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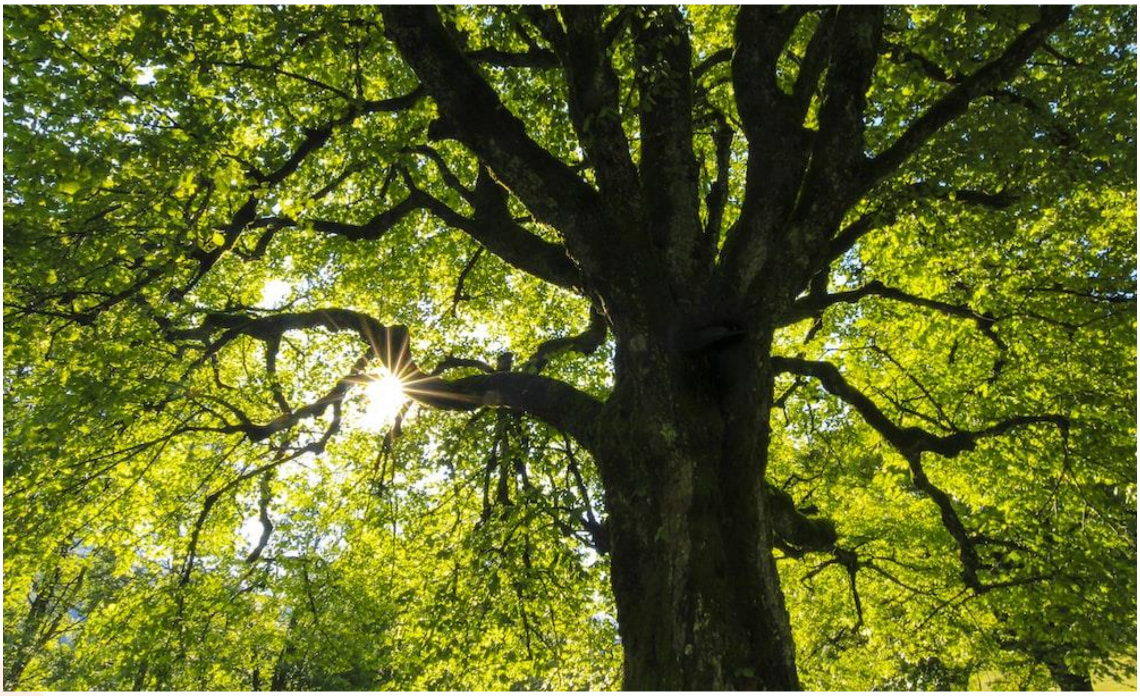
Executive Briefing

# REVERSING TELCO DECLINE: HOW TO GROW FROM NEXT-GEN NETWORKS AND EDGE

Networks are more advanced than ever, but the stagnation of top-line growth is straining telcos' business margins. This report provides practical steps on how to drive growth through 5G and edge, through case studies on Verizon, Elisa and BT.



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# Executive Summary

## Network investments must reverse CSP revenue decline

Telecom operators have invested billions of dollars to upgrade networks, with the goal of making them innovation platforms that are faster, more effective and cloud-native. 5G standalone technology has driven this shift, and communication service providers (CSPs) are optimistic about generating revenue through new, 5G-driven services. Flexible, software-defined networks provide dynamic scalability and interactive capabilities for creating new commercial offerings for consumers and enterprises. These technological advancements enable network slicing, edge computing, private 5G networks and network API-driven services, fostering new business models for customised networking.

However, to realise growth from advanced networks, CSPs need a new strategy to combat the commercial risk they face. CSPs are experiencing stagnant revenues and declining market capitalisation; two themes that stand in stark contrast to the seven largest internet players. These seven companies generate revenue almost equal to that of 78 global telecoms operator groups, yet their combined market capitalisation is nearly four times higher.

Part of this is exacerbated by telecoms operators' financial models, which are capex-heavy and leave little for meaningful investment in innovation within the investment cycle, much less for continuous investment in innovation. Shifting towards an opex-heavy investment cycle would allow operators to prioritise continuous development of platforms and services and respond faster to opportunities with lower risk. Elisa IndustrIQ (the industrial software provider arm of Finnish operator Elisa) is a prime example.

## Recommendations for telecoms operators

With limited growth opportunities in CSPs' core consumer business, focus is on the enterprise business to drive revenues long term. Successful CSPs' B2B businesses are over 30% of overall revenues, and can grow further, if these recommendations are followed:

1. **Focus on vertical strategies built around new and advanced network, private 5G and edge compute capabilities to offer relevant services and solutions for specific industries.**

   – Telecoms operators will see growth from enterprise services, especially by providing private 5G networks and edge computing services. Both private 5G and edge are nascent technologies that also offer telecoms operators the opportunity to grow by innovating and moving up the value chain.

   – However, while private 5G and edge are horizontal by nature, it is very difficult for a single operator to become a solution provider to all industries. Therefore, they will need to prioritise, depending on their strengths in each vertical, the size of its local and addressable markets, the market structure (i.e., the penetrability of customers in the market), and the ability to create a flagship customer deployment.

- Verizon, for instance, leveraged its strength in stadiums and venues in North America to target the international market, including a flagship deployment at Manchester United Football Club, while Elisa specialised in manufacturing through Elisa IndustrIQ and showcased its solutions with a flagship deployment at Proctor & Gamble.

2. **Pursue different investment and operating models to facilitate greater agility for enterprise service innovation.**

   - CFOs should shift investment models from capex-heavy allocations to opex-based allocations, as exemplified by Elisa, who limited its capital expenditure to 12% to prioritise innovation. Elisa's leadership in this area has led to higher enterprise business revenues at 38% of overall revenues in 2022.

   - Telecom operators should adapt their operating models to prioritise innovation, as demonstrated by BT's establishment of Division X in 2021. This cross-functional unit focuses on product and service innovation for emerging technologies, ensuring a commercial approach and integration within existing business units. Continued integration of innovation within wider operations will be crucial for BT's success.

3. **Coordinate globally to build strength as an industry and ensure interoperability between operator networks and edge platforms.**

   - Operators must address their historic weakness of poor network interoperability by collaborating on federated edge projects and fostering interoperability between networks to enable seamless interfaces for application developers and customers, thereby maximizing the potential for monetising edge and connected edge technologies.

   - Telecoms operators should collaborate globally with industry consortia like GSMA Operator Platform Group (OPG) and CAMARA to create seamless interfaces for application developers and customers across multiple operator networks and edges, ensuring the benefits of advanced networks are realised.

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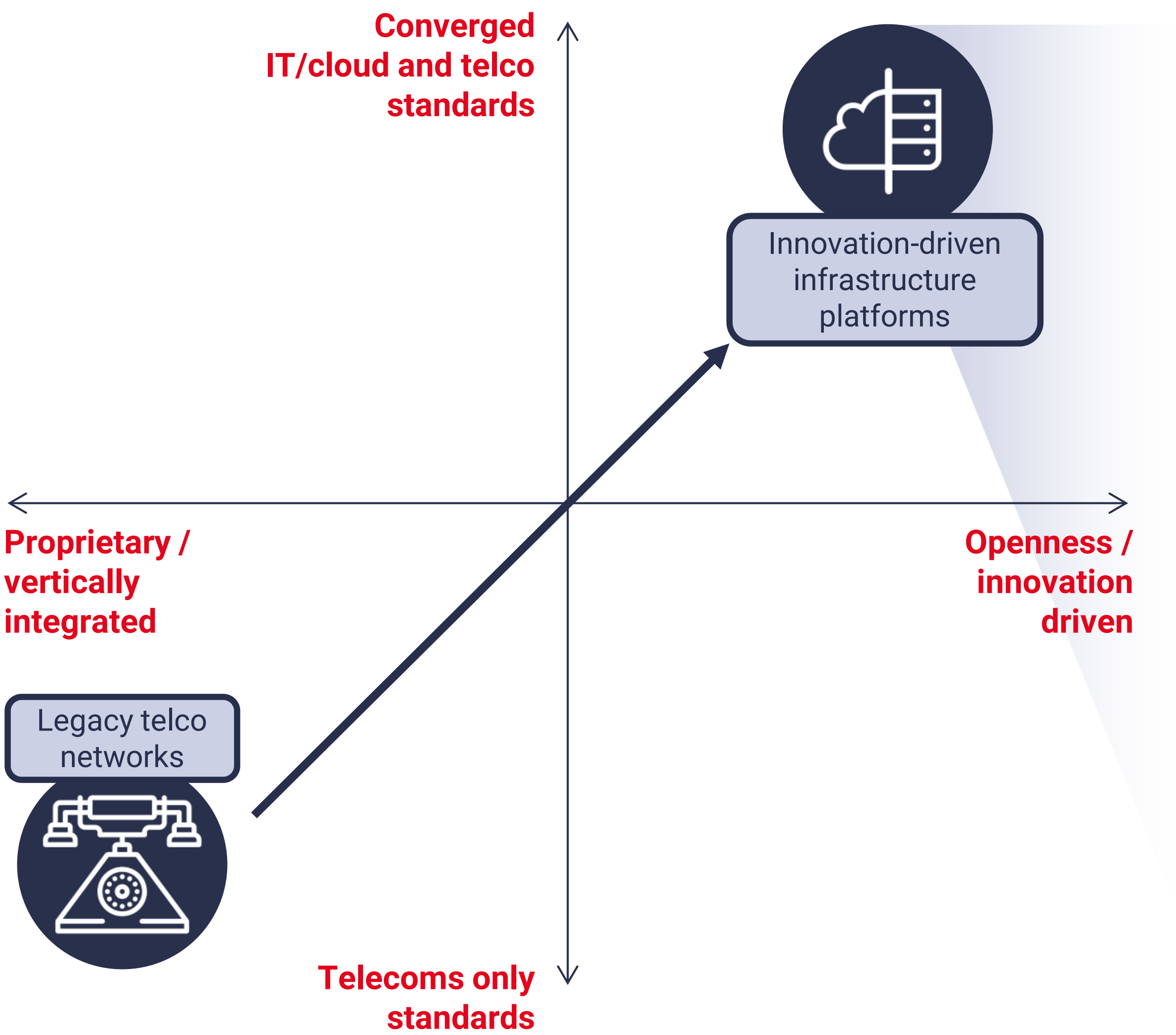
# Introduction: The telecoms industry dilemma

Telecom operators have invested billions of dollars to upgrade their networks to be bigger, faster and more effective for both consumers and businesses alike. Thanks to the move to cloud-native, networks are no longer monolithic pipes, but programmable innovation platforms. The transition to 5G standalone technology has played a crucial role in facilitating this change and making cloud-native the norm. Through industry collaboration to develop network APIs and new models to deliver connectivity, CSPs are exploring enhanced possibilities for generating revenue from their network investments. Flexible, software-defined networks offer unique benefits, such as dynamic scalability and the ability for applications to interact with the network and take advantage of customised services to create new experiences. See Figure 1.

**Figure 1: Network is an innovation-driven infrastructure platform**




Source: STL Partners

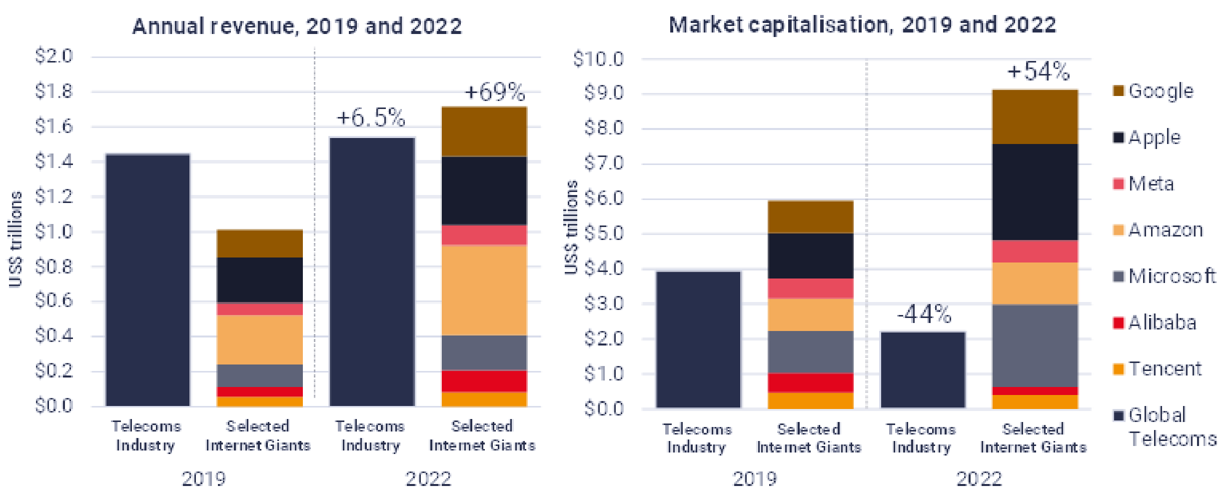
These technological advancements enable network slicing, edge computing and the creation of private 5G networks. New business models for customised (mobile) networking are emerging; CSPs can provide private networks that use the operator's mobile core combined with dedicated private radio at customer premises. These network advancements create opportunities for generating new revenues, particularly through enterprise services such as Wi-Fi, private 5G and edge computing.

While networks are more advanced than ever, CSPs are still searching for new ways to monetise their investments. This is within a context of stagnant growth for telecoms operators globally and the ever-present threat that core business revenues could decline (further) as the competitive landscape evolves and new threats enter the market.

Telecoms operators have historically struggled to translate their investments in networks into significant, incremental revenue growth. It is extremely difficult to charge consumers a premium for connectivity, despite increases in the size of the data packages offered, and CSP innovation in enterprise services has largely been driven by close-to-core services, such as network security and SD-WAN.

This is in stark contrast to the colossal growth from internet giants in recent years. Figure 2 highlights the problem: seven internet players generate almost the same revenue as that by select CSPs but have a combined market capitalisation that is almost four times as much as the CSPs'. For several years, the capital markets have believed that revenue and profit growth will accrue to these service innovators rather than telecoms operators. The speed at which this gap is widening is staggering. When comparing revenues, telecoms overall has grown 6.5% between 2019 and 2022, while the seven internet players have experienced 69% growth in the same period. In terms of market capitalisation, the telecoms industry has declined 44%, while the internet players grew by 54%.

### Figure 2: Seven internet players have surpassed telco revenues globally, 2019 and 2022




Source: Company accounts from select operator groups and seven internet players, STL Partners

Telecom operators can no longer rely on their networks as an asset that continues to deliver growth. In contrast, internet players have excelled in service innovation on a large scale. To reverse the declining trend, operators need to change their approach. Without careful focus on the right areas, they will continue to experience stagnation.

The challenge is how. There is a clear opportunity to change this trajectory, particularly given the increasing importance of connectivity and computing. STL Partners believes CSPs should prioritise service innovation within the context of edge computing, Wi-Fi and 5G, adopt new investment models and pursue vertical strategies to regenerate the business. This report dissects what CSPs must do now and highlights best practice from three operators moving in the right direction: Elisa, Verizon and BT.

# Connectivity and edge is a platform for growth

> **"Investing in next generation technologies enables telcos to access new sources of revenues, but it also helps to reduce costs by moving away from legacy networks"**
>
> ***Head of Stadiums (International Markets), Verizon***

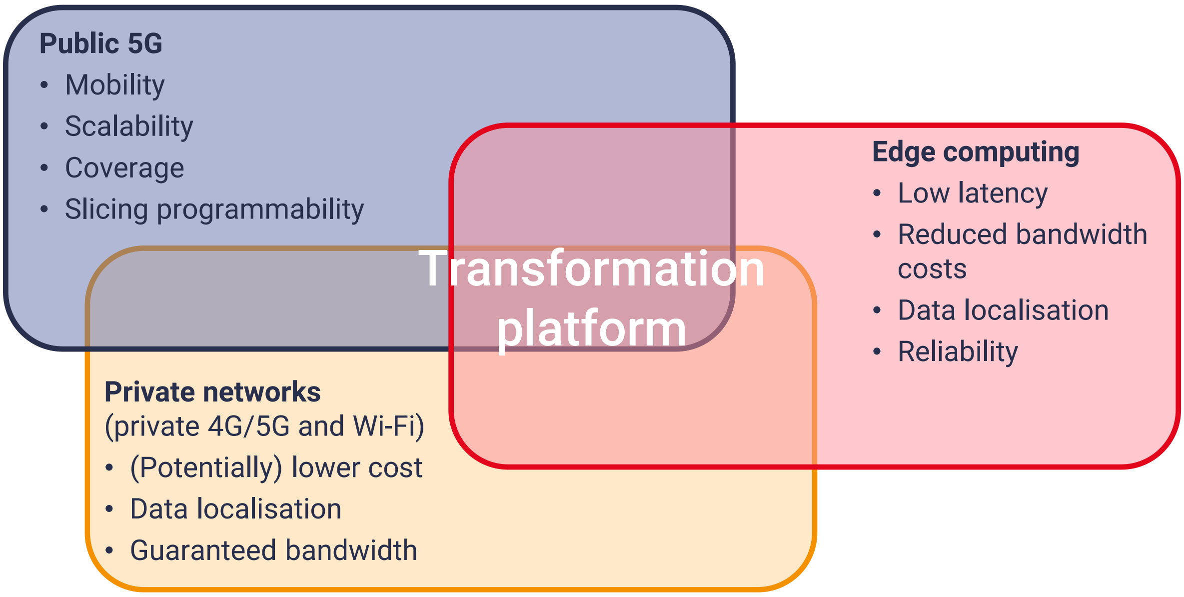
A key answer to the challenge CSPs face is to drive new revenue from the provision of advanced connectivity, provided by Wi-Fi, 5G and private mobile networks, along with edge and cloud compute.

Governments, enterprises and consumers are facing unprecedented demands to manage resources of all kinds more efficiently and effectively than ever before. Society is entering a new technology age: The Coordination Age. This refers to networks transitioning from a tool to connect people and information, to now being a key part of societal and business transformation. In the Coordination Age, people will connect with computers and, increasingly, with "things" – machines, products, buildings, processes – to improve how businesses operate. All this will require access to more data at more frequent rates, hence the need for edge computing and advanced connectivity solutions.

## 5G, edge and Wi-Fi are key enablers for enterprise transformation

As businesses in various industries undergo digital transformation, incorporating IoT and automating their operations, a significant increase in data is being generated and needs to be analysed. This will require a combination of technologies to bring it to life, with 5G (public and private mobile networks), edge computing and Wi-Fi all playing a key role, each with its own benefits, as shown in Figure 3.

**Figure 3: 5G, private networks, Wi-Fi and edge bring a range of benefits**




Source: STL Partners

For instance, in manufacturing, automated guided vehicles (AGVs) require reliable, low latency connectivity and coordination to prevent accidents as they operate at different speeds. To handle the large volume of data with ultra-low latency, enterprises are turning to edge computing with private 5G networks.

In scenarios where enterprises need to process a large volume of data, both edge computing and connectivity options such as Wi-Fi or private 5G are required. However, this does not mean that enterprises will choose only one of these options. There are situations where a combination of edge computing, Wi-Fi and 5G is beneficial, with certain applications leveraging the advantages of all three technologies. Network slicing for warehouses, for instance, leverages LTE (or 5G) RAN and edge computing technologies to help with both productivity and operational efficiencies in a warehouse environment. See STL Partners' Edge use cases for retail, warehousing and logistics.

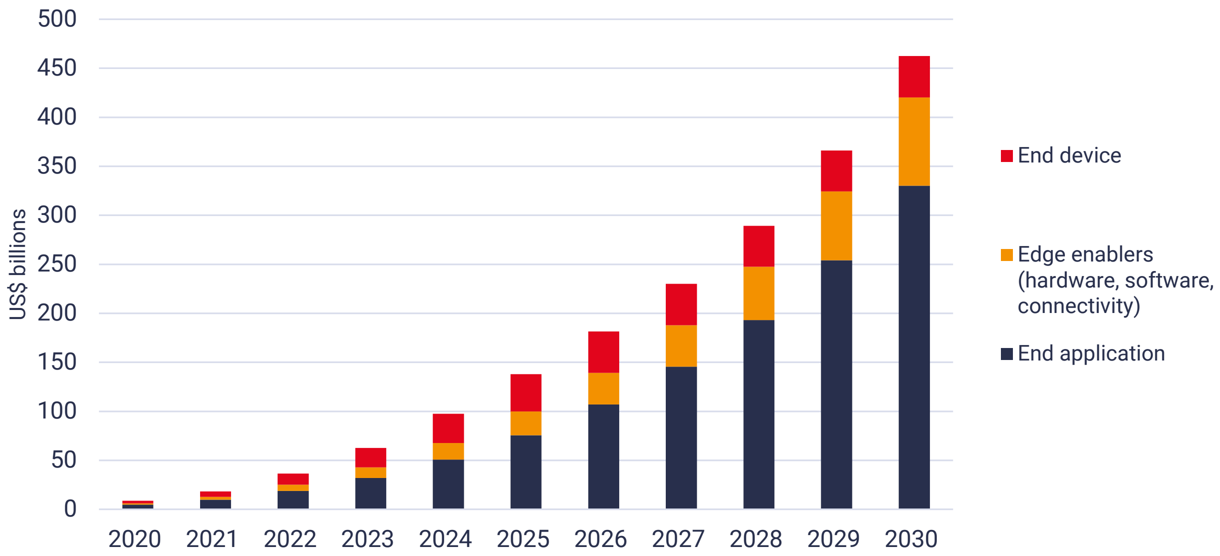
In greenfield environments, Wi-Fi is typically suitable for cost-effective indoor settings, although the specific requirements for connectivity size and scale should be considered. Private 5G excels in outdoor environments and challenging indoor environments with high speed mobility, large coverage areas or where ultra-low latency or high availability is needed, such as in the AGV example. In-stadium experiences also benefit from private 5G connectivity and edge computing. They can for example, enable crowd density analytics that ensure over-crowding is minimised, as well as offer multi-angle immersive experiences by ensuring low latency connectivity is available to viewers.

In brownfield environments where Wi-Fi is already prevalent or fixed-line connections exist, enterprises seeking advanced or improved connectivity may opt to augment their networks with private 5G alongside the existing Wi-Fi network. Along with connectivity, edge computing offers the ability to turn data into real-time actionable insights. Remote patient monitoring is an example of this, where IoT wearables can be used to monitor a patient's health and notify the practitioners in case of an emergency. See STL Partners' Where is the sweet spot for edge computing?

## Edge alone is a US$450 billion opportunity

The edge computing market is forecast to reach over US$450 billion globally by 2030, which gives an indication of the scale of the revenue opportunity for CSPs. The primary opportunity for operators is in the enablement of edge which comprises systems integration, connectivity, edge infrastructure and the edge platform. Figure 4 shows that the forecast revenues for the edge enablers in 2030 is US$90 billion with the application revenues totalling just over US$300 billion.

**Figure 4: Edge computing addressable revenue, 2020-2030**




Source: STL Partners edge market sizing, December 2023

There may be scope for operators to seize a larger slice of the opportunity by also providing the application layer of the solution. Typically, enterprises will deploy edge infrastructure because of the applications that run on top of the infrastructure and deliver business value. Successfully building and deploying edge platforms and connectivity will help operators to achieve revenue growth, and the provision of end-to-end solutions including the application will further increase the opportunity.

## New threats challenge telecoms operators in seizing the growth opportunity

Operators are not the only players who can and will avail themselves of the opportunity. Other ecosystem players are developing their own offerings around private 5G and edge. Hyperscalers and industrial solution providers, for instance, have been hiring people from telecoms companies to build out their capabilities and are launching connectivity solutions. For example, AWS now offers Private 5G and Siemens announced it will start offering its own private 5G solution. Telecoms operators will need to identify a clear unique selling point when taking their own solutions to market to counter existing and new competitors.

In addition, telecoms regulators in different markets globally are beginning to open cellular spectrum to non-mobile operators. This can be unlicensed or shared spectrum, such as that seen in the US with

CBRS, or licensed spectrum accessible directly by enterprises and other non-mobile operators, such as in Germany. The availability of this previously closed spectrum will potentially lead to accelerated growth in private 5G in markets where it is available but poses a threat to traditional mobile operators.

Telecoms operators were seen as sole providers of this unique asset and as leaders in technology. However, they are now viewed by many as slow-moving titans who are no longer the partner of choice, with the internet giants and global technology companies being preferred. Operators need to overcome this reputational challenge.

## Leading CSPs are showing signs of success in monetising 5G and edge

With the market opportunity for private 5G and edge at an early stage, it is important that telecoms operators begin to outline their propositions to demonstrate the value that they can bring to enable their enterprise customers' digital transformation efforts. There are telecoms operators who have begun this journey and are launching innovative services to enterprises with 5G and edge as the cornerstone.

- **Verizon 5G Edge:** Verizon has developed a 5G Edge platform which combines 5G cellular connectivity with edge computing to enable applications for mobile end users and wireless edge devices with ultra-low latency. The edge can be deployed either in the public network or on-premises for the private and exclusive use of the enterprise customer. This platform is used to enable several use cases, including workforce productivity, autonomous machines and customer experience.

- **Singtel Paragon:** Singtel has developed Paragon to be an all-in-one platform that brings together network connectivity, edge compute, public cloud and an applications ecosystem. The Singtel Paragon proposition is designed to be a one stop shop for enterprises looking to deploy solutions that include augmented reality for vision picking or training as well as real-time location tracking and immersive mixed reality.

## The federated edge and standard APIs are critical to unlock the true potential of CSP-driven edge compute and connectivity

A key factor for operator success in 5G and edge lies in enabling applications to function seamlessly across multiple operator networks and edges, especially in geos covered by many operators outside of North America. This necessitates the establishment of uniform platforms and interoperability that allows developers to easily optimise applications across networks. The development of network APIs and network slicing has made it possible for applications to interact with the network to optimise performance and request enhanced services dynamically.

There is still progress to be made on how to enable applications to function seamlessly across multiple operator networks and edges. One possibility is through a federated edge platform. Such a platform would ensure interoperability and user-friendliness for application developers and enterprises to monitor and move workloads across edges. Previously, aggregators have filled the role of facilitating interoperability for enterprise users across operator networks, as witnessed by the success of Twilio in SMS.

The risk for operators in not taking ownership of interoperability between networks and edges is continuing to cede a substantial role in the edge market, due to the emergence of aggregators, or the market dominance of the hyperscalers in the cloud (even though CSPs have greater expertise in local on the ground connectivity and service provision). To thrive in the 5G era, telecom operators must establish uniform standards and interoperability in their networks, with industry consortia playing a crucial role in their growth ambitions. Initiatives seeking to move this forward include:

- **GSMA Operator Platform Group:** An operator platform that defines a common platform for exposing operator services and capabilities to customers and developers for 5G connectivity. The OPG is comprised of more than 50 operators and 35 non-operators and is focused on the development of common requirements for the ecosystem. The GSMA Open Gateway is an initiative that complements the OPG through setting the requirements for APIs to achieve interoperability in operator networks and is currently focussed on federated edge as the first phase of platform development.

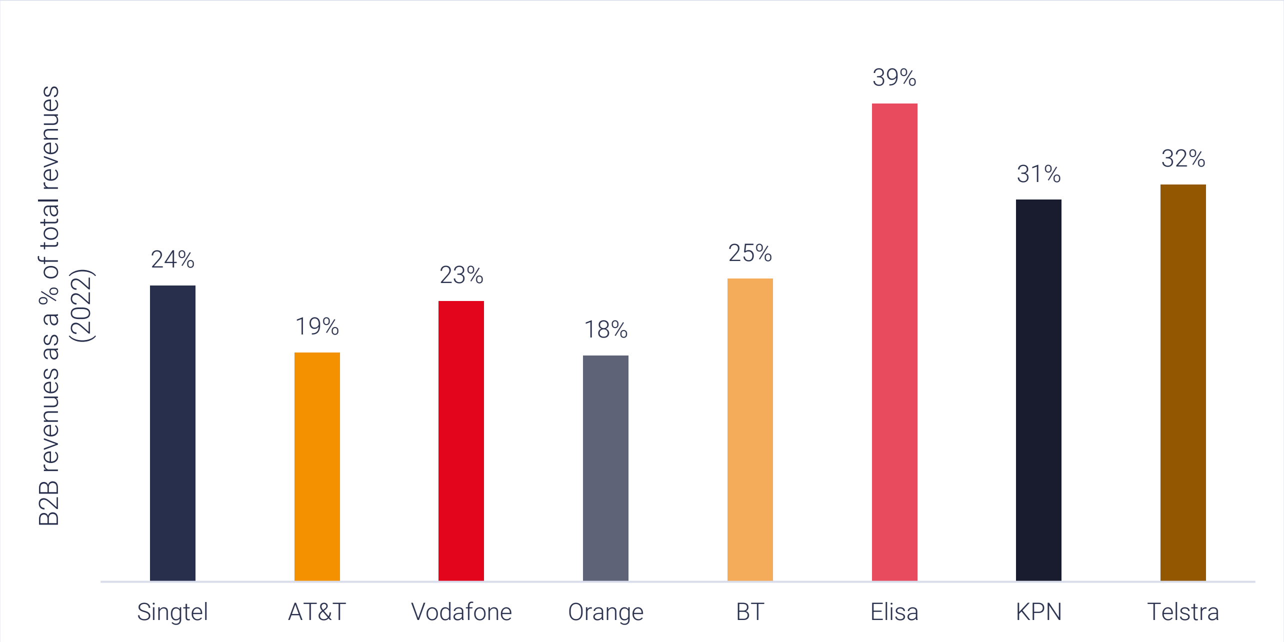
- **CAMARA:** An open-source project within the Linux Foundation developing APIs to facilitate the application-to-network integration process which will enable and enhanced and tailored service for enterprise customers using 5G. The project will abstract from network APIs to service APIs to make them user-friendly and will ensure compliance with data privacy regulations.

- **e-Gate initiative:** An EU initiative driven by Telefónica, Deutsche Telekom and TIM to create a regional, federated edge platform.

# Vertical focus will drive new B2B revenues

The need to drive growth means the B2B segment has becoming increasingly important. B2B revenues make up an average of 25% of total annual revenues, as shown in Figure 5.

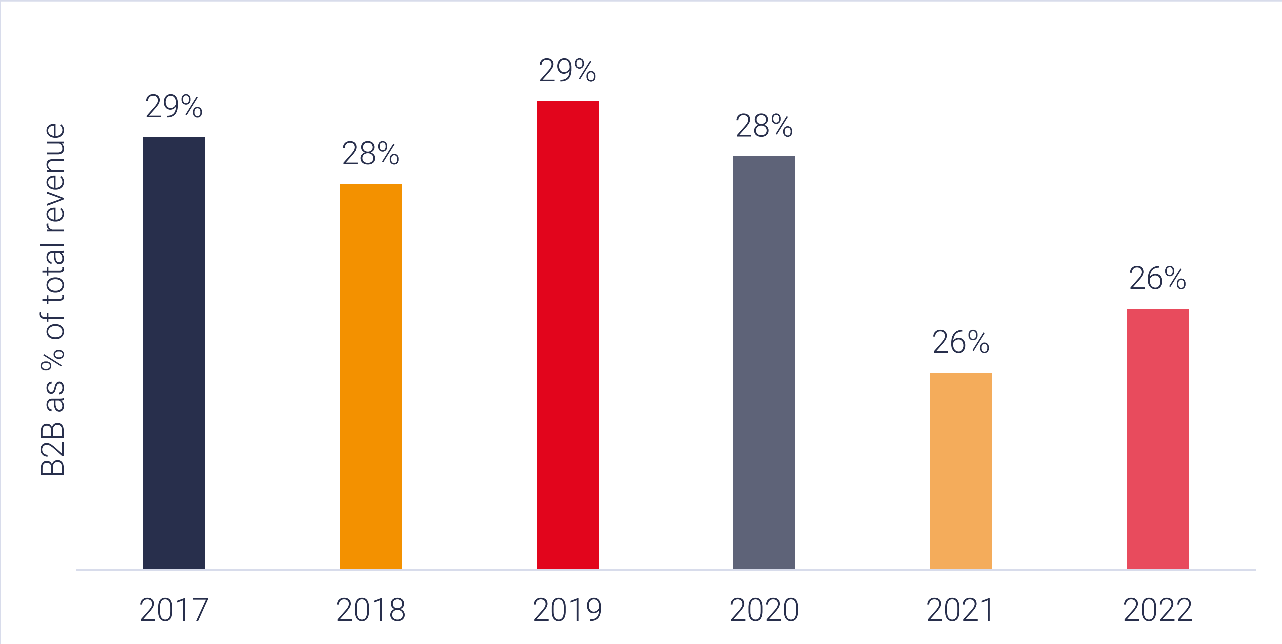
**Figure 5: B2B business size across CSPs, 2022**




Source: Company accounts, STL Partners

ARPUs in a telecoms operator's consumer business are difficult to maintain and the real value for 5G and edge will play out in the enterprise space. As shown in Figure 4, applications are a significant share of the addressable market for edge computing revenues. This resonates with many CSPs' desire to move up the value chain and provide services that span their core: connectivity. COVID-19 hit telcos' B2B revenues, as seen in Figure 6, and there is now a need to recover lost revenues, but also build new.

**Figure 6: CSPs' B2B business is in recovery mode, 2017-2022**




Source: Company accounts from seven operator groups, STL Partners

## CSPs cannot be a solution provider to all and must prioritise target verticals

While there are potential horizontal plays that span multiple industries, such as computer vision applications, for the most part, operators need to build up a deep understanding of their target industry verticals and develop solutions that match their customers' needs. Enterprises expect expertise on how connectivity and edge should integrate with their main IT and OT systems, as well as knowledge about the tools, devices and sensors that enterprises should opt for. This need to focus on key verticals has been a consistent trend among the three case studies we identified through our research. Elisa, Verizon and BT have all clearly chosen a vertical-centric approach to growing revenues.

**Figure 7: Elisa, Verizon and BT have all focused on a select number of verticals**

| CSP | Sub-division | Industry vertical | Description |
|---|---|---|---|
| elisa | elisa INDUSTRIQ | Manufacturing | • Delivers software solutions for the manufacturing industry<br>• Started as Elisa Smart Factory<br>• Enhanced through acquisitions |
| verizon | **Intelligent Venues and Arenas** (part of Verizon Business International) | Stadiums & venues* | • Leveraged success in US around stadiums to extend into international markets<br>• Initial focus to scale private 5G and edge across stadiums in Europe |
| BT | **Division X** (part of BT Enterprise) | Manufacturing* | • Division X explores next-gen technologies for new services<br>• Initial large-scale deployment of private 5G has supported teleoperation of artificial reality and video analytics for quality inspections |

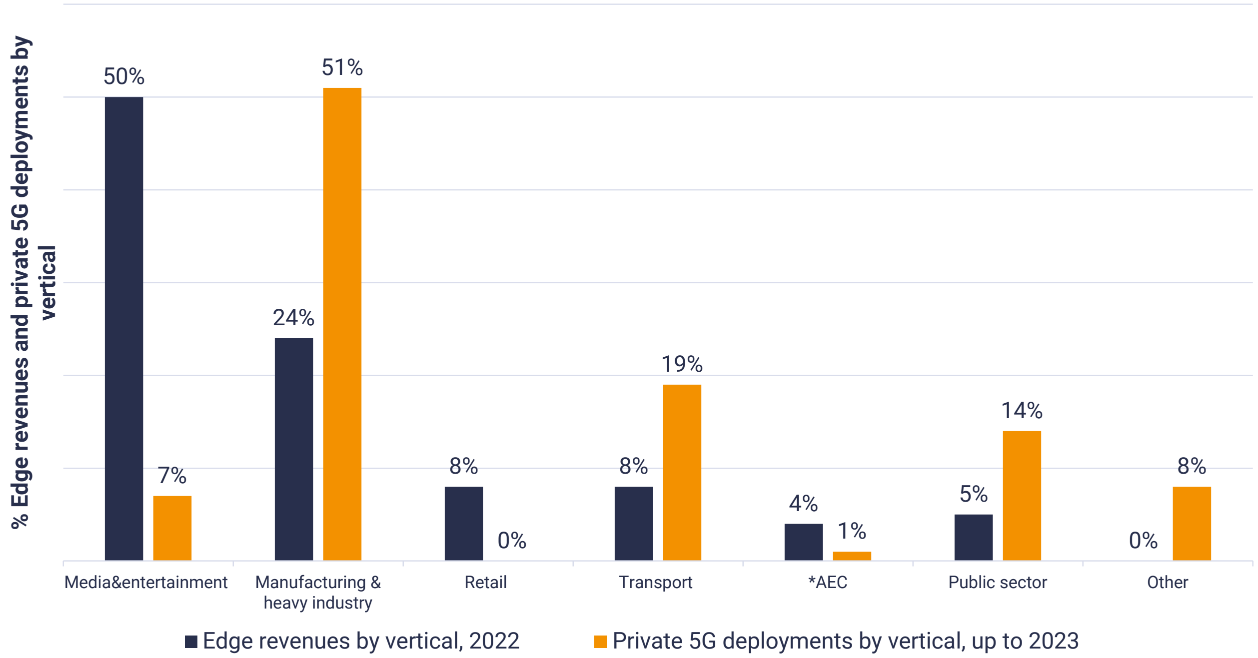
*Verizon Business International and BT Division X have prioritised other industries as well as the stadiums, venues and manufacturing focused on here

Source: Public data, STL Partners interviews

It is very difficult for a single telecoms operator to become a solution provider to all industries; therefore, they will need to prioritise. Which verticals to prioritise will depend on the markets that operators play in and the existing activity they have within each vertical. However, there are trends in digital adoption within markets that can be used to guide this decision.

In 5G and edge, media and entertainment and the manufacturing sectors are significant adopters of these technologies. Manufacturing not only leads in private 5G deployment and forecasted edge revenues but also demonstrated maturity in its digital transformation journey, particularly through Industry 4.0 adoption. Advanced connectivity and edge technologies are appealing in this sector for processing large amounts of data and optimising automated processes. The media and entertainment industry prioritises the adoption of innovative technologies to enhance customer experience, leveraging applications like AR and VR which require edge computing and advanced connectivity such as 5G. See Figure 7.

**Figure 8: Edge revenues and private 5G deployment by vertical**




*AEC = architecture, engineering and construction

Note: The media and entertainment vertical encompasses media, entertainment, sport, hospitality and events. Manufacturing and heavy industry includes manufacturing, oil, gas and extractives and mining

Source: STL Partners

The global market for edge connectivity was forecast to be US$37 billion in 2022, with the media and entertainment and manufacturing sectors accounting for 73% of predicted revenue, as shown in Figure 8. In parallel, manufacturing holds the largest share of private 5G network deployments at 51%, followed by transport at 19% of deployments, totalling 84% of deployments combined. Public sector ranks closely behind in private 5G deployment at 14%.

In addition to the market opportunity, it is important for telecoms operators to consider some of the other following factors when prioritising:

- **Current strengths in vertical:** The extent to which the CSP already has a strong presence in the target industry, including the right partners and sales channels.
- **Size of industry in local market:** The size of the industry varies by country; therefore, it is natural that a CSP prioritises verticals that are significant (in terms of GDP) and, hopefully, growing.
- **Market structure:** Some industries are more difficult to break into, for example if there are a small number of dominant customers. The makes the business potentially harder to scale, particularly if there is already a leading service provider.
- **Anchor customer:** Having a named anchor customer will help establish credibility in the vertical. For example, Elisa's smart factory play started with Procter & Gamble, and Verizon's international stadiums business with a deal with Manchester United's Old Trafford stadium.

# Vertical-specific capabilities can be grown organically or acquired

A vertical focus will require sourcing the skills, experiences and capabilities that will allow operators to develop the right commercial solutions and build trust with enterprise customers. There are a few different ways that telecoms operators can approach this:

- **Upskill existing staff or hire externally:** Most operators will look to upskill existing employees with the required vertical awareness, or they will look to external hires to bring vertical expertise with them.
- **Pursue strategic partnerships:** Working with partners such as industry solution providers or systems integrators ensures that relevant vertical expertise is embedded across the delivery of a solution and does not require the telecoms operator to invest internally. However, it is important that for any solution development, the operator has the requisite awareness and understanding of issues for enterprises within each vertical to provide meaningful solutions.
- **Undertake M&A activity:** To rapidly acquire capabilities in specific verticals, telecom operators can consider acquiring companies that already possess the desired expertise and market presence. By acquiring firms that specialise in serving enterprise customers within target verticals, operators can gain immediate access to industry-specific knowledge, customer relationships, and differentiated solutions.

> **"To build our capabilities in verticals, we are upskilling our staff as well as acquiring new talent, and we have organised people into cross functional teams"**
>
> ***Director, BT Division X***

> **"To become the technology provider for venues, you need to be open to third party partnerships. Partnering with ecosystem players gave us the edge by helping us to monetising our offerings"**
>
> ***Head of Stadiums (International Markets), Verizon***

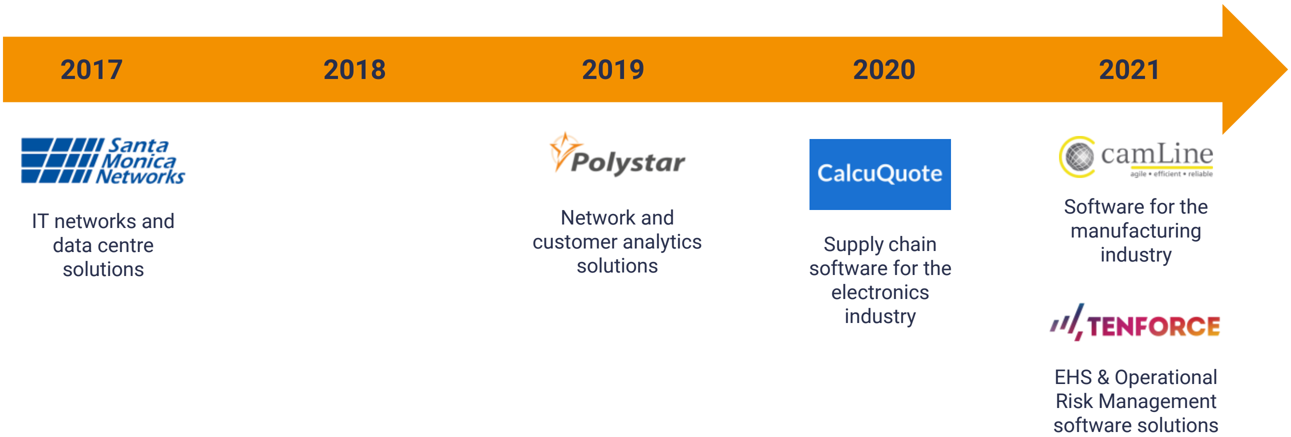
> **"We started our journey being funded by the Elisa Start-Up Fund, once we were successful we became a separate business unit, we are now looking to acquire other companies to build our expertise in different areas"**
>
> ***Managing Director, Elisa IndustrIQ***

The telecoms operators that we spoke to as part of our research programme have all invested in some form to develop vertical expertise and advance their commercial solutions. BT has focussed on its internal resources through upskilling employees and hiring externally to support the creation of cross-functional teams that operate within multiple industry verticals to put forward and create end-to-end solutions. Verizon Business is leveraging existing vertical expertise from its extensive work in the stadiums vertical in the US, including partnerships with local industry specialists such as Extreme Networks, to enhance its go-to-market strategy across global markets.

Elisa took an alternative approach; the company was not only specialising within the manufacturing vertical, but also moving towards a software business. The Finnish telecoms operator considered the cost of building capabilities internally which led to a decision to use acquisition to accelerate growth.

Elisa has pursued several acquisitions (see Figure 9) to develop both industry-specific knowledge, expertise, and a software solution portfolio. While some of these acquisitions, like Polystar, enhance Elisa's business more broadly, others such as Tenforce, camLine, and CalcuQuote have supported the growth of Elisa's "IndustrIQ family."

**Figure 9: Acquisitions made by Elisa Group**




Source: Public announcements

## CSPs must be clear about their unique value proposition to customers

Bearing in mind that telecoms operators are no longer the only players who can facilitate and deploy network connectivity, operators must be smart with how they position their strengths as connectivity and edge platform providers. Outside of networks, many telecom operators have unique assets:

- Expertise in cybersecurity and IT
- A large field force (sales and engineering)
- Local, market-specific knowledge
- Strong (enterprise and consumer) customer base
- Trusted brands (to various degrees across geographic markets)

> **"Currently we are seeing a rising demand coming from manufacturing companies regarding cyber security, there is an opportunity for us to can leverage our expertise in this area to provide solutions"**
>
> ***Managing Director, Elisa IndustrIQ***

These are all skills and capabilities that set them apart from other players providing connectivity and edge services. For example, in cybersecurity, CSPs have spent decades investing in their own security and are experts in protecting and managing mission-critical systems (i.e., the network). There is now an opportunity to bring this to enterprises.

With the onset of IT/OT convergence, enterprise technology teams are being challenged to change the way that they work and take on a more strategic role in bringing together IT and operational systems and capabilities to support the wider business goals. Telecoms operators have deep expertise in technology systems and can support enterprises, particularly those that are smaller and/or lacking internal resources, to better understand what new technologies are relevant to them and how to use these effectively.

> **" Venues and stadiums have limited capacity to keep on adding new infrastructure/cabling, therefore private networks provide a big opportunity to address these challenges and unlock new commercial opportunities"**
>
> ***Head of Stadiums (International Markets), Verizon***

> **"Our expertise in machine learning from within our own networks has enabled us to apply ML to manufacturing processes for a differentiated software solution"**
>
> ***Managing Director, Elisa IndustrIQ***

In the case of Elisa, the CSP's work on machine learning (ML) and AI has been so successful within its own network that it has been able to package their capability as a cornerstone of Elisa IndustrIQ's proposition within the manufacturing space. Advanced ML and AI are deployed at factories to detect issues in production lines and used to formulate recommended interventions, saving manufacturers time and resource.

## 5G and edge enable a new paradigm for enterprise sustainability

Enterprises are increasingly requiring all their suppliers to have an environmental, social and governance plan, including reducing emissions, and using it as a selection criterion for who to do business with. CSPs are increasingly focused on how to reduce their scope 1, 2 and 3 emissions[1]. However, they also have the opportunity to take a leadership role in supporting enterprises to reduce their own scope 1 emissions – this is often referred to as "enablement", "scope 4" or "avoided emissions". See Figure 10.

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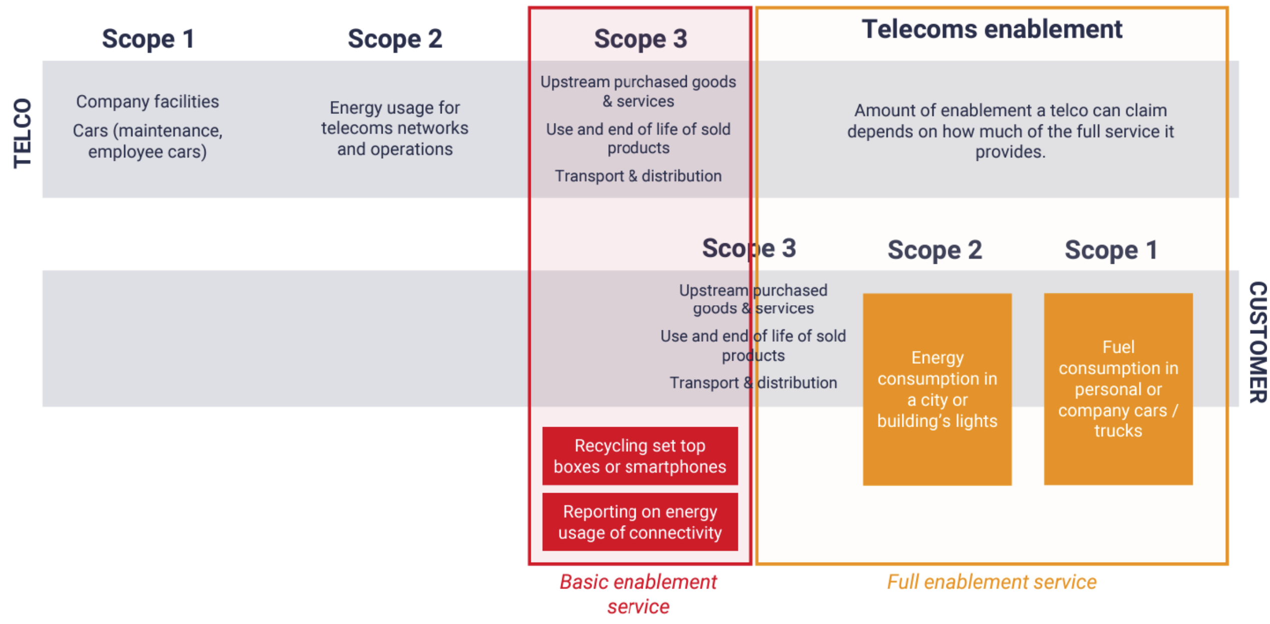
See STL Partners report: Elisa: Telco leadership excellence – and how to do it

**Figure 10: Telco sustainability services for reducing scope 1, 2 and 3 emissions**




Source: STL Partners' Intro to the net-zero enablement use case directory

Enterprises have metrics they measure at the board level, such as their carbon footprint, consumption of energy or impact based on emissions in the supply chain. 5G and edge compute not only enable the tracking of data to understand performance against these metrics but offer a more sustainable way of managing enterprise operations.

To strengthen the sustainability proposition, telecoms operators should emphasise that more sustainable operations, with sophisticated management of resources and energy can have a significant impact on enterprise bottom lines through the reduction of cost. For example, Verizon Connect supports sustainability for enterprises that manage fleets of vehicles through a smart transportation use case; it produces hardware devices which are inserted into vehicles, collecting real-time data which can be viewed through dashboards. Using this data, enterprises can optimise routes based on traffic flows and save fuel or monitor driver behaviour for enhanced fuel efficiency (for example, detecting harsh acceleration and braking).

> **"We talk a lot in the sector about security by design. I think we could do more to market private 5G as *sustainable by design*… We have sport stadium customers who don't want to train at night because of the cost of keeping the lights on… we have solutions to monitor and limit energy consumption, we should market them"**
>
> ***Head of Stadiums (International Markets), Verizon***

In addition, BT Division X holds sustainability as a central pillar of its approach to product and service development, where sustainability sits alongside cybersecurity as core considerations for enterprise-facing innovation. Similarly, Verizon believes "sustainable by design" should be core to its future solutions.

# Beyond the "what", CSPs need to consider how to incorporate innovation into operations

## Moving to an opex model helps free up resource for agile innovation

While operator networks have become more advanced and capable of operating as platforms for growth, CSPs' investment models continue to be stuck in the past, with a far greater allocation of resource to capital expenditure as a proportion of revenue than operating expenditure. CFOs must allocate resources differently, especially if telecoms operators wish to stave off threats from competitors who have so far proved to be more agile and innovative.

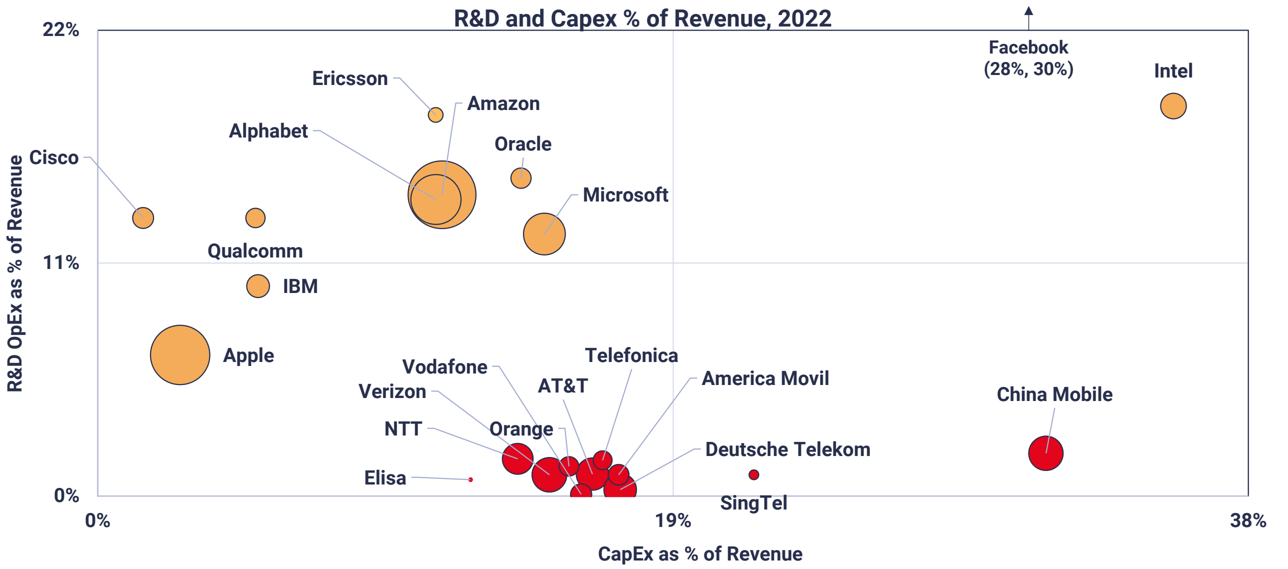
As shown in Figure 11, the average mobile operator invests around 18% of revenue in capital expenditure and just 1% in R&D, compared to technology companies, who invest an average of 13% in capex, but also 13% in R&D. To be competitive, operators will need to significantly reduce capital expenditure and divert resources to a mode of continuous development of platforms and services that deliver value.

> **"At the moment we basically have no capex spend, almost all of our spend is opex"**
>
> ***Managing Director, Elisa IndustrIQ***

Crucially, moving to a more opex-heavy investment cycle will allow operators the flexibility to address new and emerging opportunities faster and with lower risk, making the process of innovation more integral within the organisation. Elisa IndustrIQ has exemplified this, with a focus on an opex-centric investment model over capex, to be able to continually improve its software solutions and services. At the telecoms operator level, Elisa's spend on capex was 12% of annual revenue in 2022, lower than similar operators such as KPN (22.6%), and BT (25%)[2].

[2] Figures for telcos' annual revenues and capex spend have been taken from the company accounts.

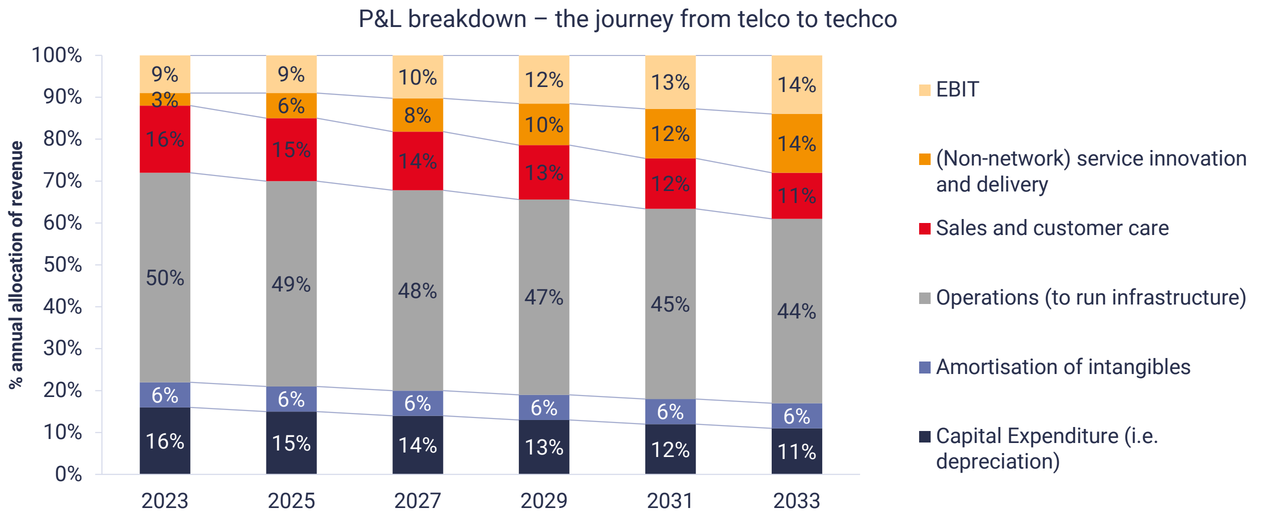
## Figure 11: Telcos lag behind technology leaders in R&D opex spend




Source: Company accounts, STL Partners

Average spends of just 1% of revenue on R&D cannot be expected to yield revenue growth for operators. Over the next 10 years operators should increase their allocation of spend on R&D to around 14%, in line with leading technology companies. Figure 12 shows the transition of spending that operators should embark on to facilitate service innovation. If they can invest in the development of platforms and services, while reducing network-related spend, including capital expenditure, then EBIT margins should expand over the next 10 years.

## Figure 12: Service innovation requires greater non-network investment




Source: STL Partners

# Innovation should be anchored in core business operations

> **"Recognizing the problems customers are facing today meant that we could bring our expertise in to offer verticalised solutions and create new revenue streams"**
>
> ***Director, BT Division X***

The more that telecoms operators can innovate and adapt within their markets and service offerings, the greater their chance of achieving revenue growth. Changing their investment cycles is of paramount importance, but so is centring innovation within the business, rather than as a standalone activity.

As operators shift focus towards their enterprise propositions, they need to create centres of innovation that prioritise developing new technology and services with a customer and commercial focus. There are different approaches as shown in the case studies: Elisa incubates internally developed start-ups within the business, whereas BT initially set up a division as a part of its enterprise unit.

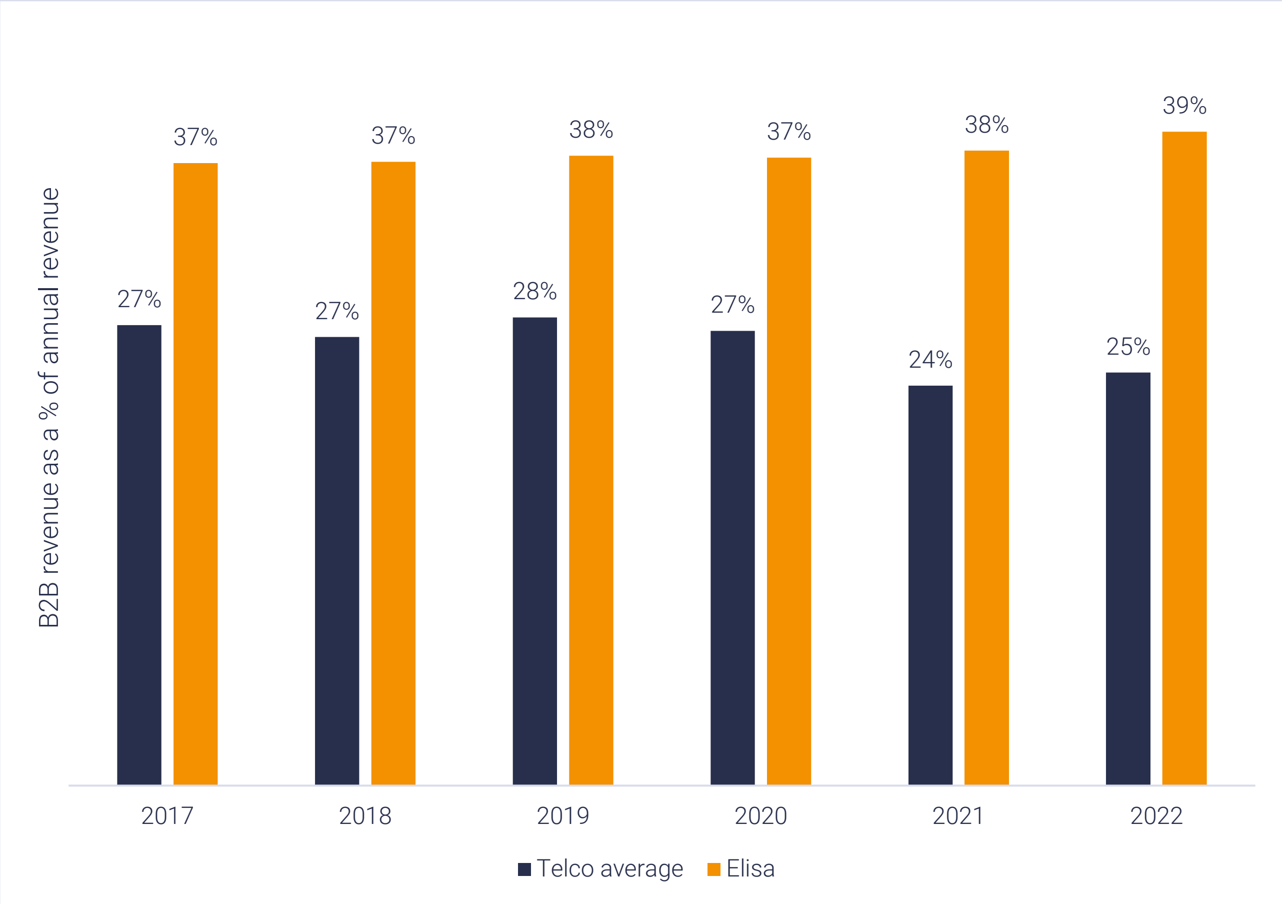
## Elisa created and incubated start-ups within the business

Elisa set up an internal structure where start-ups were established and incubated from within the company. It began with roughly 20 initiatives, backed by senior leadership and dedicated resources, overseen by an internal private equity team. One of these initiatives was Elisa Smart Factory, which over time has grown into Elisa IndustrIQ. The "start-up's" first notable customer win was with Procter & Gamble and achieving successful deployment with P&G was both a sign for Elisa that it should take the start-up further, and a compelling case study for manufacturing customers.

> **"We started our journey being funded by the Elisa Start-Up Fund, once we were successful we became a separate business unit, we are now looking to acquire other companies to build our expertise in different areas"**
>
> ***Managing Director, Elisa IndustrIQ***

Elisa's approach can be deemed as a success, given the relative size of its enterprise business compared to the average across CSPs. See Figure 13.

**Figure 13: Elisa has a significant (and growing) B2B business, compared to the average CSP**




Note: Telco average is based on company accounts of six operator groups, excluding Elisa
Source: STL Partners

## BT set up Division X to integrate innovation within its enterprise business

In 2021, BT established Division X, to focus on product and service innovation for the new technologies such as 5G, edge, IoT and AI. Unlike other organisations that place innovation in their R&D departments, BT positioned Division X as a commercial unit that aims to bring in cutting edge technologies to the company to serve the global market. Division X has been doing this by combining BT's assets spanning R&D, Digital and Networks for bringing solutions to market and selling them. The division operates with cross-functional teams following agile methodologies, incorporating customer perspectives, and fostering a shared vision for solutions and technology.

BT's notable achievement includes the deployment of a private 5G network at the Port of Belfast, covering a 35-acre operational area. This deployment enabled teleoperation of heavy machinery, remote maintenance using augmented reality, and enhanced safety through video analytics and drone surveillance. This flagship deployment has highlighted BT's internal progress and its ability to bring broader enterprise solutions to customers.

> **"Having a division specifically focused on verticalised solutions helps us commercialise the offerings of new technologies like edge computing and private 5G"**
>
> ***Director, BT Division X***

# Conclusion and recommendations

The trend of stagnating growth for telecoms operators is concerning. This is reflected by both minimal annual revenue growth and the sharp decline in market capitalisation for operators globally in recent years. However, the change in CSPs' underlying asset – the network – provides opportunity for growth, given that it is now cloud-native, programmable and uses edge computing.

If telecoms operators want to make sure they realise growth from this platform, they will have to break from the past and do things differently.

Key recommendations for CSPs:

- **Pursue innovative vertical strategies** to move up the value chain by developing and offering end-to-end solutions within industry verticals, with an emphasis on offering edge compute and private 5G services where there is a strong opportunity for operators. This will require building, buying, or partnering for additional capabilities to produce compelling offers to enterprises within target verticals.
- **Transition financial models** from capex-heavy to opex-based to enable greater agility to innovate and reduce the risk of being locked into bad investment decisions long term. A guidance, based on telecoms operators who have done this effectively, is to aim for around 14% R&D opex as a percentage of revenue. CSPs should also assess and augment operating models to ensure that innovation is well resourced and integrated as a core business function.
- **Grow as a telecoms industry.** Part of this will be to ensure that edge and interoperability between operator networks is facilitated. This will allow application developers and (enterprise) customers to experience a seamless interface across multiple operator networks with minimal added effort to maximise the success of growth from edge computing and connectivity.

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