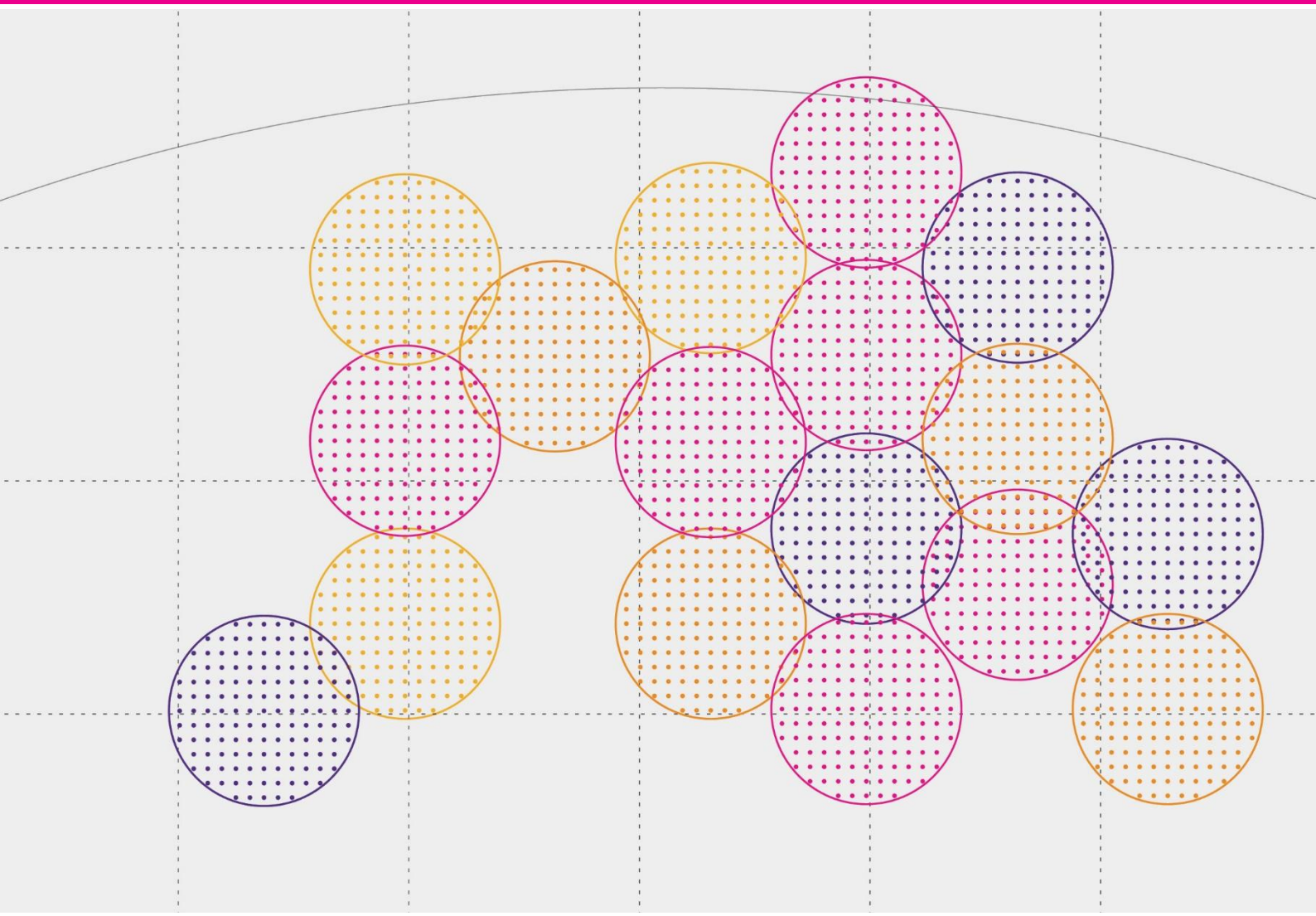
Stock-take of the French symmetrical regulatory model for FTTH

October 2025

Benoit Felten, Vincent Roger-Machart, Tony Shortall



About Plum

Plum offers strategy, policy and regulatory advice on telecoms, spectrum, online and audio-visual media issues. We draw on economics and engineering, our knowledge of the sector and our clients' understanding and perspective to shape and respond to convergence.

About this study

This study for Arcep looks back on the French FTTH regulatory framework and aims at assessing its impact on the development of the French very high speed capacity network market, and the potential impacts of changes in its regulatory framework.

Plum Consulting
8 Blackstock Mews
London N4 2BT

T +44 20 7047 1919
E info@plumconsulting.co.uk

Contents

© 2025 Plum Consulting

Figures

© 2025 Plum Consulting

Abbreviations

Abbreviation	French	English
AMEL	Appel à Manifestation d'Engagements Locaux	Call for expression of local deployment commitment
AMII	Appel à Manifestation d'Intention d'Investissement	Call for expression of interest to invest
Arcep	Autorité de régulation des communications électroniques, des postes et de la distribution de la presse	
BCRD		Broadband Cost Reduction Directive
CATV		Cable Television
CPCE	Code des Postes et des Communications Électroniques	Postal and Electronic Communications' Code
FTTH		Fibre to the Home
FTTP		Fibre to the Premise
GC-BLO	Génie Civil - Boucles et Liaisons Optiques	Civil Work - Optical Loop and Links
GIA		Gigabit Infrastructure Act
GPON, XGS-PON		Various flavours of technologies on Passive Optical Networks
IPE	Informations Préalables Enrichies	Enriched Prior Information
IRU		Indefeasible Right of Use
MDU		Multi-Dwelling Unit
NDCM		Non-Discrimination & Costing Methodology
NEBA	*Nuevo servicio Ethernet de Banda Ancha*	
NGA		Next Generation Access
NRA		National Regulatory Authority
NRA	Nœud de Raccordement d'Abonnés	Central Office for copper
NRO	Nœud de Raccordement Optique	Central Office for fibre
OC	Opérateur Commercial	Commercial Operator (retail fixed network operator) or Internet Service Provider (ISP)
ODP		Optical Distribution Point (see PBO)
OI	Opérateur d'Infrastructure	Wholesale fixed network operator
OLT		Optical Line Termination
ONT		Optical Network Termination
OTO		Optical Termination Outlet (see PTO)
OWF	Orange Wholesale France	
PBO	Point de Branchement Optique (see ODP)	Fibre Distribution Point

© 2025 Plum Consulting

Abbreviation	French	English
Plan France THD	Plan France Très Haut Débit	
PIA		Physical infrastructure Access
PON		Passive Optical Network
PM	Point de Mutualisation	Concentration Point
PPP	Partenariat Public-Privé	Public-Private Partnership
PRDM	Point de Raccordement Distant Mutualisé	Shared Remote Concentration Point
PTO	Point de Terminaison Optique (see OTO)	Optical Termination Outlet
QoS		Quality of Service
RIP	Réseau d'Initiative Publique	Public Initiative Network
SLA		Service Level Agreement
SMP		Significant Market Power
SPV		Special Purpose Vehicle
STOC	Sous-Traitance Opérateur Commercial	
THD	Très Haut Débit	Very Fast Broadband (> 30 Mbps)
VHCN		Very High Capacity Networks
VULA		Virtual Unbundled Local Access
ZMD	Zone Moins Dense	Less Dense Area
ZTD	Zone Très Dense	Very Dense Area

In this document, we have chosen to use the French terminology whenever there was a risk of ambiguity in using a close but slightly different English equivalent.

Also note that for ease of readability, regarding the names and brands of the main four leading operators in the French market, we have decided to unify company names under broad denominations. Thus, the four following names cover the following:

- Orange group includes both the infrastructure operator and the commercial operator as well as the alternative commercial brand Sosh;
- Altice group includes both the infrastructure operator (XP Fibre) and the commercial operator SFR, as well as the alternative commercial brand RED;
- Iliad group includes the commercial operator Free as well as the financial and wholesale entities Investissement dans la Fibre des Territoires (IFT) and Réseau Optique de France (ROF); and
- Bouygues Telecom represents only the commercial operator. Note that some of the owners of Bouygues Telecom are also partial owners of wholesale operator Axione, but there are no direct links between the two entities.

© 2025 Plum Consulting

1 Description of the symmetrical framework

1.1 The philosophy behind the framework

The French regulatory framework for FTTH deployment is part of a broader policy approach in which the government established a plan for modernisation of the broadband infrastructure in France and the regulator independently set up rules and approaches for deployment so that market conditions would be optimal. This framework was established before the bulk of deployment was initiated. In this section, we will explain what the reasons were for this policy approach and what the philosophy behind its design is.

1.1.1 Context in the 2000s

By the late 2000s, operators began deploying FTTH networks, initially concentrated in large urban areas. In response, Arcep initiated the development of a regulatory framework to ensure that the introduction of this new technology would not create distortions in the electronic communications market. As a result, the symmetric regulation framework was conceptualized and implemented by Arcep, taking into account the various elements of the broadband context at the time, as follows.

- Broad national availability of telecom physical infrastructure in the form of ducts and poles owned by Orange group (France Telecom at the time).
- A successful regulatory model for copper local loop unbundling for DSL, driving not only adoption of broadband in France but competition in the broadband market. From a large number of internet commercial operators in the early 2000s, the market gradually merged to form four strong companies (Altice group, Iliad group, Bouygues Telecom and incumbent France Telecom/Orange group) capable of and willing to invest in fibre infrastructure.
- The ladder of investment principle implemented as part of broadband regulation allowed these larger market players to invest in longer portions of the aggregation network and install their own ADSL equipment closer to the end user rather than lease end-to-end active wholesale products from the incumbent, thus increasing their longer-term margins. With the proceeds of these investments, they found themselves in a position to fund their own FTTH network deployments in select areas, with FTTH initiatives emerging as early as 2007/2008.
- A recognition by retail operators and public entities alike that a pure infrastructure competition model would only serve areas with sufficient revenue density and therefore not bridge the infrastructure digital divide, and in fact risked accentuating it. This is why a key feature of the symmetric regulatory framework is initial co-investment (*ab initio*): it gives the opportunity for commercial operators to co-invest in a deployment area as soon as the infrastructure operator announces deployment, thus facilitating the funding of infrastructure deployment and investing capital in access rather than renting lines.

As the basic principles of FTTH regulation were established by 2009/2010, but before the bulk of private initiative FTTH had been deployed, the French government then began the process of establishing the French plan for very high-speed broadband (that later became the *Plan France Très Haut Débit*, or Plan France THD). The objective was to ensure an even deployment nationwide and avoid a digital infrastructure divide. This plan articulated a role for central government, local governments, private operators and the regulator to encourage a broad and efficient deployment of FTTH over the whole territory. In June 2010, the French government presented its objectives related to digital connectivity with a national program aiming at a generalisation of

© 2025 Plum Consulting

30 Mbps broadband connections by 2020 (Next Generation Access – NGA) through a focus on FTTH, a technology considered both the most effective and the most future proof. Following the Covid-19 pandemic, an even more ambitious objective for the widespread rollout of fibre optic networks was set.

1.1.2 Resource optimisation

In light of the significant costs of FTTH deployment, one of the underlying principles of the regulatory framework, and then the French plan, was to ensure that investment in FTTH would favour new coverage rather than duplicate existing coverage. This would lead to homogeneous deployment across the country and resource optimisation on a number of levels:

- Both private and public euros invested in FTTH infrastructure would primarily drive coverage forward;
- Infrastructure sharing would improve the economics of FTTH provision and foster competition between retail operators with more opportunities for individual player to propose differentiating offers;
- Infrastructure operators (OI) being obliged to include the so-called *ab initio* co-investment in their access offers for commercial operators (OC), joint investments between the OI and the OCs would strengthen the business models and improve the financial performances of infrastructure operators; and
- Prioritising private sector initiatives, with public funding limited to underserved areas, would ensure optimal use of public resources (following the State Aid rules of the European Commission) without any risk of market distortion.

One of the linchpins of the regulatory framework is the Postal and Electronic Communications' Code (*Code des Postes et des Communications Électroniques* – CPCE) Article L.34-8-3, which states that any operator of a fibre access network shall comply with reasonable requests from third-party operators for access to fibre lines on this network. By ensuring the availability of passive fibre infrastructure in areas where one operator at least deployed, the framework encouraged efforts to expand coverage rather than overbuild.

Additionally, even though this was not part of the plan's rationale back in 2009, the model put in place was ecologically sound in that it minimised equipment duplication, civil works and energy consumption.

1.1.3 Open technology model

A key aspect of the regulatory framework, on which the Plan France THD then built upon, was to foster collaboration and multilateral conversations within the industry, which led to players establishing collaborative processes and ultimately agreeing on standards both for their model of deployment and the interoperability at the different layers. This resulted in a technology model aiming to promote innovation and provide choices to the operators deploying FTTH.

- The underlying infrastructure is point to point (one fibre all the way from the premise to the concentration point). This allows commercial operators to deploy either point to point or point to multipoint technologies upstream of the concentration point. In the future, this may also enable a faster development and adoption of innovative technologies such as quantum communications.
- The wholesale model designed by regulation is one of passive resell, which means that each wholesale customer (retail operators, *opérateur commercial* – OC) purchases an unbundled passive line which they can light with their own choice of technologies, equipment and product design.

© 2025 Plum Consulting

1.1.4 National availability and pricing

As explained above, in parallel to the regulatory framework put in place by Arcep, the French Government initiated the Plan France THD. This plan defines how subsidies could be granted by national or local governments to foster the deployment of FTTH networks in less dense areas in the form of public initiative networks (*réseaux d'initiative publique* – RIP). It also introduced conditions that ensured that network architecture would follow the same technical rules everywhere. This plan has been authorized by the European Commission in 2016 (SA. 37183).

The symmetrical regulatory model that enables the provision of shared access to passive fibre (whether through co-investment in the network or by renting access) is structured around the notion of "reasonable pricing" rather than "cost oriented". This pricing principle allows infrastructure operators (*opérateurs d'infrastructure* – OI) to fix higher prices (compared to cost-oriented prices), this in turn being an incentive to fibre network investment and deployment. The nature of the public private partnerships set up by the Plan France THD in areas where no market player is willing to deploy fibre without public funding organically limits the variability in wholesale prices across the nation. This has made it easier for the four major national commercial operators to be present at the same price on all networks, whether urban or rural, a key element not only for adoption of FTTH but also for digital inclusion. This has long been the case in France even before FTTH was deployed, and is expected by French consumers and businesses.

1.1.5 Service competition

The model is designed to ensure that consumers and businesses will have a choice in commercial operators no matter where they are located. Furthermore, interoperability and alignment on technical standards (for example, cabinets size, localisation of splitters and active equipment, or information systems data) means it is easy for commercial operators to offer their services on smaller fibre networks as well as large ones. Because the wholesale input is passive, commercial operators retain the freedom to choose their active equipment, differentiate on prices, quality of service and all other elements of product design under their control. Regulatory provisions also ensure that the design and sizing of wholesale network subdivisions support economic viability for commercial operators. As a consequence, customers and businesses are guaranteed to never be stuck with a single provider, no matter who actually deployed the fibre.

1.1.6 Multiple infrastructure players

The compulsory passive network sharing[1] together with tendering processes[2] put in place for public private partnerships when public funding is necessary, ensures competition at the infrastructure operator level. In practice, different projects have different infrastructure operators: while Orange group remains the largest infrastructure operator in terms of number of lines served, at least four other infrastructure companies have achieved scale through the tendering processes and are actively competing for tenders.

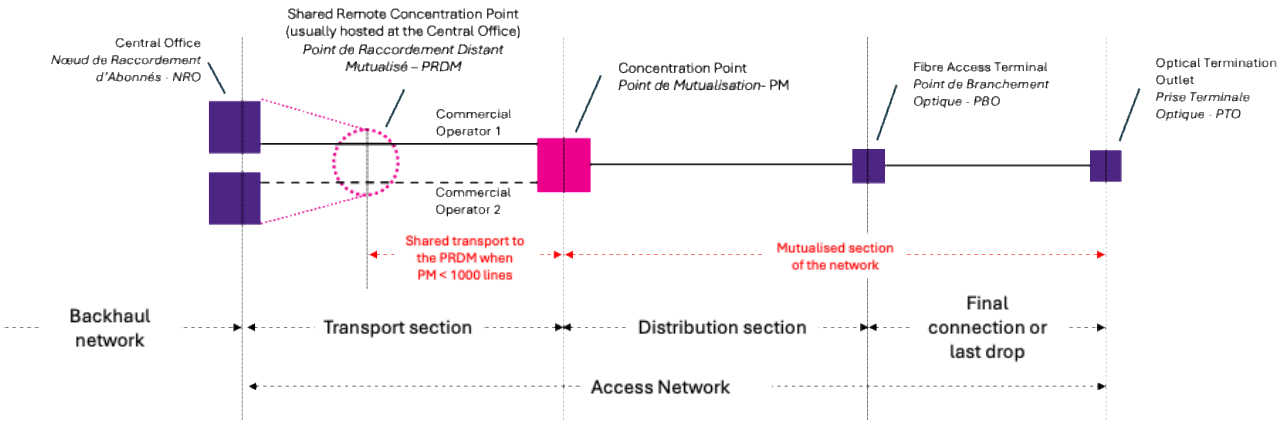
[1] Based on Article L.34-8-3 of the Postal and Electronic Communications' Code (*Code des Postes et des Communications Electroniques* – CPCE)
[2] Based on Article L.1425-1 of the Code Général des Collectivités Territoriales (*General Code of Local Authorities* – CGCT)

© 2025 Plum Consulting

1.2 Architecture blueprint

The figure below illustrates the high-level vision of the FTTH network architecture in France.

Figure 1.1: Schematic diagram of an FTTH access network



The access network can be broken down into three sections:

- The transport, or feeder, section spans from the central office (*Nœud de Raccordement d'Abonnés* – NRO) to the concentration point (*Point de Mutualisation* – PM)
- The distribution section spans from the PM to the Fibre Distribution Point (*Point de Branchement Optique* – PBO)
- The final connection spans from the PBO to the Optical Termination Outlet (*Point de Terminaison Optique* – PTO) in the premise

In all geographical areas (see below), the mutualised section of the FTTH network is deployed by a single wholesale infrastructure operator who may or may not also be a commercial operator. The distance between the PM (in magenta above) and the end-user may vary depending on the geographical area. Competing commercial operators can procure an access line by co-investing in this mutualised portion or by renting it. This is explained in detail in the text below.

1.3 Geographic breakdown

1.3.1 Why segment the market geographically?

The regulatory framework acknowledges that the economic conditions for deployment and operation differ between areas depending on housing density, and the characteristics of the geography (relief, topology, nature of habitat, etc.). This is due, amongst other things, to the distance between buildings, the number of premises in each building and the availability of civil work infrastructure. Due to France's large territory and the presence of many predominantly rural or mountainous regions, it was particularly important to account for these disparities, as they result in significantly lower per-line costs in urban areas compared to rural ones.

© 2025 Plum Consulting

On the basis of the legal obligation for infrastructure operators to share their lines,[3] Arcep drafted rules to define concentration points (PM for "*Point de Mutualisation*") that would ensure viable competition between retail players, through the access to passive fibre lines. These rules determine the location and minimum size of the PMs.

Hence, while the framework defines rules that are applicable in any part of the national territory, some specificities applicable in very dense areas lead to significantly different choices of architecture by some of the OIs. Decision 2009-1106 defines as "very dense areas" densely populated communities where infrastructure competition is possible up to very close to the end premise.

Accounting for the fact that conditions for deployment and operational management of a fibre network are not the same in areas of different densities, co-financing rules for infrastructure operators who decide to invest in these areas are also distinct (see § 1.4.2.4)

1.3.2 Very Dense Areas (*Zones Très Denses* – ZTD)

A list of 106 municipalities has been specified by Arcep.[4] These are municipalities where, over a significant part of their territory, infrastructure-based competition can emerge, i.e. where it is economically viable for several operators to roll out their own fibre optic networks close to homes. They account for about 18% of premises in France. In practice, these ZTD cover large cities such as Paris and its suburbs, Bordeaux, Clermont-Ferrand, Grenoble and its suburbs, Lyon and its suburbs, Marseille, Metz, Orléans, Rennes, Strasbourg, Toulouse, Tours, etc.[5]

The rules that apply in these very dense areas were designed based on extensive feedback from field deployments collected by Arcep, because these were areas where market players had begun deployment (between 2008 and 2013).

1.3.3 Less Dense Areas (*Zones Moins Denses* – ZMD)

In these areas, initial analyses showed that it would not be economically viable to expect several operators to roll out their own network as close to the premises as they do it in very dense areas. Hence, it was particularly important to define a regulatory framework that would make network sharing possibilities effective, to meet the legal obligation[6] that any operator shall comply with reasonable requests from OCs to access their lines in order to serve an end-user. Moreover, Arcep was aware of the importance of incentivizing efficient investment.

Two "sub-zones" of the regulatory defined ZMD were then demarcated, based on investment conditions that had been clarified by the *Plan France Très Haut Débit*. Technical rules are the same in both areas, with network sharing principles in line with Article L.34-8-3 of the CPCE. The distinction is based on the expected return on investment, and the viability of purely private investment or (conversely) the need for public funding.

1.3.3.1 Areas based on private investment only

These are areas where investment in an FTTH network by a private operator was considered sustainable. These were identified according to a public consultation process that required market players to declare if and where

[3] Article L.34-8-3 of the CPCE, see § Context in the 2000s, 1.1.1
[4] Decision n° 2009-1106, listed 148 municipalities. It has been updated by decision n° 2013-1475 taking into account the actual course of deployment and 106 municipalities are now classified in ZTD. https://www.arcep.fr/fileadmin/cru-1714402758/reprise/dossiers/fibre/annexes-2013-1475-liste-communes-ztd.pdf
[5] Complete list available here: www.arcep.fr/fileadmin/reprise/dossiers/fibre/annexes-2013-1475-liste-communes-ztd.pdf
[6] Article L.34-8-3 of the French Postal and Electronic Communications' Code (CPCE)

© 2025 Plum Consulting

they intended to begin deployment of FTTH networks within the next three years. The principle of such a consultation is based on the Guidelines on State Aid for broadband networks. The first consultation, initiated by the government, took place in 2011/2012 and was a 'call for expression of interest in investing' (*Appel à Manifestation d'Intention d'Investissement* – AMII). Other consultations have been initiated by local executives (*départements*) between 2018 and 2020 to identify new municipalities where operators would deploy without any public funding, considering the evolution of the market. Those are the 'calls for expression of local deployment commitment' (*Appel à Manifestation d'Engagements Locaux* – AMEL).

As part of the initial AMII, the two major operators Orange group and Altice group expressed their intention to invest in 3554 municipalities, covering about 13 million premises (split roughly 80% for Orange group and 20% for Altice group). In 2017, the government, noting the dynamics of the market and the willingness of several operators to invest, took the opportunity to introduce Article L.33-13 in the CPCE. This article intends to go beyond simple "expressions of interest to invest" by giving operators the possibility to make binding commitments. Further to the introduction of this article and various AMEL, the distribution of the AMII municipalities between Orange group and Altice group changed slightly, and other wholesale-only OIs took commitments in areas that were not considered viable for private-only investment in 2012.

As per Article L.33-13, infrastructure operators propose commitments to the government identifying the municipalities that they intend to cover with fibre access networks. Once these commitments have been reviewed by Arcep[7] and are accepted by the Minister in charge, they become legally binding. Arcep is responsible for overseeing compliance with these commitments. If an operator fails to meet its obligations, Arcep can issue formal notices and impose penalties[8].

In municipalities where an operator has taken a commitment, the regulatory framework ensures that there will be at least one network available between the central office and the PBO (transport and distribution segments), by the operator who made the commitment. This does not preclude another operator from deploying a competing infrastructure should they wish to do so, even though economic viability means it seldom occurs. OCs who want to access the lines can either co-invest with the OI or rent the lines (see § 1.4.2.4).

1.3.3.2 Areas based on private investment and support by public funding

For areas where no operator expressed interest in FTTH deployment on private funds, the Plan France THD (see § 1.1.4) defined a framework for the support of public funding. The plan defines a number of technical requirements to guarantee the homogeneity of network architecture at national level, so that these networks can all be operated using the same processes and the same tools. One of the first requirements was strict compliance with Arcep's regulatory framework.

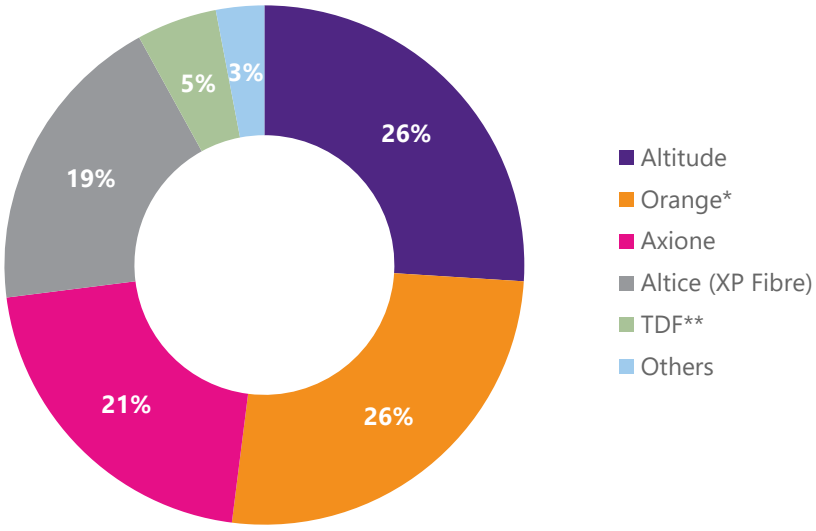
Local authorities (*départements* or *régions*) have set up public-private partnership or public works procurements, in a variety of legal forms, to allow for the partial funding by public money of the networks in these areas. They are called the public initiative networks (RIP). Tenders are issued for each of these RIP and the winning infrastructure operator becomes *de facto* the only one deploying an access fibre network in the area . Like in AMII and AMEL areas, commercial operators can either co-invest in or rent the access lines. As in other parts of the ZMD, the regulation does not preclude overbuilding on private funds, although the business model for this is unlikely to be viable in practice.

It should be emphasized that each call for tender allows for genuine competition between various infrastructure operators. As of today, about half a dozen players share the market.

[7] Note that article L33-13 only requires that Arcep gives an opinion, without requiring it to be favourable
[8] For example, in 2023, Arcep imposed a €26 million fine on Orange group for not meeting its FTTH deployment deadlines in certain areas.

© 2025 Plum Consulting

Figure 1.2: Breakdown of homes passed per operator in RIP areas (end 2024)[9]



1.3.4 Global picture

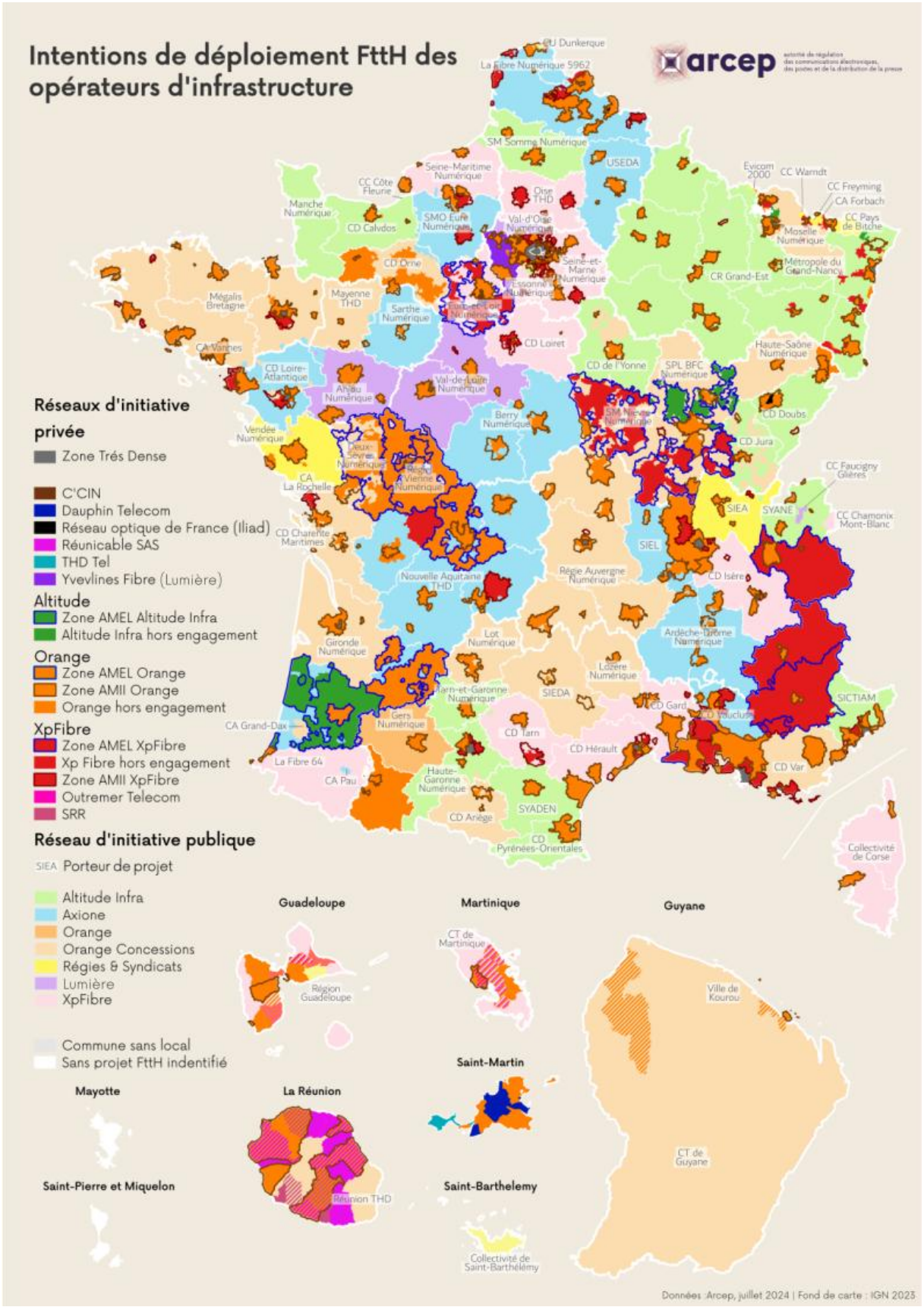
Based on this geographic breakdown, there are more than 80 networks in mainland France and overseas territories. The 5 main infrastructure operator groups are Orange group, Altice group (XP Fibre), Altitude, Axione and Lumière.[10]

As can be seen with the map hereunder, deployment contexts and main OI vary a lot from one area to another. Nevertheless, symmetric regulation applies to all these networks, in any zone and whether entirely funded by private investors or partially funded by public stakeholders.

[9] Source: Arcep, 2025 - Notes: * Orange group includes Orange Concessions (24%) and Gers Fibre (2%); ** Since January 2025, TDF has been acquired by CVC-DIF and is called Lumière.
[10] Lumière is the commercial name of the network that belonged until 2024 to TDF Fibre and was bought by the investment fund CVC DIF.

© 2025 Plum Consulting

Figure 1.3: Geographic distribution of the infrastructure operators in all type of zones (July 2024)[11]



[11] References to Orange should be read as Orange group. References to Xp Fibre should be read as Altice group.

© 2025 Plum Consulting

1.4 Wholesale market regulation

1.4.1 Access obligations to underlying civil works

Following market analyses carried out since 2009, it was found that Orange group (formerly France Telecom, incumbent) holds significant market power (SMP) over access to existing physical civil engineering infrastructure (ducts, poles, and associated facilities). Therefore, a remedy based on an asymmetrical regulatory framework has been put in place. The framework imposes to Orange group the provision of an access offer to its civil engineering infrastructure under fair and non-discriminatory conditions. This solution, called GC-BLO (*Génie Civil – Boucles et Liaisons Optiques*, or Civil Work – Optical Loop and Links) is a wholesale offer that enables operators to independently deploy their fibre networks using Orange group's ducts and pole. The principles are as follows:

- Autonomous fibre deployment: operators can independently install their own cables within or on Orange group's existing civil engineering infrastructure, facilitating efficient network expansion;
- Access to comprehensive documentation: Orange group provides detailed cartographic files of its civil engineering network and aerial support, assisting operators in planning and executing their deployments effectively; and
- Operators are responsible for conducting their own engineering studies prior to deployment but can rely on a support service provided by Orange group.

Prices for the GC-BLO offers are regulated by Arcep and are cost-oriented. The costs associated with Orange group's infrastructure are allocated between its copper and fibre networks. Initially, a large portion of the costs was attributed to the copper network. As fibre uptake increased over time, a greater share of the costs was progressively allocated to the fibre network. It should be noted that the main access price is determined by the number of premises served rather than distances. As a result, rural areas, where distances from the central office are higher are not disadvantaged compared to more dense areas. Arcep determines the rules used to calculate the prices to access Orange group's passive infrastructure. As a consequence of the above (and especially due to the high fibre penetration rate), the GC-BLO prices have increased significantly in recent years, but these increases were planned and announced in advance to the infrastructure operators purchasing access to the underlying infrastructure.

In addition, to facilitate the deployment of new fibre networks, Arcep mandated that Orange group provides access to its copper central offices (*Nœuds de Raccordement d'Abonnés* - NRA) for the co-location of any operator's fibre central offices (*Nœuds de Raccordement Optique* NRO). Orange group was also required to offer access to dark fibre links between central offices for backhaul purposes.

Arcep oversees Orange group's compliance with non-discrimination obligations. Orange Wholesale France (OWF) is the wholesale division of Orange, providing wholesale and retail operators with access to fixed and mobile networks. They were required to implement a so-called 'Chinese wall' to prevent any preferential treatment of Orange group's retail operations over external wholesale clients in the access and use of civil engineering infrastructure.

© 2025 Plum Consulting

1.4.2 Access obligations to passive fibre

1.4.2.1 Scope of the obligations

These obligations apply to any operator and for all networks. As explained above (see § 1.3.1), the access offer obligations stem from article L.34-8-3 of the CPCE.

The regulatory framework defines specific rules to ensure that where viable, sound competition can emerge between infrastructure operators who deploy their network, and that any retail operator will have the possibility to access their lines. The goal is that each operator will deploy its own network as close as possible to the final customer, following the principle of an infrastructure-based competition. Opening the network to third-party OCs becomes compulsory only after the concentration point (PM). Therefore, the minimal size of PM has been set by Arcep's directives, considering the actual conditions for networks deployment that were observed[12] and that are mainly dependent on geographic specificities.

1.4.2.2 Geographic specificities

a Very Dense Areas (ZTD)

For very dense areas, the following rules have been defined.

- For multi-dwelling units (MDU) that include at least 12 dwellings or business premises, or for buildings that are served by visitable tunnels of a public sewage system,[13] infrastructure operators are allowed to install the PM in the basement of the building (i.e. on private property), as an exception to the general principle that states that a PM should be accessible in the public domain.[14]

- For buildings with fewer than 12 dwellings or business premises, the PM must be located outside the private property, generally in the form of a street cabinet serving several buildings. It should aggregate connections for multiple buildings and at least 100 lines or 300 lines, depending on the density level (Recommendations of 14 June 2011 and 21 January 2014).

[12] Decisions n° 2009-1106 and n° 2013-1475.
[13] Accessible sewer systems are sewer conducts that can be accessed by a person and where cables can be laid very easily.
[14] Pursuant to Article L.34-8-3 of the French Postal and Electronic Communications' Code.

© 2025 Plum Consulting

Figure 1.4: Deployment and mutualisation principles in very dense areas for MDUs with more than 12 premises

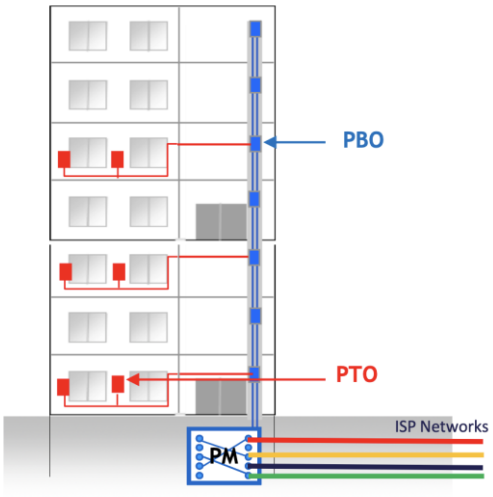
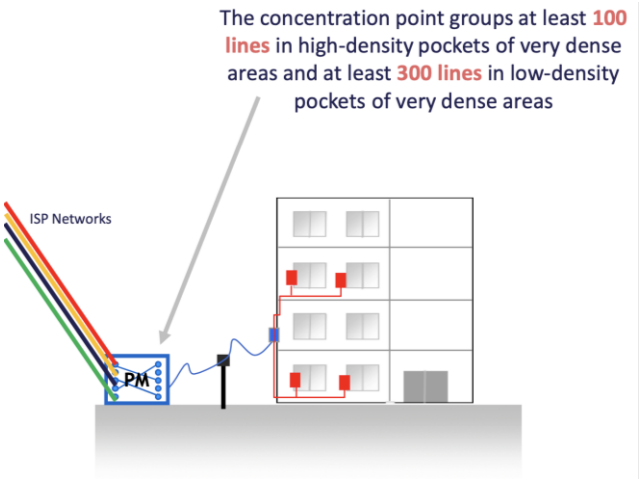


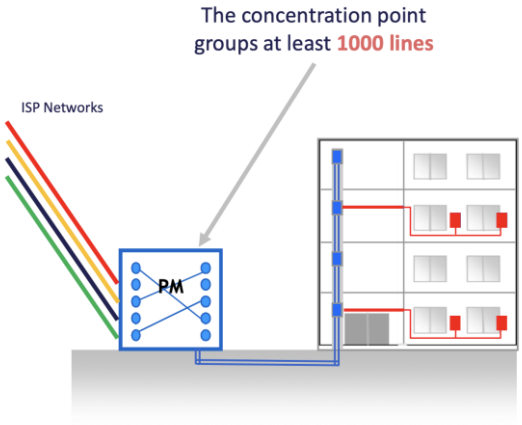
Figure 1.5: Deployment and mutualisation principles in very-dense areas (other cases)



b Less Dense Areas (ZMD)

The technical rules in these areas are the same for AMII, AMEL or RIP. The street cabinet which acts as a concentration point must be located on public land and aggregate at least 1000 lines. This 1000-line threshold comes from economic analyses and public consultations carried out by Arcep as well as previous experience with ADSL unbundling economics. Considering that OCs have to deploy their own access links and equipment (OLT,[15] splitters, and so on), a minimum size of 1000 lines ensures a reasonable deployment cost per line, and limits the number of points to be connected and operated.

Figure 1.6: FTTH Network Architecture in less dense area without shared remote concentration point offer



Nevertheless, the size of street cabinets and the spread of buildings often make it impossible to link 1000 premises from the same concentration point. Hence, Arcep introduced an exception: the threshold can be 300 lines, but in that case, the infrastructure operator has to offer a shared solution for the feeder segment, i.e. up to

[15] Optical Line Termination

© 2025 Plum Consulting

a point located higher up in the network and aggregating more than 1000 lines, called a "shared remote concentration point" (*point de raccordement distant mutualisé* – PRDM).[16] In that way, the technical and commercial conditions for an OC to access at the PRDM become similar to the ones needed to access a 1000-line PM. Physically, this PRDM is in most instances located in the central office, where OCs install their OLT.

Figure 1.7: FTTH Network Architecture in less dense area with shared remote concentration point offer

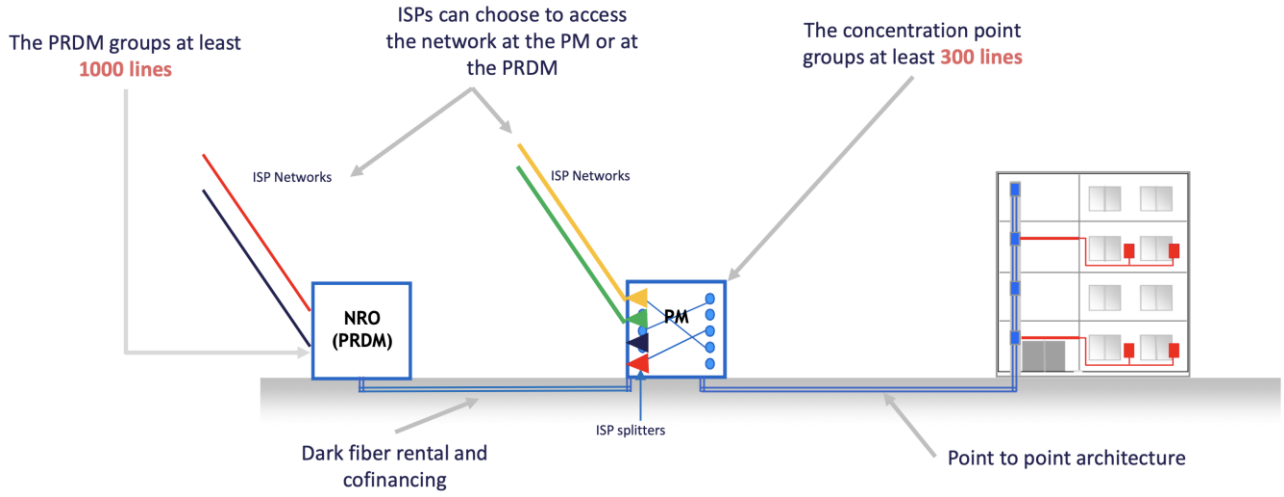


Figure 1.8: Geographic distribution of premises as per the regulatory framework (data Q4 2024)

Geographic breakdown	Area	Network Architecture	Population
Very Dense Areas (ZTD)	106 municipalities (list established by Arcep)	• Each operator deploys its own network up to the building • PM authorised in the building if MDU ≥ 12 premises • PM 100 or PM 300 on public land if MDU < 12 premises	7.9 million premises (18%)
Less Dense Areas	AMII (Call for expression of interest to invest)	• One network deployed by an OI, shared by all OCs • PM 1000 on public land (in practice, not used) • PM 300 on public land, if shared remote concentration point (PRDM) with 1000 lines	19.2 million premises (43%)
	AMEL (Call for expression of local deployment commitment)		
	RIP (Public Initiative networks)		17.5 million premises (39%)

[16] These specifications are defined in Decision n°2010-1312

© 2025 Plum Consulting

1.4.2.3 Technical access conditions

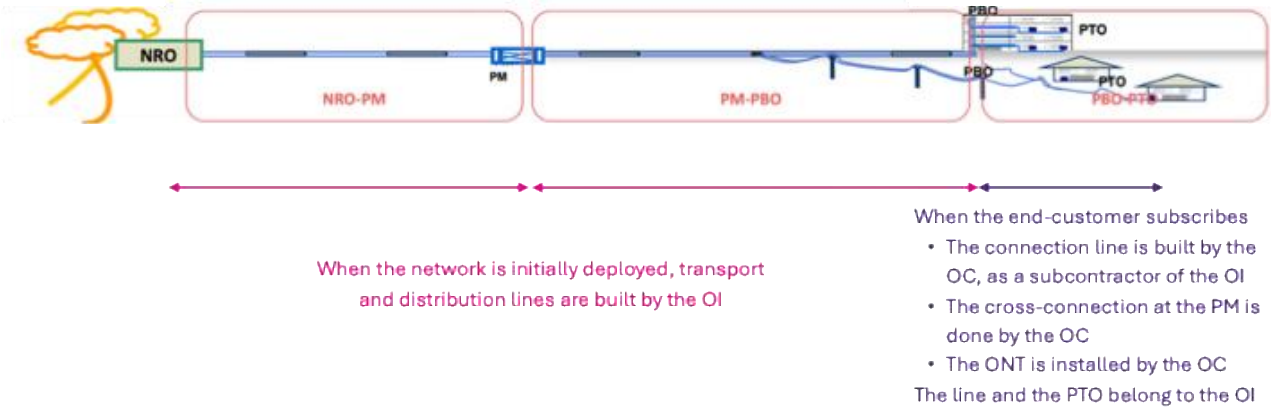
When networks are first deployed, infrastructure operators roll out cables for the transport and distribution segments, i.e. from the central office (NRO) to the Fibre Distribution Point (PBO in French).

Figure 1.9: Section of the access network and the network

By co-investing, commercial operators get the right to use passive lines. They install their OLT in the central office, in most cases a shared one, but in some cases they prefer using their own facilities (e.g. Orange group might prefer using existing copper central offices). As customer subscriptions come in, the OC orders the roll-out of the connection line to the OI.

The owner of the connection segment and the optical termination outlet is the OI, while the owner of the Optical Network termination (ONT) is the OC. Nevertheless, for the building of the connection segment, the general practice on the market is that the OI actually subcontracts the works to the OC. This practice has been made possible from a regulatory point of view since a dispute resolution between Iliad group and Orange group [17], and gives the possibility to the OC to keep a direct relationship with their own end-customers. This process of subcontracting to the commercial operator is called *sous-traitance à l'opérateur commercial* (STOC).

Figure 1.10: Responsibilities for network roll-out



Access offers for commercial operators cover each of the sections, NROs, PMs and PBOs being flexibility points of the network.

[17] Decision n° 2011-0893 states that "the OI cannot invoke its responsibility for the entire fibre network in the building to deny the OC the possibility of making its own connections to its own customers".

© 2025 Plum Consulting

1.4.2.4 Pricing for access offers

As explained above (see § 1.3.1), article L.34-8-3 of the CPCE states that OIs have to provide access offers enabling effective connection of third-party operators or OCs under reasonable economic, technical and accessibility conditions.

Arcep Decisions 2009-1106 and 2010-1312, taken pursuant to Article L. 34-8-3 of the CPCE, provide for three financial options for access.

- *Ab initio* co-financing, consisting in practice of buying a long-term "Indefeasible Right of Use" (IRU) through an upfront payment plus monthly recurring fees for maintenance. It provides a right to use the line for 20 years, which can be renewed[18] up to 20 more years at the cost of 1€. The specifics of co-investment differ in ZTD, where operators share the cost of deployments amongst themselves (1/N where N is the number of co-investing operators) and ZMD where they purchase tranches of 5% of available lines at a one-time fee per line. This *ab initio* co-investment provision was conceived as a key element of the regulatory framework: it allowed for encouraging efficient investment, reducing the costs (and risks) of the first investor OI and, by ensuring passive access for OC, allowing them to differentiate offers, hence reinforcing competition.

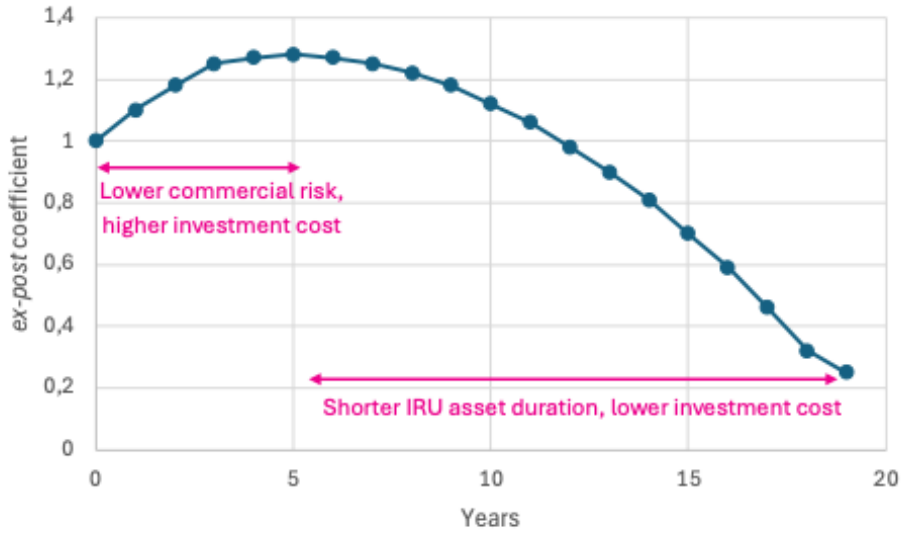
- *A posteriori* co-financing, similar to the previous one with upfront payment plus monthly recurring fees. The right of use granted expires at the same time as that of the *ab initio* co-financer(s). The upfront payment value is adjusted by a so-called *ex post* coefficient, to account for the fact that an investor coming after the initial deployment of the network gains a visibility that reduces the commercial risk incurred (civil works certainty and first tendency on demand). The coefficient increases the investment cost. After some years however, the shorter remaining duration of the IRU reduces the interest for this asset, and therefore, the coefficient decreases the co-investment cost.

- Passive rental, consisting in practice of a flat tariff per line, recurring monthly. The price level is adjusted so that for the duration of the IRU, renting will be more expensive than investing *ab initio*.

[18] Arcep Decision n° 2018-0569-RDPI dated 17 May 2018 ruling on a dispute settlement between Iliad group and Orange group

© 2025 Plum Consulting

Figure 1.11: Typical ex-post coefficient curve for co-investment rates[19]



In addition, 'bitstream' access is also available. This allows smaller players to provide services without having to bear the burden of major investments in network equipment. This option is compulsory for networks financed with public funds (RIP) when a reasonable request is made for such a product. In practice, this option is rarely used at the RIP level, but several OCs propose bitstream wholesale offers with national coverage.

Most major operators have opted for co-investment, even though some, for financial reason[20] preferred line rental. This creates long-term predictability for infrastructure investors. This variety of financial options allows OCs to position themselves as they wish on the investment ladder. Several operators created Special Purpose Vehicles[21] (SPVs) to attract infrastructure funds for their co-investment operations. These SPVs can resell to all OCs, not limited to the initiating OC.

Prior to each roll-out, the OI issues a so-called "call for co-financing" which is a consultation with third-party operators and OCs to give them the opportunity to participate in the investment for this deployment by buying IRU.

Decision 2009-1106 also introduces four general principles governing the pricing of access to the wholesale FTTH market:

- non-discrimination: operators in similar situations benefit from similar pricing conditions;
- objectivity: it must be possible to justify the pricing applied by the OI on the basis of clear and verifiable costs;
- relevance: costs must be borne by the operators who generate them or use the corresponding infrastructure or services; and
- efficiency: the costs taken into account must correspond to those incurred by an efficient operator.

The co-financing costs are based *a priori* on deployment costs, but the calculation differs according to the zone (see hereafter).

[19] Source: Covage Haute-Savoie *Offre de co-investissement FTTH*, July 2020
[20] Reducing CAPEX and increasing OPEX
[21] Orange Concessions, Scorefit, Investissement dans la Fibre des Territoires (IFT), XP Fibre, SDAIF, SDFAST…

© 2025 Plum Consulting

In addition, dispute settlements managed by Arcep ensure that the principle that prices must be reasonable is properly applied. Ten dispute settlements decisions, either about pricing or more generally about network access conditions, have been taken between 2010 and 2024 with regards to FTTH networks.

a Very Dense Areas (ZTD)

When operators choose to co-finance a shared network, the investment model follows a 1/N rule, where N is the number of co-investors. Each investor shares the cost equally and receives proportional rights over the network. Each operator pays 1/N of the total investment and gets an equal share of the fibre lines. If a new operator joins later, the total cost is recalculated, and previous investors may be compensated by the OI. For example, if there were four co-investing operators, each would hold a 25% share.

Co-investment costs are calculated based on network elements actually rolled out.

b Less Dense Areas (ZMD) – Private-only investments (AMII and AMEL) or with public investments (RIP)

In this area, the co-investment is based on a 5% increment model, meaning that:

- Co-investments are structured in incremental tranches of 5% of the line capacity within the designated area; and
- Operators can choose how much they want to invest, starting at a minimum of 5%.

Hence an OC expecting to reach 15% of the end customers over an area would co-invest in three 5%-shares to receive a right to use the matching number of lines.

This step-based model allows for more flexibility and risk-sharing, a necessity in areas where the economic viability is less certain and fewer operators are interested in deploying infrastructure.

c Guidelines on access costs in public initiative networks (RIP)

Public initiative networks (RIP) are deployed in less dense areas and therefore shall comply with the above principles. However, Law n° 2015-990[22] assigned Arcep the responsibility of defining the general principles that these RIP must follow regarding tariff structures. In response, Arcep published guidelines on RIP FTTH tariffing in December 2015. These guidelines pursue several key objectives:

- Securing investor confidence by incorporating commercial risks and profitability outlooks into tariff models while ensuring compliance with public subsidy regulations (State Aid rules) and preserving the long-term value of fibre networks;
- Providing transparency to commercial operators regarding pricing structures; and
- Ensuring tariff consistency across different access components and across territories within France, while adhering to regulatory pricing principles that encourage the use of passive offers and co-investment by commercial operators.

[22] *Loi n° 2015-990 du 6 août 2015 pour la croissance, l'activité et l'égalité des chances économiques*

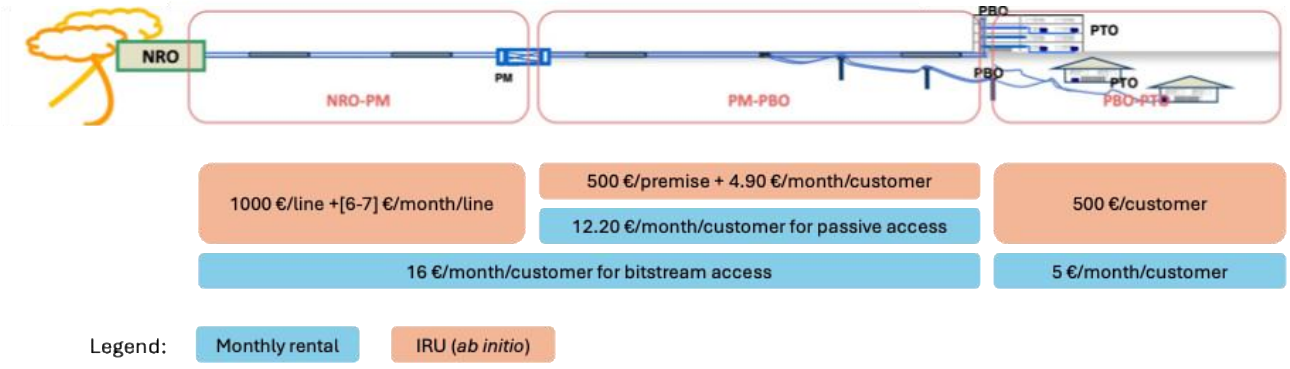
© 2025 Plum Consulting

These guidelines, together with a pricing model that was published with them, aim to create a long-term predictable, reasonable and investment-friendly regulatory framework for the deployment and operation of networks in RIP areas.

Law n° 2015-990 also provides that the local authority responsible for a RIP shall notify Arcep of the terms and conditions of their access offers at least two months before they come into force. Where Arcep considers that the pricing conditions raise difficulties, they issue an opinion (which may be made public) inviting the local authority to amend them.

The graph below illustrates the financial options available in ZMD to access the lines and costs recommended by Arcep guidelines in 2015. Since that date, applied prices have evolved.

Figure 1.12: Access costs in ZMD as per Arcep's 2015 guidelines model



1.4.3 Ensure comprehensive deployment

Arcep has taken provisions to ensure that in areas where an OI deploys a network, no premises will be left unserved, and more generally to ensure a consistency in the deployments and homogeneous coverage in the areas being served.

As soon as the first elements of the regulatory framework have been put in place, Decision 2010-1312 addressed this issue. The requirements for completeness in art. 3 are worded as follows:

> **"The building operator will install a concentration point that is designed to serve all the homes or office units located in the corresponding service area. From this concentration point, the building operator will roll out a horizontal network towards the homes or office units, within a reasonable timeframe after the notification of the service area of the concentration point, that will make it possible to connect all the homes or office units located in the service area of the concentration point to a point located in their immediate vicinity."**

This reasonable timeframe is considered in the same Decision, to be between 2 to 5 years.

A recommendation of 2018,[23] has refined the rules resulting from this decision in order to address the risks of:

- OIs pre-empting territories, i.e. the publication of rollout projects that are not rapidly followed up, with the consequence of dissuading faster rollouts by another player;

[23] Recommendation dated 24 July 2018 on the consistency of deployments of FTTH networks (*Cohérence des déploiements des réseaux en fibre optique jusqu'à l'abonné)*

© 2025 Plum Consulting

- Inefficient overlapping of networks, i.e. the publication of rollout projects targeting territories already covered by networks or network projects; and
- Cherry-picking, i.e. projects that do not provide for coverage of the most expensive lines, while making it difficult to envisage their coverage by another operator.

Therefore, the recommendation sets out how coverage areas should be demarcated by an OI declaring its intention to deploy over a territory, to ensure that no part of that area will be left without a connection option.

Furthermore, a recent recommendation[24] addresses specific cases.

- Refusals from property owners or other third parties faced by OIs. In such cases, OIs are recommended to document the efforts made to avoid or resolve these situations, and to monitor them over time, as the choices made by individuals and businesses on the premises concerned may change.
- Premises identified as "connectable on demand" by OIs (i.e. premises that can be connected within a reasonable timeframe but that require additional works): OIs shall assess potential users' appetite for fibre.
- New buildings: the responsibilities of the OIs in detecting new buildings and connecting them to the FTTH network when they are located in housing estates or concerted development zones.

1.4.4 Other provisions

In order to ensure that access offers are effective, Arcep published Decision 2020-1432[25] that details and provides more precision with regards to:

- the obligation of non-discrimination and in particular the operational and technical guarantees to ensure the effectiveness of this principle: sharing of data, information systems specifications, sensitive information transmission processes;
- the obligation to grant requests for access to offers with enhanced quality of service of different levels on FTTH networks, giving the possibility to provide offers for businesses and enterprises using the FTTH network: this implies adjusted Service Level Agreements (SLAs), in particular specific fault-repair time guarantees;
- the obligation to ensure a minimum quality of service for general and business needs on FTTH networks (commitment on QoS SLAs compliance with quantified QoS thresholds, publication of key performance indicators); and
- the accounting obligations applicable to all operators for a more efficient control by Arcep.

[24] Recommendation dated 8 April 2025 on the process to implement the obligation to complete the rollout of FTTH networks (*Mise en œuvre de l'obligation de complétude des déploiements des réseaux en fibre optique jusqu'à l'abonné*)
[25] Decision no. 2020-1432 dated 8 December 2020 specifying the terms and conditions for access to very high-speed fibre-optic electronic communications lines (*Décision précisant les modalités de l'accès aux lignes de communications électroniques à très haut débit en fibre optiques*)

© 2025 Plum Consulting

1.4.5 Working groups and operational frameworks

In addition to regulatory decisions and recommendations, Arcep fosters dialogue and collaboration between stakeholders to identify pain points, and then develop and implement collective solutions.

1.4.5.1 Interop'fibre

One of the key working groups is "Interop'fibre".[26] The works of this group are coordinated together with Arcep.

The aim of this group is to make FTTH networks fully interoperable by standardising information exchanges and harmonising processes between operators in three areas of FTTH pooling: infrastructure, access and after-sales service. In particular, the group defined a file format to be shared between operators in their information system. These so-called enriched prior information (*informations préalables enrichies* – IPE) files are updated and sent to other operators after changes. For each premise identified, this file contains information such as the address identifier, the type of engineering, the number of dwellings, and the type of zone.

1.4.5.2 Fibre Optic Expert Committee

Created by Arcep, this panel of experts brings together people involved in the rollout of FTTH networks (operators, installers, manufacturers and standards bodies). Arcep is involved in so far as they act as the secretariat.

The Committee issues technical opinions on the rollout and use of FTTH networks and aims to establish a consensual technical reference framework to serve as a basis for the deployment and operation of networks. The panel's work focuses on the integrity and proper operation of networks as part of the mutualisation of the fibre-optic local loop, and on the interoperability of active equipment (optical connection nodes) and subscriber terminals.

1.4.5.3 Other working groups

Arcep's services also lead several working groups (WG) bringing together all FTTH operators (OIs and OCs) to develop and implement collective solutions. Arcep services moderate multilateral FTTH general meetings, as well as thematic working groups. Thematic working groups active with FTTH focus on:

- Quality of FTTH operations ("GT Exploitation");
- Completion of all final connections ("GT raccordement"); and
- Streamlining the process of changing operators ("GT fluidification").

Within these groups, players share the problems they encounter, propose experiments with the aim of improving the situation, and ultimately agree to generalize the best practices identified during these working groups.

[26] https://www.interop-fibre.fr

© 2025 Plum Consulting

1.5 Conclusion

In summary, the French regulatory framework for FTTH rests on 4 pillars as follows:

- An asymmetric regulation of underlying passive infrastructure (ducts and poles) imposed on Orange group as a significant market player in this market on the basis of Article 67 of the EECC;
- A symmetric regulation of access between the concentration point and the end-user[27] that obliges a reselling of passive fibre local loops, which must be priced reasonably;
- Long-term IRU access option that incentivize investments and creates genuine infrastructure competition; and
- Technical guidelines and recommendations with regards to sharing principles, that take into consideration economic conditions for deployment and operation with a distinction between very dense areas (ZTD) and less dense areas (ZMD).

This framework, in conjunction with the Plan France THD designed to fund deployment in areas deemed not commercially viable and ensure completeness in all lower density areas (ZMD) has encouraged private operators to limit overbuild and instead focus on expanding the overall footprint of fibre.

The topology of the passive network is one of point to point up to the concentration point (PM), allowing for the broadest technology and product design choices amongst commercial operators and future evolutions in service provision. On nearly all FTTH networks, regardless of who operates them, the four national commercial operators (as well as dozens of smaller regional players) offer their products.

The Plan France THD, the regulatory framework and the industry itself have fostered a culture of collaboration amongst market players which has allowed among other, fibre broadband offers to be available in rural areas at the same price they are sold in dense urban areas, a key benefit for digital inclusion in France.

[27] These regulatory measures are based on provisions of former Access and Framework directives that then inspired current Article 61(3) of the EECC

© 2025 Plum Consulting

2 Impact of the symmetrical regulation framework for FTTH

2.1 The European Union's key objectives for electronic communications

The European Union's key objectives for the electronic communications sector are established in a series of regulatory and policy instruments from the European Commission, the European Parliament and the Council of the European Union. These underpin the modernization of the telecom industry throughout the European Union. Central to this framework, is the Directive (EU) 2018/1972[28] which establishes the European Electronic Communications Code (EECC) and sets out updated rules for telecom networks, services and associated facilities.

The EECC came into force on 21 December 2018 and outlines general objectives in Article 3. These include the following:

- Promoting connectivity and access,
- Promoting competition and customer choice, and
- Promoting efficient investment and innovation in new and enhanced infrastructure.

The subsequent sections of this report assess the performance of the French market in relation to these objectives and provide insights on how the symmetrical regulation framework that has been implemented in France contributes to achieving the European Union's strategic goals.

2.2 Fixed connectivity performance in France

The first EECC general objective (objective a.) is stated as follows:

> "**promote connectivity and access to, and take-up of, very high-capacity networks, including fixed, mobile and wireless networks, by all citizens and businesses of the Union**"

2.2.1 FTTH rollout

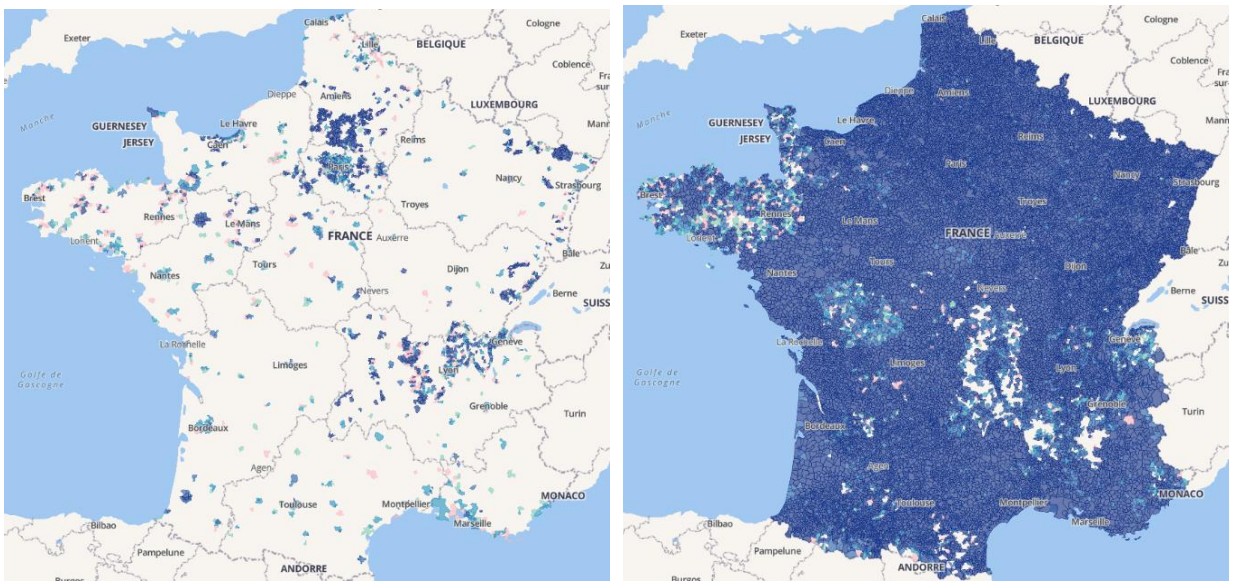
In France, FTTH roll-out was initially framed by regulation, before mass roll out occurred. Regulation promoted efficient investment through infrastructure sharing as opposed to overbuilding. The political initiative of the PFHTD built on this framework and aimed to accelerate and complete FTTH roll-out across the country by coordinating initiatives and especially by creating the conditions for public funding where necessary.

The Figure below shows how the coverage map has filled out between the end of 2017 and the end of 2024.

[28] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legissum:4379983

© 2025 Plum Consulting

Figure 2.1: FTTH coverage in France, Q4 2017 (left) and Q4 2024[29]



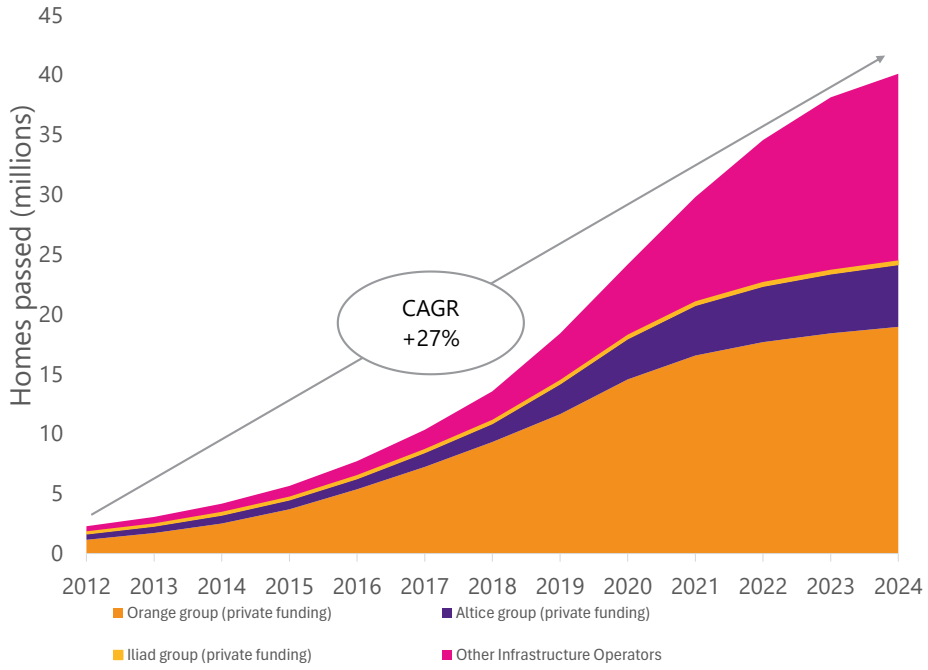
The Plan France THD, supported by the symmetric regulatory framework, has proven effective in driving fibre coverage expansion, as shown in Figure 2.2 below. Between 2012 and 2024, the number of premises covered by FTTH has increased by a CAGR (Compound Annual Growth Rate) of 27%, with Orange group leading the way, followed by Altice group and other OIs such as Altitude, Axione and Iliad group. As of end 2024, FTTH broadband service is available to nearly 40 million premises, accounting for 90% of all premises. As a comparison, the EU average for FTTP coverage at the end of 2024 was 69%.[30]

[29] Source: https://cartefibre.arcep.fr

[30] DESI 2025 (2024 Data). Note that the numbers in DESI might be slightly different to those calculated by Arcep. For reference, at the end of 2023, DESI reported 87.5% FTTP coverage in France.

© 2025 Plum Consulting

Figure 2.2: Number of premises passed by FTTH per infrastructure operator (2012-2024)[31]



In 2014, out of the 4.2 million premises covered by FTTH, 72% were in very dense areas ('ZTD'). Ten years later, the landscape has evolved significantly with a clear shift in rollout patterns across the different areas. ZTD have seen steady growth, with coverage from 3 million premises in 2014 to 7.4 million in 2024, a 9.4% CAGR.

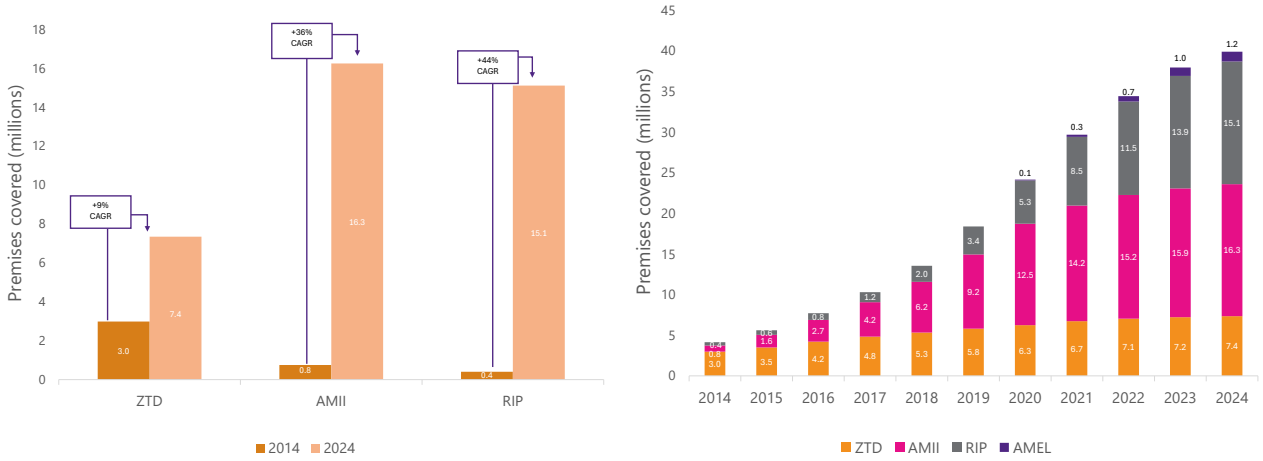
Part of the rollout in ZTD occurred prior to 2014. Since then, the bulk of rollout gradually shifted away from major urban centres to focus on less dense and more challenging areas. Since 2014:

- AMII (privately funded less dense habitat, generally Tier 2 cities and Tier 1 suburbs) areas have seen extensive growth (36% CAGR), going from 0.8 million premises in 2014 to 16.3 million in 2024; and
- RIP areas (partially publicly funded less dense areas) have also seen a significant FTTH expansion, increasing from 0.4 million premises in 2014 to 15.1 million in 2024 and account for the most rapid deployment area during this period with a 44% CAGR.

[31] Source: Arcep, 2025

© 2025 Plum Consulting

Figure 2.3: Evolution of number of premises passed by FTTH by type of area (2014-2024)[32]



The French government announced the aim to generalise FTTH coverage by 2025. With an effective coverage of 90% as of 2024, France is well on track to meet the EU's digital decade targets of universal Very High Capacity Networks (VHCN) coverage by 2030. It should be noted that the vast majority of the remaining 10% of premises not yet passed are accounted for in RIP contracts already signed and being deployed. Completion is a pre-condition of all commitments and contracts signed in ZMD, so generalisation in those areas will be achieved before 2030. In ZTD, the regulator cannot impose completion, but it is expected that the copper-switch off process[33] will lead to completion by 2030 anyway.

2.2.2 FTTH take-up

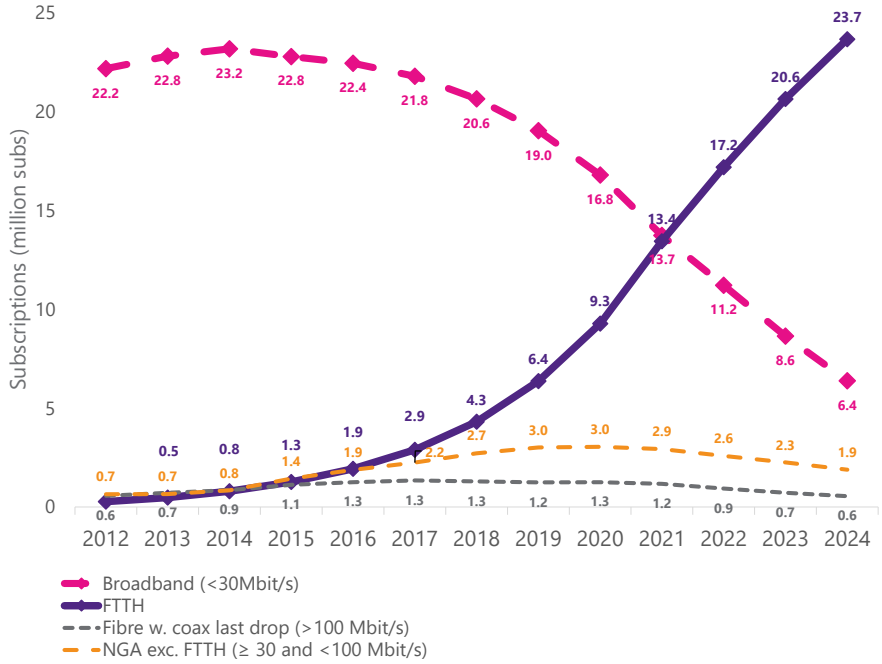
Over the 2012–2024 period, the overall broadband subscriber base in France increased from 23.7 million to 32.5 million. The most striking change lies in the rapid shift from copper-based broadband to fibre technologies. In 2012, FTTH accounted for just 0.3 million broadband subscriptions as opposed to 22.2 million subscriptions below 30 Mbps speeds (primarily ADSL broadband). By 2024, the number of sub-30 Mbps subscriptions has fallen to 6.4 million, while FTTH subscriptions soared to 23.7 million, marking an average annual growth rate of 45%. This trend clearly demonstrates the large-scale migration to FTTH, driven by the increasing deployment of fibre networks across the country and the growing consumer preference for high-speed subscriptions.

Meanwhile, coax-based services[34] above 100 Mbps, after having peaked at 1.3 million subscriptions in 2020 started to shrink as customers move over to FTTH. The main provider of coax-based services, Altice group, has announced the retirement of its coax plant.[35] Subscriptions in the 30 to 100 Mbps range[36] grew modestly, from 0.7 million to 1.9 million in the same period.

[32] Source: Arcep, Q3 2024 data
[33] The copper switch-off regulatory framework only allows copper switch-off in a given area where coverage has been completed, so even in the absence of an obligation to cover in dense urban areas (ZTD), the incumbent has a strong incentive to do so if they want to switch the copper plant off.
[34] Hybrid Fibre-Coaxial (HFC).
[35] Altice group have recently announced it would be shutting off coaxial services by the end of 2025 and migrating existing clients to FTTH (https://www.01net.com/actualites/sfr-coupe-cable-reseau-coaxial-disparaitra-fin-2025.html)
[36] These include VDSL2, fixed 4G, and other transitional technologies.

© 2025 Plum Consulting

Figure 2.4: Fixed broadband take-up by speed tiers (2012-2024)[37]



As of end of 2024, FTTH subscriptions accounted for 75% of all fixed broadband subscriptions. While there is no such data collected at European level, as a comparison we can examine the share of fixed broadband subscriptions above 1 Gbps. France is the European leader there, with 59% of broadband subscriptions above 1 Gbps in capacity, as opposed to a European average of 22%.[38]

2.3 Competition and customer choice

2.3.1 Market competition

The second EECC general objective is stated as follows:

> "**promote competition in the provision of electronic communications networks and associated facilities, including efficient infrastructure-based competition, and in the provision of electronic communications services and associated services**"

The French model for FTTH promotes competition on multiple layers:

At the retail level, there are four nationwide commercial operators in France: Orange group, Altice group, Bouygues Telecom and Iliad group. They are present on nearly all FTTH networks and altogether represent the overwhelming majority of FTTH subscriptions. In addition, there are dozens of smaller, sometimes local, commercial operators present on one or more wholesale FTTH networks.

Among these smaller commercial operators, multiple actors serve the business market. Thanks to wholesale bitstream offers, they have a nationwide coverage that allow them to address large multi-site customers. Other

[37] Source: Arcep, Q3 2024 data
[38] DESI – Share of fixed broadband subscriptions above 1 Gbps, 2024 (2023 data)

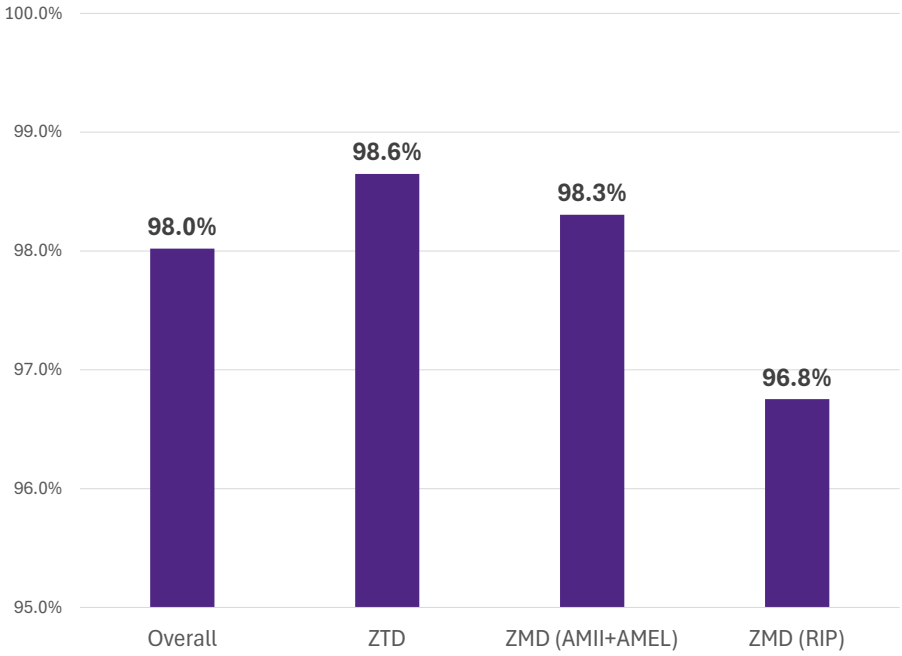
© 2025 Plum Consulting

players serve residential and business markets with locally tailored FTTH offers. National players also serve the business market although they tend to focus their marketing efforts on larger, multi-site clients.

As a consequence of this widespread availability of retail offers, FTTH customers in rural France benefit from the same choice and the same prices as those in urban areas. This is key both for bridging of the digital divide and for the commercial efficiency of national retail players who do not have to tailor their marketing to different locations.

The Figure below shows the proportion of FTTH lines where more than one commercial operator is available to the end-user. Overall, 98% of premises covered by FTTH have 3 or more commercial operators available to them. This proportion is slightly higher in very dense areas of the country and slightly lower in less dense and rural areas, although it's still close to 97% even there.

Figure 2.5: Percentage of premises covered where 3 or more commercial operators are available for FTTH service in 2024[39]



The framework has created multiple levels of competition both at the wholesale level and at the retail level:

At the wholesale level:

- Competition from co-investors at the passive fibre level who then resell passive FTTH offers to other retail commercial operators; and
- Competition from active wholesale offers powered and provided by wholebuyers of the passive wholesale offers.

At the retail level:

- National operators (who are also mobile network operators);

[39] Source: Arcep, 2025

© 2025 Plum Consulting

- Local and smaller national competitors focused on FTTH offers or offering FTTH in complement to other product lines (cloud services, IT services, etc.); and
- Local and smaller competitors focused on the business market.

Besides the impacts on availability, prices and market structure, the framework has led to a strong diversity in offerings, both in terms of speed ranges, price ranges and added value services. Offers including various flavours of TV Content, in-house IT services like Network Access Servers and home automation tools are just a few examples of what is available to French subscribers.

2.3.2 End-user pricing and Quality of Service (QoS)

Another EECC general objective is to:

> "**promote the interests of the citizens of the Union, by ensuring connectivity and the widespread availability and take-up of very high-capacity networks, including fixed, mobile and wireless networks, and of electronic communications services, by enabling maximum benefits in terms of choice, price and quality on the basis of effective competition, by maintaining the security of networks and services [...]**"

The market competition described above ensures that fixed communications end users have a wide range of choices among commercial operators and offers, ranging from 'low cost' to 'premium'.

Pricing

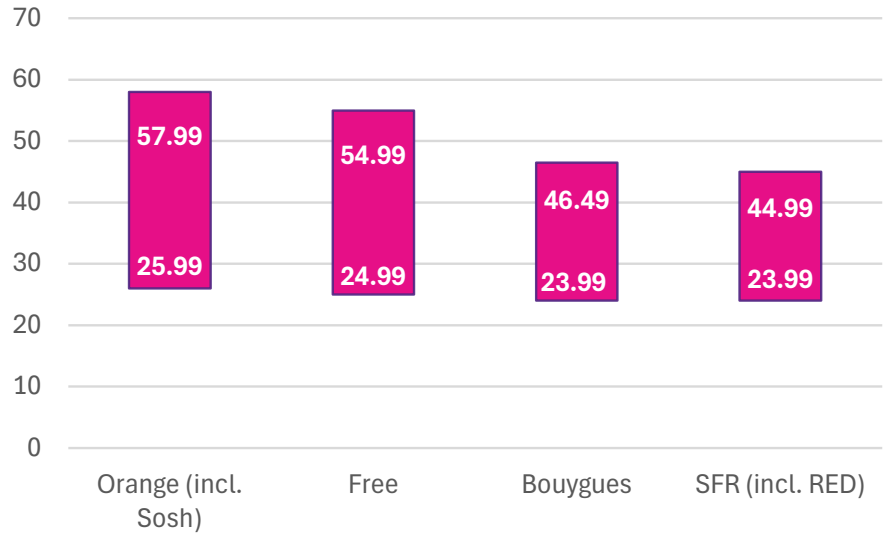
As shown in Figure 2.6, monthly retail prices for residential FTTH range between EUR 23.99 and EUR 57.99. Prices depend on three main criteria:

- maximum download and upload speeds (400 Mbps to 8 Gbps);
- whether the offer involves a 12-month contractual commitment or none at all; and
- the inclusion or not of TV services, and the number and nature of TV channels or VoD platforms subscription included.

All offers include the router (called 'box' in France) rental fee.

© 2025 Plum Consulting

Figure 2.6: FTTH residential offer retail price range by national commercial operator (EUR/month)[40]



Note : February 2025 prices. Source: https://fibre.guide/offres. Minimum and maximum prices for each operator have been calculated over 24 months, and include limited time promotions. Sosh (an Orange group brand) and RED (an SFR brand) have been integrated to Orange group and SFR data. Excludes connection costs. Since this graph refers to retail brands, we have kept the brand names rather than the group names.

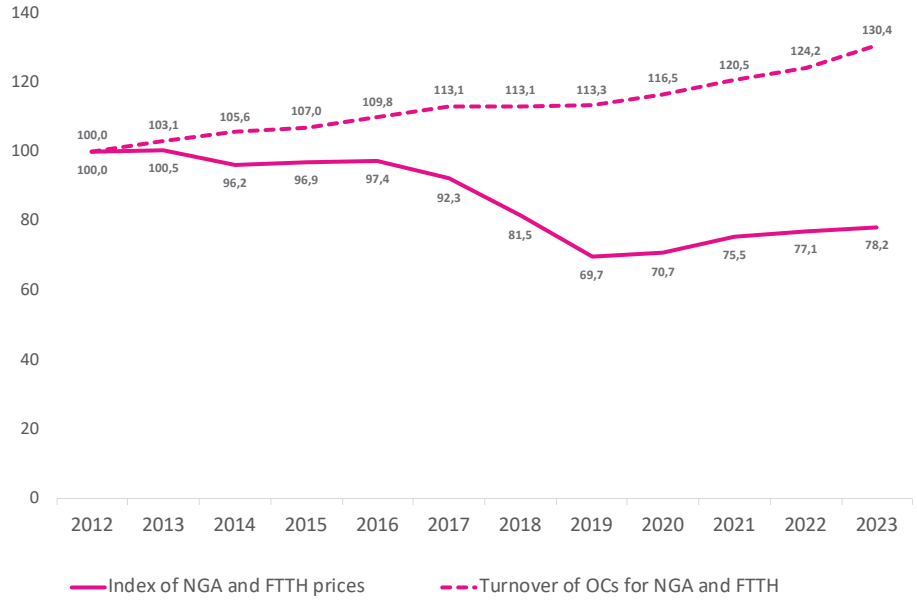
Driven by FTTH adoption and competition on the market, prices for fixed broadband offers in France have dropped sharply since 2017. As shows on Figure 2.7, the price index remains relatively stable between 2012 and 2016 before experiencing a noticeable drop from 2017 to 2020, reaching its lowest point in 2019. Since then, prices have shown a slight recovery but remain significantly lower than their peak levels.

Conversely, the dashed line representing operator revenues exhibits a steady upward trend over the years, despite the drop in prices. This suggests that telecom operators have successfully increased their revenue through factors such as higher subscription volumes, diversification of services, or improved efficiency, offsetting the decline in offers face value. These dynamics highlight the increasing accessibility of broadband services for consumers while ensuring profitability for operators.

[40] Source: Operator's websites, Plum Consulting

© 2025 Plum Consulting

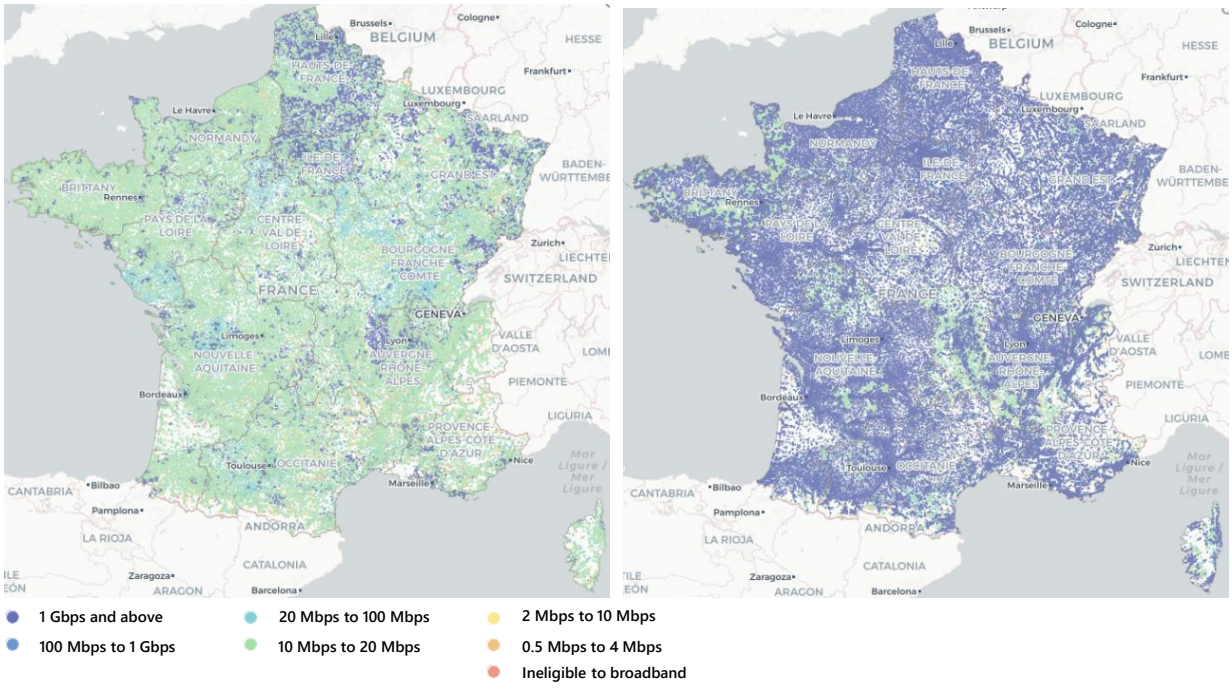
Figure 2.7: Monthly price index and total communication operator turnover 2012-2023 (base 100)[41]



Service quality and network faults

Because of the French market framework and the availability of passive fibre at a wholesale level, all FTTH lines in France deliver at least 1 Gbps peak download capacity (and more as technologies such as XGS-PON are being deployed). However, operators remain free to offer packages with lower maximum speeds.

Figure 2.8: Maximum download speed (Internet connection excluding satellite), 2020 and 2024[42]



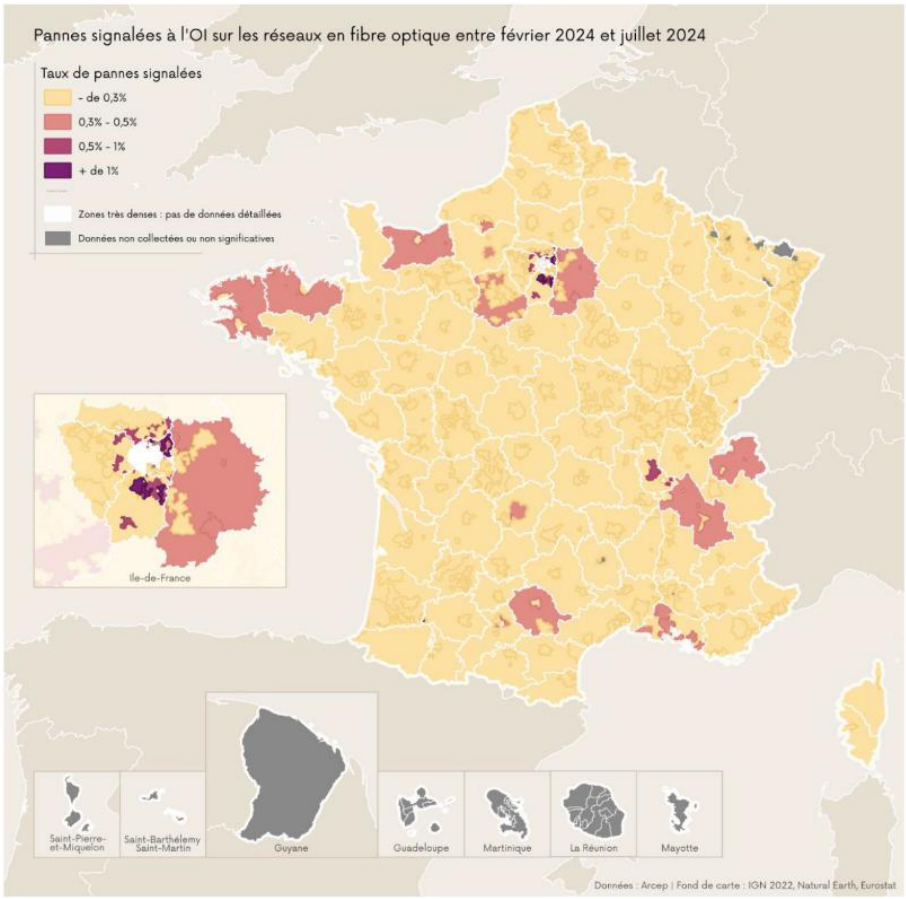
[41] Source: Arcep, 2025
[42] Source: Arcep

Arcep thoroughly monitors the quality of service on FTTH networks. This has been considered necessary for several reasons. When the initial deployments were made, broadband access was still considered as a convenience product. Over time, and especially after the COVID lockdown period, these networks became an essential facility vital to national interests. Furthermore, some quality-of-service issues, mainly related to the connection process, gained visibility at national level. The analyses completed by Arcep have shown that these issues are concentrated on a few well-identified individual networks, which are often those deployed before the regulatory framework was defined. Finally, it was important to ensure that the quality of service provided by infrastructure operators on their wholesale networks is in line with regulatory thresholds and their contractual commitments and allow commercial operators to deliver a satisfying service to end-customers.

As of 2019, Arcep put in place working groups with operators to resolve the identified difficulties, by improving the quality of work carried out by technicians on the networks with inspections and the correction of defects, and to retrofit the specific networks that due to their initial deployment conditions generate more incidents.

In addition, since 2023 Arcep has set up a network quality observatory to assess the long-term effects of actions taken. By publishing the findings, Arcep has made public which networks, and which operators faced the largest number of issues, incentivising the improvement. The observatory[43] analyses outage rate, end-user connection failures and connection process quality defects.

Figure 2.9: Rate of network outages over the period February-July 2024[44]



The monthly outage rate is defined as the number of outages (opened tickets) reported by OCs to the OI during a given month, divided by the number of fibre lines in service at the beginning of the month.

[43] Qualité des réseaux FTTH, Arcep.
[44] Source: Arcep

© 2025 Plum Consulting

2.4 Investment and innovation

Article 3 of the EECC also includes the fact that:

> **“The national regulatory and other competent authorities shall, in pursuit of the policy objectives referred to in paragraph 2 and specified in this paragraph, inter alia [...] promote efficient investment and innovation in new and enhanced infrastructures, including by ensuring that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, while ensuring that competition in the market and the principle of non-discrimination are preserved”**

2.4.1 Investment

As explained in section 1, the collaborative approach between commercial operators, government and regulator that enabled the French FTTH framework established a priori areas with higher or lower expected profitability levels, and therefore higher or lower degrees of sustainable network competition. This in turn means that while the scope of infrastructure competition vs. infrastructure sharing varies between these areas, investment is optimally directed to ensure coverage. Public investment is only allowed in RIP areas where no operator announced they wanted to deploy on a purely private basis.

By definition, this model makes investment more viable, and is one of the reasons infrastructure funds and other long-term investors have been keen to enter the French market. Additionally, while infrastructure investors see somewhat disappointing results in some parts of Europe due to limited revenue generation from networks deployed (due to lacklustre take-up), the dialog between all market players in France, and in particular OIs and OCs, has meant that all four national players are present on the large majority of networks, which in turn has driven adoption up. As a consequence, the revenue generation capability of French FTTH networks has been assured.

Between 2015 and 2024, private operators have invested close to 35 bn EUR in FTTH deployment.[45] From 2010 to 2024, in areas where public funding helps the deployment of FTTH (ZMD RIP), private infrastructure operators have invested a little above 9 bn EUR while public authorities have invested close to 13 bn.[46] Overall, this means that private funding accounts for at least 73% of the overall funding of FTTH in France.

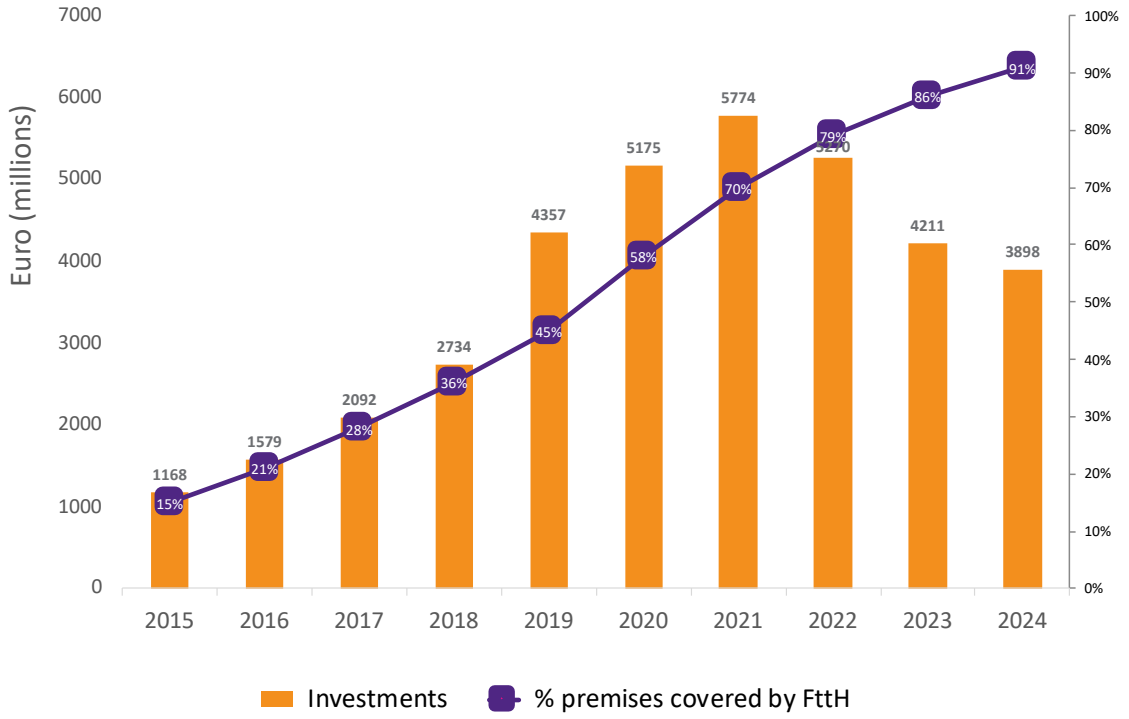
In RIP areas specifically, public funding represents 57% of the overall funding. Of that, 68.5% comes from local authorities, 27.2% from the national government, and 4.3% from European funds. It should be stressed also that ownership of the networks in RIP areas usually belongs to the local government initiating the project and (partially) funding it. The assets built therefore belong to the public.

Due to lack of public sources on both private and public investment in FTTH over the same timeframes, it’s not possible to calculate an exact average cost per FTTH premise passed. However, on the basis of existing sources, Plum Consulting estimates this number at around 1225 EUR as of end of 2024.[47] [48]

[45] Source: Arcep 2025
[46] Sources: Cour des Comptes, 2025
[47] Sources: Arcep, 2025, Cour des Comptes, 2025
[48] This is an imperfect calculation since roughly 62% of these homes passed are also connected. Therefore the 1225 EUR number includes the cost of home connection for 62% of the homes passed.

© 2025 Plum Consulting

Figure 2.10: Telecom operators' investments in NGA broadband in €millions and % of premises covered by an FTTH network (2015-2024)[49]



As Figure 2.10 shows, the investment peak occurred in 2021 for FTTH in France, and since then the annual investment, while still significant, is decreasing, even though the number of homes passed keeps increasing. This trend is expected to accelerate in the coming years as areas already in deployment come near completion.

2.4.2 Innovation in fixed networks in France

The model set-up in France facilitates network innovation. By ensuring access to passive fibre wholesale products, the model gives commercial operators the highest ability to innovate without any of the constraints imposed by an active bitstream or Virtual Unbundled Local Access (VULA) product. Also, by offering an underlying point to point topology all the way to the PM, the model does not dictate the technology used to deliver broadband services over FTTH. For example, while most of the operators have chosen point to multipoint technologies, at least one (Iliad group) deployed Point to Point in the ZTD. In addition, one retail operator initially opted for 10GEPON technology — an IEEE 802.3av standard supporting symmetric or asymmetric 10 Gbps — while other retail operators initially on GPON, later opted for XGS-PON, delivering 10 Gbps symmetric speeds.

Some infrastructure operators have chosen to develop innovative offers that have broadened the range of enterprise offers. Existing enterprise-grade offers with guaranteed repair times of 4 hours, built on dedicated fibres ("FTTO") or SDSL,[50] have been complemented by offers built on FTTH networks: FTTH with guaranteed repair times of 10 hours or 4 hours. Since December 2020, all infrastructure operators have to propose such plans in their wholesale offers. As a consequence, retail commercial operators have built new business offers, that are better suited to the needs of individual customer.

[49] Source: Arcep
[50] FTTO : Fibre to the Office – SDSL : Symmetric Digital Subscriber Line

© 2025 Plum Consulting

By comparison, in most other member states, wholesale access to VHCN, where it exists, is primarily active, meaning that innovation in products and services is constrained by the choices of the wholesale provider.

Finally, the success of the French framework in accelerating FTTH coverage has allowed for a well-defined short-term plan for copper switch-off, making sure that it will be carried out within a sure and predictable framework. When most other European Member States only have vague or no plans for copper switch-off, France can plan for its completion, ensuring that network innovation will happen primarily on the most suitable platform for such innovation, i.e. FTTH.

© 2025 Plum Consulting

3 Comparative assessment with other leading European countries

3.1 Introduction

In order to conform with European Commission terminology, this section uses the term FTTP while the rest of the report uses the term FTTH. In the context of this report, there is no significant difference in definitions.

As part of this study, Arcep have asked that a number of other European countries are considered, to look at the evolution of the market, examine the main features and identify what the main differences and similarities between France and those countries are. The seven countries selected for consideration are Croatia, Denmark, Germany, Ireland, Italy, Spain, and Sweden.[51] The idea of this examination is not to critique the regulatory approach adopted in those markets but for the study team to be able to look at the different results obtained in countries that have applied different regulatory regimes, in order to compare those results with the regulatory framework in France.

What is apparent from the work is that the range of starting points, the range of existing infrastructures and market structures were very different in each of those Member States and had a profound impact on the regulatory model chosen. Another element is that the targets being set by the European Commission evolved significantly over time with more modest "NGA" targets of 30 Mbps and 100 Mbps coinciding with a regulatory approach which put copper networks on exactly the same footing as fibre networks, the upshot being that many Member States took no action to facilitate FTTP deployment until much later.

In looking at these countries the authors consider how the markets performed since 2009. However, consideration is also given to the structure of the market at European liberalisation in January 1998 and whether they liberalised later (Ireland, Croatia) or earlier (Spain, Sweden) than the European liberalisation date. Key considerations relate to what infrastructures were available in the country, was there cable infrastructure, how strong a presence had the CATV network, what was the state of the copper network and how amenable that network was to upgrading to the various iterations of copper network evolution? Questions about the regulatory response, bearing in mind the targets of the day, are considered. It is particularly important to try to identify when or if a decision was taken to orientate the market towards a fibre-based network outcome.

What emerges in the analysis is a regulatory approach in France which performs very well in a European context given its starting point, one in which coverage growth is accelerating towards 100% coverage ahead of the 2030 deadline. Where France particularly stands out is in the area of take-up, where utilisation appears to be ahead of almost all its peers. This reflects two things about the French market, firstly that there is a competitive FTTP offering with retail prices being low in a European context and secondly, there is an overwhelming lack of alternative fixed connection options with both upgraded copper and CATV networks being much less performant.

France also stands out for its strong use of *symmetric remedies* in fibre regulation: all operators deploying fibre (not just the incumbent Orange group) are subject to obligations to share in-building fibre and from the network concentration point, ensuring open, non-discriminatory access for all commercial operators. The regulator, Arcep, sets and updates technical and economic access conditions. As a result of the symmetric remedies used, the network utilisation rate is approximately 55% compared to 21% on Spanish networks[52] for

[51] These reflect a cross section of FTTP leaders and FTTP laggards, small and large Member States, Member States with similar and dissimilar population disbursement patterns (reflecting a variety in terms of geography and population density) or which have (or have not) committed significant public funding to reach their deployment goals.

[52] 24.4m FTTP subscriptions in France with 44.6m lines deployed (54.7% calculated utilisation rate based on Arcep 2025 data for year 2024) vs 17m FTTP subscriptions in Spain with 80.4m lines (21.1% calculated utilisation rate based on CNMT 2025 data for year 2024)

© 2025 Plum Consulting

instance, however the symmetric remedies applied in France rely on the provision of the EECC to a greater extent than other Member States such that changes to the EECC may have an outsized impact on market outcomes in France compared to its peers. *Asymmetric remedies* are also used, especially for Orange group, regarding access to legacy infrastructure and wholesale business markets.[53]

The only comparator country that is as, or more, performant than France is Spain.[54] However, the Spanish model is characterised by considerable overbuild – something which caused a rapid deployment and equally competitive pricing to emerge and also a very high take-up rate. Further, there are higher operational costs associated with multiple networks and, also, a higher environmental cost. Whether that cost-benefit trade-off is worth it is beyond the scope of this paper. What is also apparent is that the current out-performance of even Spain is diminishing over time and France, which ranks amongst the first for coverage in EU27 today[55] and second for take-up and penetration[56] may well rank first on all metrics in the not-too-distant future.[57]

A review of the European markets shows that most Member States are converging on a similar approach to the treatment of FTTP.

3.1.1 Geographic segmentation

All the countries considered engage in some form of geographic segmentation of the market into densely populated and less densely populated areas. In France three zones are observed. In Italy[58] a three-zone model is laid out (similar to that described in the State Aid Guidelines[59]): Black areas have at least two NGA networks, are competitive and have lighter regulation due to market-driven deployment; Grey areas have only one NGA network, limited competition, and targeted support and regulation; White areas have no NGA and market failure, with public funding allowed and regulatory obligations focused on ensuring deployment.

Ireland and Spain simply opt for two zones; Spain divides municipalities into "competitive" and "non-competitive" zones based on the level of infrastructure competition. In non-competitive zones (7,453 municipalities), Telefónica must provide wholesale virtual unbundled local access (NEBA local) and fibre bitstream (NEBA fibre). Ireland[60] make a distinction between the area in which the NBI project is present and then the rest of the country.

Germany also views areas differently based on whether cities have less than 60,000 homes or more (although this is part of the assessment, the relevant market is national).[61] Croatia also has a national geographic market but applies different remedies depending on the level of competition.[62]

[53] For instance, in Spain infrastructure competition results in parallel fibres deployed up to the building, and only the in-building wiring is shared in most instances and those access provisions do not rely on the EECC. Where fibre access is shared, this is done based on IRUs with 20-30 year terms and not based on the EECC.

[54] A variety of data sources are used in this report. There are slight differences in methodologies and timing and hence outcomes.
DESI data from the European Commission report a given year (e.g. 2025) based on data from the previous year (e.g. 2024). Data is gathered for July via NRA datasets.
IDATE for FTTH Council Europe data is for the year indicated with data collected in September. This is collected directly from firms.

[55] France is first in the FTTH Council 2024 rankings and 6th according to the DESI numbers for FTTP coverage.

[56] According to the FTTH Council (ibid), DESI does not offer numbers on adoption.

[57] FTTH Council Europe forecasts see France first in deployment and adoption in 2029. See https://www.ftthcouncil.eu/resources/all-publications-and-assets/2046/ftth-market-forecasts-2023-2029

[58] See Dec. n. 459/24/CONS, Dec. n. 114/24/CONS , Dec. n. 82/19/CIR, Dec. n. 67/25/CONS (consultation)

[59] Guidelines on State aid for broadband networks (OJ C 36, 31.1.2023, pp. 1–42)

[60] Case IE/2018/2089-90

[61] Case DE/2020/2286: Wholesale central access provided at a fixed location for mass-markets products in Germany

[62] Case HR/2021/2295

© 2025 Plum Consulting

Denmark is somewhat more complex with 21 separate geographic markets based on the electricity distribution networks[63] while Sweden also does not adopt a national approach. Instead, PTS analyses competition at the municipal or even sub-municipal level, reflecting the fragmented nature of fibre ownership and deployment.[64]

3.1.2 Symmetric and Asymmetric remedies

All the countries considered make use of, or intend to make use of, a mix of symmetric and asymmetric remedies. Some of these aspects are not especially part of the telecoms regulatory framework, for instance some aspects regarding inbuilding wiring and the sharing of infrastructure can be part of the building code, which is particularly true for certain provision of the Broadband Cost Reduction Directive / Gigabit Infrastructure Act (GIA). In Croatia, for example, all operators deploying FTTH must allow technical and economic access and shared use of the terminating segment (in-building fibre up to the distribution point). There is also mandated access to passive telecoms infrastructure (ducts, poles) for all operators, supporting efficient fibre rollout.[65]

In Denmark, by contrast, there has been little symmetric remedies owing to the fact that fibre networks in Denmark have not been created as a gradual conversion of the copper network but are greenfield deployments by alternative players, often energy utility companies.[66]

In Germany, the Telecommunications Modernization Act (TKMoG, 2021) transposes the EU Electronic Communications Code (EECC) into German law and allows both Significant Market Power (SMP)-based asymmetric and symmetric remedies, and streamlines procedures for network deployment, including right-of-way and civil works. Deutsche Telekom must provide standard fibre wholesale products (including VULA and bitstream) under transparent and non-discriminatory terms owing to their SMP designation. While there is a higher degree of pricing flexibility on FTTP products, economic replicability of retail offers is tested to ensure fair competition.[67] The law also allows for symmetric access obligations without a finding of SMP for network infrastructure (e.g. access to ducts, etc.), supporting broadband expansion.

In Italy, Telecom Italia gave undertakings to share passive infrastructure[68] as part of a commitments agreement with the national regulator, Agcom. As Open Fiber has received significant public funding, it too has access obligations in line with the Broadband State Aid Guidelines.[69] Agcom has also imposed a series of asymmetric remedies on Telecom Italia, including on virtual access with a glide path to rebalance monthly fees for VULA to be equal over copper and fibre networks.[70]

In Ireland, the national regulator, Comreg, geographically segmented the virtual broadband markets into urban and rural areas.[71] The physical access market was deemed to be national in scope. However, over time, Comreg wanted to segment the remedies in the market to better reflect the market realities – remedies variation was preferred as the market boundaries were not considered stable over time.[72] There is remedy variation in the market to facilitate the deployment of FTTP on the basis of physical infrastructure access (PIA) sharing and

[63] Case DK/2021/2346
[64] https://www.analysysmason.com/contentassets/ef9ac1d42119403f9e273bd417a94faa/analysys_mason_ftth_regulation_scandinavia_oct2023_quarterly.pdf
https://www.mobileeurope.co.uk/eu-vetoes-swedish-proposed-wholesale-fibre-regulation-with-implications-for-other-eu-markets/
[65] https://circabc.europa.eu/sd/a/b2176be1-0e79-4b01-aacf-0a171416a2ba/HR-2021-2317-2319 Adopted_EN.pdf
https://mmpi.gov.hr/UserDocsImages/dokumenti/PROMET/Promet 6_19/Croatia-DESI2019-Telecom-chapter 11-6_19.pdf
https://mmpi.gov.hr/UserDocsImages/arhiva/Implementation_report2014_Croatia.pdf
[66] Case DK/2021/2346
[67] https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2024/20240717_Glasfaser.html
https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2022/20220721_BK3.html
[68] AgCom Decision n. 718/08/CONS, Annex 1, commitment 9.
[69] COMMUNICATION FROM THE COMMISSION Guidelines on State aid for broadband networks (2023/C 36/01)
[70] Dec. n. 114/24/CONS
[71] See market cases: IE/2018/2089, IE/2018/2090
[72] IE/2021/2344

© 2025 Plum Consulting

ComReg continues to define a national market consisting of telecom-specific physical infrastructure – namely ducts, poles and associated facilities such as chambers – that is capable of housing wired electronic communications networks. Due to its ubiquitous telecom-specific PIA network and the lack of an effective existing or potential rival PIA, eircom has significant market power in the national PIA market. As NBI receives extensive public funding, it too is subject to access remedies, as is Open Fiber in Italy. While Comreg has the power to impose symmetrical remedies under either the telecom regulation or the BCRD (and GIA once the legislation takes effect), Comreg has not applied symmetrical remedies to date.

Spain also uses a combination of symmetric remedies (e.g. for in-building wiring) and asymmetric remedies – while Spain splits the market into competitive and non-competitive areas where an extensive suite of remedies apply including for VULA (*Nuevo servicio Ethernet de Banda Ancha*, NEBA Local).[73] For the whole Spanish territory, Telefonica is designated SMP on a separate PIA market which enables extensive access conditions to be applied to facilitate parallel network deployments.

The Spanish approach is closest to the French model in some ways, where symmetric obligations apply to in-building wiring, up to the concentration point but also in the presence of SMP obligations on Telefónica (just as on Orange group in France) with respect to PIA. However, there are some very important differences – the symmetric fibre access from the concentration point in France is point-to-point to the end users home, and Arcep issues recommendations and opinions on the related to wholesale tariffs on a symmetric basis. Co-investment in France is based on physical infrastructure deployment – but in other EU countries, co-investment models are generally based on Indefeasible Rights of Use (IRUs) which last 20-30 years and which are often a form of virtual access over a shared infrastructure but can take other forms. In Spain, only the final drop at the building is shared and the network elements from the concentration point to the building is not shared in Spain.

An attempt to synthesise the principal regulatory measures in the selected countries is in the tables below:

Figure 3.1: Comparison of regulatory measures

Country	Symmetric Remedies	Asymmetric Remedies	Geographic Differences	Incumbent Obligations	Role of Public Authorities	Notable Features
France	Yes (for access to inbuilding wiring and the fibre between the concentration point and building)	Yes (Orange group for civil infrastructure)	Yes, three zones are observed.	Yes (PIA access obligations)	Strong (Arcep, strong public funding, centralised co-ordination, Local Authorities active in the most Rural Areas (RIP))	Sharing of a common infrastructure beyond concentration point.
Italy	Yes (access to inbuilding wiring and civil infrastructure)	Yes (TIM)	Yes, Italy[74] applies a three-zone model	Yes (NGA access, pricing)	Strong (multiple agencies, large scale public funding)	National registry (SINFI), public sector coordination.[75] Large scale Wholesale Only entrant.

[73] Decision adopted by CNMC on 24 February 2016 concerning the review of the wholesale broadband markets (market 3a, 3b and 4).
[74] See Dec. n. 459/24/CONS, Dec. n. 114/24/CONS, Dec. n. 82/19/CIR, Dec. n. 67/25/CONS (consultation)
[75] https://digital-strategy.ec.europa.eu/en/policies/digital-connectivity-italy

© 2025 Plum Consulting

Country	Symmetric Remedies	Asymmetric Remedies	Geographic Differences	Incumbent Obligations	Role of Public Authorities	Notable Features
Ireland	Yes (open wholesale access to civil infrastructure)	Yes (eir)	Yes (based on remedies)	Yes suite of remedies on eir (and NBI must offer access to all)	Strong (NBI, state contract is largest in EU)	State-backed NBI as wholesaler, minimum speed guarantees[76]
Spain	Yes (access to inbuilding wiring and civil infrastructure)	Yes (Telefónica,)	Yes (competitive/no competition zones)	Yes (wholesale access in non-competitive areas)	Regulator (CNMC)	Zonal approach, obligations lifted in competitive cities[77]
Sweden	Not very developed.	Yes (Telia, but under review)	Yes (municipal, and current EC push for more granularity)	Yes (Telia, but EC veto led to revised market analysis)	Municipal networks, regulator (PTS)	High municipal ownership, EC intervention on market definition[78]
Germany	Yes, typically apply to bottleneck infrastructure (e.g., in-building cabling, ducts, masts)[79].	Yes (Deutsche Telekom)	No (national targets)	Yes (access, net neutrality)	Strong (Federal ministries with significant public funding, BNetzA)	Prioritises commercial freedom, managed funding[80]
Croatia	Yes, for terminating segment (in-building) [81]	Yes (HT[82])	Remedies are geographically segmented	Yes	Strong (ministries, EU funds and national funds)	Weak rural coverage and take-up[83]
Denmark	Not very developed (some regional networks)	Yes (multiple SMP operators)	Yes (21 geographic markets)	Yes (13 SMP operators with obligations)[84]	Regulator (DBA)	Regional market approach, obligations on both incumbents and wholesale-only[85]

[76] https://digital-strategy.ec.europa.eu/en/policies/digital-connectivity-ireland
[77] https://www.cnmc.es/sites/default/files/editor_contenidos/Notas de prensa/2021/20211015_NP_Mercados BA_CO_eng (1).pdf
[78] https://digital-strategy.ec.europa.eu/en/news/commission-blocks-swedish-regulation-fibre-networks-requesting-detailed-analysis-geographic-markets
[79] https://www.dentons.com/en/insights/articles/2021/may/27/overhaul-of-german-telecommunications-rules-catalyst-for-digital-transformation-in-germany
https://www.cep.eu/fileadmin/user_upload/cep.eu/Analysen/COM_2016_590_2_Regulierung_von_TK_Netzbetreibern/cepPolicyBrief_COM_2016__590_Symmetrical_Access_Regulation.pdf
https://www.wik.org/en/publications/publication/no-350-symmetric-regulation-in-line-with-the-new-regulatory-framework-of-the-european-union
[80] https://digital-strategy.ec.europa.eu/en/policies/digital-connectivity-germany
[81] https://circabc.europa.eu/sd/a/b2176be1-0e79-4b01-aacf-0a171416a2ba/HR-2021-2317-2319 Adopted_EN.pdf
https://mmpi.gov.hr/UserDocsImages/dokumenti/PROMET/Promet 6_19/Croatia-DESI2019-Telecom-chapter 11-6_19.pdf
https://mmpi.gov.hr/UserDocsImages/arhiva/Implementation_report2014_Croatia.pdf
[82] https://circabc.europa.eu/sd/a/bfcb186f-933f-46e1-8735-1b57be13a5e4/HR-2022-2364%20Adopted_EN.pdf
[83] https://digital-strategy.ec.europa.eu/en/policies/digital-connectivity-croatia
[84] https://www.vatm.de/wp-content/uploads/2024/07/Regulierungsbehoerde_DBA-presentation-Fiberalliance-20240618.pdf
[85] https://digital-strategy.ec.europa.eu/en/news/end-depth-investigation-proposed-regulation-some-regional-fibre-networks-denmark

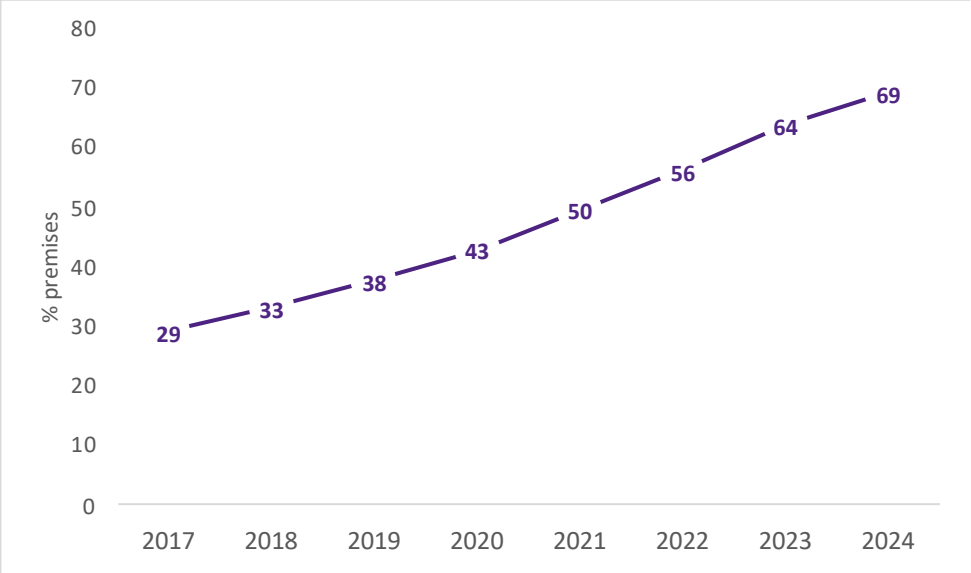
© 2025 Plum Consulting

3.2 Other Member States and their FTTP performance

3.2.1 Setting an FTTP objective

While it may seem obvious now that all Member States and the European Commission want to have FTTP deployed universally, that was not always the case. The European Commission outlined the levers that needed to be pulled to achieve FTTP in 2008 – it set these out in the first draft of its NGA Recommendation published in September 2008. That initial proposal would have seen entrant operators required to build out their own fibre networks in preference to gaining access to the incumbent networks, upgraded copper networks were to be disadvantaged compared to fully fibred networks.[86] This proposal was ultimately replaced by a continuation of a requirement for incumbents to grant access to their own NGA networks with equality of treatment for both upgraded copper and fully-fibred networks.[87] The European Commission reinforced the equal status of copper networks in 2013 with the publication of the Non-Discrimination and Costing Methodologies Recommendation[88] by making copper network upgrades equivalent to that of FTTP. It was really only in 2016 when the EECC proposal was put forward, adopted in 2018[89] and taking effect in 2020 that Europe saw a preference expressed for FTTP and its equivalents (effectively putting the original NGA Recommendation measures in the legislation). The results can be seen from the rate of deployment in Figure 3.2 below.

Figure 3.2: EU27FTTP Coverage 2017-2024[90]



Different Member States took different paths with respect to expressing a preference for FTTP. By 2009 some of the reviewed Member States, notably France and Spain, had already given a clear commitment to pursuing a transition to FTTP or at least enabling a transition to FTTP to take place. Others in that group, Germany, Italy, Ireland stayed very neutral on how networks might develop, seeing copper upgrades in their Member States as sufficient over any future time horizon, without the need for measures to enable large scale civil infrastructure

[86] Cave, M. and Shortall, T., 2011. The extended gestation and birth of the European Commission's Recommendation on the regulation of fibre networks. info, 13(5), pp.3-18.
[87] 2010/572/EU: Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA)
[88] 2013/466/EU: Commission Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment
[89] Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast)
[90] Digital Decade (DESI) visualisation tool

© 2025 Plum Consulting

sharing or an in-building fibre regulatory regime.[91] While other NRAs also adopted a neutral regulatory approach to how networks might evolve, in practice, there was strong support elsewhere in Government for FTTP (Denmark, Sweden where municipal network or utility networks, with or without tax breaks, were deploying FTTP). Though Croatia started its journey later (joining the EU in 2013) it too adopted a neutral approach about how networks might evolve.

Deciding early that a transition to FTTP was likely, meant that measures could be considered, developed and put in place before mass deployment took place rather than afterwards. This also impacted the nature of the measures adopted. That view on how networks might evolve informed decisions about whether to put in place measures to enable an early FTTP transition or not, and often depended on the state of existing infrastructures as much as regulatory practice. Hence, it is critical to understand the state of the existing infrastructures.

3.2.2 CATV network status and coverage

At the moment of full liberalisation (January 1998 in Europe), large differences were obvious in the Member States reviewed, with some Member States having no cable television (CATV) networks (Italy) while others had very extensive CATV network deployments (Denmark, Germany, Sweden).

In France, while CATV was part of the broadband landscape, it failed to really gain traction. In the late 90s, various smaller cable operators slowly coalesced through acquisitions into two large networks, Noos and Numéricable. In 2007, they merged under the Numéricable brand, then in 2014 Numéricable and SFR merged into the Altice group. While investment in the CATV plant continued in the 2010s, it was soon eclipsed by FTTH investment, and the Altice group had its own deployment commitments in ZMD to invest in. CATV adoption peaked in 2019 and has been slowly decreasing since. Altice group announced in the spring of 2025 that they were shutting down the cable plant entirely.

Spain had a very limited CATV network at the moment of liberalisation but one quickly emerged. Often, it was the traditional telecom operator who also owned the CATV network and so had conflicting views about its development. While some Member States effected a divestment more or less immediately (Ireland) others did so after some time (Germany, Sweden) while Denmark did not effect a divestment at all. Before selling its CATV subsidiary, Deutsche Telekom split that cable company into various regional operations which may have had the effect of limiting its impact on the market in the early years of broadband development.

The experience of CATV in the different markets was therefore very different – in Ireland in the period around 2009, the incumbent telecom operator struggled under a very heavy debt burden and failed to invest in its network to transition from ADSL to VDSL in the period leading up its bankruptcy (2012). This meant that the CATV network in major towns and cities had more or less a free hand in that market. In Denmark, the telecom incumbent also owned the CATV network and appeared to invest selectively at times in the CATV network (which was not susceptible to third party access).[92] In Germany, the CATV network underperformed in the broadband market in the early years and only had a significant impact on the market after a degree of consolidation and after significant investments were made (in the period up to 2016). The result of these differences could be quite dramatic in terms of the general performance of the Member States concerned.

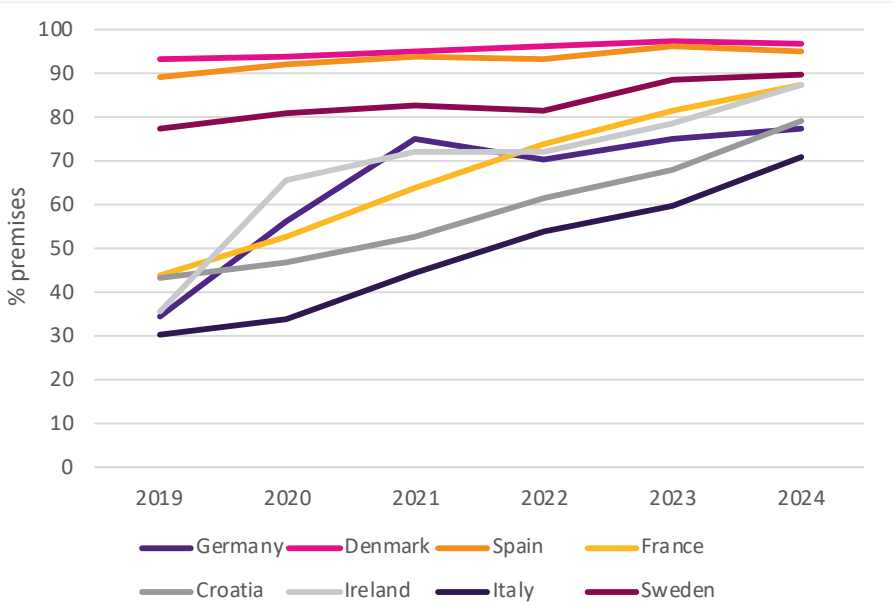
This can be seen in Figure 3.3 below tracking the performance of Member States. Germany (in yellow), which as mentioned saw a gradual consolidation and increase of investment in its CATV network suddenly jumped from last in the group to fourth and surpassed France's VHCN coverage when its CATV network was upgraded to DOCSIS 3.0. However, the footprint of CATV is not expanding and so that sets the upper bound in terms of

[91] The failure to co-ordinate early on in-home access means that in certain Member States such as Ireland, even though competing fibres pass a dwelling, there is often no, or very little, actual competition (unless homeowners are willing to allow multiple in-home deployments).
[92] Case DK/2008/0862: Wholesale broadband access in Denmark Comments pursuant to Article 7(3) of Directive 2002/21/EC1 Fn17

© 2025 Plum Consulting

VHCN reach. Equally, Denmark enjoys the highest VHCN reach, even more than Spain because Denmark has both widely deployed CATV and extensive FTTP coverage.

Figure 3.3: VHCN coverage 2018-2024[93]



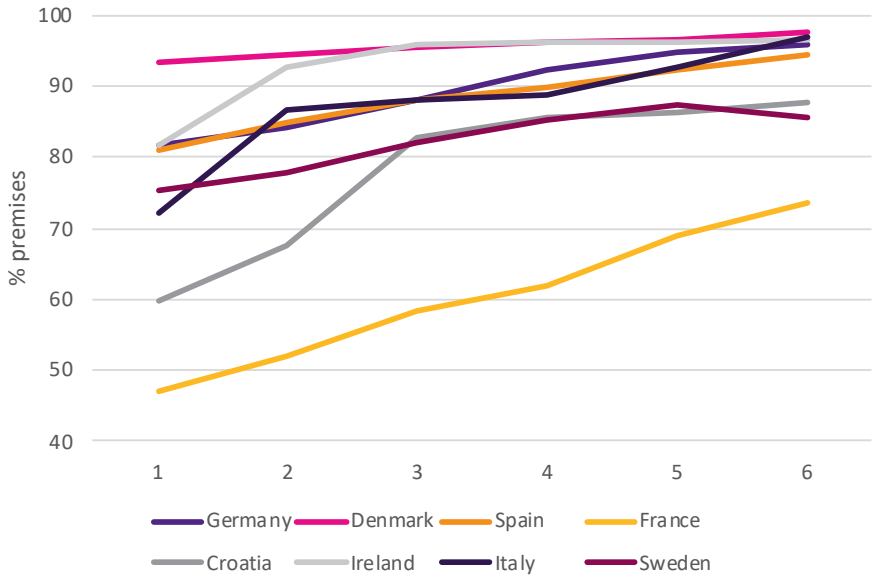
3.2.3 Copper network status and coverage

In fact, the most dramatic change occurred when the broadband targets were moved from NGA (a combination of 30 Mbps and 100 Mbps) to VHCN in 2020. Up to that point, most Member States were happy to report their network performance based on VDSL2 and VDSL2+ copper network upgrades. As can be seen at this time in figure 3.4 below, while Denmark continued to be top with 97.66% of households passed with NGA, Italy was second, with 97.01% coverage, Ireland third, Germany fourth and France last, with 73.66 % coverage and Sweden second last with 85.63% coverage.

[93] Digital Decade (DESI) visualisation tool

© 2025 Plum Consulting

Figure 3.4: NGA Coverage 2017-2022[94]



This is a key point in understanding the options and the regulatory paths pursued by the different NRAs in these Member States.

France could not upgrade its copper network because the copper network in France was characterized by very long loops and very long subloops. In contrast, Italy was characterized by very short subloops which meant that, because signal strength attenuates over distance, even ADSL delivered an outsized performance in that market and VDSL upgrades even more so. Ireland also had long loops but short subloops, while Germany and Denmark had not only short copper-loops, they also had extensive ISDN networks (where 2 or more twisted copper pairs were available in individual houses). This meant that in those countries, copper networks had the possibility to be upgraded to various iterations of copper upgrade technologies that were not available as an option in France or other Member States. When the targets were set at 30 Mbps and 100 Mbps, copper upgrades were deemed preferable by operators given the low cost compared to full FTTP deployments and perhaps preferred by National Regulators given the ability to reach targets quickly and without major regulatory interventions.

3.2.4 FTTP network status and coverage

When the focus shifted to FTTP the relative performance of the different Member States shifts again with, perhaps not a complete reversal of fortunes, but not far off. What is clear is that those Member States which took a decision on the likely need to upgrade to FTTP earlier and took steps to facilitate that transition, have performed best in achieving FTTP (France, Spain, Sweden). Spain set out a series of measures to facilitate deployment, setting out a symmetric access regime inbuilding wiring, asymmetric (cost orientation) access to PIA, etc. Furthermore, building regulations in Spain have made façade wiring possible, reducing the cost of connect multi-dwelling units. In terms of facilitating access to inbuilding wiring, the task facing Spain was considerably easier than in France for at least two reasons. Spain's housing stock is much younger than that of

[94] Digital Decade (DESI) visualisation tool

© 2025 Plum Consulting

France with 36% of Spanish dwellings built before 1980[95] compared to 78% of French dwellings.[96] In addition, almost 55% of French dwelling are individual houses[97] rather than apartments compared to 22% in Spain.[98]

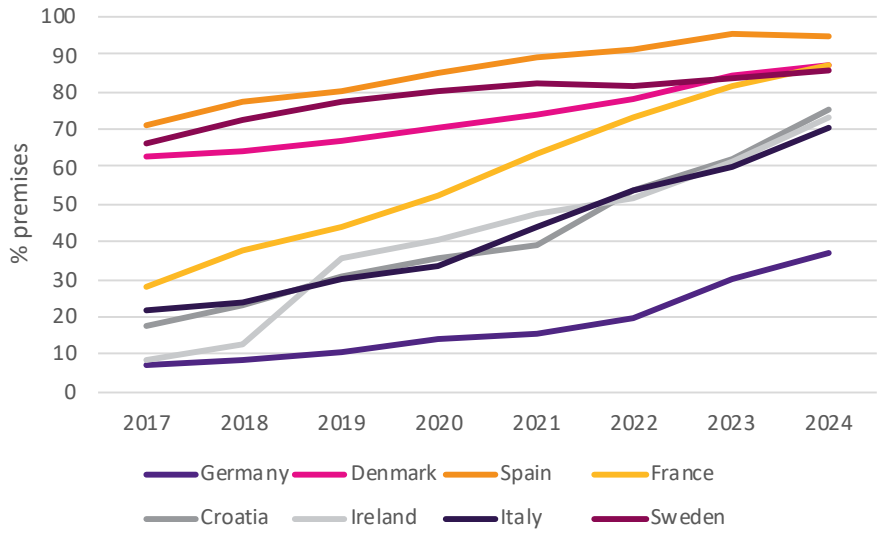
Those that committed to an FTTP strategy later, but with a coherent plan which often required significant public funding in rural areas (Ireland) have managed to accelerate their deployment and match or even overtake those with early deployments. Germany has only recently decided to move to FTTP, but not with any great conviction because it can continue to rely on its existing infrastructures to a significant extent given current levels of demand.

The lack of an alternative infrastructure in Italy was offset to some extent by large scale public funds and the entry of a partly state-owned wholesale-only entity which stimulated the market. Denmark was unusual given that the FTTP was driven to some extent from the outside in, with rural energy networks deploying first in rural areas, and then FTTP deployment moved into the cities and that caused the other network operators to react and deploy competing FTTP.

It should also be noted that, the Commission's NGA Recommendation and NDCM Recommendation mentioned earlier not only encouraged parity of treatment between FTTP and copper hybrid networks, there was an inherent assumption that it would be legacy copper network owner that would build the FTTP networks in time, with regulated access. Already in 2009, the approach in France sought to include all operators in a co-ordinated approach to deployment that actively encouraged all operators to invest in FTTP. While establishing processes that all operators could agree to took time, once in place this allowed a rapid deployment in France.

As can be seen in Figure 3.5 below, the rate of deployment is neither steady nor certain. While Spain has been the most performant in terms of deployment, it started earlier and has intense end-to-end infrastructure-based competition. Denmark and Sweden also deployed earlier and gradually – what is most impressive about France is the rapid pace of deployment achieved over the past seven years, moving from a distant fourth to a close second in the rankings. The rate of deployment in Italy and Croatia appears to be decelerating while Germany has started late and without great enthusiasm

Figure 3.5: FTTP Coverage 2018 to 2025[99]



[95] https://www.iberian.property/news/residential/from-2033-85-of-homes-in-spain-cannot-be-sold-or-rented-out/
[96] https://interactive.guim.co.uk/uploader/embed/2023/10/archive-zip-housing-stock-age/giv-13425HJ9NjxYaW71n/
[97] https://www.insee.fr/en/statistiques/8257763
[98] https://www.ine.es/ss/Satellite?L=en_GB&c=INECifrasINE_C&p=1254735116567&pagename=ProductosYServicios%2FINECifrasINE_C%2FPYSDetalleCifrasINE
[99] Digital Decade (DESI) visualisation tool

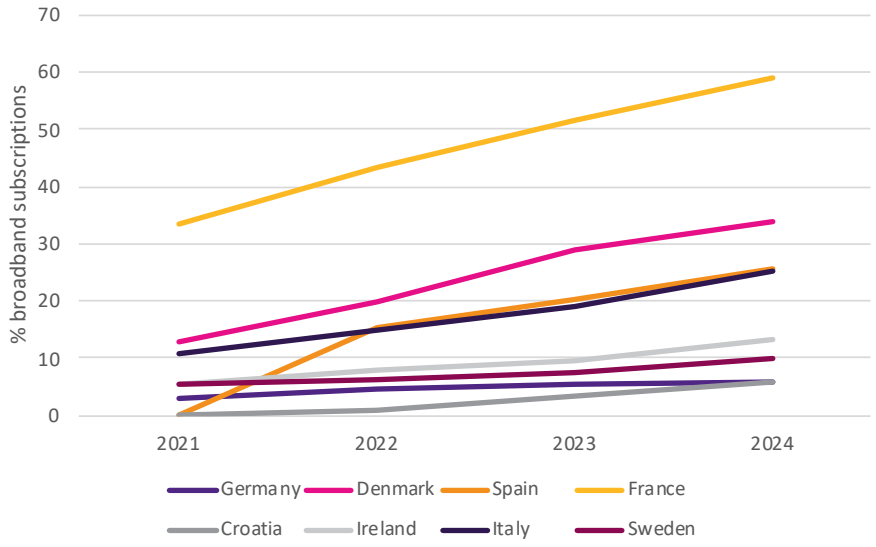
© 2025 Plum Consulting

3.2.5 FTTP adoption

A significant driver of the relative performance of deployment has been the take-up of FTTP-based offers. While the European Commission does not monitor or at least publish the take-up of FTTP where it is available, it does monitor subscription of 1 Gbps or higher and these reflect take-up rates taken from other sources. Figure 3.6 below shows that France has by far the highest take-up rate of all the countries considered, followed by Denmark and Spain with Croatia and Germany having the lowest rates.

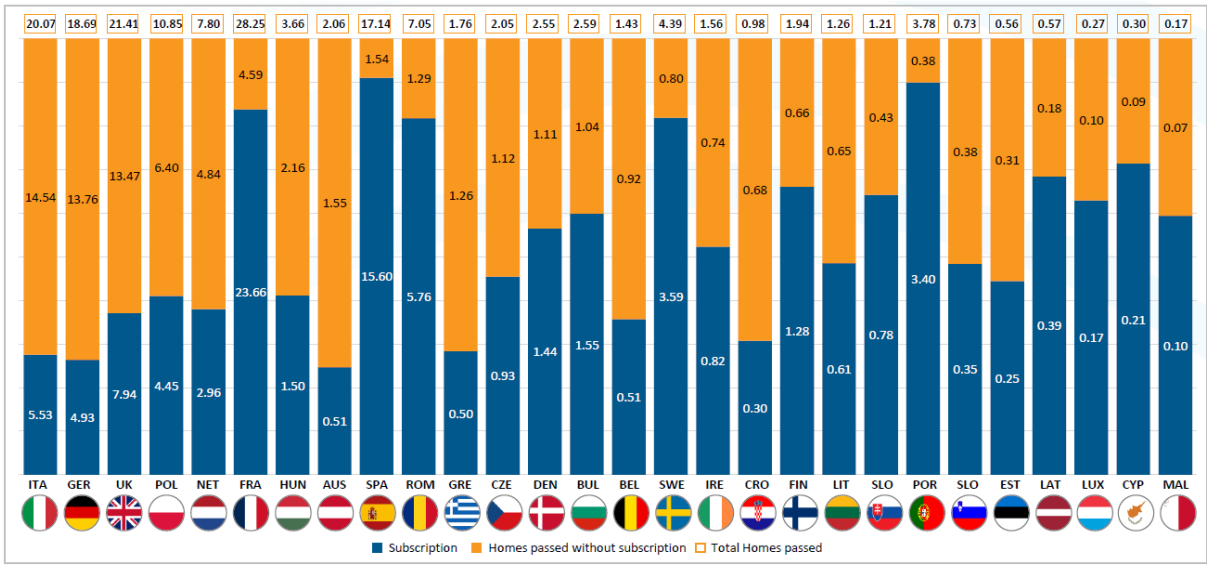
A similar story emerges looking at actual take-up rates as measured by IDATE for the FTTH Council Europe and shown in Figure 3.7 below. Based on this data, France together with Spain and Sweden (also Portugal and Romania who are outside the scope of this study) have an FTTP take-up rate far above any of the other Member States. Germany and Italy have two of the three lowest take-up rates in Europe which goes some way towards explaining the slow (and slowing) rate of deployment in those countries. In part, the high take-up rate of FTTP in France reflects the lack of viable alternatives – the situations in Germany or Italy are more complex. Looking back at the viability of either CATV or upgraded copper, end users that are happy with 100 Mbps may not be willing to switch. However, if that end user has demand for 100 Mbps, the technological options in France are very limited. In Italy and in Germany, there are more alternatives.

Figure 3.6: Share of fixed subscriptions >=1 Gbps[100]



[100] Digital Decade (DESI) visualisation tool

Figure 3.7: FTTP take-up in 2024[101]



Looking at the latest data for 2024 from IDATE for the FTTH Council Europe, France has achieved the highest coverage rate in Europe with the second highest take-up and penetration rate after Spain.

Figure 3.8: Coverage, take-up and penetration of FTTH/B in 2024[102]

Country	Coverage	Take-up	Penetration Rate
France	90%	84%	76%
Spain	89%	91%	81%
Sweden	87%	82%	71%
Denmark	84%	57%	48%
Ireland	71%	52%	37%
Croatia	66%	31%	20%
Italy	64%	28%	18%
Germany	42%	26%	11%

France's relative position continues to improve over time, but even allowing that Spain manages to maintain a lead in terms of its take-up and penetration rate, the French model has achieved these results with a network structure that has far less fibre deployed and far more active network utilisation (so less energy is used). In the Spanish market, network utilisation rates are as low as 20% end-to-end whereas in France, there is a very high degree of sharing and therefore, utilisation.

Another factor driving take-up will be relative pricing. Comparing prices across countries is notoriously difficult given different norms in package structures and pricing elements and so on. A study published by the European Commission in 2024 and conducted by Empirica[103] but using data from 2022, examined prices for a range of different packages controlling for various factors. The results show that France has relatively low prices with the

[101] FTTH Council Europe, 2025
[102] IDATE for FTTH Council Europe. 'Coverage' is measured as percentage of homes passed. 'Take-up' is the share of those homes passed with FTTH/B that have a fibre subscription. 'Penetration' is the share of total homes with a fibre subscription i.e. Coverage*Take-Up.
[103] "Mobile and Fixed Broadband Prices in Europe 2022" Study for the European Commission. VIGIE number: CNECT/2022/OP/0012

© 2025 Plum Consulting

second lowest price in the 200 Mbps-999 Mbps category and fourth lowest price in the 1 Gbps and above category. Prices in France are below the European average in all instances.

Figure 3.9: Retail prices for two broadband categories 2022[104]

Country	Price FBB4 200-999 Mbps	Price FBB5 >=1Gbps
France	€ 23,51	€ 31,36
Spain	€ 26,43	€ 27,11
Sweden	€ 25,09	€ 45,15
Denmark	€ 17,98	€ 22,01
Ireland	€ 33,26	€ 37,53
Croatia	€ 27,39	€ 31,97
Italy	€ 25,49	€ 25,49
Germany	€ 27,75	€ 36,01
EU Average	**€ 24,94**	**€ 35,17**

3.3 Conclusion

While the paths taken by the individual Member States are very different, what can be observed is that the relative performance of France, in terms of outcomes, is impressive. France has amongst the highest coverage and utilisation rates of FTTP in Europe and the second highest level of take-up. Factors which were in France's favour (though it may have not seemed that way at the time) is that the copper network in France was not amenable to more advanced upgrades. Once the network moved beyond basic broadband based on ADSL, FTTP was more or less the only viable option. The lack of a credible CATV network also made the decision to opt for FTTP obvious for all actors in the market. In markets where there were alternatives, such a decision was less obvious and indeed, the European regulatory framework first promoted the exploration of every other possible avenue to deliver fixed broadband connectivity. That realisation that large scale FTTP was likely, led to a series of measures to facilitate that outcome in advance of large scale FTTP deployments happening.

France had a high level of retail competition over copper based Local Loop Unbundling, more so than in a number of other Member States. Such competitive structures were preserved on fibre networks in France by ensuring that retail operators could share the most expensive part of any network (from the concentration point to the end user and especially the last metres). Even though there is generally only one fibre to each end user, there is strong competition by the largest retail providers competing by using their own network all the way to the end-user. While some other countries have two or three competing fibres passing a dwelling, the lack of co-ordination on in-home access, means that there is often no, or very little, actual competition in most instances.

The high degree of co-ordination conducted in France from 2009 meant that initial deployments were a little slower as that approach was bedded in, but it has accelerated in recent years and the approach is common across the dense urban, suburban and rural areas. Other Member States examined here have different approaches, with the result that competitive conditions and intensity varies to a much greater degree than in France where the geographic outcomes are essentially uniform.

The approach adopted in other Member States would not have worked in France for a variety of reasons. Achieving high-capacity broadband over existing infrastructures was not an option given the circumstances of

[104] Ibid

© 2025 Plum Consulting

the copper network and CATV network. Only FTTP was viable in France to deliver broadband, even at the level of NGA. Regulation came to reflect that reality and sought to facilitate and structure FTTP competition. The only other Member State examined with comparable infrastructure (in terms of ducting) was Spain – their regulatory approach had many similarities in terms of deciding on FTTP early, prioritising access to civil infrastructure of the incumbent operator but where it differed was in the level of co-ordination of deployment and infrastructure sharing – in Spain there was little or no coordination beyond the necessary standardisation measures. The result has been very positive and with a high level of end-to-end competition. However, that end-to-end competition means that far more network is deployed and not used in Spain than in France, which implies a much greater operational cost and environmental cost. Another feature of the Spanish market is greater variation in the level of competition by region whereas the conditions of competition are very harmonised across the entirety of the French territory.

To get to the results achieved, the remedies deployed in the Member States examined almost all use a combination of symmetric and asymmetric remedies with geographic variations. However, there are important differences in those remedies. All of the countries examined encourage infrastructure-based competition up to the building (either by deploying competing fibres or, in the case of France, physically sharing a single fibre) with varying degrees of success. Access to infrastructure enables that competition by relying on either asymmetric obligations (e.g. Spain) or symmetric obligations (e.g. Croatia). The symmetric remedies applied in France are not derived from the GIA, which to a large degree is the case elsewhere in the EU. More generally, while symmetric remedies are applied in many markets, their scope tends to be more limited than it is in France. Where competing infrastructures have been deployed or are being deployed, the absence of a regulatory framework will have less impact on the market (since those competing networks remain) than in France, where the market outcomes (and sharing of a common infrastructure) are much more dependent on continued regulatory supervision.

© 2025 Plum Consulting

4 Impact of various hypothetical regulatory evolutions

The aim of this analysis is to examine how the achievements of the French regulatory framework in terms of fostering a thriving and healthy FTTH market in France might be impacted by changes in regulation. The goal here is not to question how such regulatory changes might come to be, but simply to focus on if and how the FTTH market in France would be affected by such changes. We examine four hypotheticals as follows.

- **Hypothetical 1:** symmetrical regulation of the FTTH wholesale market goes away.
- **Hypothetical 2:** symmetrical regulation of the FTTH wholesale market goes away, but associated obligations are replicated (as much as possible) using asymmetrical regulatory tools and GIA.
- **Hypothetical 3:** the current symmetrical framework stays in place for wholesale FTTH, but the pricing guidelines are lifted; as a variant, the framework stays in place, but the completeness obligations are lifted.
- **Hypothetical 4:** symmetrical regulation of wholesale FTTH stays in place, but asymmetrical regulation of the PIA disappears.

In the following we will examine the implications of these hypotheticals for various market players and propose scenarios of what may happen and how it may play out.

A key consideration when looking at the implications of such a change in regulation is the importance of existing contracts. Contracts between infrastructure operators and commercial operators are single documents that cover both line rentals and co-investment. While the co-investment rights are guaranteed for 20 years and now entered in regulation to be renewed at a token cost (depending on the infrastructure operator) for another 20 years, these can be considered long term contracts. There is a legal question as to how much these contracts are tied to the regulatory framework, and some clauses may allow infrastructure operators to renegotiate or even annul the contracts should the regulatory framework change or disappear. The impacts are difficult to anticipate, and may range from minimal changes in pricing to full contract annulments.

In all likelihood, there would be a significant amount of inertia between a change in the regulatory framework and actual measurable impacts depending on who alters their behaviour, who contracts with whom and which type of contracts they have. In the sections that follow, we will more generally discuss impacts based on the assumptions that contracts are renegotiated or (in worst cases) annulled. In addition, it should be stressed that the very fact that contracts might be renegotiated will create a major uncertainty on the market and limit operators' credibility and mutual trust.

All of the hypotheticals developed below work in the context of a competition law backdrop. Should changes in the existing framework occur, particularly in its ex-ante aspects, competition law will act as a backstop down the line to egregious anti-competitive behaviour. However, competition law will only be a tool usable once anti-competitive behaviour has been established. Relying on these tools will take a long time, during which any degradation in competition, consumer prices, choices and other current benefits of the framework will take hold.

© 2025 Plum Consulting

4.1 Hypothetical 1: end of symmetrical obligations in the FTTH wholesale market

An end to the symmetrical obligations of the French FTTH regulatory framework would affect the following.

1. Infrastructure operators would no longer have an obligation to comply with requests from other operators to access their lines.

2. The pricing guidelines for wholesale FTTH would no longer apply, meaning in particular that (a) infrastructure operators would no longer have the obligation to price "reasonably", (b) infrastructure operators would no longer have to propose co-investment and (c) the pricing recommendations would become ineffectual.

3. The obligations made to infrastructure operators to complete private deployments in ZMD (AMII and AMEL areas) on the basis of Article L.33-13 of the CPCE would be threatened,[105] and possibly no longer applicable.

4. The obligations made to infrastructure operators to complete deployments in RIP areas of the ZMD on the basis of the regulatory framework would no longer apply (though some contractual obligations between OIs and local governments may remain in place).

5. The standardised architecture requirements to create concentration points (PM) of a certain size and to certain specifications would no longer apply. Going forward, OIs would be free to deploy in any way they see fit.

4.1.1 Implications

This hypothetical impacts primarily OIs, and it is important here to distinguish pure wholesale infrastructure operators and vertically integrated infrastructure operators.

Pure wholesale infrastructure operators would be free to increase wholesale prices for access to their networks, but their ability to do so is limited: on the one hand by the fact that they are committed by contracts currently in force that they would need to renegotiate, and on the other hand by the need to sell their access products. In all likelihood, these actors will try to renegotiate pricing in order to generate better margins, but are constrained by their need to sell: any price impact that would ultimately hurt take-up will hurt them too. Should their wholesale prices increase beyond a level that commercial operators find bearable, other solutions would emerge to partially or fully circumvent FTTH (4G/5G boxes, Fixed Wireless Access, Satellite, etc.). While an increase in prices is likely, it may be limited because of this need for wholesalers to sell.

In terms of pricing structures, it's unlikely that infrastructure operators of RIP networks would relinquish the possibility of up-front funding offered by co-investment, and therefore the current pricing structure is likely to remain in place. Moreover, they are not entirely free to define their pricing structure and levels, as the final decision ultimately lies with the local authority that initiated the network deployment. Similarly, they would have no incentive to stop selling just because the obligation no longer applies. They might consider the launch of retail brands of their own, but their ability to compete with established national brands would be limited.

Finally, pure wholesalers, since they are active almost exclusively in RIP areas only, are currently bound to completion in FTTH deployment due to both their existing contracts with local government and regulation. While

[105] Orange group's letter of commitment states the following: "These commitments are therefore proposed under the strict caveat of the pemanence of the aforementioned regulatory framework..." in Proposition d'engagement d'Orange sur ses déploiements de fibre optique jusqu'à l'abonné (FttH), datée du 11 janvier 2024. Altice group's letter of commitment states the following: "These commitments are therefore proposed under a caveat of the permanence of the current general framework for the deployment of FTTH." in Lettre d'engagement de SFR sur ses déploiements en fibre optique, datée du 28 mai 2018

© 2025 Plum Consulting

the latter would no longer apply, the former still would. They might have more leeway to not cover edge case premises that are either very complex or very expensive, but otherwise the impact on completion in the areas they cover are likely to be limited to new buildings should these not be covered in the initial contracts.

Vertically integrated infrastructure operators have a different set of incentives because they own a national retail brand. The end of the obligation to provide access on the network opens up the possibility of stopping wholesale altogether and become a monopoly provider on their own FTTH infrastructure. This could be done in privately funded ZMD areas (AMII / AMEL) by Orange and Altice group, and in ZTD areas where retailers are also building operators. This assumes there is a legal path to annul existing contracts under the justification of the shift in regulation.

In privately funded ZMD areas, such a radical shift in market structure would have a massive impact, (assuming contract annulments).

- Virtual elimination of at least two (Iliad group and Bouygues Telecom) if not three (including Altice group) commercial operators from the market, as the OCs with no network infrastructure of their own would be disproportionately affected due to their structural dependence on the dominant integrated operators, particularly Orange group, which alone accounts for approximately 50% of homes passed;[106]
- Possible emergence of overbuilding and/or wireless alternatives where viable;
- Likely price increase for retail offers in the absence of competition.

In ZTD areas – where overbuilding the in-building connectivity might seem comparatively easier and cheaper – such a change in regulation could lead to some competing infrastructure deployment. Such overbuilding might become significant in time, but would in the best-case scenario result in a patchwork as any new entrant would require authorisations from tenants' associations to install its cables. It would result in wasteful expenditure of capital, time and energy to deliver the same services as are currently available, in contradiction with the EU's goals to improve competitiveness through investment.

Furthermore, since internal conduits rarely exist in French buildings (because tenant's associations provisioned for a single fibre that they were told would deliver services from all operators to their tenants) there isn't any easy deployment path. Also, facade-based fibre deployment is generally not permitted in France. In this hypothetical, the guarantee of ongoing competition is unsure in ZTD and would in any case create a substantial disruption for consumers. It might normalise after a while, albeit with less choice and higher prices.

Even if vertically integrated OIs decide not to stop their wholesale activities, their newly found pricing freedom would likely have significant impacts on the market. Because they operate both on the wholesale and retail layers, Orange group and Altice group would be able to increase their wholesale prices in ZMD and reduce their retail prices accordingly, staying just as competitive on the retail market. Constrained by this margin squeeze, their retail competitors would be forced to either increase their retail prices (to reflect the increase in wholesale prices) or reduce their margins and therefore their profits. The only solution to address this issue would be to rely on *ex post* competition law procedure which would still be possible but lengthy. Moreover, the measures to correct market failure would only apply after significant degradation of market conditions have taken place.

One final impact of pricing freedom in ZMD in particular, might be that co-investment offers would disappear in AMII / AMEL areas as profit made from line-by-line access selling would be higher. This may not affect tranches of co-investment already contracted (depending on whether or not contracts can be and are annulled), but would in any case affect future tranches both in existing coverage areas and future areas.

[106] 47% as of T1 2025 according to Arcep's data published in June 2025 https://www.arcep.fr/cartes-et-donnees/nos-publications-chiffrees/observatoire-des-abonnements-et-deploiements-du-haut-et-tres-haut-debit/derniers-chiffres.html

© 2025 Plum Consulting

When it comes to completion, Orange group and Altice group have binding commitments in AMII / AMEL areas based on Article L.33-13 of the CPCE, but these would likely be voided[107] by the symmetrical regulatory obligations being lifted. In RIP areas, the flexibility for infrastructure operators regarding the extent of deployment would be more limited, as their obligation to cover all premises stems not only from the regulatory framework, but from contractual agreements with local authorities.

Commercial operators, while not directly impacted by the regulatory shift, would nonetheless be pressured in different ways to react to it. In particular, a partial end of wholesale in ZMD and ZTD would have massive impact on their ability to keep operating in the fixed business in areas where they are not themselves an infrastructure operator. Operators who chose to co-invest would be the less impacted since the long-term nature of their commitment would constitute a relative protection if contracts hold. Even if this end of wholesale scenario did not materialise, price increases at the wholesale level would impact commercial operators. Not only would this pressure increase retail prices and likely decrease take-up as a consequence, it would also spell the end of national uniform pricing strategies. Also, in RIP areas, some commercial operators might choose to exit RIPs on a case-by-case basis rather than absorb price increases. Finally, a number of processes that were established collaboratively by the industry on the basis of the regulatory framework, like the STOC model for home installations and the IPE files for fibre eligibility and technical information sharing would likely be in question as well.

Local governments would not necessarily have a lot of control over a change in the regulatory framework, but would likely be tempted to better ensure completion. When it comes to prices, they would likely be inclined to agree to reasonable wholesale price increases, especially in the context of RIP contract renewals. Some local governments already believe that wholesale prices must increase to secure the financial viability of the infrastructure operators.

Addressing these challenges would likely entail additional public funding. In such a scenario, questions may arise regarding the compatibility of further support with EU State aid rules, particularly if the overall balance achieved under the Plan France Très Haut Débit were to be called into question.

There would most likely be political consequences to the breakdown of the regulatory model: both the national government and local governments invested large amounts in building the FTTH network in a way that would benefit all. In particular, the goal from the start was to bridge the digital divide, and while that is on its way to success in the current model, it would be largely unattainable if the regulatory model broke down. The political furore could be significant, with constituents angry at their representatives, and themselves angry at the policy and regulatory powers, feeding an already prevalent sentiment of exclusion in rural areas, and widening the digital divide.

Investors would likely sour on the French market as a consequence of such a regulatory shift: the predictability that they value in the French model would be gone. This may have significant impacts over time as investment vessels in co-financing, that need to be refinanced on a regular basis would struggle to do so, and the remaining part of the country not covered at the time of the regulatory shift would see cost of capital increase significantly. Considering that the 9% that remains to be covered is likely the most expensive to deploy, an increase in the cost of capital there would have compounded negative impacts on the viability of public and private deployment.

These financial constraints would also undermine operators' capability to invest in network maintenance, ongoing deployment, and necessary infrastructure adjustments in response to housing developments. This would degrade network resilience, which in turn would further undermine investor confidence.

Collectively, these factors would contribute to upward pressure on retail prices.

[107] See note 85

© 2025 Plum Consulting

The **Regulator** would lose its power of arbitration for the specific questions related to access through dispute settlements. This is not insignificant as Arcep has, through a number of decisions over the years, contributed to shape the framework in a way that has significantly impacted its success.

The approach that until now was to incentivise, discuss and apply pressure, would necessarily shift toward an approach where Arcep would be much more direct and swift in imposing penalties. This more confrontational policy and the money spent on fines would reduce operators' investment in resources and finance for network deployment and operation.

4.1.2 Possible scenarios for outcomes

In this first hypothetical, we see two main scenarios for how things may unfold. They hinge primarily on the willingness of Orange group and Altice group (in AMII / AMEL areas) to keep their wholesale offers in place so that commercial operators other than their own brands could keep operating on their networks.

Scenario 1: Orange group and Altice group keep existing wholesale offers in place

In this scenario, the following is likely to happen:

- pure wholesale infrastructure operators increase their prices;
- vertically integrated infrastructure operators increase their wholesale prices;
- all infrastructure operators limit completion to areas that they see as economically in their interest, except maybe in RIP areas where contract would bind them on the medium term (though these areas represent only a minority of the total premises to be passed);
- copper switch-off might be delayed as its completion relies on the level of deployment and take-up; and
- the cost of refinancing increases, primarily for pure wholesale infrastructure operators and then for commercial operators who use co-investment.

The broader consequences on the market are likely to be:

- a significant increase in retail prices;
- the end of national retail pricing (different prices for the same products in different areas);
- a negative impact on take-up of FTTH (either slow-down of growth, or even decline, depending on the amplitude of the price increase) with a knock-on effect on the profitability of FTTH projects and therefore on the cost of investment;
- lower returns on investment, which would undermine refinancing capacity by deterring investors, thereby fuelling a vicious cycle of rising costs;
- coverage levels likely to peak at 93% and then slowly erode back down to 90% as some new builds are left unconnected;

© 2025 Plum Consulting

- a visible impact in specific geographies (most rural regions, oversea territories, etc.) where the risk of incomplete deployment and rising retail prices would be most pronounced; and
- increases in Orange group and Altice group retail market shares and profitability proportionate to their coverage.

As a result, while the impact of the regulatory shift in this scenario would not be existential (the model would prevail), outputs would definitely be degraded in terms of coverage (mild), take-up (significant), pricing (very significant), digital divide (significant) and competition (significant). This would have broad ranging implications for the digitisation of France as the rural/urban digital divide would start widening again. Politically, this would generate negative feelings towards the decision makers that led to this change, particularly from local politicians in rural areas most impacted by the changes. Economically, this would put France further away from digital decade targets, and lower the appetite for investment in the French digital economy.

Scenario 2: Orange group and Altice group pull out of the wholesale FTTH market altogether

Note that this scenario focuses specifically on these two OIs because they have the largest national footprints.

In ZMD, where Orange group and Altice group have large footprints, an exit of the wholesale FTTH market would have significant impacts with no short-term solution for competitors to stay in the market. In ZTD, where Orange group is the infrastructure operator for the vast majority of buildings, there would be similar impacts. GIA imposes sharing of passive infrastructure in-building, but most deployments were for a single fibre to each home, not for a riser that could be used by others. Building competing infrastructure there would not be trivial, and would require hundreds of thousands of new authorisations with tenant's associations.

Having said that, the scope of such an exit could be partial, subject to the solidity of existing contracts: if maintained, these contracts would guarantee access at least for the tranches of end-user lines already contracted to the signatory commercial operators.

In this scenario, the following is likely to happen:

- pure wholesale infrastructure operators increase their prices;
- vertically integrated infrastructure operators stop any wholesaling not already contracted and work to annul existing contracts;
- vertically integrated infrastructure operators increase their retail prices over time since they would be facing no significant competition;
- all infrastructure operators limit completion to areas that they see as economically in their interest, except maybe in RIP areas where local government contracts would bind them on the medium term (though these areas represent only a minority of the total premises to be passed); and
- the cost of refinancing increases significantly, primarily for pure wholesale infrastructure operators and then for commercial operators who use co-investment.

The broader consequences on the market are likely to be:

- a significant increase in retail prices;

© 2025 Plum Consulting

- a negative impact on take-up of FTTH (either slow-down of increase or decrease depending on the amplitude of the price increase);
- some impact on coverage, though small, as completion is no longer guaranteed;
- a visible impact in specific geographies (most rural regions, oversea territories, etc.) where the risk of incomplete deployment and rising retail prices would be most pronounced.
- emergence of overbuild with FTTH where viable and with wireless alternatives where not;
- an adverse impact on both the capacity and incentives to invest in network maintenance and operations, which would, in turn, affect the quality of service over time;
- a sharp decrease in fixed network competition, and likelihood of certain players exiting the retail market altogether; and
- down the line, likely cases against new monopolies under competition law or using other regulatory tools.

The impact on the market in this scenario would be existential as the competitive dynamics put in place since the late 90s in France would disappear in a few years after the regulatory shift. FTTH coverage would likely stay at the level it is currently at, but no longer increase significantly. Take-up will increase as the copper network is switched off, but not as fast and not as high as is currently anticipated in business models. Lower take-up will also likely impact the ability to maintain and renew network elements, which will impact quality of service down the line. Ultimately, retail prices would go up sharply but the quality of services of the networks would decrease. Furthermore, disparities between urban and rural areas would deepen, further exacerbating the digital divide.

4.1.3 Conclusions

Overall, hypothetical 1 – the disappearance of the symmetric framework – would have significant impacts on the success of the French FTTH market on all metrics it is currently measured on. Due to the inertia of existing contractual obligations, the impact would expand over time.

In the short term (1-2 years)

Most contracts would stay in place and the disappearance of the symmetrical framework would likely not have immediate measurable effects except a tactical increase in wholesale pricing through contract renegotiation within that period and a possible impact on new buildings in ZMD which would be slower in getting FTTH (or in some instances might not).

These impacts would likely not have immediate downstream effects on consumer and B2B retail prices and therefore limited effect on adoption.

In the mid-term (3-5 years)

Most contracts between retail operators and infrastructure operators – other than co-investment deals already signed – would likely have been renegotiated, and the subsequent increase of wholesale prices would be a lot more significant. This might lead to a margin squeeze scenario for commercial operators in areas where Orange group and Altice group are the infrastructure operators. Overall, this would lead to the end of national pricing at

© 2025 Plum Consulting

the retail level as input price disparities become too large to even out nationally. In turn this would increase the digital divide with higher prices and lower adoption of FTTH in rural areas compared to urban areas, and also likely increase the proportion of end-users switching to mobile only offers.

If Orange group and Altice group find a way to annul the existing contracts, it would furthermore have considerable impact on competition in the retail market with choice of retail offers very limited for customers.

In the long term (5-10 years)

If vertically integrated OI contracts can be annulled and this is the path taken by these OIs, there is now a significant impact on competition. In addition, new builds would likely not be fibered up (unless new models emerged where real estate would pay for FTTH connections in new builds.) Assuming that current deployment commitments are no longer met except in RIP areas, the peak of coverage would effectively be close to what it currently is, likely around 93% in a few years. After that, coverage would erode as new buildings emerge that are not connected by existing contracts. It is our estimate that coverage would diminish to around 90% in 5 years. The overall impacts in rural areas would jeopardise the public initiative networks (RIP) model.

All in all, hypothetical 1 leads to primarily negative outcomes, and the likely need for regulatory intervention through other means ex-post to remedy the lack of competition and probable recreation of local retail monopolies.

4.2 Hypothetical 2: end of symmetrical regulation in the telecoms framework, but obligations are maintained (as much as feasible) based on asymmetric regulation and GIA

An end to the symmetrical obligations in the FTTH wholesale market would have the same implications as in Hypothetical 1, except in this case the regulator would attempt to impose similar obligations through the tools of asymmetric regulation and GIA. Note that in this hypothetical we assume PIA continues to be regulated asymmetrically as it currently is. Our analysis therefore focuses on which parts of the symmetrical framework could be replicated and which could not. Here are how the existing obligations could possibly be replicated (or not):

1. Access obligations to FTTH can be replicated through asymmetrical regulation if significant market power (SMP) is demonstrated. While GIA has explicit access obligations to passive infrastructure it only mentions dark fibre in passing and it would likely not allow imposing access to dark fibre.

2. Asymmetrical regulation (if SMP is demonstrated) can be used to impose pricing guidelines for wholesale FTTH. If SMP cannot be demonstrated, pricing cannot be imposed and the regulator would likely lose its power of arbitration on pricing matters.

3. There are no regulatory mechanisms in asymmetrical regulation that can help impose completeness in deployments. The current completeness obligations in ZMD would disappear. Other tools such as universal service or state aid can help achieve complete deployments, but they would not be in the hands of the regulator, rather of the government.

4. There are no regulatory tools in asymmetrical regulation to impose standardised architecture requirements to create concentration points (PM) of a certain size and to certain specifications.

It should be stressed that the timing of such a change would be very relevant because the existence of the copper network must be taken into account if the change happens now, or soon, and would not need to be

© 2025 Plum Consulting

accounted for if it happens close to 2030. Our assumption is that the change happens now, and that this would trigger new market analyses immediately, irrespective of the current market analysis cycle.

4.2.1 Implications

In order to impose some of the current obligations through other means, Arcep would need to demonstrate SMP for the infrastructure operators it aims to impose these obligations on. The ability to do so relies on a number of key aspects.

A market definition that captures not only the reality of the current broadband experience but serves the purpose of targeting specifically FTTH. Issues around substitutability of other technologies – especially as copper and cable broadband should have disappeared by 2030 in France – should be considered. It's likely that these would have to be narrowly defined geographical markets.

- Considerations about prospects of market entry by alternative fibre providers, or possibly other substitutable technologies (recent developments in fixed wireless access may qualify some implementations as VHCN).

- Considerations about the number and size of geographical markets for the purposes of demonstrating SMP. This would be a complex exercise because it would need to take into account both the retail market situation in different geographies, and the possibility or likelihood of SMP being demonstrated on the wholesale level. In all likelihood, it would no longer be possible to operate under a national market definition.

Taking into account the above, it is likely that:

1. SMP could be relatively easy to demonstrate in RIP areas, since the infrastructure operator currently has a de-facto FTTH monopoly,[108] the prospect of entry within a reasonable timeframe is limited, and market share at the wholesale level would be 100%. This would likely necessitate a significant number of geographical markets to be considered, not necessarily one per RIP since multiple projects are owned by the same holding companies, but at least one per holding company and possibly more as retail market conditions may vary from one RIP to another. This would mean anywhere between 15 and 80 geographical markets.

2. SMP could likely be demonstrated in the rest of the ZMD (AMII and AMEL) as infrastructure operators have de-facto monopolies on FTTH provision in their respective areas, have 100% market share of the wholesale FTTH market, and it's unlikely that alternative infrastructure could be deployed in the immediate future. Different infrastructure operators' areas would have to be defined as geographical markets, but it's likely that different retail market conditions within those areas would impose more than just a few geographical markets to be considered.

3. SMP will be harder to demonstrate in ZTD, because while some retail operators (Orange group in particular) have a very high market share of vertical building access at the infrastructure level, the ability for someone else to deploy building access in the short term (at least in theory) would be hard to refute. We therefore anticipate that it might not be possible to impose obligations on access in the ZTD. There are provisions in the GIA that could impose sharing of the in-building infrastructure, but there is

[108] There may be some debate as to whether this is a natural monopoly or not. In RIP areas where deployment was only made possible due to public gap funding, it's likely that FTTH could be considered a natural monopoly. In privately funded ZMD, depending on habitat and revenue density, it may or may not be.

© 2025 Plum Consulting

very little such infrastructure in French buildings. The impact on competition would likely be severe in ZTD as a high proportion of buildings have incumbent Orange group as their building operator.

It should be noted that all of the above regarding demonstration of SMP is subject to the European Commission (a) agreeing to the market definition and geographical markets proposed by Arcep and (b) agreeing to the SMP designations. While this is also the case for the current framework, the multiplicity of market definitions and SMP designations would not only represent a much higher burden, it would also most likely result in a fragmented regulatory framework with different rules applying to different areas irrespective of how they are viewed in the current framework.

One major aspect of this hypothetical is that the regulatory burden on Arcep would be hugely increased, for less effective results than the current model delivers. Arcep would have to run dozens of market analyses, notify and defend them to the European Commission, and likely would need to hire personnel to do that. This would also trickle down to the market participants themselves, with OIs themselves having to devote significantly more effort to regulation than they currently do. As often in these cases, large players would likely find this cumbersome but manageable, smaller players might struggle to face the increased burden.

There is a huge amount of uncertainty in this hypothetical as to what can be replicated of the current framework and how. No matter what the outcome would be, the resulting framework would be patchy and rife with uncertainty, leading to negative impacts on the willingness to continue investing in French fibre infrastructure.

4.2.2 Possible outcomes

Assuming that Arcep managed to impose SMP on geographical markets as described above, obligations related to access to wholesale FTTH and pricing guidelines (or similes thereof) could be imposed on the ZMD as a whole. The one key aspect of the current framework that could not be imposed would be completeness of deployment in those areas.

In RIP areas, contractual obligations could be more stringent for infrastructure operators, but much as in Hypothetical 1, completeness in ZMD would likely not be achieved and the generalisation goal of the French government would not be met. Over time, coverage would plateau and then slowly erode as new builds would not be connected unless the operators were specifically paid to do so.

Other mechanisms could be envisaged to address some of the completeness issues, such as reinstating a model for universal service or creating additional state aid tools to ensure coverage, but both of these tools would not be in the hands of the regulator.

In ZTD, there would be a number of impacts due to the inability to impose obligations through asymmetric regulation:

For in-building sharing, GIA imposes sharing of passive infrastructure, not of dark fibre. This would make imposing network sharing in-building very complicated because deployment agreements between tenant's associations and infrastructure operators have allowed for the deployment of a single fibre to each home (to be shared amongst operators in the current framework) not of a passive riser that could be used to deploy additional fibres by other operators. A lot would depend on the solidity of existing contracts for co-investment, but generally speaking, it would be hard to maintain the current infrastructure sharing model.

For less dense areas in ZTD where horizontal FTTH is currently shared, the market would revert to a monopoly, with infrastructure operators (primarily Orange group) able to refuse access or impose whatever prices they wanted to commercial operators. This would be limited in scope geographically, but very impactful on price and competition in those specific areas.

© 2025 Plum Consulting

4.2.3 Conclusions

One key aspect of this hypothetical is that Arcep would try to recreate the conditions of the current framework using different tools. If successful, this would obviously mitigate the effects so in comparison with Hypothetical 1 the impacts are milder, at the cost of a hugely increased regulatory burden:

In the short term (1-2 years)

In the short term there would likely be limited impacts that would be perceptible at national level. The regulator would have to staff up considerably and initiate a large number of market analyses, which we would expect to happen primarily in this initial period. Operators in the market would also need to staff up to deal with the added regulatory burden. The subsequent timeframe assumes that the new measures would be put in place after 2 years, which is possibly overly optimistic.

In the medium term (3-5 years)

In the medium term, impacts would start to be felt:

- in the ZMD, where completion would start to suffer and coverage therefore, as in Hypothetical 1, would plateau as infrastructure operators arbitrate as to which premises to connect and which to leave behind; and
- in the ZTD where access to less dense areas would be problematic for some retail operators. In this initial phase we might start to see plans for overbuilding by some retail operators and/or plans for alternative wireless network solutions.

In the long term (5-10 years)

This hypothetical would in the long term deliver a model where FTTH would still be the predominant platform for broadband, with highly regulated monopolies in ZMD (assuming the European Commission agrees) and a slightly more chaotic model in ZTD with a mix of infrastructure competition and network sharing depending on where GIA could deliver the tools for impose access.

Overall, this would primarily impact coverage, with a plateau at around 95% probably, slowly eroding over time, and adoption, with alternative technologies (mobile only, FWA, satellite) eating into the FTTH share of the broadband market. The regulator would have to be much more present in market to ensure the outcomes do not drift too far from those of the current framework.

4.3 Hypothetical 3: end of completeness obligations and/or pricing guidelines in the current symmetrical model

Hypothetical 3 is less drastic variant of Hypothetical 1 where only aspects of the symmetrical framework disappear. We will examine two such aspects.

- The end of the completeness obligations: the obligations made to infrastructure operators to complete deployments in AMII and AMEL areas on the basis of Article L.33-13 of the CPCE would be in question, and possibly no longer applicable and the obligations made to OIs to complete deployments in RIP areas on the basis of the regulatory framework would no longer apply.

© 2025 Plum Consulting

- The end of the pricing guidelines: the pricing guidelines for wholesale FTTH would no longer apply, meaning in particular that (a) infrastructure operators would no longer have the obligation to price "reasonably", (b) infrastructure operators would no longer have to propose co-investment and (c) the pricing recommendations would become ineffectual.

In this hypothetical, the access obligations are maintained no matter which hypothesis is explored.

4.3.1 Implications

The detailed outcome described in Hypothetical 1 remains relevant for the two aspects that would be taken out of the framework here. In summary:

Completeness: taking the completeness obligations out would impact ZMD only since there is no completeness obligation in ZTD. It would mean that infrastructure operators no longer needed to cover 100% of the territory they are committed to, although in the case of RIP they would likely still need to cover 100% of the premises covered by the public-private partnerships (PPP) contract they signed with local government. In RIP areas, the impact therefore will primarily concern new buildings, the coverage of which may not be part of the existing commitments or contracts by default. Alternatively, real estate companies in charge of building and delivering these new premises (or the purchasers of said premises) could pay for them to be connected. There might still be a measurable impact on coverage though as end-users in these new builds might prefer to use satellite or mobile solutions rather than pay for FTTH. In AMII and AMEL areas the impact might be more significant as the sections currently not covered could simply be left unconnected by the infrastructure operators.

Pricing guidelines: the disappearance of pricing guidelines has more measurable impact as it would lead to a significant increase in wholesale prices, and likely to the end of national retail pricing as the input price disparity could no longer be evened out by retail operators. Increase in wholesale prices would particularly affect the ZMD and those retail operators that have chosen line rental over co-investment in ZMD. This in turn might impact adoption of FTTH at the retail level and consumers and businesses decide to rely on mobile-only due to an increase in pricing. Another potential impact in ZMD – in the areas that Orange group and Altice group cover – is the risk of margin squeeze, where the infrastructure operators would increase their wholesale prices but maintain their retail prices, forcing their competitors to either reduce their margins to compete or increase their prices to maintain their margins. The latter could have significant impact on the competitive landscape, even if competition law remedies would seek to prevent this in the longer term.

4.3.2 Conclusions

Taken individually, the elements that would disappear in this context have less impact that the overall removal of the symmetrical framework examined in Hypothetical 1. However, it should be noted that neither of these removals seem to lead to beneficial outcomes.

- The removal of the completeness obligations is comparatively the less impactful but likely to have a measurable impact on coverage in the long term. As above, we estimate that coverage is likely to peak at 93% in the short term, and erode back towards 90% over the longer term.

- The removal of the pricing guidelines is more impactful, from the short to mid-term (as contracts come up for renewal) and would lead to a likely end of national pricing, price increases in wholesale and retail, and a likely negative impact on adoption of FTTH.

© 2025 Plum Consulting

4.4 Hypothetical 4: current symmetrical regulation stays in place, but asymmetrical regulation of the PIA disappears

This hypothetical is substantially different from the three examined so far in that it does not focus on the current symmetrical framework, but rather on the asymmetrical regulation of passive infrastructure access (PIA) that underpins the French model.

As a preamble, it should be noted that the whole telecom industry is entirely dependent on the current PIA offer (GC-BLO) for access infrastructure. This hypothetical therefore examines the removal of a fundamental building block of the current regulatory framework.

In this hypothetical, we assume the asymmetrical regulation of the PIA disappears, and try to explore what might happen to the remaining aspects of the framework and whether the gigabit infrastructure act (GIA) as it stands can form a substitute or a backstop to the change in asymmetric regulation.

An end to the asymmetrical regulation of the PIA in the FTTH wholesale market would affect the following:

- the access obligation of the PIA would no longer be imposed by the asymmetric regulation, but GIA would be a substitute and allow for the obligation to be largely maintained;
- however, GIA does not allow for pricing obligations as detailed and defined as asymmetrical regulation currently does, and as a consequence, barring dramatic excesses in pricing which could be regulated against under GIA, Orange group would be largely free to price its PIA as it sees fit; and
- GIA also does not impose equivalence of inputs, so Orange group would be free under GIA regulation to treat its own infrastructure operator arm differently (presumably better) than it would treat other infrastructure operators.

4.4.1 Implications

This hypothetical is entirely about Orange group's choices in a newfound freedom to price and treat different clients differently.

The disappearance of the SMP regime would lead to an increase in PIA prices nationwide that would affect both ZTD and ZMD. In the absence of any alternative, and considering the amount of fibre already deployed in existing ducts and on existing poles, infrastructure operators would have no choice but to accept any price increases imposed on them. There are three approaches that Orange group could take should they wish to increase their PIA revenues, and these are not mutually exclusive.

- First, Orange group could choose to maintain the current pricing model which is per premise and simply increase the price per premise.
- Second, Orange group could choose to offer instead a model that is more geographically tied to network distances, which would then disproportionately affect ZMD and in particular RIP areas.
- Finally, Orange group could price based not on premises or distances, but on the basis of its own market dominance in various areas. This could allow them to optimise revenue across the whole vertical stack from PIA to wholesale fibre to retail broadband.

The freedom to do away with equivalence of inputs could also mean that Orange group would be in a position to prioritise its own infrastructure operator arm over other infrastructure operators for maintenance. This would

© 2025 Plum Consulting

lead to lower quality of service in RIPs where Orange group is the infrastructure operator and in AMII / AMEL areas where others are the infrastructure operator.

4.4.2 Possible outcomes

The end of asymmetric regulation on PIA would inevitably lead to price increases of the PIA, which in turn would impact the infrastructure operators, and through them the retail market. It would generate a price increase nationwide on broadband services.

If Orange group chose to do this price increase through a change in the pricing model to one more closely tied to distances, it would furthermore disproportionately impact rural networks and create a wide disparity in wholesale FTTH prices between rural and urban areas. This in turn would limit adoption of FTTH services in rural areas. It would have a negative impact on the economics of RIP infrastructure operators other than Orange group.

With higher input costs even for its own retail offers, Orange group could decide to keep its retail prices at their current level and become more competitive in the market (margin squeeze) or increase its retail prices alongside everyone else in the market and generate higher margins. In the first scenario, they would regain market share in the market and see their competitors dwindle, in the second they would earn more profit than their competitors could.

Finally, the potential differences of treatment between infrastructure operators in absence of an equivalence of inputs could mean that perception of quality of service in areas where Orange group is not the infrastructure operator would be degraded, with likely impacts on adoption again. In some parts of the ZMD, retail offers would be perceived as more expensive than they were for a lower quality of service.

4.4.3 Conclusions

This hypothetical being predominantly about the pricing freedom around Orange group's PIA, it does not take as much time to play out than the others. Orange group could adjust their pricing relatively quickly for PIA, with the impacts stated above happening pretty much in the short term.

The impacts would be an increase in retail prices for FTTH, the potential breakdown of national pricing if Orange group changes the pricing model of PIA, an improvement of Orange group's position in the retail market and/or an improvement of their profitability, and overall a slight decrease in FTTH adoption.

© 2025 Plum Consulting

5 Conclusions

Through a mix of ambitious public planning and funding, industry collaboration and a regulatory framework that set out to encourage coverage and network sharing, France has managed in a very short time to achieve very good coverage and adoption of FTTH broadband. Not only is this in line with the digital decade targets but it has propelled France amongst the European leaders in digital infrastructure.

The framework put in place and implemented by Arcep has allowed for a number of virtuous outcomes that feed off of each other to deliver positive results across the value chain from infrastructure operators all the way to consumers and enterprises:

- the focus on infrastructure sharing guarantees a high usage of assets, which makes the model profitable for infrastructure operators;
- regulatory clarity and stability mean that funding the French FTTH infrastructure has been comparatively easy and cheap as infrastructure investors are very keen to participate in French FTTH ventures;
- industry collaboration on norms, tools and pricing has become the default mode, which delivers virtuous outcomes such as the opportunity for national pricing, the participation of all major brands across nearly 100% of the FTTH footprint and swift installation and maintenance interventions for end-users;
- this effective implementation has translated into a commercial success, with a high take-up of FTTH broadband both on the networks of large national operators and on RIP networks; and
- the limited amount of overbuild nationwide guarantees that the model for FTTH deployment and adoption is one of the most sustainable in Europe.

There are still areas for improvement, particularly when it comes to quality of service, primarily on early FTTH PPPs that predate the Plan France THD and have yet to be brought to the modern standards of operation visible in more recent deployments.

This success was achieved in no small measure thanks to a resolutely ex-ante approach to fostering the market. Arcep relied on EU regulatory provisions to shape its regulatory framework in a way that would ensure symmetrical obligations were the norm. This, combined with an asymmetrical tool to ensure access to Orange group's PIA has enabled a model that proved to be incredibly effective, but is itself dependant on regulatory stability of the European regulatory toolbox that it is built upon.

As this report has shown, various evolutions in the regulatory framework, whether they are targeted and specific (lifting certain obligations) or more systemic (changing the framework) are not likely to deliver positive outcomes and would probably, if anything, slow down the ability of France to achieve its digital decade targets and commitments. Looking forward, the stability of the framework is what will deliver ongoing positive outcomes. The regulatory foundations of the French model anticipated a continuity for the life of the FTTH network, and it is this continuity that will keep delivering low prices and drive high adoption, both of which will generate the positive externalities that the infrastructure was anticipated to deliver. Looking abroad, we see many deployed FTTH networks with too few subscribers on board. The effort and investment in the French FTTH network were designed to generate revenue for the telecom industry, but also, and perhaps primarily, digital inclusion and economic growth. This is why stability remains the key to its continued success.

© 2025 Plum Consulting

© 2025 Plum Consulting Paris SAS, all rights reserved.

This document has been commissioned by our client and has been compiled solely for their specific requirements and based on the information they have supplied. We accept no liability whatsoever to any party other than our commissioning client; no such third party may place any reliance on the content of this document; and any use it may make of the same is entirely at its own risk.