

## National FTTH Plans in France, Italy and Portugal

**Marc BOURREAU**

Telecom ParisTech, Paris, France

**Carlo CAMBINI**

Politecnico di Torino, Turin, Italy

**Steffen HOERNIG**

Universidade Nova de Lisboa, Lisbon, Portugal; CEPR

**Abstract:** In this paper, we analyse the specific national broadband plans which have been developed by some European governments to foster the deployment of next generation access networks, namely in France, Italy, and Portugal. In particular, we discuss the strategies adopted to achieve wide fibre coverage and encourage co-investment between competing operators. Finally, we highlight the similarities and differences between the strategies followed in these three countries.

**Key words:** broadband; fibre; next generation access networks; regulation.

Since the start of the millennium, strong growth of broadband access to the Internet has been a worldwide phenomenon. In June 2009, broadband penetration in OECD countries (i.e., the number of subscriptions per 100 inhabitants) reached 22.8%.<sup>1</sup> The penetration rate in Europe is of the same magnitude; according to data from the European Commission, in July 2009 the average broadband penetration in the 27 Member States was 23.9%.<sup>2</sup> Actually, two European countries (namely, the Netherlands and Denmark) lead the OECD in broadband penetration. The broadband market has also been characterized by a high degree of innovation, which has led to a rapid increase of bandwidth and the introduction of new innovative services (voice over IP, TV over DSL, etc.).

---

<sup>1</sup> Source: OECD Broadband Portal, <http://www.oecd.org/sti/ict/broadband>.

<sup>2</sup> See "Broadband access in the EU: situation at 1 July 2009," COCOM09-29, 18 November 2009. [http://ec.europa.eu/information\\_society/eeurope/i2010/docs/interinstitutional/cocom\\_broadband\\_july09.pdf](http://ec.europa.eu/information_society/eeurope/i2010/docs/interinstitutional/cocom_broadband_july09.pdf).

While "traditional" broadband continues its expansion in many countries, telecommunications operators have begun to deploy so-called "next generation access networks" (NGANs), that is, fibre optic access networks, to provide high-speed broadband services to consumers. In June 2009, about 9% of broadband access subscriptions in OECD countries were provided by a fibre-optic network. The most advanced countries are Japan, South Korea, Sweden and the Slovak Republic.<sup>3</sup> In most of Europe, however, fibre-optic connections are still marginal. For example, in countries like Belgium, France, Germany, Portugal, or Spain, less than 1% of broadband lines were provided by fibre in June 2009.

Though the deployment of next generation access networks is still in an early stage, many incumbent operators and more recent entrants have plans to install FTTB or FTTH networks,<sup>4</sup> and therefore it is expected that fibre-optic connections will grow fast in the coming years. Still, the development of next generation access networks raises two concerns. On the one hand, the deployment of fibre access networks represents a large investment for the telecommunications sector, and therefore the institutional framework must create conditions that encourage (or rather, do not discourage) this investment. On the other hand, a strong concern is to avoid the monopolization of the market for high-speed broadband services, which calls for some kind of regulated access to NGAN infrastructures, but which may reduce the incentives for investment.

To solve this dilemma between competition and investment, European countries have followed slightly different routes, all consistent with the Draft Recommendation of the European Commission on next generation access networks.<sup>5</sup> Our objective in this paper is to outline the strategies of some selected countries focusing on three "pillars" for the development of NGANs: (1) the presence of a new regulatory framework for granting wholesale access to NGANs; (2) programs to assign public resources to the development of broadband connections in rural areas; (3) the presence of commercial agreements between telecoms operators for sharing investments in passive infrastructures.

---

<sup>3</sup> According to the OECD, in June 2009 the share of fibre connections over total broadband connections were 51% in Japan, 46% in South Korea, and 21% in Sweden and the Slovak Republic.

<sup>4</sup> FTTH refers to "Fibre to the home" and FTTB to "Fibre to the building."

<sup>5</sup> See European Commission, "Draft Commission Recommendation on regulated access to Next Generation Access Networks (NGA)", 12 June 2009.

For this purpose, we selected three countries, namely France, Italy, and Portugal. The reasons for considering these countries are the following: France presents a very developed regulatory setting for the provision of access to fibre optic cables, particularly in buildings; it was the first country in Europe to adopt specific and detailed *ex ante* rules, contrary to the UK where Ofcom chose a very light-handed approach to regulate NGNs. Portugal, on the other hand, advanced an interesting procedure for assigning subsidies to broadband investment in rural areas, with public competitions for subsidies having been launched in five different regions of Portugal. Furthermore, both Italy and Portugal present interesting examples of cooperation and joint ventures among the main telecoms competitors for sharing investments, especially in passive infrastructures. Finally, these countries are also the ones we know particularly well and for which we can present detailed information.<sup>6</sup>

For each of these three countries, we provide a description of the current state of the high-speed broadband market, and we then present and discuss the regulatory framework which has been put in place to stimulate the deployment of fibre. In particular, we focus on the strategy for the development of fibre infrastructure in suburban and rural areas and on the rules which are envisioned for co-investment between competitors. The rest of the paper is organized as follows. The following Sections describe the strategy for the deployment of next generation access networks in France, Italy, and Portugal. Then we conclude by discussing the similarities and differences in national strategies in these three European countries.

## ■ France

In France, the strategy for the deployment of next generation access networks has focused so far on so-called "very dense areas." In these areas, regulation has been put in place with a view to achieve infrastructure-based competition. The deployment of fibre networks is viewed as a last step in the liberalization of the telecoms market, since entrants will be able to become totally independent of the incumbent operator, France Telecom. It is somewhat ironic that very detailed regulation is being introduced to ensure this "last" step towards full liberalization. The regulatory strategy for "dense" or "dispersed" areas has not been outlined yet.

---

<sup>6</sup> See CZERNICH *et al.* (2009) for the cases of Germany, UK, and the Netherlands.

## Description of the present state

At the end of 2009, the four main providers of broadband internet access (Orange, Iliad, SFR, and Numericable) had a subscriber market share of 95%, for a total number of broadband users of 19.7 million (ARCEP, 2010a). These four main players have all started to deploy fibre in a total of 38 cities (according to ARCEP, 2010b). Orange, SFR and Iliad offer FTTH access, whereas Numericable – a cable operator – offers a high-speed broadband service through a hybrid fibre-coaxial solution (FTLA: Fibre to the last amplifier). Existing high-speed broadband offers propose a bandwidth of 100 Mbps (downstream), for prices ranging from 20 Euros to 45 Euros per month.

As of 31 December 2009, according to ARCEP (2010a, 2010b), 4.5 million households were within reach of a fibre network, and 800,000 were passed with fibre. However, the actual number of fibre customers is still small, with 70,000 FTTH clients. Beside the FTTH access technology, 220,000 high-speed customers are served by other technologies -including cable- which results in a total of 290,000 high-speed broadband customers.<sup>7</sup>

## Recent changes in the law

A new regulatory framework has been introduced to allow access at two different infrastructure levels: access to ducts, to ease the deployment of fibre networks until buildings; and access to in-building fibre infrastructure, in order to maintain some competition between high-speed broadband service providers.

The main legal instrument is Law 776/2008 of 4 August 2008 ("*Loi de modernisation de l'économie*"). The Law has two main components, as concerns next generation networks. First, it establishes rules for installing fibre into buildings and to facilitate multiple simultaneous installations. In particular, additional operators can install their fibre into the same building, while bearing the incremental costs of doing so. New buildings should also be equipped with fibre from the start. Second, Article L. 34-8-3 of Law 776/2008 states that the owner of a fibre infrastructure in a building should

---

<sup>7</sup> These figures were published by ARCEP on March, 15<sup>th</sup>, 2010, and were presented as "preliminary."

accept any "reasonable" request of access to his infrastructure, and offer a "reasonable" and non-discriminatory access price. The Law also gives to the regulatory authority the ability to set the conditions of access to buildings' fibre infrastructure.

Decision no. 2009-1106 of the regulatory authority ARCEP details the conditions of access to fibre within buildings (it only concerns FTTH deployments). This recent decision focuses on so-called "very dense areas," which correspond to an explicit list of 148 municipalities with 5.54 million households (see appendix I of the decision). These very dense areas have been defined roughly as those areas where it would be viable for more than one operator to deploy a fibre network. This list might be updated in the future by the regulatory authority.

With Decision no. 2008-0835 of 24 July 2008 of the regulatory authority, duct access is also imposed on the incumbent operator France Telecom, due to significant market power on the wholesale market of access to physical infrastructures. Since this decision, France Telecom has published a reference offer, and at the end of 2009, alternative operators were leasing a total of 560 km of ducts from the incumbent.

Notice that access to ducts applies only to the incumbent operator (asymmetric regulation), whereas access to in-building fibre infrastructure applies to all operators (symmetric regulation).

### **Fibre deployment in rural and suburban areas**

The regulatory framework for the deployment of fibre in suburban or rural areas has not been defined so far. According to a Notice from the Competition Authority published in 2009 (See: Autorité de la concurrence, 2009), suburban and rural areas raise two concerns: the risk that they will not be covered with fibre; and, at the other extreme, the risk of inefficient duplication of networks that would limit the viability of fibre deployments. Therefore, for the competition authority, there is need for some coordination of investments. One solution would be to allow the deployment of a unique network, which would be financed and installed by a group of operators. However, with this solution, competition between operators would take place only on the basis of services, and not on the basis of infrastructures, as they would share the same network. Another solution would be to allow each operator to control a fibre network in a given area. However, the competition authority is concerned that operators could then decide to make higher

commercial efforts in the areas in which they would control the infrastructure, and to compete softly in the areas where the infrastructure is controlled by competitors, which would result in (almost) local monopolies.

The French government has also recently launched a consultation on a "national program for high-speed broadband" (see DGCIS, 2010). The government plans to spend 2 billion Euros to accelerate fibre deployment.<sup>8</sup> Two types of public support are envisioned. First, calls for projects would be organized to support deployments in "viable" zones, through public loans in particular. Second, direct state aid for "less viable" zones would be awarded. However, the definition of "viable" and "less viable" zones is still unclear.

### **Cooperation agreements between operators**

Law 776/2008 of 4 August 2008 as well as Decision no. 2009-1106 of ARCEP make it possible to share fibre in buildings between competitors, with three main objectives: i) avoiding nuisance for inhabitants of having multiple operators installing fibre over time; ii) cost-sharing to reduce investment costs and hence, increase coverage; iii) maintaining competition (consumers should be able to choose their provider). Decision n° 2009-1106 also aims at being "technologically neutral," allowing both PON (passive optical network) and point-to-point fibre architectures.

The procedure in "very dense areas" is as follows (see ARCEP, 2009b, 2009c). Consider an operator which is willing to install fibre in a given building, which we will refer to as the "initiator":

*1 - Before deploying fibre within buildings, the initiator should consult the other operators.*

ARCEP decided that an initiator should consult other operators when it decides to deploy fibre into buildings within a city.<sup>9</sup> The consultation should first identify which operators are interested in co-funding the deployment of fibre into the buildings of the city (i.e., for the buildings with which the initiator of the investment has signed a contract), and then discuss the technical

---

<sup>8</sup> This expenditure is part of a larger 35 billion Euros stimulus plan called "the Big Loan," which will be financed in part by government borrowing.

<sup>9</sup> ARCEP argued that with a consultation for each building, there would be a risk of cream-skimming strategies, and if it were at a larger (e.g. regional) scale, there would be barriers to participation/entry.

details of the deployment with these operators (number of fibre cables, specific equipments, etc.). The consultation should take place within one month after the signature of the contract between the initiator and the building owner, according to Decree no. 2009-54 of 15 January 2009. In its Notice no. 09-A-47 of 22 September 2009, the Competition Authority has highlighted the risk that information exchange between operators could favour collusive behaviour (in particular, in the case of bilateral exchange of information) and therefore has suggested information exchange through a centralized system.

### *2 - The deployment of fibre depends on the number of co-investors.*

Two possible cases are distinguished. If the initiator was not able to find a co-investor in the first phase (so-called "scenario 1"), he is allowed to install only one fibre per home. However, he will have to provide access to other operators later (see point 3 below). If there are  $n$  co-investors, with  $n = 1, 2, \dots$  (so-called "scenario 2"), then the initiator must install at least  $\min\{n+1, 4\}$  fibres per home. In particular, if  $n \leq 3$ , each co-investor has access to a dedicated fibre. If  $n > 3$ , the initiator and the co-investors agree on a technical solution with a maximum of 4 fibres per home, for example, by sharing fibres among operators.

### *3 - Access to "late entrants" is required.*

The initiator should also provide access to any other operator (even if the latter has not participated in the initial investment). In scenario 1 above (no co-investor), passive access is provided at the street cabinet or at another point of interconnection. The access price must be "reasonable and non-discriminatory." In scenario 2 (at least one co-investor), access to other operators is provided either through: a dedicated fibre if more fibres than needed were installed *ex ante*; a shared fibre; or a bitstream access offer. For those "late entrants," the access price takes into account a "risk premium" for the initiator and any co-investor. According to Notice no. 09-A-47 of 22 September 2009 of the Competition Authority, the objective of allowing for late entry is not only to have service-based competition on top of facility-based competition, but also to maintain potential competition.

Cost-sharing between the initiator and the co-investors will be based on the following principles:

- Non-discrimination: two similar operators should bear the same share of costs.

- Objectivity and transparency: access prices should reflect costs.
- Relevancy: each operator should bear its specific costs (for instance, of a dedicated fibre or an equipment which is specific to its network design). This principle also dictates "some" correspondence between cost sharing (in the investment phase) and wholesale revenue sharing (when late entrants use the infrastructure).
- Efficiency of investments: the shared "costs" should be "efficient costs" (to avoid reciprocal cost-raising strategies).

In practice, ARCEP advocates cost-sharing based on the number of operators; that is, common costs should be shared equally among co-investors (shared costs should not depend on the number of fibres installed by each operator).

Decision no. 2009-1106 requires that the initiator publishes a reference access offer. The conditions (in particular, the access prices) are supposed to hold for the whole territory, though some adjustments might be done at a local level. Therefore, co-investors will share costs according to estimated and average investment costs, and not actual costs. As of March 2010, five operators have published a reference offer: France Telecom, Free, SFR, Numericable and Covage (a pure wholesaler). Infrastructure sharing is still at a very early stage. According to ARCEP (2010b), as of 31 December 2009, only 350 FTTH subscribers were served via an infrastructure sharing agreement, and 10,000 households were covered by such an agreement.

So far, no bitstream access offer has been requested explicitly (though it is foreseen for "late entrants"). In its Notice no. 09-A-47 of 22 September 2009, the Competition Authority argued that entry of new firms in the high-speed broadband market will be easier if the necessary investments can be realized progressively, that is, if operators have access to some kind of bitstream access offer with a limited number of access points; this argument is very similar to the "ladder of investment" argument of Martin CAVE (2006). The Competition Authority considered that such an offer might emerge from facility-based competition (between fibre companies). However, it also argued that if no such offer emerges ARCEP should intervene and impose a bitstream access offer. We can see here some parallels with the MVNO (mobile virtual network operator) access problem, where some regulators (e.g. in Belgium, France and Italy) have threatened to intervene if MVNOs failed to obtain access to mobile networks under reasonable conditions.

## ■ Italy

Italy does not seem to have a clear national strategy for the development of next generation networks. The regulatory framework is still to be largely developed. At the same time, the Italian Government, which committed to provide subsidies to spur investment in broadband connections all over the country, has suspended its contributions. These uncertainties, together with the financial constraints on the incumbent operator, Telecom Italia, are contributing negatively to the development of NGN in Italy. A piece of good news is the first industrial agreement between two operators, Telecom Italia and Fastweb, for sharing passive infrastructure and rationalizing investment expenditures.

### **The state of adoption of broadband and high-speed connections in Italy**

At the beginning of the second millennium, Italy was one of the leading countries in high-speed broadband, mainly through fibre. This was due to investments by Telecom Italia in the mid-nineties (the so-called Progetto Socrate ended in 1996) and the more recent investments by an aggressive alternative operator, Fastweb, whose original strategy was to deploy fibre networks, at least in the more dense metropolitan areas. Notwithstanding, at the end of 2009 the picture that emerges has completely changed: the latest data by the European Commission (EC, 2009) shows that fibre-to-the-home (FTTH) connections in Italy amounted to 320 thousand active lines, as compared to 200 thousand in 2001, leaving Italy at one of the lowest positions in the European ranking in terms of penetration of FTTH connections. In terms of passed houses, at the end of 2008 Italy had approximately 2.1 million houses passed with FTTH/FTTB technologies. However, the number of subscribers to high speed connections is still very limited: 306 thousand at the end of 2008 and 320 thousand only in July 2009.

More generally, while in July 2005 Italy accounted for 2.7% of EU total broadband lines using technologies different from DSL (including fibre but also satellite and cable modems), in July 2009 Italy accounted only for 1.5% of the total broadband non-DSL lines. Only the new member countries present lower percentages than Italy, while the majority of historical EU members have overtaken Italy in the ranking: in July 2009, the UK accounted for 15.9% of all broadband lines using other technologies, the

Netherlands have the second largest share, with 9.5%, followed by Germany, Poland and Spain with 8.6%, 8.2% and 7.6% respectively; France and Portugal have shares equal to 4% and 3%, respectively. Broadband in Italy is mainly provided using the existing network, i.e. through DSL. While in July 2006 fibre connections represented approximately 5% of total broadband lines in Italy, the share of FTTH connections decreased to 3.4% of total broadband lines in July 2009. Then the total number of broadband lines was 11.8 million, and 96% of these lines were DSL connections.

Broadband and high-speed broadband connections in Italy have faced a consistent reduction in recent years. This is mainly due to a strong reduction in investments by fixed operators: In 2008, investment in the fixed network decreased by 8.9% in one year, and the trend has been negative since 2005 (AGCOM, 2009). Telecom Italia has significantly reduced its investments due to its serious financial position.<sup>10</sup> Alternative operators also reduced their investments, concentrating their effort mainly in areas where local loop unbundling was available, while at the same time abandoning any previous plans of deploying new fibre optic networks.

### **Changes in the law and commitments between State and operators**

With Deliberation no. 731/09/CONS, signed on 16 December 2009, the Italian telecoms regulator AGCOM approved a new set of rules for granting access to new NGN infrastructure and fostering its deployment. The approach followed by AGCOM is the principle of equivalence of access to new NGN infrastructure. In line with the European Commission's Draft Recommendation on NGAN, AGCOM imposed on Telecom Italia, which is the SMP operator in the market for access to the fixed telephony network, the following set of remedies:

- obligation to provide access to its passive infrastructure, in order to give the opportunity to alternative operators to install their own fibre cables in existing ducts;
- obligation to provide access to dark optic fibre.

AGCOM also favours the sharing of existing infrastructure and co-investments among operators in order to rationalize costs and limit duplication. On the other hand, it does not impose any obligation to

---

<sup>10</sup> At the end of 2008 the net debt of Telecom Italia was 35 billion Euros, with an index of net debt/EBITDA equal to 3.

unbundle new fibre cables. This remedy is considered neither proportional nor adequate, but rather likely to devalue investments by both the incumbent and alternative operators. In order to verify the necessity to impose additional remedies and manage the migration from old to new networks, AGCOM delegated to a new committee, named Comitato NGN-Italia – established with Deliberation no. 64/09/CONS, the definition of guidelines for the transition of regulation towards NGNs. This committee is a consultative body that will provide comments and (non-binding) suggestions for the implementation of new wholesale services such as, among others, unbundling of or bitstream access to fibre, and for the migration rules from old to new networks.

The Italian regulatory framework is still in its infancy and incomplete. Anyway, AGCOM seems to prefer a gradual approach to the regulation of NGN considering the weakness of the incumbent operator (due to its substantial financial burden) and the need for having a new and upgraded broadband network as a key factor for the growth of the whole economy. In order to sustain the development of NGNs, the Italian Government originally planned to provide 1.5 billion Euros aimed at spreading broadband coverage over the entire country by 2012 through traditional broadband networks (2 Mbps connections). In dense areas, on the contrary, telecoms operators are supposed to invest in fibre networks without subsidies from the state. Notwithstanding, due to the consistent budget deficit and the need to restrain expenses, the Government first reduced the amount of resources for this investment to 800 million Euros, and then – at the time of this writing – temporarily suspended the contribution. Still, many Italian operators have been very active in signing agreements with local governments and municipalities to enlarge the coverage of broadband services in the areas where the return on investment is considered very low or even negative. Recently, for example, using a typical public-private partnership agreement, the region of Lombardy and Telecom Italia defined a project aimed at extending broadband coverage to all the regional territory not yet reached by "traditional" broadband connections (2 Mbps connections). A similar partnership has been established also between Telecom Italia and the Autonomous Province of Trento. Probably local governments, at different levels, have access to additional financial resources (such as funds for less developed areas – FAS, Fondi per le Aree Sottoutilizzate) to finance broadband projects. This in turn leads telecoms operators to sign agreements and partnerships with local governments rather than waiting for a contribution by the Central Government.

## Cooperation agreements among telecoms operators

In December 2008 Telecom Italia and Fastweb signed an industrial agreement aimed at sharing the infrastructure necessary for the conception of a NGAN, applying a model of cooperation open to all interested operators. In a Memorandum of Understanding the two companies committed to cooperate as follows:

- joint planning for the realization of civil construction work, facilitating the fibre deployment - for example in cable ducts along roads – to favour the development of next generation networks while avoiding duplication of infrastructure;
- the exchange, under reciprocal conditions, of rights to use civil infrastructure;
- joint study and testing of innovative techniques in civil engineering, such as the use of last-generation micro-tubing for the deployment of optical fibre.

Through this agreement, Telecom Italia and Fastweb committed to cooperate in the development of network infrastructure with an eye on accelerating the construction process, rationalizing costs and avoiding costly duplication of infrastructure.

Moreover, in May 2010 Fastweb, Wind and Vodafone launched a new investment plan to deploy fibre networks in 15 metropolitan cities with an investment of 2.5 billion Euros. These networks will be open to access by third parties at non-discriminatory conditions. Telecom Italia was also expected to participate in this program, even though - at the time we are writing - the Italian incumbent operator has declared its intention to instead continue with its own alternative NGN deployment plan.

## ■ Portugal

The Portuguese national strategy for the development of next generation networks has several components: Facilitation of market-based solutions through duct access obligations; protocols between the State and operators with investment commitments; investment subsidies in rural areas. Operators are encouraged to invest jointly, while the State will not force specific solutions.

## Passed homes and take-up in early 2010

At the end of the 2009, as reported in ANACOM (2010), in Portugal there were 35 providers of broadband internet access, of which four (Portugal Telecom, Zon TVCabo, Sonaecom, Cabovisão) together had 94% subscriber market share, and 12 of which offered fibre-based access. Portugal Telecom and Sonaecom offer FTTH access, while Zon TVCabo uses a hybrid fibre-coaxial solution based on the DOCSIS 3.0 standard, all with bandwidth of up to 200Mbps (and 1Gbps in some cases).

The first offer based on FTTH was presented to the market by Sonaecom in 2008, in Lisbon and Porto only. While by the end of 2009 more than one million homes were passed with fibre, there were still only 30,000 FTTH clients according to ANACOM (or 41,500 according the Portuguese government), up 50% from the previous quarter. This compares to a number of 1.86 million customers of broadband internet access on all fixed access platforms.

## Recent changes to the law

In July 2008 the Portuguese government set out its strategic orientations for the development of next generation networks.<sup>11</sup> As a result, several initiatives were undertaken, of legal and economic policy nature. On the legal front, the main instrument is Law 32/2009 of July 9<sup>th</sup>, whose application was later amplified by Decree-Law 258/2009 of September 25<sup>th</sup> to include communications operators (apart from Portugal Telecom, to which specific rules apply as outlined below). This law regulates:

- access to ducts, and other infrastructure apt to carry fibre, owned by public entities and companies owned by the State, to telecoms operators;
- the creation of a central on-line database of ducts and other infrastructures;
- a framework of rules for the construction of ducts and other infrastructures, with an emphasis on the coordination between operators;
- rules on how sites for new buildings should be equipped with the necessary infrastructure, with the latter being open to all operators;
- fibre access in new (mandatory) and old buildings.

---

<sup>11</sup> *Resolução do Conselho de Ministros* no. 120/2008, de 30 de Julho.  
<http://www.anacom.pt/render.jsp?contentId=952247>

Duct access had previously been only imposed on the incumbent fixed telecommunications operator Portugal Telecom, as part of its regulation by ANACOM as an operator with significant market power and being the concessionary of public telecommunications services.<sup>12</sup> By implication, this duct access obligation was not transferable to other entities and operators. Law 32/2009 therefore increased significantly the number of ducts and other infrastructure to which operators could demand access, while at the same time harmonizing the process of asking for and granting the latter.

The centralized on-line database will one day contain all infrastructures of different entities that can support fibre networks - ducts, posts, possibly canalizations and other types of pipes, owned by water, gas and railway companies, and municipalities, etc. The coordination of public construction work for new ducts and other infrastructure not only avoids the multiple occupation of public space by building works, but, more importantly, avoids the duplication of construction costs which make up the largest part of the cost of building a new fibre-optic network. The new rules on fibre in old and new buildings and building sites are meant to simplify and harmonize the investment in the especially costly "last mile" of fibre access.

### **Competition for rural broadband subsidies in the form of State aid<sup>13</sup>**

Roughly speaking, Portugal consists of relatively wealthier coastal areas and a poorer rural interior. In most of the latter, no competition in the market for traditional broadband services has emerged (with Portugal Telecom holding a monopoly position), and it is not expected that market-driven investment in fibre networks will occur. Therefore, in 2009 the Portuguese government launched public competitions for subsidies for the construction and operation of NGNs in five different regions of Portugal (Centre, North, Alentejo and Algarve, and the islands of Madeira and Azores). In this section we describe the tender and the rules it is subject to at a European level in some detail, in order to make clear that it is a quite complex process. While the rules of the contests as such were technologically neutral, the requirement that each final client be able to obtain download reference speeds of at least 40Mbps led to only FTTH-based proposals being

---

<sup>12</sup> See the rules and determinations for duct access, and PT's reference offers, at: <http://www.anacom.pt/template2.jsp?categoryId=256142&themeMenu=1#horizontalMenuArea>

<sup>13</sup> Steffen Hoernig was a member of the selection jury. All information presented in the present text is in the public domain.

presented. The purpose of the contests is to create "open networks," in that the winning network operators are obliged to provide wholesale offers at least at the advanced bitstream and infrastructure access levels, while the simultaneous provision of a retail offer is voluntary. As a result, in all five contests the bids delivered were headed by civil engineering companies with experience in network construction, while own retail services were subcontracted to national telecommunications operators. The three contests on the continent were decided in February 2010, while the contests for the Islands are expected to end before the summer of 2010. The winner of each contest will have to apply for subsidies from the European Union which qualify as "state aid" according to EU rules; the contract enters into force, and construction will begin, only after the subsidies are effectively granted.

Each contest is performed through a multi-criteria auction, with the four principal dimensions: (1) Size of subsidy requested; (2) Technical quality; (3) Economic and financial quality; and (4) Quality of wholesale offer. All dimensions (and sub-dimensions) are evaluated quantitatively and then a weighted overall score for each bid is computed. The single most important criterion is the amount of subsidy requested, with about 60% weight in the score, with a lower request obtaining a higher score.

Not only will a significant part (or all) of the subsidies in question be handed out by the European Union, but the European Commission will have to confirm the legality of the requested state aid in this particular context. The rules for the legality of state aid for the construction of traditional or next generation broadband networks have been set out in the EC's Guidelines on state aid for broadband networks (EC, 2009b). According to these Guidelines, state aid is always considered legal when there is no danger that competition will be distorted, which is considered to be the case if no NGN infrastructure investment would take place by market forces alone. Exactly this has previously been found for the municipalities concerned, in ANACOM's latest Decision on regional broadband wholesale markets (ANACOM, 2009b). The granting of the contract must meet the conditions outlined in Article 51 of the Guidelines: "detailed mapping exercise and coverage analysis, open tender process, best economic offer, technological neutrality, use of existing infrastructure, mandated wholesale open access, benchmarking exercise and claw-back mechanism," which are all satisfied in the present process.

An additional point to be observed with respect to the legality of State aid is that traditional broadband is already available in most places, supplied by Portugal Telecom. Thus the municipalities in question are simultaneously

"grey traditional [broadband] areas" and "white next generation access areas," to which the additional conditions of Article 79 apply: existence of a non-discriminatory wholesale offer, consultation of the national regulatory authority on the wholesale conditions, and a network architecture that admits effective unbundling and several specific types of network access, in order to allow migration of existing providers to next generation access. Also these conditions are met in the Portuguese tender.

### **Protocols between the State and operators**

In January 2009, the Portuguese government signed a protocol on NGNs with several operators (Portugal Telecom, Zon, Sonaecom); two other operators (DST and Oni) joined a few months later, but the protocol is open to further participants.<sup>14</sup> The stated aim of the protocol, which is not publicly available, is to speed up investment in NGN infrastructure, by way of mutual commitments between the State and operators. The Portuguese State has committed itself to take the following steps: promote the legislation that came to be Law 32/2009 as related above; attempt the creation of a credit line of at least 800 million Euros for NGN construction (which was achieved in May 2009); fiscal incentives for NGN construction and uptake of NGN-based services. The operators' commitments include investments of about 1 billion Euros, and the attempt to reschedule future investments to 2009, in order to combat the economic crisis and such as to give the possibility of fibre access to 1.5 million inhabitants still in the same year.

### **Cooperation agreements between operators**

In December 2009, Sonaecom and Vodafone Portugal signed a joint venture agreement (which is not publicly available) to build and operate NGN networks in Portugal's main towns. According to Sonaecom (2009) and Vodafone Portugal (2009), these networks will be used by both operators to provide their services more efficiently, duplication of investments will be avoided and due to larger scale cost efficiencies will be realized (both operators are relatively small in the Portuguese market, with a total fixed broadband market share of less than 15%).

---

<sup>14</sup> [http://www.portugal.gov.pt/pt/GC17/Governo/Ministerios/MOPTC/Notas/Pages/20090107\\_MOPTC\\_Comunicacoes\\_Nova\\_Geracao.aspx](http://www.portugal.gov.pt/pt/GC17/Governo/Ministerios/MOPTC/Notas/Pages/20090107_MOPTC_Comunicacoes_Nova_Geracao.aspx)

Access will be offered to third operators on request, following a philosophy of "open access," and also in order to commit both companies to continue to compete in the retail market. That is, both operators seem eager to stress that their joint venture will not be a first step towards coordinated (and less competitive) retail offers, but rather that it is an instrument to make both firms more competitive.

### ■ Conclusions: similarities and differences in national strategies

The following table summarizes the similarities and differences between the strategies followed in France, Italy and Portugal for the deployment of next generation access networks.

	<i>France</i>	<i>Italy</i>	<i>Portugal</i>
Regulated access to ducts	Yes (limited to incumbent operator)	Yes (limited to incumbent operator)	Yes (any duct apt to carry fibre)
Regulated access to dark fibre	No	Yes	No
Regulated access to in-building fibre	Yes	No	Yes
Subsidies for the deployment of fibre	2 billion Euros for "viable" and "less viable" areas	Subsidies planned at some point, but suspended	800 million Euros credit line and subsidy contests
Cooperation between competitors	Yes (for fibre deployment in buildings)	Yes (between Telecom Italia and Fastweb for civil engineering)	Yes (joint venture Sonaecom - Vodafone for building network)
Regulation of cooperative agreements	Yes	No	No

All three countries we have considered in this article are part of the European Union, and therefore subject to the same regulatory framework and recommendations of the European Commission in the matter of next generation networks. This fact may explain why the regulation of access to ducts and other infrastructure has advanced so fast.

On the other hand, it is striking that while the same rules at European level apply to all three countries in question, the focus of their implementation is markedly different:

- Italy is the only country among the three to have imposed access to dark fibre, and to have renounced to use subsidies (so far) to stimulate the deployment of NGANs.
- Portugal advanced with a competition for subsidies in rural areas while the European Commission Guidelines on State Aid (EC, 2009b) were still under consultation (They were finally published in September 2009). It also imposed duct access obligations on a large variety of institutions in order to make all usable ducts available to NGN operators.
- France has put a strong focus on "very dense areas" with the hope of a fast development of infrastructure-based competition. In particular, access to in-building fibre has been imposed and co-investment has been encouraged to allow for cost-sharing, and hence, decrease the investment costs for each operator.

These differences in application may be explained by a series of external factors or by national strategies. In Paris in particular, man-high canalization tunnels give access to buildings, which called for the rapid establishment of rules for joint investment in dense areas for France. Also, the French regulator believes that infrastructure-based competition in the fibre market can develop, and hence, chose to focus early on regulations to favor the development of alternative infrastructures (such as, access to ducts). In Portugal, on the other hand, the communications regulator ANACOM's 2009 Decision on broadband markets divided the country into regions with different degrees of (existing and potential) competition, which made it straightforward to run a contest for subsidies in accordance with European state aid rules. The creation of a central database for ducts also forms part of a larger national strategy to digitize available information and make it available on-line.

Our goal in this paper is not to evaluate *ex ante* which regulatory policy is the most efficient. As KATZ (2000) argues, "applying different regulations to different providers may allow policy makers to gather additional information about what works and what does not. This sort of experimentation may be a particularly useful approach during times when technologies and market structures are changing rapidly and there are no "clear" answers." We believe that this argument applies to the regulation of next generation access networks, where some form of experimentation and regulatory learning is called for. This is why it might be efficient to allow countries to follow different regulatory routes in the early phase of the deployment of fibre networks.

## References

AGCOM (2009): *Annual Report*, Rome.

ANACOM (2009): "State of Communications 2008", July.  
<http://www.anacom.pt/render.jsp?contentId=965304>.

ANACOM:

- (2009b): "Markets for wholesale network infrastructure access at a fixed location and broadband access", January.

<http://www.anacom.pt/render.jsp?contentId=812378&languageId=1>.

- (2010): "Statistical Information, Internet Access Service, 4<sup>th</sup> quarter 2009", March.  
<http://www.anacom.pt/render.jsp?contentId=1010567&languageId=1>.

ARCEP:

- (2009a): "Ultra-fast broadband scorecard as of 30 June 2009".

<http://www.arcep.fr/fileadmin/reprise/observatoire/tres-haut-debit/2009/tab-fibre-thd-280909-eng.pdf>.

- (2009b): "Décision n° 2009-1106 de l'Autorité de régulation des communications électroniques et des postes", 22 December 2009.

[http://www.arcep.fr/uploads/tx\\_gsavis/09-1106.pdf](http://www.arcep.fr/uploads/tx_gsavis/09-1106.pdf).

- (2009c): "Recommandation de l'Autorité de régulation des communications électroniques et des postes relative aux modalités de l'accès aux lignes de communications électroniques à très haut débit en fibre optique," 23 December.

[http://www.arcep.fr/uploads/tx\\_gspublication/RecoARCEP\\_mutualisation\\_fibre\\_01.pdf](http://www.arcep.fr/uploads/tx_gspublication/RecoARCEP_mutualisation_fibre_01.pdf).

- (2010a): "High-speed and ultra high-speed observatory – retail market. 4<sup>th</sup> quarter 2009 – provisional results," 15 March 2010.

<http://www.arcep.fr/fileadmin/reprise/observatoire/hd-thd-detail/t4-2009/obs-hdthd-retail-q4-2009.pdf>.

- (2010b): "Scorecard for fixed broadband and ultra-fast broadband offers – wholesale market, Q4 2009," 15 March 2010.

<http://www.arcep.fr/fileadmin/reprise/observatoire/hd-thd-gros/t4-2009/tab-hdthd-gros-t4-2009-eng.pdf>.

Autorité de la concurrence (2009): "Avis n° 09-A-47 du 22 septembre 2009 relatif au dispositif proposé par l'Autorité de régulation des communications électroniques et des postes en ce qui concerne les modalités de mutualisation de la partie terminale des réseaux à très haut débit en fibre optique," 22 September 2009.  
<http://www.autoritedelaconcurrence.fr/pdf/avis/09a57.pdf>.

CAVE, M. (2006): "Encouraging infrastructure competition via the ladder of investment", *Telecommunications Policy*, Vol. 30, pp. 223-237.

CZERNICH *et al.* (2009): "Regulatory framework for next-generation access networks across Europe", CESifo Dice Report 1/2009.

DGCIS (2010): "*Programme national 'très haut débit' : consultation publique*".  
[http://www.telecom.gouv.fr/fonds\\_documentaire/consultations/10/consthd.pdf](http://www.telecom.gouv.fr/fonds_documentaire/consultations/10/consthd.pdf).

European Commission:

- (2009): "Broadband access in the EU: situation at 1 July 2009", Communications Committee Working Document, November, Brussels.  
[http://ec.europa.eu/information\\_society/eeurope/i2010/docs/interinstitutional/cocom\\_broadband\\_july09.pdf](http://ec.europa.eu/information_society/eeurope/i2010/docs/interinstitutional/cocom_broadband_july09.pdf).
- (2009b): "Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks", 2009/C 235/04, September.

KATZ, M. (2000): "Regulation: The Next 1000 Years," in *Six Degrees of Competition: Correlating Regulation with the Telecommunications Marketplace. A Report of the Fourteenth Annual Aspen Institute Conference on Telecommunications Policy*, The Aspen Institute, Washington.

Sonaecom (2009): "*Sonaecom, SGPS SA informa sobre acordo com Vodafone Portugal relativo a rede de fibra óptica de nova geração*", December.  
<http://www.sonaecom.pt/channelDetailLast.aspx?channelId=4E8C9DAE-E509-4E01-95EB-8593002FA859&schemald=7FFB69F6-FC3B-476C-88AA-A9FA73545E13>.

Vodafone Portugal (2009): "Sonaecom and Vodafone sign cooperation agreement on NGN", December.  
<http://www.vodafone.pt/main/A+Vodafone/EN/Press+Releases/pressreleases.htm?id=2280&year=2009&quarter=4>.