



Rolling out FTTH in France

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WIK international conference

National strategies for deploying ultrabroadband
infrastructure: Experiences and challenges

Berlin,

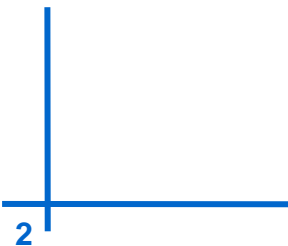
26 April, 2010



1. From broadband to ultrabroadband market

2. Regulating ultrabroadband

3. Conclusion

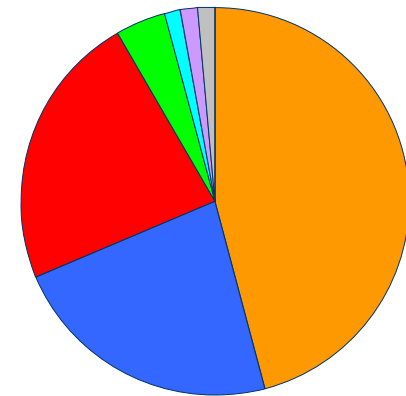


ARCEP worked to promote infrastructure-based competition in the broadband market.

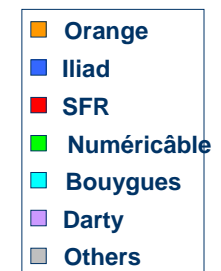
- Market dominated by DSL (94%) which covers 98.5% of households. Price of residential offers are among the lowest in Europe: €30/month for a triple-play bundle is standard (with TV/satellite used by France Telecom in non-unbundled areas, for example).
- The French market has a high penetration rate around 70% of households
 - IP telephony boom, accounting for more than 50% of traffic;
 - IPTV development (more than 8 million users);
 - as to theoretical speed, over 50% of the population have access to more than 10 Mbps and 75% to more than 4 Mbps.
- **Local Loop Unbundling has been the cornerstone of broadband regulation:**
 - It enables alternative operators to climb the ladder of investment and offer new services (VoDSL, TVoDSL);
 - It encourages infrastructure-based competition which is necessary to ensure lasting competition in the retail market, lower prices and innovation;
 - Bitstream is a complementary wholesale offer for LLU operators. Wholesale tariffs must give alternative operators an incentive to invest, to unbundle new central offices;
 - LLU coverage is still increasing (76% of households at the end of 2009) and expanding its footprint.

Despite concentration and a decline in growth rates, there is still a fierce competition

- Despite the sector's concentration, competition is still going strong:
 - since 2008 the three main operators have had a more than 90% market share, and France Telecom alone just under 46%;
 - even if the growing market is turning into a churn market, purchase rates vary widely;
 - new players (Bouygues, Darty);
 - diversity of the offers (quadruple play...).
- The declining growth rate (+10% vs. 28% two years ago) forces quality of service to become key to the market momentum.
 - Operators are expected to be offering the same Service Level Agreement (SLA) key performance indicators by mid-2010.
- Operators also working to improve quality of service:
 - at the wholesale level within multilateral groups;
 - at the retail level within multilateral groups to resolve unrequested ISP switching (slamming).



Broadband market share as of
1 January 2010

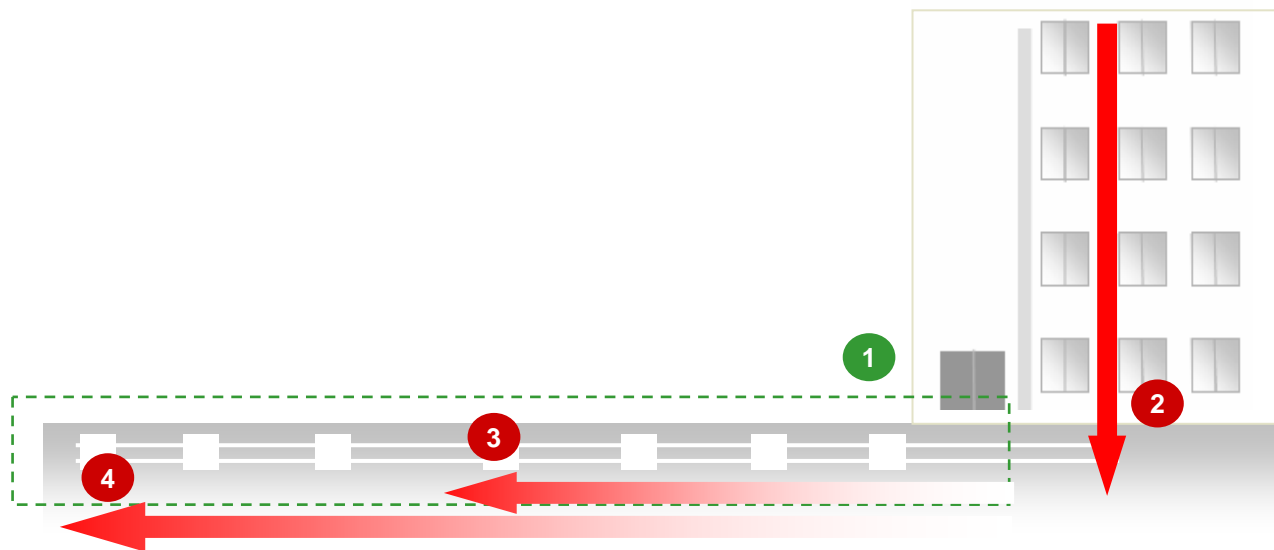


There is no single model for ultrabroadband network rollouts

- In France, broadband market competition is a strong driving force for NGA rollouts. Plus, the main telcos have decided to invest and compete in the ultrabroadband market, at least in very densely populated areas. Their objective is to climb the ladder to get as close as possible to customers, economically wise. The economic rationale is to have customers switch from copper to fibre and thereby transform OPEX paid for by the unbundled local loop to fibre CAPEX.
- The business model for NGA networks varies from one country to another, and even within the same country depending on:
 - the level of broadband market competition, which itself depends on the existence of a cable network, LLU and bitstream offers, and the quality of the copper network;
 - the geo-economic organization of the country (population density, distribution);
 - market share and additional income, particularly from content offers.
- And...
... access to existing civil engineering and network infrastructure sharing.

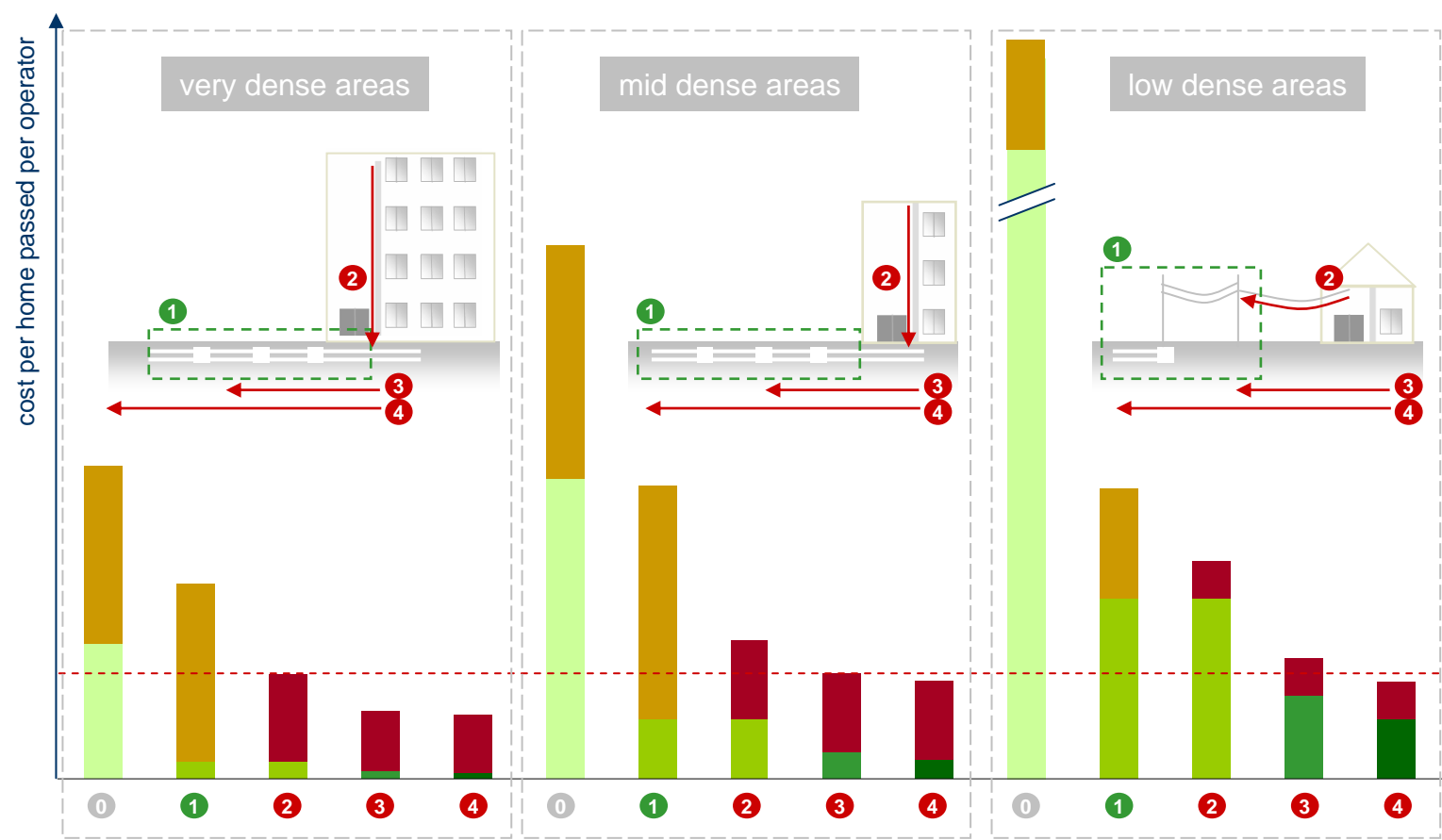
Access to existing civil engineering and sharing of networks can significantly alleviate the costs borne by an operator (1)

- 1 Access to existing civil works infrastructure (ducts, poles) is essential to stimulating investment in fibre networks by all operators:
 - in new installations, the cost of civil engineering can reach up to 80% of the total cost
- 2 Sharing the part inside the building of the fibre network is crucial to eliminate the need for each operator to install its own fibre in the same building:
 - it limits the costs per operator and the inconvenience of multiple interventions in the same building
- 3 In less densely populated areas, the “last mile” (further up the network) has to be shared so that all operators can connect to the building:
- 4 ...in sparsely populated areas the whole local loop could be shared from the optical distribution frame



Access to existing civil engineering and network sharing can significantly alleviate the costs borne by an operator (2)

- Illustration of the effects of the different sharing scenarios on the cost per home passed according to the area's population density:

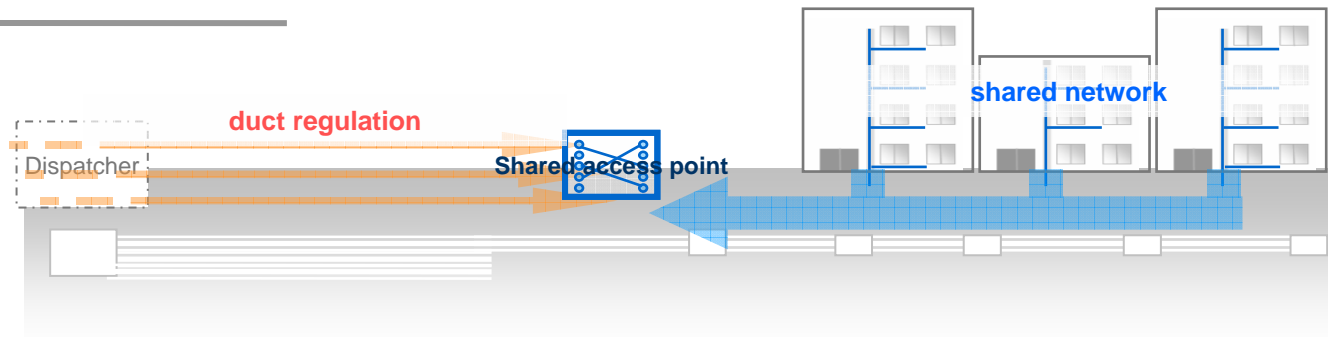


Objectives and tools for ultrabroadband regulation (1)

- Infrastructure-based competition must prevail over a significant geographic footprint, in areas where dynamic competition exists.
- ARCEP aims to enable operators to invest in ultrabroadband under equal terms, which means:
 - access to existing infrastructure, especially civil engineering which is the largest cost item;
 - sharing new investments, especially in the last mile of the network.
- Sharing the last mile allows:
 - operators to limit overall rollout costs;
 - only a single installation in buildings, instead of multiple ones by different operators;
 - the prevention of local monopolies;
 - customers to have a choice of ISPs for their very high-speed services.
- Three business cases for the fibre rollouts can be defined depending of the type of area:
 - very densely populated areas where it is economically possible for several operators to develop their own infrastructure till the customers premises (zone 1);
 - less dense areas where at least one private infrastructure is likely to be spread out in the next few years (zone 2) with a shared access point further up the networks;
 - sparsely populated areas where no broadband infrastructure exists and is unlikely to be developed in the next few years (zone 3).

Objectives and tools for ultrabroadband regulation (2)

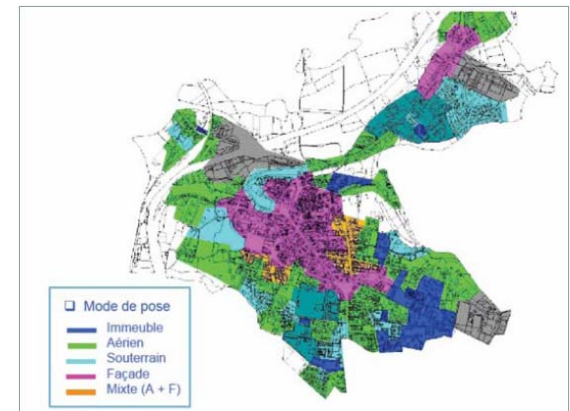
Complementary rollout tools



- Operators are not on an equal footing when it comes to accessing existing ducts:
 - France Telecom installs its fibre network in ducts it inherited from its former monopoly
 - alternative operators initially announced that their deployments would be limited to the most densely populated cities (such as Paris) where an alternative civil works infrastructure exists (i.e. sewer system in Paris, ducts belonging to the city in Montpellier)
- Having access to existing civil engineering, which is the main cost item (50% to 80% of the total rollout cost) is needed -> **regulation of France Telecom ducts**
 - In accordance with the market analysis decision of July 2008 (markets 4 and 5), France Telecom must provide access to its civil engineering under transparent, non-discriminatory and cost-oriented conditions.
- Access/shared investment in the last mile -> **sharing the last mile of the fibre network**
 - Adopted in application of Article 12 of the “Framework directive”, the Law on Modernising the Economy (4 August 2008) sets out specific rules for providing access to the last mile of very high-speed broadband networks.
 - ARCEP’s decision in 2009 defined these access obligations, in accordance with Article 12 of the Framework Directive and Article 5 of the Access Directive.

Objectives and tools for ultrabroadband regulation (3) The role of local authorities

- In recent years, municipalities have played a key role in the digital development of their regions and helped extend LLU coverage.
- Local authorities can help stimulate operators' fibre rollouts by:
 - carrying out field studies to identify best practices in infrastructure architecture and installation;
 - making civil engineering ducts and poles available for fibre deployments, plus equipment rooms for installing DSLAMs (NRO, etc.)
 - installing additional ducts during road work;
 - authorizing the installation of cables on the front of buildings, use of light engineering, installation of street cabinets, etc.
- Furthermore, the scope of involvement that local authorities are allowed depends on:
 - guidelines set by the European Commission on State aid;
 - the role of the "*Caisse des dépôts*" in the deployment of fibre;
 - the possibility of private-public partnerships with minority public funding for fibre rollouts.
- ARCEP encourages dialogue between local authorities and operators, notably during GRACO committee meetings

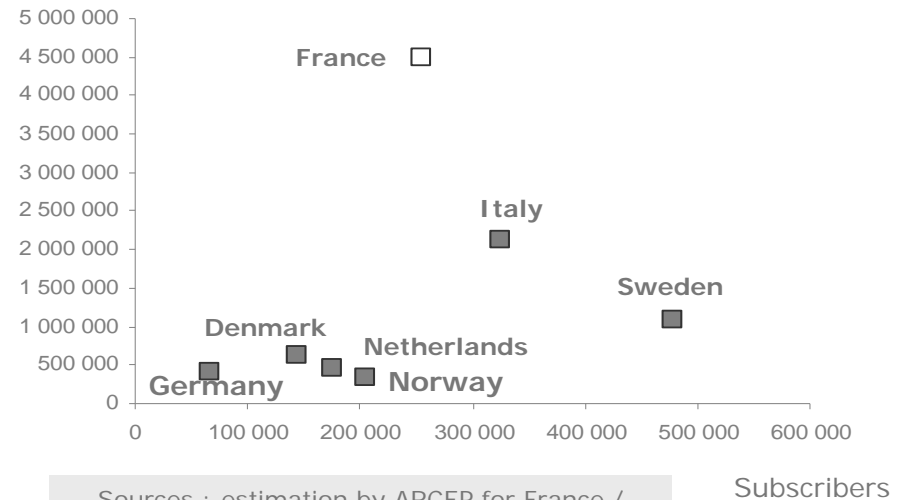


Preparatory study for the
"Manche Numérique" project

Snapshot of ultrabroadband in France (December 2009)

- The current rate of investment is around EUR 0,5 billion per year (2009-2010).
- The roll-out of the horizontal portion of optical fibre network has already started:
 - more than 4.5 million households are located close to a fiber optic network
 - 3.5 million households eligible for FttLA solutions (fiber with coaxial cable termination).
- The equipment of building with fiber is also progressing :
 - over 40 000 buildings equipped with fiber and connected to at least one operator (+11% Sept 2009)
 - 800 000 households (+ 8% Sept 2009) are located in these buildings and eligible for FttH offers.

Eligible households



Sources : estimation by ARCEP for France / estimation by IDATE for other countries

- The number of subscriptions is still limited however:
 - A total of around 290 000 subscribers all technologies combined: 220 000 subscribers with coaxial cable termination (FttLA), and 70 000 with fiber to the home access (FTTH).
- Market players have not yet begun sharing last mile infrastructure on a large scale:
 - In June 2009, 500 households have contracted a service provider who is different from the operator of the building (out of 10 000 eligible households).
 - **A clearer regulatory framework was needed to allow these figures to rise.**



1. From broadband to ultrabroadband market

2. Regulating ultrabroadband

- **Regulating access to civil engineering**
- Sharing the last mile of fibre networks

3. Conclusion

France Telecom has committed to enabling access to its civil engineering

- The Decision of July 2008 concerning market 4 requires France Telecom to provide access to its ducts:
 - at cost-oriented tariffs,
 - under non discriminatory and transparent conditions,
 - with a public reference offer.
- Multilateral technical work has begun, according to the key principles of engineering rules including optimization of available space and preventing the first entrant operator from pre-empting the available space.
- France Telecom must comply with these engineering rules and provide a reference offer.
- The process is still being fine-tuned before becoming fully operational.



Work being done on duct access pricing in France

- On 15 September 2008, France Telecom published a first reference offer setting the tariff for renting its civil engineering for FTTx rollouts.
 - The price set for FTTx deployments in France Telecom ducts was based on the surface area occupied in the ducts, and set by France Telecom at 3.7 euros/meter/cm².
- ARCEP held a public consultation on duct pricing from 17 December 2009 to 15 February 2010. This consultation aimed to identify:
 - the relevant method for dividing civil engineering costs between the copper local loop and the fibre local loop: the copper local loop accounts for €1bn a year. These costs need to be carried over gradually to the fibre local loop to ensure that FT recovers its costs over the long term, once copper cables are removed from the ducts.
 - the relevant method for pricing ducts for FTTx rollouts: civil engineering infrastructure is a scarce resource. So the pricing method applied needs to encourage limited and reasonable use of the ducts, e.g. by taking account of the amount of space that optical networks occupy.
- Following the first consultation, on 20 April ARCEP published a draft decision on duct pricing for consultation. The consultation will end on 20 May. This draft decision puts forward:
 - a method for allocating costs between the copper and optical local loops, based on activated retail market connections by technology, recorded in year n-2;
 - a pricing method for ducts based on volumes occupied by FTTx cables.
- With the proposed allocation, the tariffs for accessing ducts that are calculated using this method are expected to rise gradually as customers switch from copper to fibre, and will be especially low in the first years deployment (and most likely zero until the end of 2010).
 - Final decision on duct pricing is expected by the end of July 2010.



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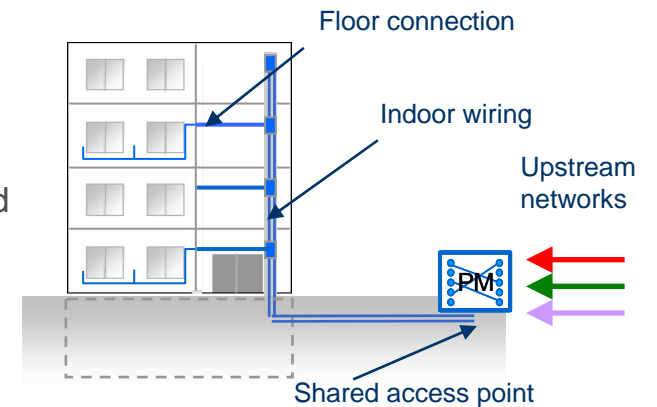
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- Regulating access to civil engineering
- **Sharing the last mile of fibre networks**

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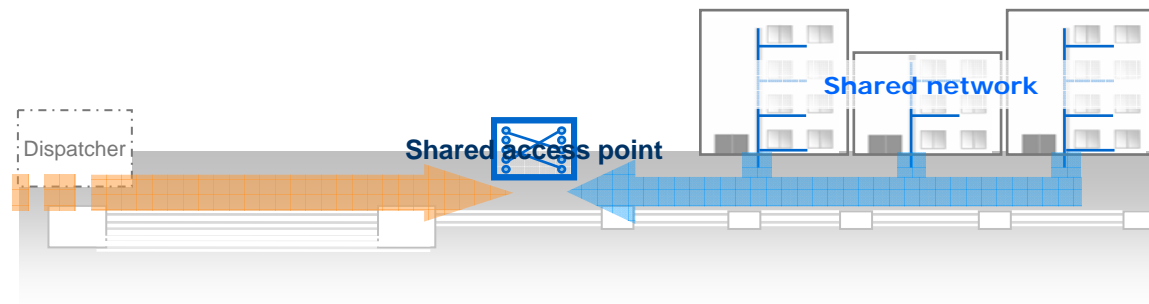
Sharing the last mile of the network

- To avoid local monopolies from forming, the Law on Modernising the Economy requires operators to share the optical fibre network they have deployed in buildings.
- This new framework comes with four dispositions:
 - inclusion of operators' proposals in part owner meetings;
 - creation of a "right of access" for fibre;
 - sample agreement between property owners/landlord and operators;
 - new buildings to be pre-equipped with fibre
- Sharing the part inside the building helps:
 - to limit the inconvenience to the building's residents of having multiple installations;
 - provide residents with a choice of competing ultrabroadband service providers, regardless of which is the building operator.



Two main issues to examine

- Location of the shared access point
 - this section of the local loop is the closest to subscribers and is difficult to replicate
 - the length of this section depends on local circumstances (e.g. density, type of building, etc.)



- Technical solutions for sharing
 - operators have different architectures which are not necessarily immediately compatible in a shared access point scheme
 - the objective is to make the co-existence of all technologies possible (PON and P2P)
 - operators have started to roll out different architectures in buildings, which vary in particular in the number of fibres installed per unit (single or multi-fibre)
 - little insight is currently available on optical network sharing, so trials have been deemed necessary
- Experiments were carried out with operators between January and March 2009 to test different architectures in buildings (single and multi-fibre)

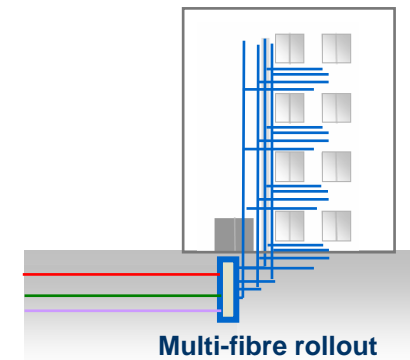
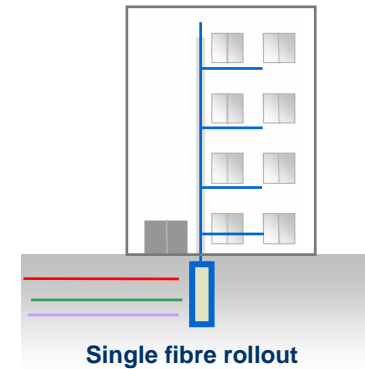
ARCEP has defined basic guidelines for installing fibre in buildings and practical sharing between operators

- In December 2009, ARCEP adopted a decision and a recommendation for setting the terms of sharing the last mile of optical networks in very densely populated areas where infrastructure-based competition is likely to exist. Key points include:
 - the shared access point may be located on private property if the building has more than 12 units, or if it is connected to visitable sewers;
 - if an operator so requests before the installation is performed, the building operator must install a dedicated fibre on its behalf, in which case the operators will share the cost of the rollout;
 - the building operator must provide access to its installation through a shared access point. It may be passive access, or active if four operators already have and use their own dedicated fibre
- ARCEP has identified very densely populated areas: 148 municipalities are concerned, representing 5.54 million households (more than half of which are outside the metropolitan Paris area), including 3.5 million which can be served immediately (buildings with more than 12 units).
- Experiments continue on the sharing conditions outside private properties in very dense areas (for small buildings with less than 12 apartments) and less dense areas.

Multi-fibre is beneficial to competition and for consumers

- Multi-fibre rollout has several advantages:
 - providers can own and operate their network end-to-end, whereas sharing a fibre leads to complex interaction between them;
 - operators can implement their own technology and differentiate themselves from the competition;
 - subscribers can choose from different offers, and churn costs should be reduced.

- Plus, constraints on the building operator appear reasonable, at least when the shared access point is located near or inside the building:
 - difference in CAPEX between single and multi- fibre rollout is limited;
 - OPEX expected to be reduced in a multi-fibre rollout, which is particularly important as the infrastructure will be used for several decades.



December 2009 decision includes a number of obligations applicable to all areas

- Access to the shared access point must be provided through a passive offer:
 - broadband market experience has shown that the existence of a passive offer (like LLU) is a guarantor of competition and innovation;
 - the decision states that the building operator must provide passive access to the shared access point;
 - in few cases, access may be provided only via an active offer when 4 fibres (per housing) have already been installed and are being used by other operators.
- The building operator is required to publish an access offer, which must specify:
 - the terms of the deployment of a dedicated fibre or of a flexible access point (cross-connection device);
 - the terms for accessing lines through a dedicated or shared fibre;
 - the terms for accessing associated facilities
- The building operator must provide prior information:
 - on buildings already equipped with a fibre network;
 - on the shared access points
- Tariff obligations:
 - the terms governing access tariffs must reasonable and comply with the principles of non discrimination, objectivity, cost-orientation and relevance.
 - WACC depends on risk and extends a risk premium to the building operator

The recent publication of co-investment offers by operators and of ARCEP guidelines paving the way for deployments

- In accordance with the rules defined in the December 2009 decision, the country's main operators (France Telecom, SFR, Free, Numericable, etc.) have published their wholesale offers for co-investment in optical fibre networks in mid-February 2010. These offers stipulate the technical and economical conditions for fibre deployments in buildings.
 - At this stage, operators are engaged in active negotiations on the terms of the contracts.
 - The first calls for proposals for shared investments were issued a few weeks ago and should be followed by effective deployments in buildings.
- At the same time, because operators may contact property owners on a large scale for the deployment of optical fibre in their buildings, ARCEP has published a guide for property owners/managers that explains their rights, the advantages of optical fibre and the installation process.
 - The guide (in French) can be downloaded online at:
http://www.arcep.fr/uploads/tx_gspublication/guide-fibre-conso-fev2010.pdf

Situation in less densely populated areas

- In less densely populated areas, the location of the shared access point further up the network leads to complex issues (definition of the size of shared access points, definition of areas, etc.). Arrangements for deploying fibre in other areas will be examined by new working groups involving all stakeholders, which will tackle the issues of coordination between players, sharing networks and investments, etc..
- ARCEP will complete the regulatory framework before the end of 2010 with the adoption of a second decision which will apply, in particular, to less densely populated areas.
- Moreover the French government wants to implement a national "very high speed" programme. This programme is intended to facilitate the deployment of very high-speed networks throughout the country, notably using fibre optics:
 - It is geared, first, to stimulating investments outside of very densely populated areas where rollouts have already begun. Through open calls for projects for each region, the plan is to grant labels together with arrangements for loans or guarantees. Second, the programme intends to provide support for local authorities' projects, by means of State financial aid.
 - After having received the opinions of ARCEP and the Competition Authority, this programme will be notified to the European Commission and is due to be launched in July 2010.



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Conclusion

- We expect to see the rate of fibre equipment increase substantially in 2010/2011 thanks to shared rollouts that will begin in application of the first ARCEP decision of December 2009 . The publication of access offers by operators, in accordance with this decision, marks the true onset of shared FTTH rollouts.
- French President Nicolas Sarkozy recently announced the goal of covering the whole of France with ultrabroadband by 2025 (and at least 70% by 2020).
- When announcing the national "very high-speed" programme, French Prime Minister Francois Fillon announced that the country would invest EUR 4.5 billion in the digital economy. Of that, 2 billion EUR will go towards deploying ultra-fast broadband networks, and especially FTTH in zone 2 and later in zone 3 thanks subsidies for local authorities.
- Other technologies will be needed to achieve nationwide coverage:
 - the rollout of new generation ultra high-speed mobile networks in the 800 MHz and 2.6 GHz frequency bands is one of the central issues of the next few years. ARCEP is devoting efforts to preparing the procedures to be used for awarding spectrum licenses;
 - sub-loop access in those areas where FTTH rollouts are not scheduled to take place in the medium term could also take place and deliver higher access speeds. It can therefore be implemented quickly, notably by local authorities.
 - new generation satellite capable of offering very high-speed internet access at an acceptable price.