

# Telecoms Outlook 2024: Stepping into the future

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2024 will be the year of the smart home, the acceleration of Europe’s fibre rollout, transformative M&A and opportunities around 5G and cyber security. New regulation improves the playing field between telecom and tech firms, while declining energy prices are a tailwind to the sector.

# Telecom tycoons on the move?

**An analysis of recent M&A trends shows the direction of travel for the European telecom industry. And large telecom tycoons hold the key. We expect consolidation within two countries to materialise, subject to remedies. Further consolidation may happen if the two transactions get cleared. We also expect some smaller deals, such as asset sales**

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

## Diederik Stadij

Sector Economist, TMT & Healthcare  
diederik.stadij@ing.com



Large, entrepreneurial shareholders have been pushing telecom companies such as Vodafone and Altice International to improve their operational focus. Other entrepreneurs, such as Digi's Zoltán Teszári, are likely to expand their footprint. Companies may also want to increase (or decrease) their ownership share of strategic assets. It would make sense for Liberty Global, where John Malone is the chairman, to be evaluating its options.

In Italy, Iliad, founded by Xavier Niel, has made a proposal to acquire Vodafone Italia. Although the offer has been rejected, we do expect progress in other countries, with proposed M&A transactions in Spain and the UK likely to be cleared (subject to conditions), in our view. In any event, we think industry consolidation is needed in Denmark, Spain, the UK and Italy.

Outside the large corporate M&A, we expect infrastructure assets to remain in demand, while ownership of some tower portfolios could change hands. Further consolidation among mobile tower companies is likely somewhat further away. Tower companies, for now, are looking to enhance the yield and other (financial) metrics of their current portfolios. Finally, we observed last year that governments have shown a willingness to step in if the control of a strategic asset is at stake. This has happened in Spain and Italy.

### **In-market consolidation**

Because economies of scale are an important opportunity for value creation, especially in markets with extremely strong competition, an updated view on the topic of telecom M&A remains relevant. Nevertheless, the financial environment has changed substantially, with higher interest rates and a decline in risk-seeking behaviour.

Industry consolidation remains a delicate process, not least given the competition legislation. Previously, the European Commission allowed for a four-to-three merger in the Netherlands, as well as in Ireland, Austria, and Germany. Nevertheless, obtaining

regulatory clearance depends on a review of competitiveness after the merger, and therefore remedies have often included the creation of a new number four operator or spectrum sales (competitors may look for opportunities to have their share). Also, favourable wholesale access terms for new competitors (mobile operators without their own network) could be part of a remedy package.

Typically, the market leaders in countries have a comparative advantage in terms of scale, and operate both a fixed and mobile network. The deployment of leading fixed and mobile networks is a relatively challenging endeavour for smaller operators since they do not generate the necessary cash flows to fund the network investments. This is troubling on a stand-alone basis with relatively small market shares. M&A will help the smaller operators to gain scale, which will enable investment in the networks needed to offer competitive products from a superior network. This remains a good argument to allow for consolidation, in our view.

## Consolidation by country

### Spain

Masmovil and Orange Spain announced a merger in Spain back in 2022. Also, Bloomberg reported that Digi has signed an agreement to purchase assets from them, subject to the merger being cleared. A cleared merger would imply that the market consolidates from four large operators to three. Given the pending asset sales, Digi could then develop into a stronger, fourth-largest, competitor. Today, the merger in Spain is still pending regulatory approval, but if it were to be cleared, it would likely be subject to conditions.

### UK

In the UK, Vodafone UK wants to merge with Hutchison 3G UK and is awaiting clearance from the British competition watchdog. We deem this merger to be a necessity for both operators. They face two large operators (BT and Virgin Media O2) with an extensive fixed network which makes it difficult to compete. The transaction is still pending regulatory approval. We expect that competitors will push for remedies that are favourable to them, such as favourable mobile network wholesale access terms.

### France

The French market has been quite competitive from time to time. Altice France has shown negative revenue growth, while Orange has faced pressure in its business segment. Nevertheless, consolidation in France has proven difficult. An explanation for delayed consolidation could be that the market players first want to see how regulators treat the proposed transactions in Spain and the UK. Also, the revenue opportunities from the fibre rollout may have softened market pressures. Nevertheless, the mobile and fixed network build-out still needs to be funded. Given its substantial debts, Altice France may at some point have to make a move. According to La Tribune, Patrick Drahi (through a banker) approached competitors, Free and Bouygues, in October last year, about a transaction.

### Italy

The Italian telecom market has probably been the most difficult in Europe for a while. In Italy, there are more than four mobile operators, while there are also multiple (local) broadband networks. As a result of intense competition, there is a transaction underway through which the fixed network will be carved out from Telecom Italia, according to Bloomberg. Moreover, Iliad has made an offer for Vodafone Italia, which has been rejected by Vodafone because it is involved in other talks. Also, Fastweb and Wind Tre are evaluating consolidation opportunities, according to Bloomberg. Note that there are quite a few cooperation agreements in place in Italy, complicating a merger agreement. Vodafone Italia and Telecom Italia have combined their towers into Inwit. Iliad and Wind Tre are cooperating on the 5G rollout in certain rural areas, while Wind Tre also has a 5G

partnership with Fastweb. We think there is scope for consolidation in Italy, but two mergers at a time are possibly a bit too much.

### Denmark

The acquisition of Telia Denmark by Norlys brings scale, but there has been no consolidation among the four mobile network operators. A previous merger in Denmark between Telia and Telenor had been blocked by the European Commission. According to the Financial Times, Hutchison was in talks with Telenor about merging operations in Denmark and Sweden, in March 2023.

### Belgium and Germany

While we see scope for consolidation in some European markets, market shares can, of course, change down the road. We have seen consolidation in Belgium and Germany, but it has now become increasingly probable that we'll see a fourth contender again with growing market shares: Digi in Belgium and 1&1 in Germany.

## Telecom tycoon targets

- **Liberty Global**, with John Malone as Chairman

Liberty Global could increase its ownership stake in joint ventures such as VodafoneZiggo or Virgin Media O2. It could sell or list Switzerland. In a CNBC interview at Davos, CEO Mike Fries mentioned that Liberty Global may also evaluate possible value-enhancing strategies by separating networks from service companies. Earlier, at the Morgan Stanley TMT conference, Fries said the company was able to slowly take the company private through buybacks. According to the FT, the CEO also said earlier in the year: "For the longest time we felt we could be a mile wide and an inch deep", but now "we'd rather be in a handful of markets and a mile deep".

- **Iliad**, founded by Xavier Niel

Iliad has shown an entrepreneurial spirit. Nevertheless, its companies are not market leaders, which means it has more flexibility to merge in Italy or France, for example. Niel could also push for change in the industry through an equity stake in Vodafone, held by Atlas Investissement.

- **Digi**, founded by Zoltán Teszári

The company is expanding its footprint in Spain, Belgium, Portugal, and Italy beyond its Romanian home base. It is already relatively large in Spain but managed to acquire a spectrum block (subject to conditions) that Masmovil and Orange Spain may have to sell as a result of a remedy package, as has been reported by Bloomberg.

- **Altice**, founded by Patrick Drahi

Altice France and Altice International could change course. Altice International has announced it could sell its operating company in Portugal. According to Bloomberg, Xavier Niel is among the suitors looking to acquire the asset. Also, according to Le Monde, Altice France is looking for another investor in its equity, while, according to The Times, Saudi Telecom may approach Patrick Drahi with the intention to acquire a stake in BT (Altice UK holds a stake).

### Minority interests show where the interests lie

We also expect to see changes to the strategic stake-building that has happened over time. Atlas Investissement (related to entrepreneur Xavier Niel), Liberty Global, and Emirates Telecommunications Group continue to own a stake in Vodafone, while Niel also bought a stake in Proximus. Altice UK and T-Mobile Holdings (Deutsch Telekom) own equity in BT.

State investment funds are also active. Saudi Telecom has bought a stake in Telefonica, while, according to Bloomberg, an investment company related to the Spanish State has been ordered by the Spanish government to do the same. Telefonica itself is looking to buy the minority interests in Telefonica Deutschland (Bloomberg). Furthermore, the Italian government has stated its intention to acquire a stake in the Italian fixed network as part of the transaction that is underway through which the fixed network will be carved out from Telecom Italia (Bloomberg). Contrary to this stake-building, there was an article in Der Spiegel that the German government is contemplating reducing its ownership in Deutsche Telekom.

An important question can be raised about the ownership of some large joint ventures. We deem it unlikely that VodafoneZiggo and Virgin Media O2 will remain joint ventures forever. Our current thinking is that Liberty Global would not mind acquiring full ownership of both joint ventures. This would bring them greater control, while Vodafone and Telefonica may need the cash. For the right price, Liberty Global will likely also be tempted to sell its equity stakes in Virgin Media O2, VodafoneZiggo or UPC, possibly through a listing.

## **Consolidation impact on selected companies**

### **Vodafone**

Vodafone has been actively looking for solutions in markets where it has had a relatively weak market position, such as Spain, the UK and Italy. Vodafone has already sold its operation in Spain. Since competition is very tough in the UK, and Vodafone lacks its own broadband network, we think there is a good chance that the proposed transaction with Hutchison 3G UK will go through. We also believe that it would make sense for Vodafone to strike a deal in Italy, while the emerging markets probably remain part of the group. Vodafone definitely has the potential to be one of the leading telecom operators, again, in a couple of years. Nevertheless, we remain underwhelmed with Vodafone.

### **BT**

We think Altice UK and Deutsche Telekom will continue to push for change. BT could unlock substantial hidden value through the (partial) divestiture of assets, such as the broadband network. Unless free cash flows improve, we think such a move will happen at some point. Given lumpy pension payments, leases and a unionised workforce, we do not see a quick turnaround for BT. Nevertheless, we do expect the new CEO to bring positive winds of change, as her realm at Telia shows.

### **Telefonica**

The Spanish state has ordered state-related entity SEPI to buy up to 10% of Telefonica's equity. This follows the acquisition of a stake by Saudi Telecom, which wanted to acquire up to 9.9%. Telefonica could also sell its technology unit, as it tries to achieve full control over Telefonica Deutschland, according to Bloomberg, and may possibly want to acquire the Oi cable assets in Brazil, according to Reuters.

Generally speaking, it is a positive signal for creditors when investors buy large equity stakes in a company. Nevertheless, we maintain a cautious stance with respect to Telefonica.

### **Swisscom**

Swisscom is included in this M&A review, not because of expected consolidation in Switzerland, but because of possible future events in Italy, where it has a growing operation in Fastweb. According to Bloomberg, Fastweb has been linked to a merger (or acquisition) with Vodafone Italia or Wind Tre. Consolidation in Italy could be good for Fastweb because it could well soften the strong competition. If it were to merge, there are economies of scale and scope. Note that the impact on Swisscom will probably be limited, given the relatively small size of its Italian operations compared to the

operations in its home country. Nevertheless, these operations are sufficiently large to be able to benefit from synergies with Vodafone Italia.

### **Orange**

Orange is building strong franchises in Belgium and Spain through M&A, while the stake in TOTEM (tower business) gives strategic flexibility.

### **Proximus**

Proximus has fallen out of favour with investors. This is probably caused by the uncertainty brought about by the new competitor Digi. We think the chances of a full buyout by a private investor are low, given the current government equity stake and that privatisation is not something most governments want for their critical infrastructure.

## **Our M&A expectations for 2024**

As this article shows, there are still many M&A options in the European telecom space. Nevertheless, we do not foresee the creation of a Pan-European telecom operator in the near term and expect the market to focus on M&A within countries. Although we probably have to await the outcome of the pending M&A transactions in Spain and the UK first, we wouldn't be surprised by consolidation in France and Italy, thereafter. Finally, there is still some appetite to do smaller transactions, for example in the tower space. We do not expect many such transactions in the near term, because the private equity market has been quiet, lately.

**Diederik Stadij**

Sector Economist, TMT & Healthcare  
diederik.stadij@ing.com

**Jan Frederik Slijkerman**

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

## More people will benefit from 5G connection in 2024 but speed improvements vary

**5G already covers densely populated areas, however, a lot of effort is required to add network capacity and to optimise the use of frequencies. Therefore, speed improvements currently vary widely**



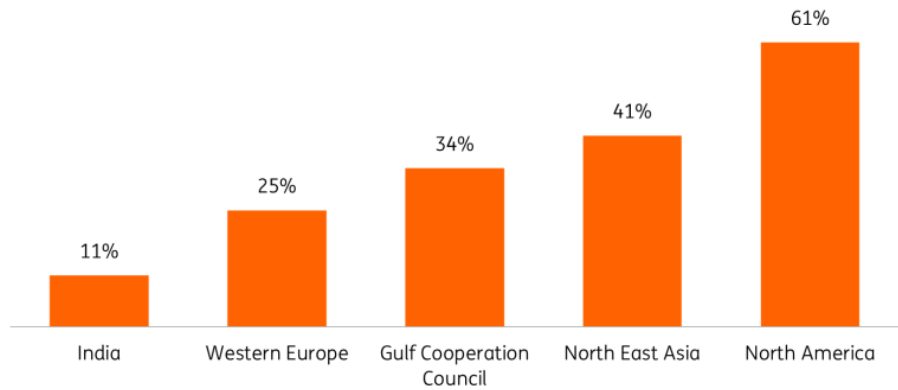
### **Strong growth of 5G subscriptions expected to continue in 2024**

The rollout of the 5G network and the availability of (affordable) handsets has seen 5G services take off. In its 2023 mobility report, Ericsson estimates that at the end of last year, 20% of all mobile subscriptions globally were a 5G subscription, this amounts to 1.6 billion global 5G subscriptions. So, 5G subscriptions showed strong growth in 2023; roughly 600 million new subscriptions were added, a year-on-year growth rate of 63%. Ericsson also estimates that in 2029, more than five billion people will be connected to 5G networks, and 85% of the global population will have coverage access by then.

Meeting the estimated number and coverage rates of 5G connections in 2029 would require a 22% compound annual growth rate in the next six years. This, in turn, requires higher penetration rates across the globe. Currently, North America has the highest penetration rate, followed by North East Asia, the Gulf Cooperation Council, and Western Europe. Higher penetration rates hinge on affordable smartphones, such as the Samsung Galaxy A14 and Motorola Moto G Stylus 5G that sell for under €200, meaning that fast 5G connections are available to an increasing number of people.

### 5G penetration rates by region

Regions below 10% are excluded



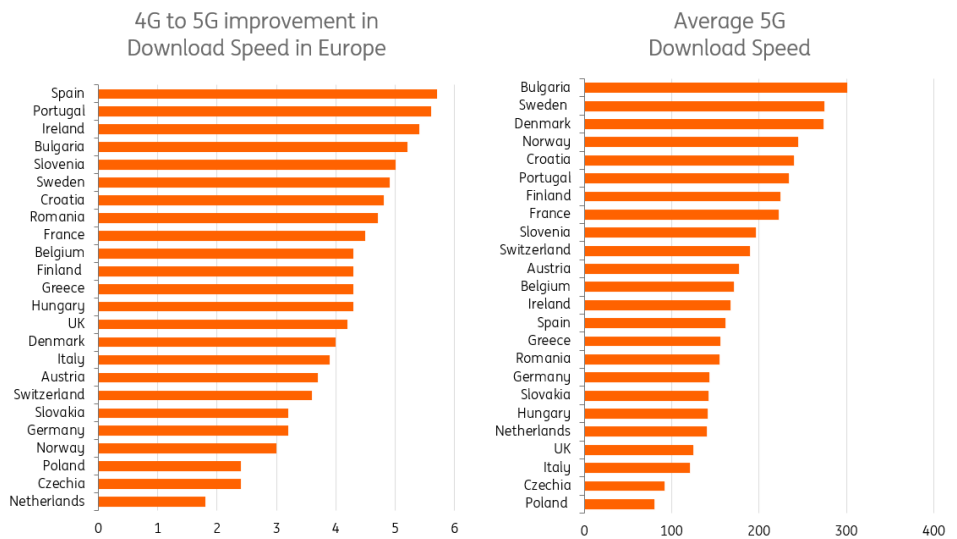
Source: Ericsson Mobility Report November 2023

### 5G speeds and speed improvements vary across Europe

Despite increasing 5G adoption, average download speeds and speed improvements vary widely across Europe. There are several reasons why speeds vary across regions. In densely populated areas, public networks that deal with a lot of traffic can have connectivity issues as towers have limited capacity to manage requests from many devices at once. In addition, proximity to a 5G tower and the surrounding environment/interference matters for speed. Moreover, the hardware used matters, as well as the speeds that the network is capable of. Lastly, in several countries, spectrum clearing and auctioning, as well as equipment deployment need more time and effort to improve.

Taken together, these factors explain why speeds and speed improvement from 4G to 5G across countries diverge. Spain, for instance, saw speeds improve almost six times, whereas speed in the Netherlands has only increased 1.8-fold. Furthermore, Bulgaria, Sweden, Denmark and Norway top the list for the highest average download speeds in Europe, while the Netherlands, UK, Italy, Czechia and Poland lag behind.

### Download speeds



Source: OpenSignal

### Speeds per network operator also vary

Speeds also differ depending on the network operator, and market leaders tend to offer the fastest connections. In Norway, market leader Telenor offers an average download speed that is roughly 30% faster and an upload speed that is about 12% faster than the second-fastest network (Telia).



In the Netherlands, the picture is very similar. Market leader KPN has download speeds that are 20% faster than the number two (T-Mobile) and 70% faster than those of Vodafone. Upload speeds also differ: KPN is nearly 10% faster than T-Mobile and almost twice as fast as Vodafone.

Conversely, the fastest operator in the UK (Three) is not the market leader. Yet, it offers download speeds that are more than three times faster than the slowest operator (O2), and upload speeds that are roughly 60% higher than those of O2.

In short, 5G differs per region and city. Telecom operators with a large market share and/or provide the fastest speeds have opportunities to monetise these advantages. In addition, market leaders may be able to offer new services such as applications that require low latency like livestreaming or high-frequency trading.

For 2024, we expect that the rollout of 5G standalone will gain traction while we see more trials with private networks based on 5G technology. Companies like Telia in Finland have completed a 5G standalone network, which means that they operate with a modern cellular infrastructure based on 5G radio technology, but also based on a 5G core network. This will improve the operating efficiency of the mobile network and unlock further services such as private networks. Companies such as Verizon and Deutsche Telekom have offered, in trials, private wireless networks to customers which are based on a new 5G technology, network slicing. The broader 5G technologies will therefore gain further traction in 2024 also because more spectrum will become available and the user experience will be enhanced further as a result.

# Lower energy prices provide a tailwind for telecom operators

## Diederik Stadig

Sector Economist, TMT & Healthcare  
diederik.stadig@ing.com

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

**Telecom operators face a brighter financial outlook in 2024. Last year, many felt the impact of higher energy prices, which they had largely hedged at high levels in 2022, to guarantee supply. As energy prices have since come down, the declining costs of energy could provide some tailwind to margins**



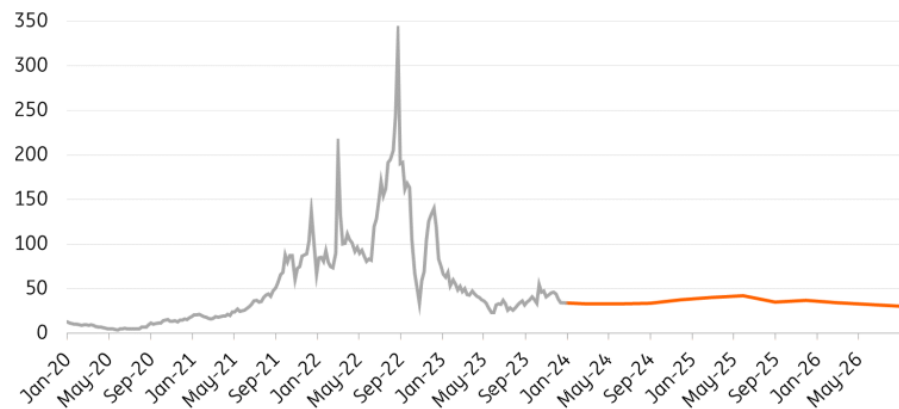
## The effect of higher energy prices on telecoms

Providing the infrastructure for phone calls, online gaming, and video conferencing is an energy-intensive business. It is no surprise, then, that the telecoms sector accounts for roughly 2% of global energy consumption. Because energy is an important cost component for telecoms, they were mostly (roughly 90%) hedged when energy prices shot up in 2022 and early 2023. However, hedging in 2022 was more expensive than in previous years. Moreover, energy prices in Europe are likely to remain above their levels before the war in Ukraine.

Historically, the price of wholesale electricity has been roughly €40/MWh. Electricity, in turn, is often generated from natural gas, which has historically been priced around €20/MWh. As you can see below, gas prices have come down and have stabilised since their peak in 2022. This means that telecom operators will feel the tailwind of lower energy prices in 2024 compared to 2023. Gas prices are chosen because regional electricity markets in Europe all have their own characteristics, while European gas markets are deep and better reflect price trends.

### Gas prices have declined since 2022's peak

3-month forward gas price in euros per megawatt hour (expected prices in orange)



Source: Refinitiv, Endex

### Telecoms' financial outlook is positive despite margin pressures

The rise in energy costs placed upward pressure on many telecoms cost bases in 2023. Rising wages also played a part; as the cost of living increased strongly, so too did wages. Yet, in this challenging environment, most telecoms have managed to increase revenue through somewhat higher prices. Cost efficiency measures countered part of the cost increase. These two measures combined mitigated inflationary pressures for telecoms.

For 2024, the financial outlook of telecoms is more positive. The headwinds from energy costs and wage increases will likely ease. Furthermore, many telecoms will continue to cut costs, for example through the decommissioning of their copper networks. This leaves open the possibility for increased profitability in 2024.

### Telecoms have procured a lot of sustainable energy, but 5G could offer challenges

The telecom sector also procures a very significant amount of green energy. So much so that, according to a report by Oliver Wyman, telecom operators are ahead of plan in greening their operations. On average, telecom operators use 11% more sustainable energy than other companies in countries where they are located. In procuring a substantial amount of green energy, telecoms further hedge themselves from higher energy prices.

Tele2, Telia and Deutsche Telekom are leading the sustainability charge. They managed to cut their Scope 1 and 2 emissions between 2016 and 2021 by 99, 96, and 93%, respectively. They, and other telecoms, made their businesses more sustainable through the procurement of sustainable energy. In addition, they decommissioned copper networks and moved to much more energy-efficient fibre networks.

However, the 5G rollout could offer challenges. 5G requires more cell towers than 4G to offer higher speeds, meaning the network likely requires somewhat more energy. There might be smart ways to offset possible higher energy use of 5G, and telecoms will likely procure enough sustainable energy. Moreover, telecoms have managed to make their Scope 1 and 2 emissions sustainable with remarkable speed. However, Scope 3 emissions are roughly 70% of telecoms' supply chain emissions. This stems mostly from the manufacturers of networks, networking equipment and the supply of products such as mobile phones.

Given the fact that the telecom sector is making important strides in the green transition, we expect them to face these challenges head on while the volatility of energy prices should recede compared to 2022.

# European telecom sector faces additional regulation

## Diederik Stadig

Sector Economist, TMT & Healthcare  
diederik.stadig@ing.com

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

The already densely regulated European telecoms sector faces three new regulatory packages, but the playing field between technology companies and telecom operators might also be levelled



## The state of current telecom regulation

The European telecom sector is one of the most densely regulated sectors in the European Union. The most comprehensive regulatory package is the EU Electronic Communications Code (EECC). The EECC aims to harmonise telecom regulations across EU member states. It covers a plethora of different topics. Examples are spectrum management, which aims to harmonise spectrum allocations and licensing conditions within the EU. The harmonisation of spectrum allocations should, in turn, facilitate the rollout of wireless communication services. The EECC also covers competition rules, consumer protection, and the promotion of high-speed broadband development.

Other European telecom regulations cover net neutrality, data protection (under the GDPR), the sharing of infrastructure and access, as well as prices of telecom services under the Universal Service Directive. Recently, the EU added the elimination of roaming charges within its borders to the list.

In contrast, the technology sector is less strictly regulated, especially when it comes to consumer data. The technology sector is, of course, subject to the same antitrust regulations, as well as the GDPR, but it can process consumer data much more freely than telecom operators. The proposed ePrivacy Regulation of the European Commission might soon level the playing field, while three new regulatory packages provide both challenges and opportunities.

## The DMA could change the technological landscape

In previous years, the European Union agreed on three major regulatory initiatives covering the telecom sector (alongside other sectors). The first is the Digital Markets Act (DMA), which came into force in November 2022 and became applicable in May 2023. The aim of the DMA is the removal of market barriers created by so-called gatekeeper platforms. Gatekeepers have more than 45 million monthly users, operations in at least three EU member states, and have global turnover exceeding \$7.9 billion (e.g. Google, Facebook, Amazon). The DMA could affect telecoms in several ways. Firstly, it might curtail the dominance of large tech companies. Secondly, the DMA contains

interoperability requirements for core platform services. This means that gatekeeper platforms need to ensure that their calling and messaging services are compatible with those offered by other parties. This reduces the digital stronghold of large technology companies on digital communication and offers room for novel initiatives, which could be launched by telecom operators (e.g. RCS). Lastly, the DMA also affects M&A because it contains a provision that mandates the reporting of all digital sector-related and data-related M&A transactions to the European Commission. Moreover, it aims to prevent the combination of personal data from different services offered by the same platform (e.g. YouTube and Google Search). Combined with the interoperability requirements, this will make M&A more complex for telecoms.

### **The DSA will increase content moderation costs**

The Digital Services Act (DSA) aims to regulate digital services and online platforms in particular. It primarily takes aim at illegal content and disinformation, as well as transparency of data and algorithms used. It was approved in October of 2022 and came into effect in August of 2023 for very large online platforms and search engines. Digital service providers need to comply from January of this year. The DSA affects telecom companies in several ways. Firstly, the DSA states that companies hosting the data of others are liable when informed that this data is illegal. This affects telecoms that operate platforms where content is shared and it affects telecoms that offer hosting services. Secondly, companies that operate or host online platforms and services need to be transparent about their content moderation practices. This includes their decision-making practices around the removal of content, and their algorithms concerning content recommendation and advertising practices. In short, companies hosting data or operating online platforms need to ramp up their content moderation efforts.

### **The implementation of the AI Act might come with increased compliance costs**

The AI Act is the first regulatory package of its kind. It aims to increase transparency, trust, consumer protection and fundamental rights where artificial intelligence applications are concerned. The cornerstone of the regulatory package is the division of AI applications in risk categories: higher risk applications are regulated more strictly than lower risk applications. The provisional version was agreed upon in December 2023 and it should apply from January 2026 onwards. Naturally, if telecom companies were to introduce AI applications then they may need to adapt the development, monitoring and deployment of those applications (e.g. in customer service) following the AI Act. Furthermore, companies need to carry out risk assessments of their AI systems which increases costs. In addition, strict European rules on AI will likely incentivise European telecom companies to make diligent choices on how they implement AI.

### **The ePrivacy regulation might level the playing field**

The proposal for the ePrivacy Regulation was adopted by the European Commission in 2017. It is currently subject to interinstitutional European negotiations. If the proposed measures are agreed upon, then the playing field between telecom operators and technology companies will be levelled from a regulation standpoint. It currently includes provisions that will require so-called 'new players' (like Whatsapp or Skype) to offer the same privacy during (online) calls as telecom operators. In addition, it proposes to guarantee privacy on communications content and metadata, and can no longer be used by technology companies without user consent. This would offer an opportunity for telecom operators because the opt-in also applies to them. Currently, they cannot use any metadata, but if consumers give their consent they can. This could, for instance, result in the creation of heat maps that could aid transportation or public authorities. In short, the ePrivacy regulation in its current form looks fair, which would be good news for telecom operators.

### **More regulation to follow?**

Currently, the European Commission is exploring two other major regulatory initiatives. The first is the Digital Networks Act (DNA). European Commissioner for the Internal Market Thierry Breton presented the core proposals of the DNA at the end of last year, although European elections are on the agenda for November of this year. The DNA updates many telecom regulations, but also supports the creation of so-called EU telecom 'champions'. Breton wrote in October 2023 that telecoms need both scale and agility, but that current European market fragmentation holds them back. Removing national boundaries might thus foster cross-border M&A and create pan-European telecoms with more scope for large investment. If this were to happen, the DMA that was mentioned earlier will likely not prevent cross-border M&A because, for very large transactions, additional compliance costs will likely be overcome. This was celebrated by large telecoms, yet an uptick in cross-border deals is not expected in the near future. Compared to the US, the EU has a huge number of telecom companies, yet its consumers pay less and get better services.

The second major initiative being explored is whether or not the European Commission should propose making so-called 'big streamers' pay for the next generation of internet infrastructure. Some telecoms have argued that they foot the bill for large amounts of traffic generated by content providers such as Netflix and YouTube. Yet, others argue that this would violate net neutrality and that costs for telecoms do not increase with an increase in data traffic. It remains to be seen how the European Commission will proceed, but this will remain an interesting topic to follow in 2024.

In sum, a lot has happened in telecom regulation in the past years. This will provide telecoms with a few challenges in the years to come, but it might also level the playing field between technology companies and telecom operators.

# Stark differences in fibre coverage across Europe persist

## Diederik Stadig

Sector Economist, TMT & Healthcare  
diederik.stadig@ing.com

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

As was the case in previous years, there are stark differences in fibre connectivity across Europe. However, many of the laggards will continue to catch up in 2024



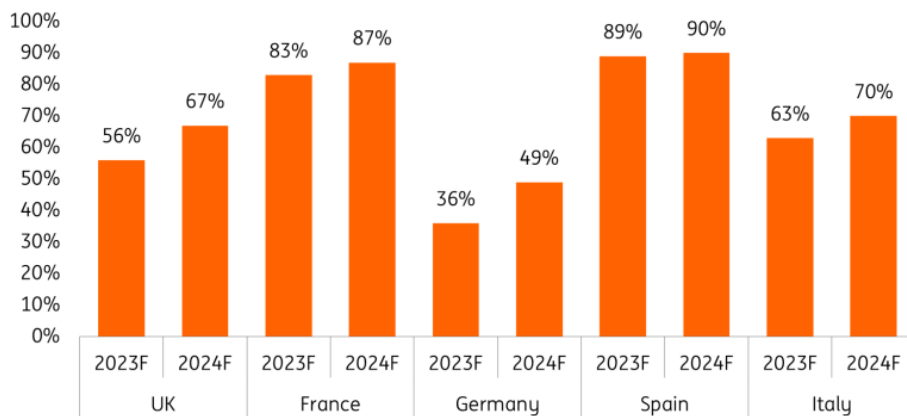
## Significant investment required to meet Digital Decade goals

Europe's Digital Decade is in full swing, yet the ambitious connectivity goal of delivering Gigabit download speed to all European households in 2030 looks like a tough task, even though millions of new homes are covered by fibre every year. Recently, a report commissioned by the European Commission found that around €114 billion needs to be invested to achieve the Gigabit coverage goal, and that €33.5 billion is necessary to achieve mobile goals (WIK-Consult). This adds up to a €148 billion investment. But depending on the deployment mode, €26 to €79 billion is required for the main transport paths. This makes for a total investment gap of €174 billion, based on the least costly deployment mode.

In short, private sector investments, as well as public funds (i.e. CEF Digital and the Recovery and Resilience Facility), are necessary to achieve Europe's lofty connectivity goals.

- Additional investment is particularly required in Belgium, Germany, and Greece, where less than 30% of homes were connected to fibre in 2022 (FTTH Council Europe).
- This stands in stark contrast to Lithuania, Portugal and Romania, which had connected roughly 90% of their households to fibre at the end of 2022. The difference is largely explained by lower costs per premises in South and Eastern Europe, which is why networks overlap more often.
- In France, which is also ahead of the curve, early coordination by local authorities proved very efficient. However, based on recent trends and reports, we estimate that many European laggards are currently making quick strides forward.
- In Germany, for instance, we estimate that it will have nearly half of all homes passed at the end of 2024. We expect a similar acceleration in the UK, where we estimate that two-thirds of all homes will be passed at the end of this year.

**Forecast percentage of homes passed  
In the UK, France, Germany, Spain and Italy**



Source: ING

**Interest rates, wage increases and competition make closing the investment gap more difficult**

After an all-time high in 2022, there was slightly less activity in fibre financing markets in 2023. This is driven by three factors, the first of which is higher interest rates. As the sector is mainly debt-financed, much of the interest rate risk is hedged by undrawn facilities. However, the cost of additional financing, which is sometimes necessary, has increased, which also holds for a renewal of the financing.

Second, labour costs have gone up due to wage increases, which makes new networks more costly to build. In addition, overbuild risk in very developed fibre markets makes new networks in densely populated areas a more challenging endeavour.

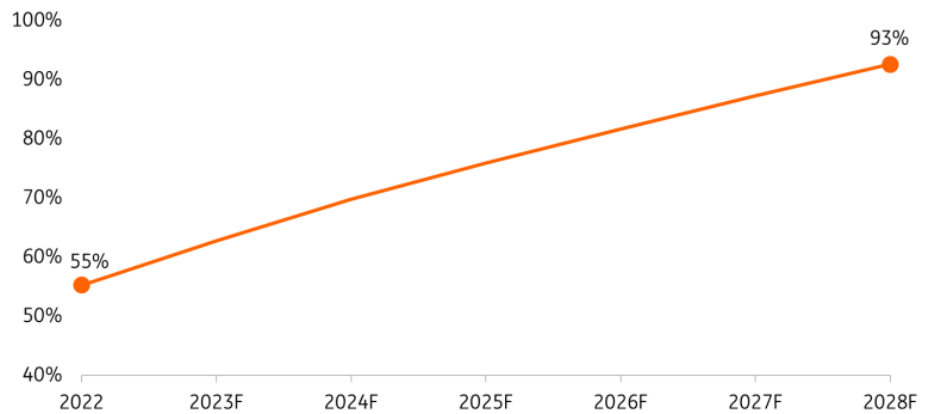
Third, there is stiff competition in the fibre market, which means that money is also used to acquire new customers on existing networks next to building networks in new areas. However, there is still a lot of demand for better and faster connections with fibre, and the long-term prospects for fibre to the home, once the economy exits its current choppy waters, are good.

**New homes are still passed at an impressive rate**

Despite a slower financing environment, new homes are still being passed at an impressive rate, as mentioned previously. We have calculated, based on data from the FTTH Council Europe, that 93% of European (EU-27 and UK) households will have fibre coverage in 2028, up from 55% in 2022. To meet this forecast, a lot of work remains to be done. The signs are promising, however, as we expect many European laggards to catch up quickly in the years to come. We do not just expect companies in the five largest countries to invest significantly in the fibre rollout, but those in other European countries as well. Moreover, private-public partnerships are showing promise. In Belgium, for instance, Proximus, together with the Belgian Infrastructure Fund, plan to bring fibre to an additional 1.7 million homes on top of existing rollout plans which would extend coverage to 95% of Belgian households. In short, the European fibre rollout is progressing at speed, in spite of challenges.



### Percentage of passed homes expected to keep growing



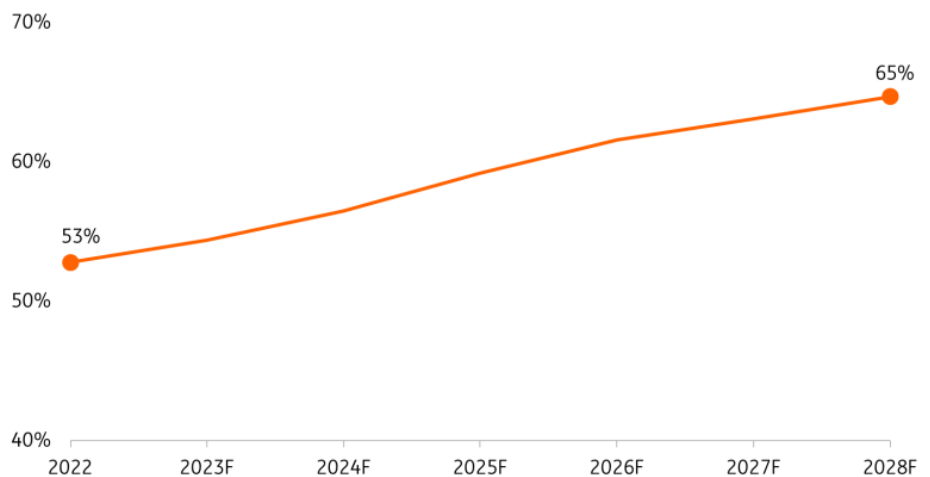
Source: ING; FTTH Council Europe

### Consumer demand for fibre connections is also growing

In 2012, only 30% of households were connected to fibre networks. Currently, the take-up rate is 53%, and we expect this to keep increasing for the foreseeable future. Consumers value the fast connection that fibre offers, for instance, for video conferencing and video games. It is also important for service providers because profitability increases with higher take-up rates. By 2028, we expect the take-up rate to be 65%, in line with the expectations of the FTTH Council Europe.

### Usage of fibre networks will keep increasing

Percentage of people that subscribe to fibre when available



Source: ING; FTTH Council Europe

### Outlook for fibre rollout looks bright in spite of challenges

Many companies have ramped up their fibre rollout efforts. We expect the percentage of homes passed in countries that currently lag behind in the fibre race to increase by (near) double digits in 2024. We should thus see strong growth in Germany, the UK especially, and to a lesser extent, Italy. This is driven by consumer demand and the connectivity goals of European governments. Thus, the fibre rollout will continue at speed in spite of increased interest rates, higher labour costs, and the risk of overbuilding. In the longer term, after 2028, we expect the fibre rollout to slow down. This is because it is prohibitively expensive to cover rural areas with fibre, especially if very large distances need to be covered. In those cases, fixed-wireless access or satellite connections can offer suitable alternatives.

In short, the fibre rollout will continue at pace in 2024, despite challenges.

# 2024 year of the smart home

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

## Diederik Stadij

Sector Economist, TMT & Healthcare  
diederik.stadij@ing.com

The smart home will finally arrive in 2024. Today, there are many cheap microchips, excellent broadband and Wi-Fi networks, and many affordable smart home products. A new smart home standard, Matter, improves the ease of use while the desire to lower energy consumption is a killer application. Telecom operators could benefit through resell agreements



## Introduction

Some 30 years after the 'House of the Future' was built in the South of the Netherlands - a project which employed smart systems and devices, including voice technology - we are finally ready to declare that mass adoption of the smart home is on the way. This is because a number of developments are finally coming together. The problem with the smart home and smart gadgets for some time now has been that the different devices, such as smart lamps, detection devices and cameras, did not work together, while the functionality of an integrated user interface was limited, also because the number of devices in houses was limited. Now, all of this is changing. There is a lot of (relatively) cheap gear, good user interfaces, and also a killer application to give customers the ability to better control energy use at home. Most importantly, there is also a new standard setting the scene: Matter, which greatly enhances the eco-system of smart home tools.

## Cheap semiconductor sales are rising strongly

Let's start by discussing the greatly improved availability of affordable smart home gadgets. Every device needs a microcontroller and a means to communicate. Any smart home device therefore has a small microprocessor system that is also capable of communicating by using, for example, a Wi-Fi or Bluetooth protocol. It is here where, over a decade ago, the ground was laid for the boom in smart devices. New products have been developed based on an ESP8266/ESP32 or ARM Cortex processor architecture. This architecture provided a cheap building block that became the foundation of many devices. As can be seen in the graph below, the number of ESP8266/ESP32-based systems that are cumulatively manufactured is expected to double in three years to two billion devices in 2026, up from nothing in 2013.

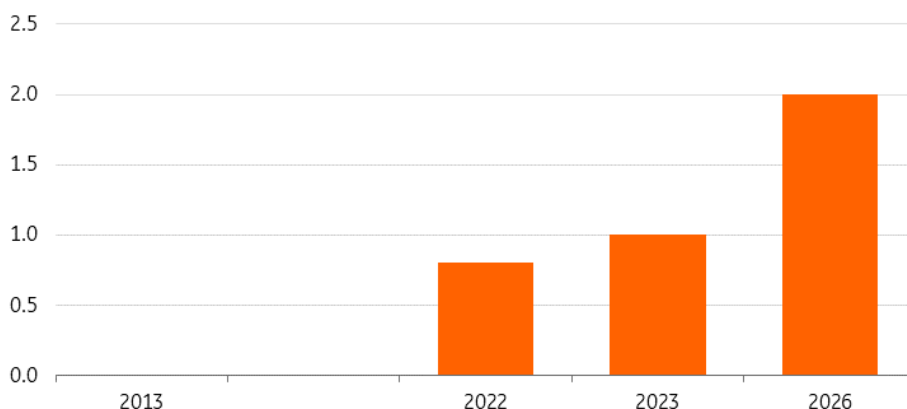
## Stable networks are common today

At the same time, the quality of fixed network connections has improved, including enhanced indoor Wi-Fi through mesh networks. Reliable, high bandwidth networks are a condition for the acceptance of wireless control of domestic appliances because

customers do not like the inability to connect to tools providing basic functionalities, such as controlling the room temperature or lighting systems. Moreover, the availability of high mobile data bandwidth gives customers the ability to see what’s on the cameras in their homes: functionality that is in demand as can be witnessed on the streets where camera-enabled doorbells are becoming ever more frequent. This is also why there is now a wide availability of cameras with large electronics retailers. The quantity of devices is not the only development that matters. The devices need to speak a language that is understood by the main dashboard. This challenge has also been resolved over a year ago, so that manufacturers have had time to develop innovative products, meeting the new standard.

**Smart home semiconductor demand explodes**

Espressif leads the IoT market with 1bn shipments of ESP8266/ESP32 platform



Source: Espressif, ING

**The new standard: Matter**

For some time, large technology platforms included dashboards and control panels for the smart home in their software. Examples include Apple’s Home Kit, Amazon’s Alexa, Google Home, but also the Philips Hue system and Home Assistant, an open-source project with global reach. There were also many companies offering products for the smart home, such as smart lighting solutions from Signify, smart plugs, doorbells, cameras, home audio and smart domestic appliances. Also, Ikea has a wide range of products for the smart home. The interoperability has been greatly improved because of the new standard, Matter. This new standard was designed to enhance the compatibility and interoperability of devices from different vendors. Matter has been developed by the Connectivity Standards Alliance. Members of the alliance are, for example, Apple, Amazon, Google, as well as Ikea, Schneider, Huawei, Signify, NXP, Infineon, ST Microelectronics, Tuya, Samsung, Resideo and Verizon. Truly an industry-wide group. Devices that are designed according to the Matter standard are interoperable across multiple platforms, removing barriers between multiple ecosystems.

**IDC’s Worldwide Smart Home Device Forecast by Shipment Volume**

Expected shipments in millions

Device category	2023 Shipments	2027 Shipments	2023-2027 CAGR (%)
Video Entertainment	279	306	2.4
Home monitoring/Security	192	252	7.1
Lighting	102	170	13.6
Smart Speaker	107	123	3.5
Thermostat	25	30	4.5
Others	153	211	7.7
<b>Total</b>	<b>857</b>	<b>1,092</b>	<b>6.2</b>

Source: IDC Worldwide Quarterly Smart Home Device Tracker (June 2023), ING

### **Shipment volume as expected by IDC underestimates demand for smart home products**

We are not alone in expecting strong growth in the market. IDC expects that the market for smart home devices will expand by 6% annually from 2023-2027. Product categories that show above-average growth rates are Home Monitoring (7.1%) and Lighting (13.6%). Nevertheless, we think the figures underestimate the growth in shipments, as the expectations on the expected increase in shipments show, above. If the shipments on the ESP8266/ESP32 platform show, these shipments double until 2026. These microchips are not only used for smart home products. Nevertheless, we think the growth rate of these products is more indicative of the increase in shipments of smart home tools.

### **Need for energy preservation could be a catalyst**

Apart from user friendliness and affordable prices, many citizens are currently concerned with their environmental footprint and their energy use at home. Smart tools offer a great way to monitor one's energy consumption while giving greater control over domestic lighting and heating. This is especially relevant with fluctuating energy prices. Notably, some consumers in the Netherlands are looking to profit from negative electricity prices, using machines that use a lot of energy when prices are negative. Smart home applications can therefore fulfil an important customer need today, beyond the ability to switch devices on and off remotely. Data from a report by Park Associates (on behalf of Resideo) shows that 16% of Americans (with broadband) have a smart thermostat.

### **Smart homes need to be safe**

Besides the need for a great user experience, one likely obstacle to the broad adoption of smart products has probably been safety. Lately, there have been many news stories about insecure devices hosting botnets. Also, devices that use remote cloud server providers host data outside the home. The Matter standard is focused on enhanced security and local control as is the Home Assistant platform. Apple also has a strict requirement in place for products that want the "Works with Apple Home" badge. Nevertheless, we believe there is scope for a consumer service focused on the secure maintenance of a (separate) in-house network.

### **Can telecom operators benefit from the opportunities the smart home offers?**

What's in it for telecom providers? The smart home is a natural extension of the traditional services of telecom operators: secure communication and often the provision of a media box. So far, some telecom providers are giving advice to customers on the optimal use of indoor Wi-Fi. They sometimes also offer software packages to enhance network safety and sell mobile handheld devices. Now that smart home platforms and smart products look stable and relatively easy to install, we think telecom providers could become resellers of secure smart home devices and possibly services, such as the provision of a smart hub at home, or trusted cloud access. KPN is doing this already, today. In doing so, happy customers are less likely to go to a competitor. Given that churn reduction is the holy grail for the telecom industry, exploring the option of selling innovative services is worth a try.

# Cybercrime, AI and the growing need for digital identity protection

## Jan Frederik Slijkerman

Senior Sector Strategist, TMT  
jan.frederik.slijkerman@ing.com

## Diederik Stadij

Sector Economist, TMT & Healthcare  
diederik.stadij@ing.com

The protection of our digital identity is becoming more and more crucial as phishing activity remains high and AI provides increased opportunities for criminals. Malicious online activity is still on the rise, and we stress the high importance of using safe mobile phones. Mobile safety features could also be of interest to telecom operators



## Phishing activity remains high

Many of us have received an email with the false promise of an inheritance of a deceased (unknown) family member, a business proposal that was too good to be true. The aim of these emails is to engage in a conversation while revealing confidential information in the process.

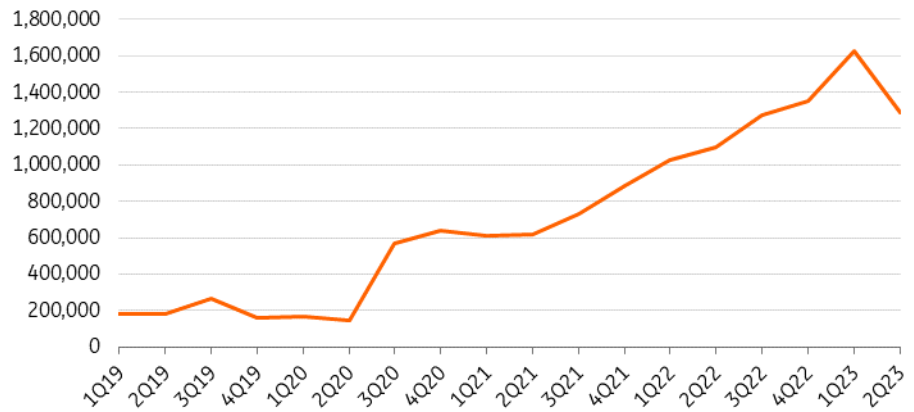
This is one of the most disturbing forms of cybercrime – the theft of personal identifiable information, or phishing. This data allows further criminal practices that could lead to great (financial) damage. Today, scammers approach us through all available communication channels, including those on mobile phones.

Throughout the years, phishing activity has seen a strong increase, despite a slowdown during the second quarter of 2023. The increase in phishing activity is the result of increasing professional capabilities. Nevertheless, it could be that the second quarter data reflects international law enforcement agencies finding some success in taking down the large criminal trading website Genesis Market through Operation Cookiemonster. But also the malware from Qakbot has been taken down and ransomware group HIVE.

Today, many employees and customers are trained to recognise phishing attempts, and there is now software available that monitors and blocks traffic that is directed towards phishing sites. Even so, we expect that activity will pick up going forward because criminal networks are likely to continue improving their professional skills. Opportunities will also increase as the number of devices that can be used for phishing rises. Notably, towards the end of 2023 low-tech phishing attempts were on the rise, luring customers to scan QR codes that directed them to malicious sites.

### Phishing activity went up significantly throughout the years

Number of unique phishing Web sites (attacks) detected



Source: APWG, ING

### AI may help criminals

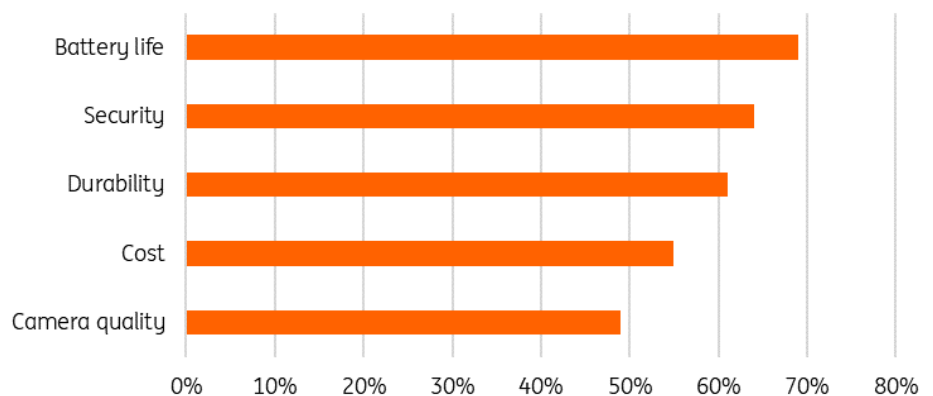
Some criminals engaging in cybercrime can be highly sophisticated – but equally, others are often just testing the waters and giving things a try. Often, these could be spotted through spelling mistakes. AI may unfortunately increase the risk that comes from less sophisticated fortune seekers. AI technology provides an easy way to produce well-written messages, and can help with impersonating others through manipulated audio messages or with training criminals. Criminals committing cybercrimes have also professionalised in recent years, with organised groups now providing services for each step along the value chain. Fortunately, companies may also benefit from AI helping to analyse and detect traffic with malicious intent.

### Identity data theft continues to pose a challenge

As a result of the increasing threat, defences against unauthorised access and data theft have to be in place. These measures involve additional layers of protection against social engineering, but also against malicious software. In the context of the 2024 Telecom Outlook, we identify three trends evolving around the need for secure and trusted data connections. We see a greater need for multi factor authentication, a bigger demand for secure connections (VPNs), as well as a greater acceptance of endpoint protection software. These measures obviously have to be taken into wider security policies and a secure infrastructure, based on the concept that requests to access information and systems can only be trusted unless it is verified (zero trust infrastructure).

### Smartphone purchasing criteria

Security ranks second as very important reason to choose the next smartphone



Source: GSMA Intelligence, ING

**Mobile phone takes centre stage in efforts to enhance digital safety**

As research by the GSMA shows, security risks rank in the top three most considered features for buying a mobile phone, right after battery. Apple is a company that sees safety as a key feature, and this differentiates the brand from others. It operates a trusted ecosystem, limiting the ability by users to install software that was not checked for its safety aspects. Today, there is a greater pressure on phone manufacturers to make security enhancing software updates available for a considerable period, as shown by new standards such as the Protection Profile for securing smartphones from the ETSI. Legacy phones with an outdated and unsafe operating system expose their users to phishing attacks and privacy infringements. Surprisingly, we do not see much business communication encouraging people to replace old phones with new ones for their improved safety features. The same holds true for the use of software enhancing mobile safety. While software protecting the network endpoints (such as the phone) is very common in a business environment, this is not the case for consumers.

As most of us know, mobile phones can also be used as a means to provide an additional layer of security. There are many identification apps, such as Microsoft Authenticator or Google Authenticator, which enable multi-factor authorisation. But phones also offer the infrastructure through which a verification code can be sent. This is done through providers such as Twilio, CM.COM and Telesign (part of the telecom company Proximus). These tools greatly help to improve access security for digital infrastructure. They can also act as a building block for interesting business offerings that are around. Nevertheless, once a device (such as a mobile phone) is unsafe, authentication from that device become unreliable. This shows again why devices need to be safe and protected.

**Telecom providers could enhance their role, enhancing digital safety**

We think safety enhancing features offer a further opportunity for telecom operators, although they already do a lot to protect digital infrastructures today. Telecom operators could further seduce customers to replace unsafe phones, while consumers may start to use software that enhances the safety of mobile phones (end-point protection software) and look for services that protect their identity and data integrity (VPN software).

Vodafone and KPN are among the companies that are leading the way here. Vodafone offers security software for mobile phones in the business segment, while KPN has a collaboration with ESET, a global digital security company. Traditionally, cyber defence efforts were directed towards the business segments and telecom operators already have offerings in place for this market segment. A notable example is Orange. Orange has been growing its cyber defence entity by 14% year-on-year in 2022 to €977m and 11.4% YoY in the first half of 2023. The objective is to generate €1.3bn revenues from cybersecurity services in 2025. This clearly shows that there are opportunities in the telecom space.

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