds, and customer perception of an operator's business. Innovative, collaborative, and forward-thinking initiatives must be prioritized as operators look to grow or build new networks

Rolling (out) with the times

In the UK - and the rest of Europe - targets have been set to reach universal gigabit connectivity by 2030. However, this ambition has faced growing scepticism over the past couple of years. With the fiber sector predominantly debt-financed, high interest rates have made it harder to finance expansion, innovation, and operational growth. Alongside this, inflation has increased operational expenditures and the cost of materials, as well as consumer purchasing power. Energy prices, regulatory considerations, and a more competitive environment have also affected the ability of many operators across Europe to expand.

It is not all doom and gloom, of course - the most recent figures from fiber-to-the-home (FTTH) Council Europe's Market Panorama show that incredible progress has been made across the continent to connect customers. Based on Panorama figures, [ING estimates](#) that "93 percent of European (EU-27 and UK) households will have fiber coverage in 2028". It also notes, however, that much work needs to be done. One way to help is by cutting costs (Figure 1 on next page).

A significant - and costly - challenge that large-scale fiber-to-the-home (FTTH) deployments face is cable waste. Inefficient stock management and installation processes lead to significant material losses, with some industry reports indicating a 10 percent average waste rate. This not only strains

the supply chain but also increases costs and undermines the environmental benefits of fiber broadband. By focusing on sustainability in this manner, it can help reduce energy consumption, minimize waste, and optimize processes.

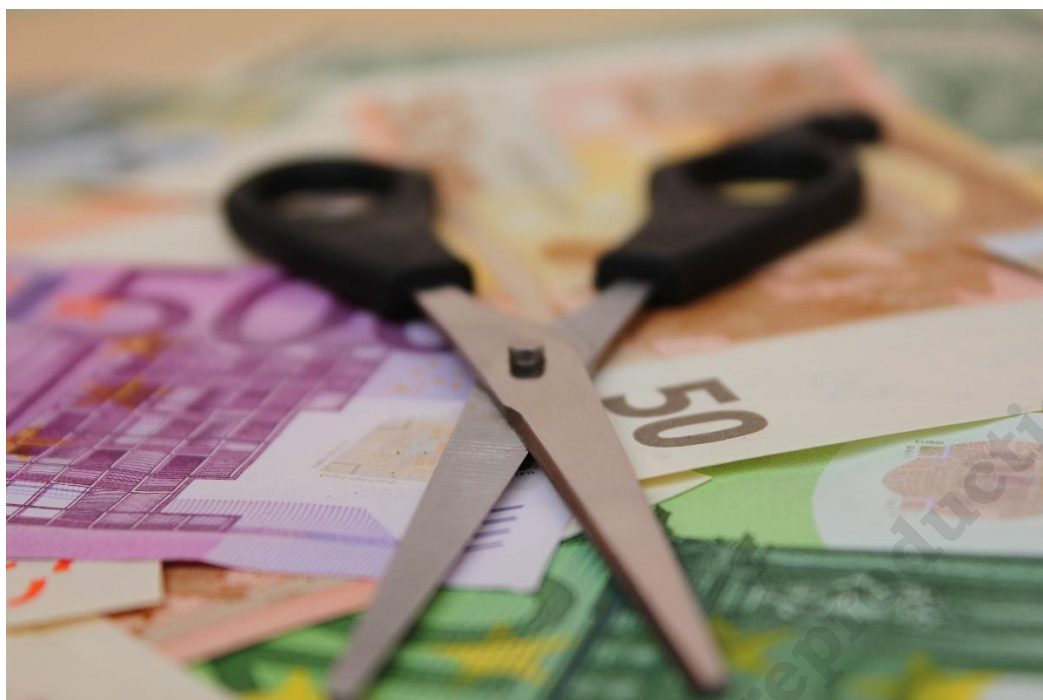


Figure 1: Could fiber network builders cut costs with better cable management?

Credit: Freemages.com/svklimkin

The lack of real-time visibility in network deployment processes has been identified as a major contributor to this issue. Without accurate tracking, network builders often overorder cables to prevent stock shortages, leading to surplus inventory that is difficult to utilize at the end of the project. Conversely, underutilized inventories result in unnecessary production, further exacerbating resource inefficiency.

Beyond deployment inefficiencies, improper disposal methods add to the problem. Landfills are increasingly burdened with non-recyclable telecommunications waste, leading to further ecological consequences. There's also increased pressure from customers and regulators to decarbonize.

Regulations and expectations

Earlier this year, a Digital Connectivity Forum (DCF)-led [announcement](#) with 10 of the UK's biggest broadband and connectivity providers (including BT-Openreach, CityFibre, VMO2, Sky, and Vodafone) said that they would write to their suppliers encouraging sustainability reporting and implementation of standards as part of their efforts to reach climate goals. While the directive was non-binding, it signalled a growing appetite in the country for greater responsibility amongst suppliers to show a commitment to tackling emissions.

Scope 3 emissions - those produced indirectly by a company's supply chain - are often the hardest to track and tackle, yet account for [more than 80 percent](#) of operators' emissions. Under current UK law, Streamlined Energy and Carbon Reporting (SECR), Scope 3 emissions reporting is primarily voluntary for quoted companies, but strongly recommended. Since last year, the European Union has made corporate sustainability reporting compulsory through its Corporate Sustainability Reporting Directive (CSRD) law (by 2026, this will be extended to small and medium enterprises).

The telecoms industry has become more sustainable in recent years thanks to the retirement of copper and the introduction of fiber optic cabling. Using up to [80 percent](#) less energy, fiber optic cables are longer-lasting, less consuming, and have a higher bandwidth. It is also worth remembering that despite connecting over [95 percent](#) of the world's population over wired and wireless networks, it was only directly responsible for only about [1.6 percent](#) of global emissions a couple of years ago. Though there is

still room to improve, [McKinsey & Company](#) says that while some companies have made progress on emissions from their operations (Scope 1) and those from the energy they use (Scope 2), “few have squarely taken on the much more challenging emissions from their value chain (Scope 3)”. It says that they should focus on major sources of Scope 3 emissions, such as sources of network equipment, and construction materials, as well as the services provided by third-party companies that build and operate telecom networks.

For the fiber industry to approach both the financial, regulatory, and market pressures to become more sustainable, working collaboratively will be key.

Sustainable growth through collaboration

As the FTTH Council Europe [Sustainability Committee](#) Chair said, as operators aim to reduce their suppliers' Scope 3 emissions (scope 3), there is an opportunity “to start sustainability projects with each other so that there is a win-win situation for both parties”. Likewise, McKinsey's [report](#) says that “telecom operators cannot decarbonize their Scope 3 emissions on their own—they will need to partner with their suppliers and customers on these efforts.”

Collaborating with partners throughout the value chain provides access to innovative technologies, forward-thinking programmes, and knowledge on cutting emissions. For example, FTTH Council Europe has launched initiatives such as the Eco Platform. This allows companies to share environmental, social, and governance ([ESG](#)) [best practices](#), build a database of detailed carbon intensity information for all products - essential for precise Scope 3 reporting - and offer preferential access to consultant services and a dedicated tool for organisations measuring their carbon emissions for the first time.

Solutions such as real-time tracking, optimized inventory management, and stronger recycling incentives have emerged as tactics for minimizing environmental impacts while ensuring a more efficient fiber rollout. For example, the fiber sector has developed digital solutions capable of enhancing stock management and optimizing fiber rollout strategies. Real-time tracking and smart logistics are playing a crucial role in minimizing waste, ensuring that network builders only use what they need, when they need it. These digital tools also help operators comply with the aforementioned sustainability regulations that have become stricter in recent years.

Innovation is key

One of the most promising innovations in this space is the digitization of the cable unwinding, which enables precise monitoring of drum and cable usage and allows operators to track fiber resources with an accuracy of one meter. The integration of Quick Response (QR)-based tracking (Figure 2) is helping FTTH network builders cut fiber waste by 50 percent or more, for example, ensuring that excess material is repurposed rather than discarded. Many tracked drums are thus returned to the warehouse for future use. The result: cable drum management becomes more efficient, facilitated by digital tools, allowing companies to recover value from unused materials, reducing financial losses and environmental footprint.

Industry testing has already demonstrated the potential of these smart tracking systems. By implementing real-time visibility tools, operators can significantly reduce overordering and

improve the utilization of existing stock. Digital solutions also enable companies to predict stock requirements more accurately, avoiding unnecessary production and reducing emissions linked to manufacturing and transportation.

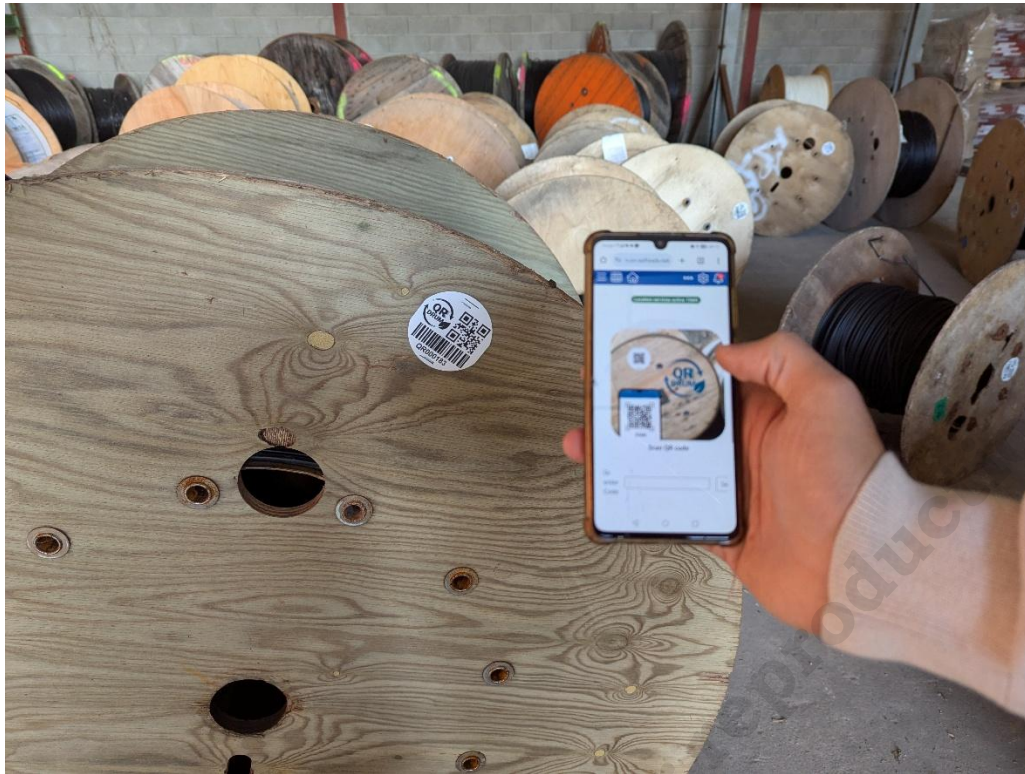


Figure 2: QR-code cable drum tracking in action. Credit: ACOME Group

Beyond digital tracking, several telecom companies are exploring recyclable alternative materials for fiber optic cables. These efforts are part of a larger movement toward a circular economy, where materials are reused rather than disposed of.

Not just an option, but a necessity

Sustainability in broadband infrastructure is no longer an option—it is a necessity. Telecoms companies - as publicly traded, consumer-facing, for-profit companies - can benefit from improving sustainability as it can help comply with regulations, attract subscribers, and strengthen financial performance. The shift to fiber networks presents a valuable opportunity to reduce environmental impact, but only if resource management is optimized to minimize waste and a circular economy is adopted. By leveraging smart tracking solutions, digital tools, and industry collaboration, network builders and operators can improve their sustainability - both environmentally and financially.