The evolving role of LEO satellites in Europe's connectivity future

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Executive summary

Low Earth Orbit (LEO) satellites are reshaping the future of consumer broadband in Europe. While adoption today is mainly concentrated in rural and hard-to-reach areas, LEO's ability to deliver faster speeds and lower latency is closing the gap with fibre and 5G. Starlink remains the front runner in Europe with other players like Eutelsat-OneWeb competing, and new entrants including Kuiper, Lightspeed, AST, and Lynk announcing ambitious constellation plans. As these new technologies mature, LEO satellites could evolve from a niche solution into a full-scale competitor or become part of a blended model alongside fibre and wireless networks in Europe. Alongside this shift, new ecosystem opportunities for third-parties are emerging across Europe, particularly in areas like ground station infrastructure, user terminals, and value-added services – opening the door for telcos, technology providers, and infrastructure investors to play a leading role in the next phase of broadband evolution.

From legacy to low latency

LEO is emerging as the future of satellite broadband

Satellite technology has been in use since the 1960s, mainly relying on geostationary earth orbit (GEO) satellites that operate far above the Earth, around 36,000 km in altitude, and stay roughly fixed over a point on earth. The high orbital altitude allows GEO satellites to cover vast areas of the Earth with relatively few orbiters – in fact, just three GEO satellites in geostationary orbit can provide near-global coverage. This position made them well-suited for B2B and government applications such as international telephony, television broadcasting, maritime, aviation, defence, and weather tracking. However, the smaller number of satellites and high altitudes result in lower aggregate constellation capacity and high latency – falling short of the performance required for today's consumer broadband, B2B and government applications, where high bandwidth and real-time interaction are essential (e.g., video conferencing, gaming, streaming, industrial IoT etc.).

In contrast, LEO satellites orbit much closer to the Earth – typically between 350 and 500 km – significantly reducing the time it takes for signals to pass between the satellite and ground infrastructure, and therefore the latency. Their larger constellation sizes also enable more aggregate capacity for low-latency broadband service **(Exhibit 1)**.

Exhibit 1: How do Starlink's LEO satellite work?

Starlink; EY-Parthenon analysis

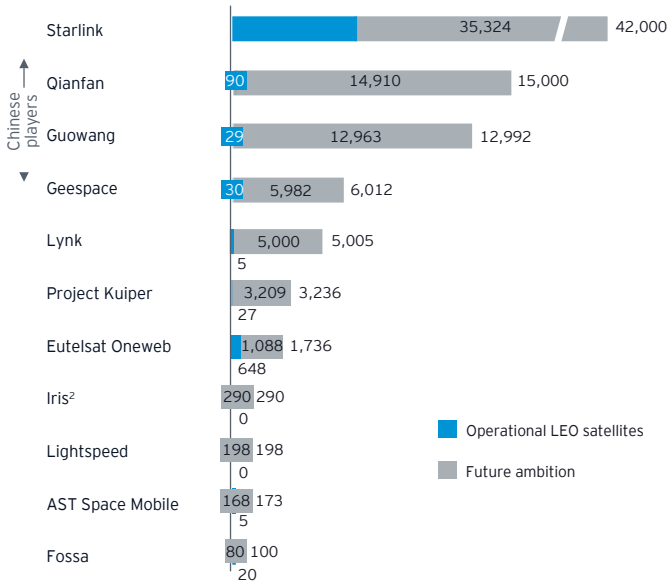
Starlink dominates the space

Starlink is the leading player in the LEO satellite market with by far the largest constellation and most ambitious plans, followed by Eutelsat-OneWeb.

Today, Starlink leads the LEO satellite market, with close to 7,000 active satellites with an ambition of expanding to 42,000 in the future. Eutelsat-OneWeb comes next, operating around 650 satellites. Lynk and AST SpaceMobile are also in the race. **(Exhibit 2)**

Three emerging Chinese LEO satellite companies – G60/Qianfan, Guowang, and Geespace – have set out bold plans to deploy between 6,000 and 15,000 satellites each. Despite their ambitions, regulatory barriers are expected to limit their ability to operate within the European markets.

Exhibit 2: LEO satellite providers – constellation size*



Sources: FCC, ITU, European Commission

* LEO satellite providers with ambition of 100+ LEO satellites

Niches to masses

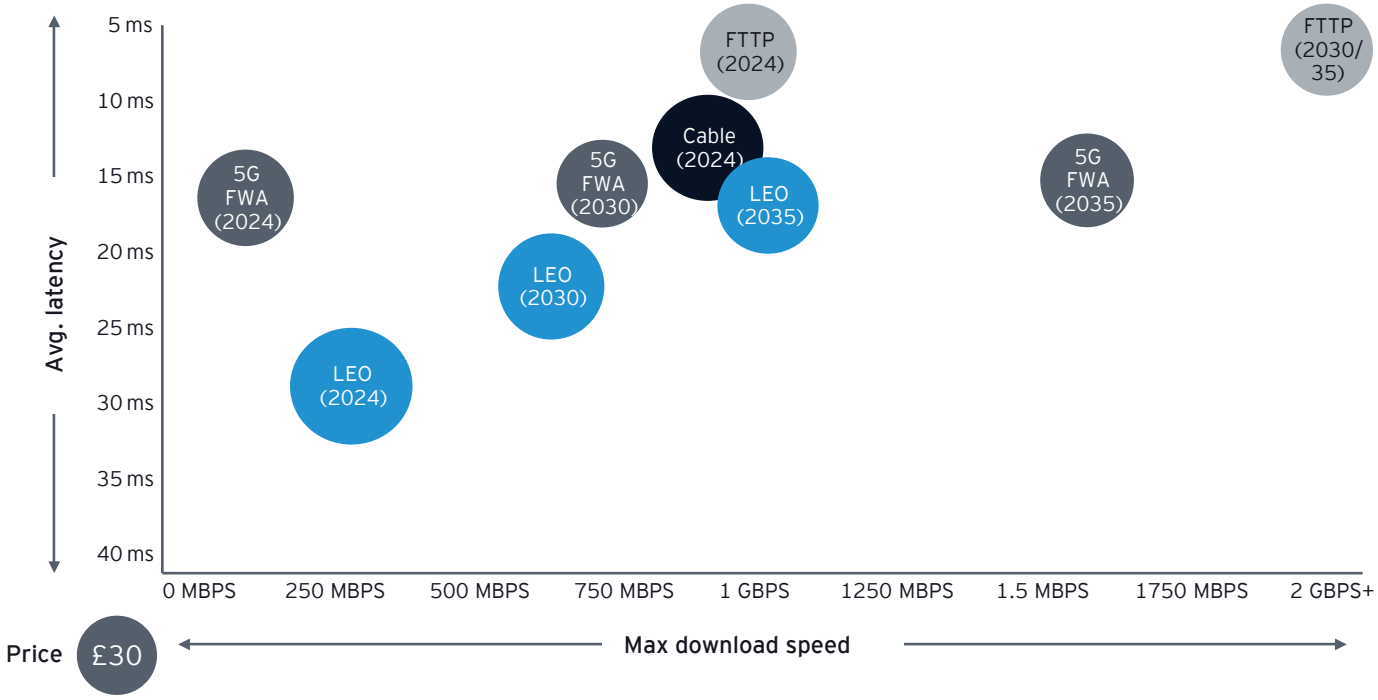
Current adoption is limited in rural and underserved areas of Europe. In the future, LEO satellite broadband could become significant competitor to FTTP and FWA across all areas.

LEO satellite adoption remains concentrated in rural and underserved areas. In Europe, the UK has the largest user base (~87,000 in 2024), followed by Germany (~80,000) and France (~60,000) – still accounting for only 0.2-0.3% of households. However, growth is accelerating – in the UK, Starlink subscribers increased from ~13,000 in 2022 to ~42,000 in 2023 and ~87,000 in 2024 (~160% CAGR '2022-2024') – mainly across the Scottish Highlands, rural Wales, and parts of Northern and Southwest England as per ISP review. In London, Starlink has ran out of capacity based on their current constellation.

Starlink's broadband offers a maximum download speed of around 250 Mbps and 20-30 milliseconds average latency – a clear step forward for satellite technology, yet still trailing FTTP services that offer 1 Gbps+ speeds and 5-10 milliseconds average latency. LEO also remains more expensive – in the UK, Starlink subscriptions average £75 per month, compared to £30-£40 for fibre-based services. However, the price gap has already seen reduction in other parts of Europe.

With continued advancements in satellite technology and network architecture, LEO broadband could offer 1 Gbps speed (potentially even more) with 15-20ms latency in the future. This will make LEO broadband a credible rival to FTTP and FWA. Although fibre and Fixed Wireless Access (FWA) will also see performance gains, the reality is that most consumer use cases do not require more than 1 Gbps in the near future – a level LEO satellites could also deliver. **(Exhibit 3)**

Exhibit 3: Tech evolution – FTTP, 5G FWA and LEO



EY-Parthenon analysis

Four potential scenarios could emerge:

Scenario 1

A rural-only play

LEO remains a specialised solution for hard-to-reach areas, focusing on areas where FTTP and 5G FWA infrastructure rollout is not economically viable. Adoption grows but stays largely limited to rural or remote locations.

Scenario 2

Primarily rural with specific urban use cases

LEO remains a specialised solution for hard-to-reach areas, focusing on areas where FTTP and 5G FWA infrastructure rollout is not economically viable. Urban adoption also grows but limited to specific use cases – such backup connectivity for mission-critical businesses (e.g., hospitals), IoT (e.g., Tesla autonomous cars), etc.

Scenario 3

Converged access models

ISPs integrate LEO, FTTP, and 5G into bundled offerings, enabling customers to switch dynamically based on location, use case, or redundancy needs. LEO broadband provides back-up connectivity, mobility, and additional capacity – enhancing resilience and user experience.

Scenario 4

A full-scale competitor

LEO broadband reaches its full potential – delivering 1 Gbps+ speeds with low latency and becomes a direct competitor to FTTP and 5G FWA across both rural and urban areas. Consumers perceive minimal added value in speeds beyond 1 Gbps, enabling LEO broadband to catch up to the competitive field.

Factors to full potential

The extent to which LEO satellites will achieve full potential to become a full-scale competitor (Scenario 4) will depend on five key factors – orbiter densification, spectrum availability, technology advancement, ground infrastructure development, and consumer adoption.

1. Densification – more satellites, lower orbits, greater performance

Starlink is currently launching satellites using its Falcon 9 rockets, which typically carry around 30 v2 Mini satellites per launch. In future phases, the company aims to transition to Starship – a much larger vehicle capable of significantly increasing launch capacity per mission. Despite current setbacks, if Starship delivers as envisioned, it will give Starlink the ability to scale its constellation faster and significantly expand individual satellite throughput and resulting aggregate constellation capacity, as well as significantly improve coverage density.

For example, today only ~7 Starlink satellites serve the UK at any given time. As the constellation grows, this number could rise to 40–50, substantially improving bandwidth availability and network performance for UK users. In parallel, Starlink aims to reduce its entire satellite constellation's altitude from ~500 km to ~350 km, which would further lower latency and enhance real-time responsiveness for broadband services.

2. Expanded spectrum access – unlocking higher throughput

Starlink currently operates in the Ku and Ka frequency bands. It is deploying higher frequency E band to its gateways and pursuing additional spectrum within existing bands (e.g., 2024 FCC permission to utilise additional Ku frequencies), as well as pursuing access to higher frequency Q/V bands. These increases in spectrum have the potential to significantly boost data capacity and enhance overall network performance – critical to meet rising consumer broadband demands.

Satellite operators, including Starlink, have expressed interest in utilising the Q/V and E-bands to enhance their service offerings in the UK – Ofcom has temporarily authorised Starlink to harness E band for backhaul link capacity and Starlink has already been approved to utilise E-band spectrum in the US and elsewhere. However, until Ofcom completes its consultation process and formally allocates these frequencies, satellite operators need to continue to operate within the currently authorised spectrum bands in the UK. **(Exhibit 4)**

Exhibit 4: Starlink's frequency bands in the UK

	Frequency Band	Frequency Range (GHz)	Band Size (GHz)	Primary Use
Existing spectrum bands	Ku-Band	10.7–12.75 (downlink)	2 GHz	User terminals to satellites
		14.0–14.5 (uplink)	0.5 GHz	
	Ka-Band	17.7–20.2 (downlink)	2.5 GHz	Satellites to gateway stations
		27.5–30.0 (uplink)	2.5 GHz	
Future bands	E-Band	71–76, 81–86	10 GHz	Temporary authorisation to use for satellites to gateway stations
	Q/V-Band	37.5–43.5, 47.2–50.2	9 GHz	Future use

Source: Ofcom, ITU, Starlink

3. Technology advancement – next-gen satellite capabilities:

Starlink's current satellite generation (V2 mini) is expected to be succeeded by the V3 platform eventually, which could deliver 1 TBPS capacity per satellite – representing a 10-15x increase in capacity over existing models. The incremental capacity will primarily be driven through the V3 model's larger size, improved beamforming technology, and expanded backhaul capacity (including more capable inter-satellite links), along with more spectrum access.

4. Ground networks – supporting growing constellation of orbiters

Ground stations play a critical role in linking LEO satellites to terrestrial internet infrastructure. The number and distribution of ground stations directly impact the performance of LEO satellite constellations – influencing coverage, latency, and available capacity. While at minimum just two stations may be sufficient to meet coverage and redundancy requirements in a market like the UK, where the entire geography may be in sight of the satellite, additional ground infrastructure is essential to providing the capacity to support growing data volumes and reduce signal delays, similar to densification of cell sites for higher capacity mobile networks.

Starlink currently operates three ground stations in the UK and plans to add six more, enabling greater throughput across its network.

5. Consumer adoption – the catalyst for scale

Starlink's constellation is primarily anchored on its US customer base, requiring very small marginal cost to serve the European customers – potentially creating opportunity for increasing adoption by lowering prices in Europe. Starlink has already demonstrated strong momentum in Europe, with subscribers rising from 271,000 in March 2024 to 658,000 a year later – a 143% YoY increase as per Idemest Starlink subscriber tracker. Early satisfaction indicators are also promising. In the UK, Starlink's Trustpilot rating (3.2/5) compares favourably against large incumbent telecom providers (1.2–1.8).

Is this a threat or opportunity?

The emergence of LEO satellites is both a threat and an opportunity for existing telecom and digital infrastructure players

The rise of LEO satellite broadband introduces a disruptive connectivity model that challenges traditional telecom incumbents, particularly in rural and underserved regions where fibre or FWA rollouts are cost prohibitive. With improving speeds, lower latency, and expanding coverage, players like Starlink are already carving out a foothold in geographies where traditional telecom providers have struggled to maintain service quality. As LEO's performance improves and pricing becomes more competitive, it could begin to erode telcos' market share – forcing telecom operators, and regulators, to reassess long-term infrastructure plans in these areas.

In most European markets, telcos operators and altnets have already made substantial investments to roll out fibre networks across urban and semi-urban regions. With a typical lifespan of 20 to 30 years, fibre infrastructure offers long-term stability and reduces the need for incremental capital expenditure over the foreseeable future. In contrast, achieving full-scale LEO satellite constellation ambitions requires a significantly higher and ongoing capital outlay. The estimated average cost per Starlink V3 satellite – including manufacturing, launch, and associated ground infrastructure – is approximately £2–2.5 million. Compounding this challenge, LEO satellites have a relatively short operational lifespan – often as low as five years – due to the high fuel usage required to maintain LEO stations with atmospheric drag and also enables faster refresh of the constellations to keep up with terrestrial technological advances. While Starlink is expected to only expand capacity based on reasonable ROIC to meet incremental demand, this recurring CapEx burden raises questions about the long-term scalability of LEO satellite networks – particularly in high-density urban and semi-urban areas where fibre is already entrenched. While investor interest in satellite broadband infrastructure remains strong and continues to support ambitious deployment targets, the economic gap between sustainable fibre models and capital-intensive LEO constellations may limit direct and sustained competition in established fibre and FWA markets.

Despite competitive concerns, Direct-to-Device (D2D) LEO satellite networks offer a strategic opportunity for telecom operators and infrastructure providers to enhance their service portfolios. As demand rises for seamless, high-availability internet – especially in rural, remote or mobile environments – LEO constellations provide a complementary layer of coverage and resilience. Rather than investing heavily in unprofitable expansions of rural terrestrial infrastructure, mobile network operators (MNOs) are increasingly turning to partnerships with Direct-to-Device (D2D) LEO providers to extend reach, minimise capex, and unlock new enterprise and consumer use cases.

These partnerships are expanding rapidly. In the US, T-Mobile has launched a beta test of direct-to-device services with Starlink, targeting nationwide coverage in current T-Mobile dead zones. The service is currently limited to messaging only, with plans to expand to voice and limited broadband next year (**Exhibit 6**), and potential expansion to weak coverage areas beyond just dead zones. Japan's KDDI has rolled out similar services to improve coverage in remote regions.

Exhibit 5: Case study – Starlink and T-mobile

Objectives	Direct-to-cell connectivity via Starlink Gen 2 satellites - **Eliminates mobile dead zones without new towers Starlink:** Enter mass-market mobile segment via D2D (direct-to-device) service ▪ **T-Mobile:** Expand coverage to remote, rural, and dead zones without cell towers				
Technical model	Satellite payload	Starlink Gen 2 satellites with specialized D2D antennas operating in T-Mobile's 1.9 GHz PCS band			
	Ground device	Unmodified 4G LTE smartphones (no new hardware needed)			
	Initial services	Text messaging (SMS, MMS), later voice, IoT & limited data			
	Spectrum use	Uses T-Mobile's licensed spectrum, approved under FCC experimental authority			
	Coverage model	Ubiquitous – wilderness, ocean, disaster zones, and sky corridors			
Pricing model	Premium T-Mobile customer	No extra fee	Other T-Mobile, Version and ATT&T customer	$10/ month	
Timeline and progress	**August 2022** Partnership announced	**2023** FCC granted experimental licenses	**Jan 2024** First D2D test messages sent using Starlink V2 Mini	**2025** Launched SMS/MMS in remote areas (Beta phase); Commercial launch July 2025	**2026+** Gradual rollout of voice and limited broadband
Impact	500k sq. mile additional coverage at no extra capex		4% increase in share price for T-Mobile next day after announcement		

T-Mobile, Starlink, EY-Parthenon analysis

1. Initial price was $15/ month for non-premium T-Mobile customers and $15 for a large US based telecom company and Verizon; In April, 2025 during Super-Bowl a reduction to $10/ month for all these user was announced

Globally, other telcos are also pursuing similar models with D2D LEO satellite providers:

- **Vodafone** has partnered with **AST SpaceMobile** in Europe to offer direct satellite-to-smartphone connectivity
- **Optus** is working with **Starlink** in Australia to expand mobile coverage in underserved regions
- **Kyivstar** is deploying **Starlink** service to expand mobile coverage in areas that lack coverage or where infrastructure has been damaged or destroyed
- **Rogers** is partnering with **Lynk** to enhance nationwide coverage

Partnerships typically span across three key areas:

- **Rural and remote coverage extension**, enabling voice and data services in low-density or hard-to-reach locations
- **Direct-to-device connectivity**, allowing smartphones to connect directly to LEO satellites without specialised hardware
- **Enterprise and mobility services**, including maritime, aviation, mining, and logistics, where traditional networks struggle to maintain coverage

These alliances are not only helping operators fill coverage gaps but also creating competitive differentiation through "signal anywhere" offerings – a powerful value proposition for both consumer and enterprise segments.

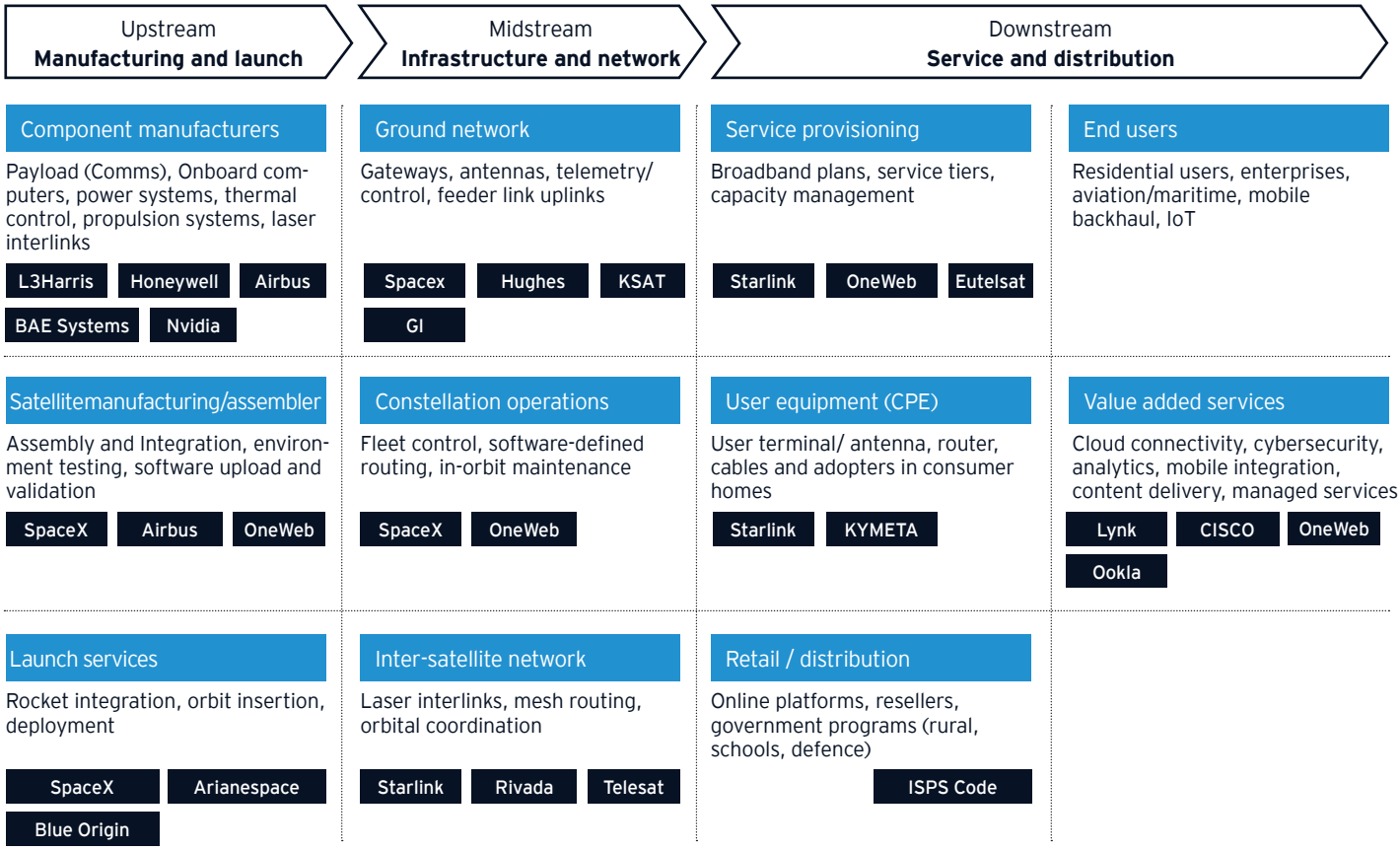
Beyond Direct-to-Device (D2D) partnerships, mobile operators are also forming a wider range of partnerships with LEO satellite providers to extend coverage, improve resilience, and tap into new markets. One approach is wholesale backhaul, where satellites connect remote mobile sites or enterprise hubs – such as Orange's recent multi-year agreement with Eutelsat's OneWeb, which enables secure, low-latency coverage for businesses and government clients in hard-to-reach areas. Operators are also joining public-private consortia to support national or regional sovereignty goals, like Deutsche Telekom's participation in the EU's IRIS² programme, which is building a European-owned satellite network. Finally, some telcos are investing in research and development hubs to accelerate integration of space and terrestrial networks, such as Vodafone's innovation centre in Málaga with AST and the University of Málaga. Together, these broader partnerships are helping operators go beyond coverage gaps, unlocking new services, boosting resilience, and supporting strategic autonomy in an increasingly space-enabled connectivity landscape.

The expanding value chain

As LEO constellations continue to scale rapidly, opportunities are emerging across the entire value chain.

The LEO satellite ecosystem in Europe is evolving rapidly across three core segments: upstream (manufacturing and launch), midstream (infrastructure and network operations), and downstream (distribution and value-added services). From an investment standpoint, Europe presents strong potential in midstream and downstream segments — particularly in ground station infrastructure and value-added services. (**Exhibit 7**)

Exhibit 6: LEO satellite value chain for consumer broadband*



*Illustrative examples from EY-Parthenon analysis of prominent players in each categories with existing offers

Upstream activities in Europe are being driven by a growing ecosystem of satellite manufacturers and component suppliers. Even though Europe currently does not have LEO satellite launch capability, UK-based player, Eutelsat-OneWeb is expected to lead efforts in satellite deployment with satellites made primarily using a European supply chain. European companies such as Thales Alenia Space, Airbus Defence & Space, and OHB are expected to contribute to payload, bus, and subsystem production. EU initiatives such as the IRIS^2 secure connectivity programme (European Union's sovereign satellite constellation initiative) aim to accelerate upstream industrial scale-up and strengthen autonomy.

In addition to LEO constellations, the smallsat GEO segment represents a growing opportunity within Europe's satellite industry. Swiss-based Swissto12 is a prominent example of a European smallsat GEO vendor, with an active pipeline including contracts from operators like Intelsat.

Midstream infrastructure is gaining importance, with an expanding footprint of European ground stations and gateway hubs in countries like France, Germany, the UK, Spain, and across Scandinavia. As LEO constellations scale, meeting increasing capacity requirements will depend on investments in ground stations, access to spectrum, real-time network control, and inter-satellite laser communications. Beyond technical enablers, the ownership and operating model of midstream assets is evolving: operators are spinning off captive infrastructure — much like mobile network operators did with towers — as seen in Eutelsat's recent sale of a majority stake in its teleports to EQT. In parallel, Ground Station-as-a-Service (GSaaS) models are gaining traction, driven by independent infrastructure service providers such as KSAT, SSC, and Leaf Space. Meanwhile, build-to-suit (BTS) activity is ramping up to support gateway rollouts for most prominent LEO players like Starlink and Kuiper, with infrastructure partners such as fibre carriers (e.g., Zayo in the U.S.) to telcos (e.g., Vocus in Australia). A similar wave of specialist partnerships and infrastructure leasing models is expected in Europe as competition intensifies and network density increases.

Downstream services are growing rapidly with particular investment opportunities in Europe expected to come from customer equipment, value added services, and retail and distribution segments.

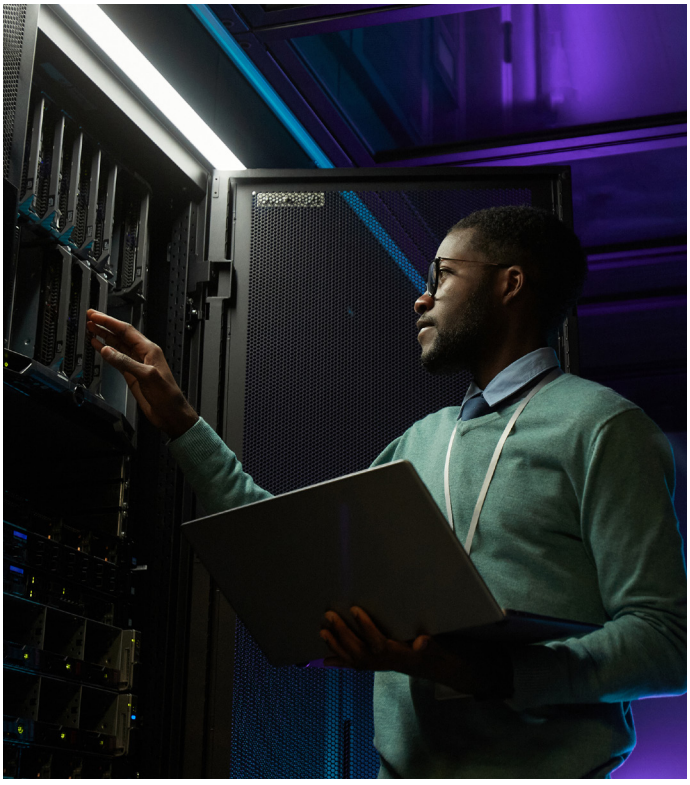
- **Value-added services:** The hybrid forms of satellite connectivity (GEO + LEO, L-band + Ku-band, etc.) plus convergence of satellite connectivity with cloud, cybersecurity, remote monitoring, and analytics is creating strong demand for managed service propositions. As these services mature, demand is expected to shift towards sector-specific, customised solutions.
- **Retail and distribution:** Europe's fragmented telecom market opens space for pan-European distribution platforms that offer bundled LEO services, onboarding, and customer support. However, distributors and retailers may struggle to make strong profit margin, or need to meet volume commitments, as Starlink and other major satellite operators have significant pricing power with channel partners.
- **Customer equipment:** As LEO broadband adoption grows, so will the need for cost-efficient, CE-certified user terminals. This demand creates a strong opportunity to innovate to meet specific needs for different customer segments. While players like Starlink and Kuiper build their customer equipment in-house, others such as Eutelsat-OneWeb, Telesat Lightspeed, and Iridium rely on outsourced production.

Key areas to consider for the decision makers:

Strategic positioning in the value chain: Investors and telcos must assess where to play — whether in infrastructure (e.g., ground stations), consumer equipment (e.g., terminals), or services (e.g., bundled broadband, value added services). Each layer offers different risk-return profiles and partnership dynamics.

Sustainable economics and business models: While performance metrics are improving, LEO broadband's long-term viability hinges on achieving competitive cost-per-megabit economics for targeted geographies and customer segments (e.g., rural areas). Investors and operators must evaluate when and where profitability will emerge — particularly in transitioning from rural niches to mass-market adoption.

Integration with existing networks and platforms: The real opportunity lies in convergence — where LEO becomes part of hybrid access models with fibre, FWA, 5G, and even GEO. Telcos must rethink network architecture, customer onboarding, and service differentiation to fully unlock the strategic value of LEO integration.



To find out how EY-Parthenon can help you think through what this means for your business, please get in touch.

EY-Parthenon Telecommunication Strategy team

EY-Parthenon's Telecommunication Strategy team partners with operators and digital-infrastructure investors to unlock growth and value creation. We advise on satellite communication ecosystem, end-to-end network transformation, 5G or FTTx monetisation, fibre- and tower-asset carve-outs, data-centre expansion, and broader ICT-market plays, supporting clients across both strategic-planning and M&A lifecycles.

The practice operates as part of EY-Parthenon's global Strategy business, with a presence across multiple countries. It leverages the global reach of EY-Parthenon professionals to support its work. Our telecom capabilities were further strengthened through the integration of CMA Strategy Consulting, a boutique firm recognized for its expertise in telecommunications and digital infrastructure.

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