

ISSUE 1 JAN-MAR 2023

ANALYSYS MASON

# QUARTERLY

Global leaders in TMT management consulting







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# Analysys Mason's predictions for M&A activity in the telecoms market in 2023

Alessandro Ravagnolo and Analysys Mason's transaction support team

**TMT M&A AWARDS 2022**  
**WINNER**  
**TMT Due Diligence Adviser of the Year - EMEA**

2022 was another important year for Analysys Mason. The company has continued to grow according to plan. We supported another record number of mergers and acquisitions (M&A) deals, and added senior experts to further strengthen our team. Analysys Mason itself played a role in the M&A flow by acquiring Northern Sky Research, whose expert team adds specialist satellite and space competencies to our product offering, and through the completion of our partnership with Bridgepoint Development Capital. Both deals will be vital to our ongoing development as industry thought leaders so valued by the financial community.

We start 2023 with our customary passion and our traditional top-ten predictions. While many of our previous years' predictions still apply, we have avoided repeating them here. If you are curious, you can consult them on our website or ask your Analysys Mason contact about them. In this article we focus on new trends and dynamics whose expected influence on the sector have greatly increased.

## **Prediction 1: The slowdown in equity deals will not last and will vary across vertical sectors and regions**

The changing macroeconomic environment (most notably the higher interest rates and inflation) is having an impact on the financial markets – the number of equity deals in the telecoms, media and technology (TMT) sector fell at the end of 2022 compared to the same period in 2021. This trend is expected to continue in 2023. This slowdown is expected to have a particularly marked impact on those vertical sectors that benefit most from the availability of a large supply of low-cost capital – so digital infrastructure and developed regions look set to suffer more than private equity investors and emerging markets.

The reduced number of deals can be explained by the mismatch of price expectations between buyers and sellers in a changed macroeconomic environment. Analysys Mason is still bullish on the long-term outlook for M&A deals in the TMT sector as we continue to observe financial sponsors raising new capital, and there is still a long list of existing (and new) assets that are looking for new backers, or that are in need of capital injections.

“ 2022 was another important year for Analysys Mason. The company has continued to grow according to plan.

### **Prediction 2: Operators will focus on debt management and structured refinancing deals**

With recent rises in interest rates, companies may need to spend more money on serving debt. Firms with a lower cost of debt than their industry peers will enjoy a more pronounced competitive advantage than usual (see Prediction 4).

Companies that can postpone refinancing deals will do so. Others will have to refinance because their debt will come to maturity and, as a result, they will undergo deeper scrutiny by the lenders. These companies stand to gain from more independent due diligences to prove their merits to lenders and secure competitive financing terms.

### **Prediction 3: Lenders will pay close attention to ensure that capital is used efficiently and companies are operationally sound**

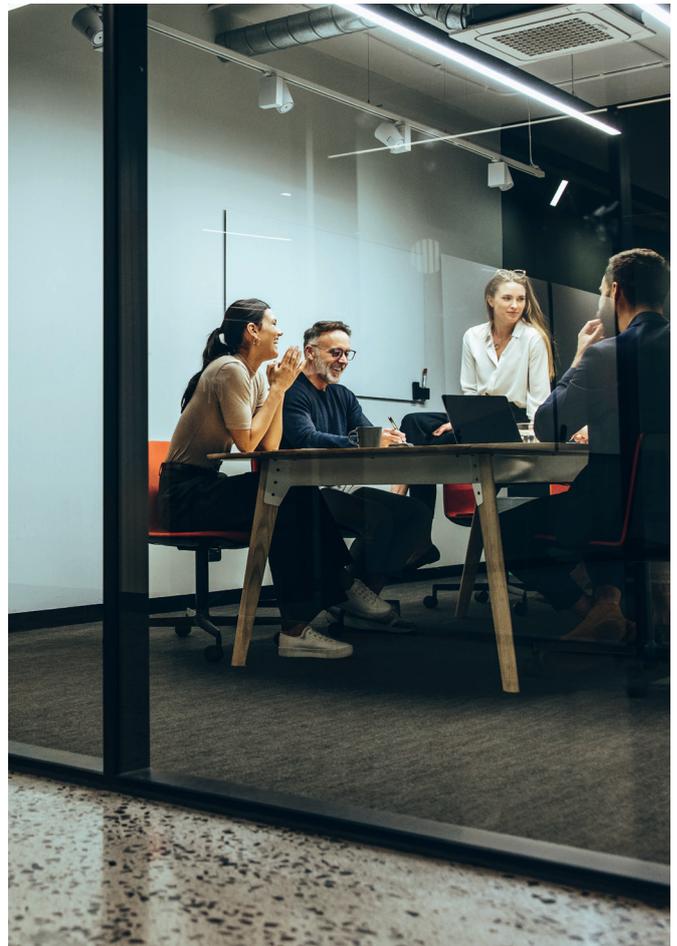
Project financing – or similar financing approaches – have been popular in certain markets (e.g. France) to support greenfield investments (i.e. new deployment) in digital infrastructure. These operations are more exposed to financial downturns than brownfield assets (where for the most part the infrastructure already exists) and so need to be monitored more closely.

Lenders will demand closer monitoring of how businesses are progressing against the business plans they invested in. This monitoring will need to be done by independent experts who are able to comment authoritatively on technical, operational and commercial aspects of the business. This requirement will become more common among lenders around the world and equity investors will also start adopting this more frequently to make sure that their capital is being used efficiently and where it is needed the most.

### **Prediction 4: Financially sound companies will have a chance to consolidate the market**

Companies will handle the increased cost of debt with different degrees of success. The most financially diligent companies with successful business models will be able to refinance at low rates, and so gain a competitive advantage. This advantage is expected to translate into opportunities to grow inorganically through bolt-on acquisitions of players that have come under balance-sheet pressure or have struggled to find adequate capital to support their own organic growth.

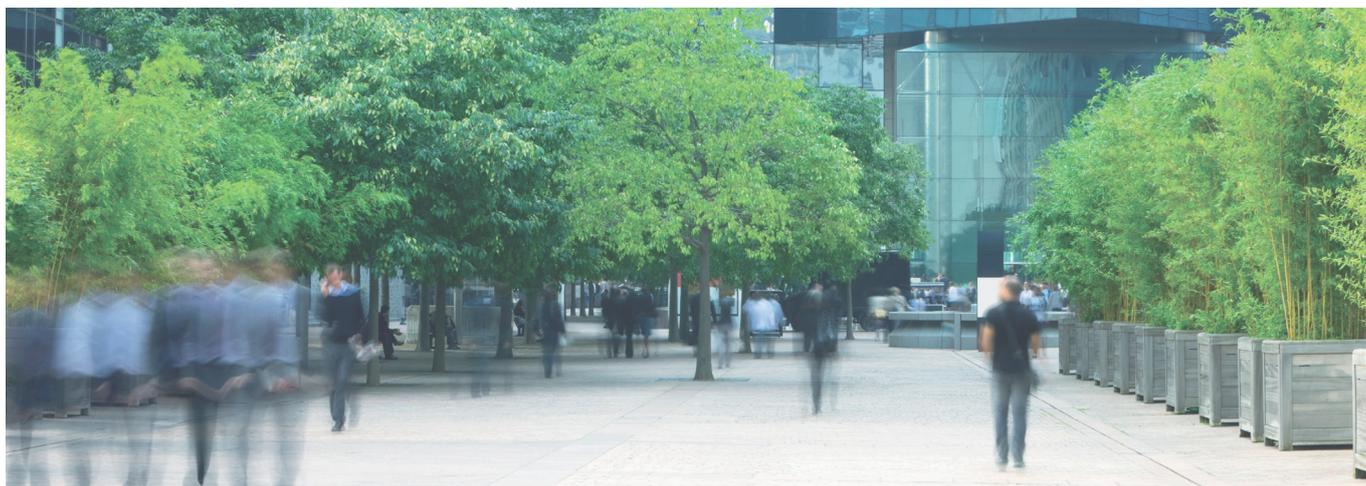
This acquisition opportunity will be important in those market segments that are more fragmented, and characterised by multiple sub-scale players (e.g. fibre to the home (FTTH) in certain markets, Internet of Things (IoT), co-location data centres). The major benefits will be for those operators that have developed the ability to integrate and restructure target companies smoothly and efficiently. This will be an increasingly important requirement to pursue inorganic growth strategies.



### **Prediction 5: Commercialisation opportunities will help telecoms nodes emerge as a new vertical sector within digital infrastructure**

There is life beyond the three main digital infrastructure pillars – towers, fibre, data centres – that have dominated the scene in the last decade. Mobile and fixed telecoms operators will realise that their telecoms nodes (e.g. switches, exchanges, transmission) offer substantial monetisation opportunities, and they will likely bring in financial and/or strategic partners for the carved-out entities that are better designed to address the opportunity.

Telecoms nodes are typically high-value real-estate assets that are strategically positioned across a network footprint. They boast fibre connectivity, well-dimensioned industrial power equipment and a lot of floor space freed up by the downsizing of equipment when fixed and mobile networks moved from analogue to digital and from physical to virtual machines. Beyond hosting telecoms equipment, they are ideally suited to be repurposed as edge data centres. Analysys Mason has already identified, and seen appear in the market, further business opportunities within and beyond the TMT space (e.g. energy communities, distribution, vehicle to grid).



### **Prediction 6: Space M&A will continue in 2023**

We are seeing exponential growth in satellite capacity supply and the entry of new players, boosted by innovations in rocket launches and the increasing sophistication of satellite systems, which can be achieved at significantly reduced capex.

Incumbent players are reacting by forging strategic partnerships and consolidating to cement their market-share positions. Meanwhile, new entrants are pursuing acquisitions to reduce time to market. Viasat's acquisition of Inmarsat and Eutelsat's announced merger with OneWeb highlight the trend in 2022, alongside other M&A activities disclosed during the year.

Analysys Mason predicts that this M&A wave will continue in 2023, driven mainly by the need to secure distribution for the enormous capacity supply and strategic geographical expansion. Operators seeking greenfield opportunities in niche or developing segments through application-level differentiation will seek to acquire strategic assets.

There are marked differences in the competitive positioning and revenue streams of legacy prime contractors relative to start-up space companies and those that recently emerged from Special Purpose Acquisition Company (SPAC) status. These differences will be exacerbated as the macroeconomic environment (interest rate hikes, inflation, supply-chain challenges and recession fears in 2023) places pressure on revenue streams. As a result, these trends will disproportionately affect companies with negative cashflow in 2023, forcing more assets to become available for sale. Analysys Mason expects the search for complementary intellectual property and talent to drive M&A activity around space infrastructure during the coming year.

### **Prediction 7: We will see deals to develop new green energy infrastructure generally, as well as divestments away from energy infrastructure in countries with less green focus**

Momentum is gathering globally behind the transition to green infrastructure, and so we expect to see increased differentiation at a local level.

The renewed drive to boost investment in green infrastructure (generation and distribution of renewable energy, electric vehicle (EV) charging, etc.) will see new opportunities arising in most regions. Some regions and markets may have less of a focus on, and ambition for, a low-carbon future; as a result, some players with high green ambitions may look to exit these markets and regions in search of a more favourable environment. The generation of new opportunities, both from new investment and from gaps in the market, will lead to several transactions relating to energy infrastructure. Those players with a focus on sustainability will invest in new green infrastructure. Those players with less exacting standards for sustainability may invest in existing infrastructure, though this will still need to be aligned with the Paris Agreement's trajectory for decarbonisation.

### **Prediction 8: Following years of widespread B2C fibre transactions, the focus will shift towards B2B**

The ongoing transition of public and private data and processing into the cloud (and associated data centres) will drive demand for symmetrical fibre-based broadband connections (i.e. with the same uplink and downlink speeds). This will apply to companies' day-to-day operations, even if not located in city centres or very densely populated areas. This trend requires the deployment of geographically granular business-to-business (B2B) fibre networks that have different properties from business-to-consumer (B2C) fibre connections (more secure, with redundancies and providing symmetrical, or at least very high upstream, speed). Hyperscalers also require further fibre connections (on separate redundant routes) to connect submarine landing stations to their data centres (and to interconnect their numerous data centres).

After many B2C fibre transactions in a range of countries over the last few years, B2B-focused companies will require further capital to expand their activities, connect the increasing number of data centres in fully meshed networks and provide on-net fibre links to connect companies to their main data centres and the internet. We expect this to drive further M&A.

### Prediction 9: The wave of IoT M&A activity will not stop

A number of M&A deals and investments occurred in the IoT market in 2022. Most notably, Semtech bought Sierra Wireless and Unabiz took ownership of Sigfox. Several high-profile deals are already planned for 2023; among these might be the spin-off of Vodafone's IoT unit, potentially worth billions of euros, which will be watched closely by other operators that are considering a similar move. Aeris should also complete its acquisition of Ericsson's IoT unit in Q1 2023, and Soracom plans to list on the Tokyo Stock Exchange, making it just the second IoT connectivity firm to list publicly (after KORE in 2021).

As the IoT sector continues to mature, this will create opportunities for investors that do not focus on early-stage investments and so have not looked at this space before. Further deals in 2023 will include the acquisition of small players by larger IoT mobile virtual network operators (MVNOs) such as Wireless Logic and KORE, as well as operators' investments in, or acquisitions of, innovative connectivity disruptors to gain new capabilities. We also expect to see telecoms operators spinning off their IoT divisions to highlight the value of the business and, potentially, attract investors.

### Prediction 10: Retail operators no longer burdened by network operations will look for M&A options

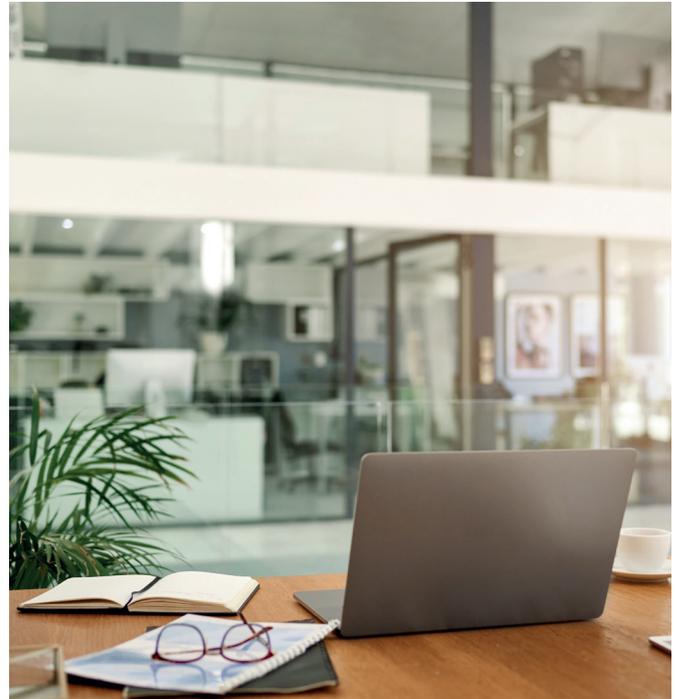
The trend towards de-layering network businesses (NetCos) and service provider businesses (ServCos) will continue. A great deal of attention has been paid to the creation of, and experimentation with, various NetCo/InfraCo business models. Over the coming year (regulation permitting), this process should also allow B2C ServCos to be reconfigured, both to generate economies of scale (e.g. by removing duplicated IT assets), and to expand and seek co-investment.

Freed from the obligation to monetise a particular NetCo's local or national infrastructure investment, ServCos will think more independently, evolve into more digital and platform-focused businesses, and therefore develop different expectations and ambitions. For example, they could develop a common set of, or platform for, containerised in-home services. These service provider federations are likely to be a precursor to full-blown M&A. De-layering will lower the barriers to national and transnational ServCo consolidation; this is likely to play out in Europe and in other regions with small national operators.

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We would be pleased to have further discussions on our top predictions, as well as other – no less important – predictions that did not make the shortlist this year. We expect 2023 to be another exciting year for deal makers, with a completely new set of challenges to be overcome. We look forward to sharing this journey with our clients as a trusted commercial and technical adviser, especially in light of our expanded capabilities in emerging sectors such as satellite, environmental, social & governance (ESG), technology & operations, energy and utilities, among others.

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Analysys Mason is the commercial and technical adviser of choice of multiple major financial investors and industry players due to our focus on TMT, convergent digital vertical sectors and the experience that we have gained in over 750 transaction support assignments worldwide during the last five years. 2022 was our biggest year ever with ~250 transaction support assignments that cover the full investment lifecycle of our clients, demonstrating marked acceleration of activities and the expansion of our team across domains and geographies.

**Questions?** Please feel free to contact Alessandro Ravagnolo, Partner, at [alessandro.ravagnolo@analysismason.com](mailto:alessandro.ravagnolo@analysismason.com)



## Analysys Mason's research predictions for the telecoms, media and technology sector in 2023

Research

Here are Analysys Mason's 10 most-compelling predictions for the telecoms, media and technology (TMT) sector in 2023. These predictions will be supported by more detailed predictions for specific areas; consumer and enterprise services, networks and software, and satellite.

The biggest issue for telecoms operators in 2023 will be coping with inflation and particularly rising energy costs. After a decade of low inflation and low interest rates, telecoms operators, like other businesses face the problem of managing rising costs and uncertainty about how much they can increase their own prices to cope.

### **Price rises for telecoms services will become a political issue**

Elected officials have largely left pricing issues up to regulators for the past decade. Operators and regulators will be under pressure to moderate price increases, especially on consumer services. Operators will also be pushed to introduce, and publicise, 'social' tariffs for consumers in financial hardship, especially for fixed broadband services. We believe that operators will be able to raise retail prices, but it is possible that ARPU will not keep pace with inflation, meaning a cut in real terms. However, it is worth remembering that telecoms services are a relatively small part of any household budget and the annual price increases will be far lower than those for other products and services, such as food and energy.

### **Telecoms operators were relatively unscathed in the pandemic but must now cut costs**

Some cost cutting will come from the automation that telcos have invested in in the past few years, but they must focus on reducing energy costs. One particular area will be decommissioning older networks more rapidly than previously planned.

### **Telecoms operators will continue to invest in fibre and 5G infrastructure**

FTTP investment will continue to grow and infraco joint ventures will shoulder a greater share of the financial burden. Telcos will move to FTTP pushed by competition from other technologies and pulled by an increasing number of consumers demanding high-bandwidth services that are not adequately supported by current broadband connections or preferring FTTP for reasons such as its better reliability. Traditional telco capex budgets are constrained by the need to invest in 5G, but the long-term value of fibre (and utility-like models) will continue to attract outside investors.

### **The metaverse will not materialise in 2023, but many more telecoms operators will align their roadmap to fit the vision of an xR-centric future**

Meta will continue to spend billions in R&D in 2023 with little return on investment in that timeframe: 2030 will be increasingly framed as 'the year of the metaverse'. However, operators will take xR use-cases (like VR immersive calls, 3D video calling or digital twin technology) more seriously in 2023 and most will formulate a specific metaverse strategy (internally, if not externally) this year. Apple's long-rumoured xR headsets may be launched in 2023 but are more likely in 2024.

### **Telecoms operators will not give up on digital services despite some mixed results**

Some high-profile operators have recently left digital services areas (in particular, AT&T and Verizon sold their advertising divisions) and some are rumoured to be planning to divest assets (for example, Orange's reported plans to sell Orange Bank), but these decisions should not be taken as signals that all operators in high-income countries are rethinking involvement in digital economy services. The US cable operators continue to invest in advertising initiatives, and European operators are likely to follow. TELUS is expected to generate more than 10% of its revenue from health services in 2023. Others are looking at digital education as a growth opportunity.



### Private networks take-up will continue, but progress will not be smooth

Take-up of new private networks has been led by large organisations with networking teams and significant internal expertise. We expect this to continue in 2023, but if take-up is to be strong in the next tier of organisations, private networking solutions will need to be simpler and easier to buy. Suppliers will need to offer networks, devices, edge computing, spectrum and other capabilities as a package. Some form of opex/as-a-service pricing will need to be offered. If these developments do not happen, it is possible that adoption will stall.

### Demand for multi-cloud connectivity will drive the launch of new solutions

Enterprise demand for SLA-based, on-demand multi-cloud connectivity and network-as-a-service (NaaS) platforms will accelerate because it will be imperative for many businesses to have cloud interconnection, app-to-app networking, zero-trust security and data-sovereignty-compliant traffic management across multiple public clouds and SaaS providers. Telecoms operators with large enterprise/B2B divisions will increasingly prioritise multi-cloud network investments using software-defined networking (SDN) and cloud-native IP networking technologies to gain ground against the alternative service providers that are dominating the market today.

### Open RAN will expand in rural and enterprise environments but the crucial massive MIMO challenge will remain inadequately addressed

An ecosystem is developing around Open RAN in areas that are poorly addressed by traditional cellular architecture and operator models, namely rural extension and enterprise small cells. These deployments will gather momentum in 2023 as organisations such as the Telecom Infra Project address issues such as common testing models. However, significant challenges remain to achieve optimum performance in urban macro networks using Open RAN architecture, especially those incorporating massive MIMO. These challenges will take several more years to address to the satisfaction of large operators, and a separate and parallel ecosystem is likely to be established for macro Open RAN.

“ These predictions will be supported by more detailed predictions for specific areas; consumer and enterprise services, networks and software, and satellite.

### The use of SaaS deployment models will grow by 19% in the telecoms industry in 2023

This growth will come from both BSS and OSS application areas as operators use hosted applications to help them to transform their current IT stacks to support new 5G services or use them to transform legacy systems to cloud-native, cloud-delivered hosted applications. Application vendors that previously sold on-premises applications will launch increasing numbers of delivery options that will include SaaS.

### Direct satellite-to-device connectivity will enter a second wave

Apple, Globalstar, SpaceX/Starlink and T-Mobile have made the first moves in this market, and we expect significant developments in 2023 from the likes of Inmarsat, Iridium, Samsung, other LEO/MEO satellite providers and major telecoms operators. The Apple/Globalstar and SpaceX/T-Mobile propositions are narrowband SoS/emergency-type services, but the competitive edge in this second wave of deals or partnerships will be announcements of two-way wideband or broadband propositions, as well as non-US coverage. Direct satellite-to-device connectivity will have more than 25 million subscribers by the end of 2023, whether it be through mobile satellite services or mobile operators' terrestrial spectrum, making it a milestone year for this technology.

**Questions?** Please email [enquiries@analysismason.com](mailto:enquiries@analysismason.com)



# The global postal and parcel delivery sector needs to change, and technology can help

Ian Streule, Partner

The postal, parcel and courier services sector is being transformed by changing demand for letters and packets (driven by changes to interpersonal communications and e-commerce trends that are transforming the economy). In turn, the sector is undergoing a series of digital transformations of its own to improve efficiencies and dramatically change the consumer experience. Technology will play a central role in the industry, using advanced wireless networks, AI-based automation, driverless vehicles (both inside and outside warehouses) and a digitally managed and optimised workforce that can deliver to consumers as well as a connected parcel locker infrastructure. These developments will support smart-city plans and policies, given their ability to transform the efficiency of the 'last mile'. However, the sector will need to handle workforce issues throughout these transformations, and recent labour strikes in the UK point to how challenging this might be. A subset of these benefits and challenges are discussed in this article.

## **Digital parcel locker infrastructure is heralding rapid change in supply and demand preferences**

Consumers increasingly expect to have access to real-time tracking of items, co-ordinated by software that integrates visibility and control of the delivery pipeline with users and suppliers. While parcel shops are reasonably established, digitally connected and controlled parcel locker infrastructures are transforming the delivery of items from a physical, traditional knock-on-the-door type approach to one controlled by software and application interfaces.

This infrastructure offers an efficient alternative to doorstep delivery and will be positioned by market players as the default for low-cost delivery of parcels. Analysys Mason and Last Mile Experts (LME) predict investment in 50 000 parcel lockers in the UK by the end of the decade.

Later in 2023, detailed information about the fast-growing parcel locker segment across Europe will be published by LME in collaboration with Analysys Mason, in the Out of home delivery in Europe 2023 report.

## **Smart and green city policies will reinforce the need for new postal and parcel delivery technologies**

Consumers will also see technological changes as local authorities place emphasis on reducing urban emissions and move towards developing more environmentally friendly cities, with the postal and parcel delivery sector having to respond. Parcel lockers and electric delivery vehicles are part of the solution, and visionary local authorities are implementing specific regulations for their introduction.

The postal and parcel sector already shows significant promise in adopting these technologies, with robotic and predictive AI applications in sorting centres. The advent of driverless vehicles on urban delivery routes<sup>1</sup> is the sector's newest contribution to smart cities. Further technology deployments will lead to greater benefits including greater optimisation and efficiency of supply chains, cost reductions and more-integrated smart town and city infrastructures.

“ The postal, parcel and courier sector requires a strategic approach to digital transformation in order to achieve its benefits and overcome the challenges.

### Workforce optimisation is possible but must be carefully handled

Meanwhile, digitally managed workforce optimisation is transforming the way that parcel delivery companies organise employees. Linked to the above developments is the opportunity for route optimisation for both pedestrian and vehicle delivery routes around urban and rural areas. As a result of technology deployment and data analysis, postal and parcel companies are now able to experiment with driverless solutions, monitor delivery rates, redirect employees while en route, and use data to estimate the number of staff needed per day in real time. However, these new technologies may bring about social and governance issues that could lead to negative consequences for business performance, quality of service and profitability, such as dissatisfaction in the workforce and management challenges.<sup>2,3</sup>

### What is needed for technology to succeed in transforming postal and parcel delivery?

A well-managed digital transformation has the potential to significantly improve the performance of the postal and parcel sector and realise benefits for users, for cities and their residents, but should be based on various components, including:

- high-level objectives and outcomes
- a detailed digital technology strategy
- investment in well-designed, leading-edge equipment and infrastructure, supported by effective software
- a profitable commercial model and transformation business case
- engagement and buy-in with national and local authority stakeholders who seek smart solutions but need national priorities such as universal services to be satisfied, and
- careful planning with the business and workforce regarding social and governance impacts.

Analysys Mason can help you to consider these issues and devise strategies that work with all parties.

**Questions?** Please feel free to contact Ian Streule, Partner, at [ian.streule@analysismason.com](mailto:ian.streule@analysismason.com)



<sup>1</sup> For example, Starship robots. See Starship Technologies (16 November 2022), *Delivery robots now available to Cambridge residents*.

<sup>2</sup> This month, Amazon in the UK is facing industrial action, with striking workers mentioning pay and performance monitoring conditions. For more information, see BBC (25 January 2023), *Amazon strikes: Workers claim their toilet breaks are timed*.

<sup>3</sup> For more information, see Analysys Mason's *The digital transformation of the postal sector is creating new social and governance issues*.

# Valuation methods for spectrum in the 26GHz band represent an evolution of current best practice

Mark Colville, Principal and Gentiana Shiko, Manager

## mmWave spectrum valuations need to account for local and band-specific factors

The value of mmWave spectrum (such as that in the 26GHz band) is dependent on many factors that are specific to individual operators. Carrying extra mobile broadband (MBB) traffic (using mmWave spectrum) is unlikely to lead to significant changes in ARPU in a market where consumers commonly use unlimited data packages. However, using mmWave spectrum may also improve the quality of connection, which can have customer retention benefits for operators in countries where competition is strongly focused on network-quality-related factors.

The scope for using mmWave spectrum to increase ARPU is limited, so MNOs are under financial pressure to deliver and maintain a high quality of service (QoS) in a cost-efficient manner against the backdrop of rapid growth in data traffic. The bandwidth available in mmWave bands such as the 26GHz band can help MNOs to meet demand in traffic hotspots and can enable them to innovate and access new market segments. As a result, appetite for 26GHz spectrum among MNOs is growing, and many regulators are keen to bring the spectrum to the market quickly. Indeed, several auctions for spectrum in the 26GHz band have already taken place in Europe,<sup>1</sup> and regulators in a number of other European countries are preparing<sup>2</sup> to carry out such auctions in the near future.

MNOs that are partaking in any spectrum auction must carry out a detailed valuation exercise, and auctions for spectrum in the 26GHz band are no exception. However, calculating an accurate valuation for such spectrum continues to be challenging, partly because the commercial use cases remain somewhat uncertain.



A traditional spectrum valuation approach considers the savings that can be made in network costs as a result of deploying the spectrum (the 'technical value') and the commercial performance improvements that are realised due to improved network performance (the 'commercial value'). In our view, this approach continues to provide the best foundation for valuing spectrum in the 26GHz band. However, each value component needs to carefully account for both the local context and the idiosyncrasies of mmWave spectrum, including, but not limited to, the following.

- **The high capacity but limited propagation** (and hence coverage) of mmWave spectrum means that spectrum in the 26GHz band is best-suited to a localised/hotspot-based deployment model, which requires careful consideration of both the specific areas that will be covered and the proportion of customers that are likely to benefit from a 26GHz deployment. Identifying these areas is not trivial and may require a detailed market analysis of customer preferences at a local level. As such, even nationwide licences may benefit from consideration at a regional or geotype level for valuation purposes, provided that sufficiently granular data is available to support such analysis.
- **Network architecture and hence cost structures will be different** for mmWave deployments than for deployments using lower-frequency spectrum bands; there may be a greater reliance on small cells than on the macro network.
- **The regional topography and its impact on the cost of spectrum deployment** must be considered alongside the MNO's strategy for each location, the impact of co-existence restrictions and the potential for cost savings via approaches such as network sharing.

“ A traditional approach continues to provide the best foundation for valuing mmWave spectrum, but local and band-specific factors must be taken into account.

- **Commercial value from the existing customer base may be increasingly important.** We believe that the deployment of spectrum in the 26GHz band is unlikely to increase ARPU, but it can support a higher QoS, which may improve customer retention in the mid-to-long term.
- **The commercial value from alternative use cases needs to be considered** alongside the ability to support MBB services at traffic hotspots. The attractiveness of novel use cases will vary by geography, but could include applications such as 5G fixed-wireless access (FWA)/fixed-mobile convergence (FMC), private 5G networks, ultra-reliable low-latency (URLL) industrial applications and indoor-only MBB solutions.

Moreover, it is important to consider that the novel uses of mmWave spectrum may be of commercial interest to other industry stakeholders as well as MNOs when using valuations to formulate auction strategies. For example, 5G FWA could be attractive to existing mobile network virtual operators (MVNOs), cable companies and other fixed operators.

#### Valuations may need to take account of regional licensing

MNOs typically value national licences, but mmWave bands may be better suited to a regional licensing approach, such as is being proposed in the UK. The valuation of spectrum awarded using regional licences can follow two broad approaches.

- Valuations can be made at a national level and then regionalised, although this can potentially miss complementarities of lots between regions (for example, arising from a perception of widespread service improvement, or in relation to economies of scale) as well as regional specificities.
- Valuations can be made at a regional level, which allows full flexibility and the greatest accuracy, but can also be onerous in terms of data requirements and timescales.

In theory, a detailed geo-analysis could be undertaken for the valuation of regional spectrum licences. This includes:

- analysis of population/traffic densities based on granular geographic information system (GIS) data
- identification, definition and analysis of areas where spectrum is to be awarded on a regional basis
- overlay of other GIS layers of interest (such as transport networks) to analyse coverage.

A price benchmarking exercise can help to validate the outputs, regardless of the valuation approach taken. Standard approaches to normalising benchmarks, including those for bandwidth, population, licence duration and additional annual licence fees, remain appropriate. However, the value of spectrum in the 26GHz band is very dependent on local factors, so benchmarking may also need to be sensitive to award conditions (such as coverage/deployment/QoS obligations, the amount of bandwidth available, relative bandwidth scarcity and reserve prices) and local market factors (such as population density, geographic topology, ARPU, historic take-up of new services and willingness to pay for higher-QoS services) that may have influenced prices in past auctions.

Long licence durations and uncertainties over future use cases mean that there will always be a degree of uncertainty in the valuation of mmWave spectrum, but we believe that a careful approach can still offer substantial insights when preparing for spectrum auctions. Analysys Mason has already supported a number of stakeholders with mmWave spectrum valuations and auction preparation.

**Questions?** Please feel free to contact Mark Colville, Principal, at [mark.colville@analysismason.com](mailto:mark.colville@analysismason.com) or Gentiana Shiko, Manager at [gentiana.shiko@analysismason.com](mailto:gentiana.shiko@analysismason.com)



<sup>1</sup> Auctions for spectrum in the 26GHz band have successfully taken place in Croatia, Finland, Greece, Italy, Slovenia and Spain; there have been administrative awards in Germany.

<sup>2</sup> Regulators in Austria, Estonia, Montenegro, Slovakia, Sweden and the UK are actively consulting or have set a date for the award of spectrum in the 26GHz band in 2023.



## Copper decommissioning: the final step on the road to fibre and the end of the (copper) line

Omar Bouhali, Partner

Fibre roll-out is almost complete in an increasing number of countries, which is making copper decommissioning a concrete economic and environmental opportunity. At the same time, many operators and regulators still have important details to finalise in order to enable this final step.

Analysys Mason's *Wireline decommissioning tracker* reports that four incumbent operators have decommissioned their copper networks (Jersey Telecom, NTT, Orange Côte d'Ivoire and Singtel), 13 have planned completion dates before the end of 2030 and another 12 have started the process but have not yet set a completion date.

From an economic perspective, copper decommissioning is supported by a convergence of interest between fibre operators, for

whom it will imply a quicker migration to their networks, and the copper operators (generally the incumbent operators) who need to shut down a service line that will become loss-making as end customers churn to fibre, as their operating costs are fixed to a large extent. Operators also have an opportunity to realise the scrap value of the copper in the old cables.

Copper decommissioning is also a key step from an environmental perspective. A modern fibre access system generally consumes less power than its copper/DSL equivalent and can carry several orders of magnitude more data. Many of the potential energy savings on the access network can only be achieved when the legacy copper/DSL networks are switched off.



However, many prerequisites need to be in place before copper is decommissioned, including full coverage (or an acceptable proxy) and a decommissioning plan that limits competitive distortions.

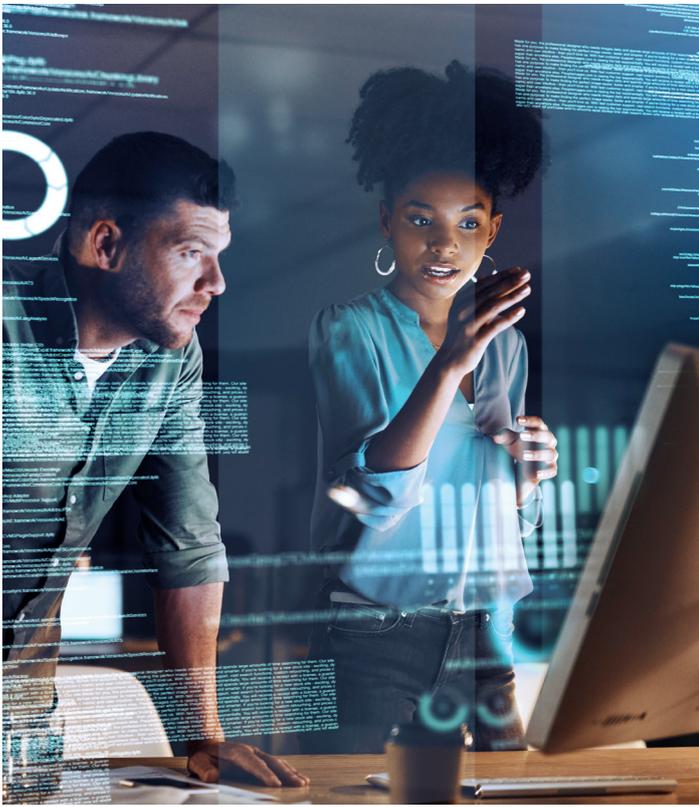
The **full coverage** prerequisite aims to ensure that all clients of copper-based services (mass market, business, public sites ... ) will find a suitable substitute based on fibre, cable, or, for a limited number of cases, fixed wireless access or satellite. The required minimum performance of this substitute access and/or the proportion of lines that can be delivered through fixed-wireless access or satellite (which typically have lower bandwidth, and sometimes inferior latency) are parameters that are typically determined by regulators and governments based on local techno-economic conditions. Mechanisms such as public subsidies or universal service funds can be used to increase the proportion of lines that have access to optimal performance. The size of the available subsidies and the required parameters of the full coverage prerequisite for decommissioning therefore need to be set consistently, which will constrain the copper decommissioning plan.

The prerequisite seeking to **limit competitive distortion** is likely to depend on the way access competition is organised in each country. It may include provisions to ensure that, when the incumbent operator provides fibre in some areas but not in some others the copper decommissioning process cannot be used to distort this competition. As an example, FTTH roll-out in the medium- and low-density areas of France (around 35 million dwellings) has a single local infrastructure operator in each area that is required to grant a non-discriminatory access to its network to all internet service providers (ISPs), either via a line rental model or via a co-investment model. The incumbent operator, Orange, is this infrastructure operator in medium- and low-density areas representing around 19 million dwellings (less than 55%). ARCEP, the regulator, has determined that Orange's copper decommissioning plan needs to be based on objective criteria, so that the order of areas for copper decommissioning does not depend on whether Orange is the local infrastructure operator.

“ Copper decommissioning is becoming a concrete economic and environmental opportunity, but some prerequisites need to be in place.

It is therefore important for operators, regulators and investors to fully understand the consequences of key parameters in copper decommissioning plans. This will allow them to avoid costly delays arising from unmet prerequisites, and avoid the possibility that copper decommissioning results in material harm to end users or competition.

**Questions?** Please feel free to contact Omar Bouhali, Partner, at [omar.bouhali@analysismason.com](mailto:omar.bouhali@analysismason.com)



## Market mechanisms that are applied to licensed mobile spectrum in the UK could be improved

Mark Colville, Principal and Chris Nickerson, Manager

Analysys Mason has undertaken a study to review the three market mechanisms that are currently applied to licensed mobile spectrum in the UK. Our study examined the benefits of, and issues with, these market mechanisms and concluded that changes – particularly to pricing – would be beneficial.

### Context

2022 marked the 20th anniversary of a report commissioned by the UK government entitled *Review of radio spectrum management*, led by Professor Martin Cave ('the Cave report'). The Cave report played a key role in shaping the market mechanisms that the government and Ofcom have defined for managing access to licensed mobile spectrum in the UK, namely:

- **auctions:** the assignment of spectrum licences through an auction process
- **pricing:** the levying of annual licence fees (ALFs)
- **trading:** the ability for spectrum licences to be traded (and potentially leased).

Since the Cave report was published, the mobile sector in the UK has evolved significantly and we expect it to continue to change in terms of the technologies that will be used, the demand for services and the structure of the market.

These changes raise the question of whether the market mechanisms also need to evolve. Our study reviewed the effectiveness of the three mechanisms over the last two decades, and their appropriateness to the present – and future – environment for spectrum management.

We considered the application of market mechanisms for their stated purpose of promoting the efficient use of spectrum,<sup>1</sup> and positive outcomes for users of mobile services. Whether by design or not, some of the market mechanisms may also have a wider impact (for example, they could generate income for the government, which can in principle be used for wider social benefits, such as building hospitals or raising pay for public sector workers). However, such considerations were beyond the scope of our study.

The study, for techUK on behalf of the UK Spectrum Policy Forum (SPF), underwent a rigorous peer review process by a panel that included three former Ofcom Directors. It was carried out by Analysys Mason, together with Professor Martin Cave.

### Findings: trading and auctions work well overall, but ALFs are not needed to promote efficiency

A high-level summary table of our conclusions is shown in Figure 1.

Question		Trading	Auctions	Pricing (ALFs)
Does the basic philosophy articulated in the Cave report still support the use of a market mechanism of this form?		Yes	Yes	No
Is the market mechanism approach and current implementation of that approach optimal in terms of both promoting spectrum efficiency and avoiding undue problems/risks?		No	No	No
Are there possible alternative options that might lead to better outcomes, in relation to ...	... the market mechanism approach?	No	No	Yes
	... the way the market mechanism approach is currently implemented?	Yes	Yes	Yes

Figure 1: Key conclusions [Source: Analysys Mason, 2023]

In summary, we concluded that both auctions and trading work well overall, and should continue to form an important part of the management of mobile spectrum in the UK. However, in both cases, some changes could be beneficial.

- For **trading**, we recommend the introduction of market-led leasing and potentially a more automated system involving less friction and lower transaction costs (that is, if more localised use of higher frequencies leads to increased volumes of trades at lower value).
- For **auctions**, consideration should be given on a case-by-case basis to whether alternative options (for example, administrative assignment, dynamic spectrum access (DSA) or hybrid approaches) are more appropriate. For higher frequencies, or where there is expected to be some form of shared use in the future, such options might increase spectrum utilisation.

The most significant issue we identified with the current market mechanisms relates to **pricing**. Given the ability to trade, ALFs levied on licensed mobile spectrum are not required in order to promote efficiency, since mobile network operators (MNOs) already face the opportunity cost of their spectrum (that is, because they could sell it, it represents capital tied up in their business). While there might be other reasons why ALFs are beneficial, these do not form part of their stated purpose and therefore fall outside the scope of our study. As such, we recommended that two possible alternatives to ALFs should be considered.

**Alternatives to ALFs**

**Option 1: remove ALFs**

This option would not result in any loss:

- (relative to the current situation) in terms of spectrum efficiency, and potentially offers gains if barriers to trading are reduced
- in terms of spectrum utilisation, and potentially offers gains if there is an increase in network investment
- of consumer benefits in terms of increased retail prices, and potentially offer gains if retail prices were to fall.

**Option 2: adopt a ‘non-cash’ (or hybrid) approach (for example by replacing ALFs with coverage/investment commitments)**

While ALFs are not required to promote efficient use of spectrum, the scope of our study also includes the application of market mechanisms to achieve positive outcomes for users of mobile services. Levying the amount that MNOs would have been required to pay in ALFs (~GBP360 million in 2022) in the form of coverage or other investment commitments, which improve the quality of mobile services could help to achieve such positive outcomes. For example, requiring MNOs to invest in extending mid-band (for example, 3.5GHz) 5G coverage into rural areas, improving network quality along transport routes, or increasing the power resilience of their networks.

“ An Analysys Mason study suggests that some changes to the market mechanisms used for managing licensed mobile spectrum in the UK would be beneficial.

This option effectively replaces the wider social benefits that are achieved through government spending of the current cash ALFs with benefits targeted at mobile users specifically (noting that wider social benefits are beyond the scope of our study). Implementation challenges would need to be carefully explored, but this option would:

- offer benefits in terms of driving improvements to digital infrastructure
- offer benefits to consumers through enhanced network quality, with a possibility of some downward pressure on retail prices
- potentially offer benefits to the MNOs (if there was incremental revenue)
- not result in any loss (relative to the current situation) in terms of spectrum efficiency.

**Questions?** Please feel free to contact Mark Colville, Principal, at [mark.colville@analysismason.com](mailto:mark.colville@analysismason.com) or Chris Nickerson, Manager, at [chris.nickerson@analysismason.com](mailto:chris.nickerson@analysismason.com)



<sup>1</sup> This refers to both economic and technical efficiency, as well as spectrum utilisation. Economic efficiency (by which we mean “allocative efficiency”) is maximised when spectrum is allocated to users that generate the greatest economic value from it. Technical efficiency refers to spectral efficiency (that is, bits per second per hertz). Spectrum utilisation refers to how widely the spectrum is used in a geographical sense, and how frequently.



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