Focus

Roland Berger

Future Telecoms | Challenges, growth opportunities and new models in the era of ultra-high-speed broadband

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Despite the highest ever levels of investment, telecom operators are facing stagnating revenues and are underperforming against big tech, particularly in Europe. Operators must adapt to overcome these challenges and seek new opportunities. We see six levers for telecom operators:

Exploit growing demand
- Ultra-high-speed broadband will become mainstream in the next decade; Europe will be the leader
- Global data usage will increase by 300%, boosted by more intense consumption and new services

Roll out new use cases
- Home broadband and video calling are the leading potential uses of 5G, although no revolutionary 5G use case has yet been developed
- New 5G-enabled use cases will disrupt the core of B2B, with industrial 5G projects among the first
- Monetization of fiber-to-the-home (FTTH) and 5G has begun but is overshadowing a data price fall

Use central position in the ecosystem
- To generate more growth, telcos will continue to establish new non-connectivity-related businesses
- In the next decade, the telecom ecosystem will expand, and telcos will have to deal with a wide array of players from multiple industries, with winners as well as losers

Engage in targeted M&A
- Major market consolidation is expected, driven by telcos and private equity players
- Many operators have engaged in carving out infrastructure and businesses, and consolidation has begun to take place at the infrastructure level

Accelerate structural changes
- Copper decommissioning has started, particularly in Europe/Asia Pacific, driving massive benefits
- Softwarization and cloudification of networks and IT are a critical part of the reinvention of telcos
- Players will fully embrace digital in operations, especially for efficiency and environmental goals

Embrace sustainability
- Telcos' environmental, social and governance impact is significant but often overlooked early on
- Leading telcos have announced ambitious decarbonization goals. Telecom operators can generate massive carbon and energy cost savings by running transversal efficiency programs

To manage future challenges and opportunities, telcos must rethink their strategic and operating models, supported by common enablers. We propose three non-exclusive models: **connectivity provider** (focused on high-quality, data-oriented connectivity), **digital services champion** (agile provider of digital telecom and non-core services) and **ICT player** (platform-based operating model with multiple partnerships).

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Cover photo Yuichiro Chino/Gettyimages

Introduction

For decades, traditional operators dominated the telecommunications landscape. Any household, business or public organization requiring a real-time connection to the outside world was dependent on a fixed-line service, ensuring a steady stream of revenues and growth for operators. The liberalization and digital revolution of the 1990s changed all this. Telecom services went mobile, shifted online and began a cycle of ever-smarter, ever-faster communications driven by big tech firms and agile startups.

After 20 years of outstanding growth, and faced with stagnating markets and new competition, many telecom operators have struggled to adapt. Over the past decade, revenues have slowed, while capital expenditures (CAPEX) have soared as operators try to keep pace with the latest technologies. In the same period, the valuation gap between telecom operators and big tech companies has widened. The first chapter of this report looks in more detail at the challenges facing telecom players.

However, there is still value to leverage, and we believe that there are multiple growth opportunities for telecom operators. In the second chapter of this report, we consider six levers with the potential to reshape the industry, from exploiting the ever-growing demand for new connections to rolling out novel use cases, applying smart M&A strategies and embracing sustainability.

As part of our analyses, we assess relevant trends to better understand their potential future impact on the six levers. Our study also provides sector examples, as well as parallels with other industries to emphasize the benefits of potential applications.

In the final chapter of the report, we pick up on these levers to recommend and outline three potential models for telecom players to rapidly secure their strategic position, with each model supported by one or more enablers.

1 / Challenges

KEY PROBLEMS FACING THE TELECOM INDUSTRY

On the surface, telecoms appears to be an ultra-dynamic industry. Almost everyone now has access to a network and the services and opportunities that connection provides. Yet telecom operators are under pressure, with current market conditions the most difficult they have ever been and several issues degrading the industry's attractiveness. We see two key challenges: the need for high CAPEX despite stagnating revenues, and a failure to keep pace with big tech.

HIGH CAPEX/STAGNATING REVENUES

Average revenues for the top 10 telecom operators worldwide grew by just 2.7% per annum over the past four years. Unfortunately, this slow growth occurred at a time when CAPEX requirements skyrocketed and reached an all-time high, with the CAPEX/revenue ratio increasing by 32% over the same period. While revenues are limited predominantly by fierce competition in the sector, the jump in investment is a result of the requirement to deploy each new generation of network (3G, 4G, 5G, ADSL/cable, fiber, etc.) and the ever-increasing data consumption per capita. As part of this never-ending process, operators must continually invest to avoid becoming outdated.

UNDERPERFORMANCE AGAINST BIG TECH COMPANIES

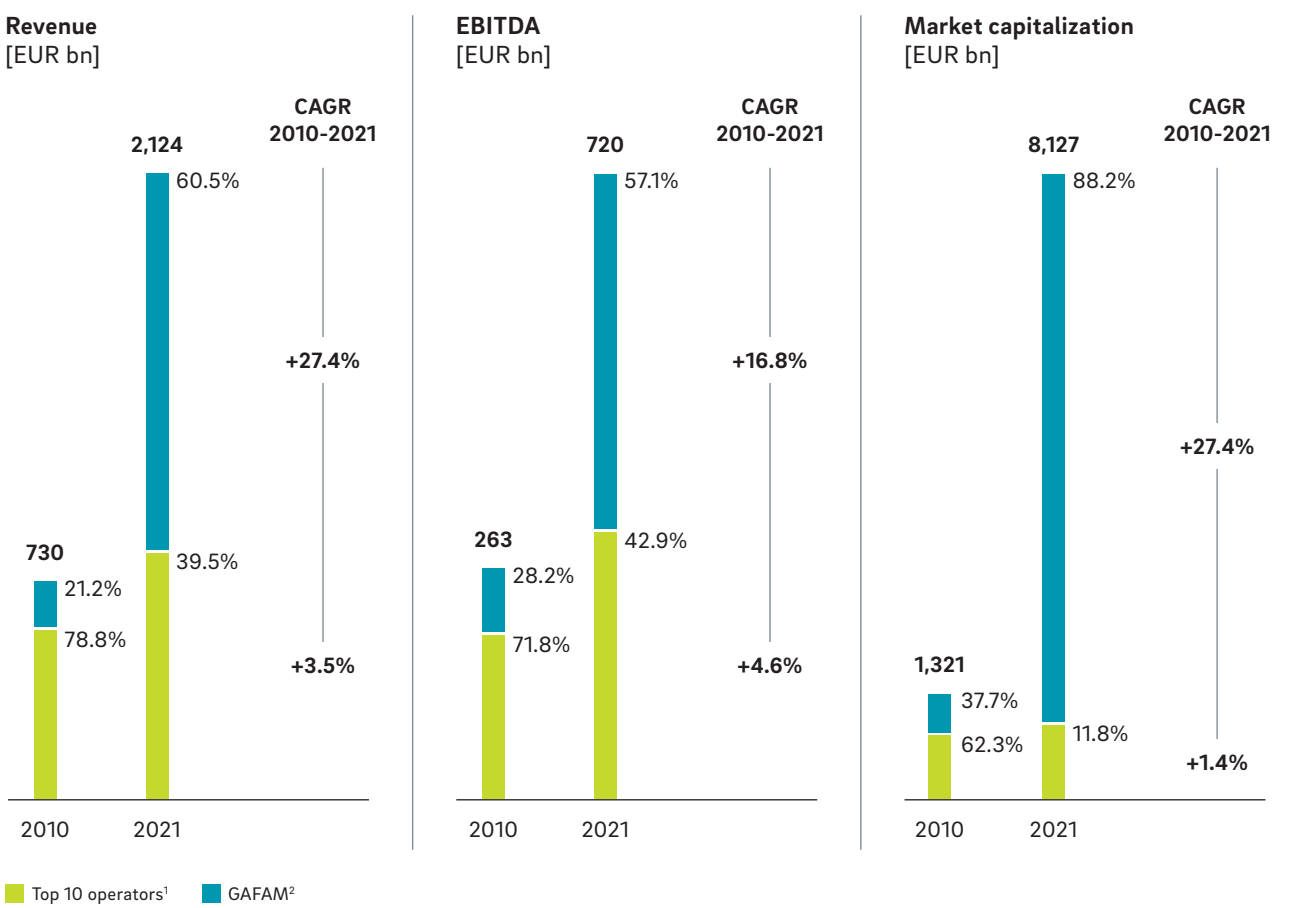
The shift in market dominance in the telecom and technology sector has been rapid and stark. In 2010, the top 10 telecom operators generated about four times more revenue and 2.5 times more profit than Google, Apple, Facebook, Amazon and Microsoft (GAFAM). By 2021, the situation had been completely reversed. GAFAM now generate 1.5 times more revenue and 1.3 times higher margins than the telcos. → A

The shift in dominance has severely impacted the market capitalization of telecom operators. The average share price of the major telecom companies dropped by

an average of 6% per year between 2015 and 2022, while GAFAM saw their share prices grow by an average of 26% in the same period (taking into account the sharp drop in technology stocks in 2022). → B

A: All change

Evolution of telecom operators and GAFAM performance between 2010 and 2021

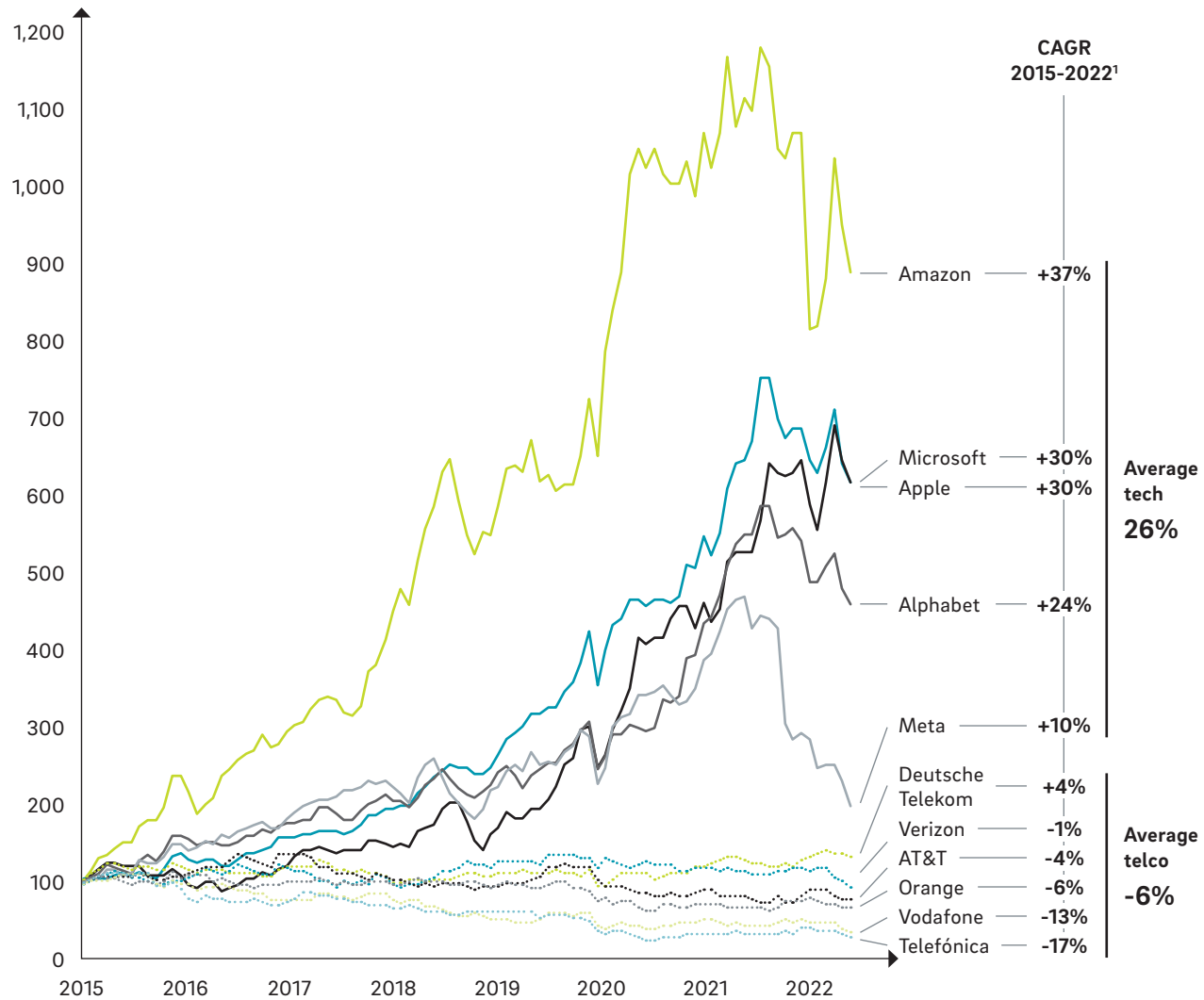


[1] Top 10 operators by revenue excluding SoftBank: AT&T, Verizon, China Mobile, Comcast, Deutsche Telekom, China Telecom, Telefónica, América Móvil, Vodafone and Orange
[2] Google, Apple, Facebook, Amazon, Microsoft

Source: Companies, Bloomberg, Roland Berger

B: Tech vs. telco

Share price evolution of major global telecom operators and leading big tech firms (baseline = 100)



[1] January 01, 2015 to October 31, 2022

Source: Bloomberg, Roland Berger

2 / Opportunities

SIX LEVERS FOR GROWTH

The performance of the tech companies shows that there is value to be found in the digital ecosystem. But given the challenges facing them, telecom operators must adapt and pursue new opportunities to regain attractive margins and generate value. In this chapter, we outline six levers that we believe will be key to future growth.

2.1 EXPLOITING EVER-GROWING DEMAND FOR CONNECTIONS

Our research shows that growing demand for infrastructure, operators and connected services remains the most significant trend in telecoms. This is the case when it comes to network coverage, ultra-high-speed broadband and data traffic issues.

Data penetration remains variable between different regions of the world, and still has room for improvement. In 2021, mobile high-speed broadband (4G and 5G) penetration stood at 94% of the population in Europe, 80% in the Americas and 78% in Asia. However, the figure for the Middle East and Africa was roughly 27%.

With mobile fast broadband increasingly viewed as a basic requirement, adoption rates are higher in regions with low penetration. The expected adoption rate in the Middle East and Africa over the next few years, for example, is 12% per annum. This would result in a penetration rate of 54% in 2027, compared to 98% for the Americas, 103% for Asia Pacific (APAC) and 130% in Europe.

Fixed high-speed broadband connections are expected to follow a similar pattern. Europe leads the way, with 70% of European households expected to be connected at speeds greater than 30 megabits per second in 2027. The majority of these will be at speeds of more than 100 Mbits/s via fiber-to-the-home (FTTH) connections, making ultrafast broadband mainstream. APAC countries are expected to experience moderate to slow acceleration, with a mix of FTTH and FTTx technologies leveraging existing networks. → C

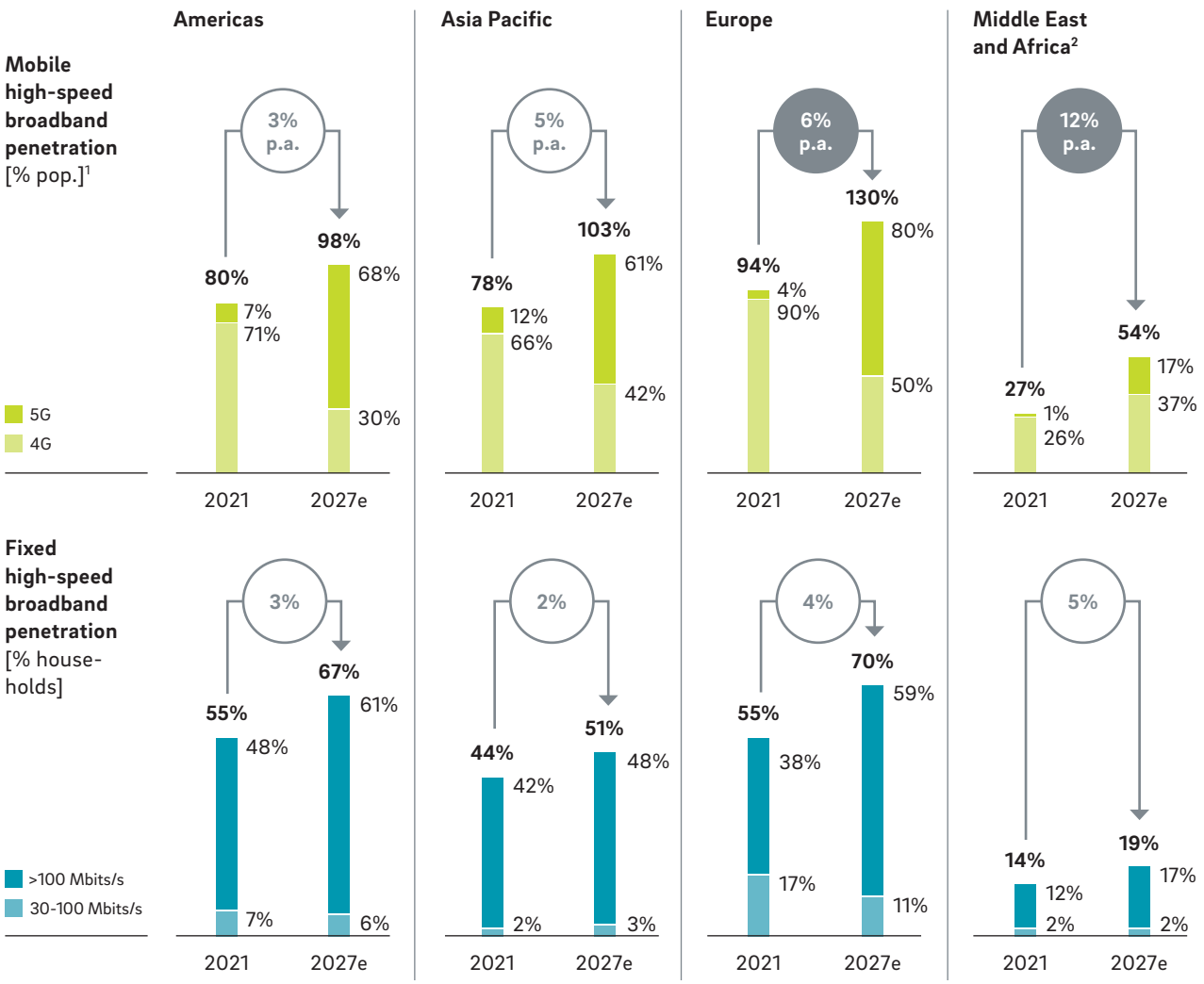
"Given the challenges telecom operators are faced with, they must adapt and pursue new opportunities to regain attractive margins and generate value."

Nicolas Teisseyre
Senior Partner, Paris Office, Western Europe

We also analyzed the amount of data flowing through mobile devices. According to Ericsson, average global usage per smartphone is expected to almost quadruple to 41 gigabytes per month by 2027, boosted by more intense consumption and new services. However, the figure varies by region. In Western Europe, for example, traffic is set to multiply by around 3.5 to reach approximately 50 GB/month, while in Southeast Asia it is set to increase sixfold to around 46 GB/month. All of these figures point to a wide spectrum of opportunities for telecom operators. → D

C: High-speed rollout

Evolution of mobile and fixed fast/high-speed broadband connections by region

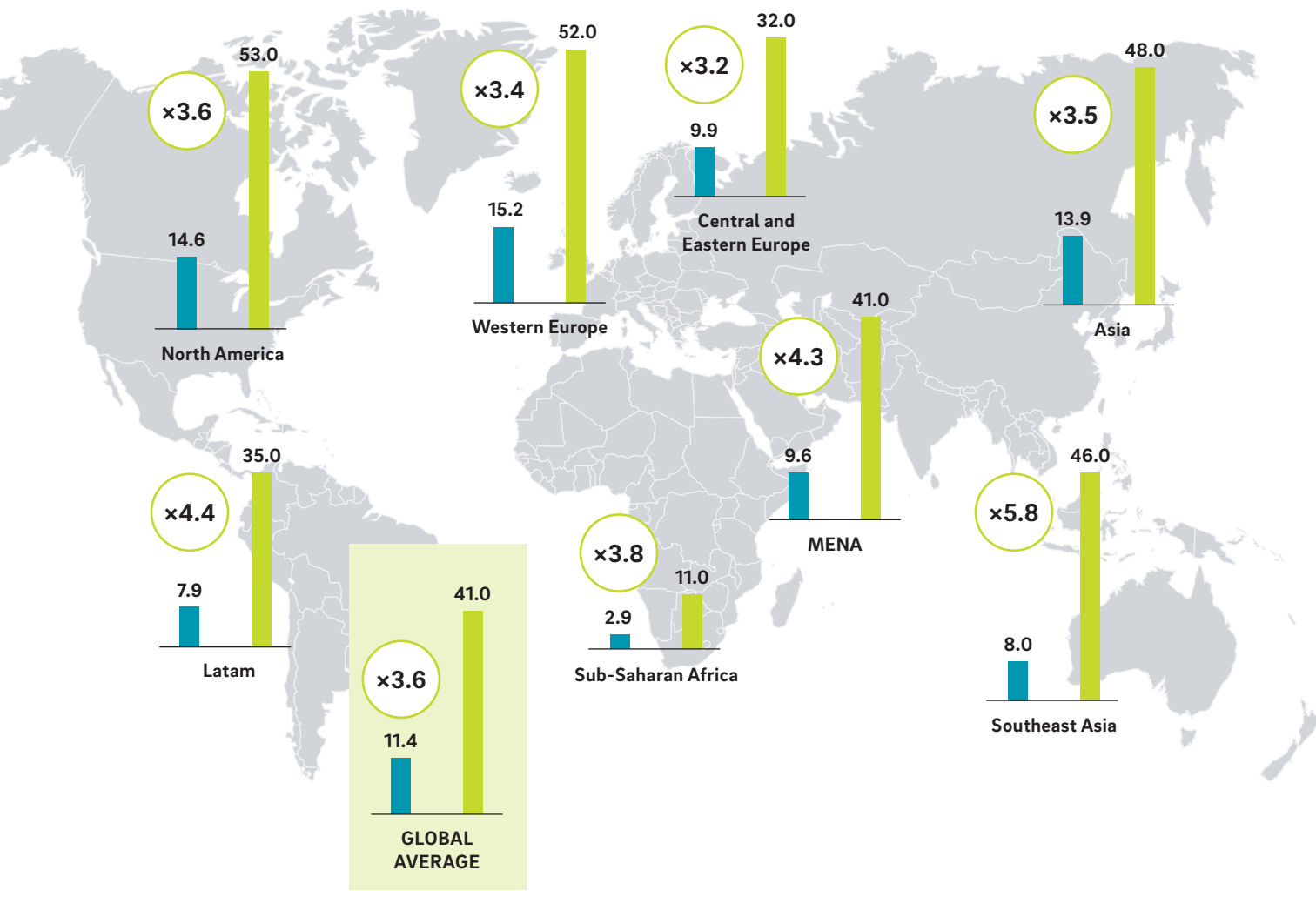


[1] # subscriptions per 100 inhabitants [2] Incl. sub-Saharan countries

Source: Ericsson, Euromonitor, Roland Berger

D: Data boom

Evolution of mobile data traffic per smartphone [GB/month]



2021 2027

Source: Ericsson

2.2 LEADING IN THE ROLLOUT OF NEW, TECHNOLOGY-ENABLED USE CASES

Ultra-high-speed broadband is expected to drive new use cases, mainly in two key technologies: 5G and fiber.

5G networks enabling new opportunities

There are undoubtedly many expectations and uncertainties surrounding 5G. It is hailed as the next disruptive technology, yet no revolutionary 5G consumer use case has so far been developed.

We expect that new 5G opportunities will likely emerge in the enterprise space. There are multiple potential use cases in Industry 4.0, from opportunities for time-critical process control or non-time-critical factory automation to predictive maintenance as well as internal and external business communications.

The transport industry is another key target. Autonomous vehicles will be reliant on 5G, for example, and the technology will be crucial to the further digitalization of transport and logistics. The energy sector

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B2B projects

There are several B2B 5G projects in development in different sectors around the world, albeit at an early stage.

INDUSTRY 4.0

The automotive sector is leading the charge in 5G technology. German automaker Volkswagen, for example, has connected 20 of its plants via a local standalone 5G network (provided by Nokia), and plans to link 133 by 2025, as part of its push towards fully networked smart factories. Mercedes has launched a similar project with Ericsson, connecting six of its plants, while the auto-parts supplier Bosch plans to create a private network of 250 connected plants.

HEALTHCARE

Connecting ambulances to emergency rooms via 5G allows doctors to quickly collect and analyze patient data and provide remote treatment options, as well as determine the fastest route to hospital, all of which improve recovery chances. The Ministry of Health and Welfare in South Korea is pioneering such intelligent emergency medical services, with a project linking 36 ambulances to five medical centers via 5G.

PORTS

Logistics presents hundreds of potential applications for 5G, and nowhere is this more apparent than in freight management. For example, the Hamburg Port Authority, which operates the world's 18th-largest port, has launched a project with Deutsche Telekom and Nokia using dedicated virtual networks to help with data gathering, infrastructure monitoring and traffic-light controls.

AIRPORTS

With their high indoor density of workers, businesses and members of the public, airports offer a perfect environment for private mobile networks. The three Parisian airports of Roissy-Charles de Gaulle, Orly and le Bourget have implemented a private 4G mobile network thanks to digital technologies operator Hub One (part of the Aéroports de Paris group). It is now transitioning to 5G, providing customers with secure, high-speed connectivity that ensures operational efficiency.

will also benefit, with management of power grids a key opportunity. Elsewhere, potential 5G applications in healthcare include telemedicine, robotics and smarter medications, while ultra-high-fidelity and live experiences could be enabled in the media and entertainment industry. The public safety sector presents yet more opportunities, for example in the form of connected video surveillance systems.

Monetization of ultra-high-speed broadband

Opportunities for monetization of fixed and mobile networks are numerous. The traditional strategy of offering more data for more money is still the way to go and is likely to remain relevant in the coming years. While the price per gigabyte of mobile data continues to decline, the volume of mobile data consumed is increasing, resulting in an overall positive trend for telecom operators. When it comes to fixed-line services, FTTH will remain the preferred technology for years to come, thanks to its performance advantages. These monetization trends are particularly apparent in Europe, Asia and the US.

"5G is hailed as the next disruptive technology. We expect that new 5G opportunities will likely emerge in the enterprise space, for example in Industry 4.0 and transport."

Damien Dujacquier
Senior Partner, Singapore Office, Southeast Asia

IN FOCUS

Inflation and the telecom industry

Since the end of the Covid-19 pandemic, inflation has been hitting global economies hard. The telecom industry has not been immune to its impact, albeit feeling the effects to a lesser extent than other industries. This is largely due to the relatively small share that energy and manpower costs account for in telcos' total operating costs. In 2021, manpower expenses made up approximately 17% of incumbent telcos' operating costs (approximately 11% for alternative operators), while energy consumption contributed roughly 2% (roughly 1% for alternative operators). By way of comparison, wages make up more than 30% of costs in the construction industry. Even so, telcos' cost control initiatives will have to be accelerated, and price rises appear inevitable.

2.3 TAKING ADVANTAGE OF TELCOS' CENTRAL POSITION IN THE TELECOM ECOSYSTEM

The telecom industry is becoming increasingly complex. In the past, the value chain was relatively simple, with only a few players, namely infrastructure players, operators and a small number of additional service providers who largely remained in their respective domains. Today, however, the industry has been transformed: it has expanded rapidly in the past few years, extending its reach into multiple other industries, paving the way for a huge and varied range of applications.

In particular, additional service providers have grown rapidly and successfully. Companies such as Apple and Netflix now play major roles in the industry and have attracted a large share of the ecosystem's value. Many providers are now able to call the shots and impose new set-ups, push technologies and leverage partnerships with established players to set the pace in the industry. This growing threat is unlikely to fade in the next decade, mainly because they offer the promise of a brand-new scope of services.

As a result, telcos will have to deal with a wide array of players from multiple industries in the coming years. Their location at the core of the value chain puts them in a position of strength. They must leverage this to create opportunities and overcome future challenges.

"Global tech players are a clear threat to established telecom players, as they offer a broad and fast-moving scope of services and content."

Didier Levy
Partner, Paris Office, Western Europe

2.4 SELECTING THE RIGHT TARGET IN A FAST-MOVING M&A ENVIRONMENT

As technologies move forward, strategies change and new players enter the market, M&A activity in the telecom industry is only likely to increase in the future. We see two main drivers:

Imbalance in global consolidation opportunities

The number of players in mobile telecom markets varies significantly by region. This is especially true when comparing Europe and the US. The European Union (EU) has a highly fragmented marketplace with more than 100 mobile network operators (MNOs) and a total population of almost 450 million, whereas the US is tightly consolidated with only three (nationwide) MNOs and a population of 330 million.

In terms of mobile subscribers, US MNOs have 110 million clients on average, while the EU average is 4.7 million (17 million on average for each of EU's top five economies, the EU5).

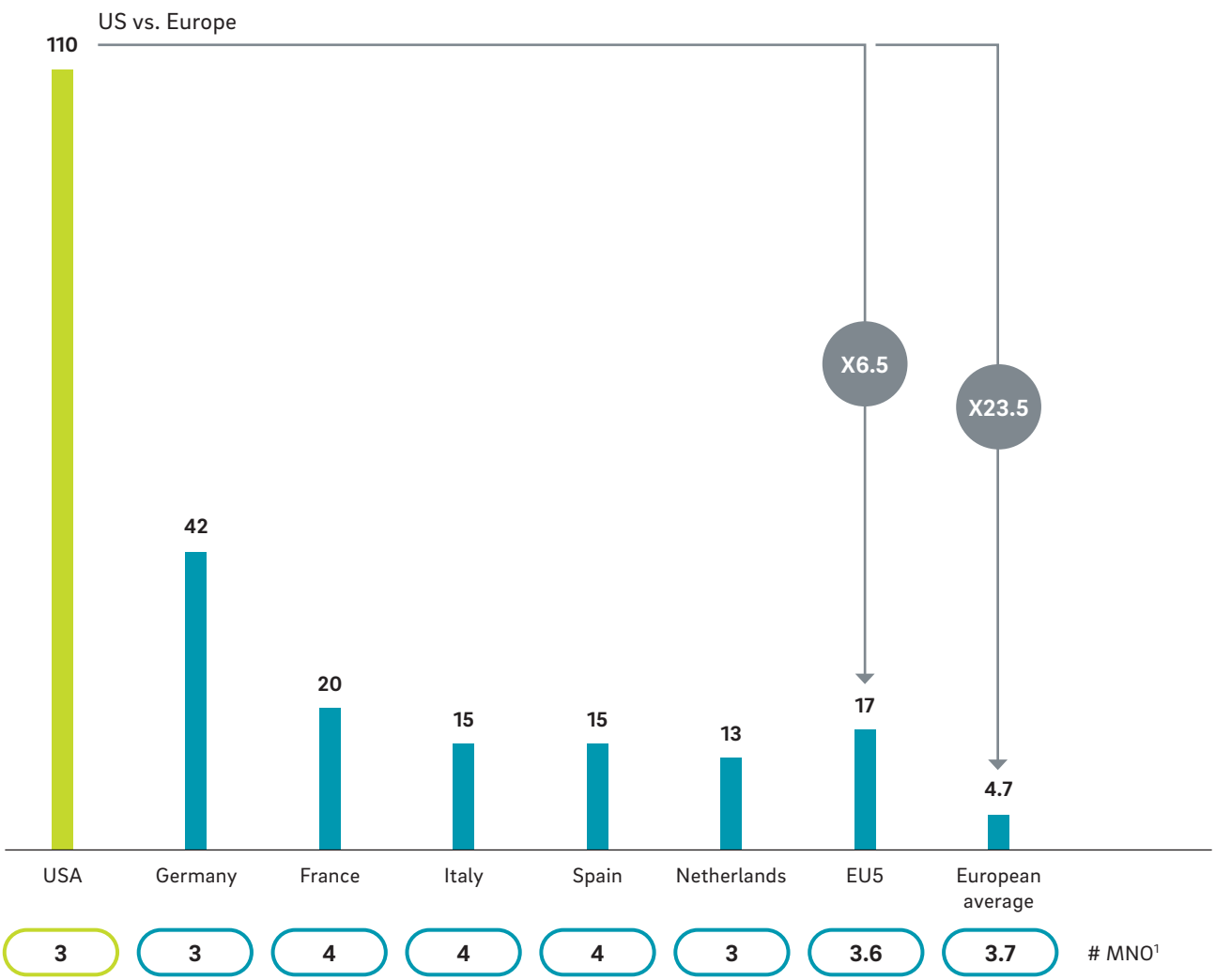
This means that, on average, operators in the US capture more than 6 times more customers than operators in the EU5, or 23 times more than operators across the whole of the EU. This makes it much easier for US players to leverage scale effects.

A major factor behind the lack of consolidation in Europe is the EU's competition legislation. This affects most operators, even when it comes to expanding operations in individual countries.

However, big telcos are keen to consolidate, as evidenced by a string of recent high-profile, multibillion-dollar deals. These include the mergers of T-Mobile US and Sprint in the US in 2020 (USD 26 billion), Orange Spain and MasMovil in Spain in 2022 (USD 19 billion) and Thailand's True Corp and Digital Total Access Communication, also in 2022 (USD 9 billion). → E

E: Far apart

Telecom operator average number of clients by geography – US vs. Europe
[# subscribers/# operators in m; 2020]



[1] Mobile network operators (with a telecoms license)

Source: GSMA, CTIA, CapIQ, Roland Berger

Infrastructure gold rush

Telecom operators are increasingly favoring carve-outs to leverage value, and consolidation is taking place at the infrastructure level. Their rationale is to achieve a higher valuation multiple and crystallize value from existing assets, allowing debt level reduction and/or cash generation for core business development.

Operations take the form of spin-offs or disposals and can relate to technical assets (towers, fiber networks, data centers) or businesses. For example, Deutsche Telekom sold its Dutch mobile operations for EUR 5.1 billion in 2021 and a 51% stake in its tower unit in Germany and Austria for EUR 10.7 billion in 2022. Also in 2022, Airtel Africa spun off its mobile money business for USD 2.65 billion.

Interestingly, private equity firms are moving in on telecom infrastructure, significantly increasing their investments in recent years in an attempt to buy up and consolidate spun-off telco assets. As they tend to target specific areas of infrastructure such as towercos, competition legislation is less of a problem.

Big funds such as KKR, Morgan Stanley and Apax Partners have all invested in telcos as strategic assets. For example, KKR acquired a 37.5% share (EUR 1.8 billion) of TIM's spun-off fiber company in Italy in 2021, and in the same year bought the Spanish fiber operator Euskaltel for EUR 2 billion. Meanwhile, Morgan Stanley bought Germany's Tele Columbus in 2021 for EUR 1.8 billion.

2.5 ACCELERATING STRUCTURAL CHANGES: DECOMMISSIONING AND DIGITALIZATION

Adapting to the new telecom landscape will mean significant structural change for telecom operators. In particular, telcos will have to shift away from legacy networks and adopt new software/cloud-based solutions to run their core business.

"Adapting to the new reality for telecom operators means fully transitioning to digital, automated, AI-enabled, cloud-based operations."

Jawad Shaikh
Partner, Riyadh Office, Middle East

Copper decommissioning

For years, telecom operators relied on an extensive network of copper cables, but these are now rapidly becoming outdated and expensive to maintain. As such, many telecom companies have recently begun decommissioning their copper networks with target dates – where announced – in Europe in particular ranging from 2023 to 2030. This process offers multiple benefits and opportunities:

Reduced OPEX: Operating costs will fall due mainly to the need for less maintenance, lower energy consumption (fiber-optic networks use at least three times less power and require little active cooling) and reduced system complexity.

Higher ARPUs: Fiber connections are growing in popularity and offer a stronger business case than copper, as well as higher sales.

Improved customer experience: Fiber connections are faster, have reduced downtime frequency and offer users greater choice.
Increased reliability: Fiber is largely immune to temperature changes, extreme weather, moisture, fire, electromagnetic interference and radio signals.
More security: Fiber is difficult to tap into and if it is compromised or damaged, the problem can be easily detected by monitoring the power transmission.
One-off revenues: The price of copper is currently high, with a kilogram fetching around EUR 7.90.

Digital, software and cloud-based solutions

Modernization offers big opportunities for telecom operators, as many are still only in the early stages of adopting new digital and cloud-based trends. There are three main targets:

Frontend: Customer relations in telecoms fall short of those in other industries. Channels are still largely bricks-and-mortar based and new measures are required to adapt to the latest trends; online sales, in particular, need improvement. For example, online sales accounted for just 24% of Deutsche Telekom's sales in 2020, and are expected to reach only 30% by 2024. Further automation of customer management, through services such as chatbots and query resolution tools, should also be a key objective.

Backend: Telco operations can also be improved. The key challenges here are moving production workloads to the cloud and the unification of infrastructure. A cloudified production workload should make the industry more agile, yet only 9% of firms were using cloud-based services in 2020. However, this figure is set to reach 67% by 2024. On infrastructure unification, backend operations need to become more robust to ensure times to market remain competitive. Operating expenditure (OPEX) optimization should be prioritized, specifically in maintenance operations. While telcos have launched multiple OPEX optimization initiatives, there are still numerous opportunities for further reduction.

Networks: While legacy network decommissioning is already underway in many markets, there are several other opportunities to modernize networks. Critical issues such as RAN (radio access network), value-based network rollout and predictive maintenance also need to be carefully considered.

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The benefits of digitalization

While the shift to softwarization and cloudification may seem daunting, the benefits are clear:

- Faster innovation and higher potential for automation and AI
- Greater agility and less complexity
- Competitive advantage with high-performance solutions leading to increased monetization
- More flexibility in resource utilization
- Easier scalability with dynamic scale-up during peak times
- Streamlined infrastructure management
- Up to 20% reduction in total cost of ownership due to lower operational costs, and less maintenance and service

However, to achieve such benefits, telecom operators must overcome the challenge of maintaining high security standards while managing high implementation CAPEX. Developing partnerships with cloud providers could be an interesting option.

"We are still in the early stages of telco digitalization, and we expect operators to push forward with gains in efficiency and agility."

Carsten Rossbach
Senior Partner, Frankfurt Office, Central Europe

Achieving these digitalization goals will require active softwarization development coupled with an efficient cloud architecture. Softwarization is driven mainly by technological innovation, for example network virtualization (decoupling network functionalities from hardware), software-defined networks (separation of the control plane from the user plane), and the standardization and accessibility of network interfaces and APIs (application programming interfaces).

Cloudification, meanwhile, is driven mainly by new architectural and agility needs. These may include separating hardware from software so certain processes can run in the cloud, passing asset ownership to third parties and choosing between public/private clouds and core data centers.

Another emerging trend is Open RAN, which involves interoperability of hardware, software and interfaces for mobile networks. This enables a multi-supplier RAN solution, allowing the separation (or disaggregation) of RAN layers. Open RAN is in its early days and still in development, but it holds great promise for the future.

2.6 EMBRACING ESG OBJECTIVES

Environmental, social and governance (ESG) impact has become more than just a buzzword in recent years, with most industries making significant progress towards sustainability. The issue is less spoken about in the telecom sector than in, say, heavily polluting industries but is just as important. Across each of the ESG pillars, there are both challenges and opportunities.

Environment

The telecom industry emits around 700 million metric tons (mMT) of greenhouse gases each year (compared to around 860 mMt emitted by the global aviation industry pre-Covid). It also consumes around 1,100 terawatt hours of energy, a figure that will rise significantly as 5G is rolled out. In addition, the industry produces 54 mMt of e-waste from consumer devices, plus more from towers and other infrastructure. These figures will grow rapidly as the industry expands, posing a serious threat to the environment if left unchecked.

Emission reductions and cost savings can be achieved through initiatives such as improving energy efficiency, shifting to renewables, outsourcing to energy providers and enhancing operational efficiencies. Many large telecom operators have already announced emission reduction and renewables targets. These include Verizon (carbon neutral by 2035), Telefónica (100% renewables by 2030), Orange (net-zero carbon by 2040) and Taiwan Mobile (30% reduction in greenhouse gas emissions by 2030, compared to 2016).

Social

With the growth of social media and 24/7 connected lifestyles, fears are growing about the negative impact of telecom services on people's health, security, privacy and social inclusion. Cybersecurity breaches, for example, are a growing concern for both the public and businesses, while smartphone theft is a major issue in towns and cities. Awareness campaigns and investment in cybersecurity are just some of the possible solutions.

Governance

The telecom sector is one of the most regulated industries in the world. Managing regional and company-specific governance exposure is therefore critical, be it in compliance, risk or sustainability goals. This includes, for example, transparent reporting of operations or subsidiaries in foreign countries, mitigating supply chain risk to minimize reputational damage and ensuring sustainability drives are maintained. An overhaul of corporate governance strategies could, therefore, present opportunities for reducing exposure in these areas.

"Company and community purpose, decarbonization-driven product and network design, future of work, and responsible performance management are all key to enabling a sustainable telecom business."

Michael Knott
Senior Partner, London Office, Western Europe

3 / Recommendations

MODELS FOR A SUCCESSFUL FUTURE

It is clear from the challenges and levers outlined in the preceding chapters that traditional telecom operator models need a rethink. While the levers can form part of a new model, they are not substitutes for a new, overarching strategy. In this chapter, we look at three such models, along with their enablers.

MODELS

Connectivity provider

This model is focused on high-quality and reliable connectivity, with telecom services that are strongly data oriented. A connectivity champion optimizes its network costs and physical footprint by adopting a network leadership position or through a commodity-driven approach.

Digital services champion

This type of organization acts as an agile provider of digital telecom and non-core services. Its key focus is on customer experience and service delivery, with an emphasis on specific target segments and/or product leadership.

ICT player

This archetype involves a platform-based operating model with multiple partnerships oriented towards technology and service. This model is more of an enterprise play and should focus on delivery, automation and cost effectiveness.

ENABLERS

To support these models, we have also identified four enablers to consider:

Recharge and innovate the core

Telecom operators should first focus on their products by executing 5G and FTTH rollout, differentiating clearly between core and non-core services and establishing a robust partner ecosystem.

Reconfigure assets

Players need to refocus on their core assets and leverage more value from non-core business units, alongside vertical/regional M&A. To complement this, software-driven networks and analytics-based capital should be enhanced in the future to extract more value from existing assets.

Digitalize operations

In order to optimize operations, telecom operators must implement fully digital, automated, AI-enabled, cloud-based processes.

Embed sustainability

ESG should be placed at the core of business models. Company and community purpose, decarbonization-driven product and network design, future of work, and responsible performance management are all key to offering a sustainable business.

Our models and enablers do not represent a silver bullet. However, each is designed to help address challenges, exploit opportunities and ensure traditional telecom operators are not just fit for the future but thrive in it. A failure to urgently rethink strategies around them could dial up a challenging endgame for telcos.

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CONTACTS

NICOLAS TEISSEYRE
Senior Partner
nicolas.teisseyre@rolandberger.com

DIDIER LEVY
Partner
didier.levy@rolandberger.com

ALEXIS de PERETTI
Principal
alexis.deperetti@rolandberger.com

TARIQ ASHRAF
Principal
tariq.ashraf@rolandberger.com

PRESS CONTACTS

NICOLAS PLUMP
nicolas.plump@rolandberger.com

ANTOINE BARBIER
antoine.barbier@rolandberger.com

ALFREDO ARPAIA (Italy)
alfredo.arpaia@rolandberger.com

WIM DHONDT (North America)
wim.dhondt@rolandberger.com

DAMIEN DUJACQUIER (Southeast Asia)
damien.dujacquier@rolandberger.com

BING LI (China)
bing.li@rolandberger.com

MICHAEL KNOTT (United Kingdom)
michael.knott@rolandberger.com

VICTOR MARÇAIS (France)
victor.marcais@rolandberger.com

CARSTEN ROSSBACH (Germany and Central Europe)
carsten.rossbach@rolandberger.com

JAWAD SHAIKH (Middle East)
jawad.shaikh@rolandberger.com

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comments and suggestions

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