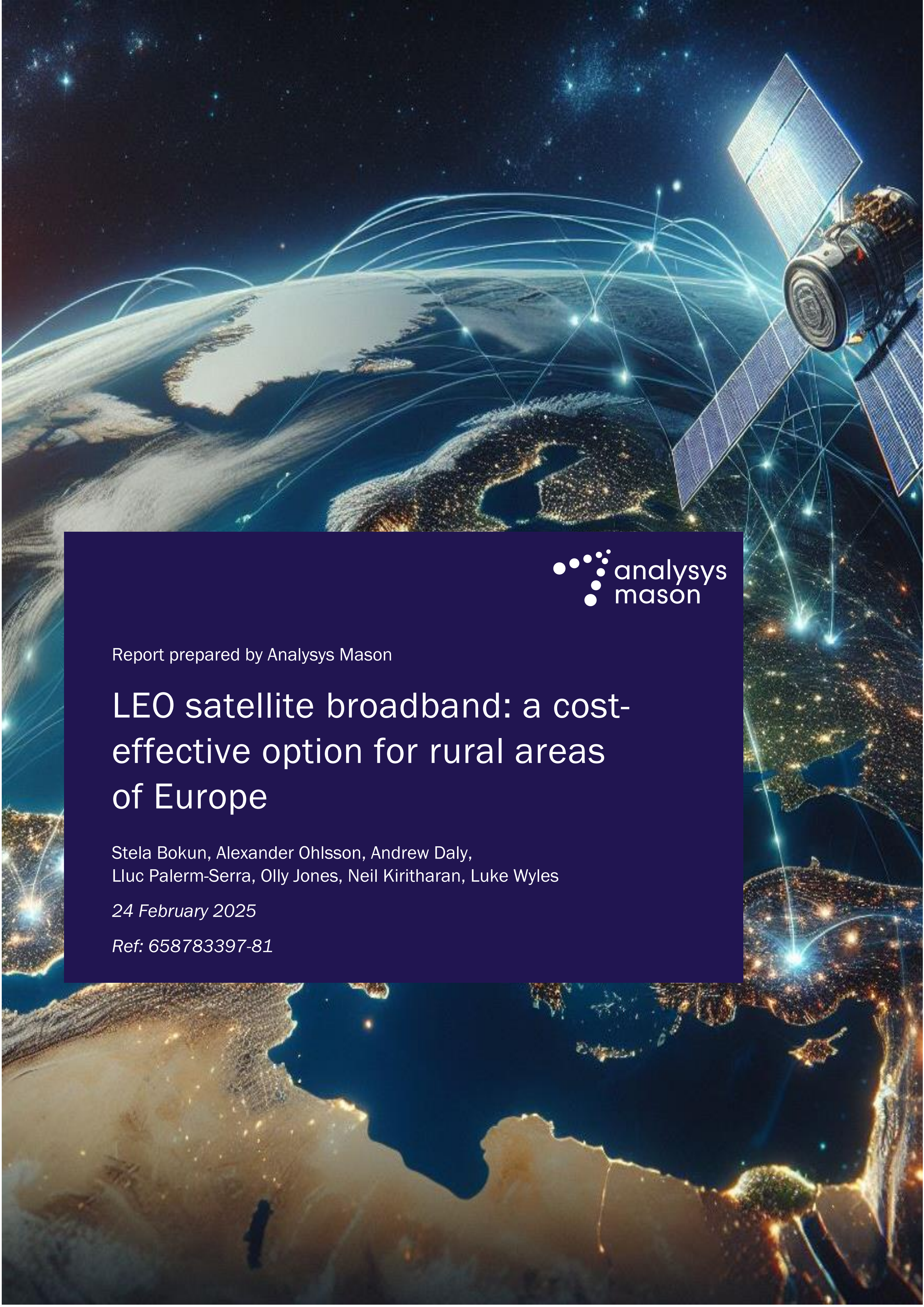

Report prepared by Analysys Mason

LEO satellite broadband: a cost-effective option for rural areas of Europe

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Abstract

The European Commission's Digital Decade goals include a target for nationwide gigabit-capable broadband by 2030 for all European Union (EU) member states. Fibre to the home (FTTH), the main technology that is expected to deliver on this ambitious target, has been receiving significant government support at a national and regional level. However, the cost of deploying FTTH increases exponentially as population density decreases, and on average across the EU, over 20% of households remain uncovered by gigabit-capable networks based on either FTTH or coaxial cable DOCSIS 3.1.[1] The high cost of deploying FTTH in the most rural areas, and shortfall against connectivity targets to date, raise the question of whether complementary connectivity technologies could be used to fill coverage gaps more cost-effectively.

In this study, we consider the potential for LEO satellite broadband to meet end users' needs in a more cost-effective manner than FTTH in the rural areas of seven EU countries: Czechia, France, Germany, Greece, Hungary, Italy and Poland. Our modelling approach is based on two distinct projections of future end-user data consumption: a high-bandwidth scenario and a low-bandwidth scenario. We thus present two sets of modelling outputs for each of the countries throughout the study.

Our main finding is that, while FTTH remains a good choice for the majority of households, **there are compelling reasons to consider complementary technologies such as LEO satellite** to serve more remote areas in a cost-effective manner. This finding is based on our estimates that LEO satellite constellations expected to be deployed by 2030 will have sufficient capacity to serve as many as 2.6 million to 4.2 million customers in the countries studied and that the technology could be more cost-effective than FTTH for 5–42% of households, depending on the country and the bandwidth scenario in question. Without factoring in existing FTTH network coverage, we estimate that relying on **commercially offered LEO satellite broadband could save up to EUR21–26 billion in fibre subsidies** that would be required to achieve nationwide fibre coverage in the seven EU countries considered (**30–37% of the total** subsidy required).

1 DOCSIS is short for Data Over Cable Service Interface Specification, a standard that allows data transfer (including internet access provision) over hybrid fibre-coaxial (HFC) cable; DOCSIS 3.1 (and 4.0) enable gigabit connectivity and therefore qualify as very-high-capacity networks (VHCNs) in the European Commission (EC) context.

1 Executive summary

1.1 Context and objectives

Access to high-speed connectivity at home has become fundamental to the daily lives of European citizens. A lack of reliable, secure and sufficiently fast broadband impedes the ability of people to work, to learn, and to connect with friends and family across the continent.

However, the economics of broadband roll-out mean that high-speed broadband access is unequally distributed, and that rural areas are at a significant disadvantage compared to their urban counterparts.[2] The cost of technologies such as fibre to the home (FTTH) increases exponentially as density decreases, reducing commercial incentives and requiring significant subsidies to encourage deployment.

European Commission (EC) Digital Decade goals have acted as an important catalyst to increase broadband coverage, but these targets are ambitious and there is a real risk that they will not be met in time.[3] Additionally, it is not clear that consumers are demanding gigabit speeds, and focusing purely on subsidising FTTH deployment could delay the reach of high-speed broadband to rural areas – exacerbating regional inequalities and failing to fix the digital divide.

The past half decade has seen technologies such as low Earth orbit (LEO) satellite become increasingly performant,[4] presenting an attractive complement to FTTH in the quest to achieve Digital Decade objectives. In this context, Analysys Mason has set out to compare the cost of broadband deployment using FTTH and LEO satellite in rural areas of seven EU member states. Our study, sponsored by Amazon, aims to further inform future policy discussions by:

- investigating the extent to which LEO satellite services could meet end users' needs more cost-effectively than FTTH in the rural areas of seven EU member states – Czechia, France, Germany, Greece, Hungary, Italy and Poland[5]
- determining the magnitude of subsidies that could potentially be saved if LEO satellite were used to connect these rural areas instead of FTTH.

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2 Gigabit-capable networks reach 55.7% of rural households in the EU, relative to 78.8% overall; Greece had no rural gigabit coverage – European Commission (2024), *Broadband Coverage in Europe 2023*, available at https://digital-strategy.ec.europa.eu/en/library/digital-decade-2024-broadband-coverage-europe-2023).

3 2030 targets for nationwide roll-outs of gigabit-capable network are unlikely to be met without urgent action, as per latest European Digital Decade report – European Commission (2024), *2024 State of the Digital Decade*), available at https://digital-strategy.ec.europa.eu/en/policies/2024-state-digital-decade-package.

4 LEO satellite broadband has become commercially viable – providing higher speeds, latency and reliability as compared to geostationary Earth orbit (GEO) satellite broadband.

5 These countries were selected for diversity of geographies within the EU. Analysys Mason has presented results for all EU countries modelled; we also conducted a cost assessment for the UK as a calibration exercise, and have discussed the relevance of our results to the wider EU-27 countries in Annex G.

This report summarises our findings, methodology and the wider background against which this study has been conducted. The remainder of this section provides a summary of our key findings. We subsequently describe and expand upon our main findings across five sections:

- Section 2 explains the trends in connectivity and data usage that call into question the need for gigabit-capable broadband in the medium term
- Section 3 describes the number of customers that could be addressed by LEO satellite broadband
- Section 4 compares the relative costs of deploying LEO satellite broadband and FTTH networks
- Section 5 estimates the potential subsidy savings if LEO satellite broadband were to be used in place of FTTH for more remote areas and households
- Section 6 summarises the key conclusions and implications of our report.

We also provide details of our methodology in annexes at the end of the report:

- Annex A presents our considerations in forecasting future bandwidth demand
- Annex B describes our methodology to derive the number of LEO satellite customers served
- Annex C explains how we have estimated the cost of LEO satellite broadband provision
- Annex D provides Analysys Mason's methodology for calculating the costs of fibre networks
- Annex E illustrates how we have estimated the resulting potential subsidy savings
- Annex F provides country-level maps of where LEO satellite is cost-effective relative to FTTH
- Annex G discusses the relevance of results to other EU-27 countries.

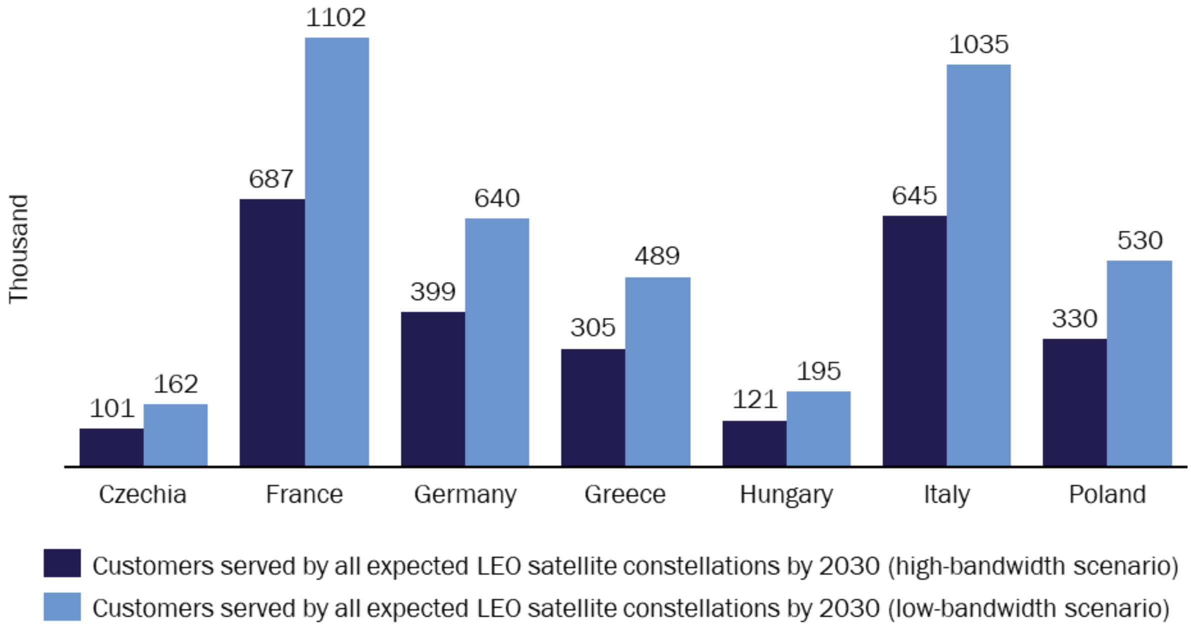
1.2 EU countries are not on schedule to deliver Digital Decade goals, in part due to FTTH deployment costs in rural areas

The EU's ambition is to meet the Digital Decade's gigabit target using FTTH and coaxial cable DOCSIS 3.1 technologies. However, there is a long way to go to reach universal gigabit-capable coverage across the board. Slower-than-expected progress is making it unlikely that the 2030 targets are met without urgent action – as further discussed in Section 2.1 below. Additionally, the Digital Decade targets focus on coverage of gigabit-capable connections – but it is notable that penetration of gigabit-speed broadband lags behind gigabit-capable network coverage across the EU for all countries. This suggests limited consumer demand, and calls into question the need for gigabit-capable broadband in the medium term.

1.3 LEO satellite constellations deployed by 2030 could offer high-speed broadband to millions of customers in EU countries

Analysys Mason estimates that the LEO satellite constellations expected to be deployed by 2030 will have sufficient capacity to serve as many as **2.6 million** to **4.2 million** customers in the seven EU countries of interest alone (depending on the level of bandwidth required[6]) – as shown in Figure 1.1 below.

Figure 1.1: Number of addressable LEO satellite customers in the high- and low-bandwidth scenario, 2030 [Source: Analysys Mason, 2025]

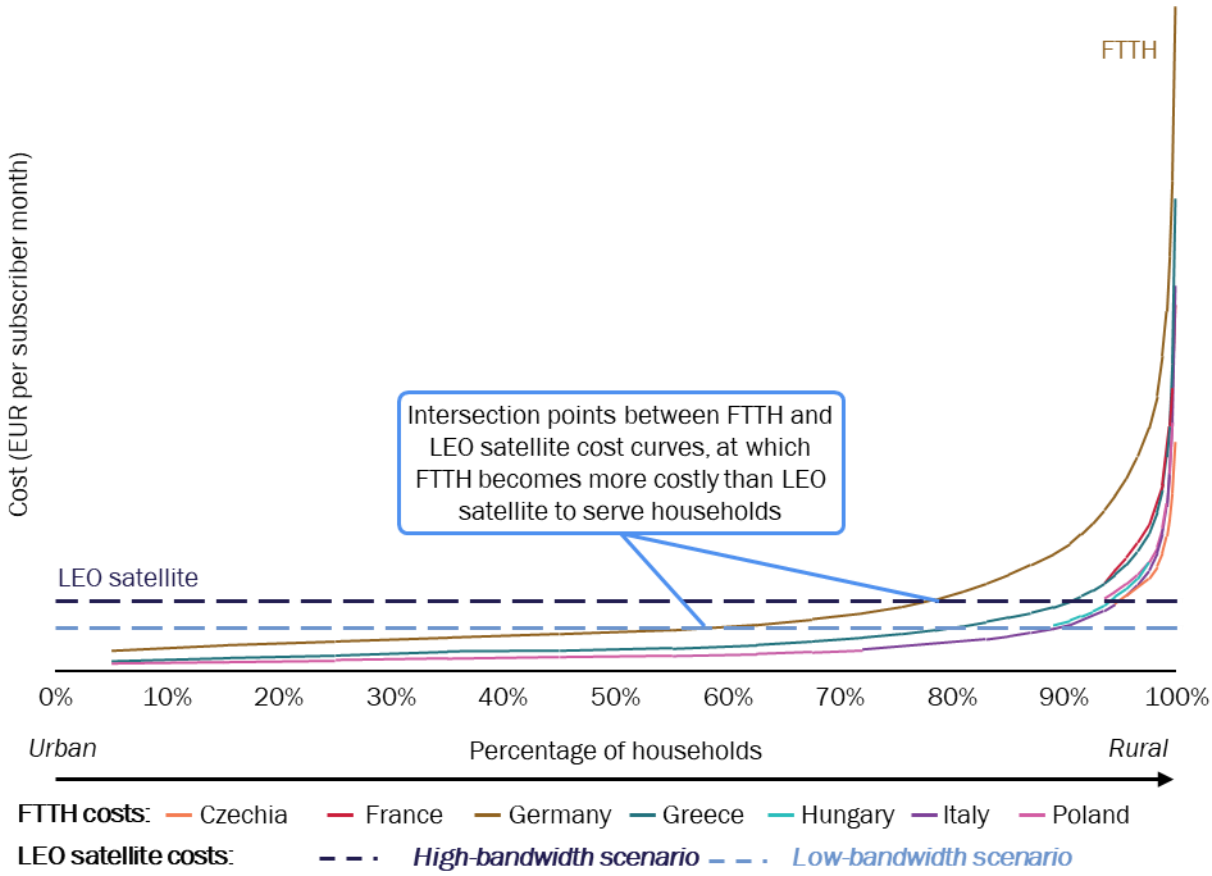


1.4 LEO satellite is more cost-effective than FTTH for rural households

The cost of deploying LEO satellite broadband does not vary with the density and distribution of households and it is constant across urban and rural areas. In contrast, the cost of deploying FTTH is non-linear, with the cost of deployment in the hardest-to-reach 10% of households (where longer lengths of fibre are required) around five times higher than the average across the previous 90%. LEO satellite is thus estimated to be more cost-effective than FTTH for the most rural **5–42%** of households, depending on the country and bandwidth scenario in question, as shown in Figure 1.2 below.

6 As mentioned in the abstract, we have defined two bandwidth scenarios for this study: a high-bandwidth scenario (which represents a projection of current year-on-year growth in usage being maintained until 2030) and a low-bandwidth scenario (which explores the results if bandwidth demand continues to grow, but at a lower rate, in line with the slowing growth rates seen in historical trends). Thus, our high-bandwidth scenario assumes traffic grows at a compound annual growth rate (CAGR) of 15%; the low-bandwidth scenario assumes a CAGR of 7.5%. The satellite capacity simulation assumes all bandwidth is used for consumer broadband, and not for other use cases (e.g. enterprise broadband).

Figure 1.2: Comparison of estimated cost to deploy and operate an FTTH network against LEO satellite, by household density [Source: Analysys Mason, 2025]



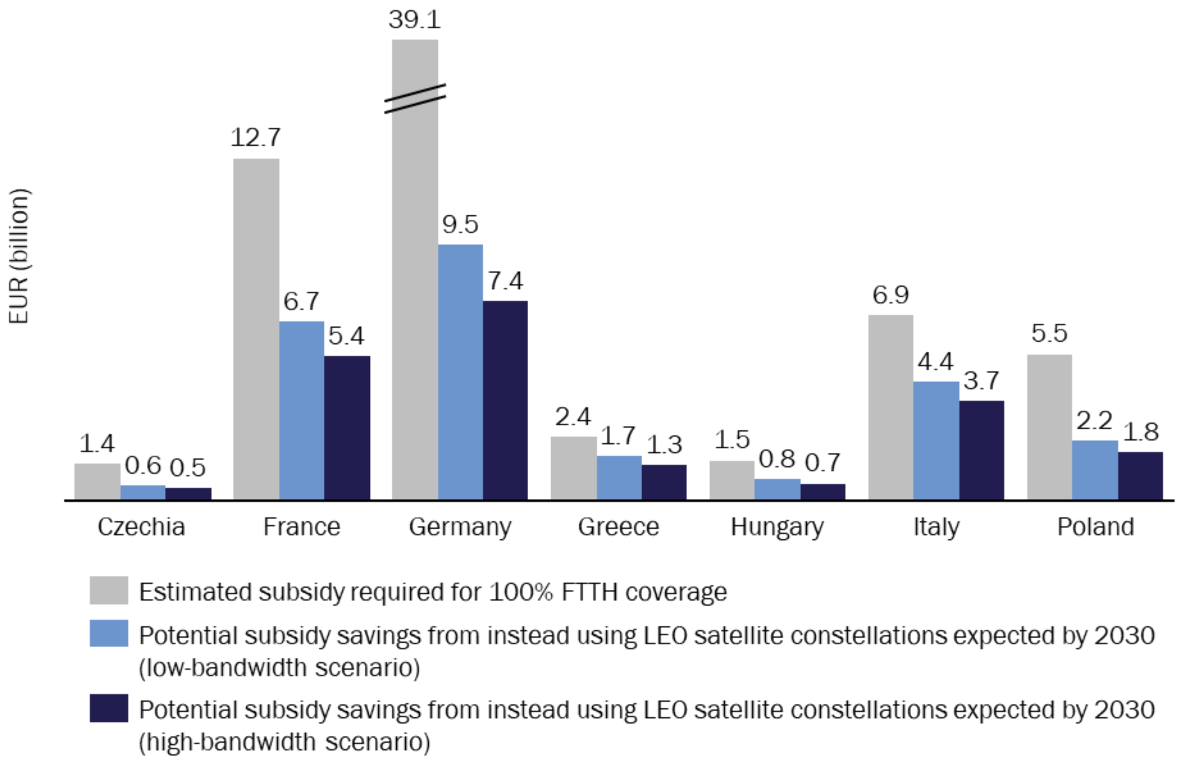
1.5 Billions of euros in subsidy could be saved by using LEO satellite to complement FTTH

Up to EUR21–26 billion[7] in subsidies could potentially be saved in the seven EU countries studied by relying on commercially offered LEO satellite in areas where it can be more cost-effective than FTTH.

Estimated subsidy savings are based on the available capacity from LEO satellite constellations that are expected to go live by 2030. In total, they amount to 30–37% of the total EUR69 billion subsidy required for nationwide FTTH roll-out across the seven countries – potential savings are shown on a country level in Figure 1.3 below.

7 Before accounting for subsidies already awarded, in our high- and low-bandwidth scenarios respectively.

Figure 1.3: Estimated subsidy required for nationwide FTTH and potential savings from using LEO satellite broadband instead [Source: Analysys Mason, 2025]



On a per-household basis, the implied average subsidy savings for those served by LEO satellite are substantial – varying between EUR3500 and EUR18 600 depending on the country and bandwidth scenario. The scale of potential savings thus raises the question of how technologies that are complementary to FTTH can be taken into account as part of future broadband policy, particularly given the increasing ability of satellite technology to meet end-user requirements for high-speed connectivity as LEO satellite technology has developed.

In summary, LEO satellite broadband could be a viable and cost-effective complement to FTTH in both scenarios examined in this study. Millions of rural customers could gain access to broadband services more rapidly than implied by current progress towards Digital Decade targets,[8] and governments in Europe would potentially be able to divert billions of euros to other initiatives (see Figure 1.4 below).

8 Commercial deployments of LEO satellite constellations for consumer broadband are expected sooner than nationwide roll-outs of gigabit-capable networks (which are not expected to be completed by 2030, as per the European Commission (2024)).

Czechia, France, Germany, Greece, Hungary, Italy and Poland	Low-bandwidth scenario	High-bandwidth scenario
Potential number of **customers** served via LEO satellite constellations by 2030	4.2 million	2.6 million
Share of households that could be more cost-effectively served by LEO satellite than FTTH (irrespective of capacity)	12–42%	5–22%
Potential **subsidy savings** if using LEO satellite broadband to serve the most rural households (before accounting for subsidies already awarded)	Up to EUR26 billion	Up to EUR21 billion
Share of subsidy saved out of total required for nationwide FTTH deployment	~37%	~30%

Figure 1.4: Summary of key findings for the seven countries of interest, low- and high-bandwidth scenarios [Source: Analysys Mason, 2025]

2 Slowing data usage growth rates are undermining the case for gigabit-capable connectivity

2.1 The goal of universal gigabit-capable broadband coverage was set before a post-pandemic slowdown in traffic growth rates

The internet, and its underlying connectivity infrastructure, enable access to communication, entertainment, education, smart home features, news and online shopping. The EC defined connectivity targets as far back as 2010, aiming for universal availability of 30Mbit/s speeds and availability of 100Mbit/s for 50% of households in the European Union (EU) by 2020.

Since the introduction of the EC's original targets in 2010, fixed data traffic usage has increased dramatically. Usage grew at a more than 20% compound annual growth rate (CAGR) between 2010 and 2019 and jumped even further (more than 40%) from 2019 to 2020 over the course of the Covid-19 pandemic. However, the rate of growth has declined continuously since 2010 – with the exception of the Covid-19 period – and post-pandemic growth rates have slowed down to below 20%, challenging past industry assumptions about perpetual exponential growth (as further discussed in Annex A).

In the context of significantly higher fixed data traffic by 2020, the EC established upgraded connectivity targets for its member states as part of its Digital Decade (2020–2030) goals, aiming to reach nationwide coverage of gigabit-capable broadband across all EU member states by 2030. These targets were supported by significant funding, with over EUR14 billion allocated directly towards this from the EU budget between 2020 and 2026 (in addition to subsidies provided at a national and regional level).[9]

There are two technologies currently used to meet the gigabit-capable Digital Decade connectivity targets: fibre and cable DOCSIS 3.1.[10] However, the expectation is that greater EU-wide coverage with gigabit connectivity will come primarily from the expansion of FTTH networks,[11] which are the main recipient of funding support. Figure 2.1 below shows current progress towards nationwide gigabit-capable roll-out, highlighting countries included as part of Analysys Mason's study (Czechia, France, Germany, Greece, Hungary, Italy and Poland).

There is still a long way to go to reach universal gigabit-capable coverage across the board. This is illustrated by the EU's average household coverage of 79% (up from 60% in 2020); the areas already

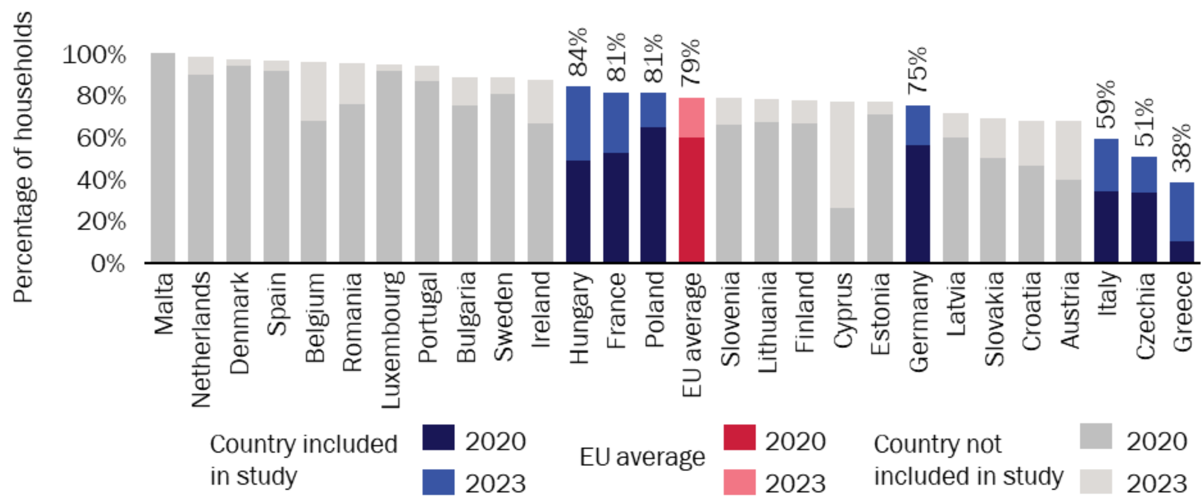
9 As per the latest European Digital Decade report (2024 State of the Digital Decade). European Commission (2024), *2024 State of the Digital Decade*, available at https://digital-strategy.ec.europa.eu/en/policies/2024-state-digital-decade-package.

10 The EC targets refer to fixed very-high-capacity networks (VHCNs), and defines these networks as gigabit-capable networks using FTTH, fibre-to-the-building (FTTB) or cable DOCSIS 3.1 technologies.

11 Coaxial cable is a legacy technology that was originally used in the transmission of cable television programme signals (CATVS) and that can be upgraded using the DOCSIS standard to deliver gigabit download speeds. Most EU countries do not have legacy CATVS networks and are therefore expected to reach the Digital Decade gigabit target using new FTTH networks instead.

covered tend to be the easiest-to-reach (and lowest-cost) urban areas, underscoring the scale of the task ahead – it will take longer and cost more to reach the remaining, more rural, uncovered areas. Furthermore, it is likely that most of the easier progress (e.g. upgrades from DOCSIS 3.0 to 3.1 in areas with existing cable coverage) has now been achieved, with further coverage expansion generally requiring more costly deployment of new infrastructure.

Figure 2.1: Percentage of households covered by gigabit-capable fixed networks, EU, 2020 and 2023 [Source: European Commission Digital Economy and Society Index (DESI), 2024 (data from 2023) and 2021 (data from 2020)]

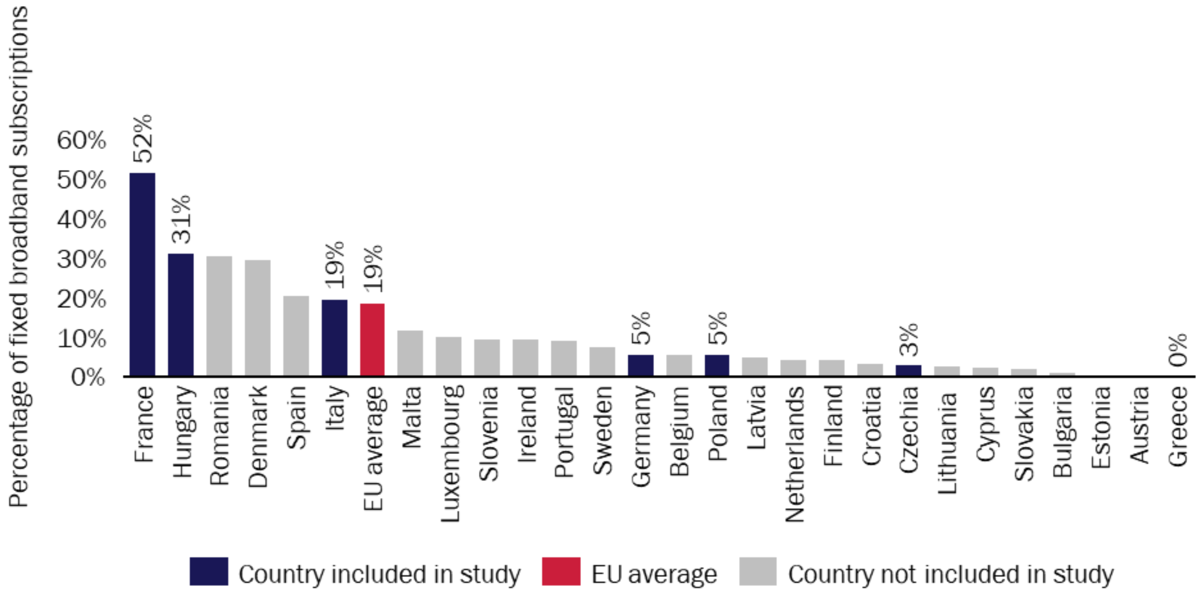


2.2 Take-up of gigabit-speed broadband is limited even in countries with high coverage

The Digital Decade targets are focused on gigabit-capable coverage, but it is notable that penetration of gigabit-speed broadband significantly lags behind gigabit-capable network coverage across the EU for all countries (shown in Figure 2.2 below).[12]

12 Furthermore, household gigabit take-up is likely lower than shown in Figure 3.2 as some businesses also use gigabit-speed broadband lines as a substitute for dedicated leased lines.

Figure 2.2: Penetration of gigabit-speed broadband subscriptions, EU [Source: European Commission Digital Economy and Society Index (DESI), 2024 (data from 2023)]



The relationship between coverage and take-up of gigabit-capable technologies calls into question the level of consumer demand for gigabit broadband speeds. In addition, high-gigabit tariff take-up in France has not resulted in higher data traffic: monthly traffic per user in France is in line with the European average and is below the overall average in Western Europe.[13] This echoes the findings of Kenny, Kenny and Gehan in June 2023[14] and Webb in June 2024[15] that past certain speed thresholds, higher speeds are not associated with greater household data usage, and calls into question the need for gigabit connectivity in the medium term.

In the context of low consumer demand for gigabit speeds and slow fibre roll-out, there is an opportunity for other connectivity technologies to fill gaps in coverage within the EC's 2030 timeframe. As per the latest Digital Decade report,[16] urgent action is needed to speed up progress, as the pace of progress on high-quality connectivity has been slower than expected. One such action could be considering complementary connectivity options.

13 Analysys Mason (2024), *Fixed network data traffic: worldwide trends and forecasts 2023–2029*, available at https://www.analysysmason.com/research/content/regional-forecasts-/fixed-network-data-rdfi0-rdmb0/.

14 Kenny R., Kenny C. and Gehan Z. (2023), 'What Drives Broadband Traffic?', *Telecommunications Policy*, Vol. 47 (9).

15 William W., *The End of Telecoms History* (June 2024, independently published).

16 European Commission (2024), *2024 State of the Digital Decade*, available at https://digital-strategy.ec.europa.eu/en/policies/2024-state-digital-decade-package.

LEO satellite could be a cost-effective complement to FTTH to provide high-speed broadband to rural areas more quickly

In the subsequent sections of this report, we assess the areas where LEO satellite could be used to serve households more cost-effectively by comparing the costs of deployment per household on a granular geographic basis, and discuss whether governments' subsidy requirements could be reduced by using LEO satellite to address these areas alongside FTTH.

3 LEO satellite broadband could serve millions of European households by 2030

3.1 As many as 2.6 million to 4.2 million broadband customers could be addressed in the countries studied

Millions of customers in rural areas of Europe could be served via LEO satellite broadband constellations by 2030. Analysys Mason has defined two 'bandwidth scenarios' for projections in this study due to the inherent level of uncertainty in how data usage trends will develop in coming years (further discussed in Annex A).

In the seven countries assessed, we expect that LEO satellite constellations[17] will have sufficient capacity to serve as many as 2.6 million customers in our high-bandwidth scenario (which assumes that fixed data traffic will grow at a CAGR of 15% until 2030, broadly in line with annual growth rates observed post-pandemic). In our low-bandwidth scenario (which assumes that traffic growth will continue to slow in line with historical trends, and thus instead takes a lower CAGR of 7.5%), we expect that LEO satellite constellations could serve up to 4.2 million customers.[18] Both of these results assume that all bandwidth is allocated to consumer broadband.[19]

3.2 A larger share of households can be served in countries with lower latitudes and density

Figure 3.1 below shows how the number of subscribers supported translates into the proportion of households served in each country, varying by bandwidth scenario. In the higher-bandwidth scenario, a smaller number of customers are able to be supported as each individual user is assumed to consume more capacity.

In absolute terms, countries with a larger surface area will have more satellites covering them, and thus constellations are able to support a larger number of customers than in smaller countries. However, countries with a larger surface also tend to have larger populations, potentially resulting in a lower proportion of addressable households than for smaller countries, depending on population density. In more population-dense countries, areas of the country will more quickly run into the capacity constraints of satellite systems. Germany is the most densely populated of the seven EU

17 Constellations expected to be in operation by 2030, dimensioned based on public filings with the US Federal Communications Commission (FCC).

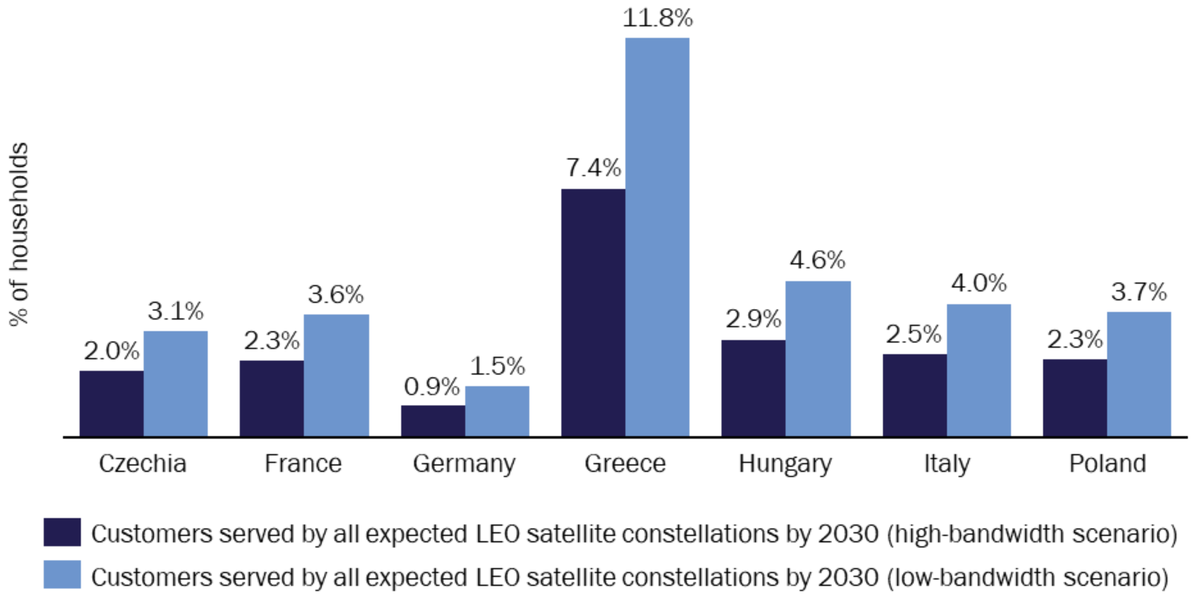
18 Extrapolating at 7.5% (low-bandwidth scenario) or 15% (high-bandwidth scenario) from 300GB of monthly downstream usage per subscriber in 2023 and converting this average into peak-hour bandwidth using a two-times peak-to-average ratio (which is based on average peak hour usage and overall average usage data from public benchmarks, as well as Analysys Mason's previous experience).

19 In practice, some of this capacity will be employed for other use cases – such as business, government or mobility purposes. However, for the purposes of this report, the number of customers that could be served if all capacity were dedicated to consumer broadband is relevant for estimating a LEO satellite broadband cost per household (dividing the total cost of a satellite constellation by the number of customers that could be served) – because if some capacity were dedicated to alternative use cases, these use cases would also be allocated a share of the cost.

countries modelled, while Greece is the least densely populated, which goes some way to explaining the reasons these countries differ from others in the sample.

The other factor affecting the satellite capacity for each country is latitude. The inclination of the orbits (angle between the equator and the orbital plane) influence the distribution of supply along different latitudes. Density of supply peaks in latitudes close to the inclination angles. Consequently, density of supply for LEO constellations typically peaks at middle latitudes and is lower in the equator and polar regions. In the context of Europe, northern areas of Germany would typically experience a lower density of supply than other geographies like Greece, Italy or France.

Figure 3.1: Number of addressable LEO satellite customers in high- and low-bandwidth scenarios, as proportion of total number of households in each country, 2030 [Source: Analysys Mason, 2025][20]



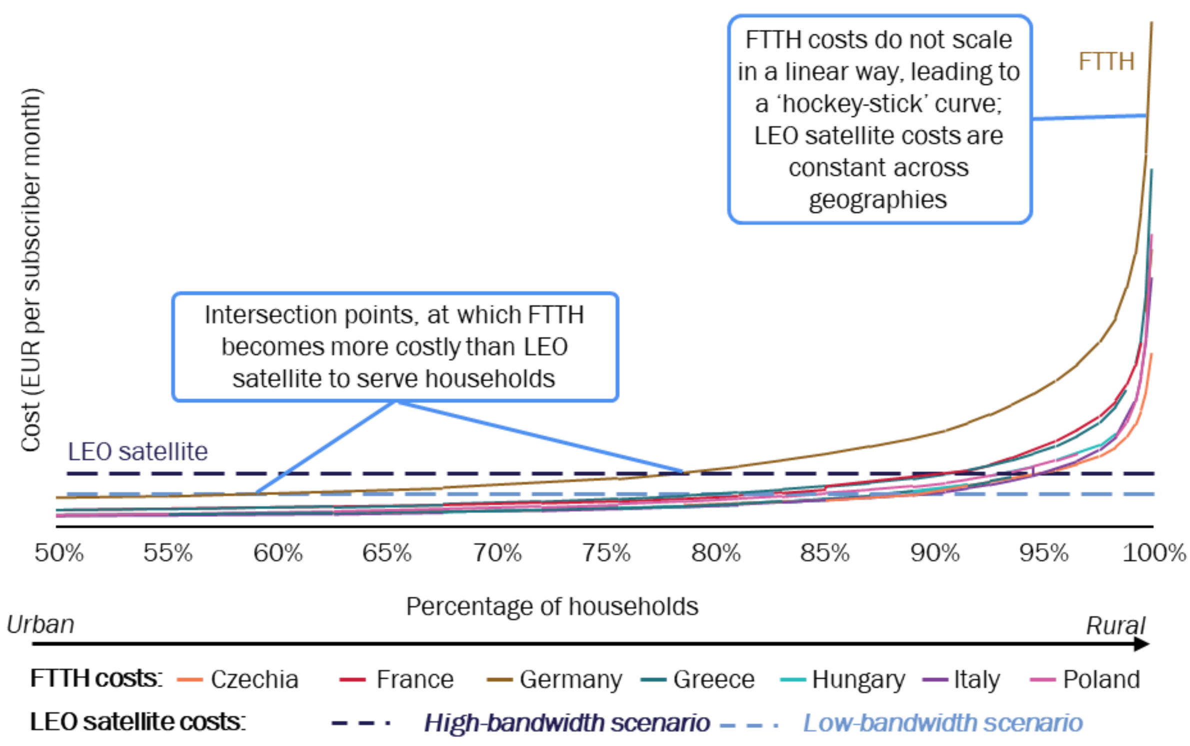
20 The numbers presented account for overlap in capacity between countries – that is, the number of customers that could be served in any individual country could theoretically be even higher if all visible capacity from the satellites simulated was pointed at the country, rather than shared equally with its neighbours.

4 LEO satellite is a cost-effective complement to FTTH when serving the most rural households

4.1 FTTH costs scale exponentially in more rural areas, while LEO satellite costs do not vary with population density

Based on the total wholesale cost per subscriber month for LEO satellite in the two defined bandwidth scenarios,[21] as well as the equivalent cost for FTTH in each of our seven countries,[22] we are able to compare the cost to build and deploy LEO satellite and FTTH broadband networks at a per-household level. Figure 4.1 below shows this comparison, focusing on the most rural 50% of households.[23]

Figure 4.1: Comparison of estimated cost to deploy and operate an FTTH network against LEO satellite, by household density [Source: Analysys Mason, 2025][24]



21 Methodology for LEO satellite costs is explained in Annex C.

22 Methodology for FTTH costs is explained in Annex D.

23 So as to focus on the intersection points between the FTTH and LEO satellite cost curves.

24 For both FTTH and LEO satellite we modelled upfront and ongoing costs to 2043, including replacement costs at the end of life for individual components, using a discount rate of 10% per annum. More details on our LEO satellite broadband cost methodology can be found in Annex C, and details on our FTTH cost methodology can be found in Annex D.

LEO satellite costs are flat across geotypes, while FTTH costs increase in a non-linear manner in more rural areas. There is therefore an intersection point between FTTH and LEO satellite for each bandwidth scenario and for each country. From the point at which the discounted cost curves intersect, LEO satellite is the comparatively more cost-effective option in the modelled period.[25]

It is also worth noting the extent to which FTTH costs increase in a non-linear way – across countries, the average cost of FTTH deployment is around five times higher in the hardest-to-reach 10% of households, as compared to the average across the previous 90%.

FTTH deployment in Germany stands out as particularly high cost. This is consistent with the relatively slow gigabit-capable network deployment in Germany observed in Figure 2.1 and is a result of four major factors that drive differences in FTTH costs between countries:

- underlying geography and population distribution
- the extent to which underground ducts are used for deployment rather than (less expensive) overhead poles
- the extent to which existing duct and pole infrastructure can be re-used
- the local labour rate.

Each country modelled is impacted in a different way by each of these dynamics, but Germany experiences a significant impact from all four: it is large relative to other countries, has very little aerial cabling, very few available ducts (its existing copper networks often use 'direct-buried' cable installations) and high labour rates.

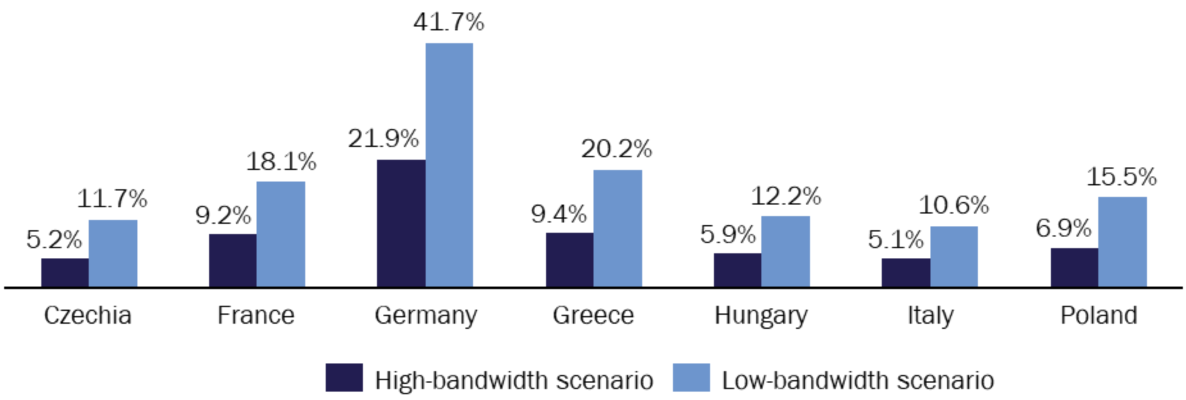
4.2 LEO satellite is constrained by capacity, not by relative cost-effectiveness to FTTH

As discussed above, the cost of deploying LEO satellite broadband does not vary with the density and distribution of households. In contrast, the cost of FTTH deployment increases significantly in rural areas where longer lengths of fibre are required. As a result, LEO satellite can present a cost-effective complement to FTTH, with an average cost per household that is lower than FTTH for the most rural 5–22% of households in our high-bandwidth scenario, and 12–42% of households in our low-bandwidth scenario.

Figure 4.2 below represents the intersection points of the cost curves represented in Figure 4.1 above – the proportion of households that would be served more cost-effectively by LEO satellite in each of our countries of interest. The country with the highest share of households that could be more cost-effectively served by LEO satellite is Germany, due to it being the country with the highest expected cost to deploy its FTTH network (for reasons explained further below) – but across all countries, at least 5% of households could be more cost-effectively served by LEO satellite than by FTTH.

25 We modelled both the LEO satellite and FTTH costs to 2043. For more details, refer to Annex C and Annex D.

Figure 4.2: Share of each country that could be more cost-effectively served by LEO satellite than FTTH [Source: Analysys Mason, 2025]



In all countries modelled, across both bandwidth scenarios, the percentage of households that can be served more cost-effectively by LEO satellite than FTTH is greater than the total number of addressable LEO satellite customers (due to the capacity constraints of satellite constellations). This suggests potential appetite for further subsequent satellite deployments.

5 LEO satellite broadband could help save 30–37% of required subsidies for nationwide FTTH deployment

5.1 Governments can avoid billions of euros of FTTH subsidies by using LEO satellite to serve households in rural areas

The results presented in the previous section indicate that LEO satellite can be more cost-effective than FTTH in serving the most rural households. By calculating the required subsidy for nationwide FTTH coverage, and then applying constraints based on the number of customers that could be supported by the LEO satellite constellations expected by 2030, we can thus estimate the potential savings made if FTTH deployment to these areas were avoided.

We estimate that governments and policy makers could potentially save EUR21–26 billion[26] across the seven countries modelled if LEO satellite were used to serve the most rural households instead of subsidising FTTH.[27] This is equivalent to an average of EUR3500–14 900 in savings per household in our low-bandwidth scenario, or EUR4400–18 600 in our high-bandwidth scenario[28] (with savings in Germany being the highest and Greece being the lowest).

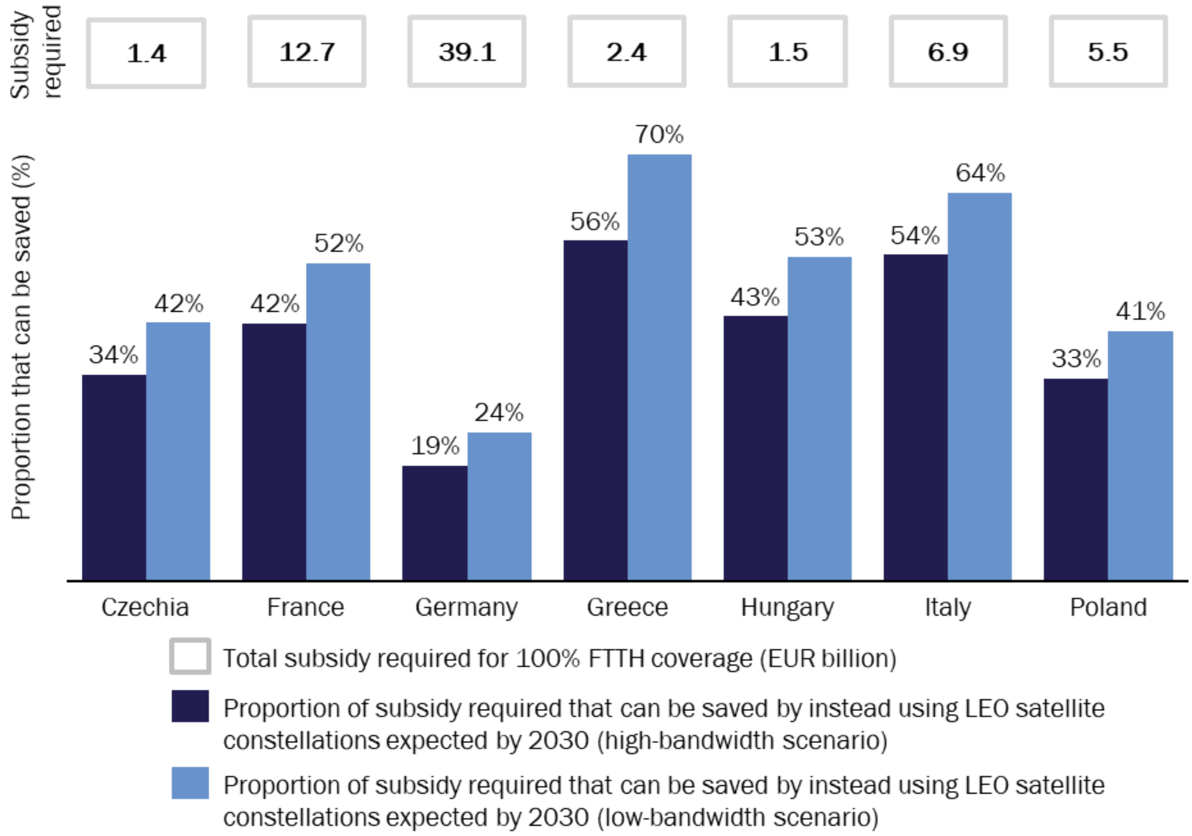
The estimated total subsidy required to support nationwide FTTH coverage, and the potential subsidy savings in our low- and high-bandwidth scenarios, are shown in Figure 5.1 below. In our high-bandwidth scenario, savings comprise 30% of the total estimated subsidy required, and in the low-bandwidth scenario they make up 37% of the estimated total required.

26 EUR21 billion in the high-bandwidth scenario; EUR26 billion in the low-bandwidth scenario.

27 Before accounting for subsidies already awarded.

28 Savings per household are reduced in the low-bandwidth scenario as a larger number of customers are supported by LEO satellite, extending potential savings to customers with somewhat lower average cost of FTTH build.

Figure 5.1: Estimated subsidy required for nationwide FTTH coverage and potential savings from using LEO satellite instead of subsidising FTTH [Source: Analysys Mason, 2025][29]



5.2 Half of the required subsidy for full FTTH deployment is needed to connect just the hardest-to-reach 5% of households

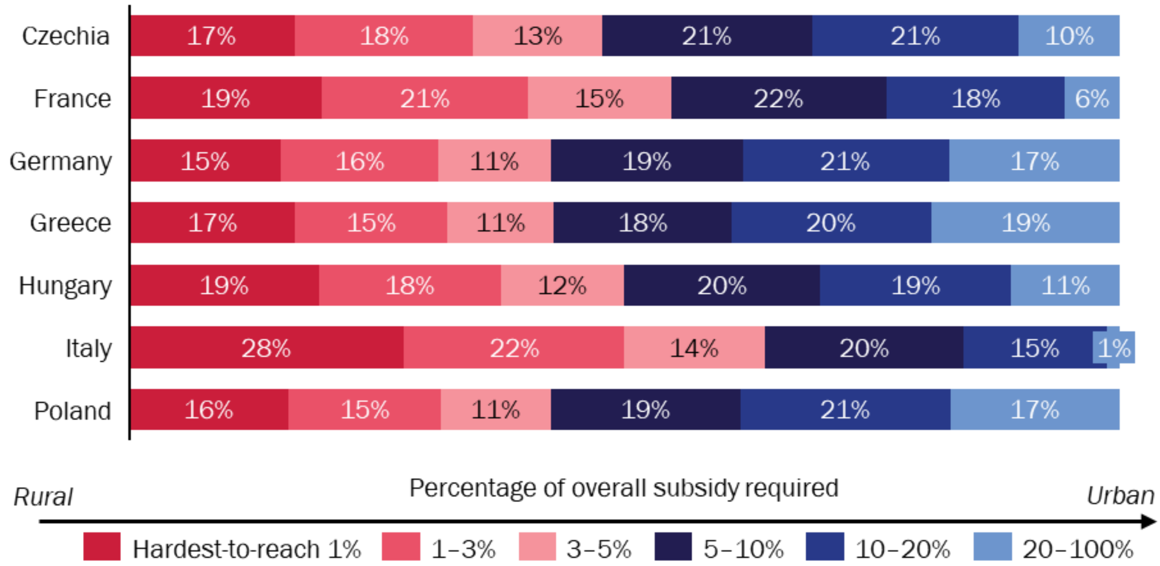
Due to the disproportionate share of subsidies required to serve the most remote households, even a limited number of customers connected in these areas can generate significant total savings. The number of addressable LEO satellite customers in Germany, for example, makes up 0.9–1.5% of households (in the high- and low-bandwidth scenarios respectively). This is significantly fewer than the 21–42% of households that could potentially be more cost-effectively served by LEO satellite than by FTTH in that country. However, avoiding subsidy to only these 0.9–1.5% hardest-to-reach households would still save a significant share (19–24%) of the total subsidy requirement for the country. Similar dynamics apply to the other countries considered.

This non-linear nature of potential subsidy savings is illustrated in Figure 5.2 below, which shows the share of subsidy required to serve various proportions of households in each country – from the hardest-to-reach 1% of households to the easiest-to-reach 50% of households. The most remote 1% of households alone represents 15–28% of the FTTH subsidy required in each country, and 5% of

29 Before accounting for subsidies already awarded.

households account for between 43% and 64% of total subsidy. This is a result of the exponential increase in FTTH roll-out costs within the last few household percentiles.

Figure 5.2: Share of total subsidy required to serve each percentile of households, by country [Source: Analysys Mason, 2025]



The current study does not assess in detail the existing level of FTTH deployment or subsidy allocation across the seven countries. Given that many countries have already allocated subsidies towards FTTH deployment, or even deployed in uneconomical areas, the actual potential subsidy saving that could be generated will be lower than the headline results above. However, the scale of potential savings nevertheless reveals an important question for European decision makers. In the context of declining year-on-year traffic growth, slow progress towards the Digital Decade targets and many competing spending priorities for governments, how can policy makers factor technologies that are complementary to FTTH (such as LEO satellite) into their broadband policies?

6 Conclusion: governments should consider complements to FTTH for the most remote households

6.1 The value and costs of rural gigabit broadband provision should be carefully assessed

Our study finds that Czechia, France, Germany, Greece, Hungary, Italy and Poland could potentially save EUR21–26 billion[30] by relying on the expected capacity of LEO satellite to address the most rural households, rather than subsidising FTTH roll-out in these areas. On a per-household basis, this would save an average of between EUR3500 and EUR18 600 per household served by LEO satellite (dependent on country and the bandwidth scenario).

The scale of potential savings demonstrates that LEO satellite should be taken into consideration as an attractive complement to FTTH, in order to serve more remote areas in a cost-effective and timely manner.

While LEO satellite can provide cost savings in serving the most remote households, it is not currently able to match the gigabit-capable speeds offered by FTTH technology. However, there does not appear to be consensus on the need for gigabit consumer broadband speeds, with data indicating that most customers are not choosing gigabit subscriptions when available.[31] We invite any key industry stakeholders reading this study to conduct a comprehensive review of the expected demand (for example, through analysis of usage and take-up data, but also potentially via consumer surveys), in order to reach a conclusion as to the value of gigabit-capable broadband for the most rural households.

6.2 Potential savings on FTTH subsidies could be redirected into alternative public spending programmes

By choosing to use LEO satellite (or other technologies) alongside FTTH to provide high-speed connectivity to Europe, policy makers would be able to free up public funds for use in any number of alternative public programmes.

While the total savings from avoiding FTTH subsidies would not be expected to reach the maximum of EUR21–26 billion identified in this report, due to existing subsidy allocation and FTTH roll-out progress, this study demonstrates that significant savings exist even exclusively in the very hardest-to-reach households.

30 Compared to the total cost of subsidising a nationwide FTTH roll-out, before accounting for subsidies already awarded.

31 Covered in more detail in Section 2 and Annex A.

To contextualise the total potential saving, we have identified comparable public spending programmes in each of our countries of interest – illustrating how the public funds could be used in providing digital skills, assisting the green transition or supporting taxpayers.

Figure 6.1: Maximum theoretical subsidy savings by bandwidth scenario, and comparable public spending programmes in the public domain [Source: Analysys Mason, 2025]

Country	Maximum subsidy savings (EUR)	Comparable public spending programme (reported cost in EUR, with links to sources)
Czechia	EUR0.6 billion *(low-bandwidth scenario)*	'Digital skills for the digital age' component of Czechia's digital transition, as part of Covid-19 recovery and resilience plan (EUR0.6 billion)
	EUR0.5 billion *(high bandwidth scenario)*	Education reform and investment to help ensure equal access to education (EUR0.5 billion)
France	EUR6.7 billion	Green building renovations as part of France's green transition in its recovery and resilience plan (EUR7.7 billion)
	EUR 5.4 billion	Measures to foster jobs and training for young people, as part of recovery and resilience plan (EUR4.6 billion)
Germany	EUR9.5 billion	Public support to attract Intel chipset factories and EUR30 billion investment to Germany (EUR10 billion)
	EUR7.4 billion	Support for electric cars, clean buses and rail as part of green transition of transport sector (EUR7 billion)
Greece	EUR1.7 billion	Subsidised low-rate mortgages for young families (EUR1.75 billion)
	EUR1.3 billion	General pro-child measures, including financial incentives for assisted reproduction (EUR1 billion)
Hungary	EUR0.8 billion	Digitalisation of education and healthcare as part of Covid-19 recovery and resilience plan (EUR0.6 billion and EUR0.5 billion respectively)
	EUR0.7 billion	Renewable energy research and infrastructure (EUR0.7 billion)
Italy	EUR4.4 billion	Tax relief support for low-income workers as part of 2023 budget (EUR4.2 billion)
	EUR3.7 billion	Healthcare spending increase in 2024 budget (EUR3.7 billion)
Poland	EUR2.2 billion	'European Funds for Eastern Poland 2021–2027' programme, supporting development in six Eastern Poland provinces (EUR 2.65 billion)
	EUR1.8 billion	Support for investments into electricity storage facilities (EUR1.2 billion)

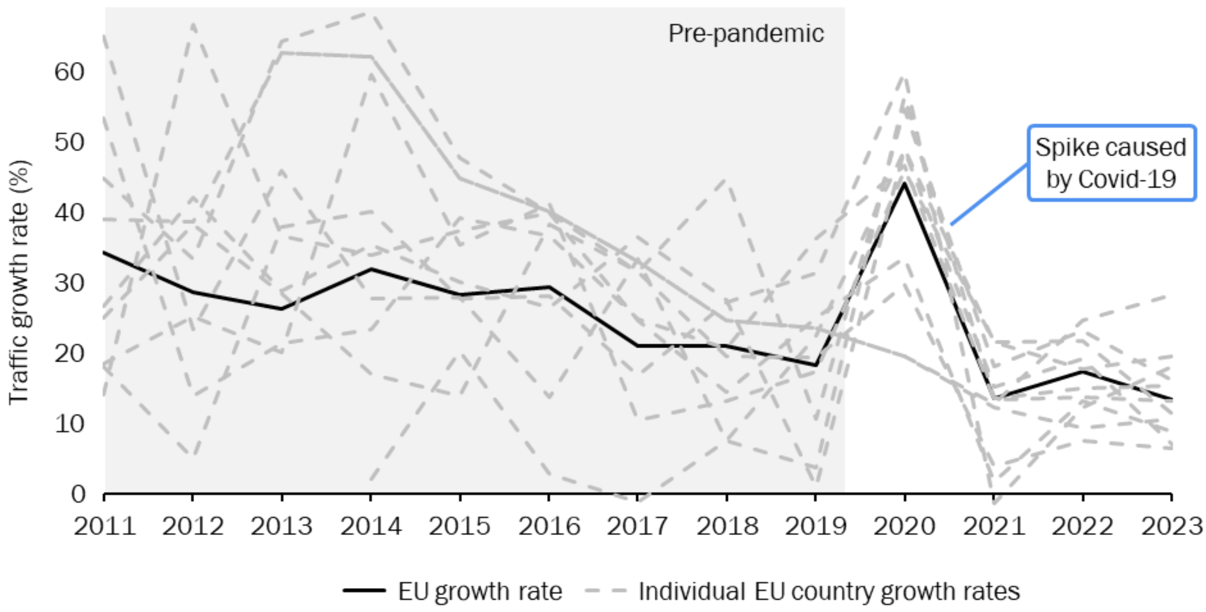
Fibre is a suitable technology to provide high-speed connectivity, but requires larger funding and roll-out timelines compared to other available technologies. Using complementary technology options such as LEO satellite alongside fibre could help free up public funds for other important priorities – and allow high-speed connectivity to reach more European households faster than current FTTH build progress implies. We hope our findings will invite creativity and discussion between industry participants and policy makers on how to best address Europe’s connectivity challenges and opportunities.

Annex A Considerations in forecasting bandwidth demand

A.1 We defined two bandwidth scenarios due to the level of uncertainty in how data usage trends will develop over the coming years

Figure A.1 below plots the growth rates of monthly fixed data traffic per subscriber across the EU. It shows how the growth of data traffic generally slowed year on year prior to the Covid-19 pandemic, at which point data traffic jumped as a result of lockdowns, isolation and increased acceptance of remote working.

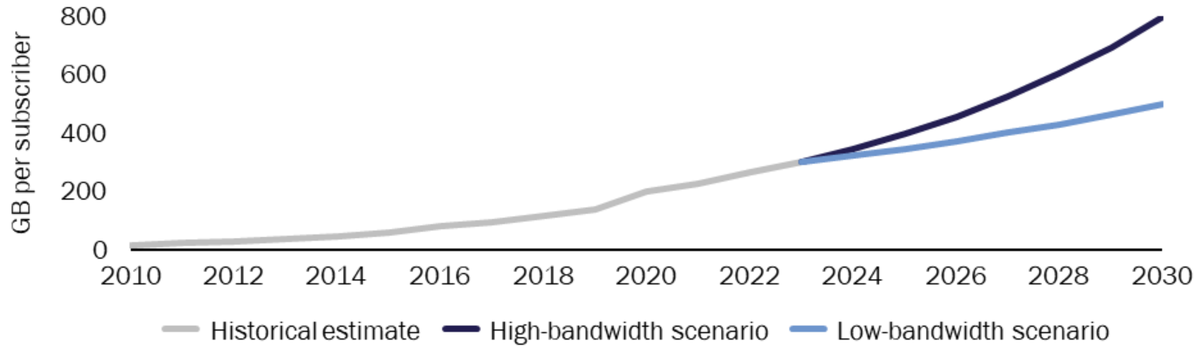
Figure A.1: Growth rates in fixed data traffic per subscriber, average across European Union (EU) [Source: Analysys Mason, 2025]



In the three years since, growth rates have continued to trend down – but it is not definitively clear whether growth is now at a relatively constant rate or growth will continue to slow in the coming years.

As such, we defined two projected scenarios for data traffic growth, allowing us to calculate results in this study within a range of probable data traffic demand from EU subscribers. Figure A.2 below shows the growth of monthly fixed data traffic on a per-subscriber basis across Europe, followed by our two sets of projections (a high-bandwidth and low-bandwidth scenario), indicating how this trend may develop in the coming years.

Figure A.2: Historical and projected downstream fixed data traffic per subscriber per month, in high- and low-bandwidth scenarios, EU [Source: Analysys Mason, 2025]



Our high-bandwidth scenario assumes traffic will grow until 2030 at a CAGR of 15%, which is broadly in line with post-pandemic growth rates, whereas our low-bandwidth scenario assumes a continued flattening of this curve at a CAGR of 7.5%. The decline in traffic growth in our low-bandwidth scenario is in line with expectations of many third-party forecasters, including Robert Kenny (2024)[32] and Brian Williamson (2024).[33]

There are a number of potential drivers of data traffic growth, including the increasing availability of high-capacity digital infrastructure (on the supply side) or adoption of increasingly data-hungry applications (on the demand side). Where there is unmet demand for more data-hungry applications, improvements in supply cause rapid growth in data traffic – but if there is significant supply overhead, then growth rates would be expected to naturally slow to match the increases in demands from applications.[34]

Increasing demand from applications can either take the form of higher-definition content, or new types of applications. For example, a higher-resolution video requires more bandwidth to stream or download, and thereby increases data traffic. However, a combination of factors (e.g. lower marginal benefit of higher resolutions; on-device upscaling; content consumption on smaller, mobile screens; improved data compression techniques) are limiting the upward pressure on data traffic from higher-definition content.

32 Kenny, R. ((2024), *Low fixed traffic growth – the old normal*, available at www.linkedin.com/pulse/low-fixed-traffic-growth-old-normal-robert-kenny-sibff/).

33 Williamson, B. (Communication Chambers (2024), *The future of connectivity*, available at www.linkedin.com/posts/brian-williamson-bb60319_the-future-of-connectivity-a-vision-beyond-activity-7206543271890747392-UApg).

34 Analysys Mason (2024), *A crisis of overproduction in bandwidth means that telecoms capex will inevitably fall*, available at https://www.analysysmason.com/research/content/articles/bandwidth-overproduction-crisis-rdns0/;
Analysys Mason (2024), *Future fixed traffic demands depend less on technological leaps and more on user engagement*, available at https://www.analysysmason.com/research/content/articles/fixed-traffic-forecast-rdfi0/.

Therefore, the main demand-side driver of data traffic would be the emergence of new types of application, which is inherently hard to predict. The possibility of widespread consumer adoption of virtual or augmented reality is a potential driver of traffic growth, but it is unclear that there will be mass-market penetration for these products and, even in that case, expected timelines for widespread adoption could be lengthy. By comparison, adoption of AI-based applications (particularly those involving GenAI) have risen steeply in recent years, but these have not driven large increases in data traffic – most processing occurs in data centres, with only text- or image-based outputs shared with end users.

Annex B Approach to derive LEO satellite customers served

B.1 We used detailed capacity simulations to derive the number of customers that could be served by LEO satellite constellations

In order to estimate the number of customers that could be served by LEO satellite broadband, Analysys Mason conducted capacity simulations using our proprietary Non-Geostationary Orbit (NGSO) Constellation Analysis Toolkit (NCAT) platform version 4.2.[35] The NCAT platform provides assessments of bandwidth supply and demand dynamics for NGSO satellite constellations.

For the purposes of this analysis we focused exclusively on constellations expected to be fully deployed by 2030, as per Federal Communications Commission (FCC) filings.[36] Inputs into our simulations (e.g. the number of satellites, orbital altitudes, maximum latitude reach, satellite payloads and frequency re-use for each orbital shell of each constellation) relied on publicly available information, primarily from FCC filings. Based on these inputs, the NCAT tool was used to calculate the average uplink and downlink capacity in Gbit/s for each orbital shell of each of the constellations.

The resulting number of user terminals (see Figure B.1 below) that could be supported across Europe (and in each of our countries of interest) is a result of the amount of visible capacity for satellites in each constellation in a dynamic 24-hour period,[37] and the expected downstream provisioning rate per user by 2030 in both the high- and low-bandwidth scenarios.[38]

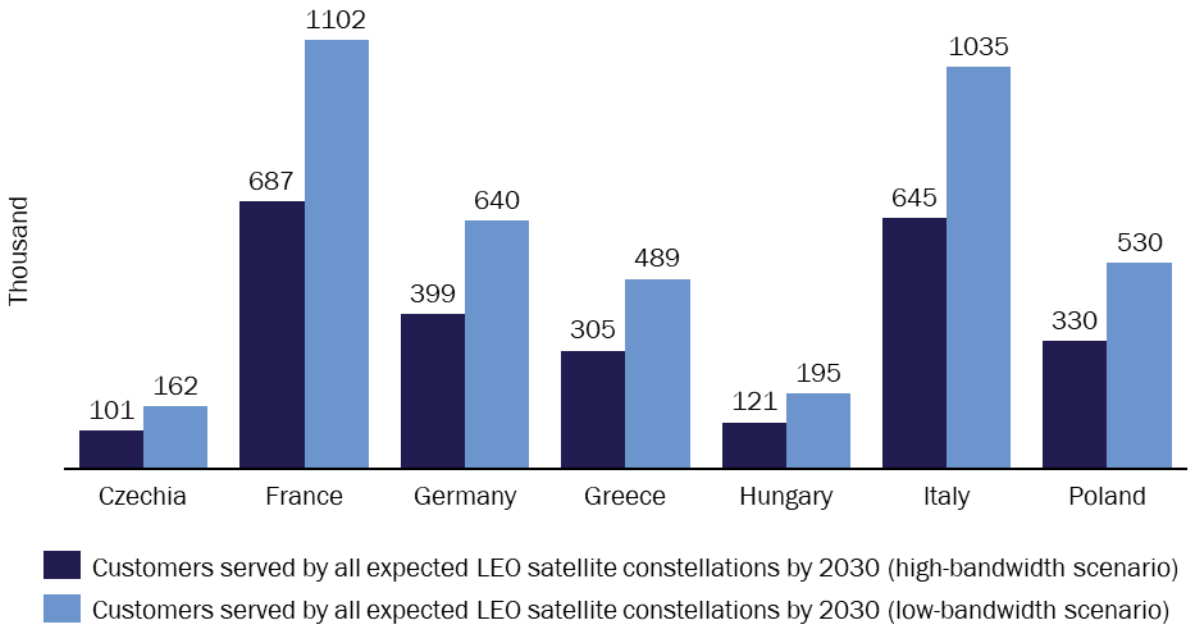
35 Version 5.0 was released in October 2024, and included features developed for this project. More information is available at https://www.analysysmason.com/research/content/reports/nongeo-constellations-analysis-toolkit/.

36 By focusing exclusively on publicly filed FCC data, we did not factor in any potential under-delivery of satellites into orbit for the constellations – though this is balanced by not taking a view on any potential additional entrants into the market.

37 Using maximum clear-sky channel capacity assuming DVB-S2X[37] coding. In practice, some capacity will be lost to rain fade, dependent on weather conditions.

38 This approach accounts for overlap in visible capacity between countries, and therefore does not overestimate the total shared capacity for the region. It is possible, however, that LEO satellite operators may focus capacity on certain countries, particularly as demand prioritisation may factor in enterprise demand or pricing/service quality tiers (not factored into our simulation or modelling methodology). This could result in higher (or lower) numbers of users ultimately served in each country.

Figure B.1: Number of addressable LEO satellite customers in the high- and low-bandwidth scenario, 2030 [Source: Analysys Mason, 2025]



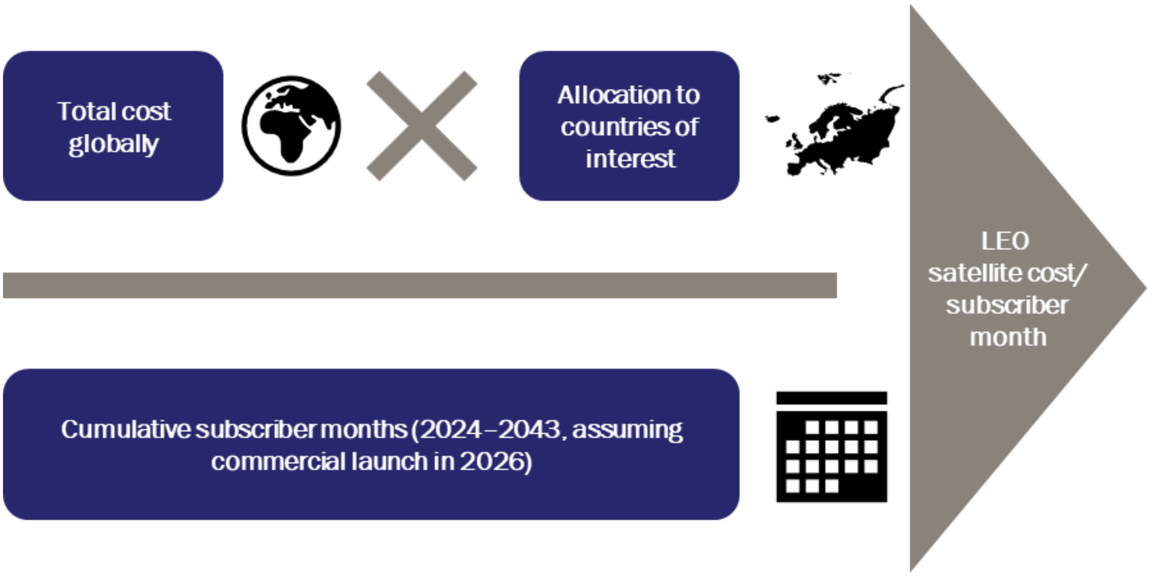
Annex C Approach to costing LEO satellite broadband

C.1 The cost per household of LEO satellite broadband provision is based on an allocation of the costs associated with a generic global LEO satellite constellation

Our LEO satellite cost model estimates the total global cost for a generic LEO satellite constellation, factoring in industry benchmarks and publicly available information for launch costs, manufacturing costs, ground segments, customer premises equipment (CPE) and operating expenses (opex). The number and size of satellites modelled as part of our generic LEO satellite constellation are consistent with the results of our capacity simulation (discussed in Annex B) – but instead of accounting for total capacity across all expected constellations, the costing divides the cost for one generic constellation by the number of subscribers supported by the capacity of that constellation. For this generic constellation, the model assumes that no satellites have yet been deployed, and that commercial operations (and associated costs) would begin in 2026.

After modelling the global cost for the generic satellite constellation through to 2043, including full replacement of the satellites in the constellation when they reach end of life, we allocate these costs by country. The cost allocation accounts for both demand (the share of global satellite revenue expected to be attributable to Europe, and country-level adjustments based on population and gross domestic product per capita) and supply factors (the simulated number of addressable terminals in each European country from capacity simulations). This calculation, illustrated in Figure C.1 below, results in around 6% of global constellation cost allocated to the seven countries modelled.

Figure C.1: Calculation of LEO satellite cost per subscriber month [Source: Analysys Mason, 2025]



Annex D Approach to estimating the costs of fibre networks

D.1 We conducted a granular geoanalysis exercise to accurately estimate the cost of FTTH deployment across urban and rural geotypes

Our FTTH cost model estimates the total cost of building a new, XGS-PON-based[39] fibre network in each country of interest. We account for existing 'pre-FTTH' infrastructure[40] and a fibre backbone connecting local (telephone) exchanges, from which the FTTH network would be built out. By accounting for this existing infrastructure, our model accurately captures the real-world cost savings from re-use of pre-existing infrastructure. For comparability with the LEO satellite model, and to focus on accurate estimates of cost per household in areas that have not yet been covered by fibre, the model assumes no existing FTTH deployments – it does not take into account any existing fibre deployment or coverage, other than the aforementioned fibre backbone up to local exchange nodes.[41]

To accurately capture the effects on cost of increasing line lengths in rural areas, our FTTH cost model approach involves granular geoanalysis and population mapping. This geoanalysis accounts for the particular spatial geography of each area of a country, including how FTTH deployment in less dense areas differ from deployment in more dense areas. In less dense areas of a country, there are different relative quantities of components, as a result of the lower density of households clustered around the nearest network node.

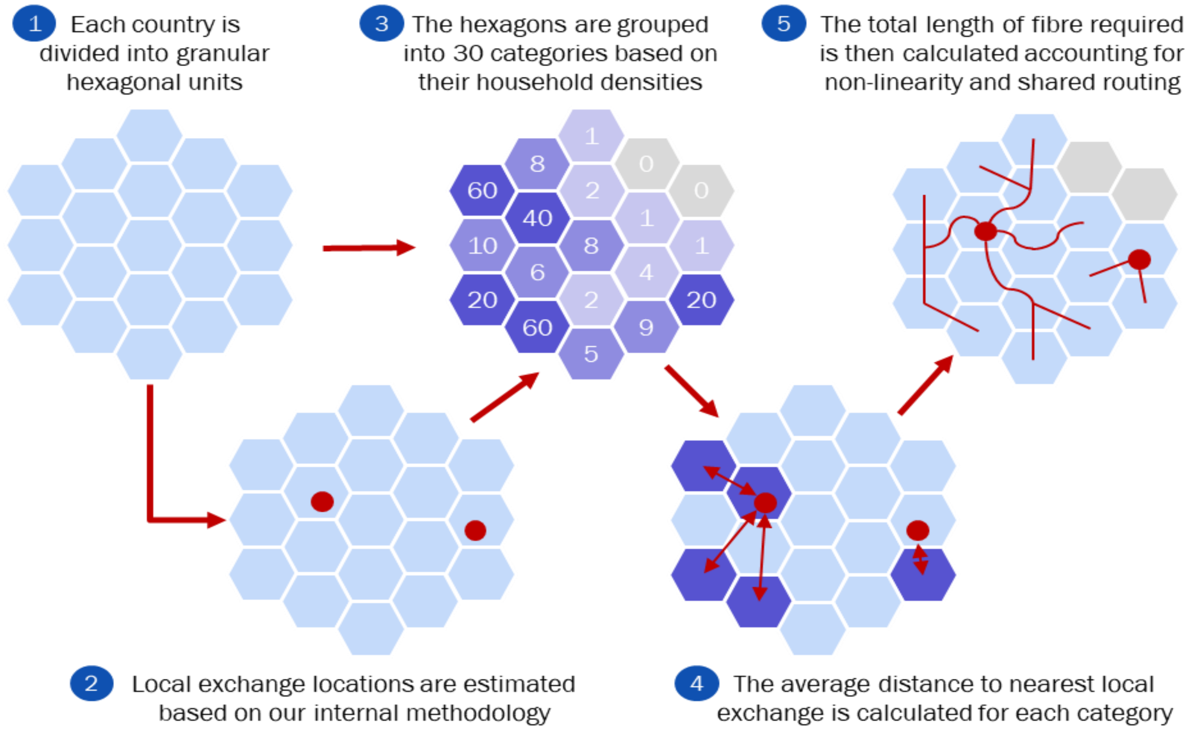
Our geoanalysis methodology is illustrated in Figure D.1 below.

39 10 gigabit-capable passive optical network (XGS PON) is a standard of FTTH technology that enables symmetrical data transfer speeds up to 10 gigabits per second.

40 Such as local exchanges, street cabinets and ducts or poles that were deployed for copper-based networks (e.g. digital subscriber line (DSL), fibre-to-the-cabinet (FTTC) or HFC connectivity technologies) and can be re-used for fibre roll-outs.

41 This methodological approach impacts the findings around potential subsidy savings discussed in Section 5. We assume that existing fibre deployments have been located in easier-to-reach areas, and so this impact is somewhat mitigated.

Figure D.1: Illustrative methodology of FTTH geoanalysis [Source: Analysys Mason, 2025]



Our FTTH cost model first divides each country into granular hexagonal units[42] with an average radius of ~180m. These units are grouped by population density into 30 categories (shown in Figure D.2 below), to compute an average distance to the nearest local exchange.[43]

Figure D.2: Cumulative population categories used in the FTTH cost model [Source: Analysys Mason, 2025]

Category number	Cumulative population bounds	Category number	Cumulative population bounds	Category number	Cumulative population bounds
1	0–10%	11	77–80%	21	94–95%
2	10–20%	12	80–82%	22	95–96%
3	20–30%	13	82–84%	23	96–97%
4	30–40%	14	84–86%	24	97–98%
5	40–50%	15	86–88%	25	98–98.5%
6	50–60%	16	88–90%	26	98.5–99.0%
7	60–65%	17	90–91%	27	99.00–99.25%
8	65–70%	18	91–92%	28	99.25–99.50%
9	70–74%	19	92–93%	29	99.50–99.75%
10	74–77%	20	93–94%	30	99.75–100%

42 Using Uber's H3 grid system at resolution 9 granularity, overlaid with population density data from Meta's Data for Good high-resolution population density maps.

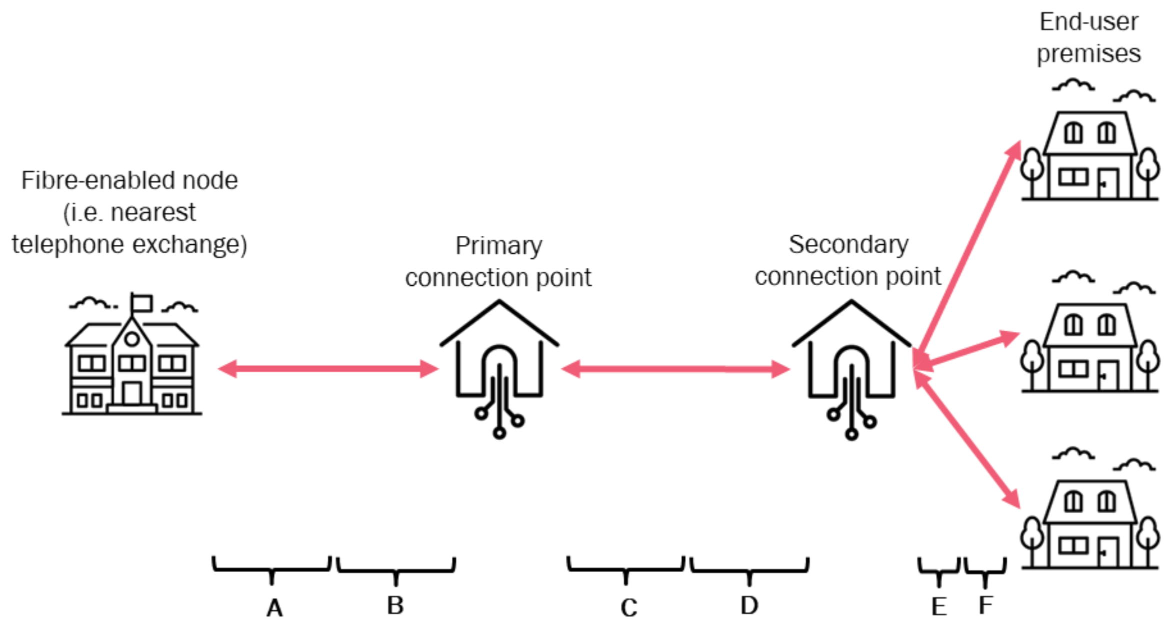
43 Using known local exchange locations or estimated locations where these are not available (based on a detailed clustering algorithm calibrated on countries with known locations, and matched against country-level data on total number of local exchanges).

We convert this average distance into the total length of fibre required, after accounting for:

- non-linearity (as fibre is unlikely to be able to be deployed in a straight line from exchanges to end users, and instead typically follows carriageways)
- shared routing (as much of the length of fibre between exchanges and households is shared, before being spliced at street cabinets or junction boxes).[44]

The total non-linear fibre distance is subdivided into segments as shown in Figure D.3. below. Each of the primary and secondary connection points splices fibre to a number of connection points/premises. The distance between the nodes is split between shared cable/ducting or unique/individual cable/ducting – resulting in six segments of fibre length between the exchange and the end-user premises.

Figure D.3: Illustration of FTTH network from local exchange to end-user premises, divided into nodes and segments [Source: Analysys Mason, 2025]



Segment A above is the shared route of fibre between an exchange and the primary connection point (typically a street cabinet), while segment B is the unique length of fibre for each cabinet. The same logic applies to C (shared fibre between primary and secondary connection points) and D (unique to each secondary connection point). The secondary connection point, typically a junction box, then splits in the same way into a shared route (E) and a 'final drop' (F).

The model accounts for the differences in FTTH deployments between single- and multi-dwelling units (SDUs and MDUs). MDUs replace the final-drop length (i.e. there is no length 'F') with

44 We do not account for additional costs of deploying fibre from local exchanges back to the network core, as each local exchange is assumed to have pre-existing fibre backhaul from copper network deployment (this holds even for decommissioned exchanges, which are typically routed to another active, local exchange).

vertical and horizontal in-building wiring. Our model accounts for the fact that there are typically very few MDUs in rural areas, which is the focus of the deployment areas in this study.

The cost per metre of fibre deployment differs significantly depending on the type of roll-out. Therefore, the total fibre network distance in each network segment is further divided into shares deployed via underground duct[45] or aerial poles, as well as the share of deployment that re-uses existing infrastructure (both ducts and poles). The shares of deployment type and level of re-use have been calibrated based on Analysys Mason's project experience, and expert interviews conducted for the purposes of this project.

We subsequently compute the quantity and cost of equipment and materials that would be required to build an FTTH network that reaches all households in the country in question,[46] assigning unit costs to each item with appropriate country-level variations based on relative labour and materials costs. We model costs for the FTTH network through to 2043, in line with the LEO satellite model, and so consider replacement costs for each item based on estimated component lifetimes, as well as associated opex costs for maintenance, infrastructure re-use charges and backhaul.[47] We apply a consistent discount rate of 10% per annum across both the FTTH and LEO satellite cost models in order to ensure comparability between the two.

45 With separate cost estimates for duct deployed along carriageways, footpaths or grass verges.

46 Including optical line terminals (OLTs), optical distribution frames (ODFs), splitters, length of ducting, poles and CPE.

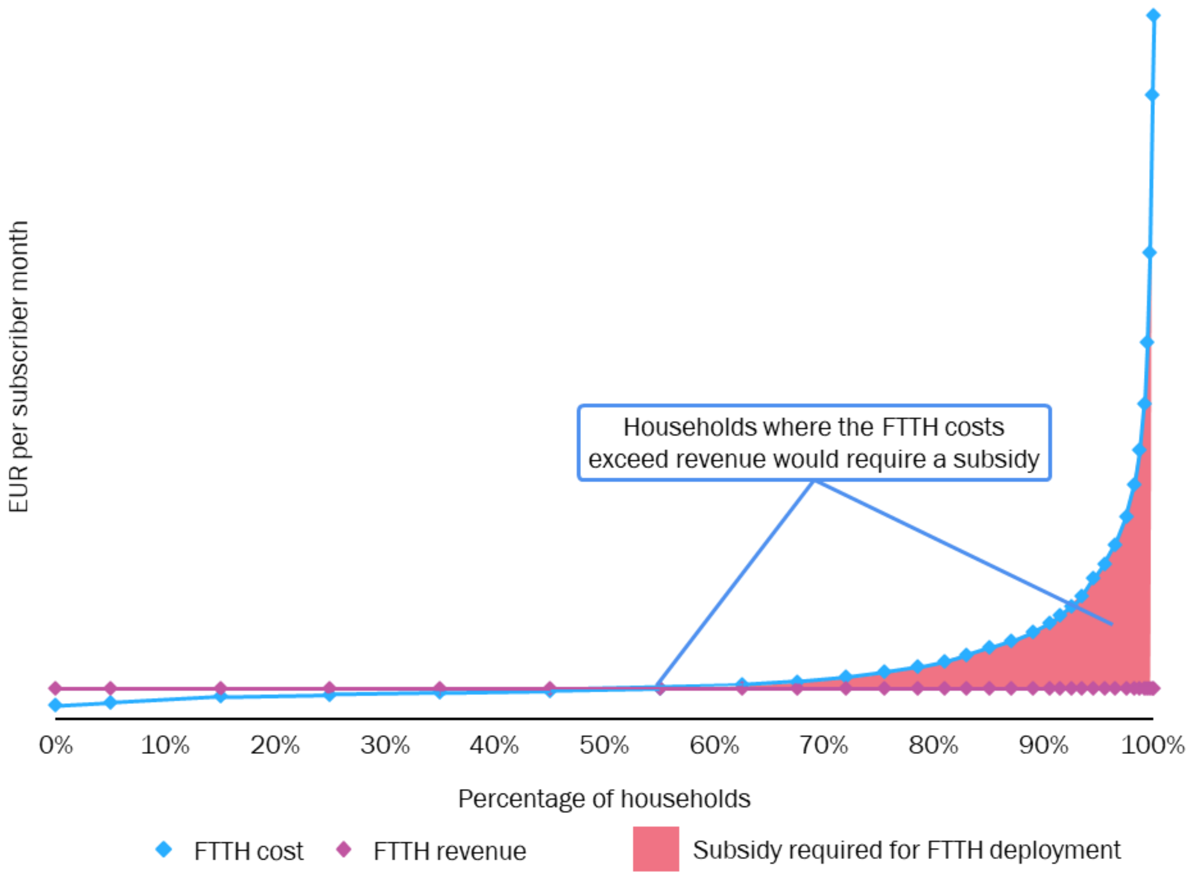
47 The inclusion of some backhaul opex is intended to allow for a fairer comparison to LEO satellite, which will have a smaller number of gateways (and thus lower onward backhaul costs) than there will be local telephone exchanges (where the active FTTH network terminates) per country.

Annex E Approach to estimating fibre subsidy savings

E.1 The subsidy that would be required for full FTTH coverage is calculated based on the implied delta between FTTH wholesale revenue and costs

To calculate the subsidy that would be required for nationwide FTTH roll-out, we use our modelled FTTH cost curve for each country and compare it against the estimated wholesale revenue a network operator could expect to generate per household.[48] Where total costs across the modelled period exceed revenue, there would not be a commercial case for FTTH deployment. Thus a subsidy is expected to be required to compensate for the difference between discounted expected revenue and costs, and to encourage roll-out, as illustrated in Figure E.1.

Figure E.1: FTTH wholesale revenue, cost and implied subsidy [Source: Analysys Mason, 2025]



The red shading in Figure E.1 above illustrates the methodology used to determine the scale of subsidy needed for nationwide deployment. As FTTH costs increase in a non-linear manner, the most rural households require significantly more subsidy per household than less rural households.

48 Take-up is assumed to grow to 95% over time (~12 years), with average revenue per user (ARPU) varying based on national broadband ARPU, median disposable income, total FTTH build cost, and a labour cost factor for each country.

It is for this reason that many countries are not currently expected to reach full nationwide coverage with their FTTH networks, despite the planned subsidy schemes – leading to a risk that some of these areas will be left behind.

Where governments have published information regarding the expected costs of FTTH subsidies in their countries, we have cross-checked these numbers to ensure the broad accuracy of our results and approach. Published figures may not always correlate with our findings for two main reasons:

- governments often do not plan to reach 100% of households with FTTH, even in subsidy programmes
- they may not have public, up-to-date estimates of the required subsidy for 100% roll-out.

E.2 Using LEO satellite broadband in place of FTTH could result in significant subsidy savings per household in the highest-cost areas

The potential subsidy savings from LEO satellite as a complement to FTTH is based on using the available satellite capacity expected from constellations deployed by 2030, to serve the most 'expensive' households (the hardest-to-reach households, requiring the largest subsidy).[49]

Figure E.2 below shows the mechanics of this calculation, with the potential savings implied by our low-bandwidth scenario shaded in blue. The large scale of savings from avoiding FTTH deployment to even a small share of households is well illustrated by this representative example, where savings are worth around half of total subsidy required despite coming from less than 5% of the hardest-to-reach households in the country (with the other 30% of subsidised households having much lower per-household requirements).

49 In practice, LEO satellite operators will likely also serve more urban households – but additionally there is potential to expand satellite capacity beyond currently announced plans, which would increase the number of customers that could be served (and the subsidy saved).

Figure E.2: FTTH wholesale revenue, cost and LEO capacity, with implied subsidy saving [Source: Analysys Mason, 2025]

Annex F Country-level maps of LEO satellite cost-effectiveness relative to FTTH

The following maps indicate the proportion of households within each country analysed that are more cost-effectively served by LEO satellite, in our high-bandwidth and low-bandwidth scenarios. Results are presented through Uber H3 grids at resolution 8-level granularity.

Figure F.1: Czechia, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

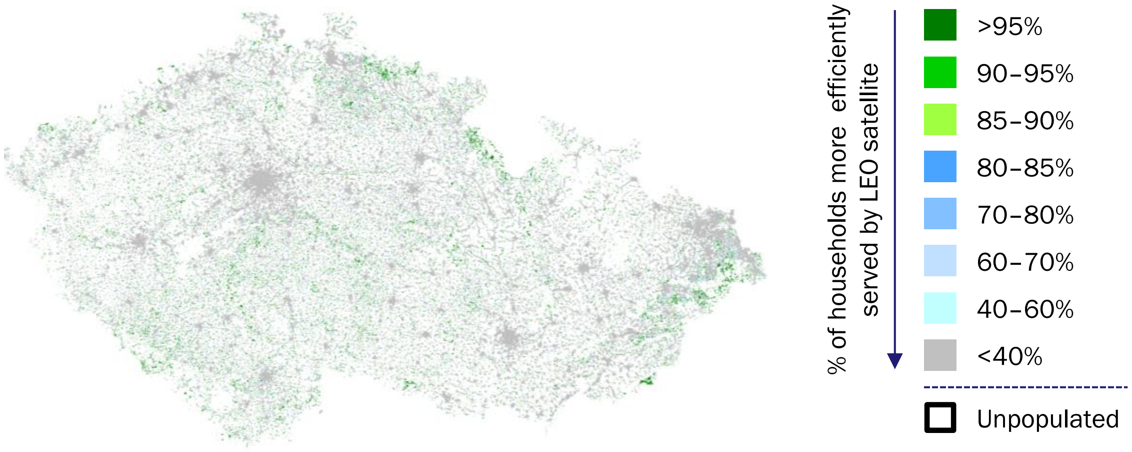


Figure F.2: Czechia, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

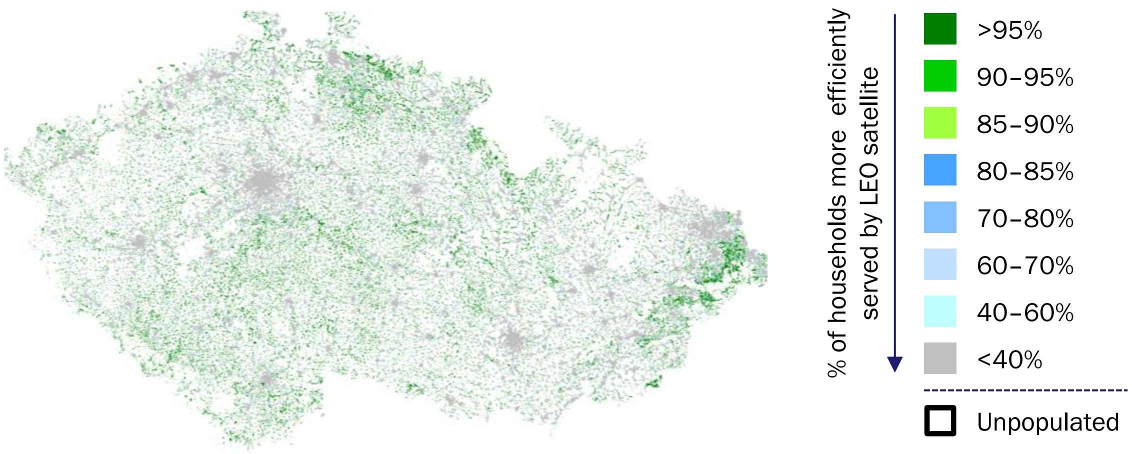


Figure F.3: France, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

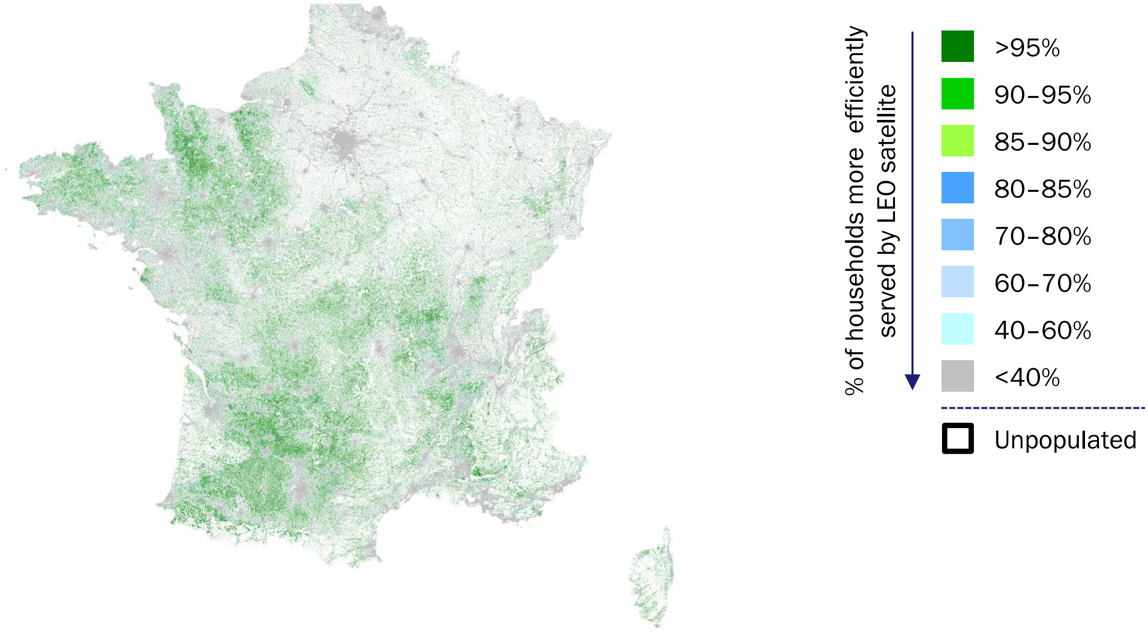


Figure F.4: France, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

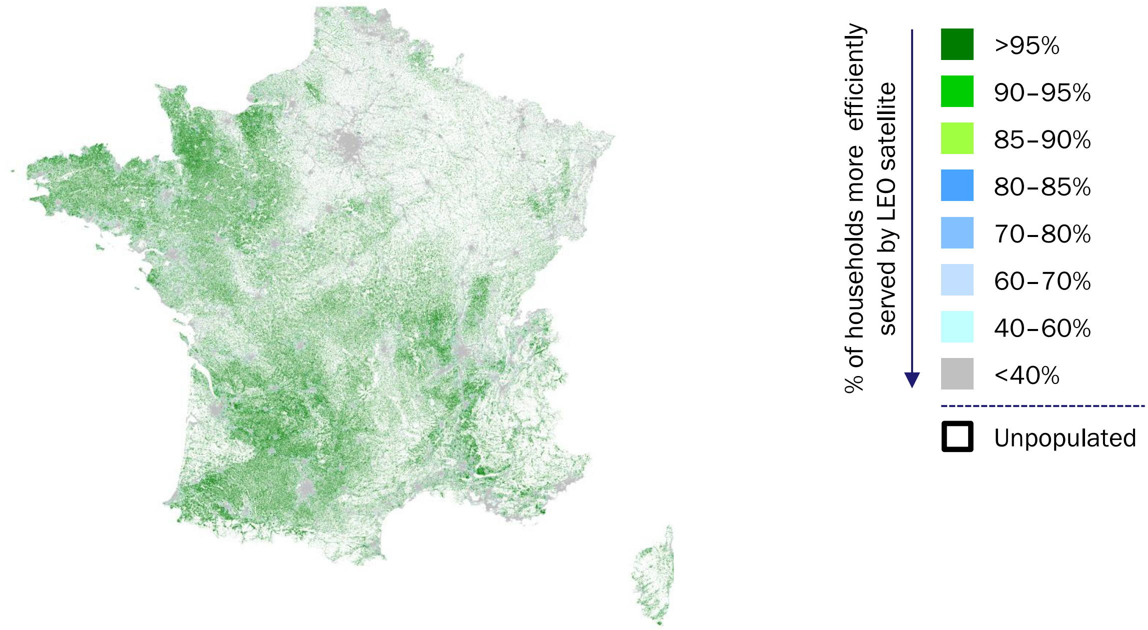


Figure F.5: Germany, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

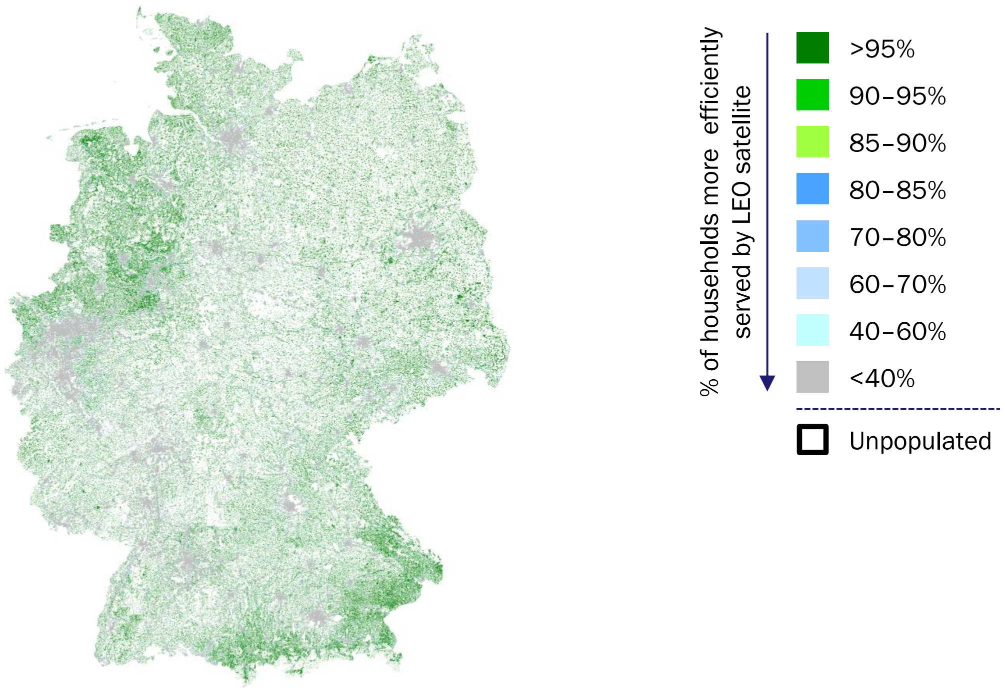


Figure F.6: Germany, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

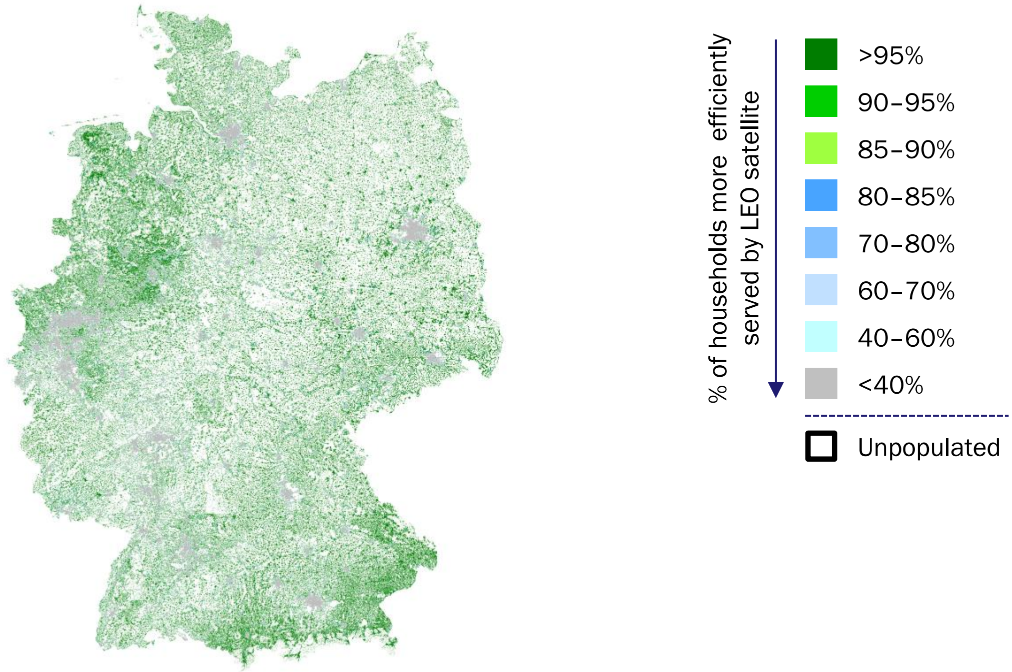


Figure F.7: Greece, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

Figure F.8: Greece, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

Figure F.9: Hungary, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

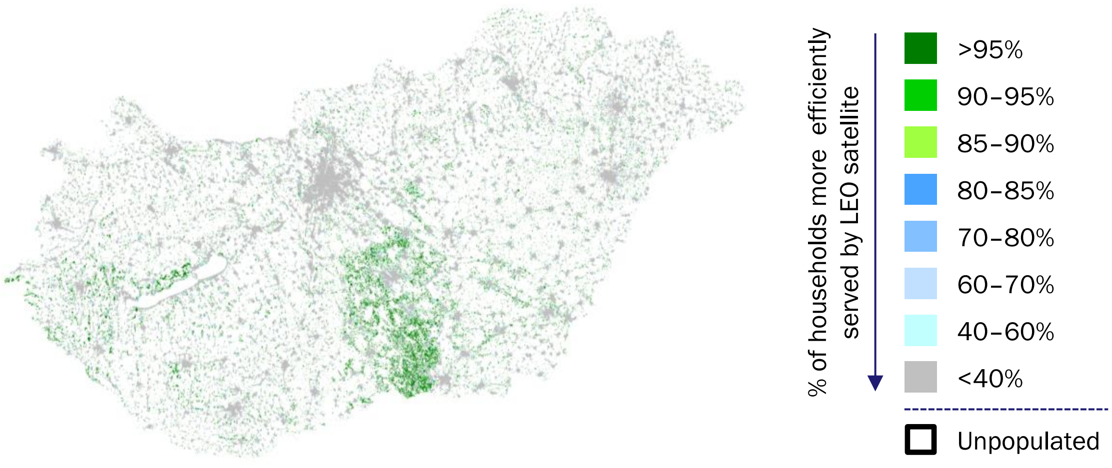


Figure F.10: Hungary, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

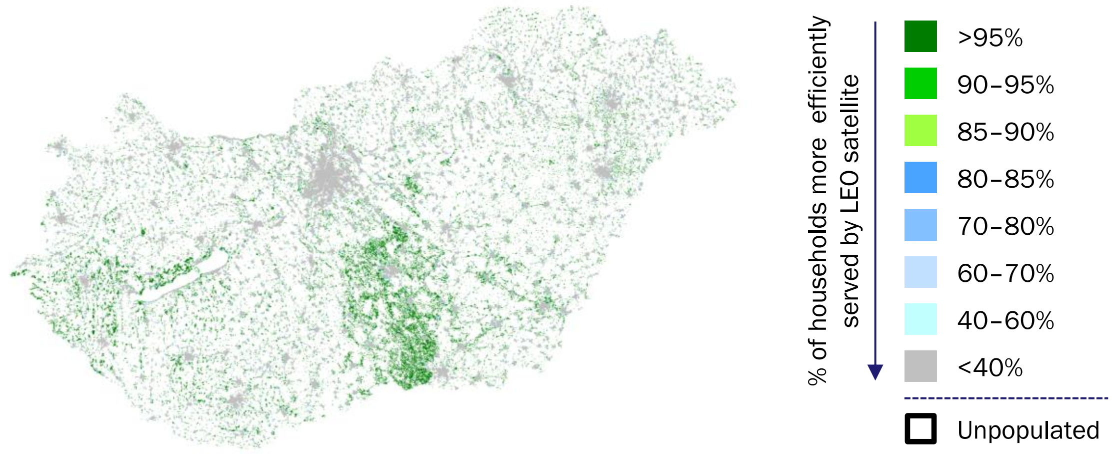


Figure F.11: Italy, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

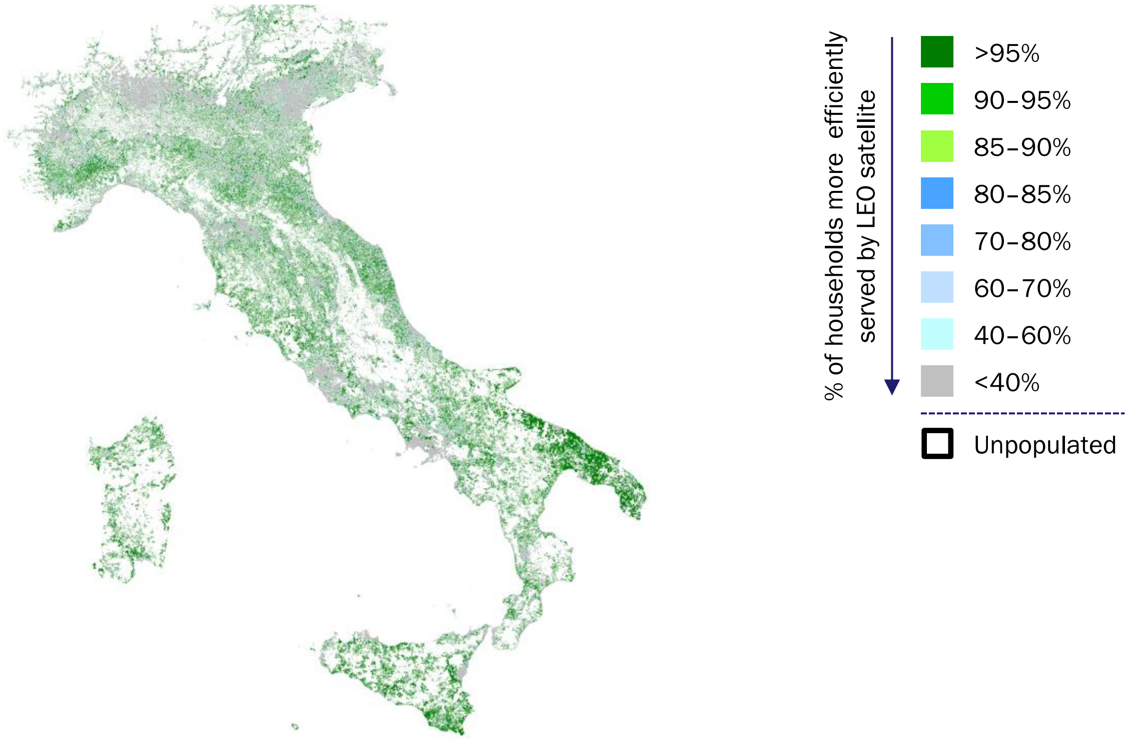


Figure F.12: Italy, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]

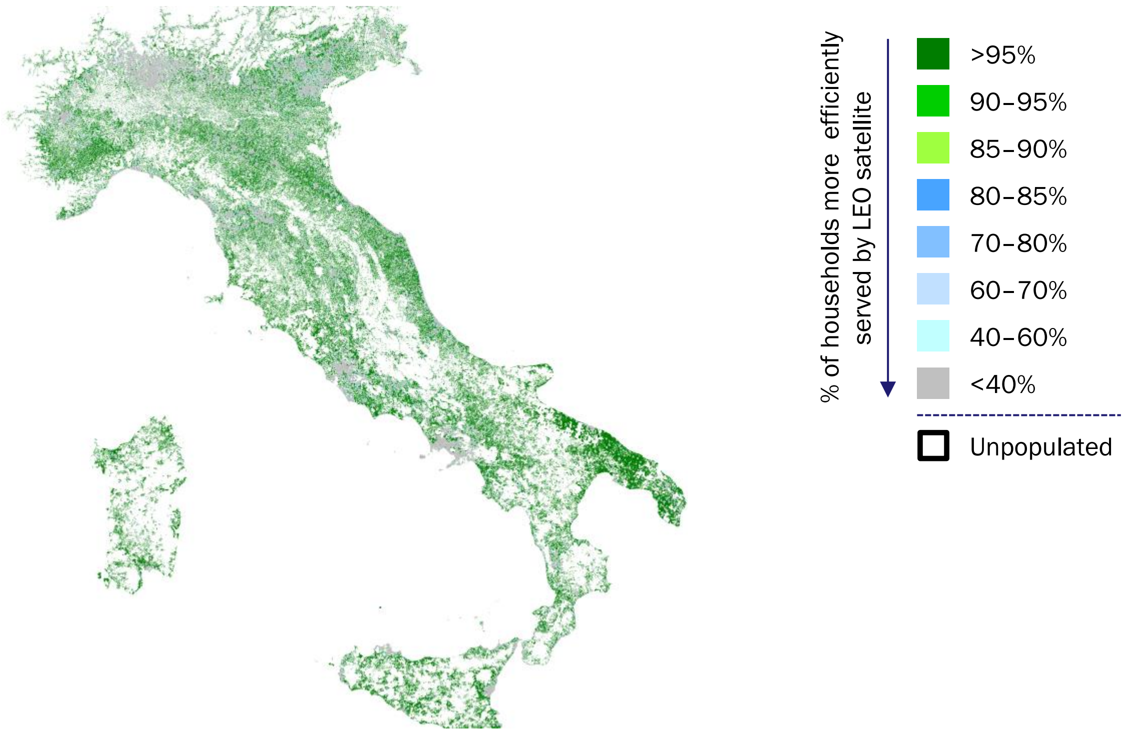
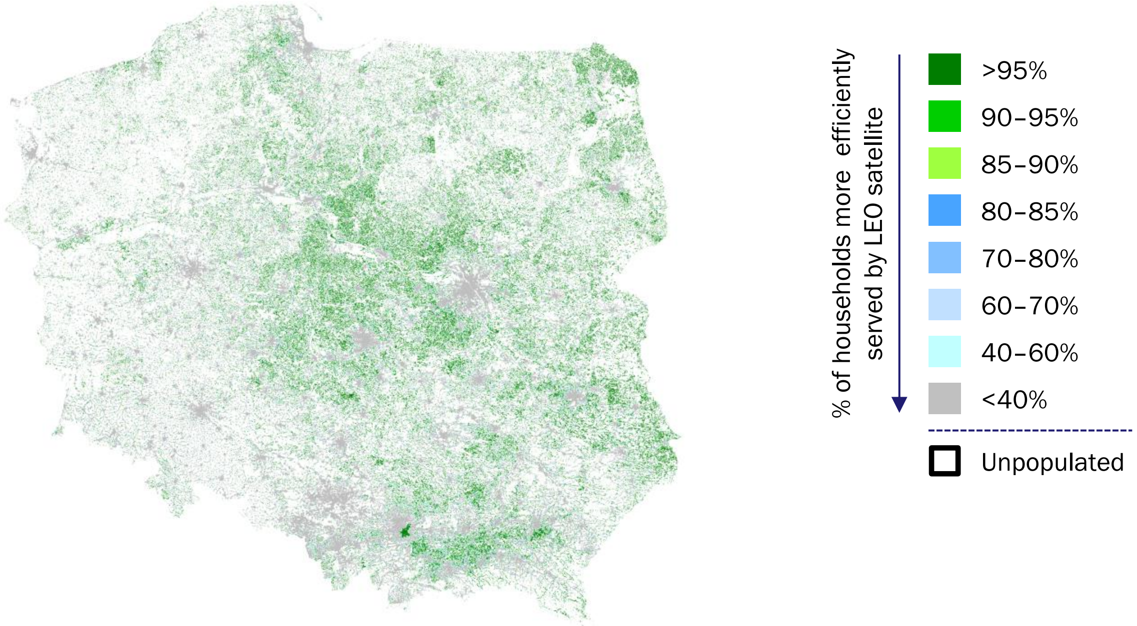


Figure F.13: Poland, by percentage of households more cost-effectively served by LEO satellite, high-bandwidth scenario [Source: Analysys Mason, 2025]

Figure F.14: Poland, by percentage of households more cost-effectively served by LEO satellite, low-bandwidth scenario [Source: Analysys Mason, 2025]



Annex G Relevance of results to other EU-27 countries

This study has focused on granular geographic analysis of seven countries, and has not estimated the total level of potential subsidy savings across the EU offered by the use of LEO satellite as a complement to FTTH. However, we offer some thoughts on the degree to which results can be extrapolated to EU-27 countries.

The countries modelled as part of this study were selected to represent a diverse range of countries across the EU, including larger and smaller countries from both Western and Central/Eastern Europe across varying latitudes. Selection was not made with any conscious bias to reach particular results, nor did Analysys Mason model any other EU countries than the ones presented in this report. Analysys Mason did, however, conduct a cost assessment for the UK as a calibration exercise, in order to validate the accuracy of our geoanalysis and FTTH cost modelling in a country for which we have very robust data.

It is challenging to directly extrapolate the results of our study to other countries in the EU without undertaking a similarly rigorous exercise, due to the number of factors considered within our cost modelling (e.g. geographic density, existing infrastructure available, labour rates, and the amount of satellite capacity available), the extent to which these vary from country to country, and the significant impact each of these had on our results. However, extending the scope of the study to additional EU countries would increase the magnitude of the subsidy savings in absolute terms, and we believe that the overarching findings and relative proportions from our work are likely to apply to other EU countries: even in the countries with the lowest-cost FTTH deployment per household, LEO satellite was cost-effective for more than 5% of households in the high-bandwidth scenario and 10% of households in our low-bandwidth scenario.

The findings of this study therefore carry important lessons for EU countries beyond those selected for detailed modelling, and it is likely that broadly similar levels of proportional subsidy savings could potentially be achieved by using LEO satellite as a complement to FTTH for the most remote areas of other EU-27 countries.