TXO

Whitepaper

Debunking Telcos' Circular Economy Myths

Why being sustainable is good for the environment & good for business

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Contents

Executive summary

The circular economy offers businesses across the globe a myriad of benefits: from reducing their carbon footprint and decreasing their reliance on raw materials to delivering efficiencies and value savings throughout their business and supply chain. But despite these benefits, only 8.6% of the world economy is circular[1] which means that less than 10% of materials used in a year are reused and then recycled.

This comes at a time when environmental pollution is at the highest it's ever been[2] and the earth is set to reach a temperature rise of 1.5°C in around a decade.[3] However, many polluting industries are still not showing enough motivation or action to change. The Information and Communications Technology (ICT) industry is one of them, currently producing double the global CO2 emissions of civil aviation, at 3-4%. However, with global data use increasing by around 60% per year this contribution is forecast to grow to 14% of all CO2 emissions by 2040, according to the Boston Consulting Group's (BCG) 'Telco Sustainability Index.'[4] So while the industry grows to accommodate the increased demand for bandwidth, it now requires much more power which in turn generates a higher level of CO2 emissions.

For the telecoms industry, the issue of sustainability is urgent. This is due to significant growth from rapid technological changes in network infrastructure due to customer demands for high-speed connectivity, exacerbated by the pandemic. This infrastructure, in many cases, requires new equipment, putting a strain on the world's raw materials, and also demanding more power due to network densification. While some operators have bucked the trend and joined the circular economy to reap the financial and environmental benefits of buying and selling refurbished or repaired equipment, we still have a long way to go, with four in ten operators admitting to being behind on their environmental targets.[5]

However, the industry offers huge potential for change, with BCG estimating[6] that more action by the ICT industry, i.e. adopting the circular economy, could eliminate up to 15% of all global emissions by 2030. This is more than a third of the total emissions reductions needed to meet global sustainability targets as outlined by the Paris Agreement.

In fact, operators are starting to make good progress. According to the GSMA's 'Mobile Net Zero: State of the Industry on Climate Action 2022' report, 50 operators representing 63% of the industry by revenue and 44% by connections, have committed to rapidly cutting their emissions over the next decade.[7]

[1] www.renewablematter.eu
[2] www.ipcc.eh
[3] www.theconversation.com
[4] www.bcg.com
[5] www.edie.net
[6] www.bcg.com
[7] www.gsma.com

But to understand how the telecoms industry could achieve greater circularity and fulfil the potential outlined by BCG, we conducted research among global operators to find out their awareness of the circular economy, the perceived benefits and barriers, whether myth or fact and how we can collectively overcome them.

"The circular economy is a critical step towards reducing greenhouse gases and creating a resilient, net-zero world in line with the 2050 targets set out in the Paris Agreement. In our current economy, we follow a linear process of taking raw materials and then making disposable products from them which are eventually thrown away as waste. However, this approach isn't tenable.

"As the climate crisis worsens, we need global industries to urgently embed the circular economy in their climate strategies and make smart decisions about how to design and sell products and services. For the telecoms sector, the circular economy offers a huge opportunity for operators to reuse and recycle existing equipment to reduce their carbon footprint, minimise waste, reduce costs and ease pressures on supply chains.

"But we are reliant on businesses around the globe changing their mindset and adapting their business models to join the circular economy. Only then, do we have any chance of eliminating global emissions, tackling climate change and creating a better future for business and society."

Darren Pearce, Group CEO, TXO

Industry overview

What is the circular economy and how can telcos access it?

The European Parliament defines the circular economy as "a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible."[8]

What this means is that the circular economy keeps products and materials in the economic system for as long as possible by extracting the most amount of value from them. This reduces the number of new products that need to be manufactured and so minimises the environmental impact.

There are two main ways that operators can access the circular economy:

1. **Demand side:** Operators that want to source pre-owned equipment because they need resilience in their network from parts that are no longer available from OEMs, or they want to source an alternative to buying new.
2. **Supply side:** Operators that want to resell or recycle old equipment so they can generate revenue and save space and resources. To resell, they'd work with a specialist intermediary to source a buyer and manage the sale.

To support the supply side, operators need to gain a clear understanding of what's in their network and warehouse. Many operators have equipment that hasn't been catalogued, tracked or added to inventories which could be reused, resold or recycled. Operators also have a lot of old equipment within their network, using up power, that could otherwise be added to the circular economy. Getting a complete end-to-end understanding of their inventory is one of the most important first steps for operators that want to join.

While the circular economy needs a balance of operators engaging on both the demand and supply side, we haven't reached this point yet, with the current model looking more like a 'semi-circular economy.' There are three reasons for this:

1. **Many operators shy away from buying refurbished equipment:** They tend to have the cultural mindset that new equipment is much more reliable and of higher quality. While changing this mindset isn't going to happen overnight, mobile operators have already had success using the circular economy model with mobile phones, so expanding this approach to network equipment is an obvious next step.

[8] www.europarl.europa.eu

2. **Altnets and smaller operators dominate the demand side:** As alternative network operators (Altnets) and smaller operators are building networks for the first time and have smaller budgets, purchasing refurbished equipment is more attractive because it's cheaper. They're also lower down the priority list for OEMs, so buying new equipment often means longer wait times.
3. **Larger operator groups often believe they can't buy pre-owned:** They tend to focus more on re-selling or recycling their old equipment to generate additional revenue. The reason is that many are hesitant, confused or unsure how to buy refurbished equipment due to being tied into Service Level Agreements (SLAs) with the major OEMs. But once they reach the end of their SLAs, they have the opportunity to embed the circular economy into their purchasing strategy.

As the circular economy is a growth market, not many operators are buying pre-owned equipment, as well as refurbishing or recycling their old equipment. Yet, despite this imbalance, many consider the circular economy to be a business imperative. According to our research, nine in ten operators (90%) believe the circular economy is important to their organisation and 89% say it's part of their current business strategy, rising to 94% over the next five years.

These plans are beginning to translate into action with some fixed line network operators investing in repaired or refurbished equipment in their network:

- 50% say that power equipment is the area they're currently using the most repaired and/or refurbished equipment and for 38% it's their core network.
- Half of the respondents say the most commonly replaced items are power modules and half say transceivers / small form-factor pluggables (SFPs).

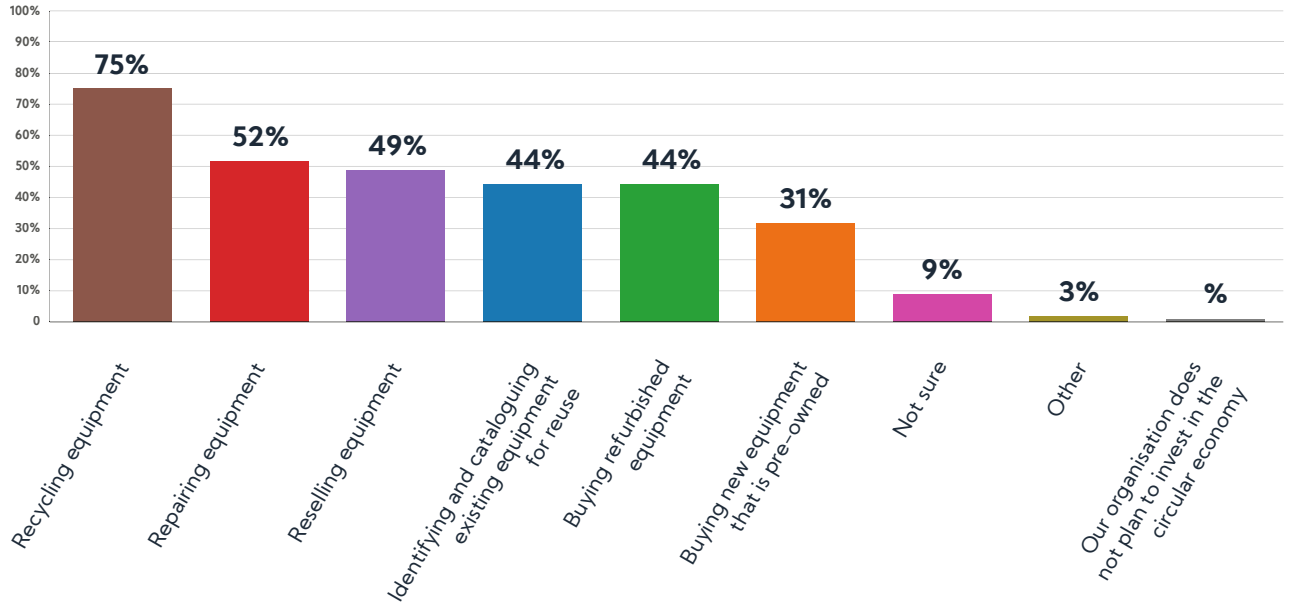
> "Many companies who are tied into SLAs with OEMs need to review and update their contractual and commercial agreements. This would free them up to start buying refurbished products."
>
> **Research respondent**

For mobile network operators, it's slightly lower:

- Just over a third (36%) say they're using repaired or refurbished equipment in their core network and 27% are using it in power equipment.
- 41% say basebands and radio modules whereas 45% say batteries, rectifiers and power equipment are the items being replaced most frequently.

Over the next five years, the appetite for investing in refurbished equipment and recycling is set to increase but at different rates. While nearly three quarters (75%) say they'll recycle equipment, only 44% of operators plan to buy refurbished equipment. This disparity indicates that the 'semi-circular economy' could last longer than we'd like. Furthermore, only 52% say they'll be repairing equipment, 49% will resell it and 44% will work with a specialist intermediary to catalogue existing equipment for reuse over the same period.

Over the next five years, telecom operators plan to invest in the above areas of the circular economy



To fulfil the potential of the circular economy and reduce our carbon emissions, we need to get to a point where operators and tier 1 OEMs buy refurbished equipment as well as refurbish, resell or recycle their existing equipment. To achieve this, we need the industry as a whole to step up and join the circular economy on both the demand and supply sides.

Case study: Telia Company[9]

Acting sustainably is all about implementing circular economy practices. Telia Company believes in the important role that collaboration plays in creating solutions that accelerate the transition to circularity and enhance sustainability.

The circular economy is based on three principles: designing out waste and pollution, keeping products and materials in use and regenerating natural systems. At Telia Company, not only does it provide the backbone of the digital society in the Nordics and Baltics, but it's also embracing sustainability at the heart of its purpose and strategy. The company partnered with TXO to help its business adopt circular practices and achieve incredible environmental and business results.

Its focus is working towards a zero-waste goal by supporting the continual use of resources. This means adopting TXO's circular economy services, which include:

- Identifying, testing and repairing equipment for internal reuse.
- Sourcing and refurbishing pre-owned products for spares and new deployments.
- De-installing surplus items and selling them to other operators.
- Turning to WEEE recycling as a final step in the process.

To provide local sustainability, TXO has established an operational hub in Sweden to serve Telia Company and the Scandinavian region.

"Sustainability is at the core of what we do and partnering with TXO has really helped us demonstrate what becoming circular means in practice" said Simona Vitėnė, Telia Company's Business Development Manager. "What's more, the revenue generated provides an incredible opportunity for us to integrate sustainability even deeper into our business strategy."

David Evans, TXO's Head of Asset Recovery and Services, said, "We love partnering with our customers to support the circular economy at the same time as helping our clients minimise their carbon footprint and maximise financial returns from the green market. At TXO, we're here to help make your sustainability goals a reality."

[9] www.gsma.com

What are the benefits of joining the circular economy?

1. Lowering carbon emissions

The number one benefit of joining the circular economy is lowering carbon emissions. The majority of operators (72%) agree with this and 67% of operators expect to reach net-zero carbon emissions by 2040, 44% by 2030s and 23% this decade.

Despite this optimistic outlook, almost every major company in the telecoms sector now has a net-zero target with a deadline of 2050, according to BCG[10]. But while some operators have committed to an earlier target, like Vodafone,[11] which is aiming for net-zero for its operations by 2030, and 2040 for its full carbon footprint, the wider industry target of 2050 is too late. Operators need to take more action earlier.

And there is no excuse for delay. With operators shutting down 2G and 3G networks in the US, UK, and other countries such as France, Spain and Belgium,[12] as well as replacing copper with fibre, legacy operators will have a lot of old equipment going spare that can be refurbished and resold. It, therefore, makes business sense to re-sell it and generate additional income, while encouraging global reuse.

2. Overcoming supply chain challenges

As many of the world's major OEMs face supply chain challenges due to the pandemic, security concerns over China and the Ukraine conflict, new equipment is taking longer to source.

In fact, the delays are so severe that 72% of operators we spoke to think supply chain challenges will be a problem for network deployments over the next year. However, the silver lining is that 84% of operators believe the circular economy can help solve these supply chain challenges and accelerate network deployment. 31% also say that one of the benefits of joining the circular economy is easing reliance/pressure on supply chains.

This is just as well, given the pressure that operators are under to extend connectivity and meet government targets for 5G and fibre network deployments.

[10] www.edie.net
[11] www.vodafone.com
[12] www.fiercewireless.com

In developed markets, there's a race to roll out 4G, 5G and fibre to the X. In the UK, for example, 2G and 3G networks are set to be phased out by 2033 as part of new plans to increase the capacity of the nation's 5G coverage. The UK government has also pledged to deliver gigabit broadband to 85% of Britain by 2025 of which the BT Exchange closure programme can both help and hinder this making Physical Infrastructure Access (PIA) more available but dark fibre access (DFA) and Ethernet Backhaul Direct (EBD) more costly for Altnets. Whereas, in developing markets, like Africa, they're still focused on rolling out 3G networks and to a lesser extent 4G and 5G.

Governments are also incentivising operators to accelerate 5G and fibre network expansions. In Italy, the EU has approved a scheme for boosting 5G and fibre networks[13] which will run until June 30, 2026, with allocated funds of 2 billion euros ($2.14 billion). As there are only four years left to qualify for the investment money, the pressure is on for operators to source the right equipment and build out their network in time.

Since most operators across the world rely on major OEMs for new equipment to extend or modernise their infrastructure, despite the best intentions of the government, service providers are still at the mercy of the OEMs and their supply chains. However, this reliance can be negated by accessing the circular economy and buying pre-owned equipment to overcome the long waiting times for buying new. It can also help accelerate network roll-out in line with government targets.

3. Reducing costs

While operators are under pressure to upgrade their networks, they need to do it cost-effectively. 57% of operators believe that joining the circular economy can help reduce costs.

This is a priority for Altnets, who are emerging as an alternative to the major operators but don't have the same purse strings.

Aside from cost saving through buying refurbished equipment, operators can make additional revenue by re-selling old equipment that is no longer in use or rarely used, and so wastes power. This approach enables them to significantly reduce their CAPEX by offsetting revenue generated against purchases of new equipment. OPEX can also be reduced by eliminating warehousing costs of obsolete inventory.

[13] www.rcrwireless.com

Cost saving through buying refurbished equipment also enables operators to quickly take advantage of government initiatives such as the French government's[14] new procedure for assigning 5G frequency licences, at a fixed price of 350 million euros ($386 million) for a bloc of 50 MHz, and 70 million euros for an additional bloc of 10 MHz. In return, operators have strong obligations to deploy their network across the French territory.

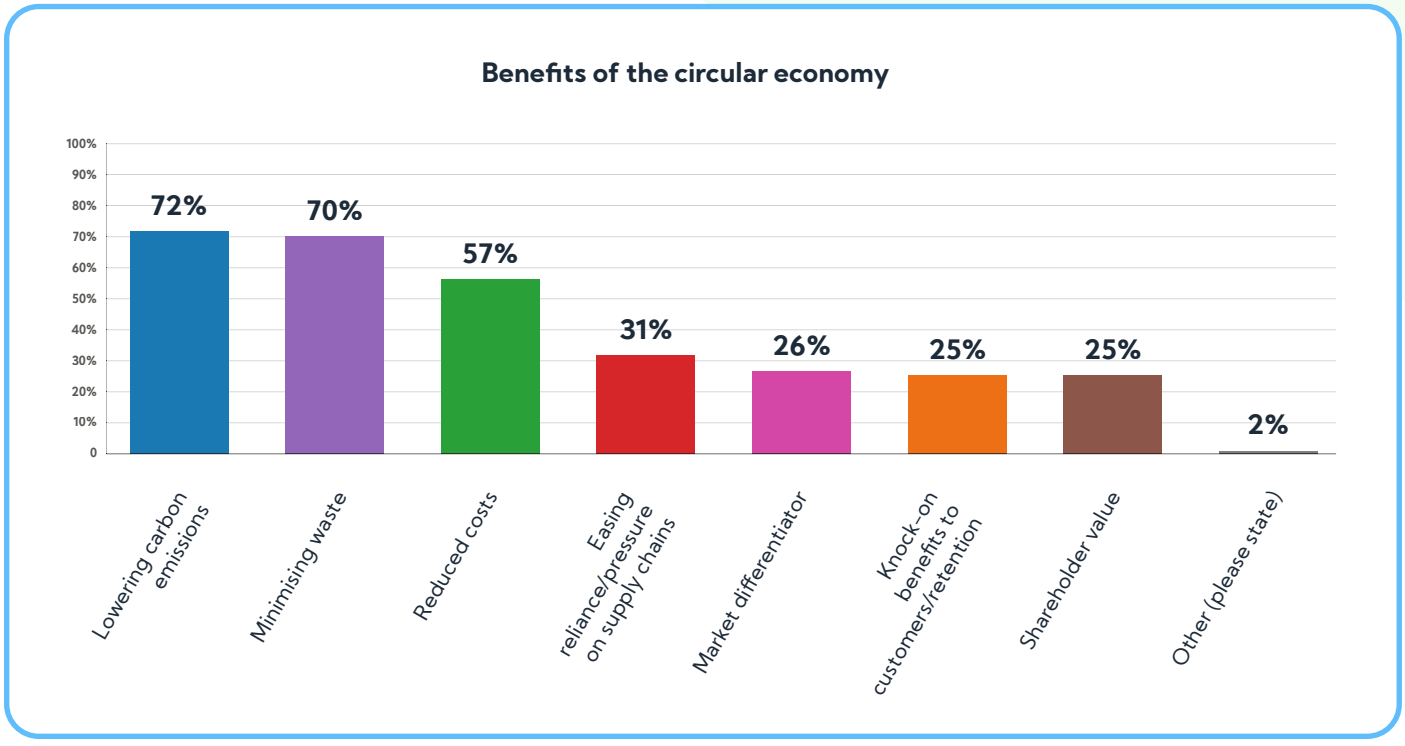
4. Minimising waste

70% of operators believe joining the circular economy offers huge advantages by minimising waste. While mobile operators have already successfully recycled a huge volume of mobile phones as part of the circular economy, expanding their recycling capabilities to include network equipment is a natural next step.

However, waste is still a big problem for the industry. The GSMA estimates that around 50 million tons of e-waste[15] is produced every year, a figure that continues to rise. E-waste is electrical or electronic devices either discarded or reaching the end of their useful life. If e-waste isn't recycled, it goes straight to landfill and is hugely damaging to the environment.

Additional benefits

26% of operators consider 'market differentiation' as an advantage to joining the circular economy, with a quarter (25%) saying, 'knock-on benefits for customers/retention' and the same number saying, 'shareholder value'. This indicates that some believe joining the circular economy improves your reputation among customers by being seen as 'doing the right thing' as well as giving you a competitive advantage.

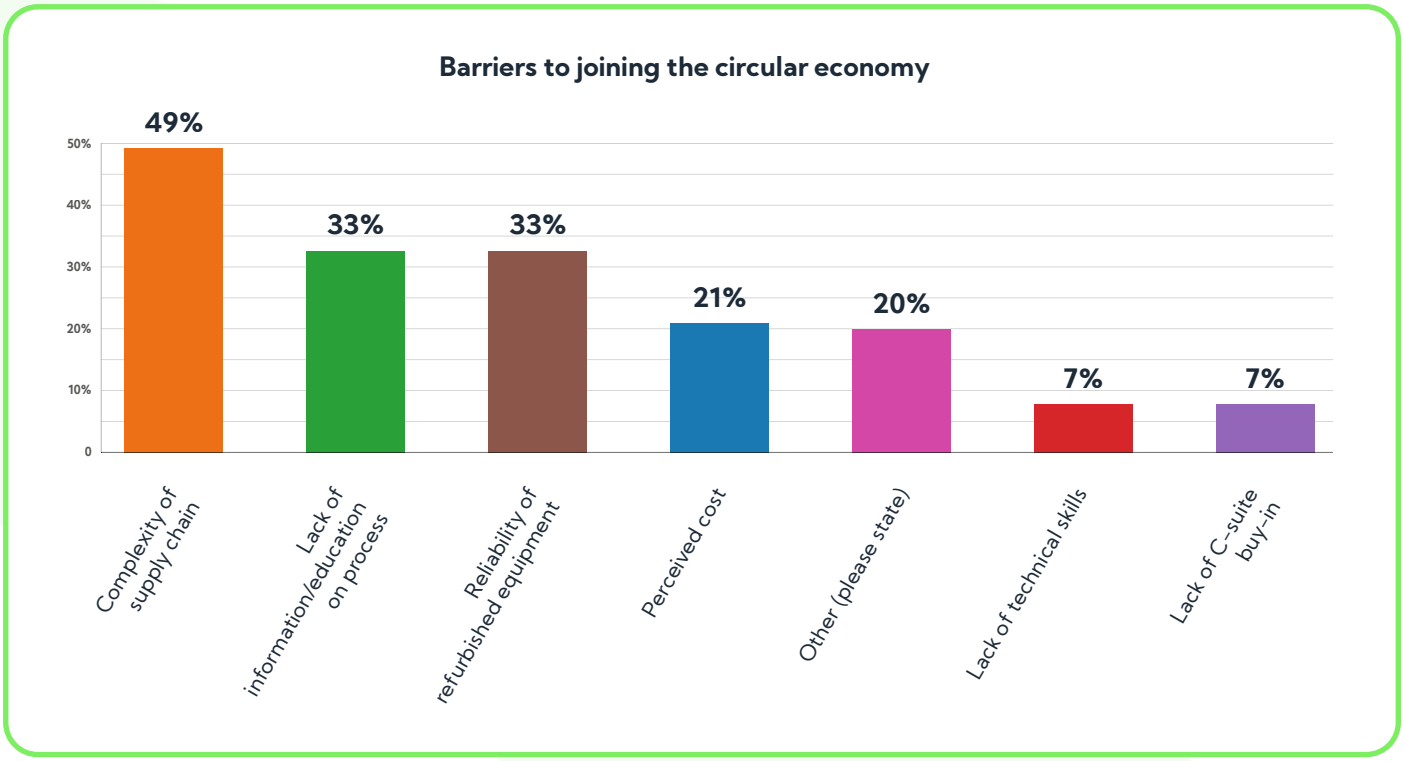


[14] www.reuters.com
[15] inform.tmforum.org

So, what are the barriers?

While there are many benefits to joining the circular economy, operators we spoke to cite four main barriers:

1. 33% are concerned about the reliability of refurbished equipment, believing it is less reliable and less efficient.
2. 49% cite the complexity of supply chains, thinking it takes too long to source refurbished equipment in comparison to ordering new.
3. 21% see perceived cost as a barrier. Refurbished equipment is viewed as being more expensive than new.
4. 33% think there's a lack of education/information, indicating they're unsure how to join.



Debunking the myths

But if we break them down and reflect on the benefits discussed in the previous chapter, these barriers are myths. Here's why:

MYTH 1. Refurbished equipment is unreliable and less efficient

This statement is incorrect. If you work with a reputable partner products will go through a rigorous screening and/or testing process before being sold and typically have a minimum one year warranty. Also, refurbished equipment often comes from a live working environment, proving that it's as reliable and efficient as new equipment.

MYTH 2. Refurbished equipment takes too long to source

This statement isn't true. The circular economy supply chain usually has a shorter lead time. As the world's major OEMs face supply chain challenges, new equipment is taking a lot longer to source. Buying refurbished equipment solves this problem by having shorter wait times but also enables operators to acquire parts that are no longer produced or supported by OEMs.

Some equipment required by operators can be relatively niche and difficult for companies within the circular economy to source. It's therefore important that operators start to plan for what equipment they will need one or two years down the line and start feeding that information into equipment suppliers within the circular economy. Likewise, on the supply side, operators need to conduct inventories of existing equipment to identify what can be resold or recycled. To achieve this, there needs to be effective provisioning and information sharing by the operators, with an increased ability to store and ship on-demand, through using the best-in-class circular economy solutions providers.

MYTH 3. Buying refurbished equipment is more expensive

This statement is a myth. Refurbished network equipment offers significant cost savings while providing the equivalent functionality and reliability to buying new. Aside from the environmental benefits, cost saving is usually the primary reason for buying refurbished equipment, as it can significantly reduce your capital investment.

MYTH 4. The circular economy isn't accessible enough

While operators claim there's a lack of education and information about the circular economy, this could be considered a myth. Organisations such as TXO and the Ellen MacArthur Foundation are committed to building and promoting the circular economy and regularly provide content on the benefits and how to join. So, operators who find the circular economy less accessible are probably less proactive and less willing to source the right information, learn about the benefits and prioritise joining.

> "The most important thing my company can start doing to support the circular economy is to break the procurement supply chain perception that new is the only way to go. Refurbished equipment is just as good as new."
>
> **Research respondent**

Conclusion: Telcos' future in the circular economy

As businesses around the world confront the issues of climate change and carbon emissions, it's become clear that we need to urgently shift from awareness to action. While moving to the circular economy requires all sectors to transform their business models, it's particularly important for telecom operators due to the sector's critical role in our increasingly connected world.

Furthermore, as operators face pressure to upgrade their networks to meet internal and government targets, the circular economy enables them to accelerate network roll-out as well as reduce their carbon footprint, minimise waste, reduce costs and ease pressures on supply chains. This is while ensuring uptime is maintained to meet the capacity demands of customers who expect to be able to access content and rich media / high bandwidth activities such as video streaming, gaming and video conferencing on-demand.

The circular economy also helps operators to demonstrate their sustainability efforts and strengthen their triple bottom line by measuring the impact on their stakeholders (people), impact on the environment (planet) and impact on the local and international economy (profit).

But despite high market awareness of the circular economy, penetration among operators is still fairly low due to the OEMs' lack of acceptance and willingness to join the circular economy, as well as misleading myths. Encouraging OEMs to change their mindset, and debunking these myths are key steps we need to take to encourage more operators to give refurbished equipment the same consideration as new in business proposals and urge more players to reuse, repair, refurbish and recycle. Only then do we have any chance of achieving a greater circularity in telecoms and reaching our sustainability targets.

About TXO

TXO is the world's leading provider of critical telecom network hardware and asset management services. With close to one million parts, our huge stock of multi-vendor networking equipment sets us apart from the rest. Through a combination of our products and services, we can enhance your productivity and secure the future of your telecom operation. Additionally, we design solutions specifically tailored to your business and using our extensive product knowledge, help with the maintenance and progression of your telecom network.

We also provide asset recovery solutions for our clients across a wide variety of disciplines, such as telecoms, data centres, utilities, oil, gas & renewable energy and civil, government & critical comms. Here our goal is to support your company to achieve its sustainability targets while maintaining your high standards.

We're certified with ISO 9001, ISO 14001, ISO 45001, ISO 27001 and TL 9000 and we are a licensed AATF adhering to WEEE compliant processes. In addition, we hold certification from EcoVadis in recognition of our exceptional levels of corporate social responsibility and we are keen to share this with all of our clients.

Our vision is to be the world's local partner in sustainable communication networks. We view this as our contribution to the circular economy and a greener planet.

TXO has offices in the UK, France, Italy, Spain, Sweden, North America, Brazil and Australia.

To find out more about TXO and how you can join the circular economy, please email us at hello@txo.com

Appendix

Research methodology

TXO conducted the research in Q1 2022, interviewing 61 global network operators including:

- 8 Fixed line network operators
- 22 Mobile network operators
- 31 Fixed & mobile network operators