

High levels of FTTH coverage are achievable with bold decisions by policy makers

Despite high upfront costs, taking a long-term view could result in FTTH coverage beyond 90%

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Executive summary

The EU's Digital Decade policy programme targets 'gigabit connectivity for all' by 2030.¹ This gigabit coverage is expected primarily through the use of fibre-based access networks, commonly known as fibre-to-the-home (FTTH) networks.

Despite the increased commercial and governmental focus, significant challenges remain in reaching underserved and remote areas where operators are unlikely to deploy networks due to challenging economics.

At the midpoint of the Digital Decade policy's implementation, gigabit coverage across Europe varies considerably. A number of countries have achieved greater than 90% coverage through commercial deployment supported by government programmes. Others lag behind, with networks largely based on fibre-to-the-cabinet (FTTC) technology requiring significant upgrades. This leads to two questions: how can the ambitious targets of the Digital Decade and other long-term national policies be met across Europe, and how can addressing the challenges of achieving high levels of FTTH coverage help meet said targets?

Governments can provide support in the form of subsidy funding, enabling network coverage to be extended beyond the threshold of normal commercial viability where deployment costs outweigh the return on investment. However, governments must make nuanced decisions when developing such support schemes, balancing the trade-offs between the subsidy funding required (cost to the 'public purse'), the specification of solutions (i.e. quality) and the coverage achievable (and the time it takes to implement it).

There are a large range of factors that need to be considered to determine how best to develop support schemes, including:

- technology options available and their different technical characteristics, technology roadmaps and maturity of solutions, and deployment timescales
- local market conditions, including market structure, levels of competition, the regulatory environment, supply chain capacity, and barriers to deployment.

While FTTH often remains the preferred technology for its combination of performance and futureproofing over the long term, as demonstrated by support schemes in markets such as Ireland, balanced use of alternative technologies or hybrid solutions may be necessary for the costliest or hardest-to-reach premises in the short term, as is being considered in Sweden and the UK.

Whilst all EU Member States have plans to reach 'gigabit for all', these plans are at differing stages; with most developing or implementing broadband support schemes, there are still opportunities to refine and improve such schemes. Careful planning of support schemes can potentially help make national gigabit coverage an achievable target, and this can include high levels of FTTH coverage, which is the most futureproofed digital infrastructure (despite it often having the highest upfront cost).

Scheme requirements are not uniform, and there is no simple blueprint because of the highly varied nature of key factors by country (some of which are outlined above). There is also the type and topography of underserved and 'final percentage' premises to consider. However, Analysys Mason believes there are a number of actions that should be considered when designing any new scheme.

¹ <https://digital-strategy.ec.europa.eu/en/policies/broadband-support>

These include:

1. Undertaking careful review of targets, demand, timescales and affected premises
2. Estimating potential scheme costs and subsidy funding requirements
3. Considering the need to bolster regulatory mechanisms that could support network deployments.
4. Engaging extensively with stakeholders as input to scheme design
5. Making clear decisions that balance the trade-offs between quality (specification of requirements), time (the extent of coverage of the chosen specification) and costs (the quantum of subsidy funding required)
6. Undertaking internal planning for the scheme delivery stages
7. Developing a comprehensive resourcing plan to enable robust monitoring of deployment and operations.

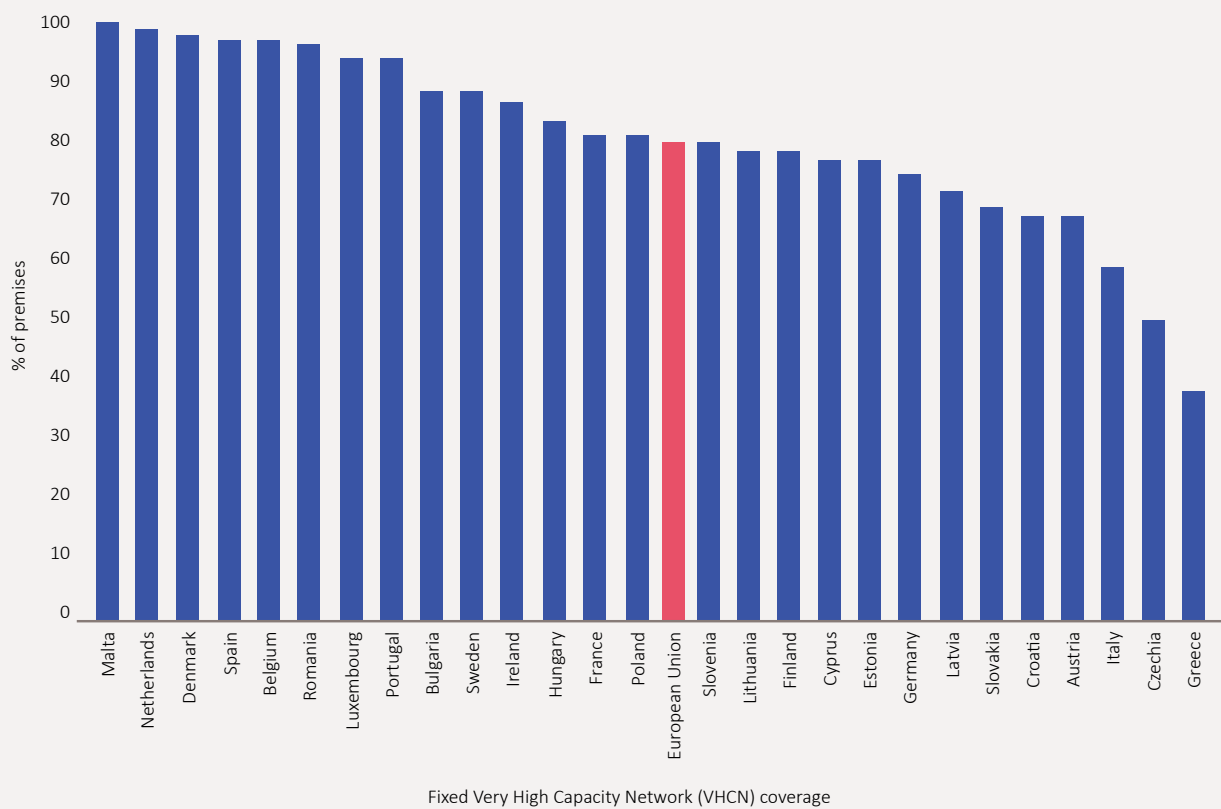
Achieving 'gigabit connectivity for all', with high levels of FTTH coverage, could be feasible for many countries, but requires clear ambition and a long-term view from governments with a robust approach to scheme design that takes account of local market conditions. Addressing this challenge as soon as possible will give the best chance of such schemes bridging the digital divide, supporting true digital equity and ensuring a connected future for all European citizens.



Gigabit connectivity coverage in Europe is mixed and more government action is needed to meet Digital Decade targets

Across Europe, governments and operators are focused on expanding gigabit-capable connectivity, largely through the deployment of fibre-to-the-home (FTTH) networks. These are sometimes referred to as fibre-to-the-premises (FTTP) networks. This aligns with the EU's Digital Decade policy programme's digital infrastructure target of reaching 100% of households with gigabit-capable technology by 2030.² However, gigabit coverage across Europe is mixed, as Figure 1 shows. Even where European Commission (EC) member states are close to the Digital Decade policy programme's 100% coverage target, networks take significant time to deploy, especially in challenging terrain or remote communities.

Figure 1: Gigabit coverage in European Union member states; mid 2023 [Source: European Commission, 2024]



² Europe's Digital Decade - <https://digital-strategy.ec.europa.eu/en/policies/europes-digital-decade>



The 100% gigabit target coverage will likely be met with a combination of both commercial deployment and support from government broadband schemes in areas where high deployment costs mean the investment case is challenging. High levels of gigabit coverage are, however, achievable, as shown in Figure 1, although it is important to note there are multiple routes to get there. Countries such as France, Ireland and Spain already have high levels of gigabit coverage, despite different geographies and market structures.

In France, the government embarked on a major programme to deploy networks in a scheme called Public Initiative Networks. Networks have been deployed on a **regional** basis using private and public funding, and the scheme has helped bring significant new private investment to the market (from operators such as Orange, SFR and Axione). In contrast, the Irish National Broadband Plan (NBP) is a **national** scheme that aims to support a policy of 100% FTTH coverage, with plans to deploy fibre to over 560 000 households and businesses. Here, the scheme is being delivered by one entity, National Broadband Ireland (NBI). This scheme is a major undertaking as Ireland is one of the most rural countries in Europe. In Spain, the population density and significant number of premises in multi-dwelling units have led to high levels of commercial deployment. Announced in July 2020, the Digital Spain agenda was supported by EUR20 billion in public money from both EU programmes and the Spanish government to ensure improved rural connectivity and whole-population access to 100Mbit/s by 2025 (as well as other digital priorities).³

As shown in Figure 1, by mid 2023, most countries were facing challenges in reaching rural areas (i.e. the last 10–20% of premises) due to the higher implementation costs involved. The majority of EU countries are attempting to address these challenges through national broadband plans to support gigabit deployment where it is not commercially viable for operators. These plans differ in approach and are at varying points across EU countries, with some plans further along the road than others.⁴ Despite these existing plans, challenges remain to achieve the Digital Decade targets.

Now we are at the midpoint of the ‘Digital Decade’, it seems clear that significant effort is required by all stakeholders to ensure ‘gigabit connectivity for all’ is achieved. Reaching these underserved and geographically difficult-to-connect premises is a major challenge and understanding potential solutions is critical. This starts with understanding the core challenges faced by operators and governments alike. In this perspective, Analysys Mason outlines the common challenges faced by operators and governments and sets out a series of key considerations for future support schemes to achieve their gigabit coverage targets.

³ La Moncloa. 23/07/2020. Pedro Sánchez presents Digital Spain 2025 Agenda to mobilise public and private investment of 70 billion euros in 2020-2022 [News]

⁴ ‘Updated study on National Broadband Plans in the EU27 - <https://digital-strategy.ec.europa.eu/en/library/updated-study-national-broadband-plans-eu27>

To guide support schemes, governments should look to understand local market conditions and operator deployment challenges

Network operators focus on infrastructure deployment where return on investment (RoI) meets a minimum threshold. The most critical factor influencing where FTTH operators deploy is the cost. However, each operator has different strategies and is affected by both supply- and demand-side factors that guide which premises are targeted and what levels of penetration (take-up) can be expected. These factors vary between countries depending on local market conditions (notably market structure and the nature of competition) and the regulatory environment.

Some of these key factors are outlined below:

- Regulatory obligations (such as passive infrastructure access) have been introduced in some countries to encourage the sharing and re-use of existing infrastructure, which helps reduce the cost of deployment. However, in rural areas, it is not uncommon for such infrastructure to be in need of repair or significant upgrades
- Operators express concerns about the barriers to network deployment caused by various bureaucratic processes and direct costs charged by municipalities for accessing public land and road infrastructure. These processes are often significantly different even within a single country, meaning that there are very locally specific issues for operators to deal with that can lead to inefficiencies and increased costs
- Demand density – which also relates to premises density in target areas – impacts the scalability of costs
- The topography and geographic terrain, which again strongly impacts costs
- The existence of competition and legacy services (e.g. legacy copper networks yet to be switched off).

These considerations drive operator strategies when deploying FTTH networks in a given country. They also determine where operators target their commercial deployments, typically where the RoI is acceptable.

However, for rural areas, premises density is lower and the terrain is often more challenging, meaning the economics of FTTH networks become strained. In these situations, government support schemes may be considered if FTTH coverage is to be expanded into rural areas and beyond 90%.

Figure 2 is an illustrative chart relevant for most countries, showing how FTTH deployment costs increase as the network moves further into rural areas, and how government funding constraints potentially limit the extent of FTTH coverage. The limits of 'rural' and 'hard-to-reach' premises can be drastically different across markets.

Figure 2: Illustration of how government funding constraints might limit FTTH coverage [Source: Analysys Mason, 2025]

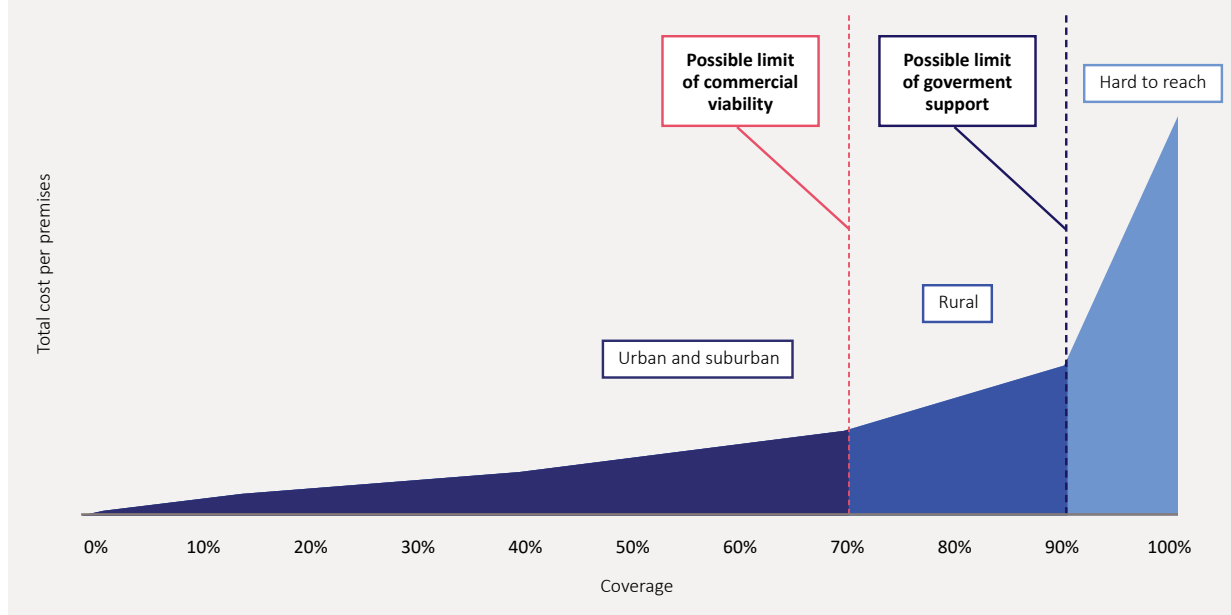
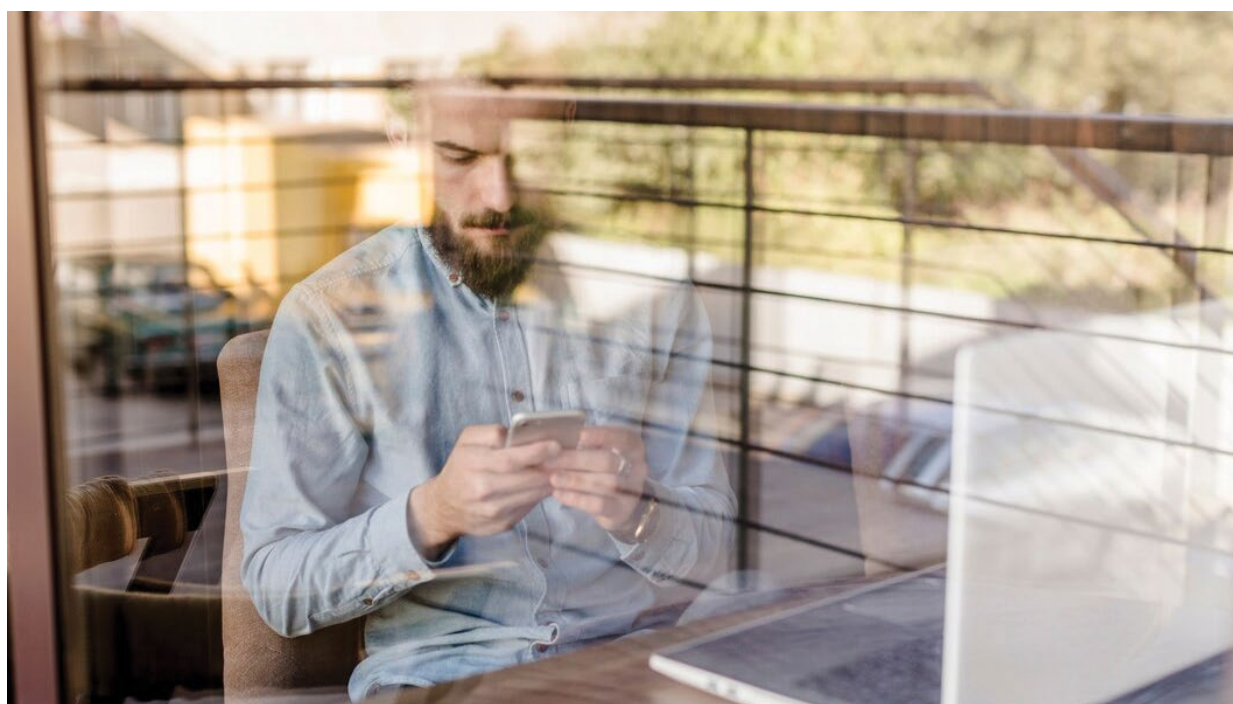


Figure 2 shows that, at any given point in time, coverage for commercial builds will only reach so far. While government support schemes can help extend coverage, funding constraints may limit subsidies, throttling funding availability to cover hard-to-reach premises. If this is the case, then governments could consider alternative technologies (such as fixed-wireless access (FWA) or Low-Earth Orbit (LEO) satellite) or make deliberate plans to defer these areas and revisit at a later date. However, such deferrals carry additional challenges, including political (some premises still with low-quality copper-based connectivity) and attractiveness to the private sector, since the scale economies of a scheme focused solely on hard-to-reach premises may be limited.



Governments have to consider many factors and trade-offs to develop support schemes

There are many reasons why European countries are at very different stages of their lifecycle in terms of gigabit coverage. In order to reach the Digital Decade policy programme's targets by 2030, direct public funding seems essential. We focus here on the policy challenges of designing and managing government support schemes, including how governments can use public funding wisely while complying with market regulations and competition rules. This includes those listed in the EC's guidelines on State aid for broadband networks.⁵

In simple terms, there are three key dimensions to any support scheme – specification, coverage and cost – and governments need to understand the related trade-offs before embarking on any detailed scheme design. For example, it may be necessary to lower coverage targets or accept less stringent technical specifications if government funding is limited. Below, we examine these decision factors and potential solutions in more detail using Analysys Mason's experience and observations of best practice.

Choices surrounding scheme specifications could impact the quality of the long-term solution

There are now several technologies that could provide gigabit connectivity, each with differing technical capabilities, deployment requirements and cost dynamics. Governments need to understand these technology options so that the scheme specification/requirements will be able to satisfy support scheme objectives (in terms of performance, timing of deployment, etc.). However, in most government support schemes, following best practice, the actual technology selection would be made by operators and/or suppliers; this complies with the technology neutral principle in the broadband State-aid guidelines.

Typical technical characteristics include service performance requirements (e.g. download/upload speeds in busy-hour and non-busy-hour scenarios), and an associated service-level regime including network performance KPIs⁶ and service delivery obligations (e.g. maximum time to fulfil a customer order).

Crucially, the specification ultimately influences the technology choice, the design of the network solution, and the solution quality (which may change over time). Increasingly, environmental and sustainability concerns for each technology must also be considered (such as the effective lifetime of different technologies), in line with the Digital Decade policy programme as well as wider European green goals (e.g. The European Green Deal).

⁵ <https://eur-lex.europa.eu/EN/legal-content/summary/guidelines-on-state-aid-for-broadband-networks.html?fromSummary=08>

⁶ Key performance indicators

Limited government subsidies will often need to be boosted by private-sector investment

The nature of government funding means that subsidy availability will be a limiting factor for all support schemes – and there will always be competing governmental priorities, like health and education, for those limited funds. Therefore, governments must consider how to make the most of available resources to achieve policy goals in the best way possible.

Analysys Mason believes it is essential that governments work with operators and leverage subsidies to encourage the maximum possible private-sector investment. By designing schemes in consultation with the market, governments can attract operators and their investors to compete for subsidies which can in effect bolster private capital. This means the choice of business model is a critical success factor. Public–private partnerships can be constructed in various formats, including joint ventures, special purpose vehicles, and gap funding. These partnerships not only help deliver the policy objectives, but can also open up new revenue creation opportunities for operators and local economies.

The key to success will be listening to what is attractive to operators and understanding which business models can achieve the best outcomes, whilst designing protections and managing risks to ensure the best value for the ‘public purse’.

Balancing the trade-off between cost, coverage and specification will be different for each support scheme

For premises in rural areas, the cost to cover and connect premises can be very high, resulting in countries with very high FTTH coverage (usually above 95%) potentially electing to forgo the last few percentage points of their premises targets. Due to these costs, governments may choose to avoid FTTH and rely on alternative, lower-cost technologies to expand coverage in these high-cost rural areas.

Some governments, such as Sweden, have suggested the use of alternative non-FTTH technologies – such as FWA and satellite – to provide high-speed broadband to premises in these areas at reasonable cost.⁷ Here, the Swedish government is making a trade-off with a different specification of service to reach higher levels of coverage for a given funding limit.

For governments that want to maintain their long-term ambition to provide 100% gigabit-capable coverage to deliver national digital equality, there are potential ways forward. For example, one approach could be to target all non-commercially profitable premises in one go as part of a large-scale (effectively national) support scheme. The Irish NBP is one example of such a scheme, where all rural premises in Ireland were designated as being in scope. The scheme took a long-term view of support and investment, which led to a market-driven solution of 100% FTTH, although this may not be suitable for all markets.

With a single process like the Irish NBP, the average total cost per premises is reduced and the benefits of economies of scale and delivery efficiencies in the supply chain are more likely to be recognised. Furthermore, it may become challenging to justify a separate, second phase if the coverage of the last 1–2% of premises was deferred to a later phase, given these would be the highest-cost premises left. A cost–benefit analysis of the last few percentage points of coverage may also be difficult to justify for subsidy investment at a later stage.

⁷ For example, satellite broadband offering >100Mbit/s has been suggested as an intermediate target for the final 0.1% of premises to guarantee the country's short-term 2025 target

Careful planning of support schemes can help towards achieving high levels of FTTH coverage

As explored in this perspective, the road to 100% gigabit-capable coverage is achievable, but is not straightforward, and it needs strategic planning to accomplish. The same can be said of pushing for high levels of FTTH coverage, which is likely to be essential for futureproofing digital infrastructure. Several European markets have demonstrated that this goal is within reach, provided there is a clear ambition and a long-term view from governments, with a tailored scheme that takes account of local market conditions.

Engaging with market players is key to understanding local market conditions

Government policy makers can only set practical targets by understanding the market environment and technological options fully, and working with stakeholders, including operators and investors, as well as other government departments that can help reduce barriers to deployment. This collaboration helps governments stay up to date with local market conditions, such as keeping track of commercial build progress, understanding the barriers impacting network roll-out in underserved areas, and testing market interest.

Setting policy targets will need to be balanced alongside realistic scheme requirement

In order to set long-term coverage targets (and intermediate ones, if applicable) in a national scheme, governments need to define clear technical and commercial requirements. These should be as fully detailed as possible, ideally close to being 'procurement ready'. This should include key contract management principles; robust contractual guidelines are considered best practice to ensure targets are maintained and met. This level of detail will make it easier for governments to plan future management of the scheme and for operators to understand the requirements needed to determine the best solutions. Full details of the proposed scheme (e.g. policy targets, scheme requirements, delivery strategy, business model) should be published in a formal consultation for all stakeholders to provide comments and get buy-in to support the scheme. Stakeholder comments can be addressed in the preparation of a final scheme strategy before delivery.

Developing robust monitoring programmes will help ensure benefits are realised

Governments will need to develop substantive monitoring programmes that not only cover the network build process but also network and customer service operations over the long term. For example, ensuring that the network is performing to the standards defined will, in turn, drive a higher likelihood of end-user take-up and therefore achievement of the socio-economic benefits growth that arises.

Based on the broadband State-aid guidelines, public subsidy programmes (i.e. support schemes) must be monitored for at least seven years – and policy makers should clarify how this monitoring process will work before the programme starts. This includes defining network performance KPIs and setting regular checkpoints through periodic reporting. Proactive and reactive remedies should be in place if the network build or performance fail to meet the KPI targets.

There are multiple considerations that can be proposed to help policy makers meet their broadband goals

In light of the considerations previously outlined, how can governments properly shape their support schemes to meet their broadband policy goals, such as Digital Decade targets and other, longer-term targets? Scheme requirements are not uniform and there is no simple blueprint, because of factors such as local market conditions, the type and topography of underserved and ‘final percentage’ premises, and the other nuanced issues we have examined in this perspective.

The actions below offer a solid working structure applicable for a range of situations that countries may face, and should be considered when designing any new scheme. Analysys Mason believes following these core tenets will help ensure national policy targets are met in the most effective and cost-efficient manner, with healthy collaboration between commercial operators and government. We recommend governments:

1. Undertake careful review of targets, timescales and affected premises
2. Estimate potential scheme costs and subsidy funding requirements, with careful consideration of market plans
3. Consider the need to bolster regulatory mechanisms that could support network deployments
4. Engage extensively with stakeholders as input to scheme design around key issues such as resilience, specifications, technologies, coverage, business models and funding
5. Make clear decisions that balance the trade-offs between quality (specification of requirements), time (the extent of coverage of the chosen specification) and costs (the quantum of subsidy funding required); this will need iterative refinement to reach an optimum balance
6. Undertake internal planning for the scheme delivery stages, including procurement, contract management, contingency planning and risk-mitigation strategies
7. Develop a comprehensive resourcing plan at the contract management stage, to enable robust monitoring of deployment and operations. This ensures the quality of the build and adherence to the KPI regime over the lifetime of the contract.

The proposed actions support schemes in meeting ‘gigabit connectivity for all’ targets, but could also be feasible for countries to achieve high levels of FTTH coverage. There are examples, such as Ireland, that show that policy makers allocating significant public funding to subsidise underserved areas can achieve high FTTH coverage if local market conditions allow. The trade-offs between coverage, specification and cost are not straightforward, and ultimately policy makers will need to find the right balance in driving high coverage of FTTH alongside alternative technologies where time and cost factors need to be considered. Developing support schemes takes time, so policy makers should consider taking action as soon as possible to ensure such schemes can help bridge the digital divide, support true digital equity, and create a connected future for all European citizens.

Our insights from three European countries

Analysys Mason has advised governments, operators and investors on national broadband plans globally over many years, to formulate policies, design schemes, prepare delivery strategies, develop specifications, and to support bids for subsidy funding; this experience offers key insights and guidance on how operators and governments can navigate challenges in reaching very-rural locations.

Ireland

Ireland's government set the target of provision of 1GB broadband to 100% of homes by 2028. This will be achieved through both commercial roll-out and a state supported scheme (the National Broadband Plan) which will provide services to rural areas. The NBP is delivering 100% high speed broadband coverage of rural premises in Ireland. Rural Ireland is sparsely populated, with 23% of homes dispersed over 95% of the landmass.

The scheme involves providing connectivity to the most rural and difficult-to-serve Irish premises, including those on isolated islands with harsh terrain and weather – some of the most challenging locations in which to deploy FTTH solutions. Analysys Mason has seen first-hand how these harsh conditions have been overcome as National Broadband Ireland (NBI), the supplier to the NBP, has successfully deployed innovative FTTH solutions.

For example, overground armoured ducts have been deployed in place of underground ducts due to the islands' impenetrable granite rock surfaces. Microwave backhaul links have also been used to connect to the mainland where fibre could not be deployed overhead or undersea without excessive costs. As these examples show, even where FTTH is the preferred technology choice, innovative deployment methods have helped to overcome harsh conditions and topographical challenges.



France

In France, the government designated a regional-based subsidy framework called Public Initiative Networks or PINs, which are managed by the local authorities. Approximately 70 PIN contracts have been signed to date with a variety of infrastructure operators (including Orange Concessions, Altitude Infra, XpFibre and Axione) with FTTH the exclusive technology choice of all contracts. Each area will only have one network, and is obligated to provide all operators access on a non-discriminatory basis at regulated pricing, including a co-investment option.

Analysys Mason supported infrastructure investments for these initiatives at different stages of their development, as well as the financing of co-investment by leading ISPs. As of Q3 2024, over 15 million lines had been deployed of the committed ~16.8 million lines. This will help to take France's FTTH coverage to 98–99% in the coming years. The approach for the final 1–2% is likely to use a mixture of different technologies (FTTH, FWA or satellite).



The UK

The UK's large-scale national broadband plan – Project Gigabit – targets rural areas at a regional level, with multiple different contracts. In November 2024, it was announced that the UK had reached its 2025 target of 85% gigabit-capable coverage ahead of schedule,⁸ with the next target extending to 100% by 2030. The scheme has encouraged significant private investment from a multitude of different alternative network operators. The bid solutions have demonstrated that up to (and sometimes beyond) 95% regional coverage is achievable for the fixed subsidy amount available, with all current solutions using FTTH. However, the UK government has previously noted that 0.3% of premises (or ~100 000 premises) are “prohibitively expensive to reach”, and are exploring innovative and wider technology solutions to reach them and potentially more premises.⁹



⁸ Project Gigabit progress update – November 2024- GOV.UK

⁹ Satellite communications to improve connectivity in remote areas- <https://www.gov.uk/government/news/satellite-communications-to-improve-connectivity-in-remote-areas>

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