

# **POLICY FORUM of the IKINET Project**

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**Regional “Competence Centres” and European Knowledge and innovation networks: an international comparison of innovation cluster policies.**

**Theme 3. How to promote an effective governance of networks of competence Centres:**

## **Digital Divide - the “Broadband Divide” generations**

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### ***Introduction***

The progress in the roll-out of Broadband and IT is a key factor for the community, from the point of view of both business and social development.

From the business point of view, an increasing number of businesses are internet-based or rely (in whole or in part) on the internet as a marketplace for their products, and e-business accounts for more and more business transactions, that become increasingly content-rich.

From the social point of view, the availability of a broadband connectivity is a crucial point: in the past, community arose largely from geographical proximity of residence. People living together shared common interests and concerns, common goals and aspirations. As technology developed, it became possible to redefine one’s community, and now we have the capacity for the development of ‘virtual communities’ that are completely independent of geographical location. These communities can range from groups based on common interests to groups with common (global) aspirations, to communities based on collaborative online working, and so on.

**“Digital divide”** is a term for the disparity between those who have Internet access and those who do not. As more and more transactions (social as well as business; dealings with statutory bodies along with commercial transactions) become internet-based, get over “digital divide” presents both challenges and opportunities for social development and rural disadvantage.

In this contribution we’ll make some consideration about a specific aspect of “digital divide”, and in particular the different **“broadband divide”** generations enabled by technology evolution and network deployment.

### ***“Broadband Divide” generations***

Different “tech innovation waves” allow gradual services delivery with non-homogeneous deployment in terms of access and adoption, generating different “Broadband Divide” generations, characterized by different peak downstream speeds and reference technologies.

The **“First Generation” of Broadband Divide** is characterized by a peak downstream speed of about 10x dial-up, i.e up to 5 Mbps. ADSL “version 1” is the reference technology to realize this type of access, and the resulted solution is well suited for Internet Access.

With ADSL2+ in the so-called FTTE (Fiber-To-The-Exchange) access network architectures it is possible to reach up to 25 Mbps in downstream, that means about 100x dial-up. This type of solution represents the **“Second Generation” of Broadband Divide**, opening the door to support Triple Play services (e.g. IPTV).

The evolution towards **“Next Generation Access Networks”**, the pervasive usage of the fiber up to the Cabinets (FTTCab, Fiber-To-The-Cabinet), Buildings (FTTB, Fiber-To-The-Building) and Homes (FTTH, Fiber-To-The-Home) enables “Ultra-Broadband Divide” scenarios.

In particular, with VDSL2 in FTTCab architectures it’s possible to reach downstream speeds greater than 25 Mbps (about 500xdial-up), supporting new hungry-bandwidth applications like High Definition Video. This can be called **“Third Generation Broadband Divide”**, meanwhile the **“Fourth Generation”** is possible with FTTH / FTTB architectures, with more than 50 Mbps in downstream (about 1000x dial up).

## ***Get Over Digital Divide in Italy***

In Italy, the reference target for an ADSL coverage (First Generation Broadband Divide) is about 26 million equivalent lines.

**At the end of 2006 89,4 % of the entire population was covered by ADSL service.**

It is important to notice that CO dimension is highly variable, due to Italian demographic and territorial characteristics, from some hundreds to some thousands of customers.

Telecom Italia is proceeding to extend the **ADSL coverage, up to around 95% of total population, by the end of 2007 and up to around 98% by the end of 2008.**

To reach this objective and get over the First Generation of Broadband Divide, Telecom Italia has defined a specific **“Anti Digital Divide Project”** which will be based on

- 1) An ordinary evolution plan, based on the evolution of coverage in the area in economic convenience and based on **“Full DSLAM”** solution;
- 2) The **“Mini DSLAM”** plus nx2Mbit/s copper backbone, technical solution, which consist of the ADSL light upgrading of many Central Offices through a cost reduction approach specifically conceived for COs that today have a lower Return on Investment and lower potential customer base.
- 3) New forms of collaborations with Public Entities, like contributions according to European Commission principles, and agreements to stimulate the broadband services demand and develop new ICT initiatives.

## ***Telecom Italia broadband strategy: the NGN2 project***

Furthermore Telecom Italia has developed a wide broadband strategy, to extend not only “traditional” ADSL coverage, but also VDSL2/FTTx coverage, so enabling the “Ultrabroadband” generations.

This strategy will follow, in the first steps, a “Market driven” approach, realising primarily FTTCab architectures, and FTTB in main cities. Moreover, FTTP (Fiber-To-The-Premises) architectures will be realized for TOP Clients.

Network status is an important motivation for Telecom Italia NGN2 project: increasing Capex& Opex to face network obsolescence and inertial evolution, not enough bandwidth for launching future bandwidth hungry services (media, ICT, ...), physical saturation effect, i.e. the broadband lines to copper cable lines ratio is close to its physical upper limit (50 to 60%).

NGN2 Project relies on important drivers, as:

- “All-IP” as unifying tech choice, to simplify, flex and reduce cost structure
- Satisfy the continuous growth of bandwidth needs to support content-based services (e.g. multiple play, broadband mobile).
- Enable new scenarios for ICT applications and services (e.g. IT managed services, Home control and Automation, e-Health).

Key milestones of NGN2 Project in the medium-long term are:

- 4 Massive introduction of Fiber (FTTx) in the access network & installation of VDSL2 technology
- 4 Strong push on ADSL2+ / 3-Play (FTTE) platform deployment to be ahead of FTTx’s time and to eliminate the First Generation Digital Divide
- 4 Introduction of ultra-broadband connectivity for mobile access (deployment of fiber-based access solutions)
- 4 Deployment of new regional Data Centre to enable the distribution of “vertical application”
- 4 Progressive full migration to ToIP starting from 2009
- 4 Implementation of “Full-IP” network

As regard to mobile access, NGN2 enables the path towards 4G: mobile access evolution towards 4G requires more bandwidth and higher speed, and it is not possible to guarantee 4G coverage without fiber access connectivity. Generally speaking, the fiber availability will be more and more necessary for mobile traffic backhauling, UMTS/HSxPA and 4G.

### ***Services: first wave on new digital applications for Consumer and Business***

Get over Digital Divide means also create the conditions to develop new business models / paradigms based on broadband, and stimulate the demand of new digital services (“not only e-mail and chat”).

The availability of an “Next Generation Network” with Broadband and Ultrabroadband connectivity enables a great variety of new digital applications and services, for both consumer and business customers:

- Telemedicine-eHealth: Telemonitoring and teleassistance outdoor
- Home control & automation: Telesurveillance, Intrusion and Access Control, Ambient tele-alarms
- Entertainment: Mobile TV, Video and Music on Demand, Personal Content, Gaming
- Infomobility: Infotraffic Real-time, Tele-pay and road pricing
- Public Safety: Specific support for Firemen, Forest warden, ...

- Productivity SW: Remote assistance, CRM, ERP, Sales Force Management, Work Force Management
- Tourism: Mobile access to touristic information, maps, infotraffic, localization

NGN2 is not only fiber and bandwidth: the IT – TLC integration enables **“Net Centric – based” services and platforms** offerings, as Vertical Systems and solutions, Business Productivity applications, Application and computation hosting, Platforms / network / device management for fixed and mobile, tech building blocks as enabler of more complex services.

## **Conclusions**

Get over “Digital Divide” could mean many different aspects: broadband connectivity, basic IT furniture (i.e. families’ PC availability), skill and culture.

In this paper we have made some consideration about a specific aspect of “Digital Divide”: the “Broadband Divide” obtained as a consequence of different “tech innovation waves”, and related gradual services delivery with non-homogeneous deployment in terms of access and adoption.

### **Telecom Italia is following an important strategy to get over the various “Broadband Divide”:**

1. Continuous evolution of **basic ADSL coverage** to follow the market demand and the economic objectives.
2. Deployment of **“Mini DSLAM”** in the small COs with no Fiber backbone, as a part of the **“Anti-Digital Divide Project”**;
3. Closed cooperation with Public Regional entities in order to develop joint Regional Anti Digital Divide Project (in the form of **public contribution** – according to EC principles e.g. economic neutrality- and in the form of **agreements** to stimulate broadband services demand and new ICT initiatives). These first two elements intend to eliminate the first generation of broadband digital divide;
4. Strong push on **ADSL2+ and FTTE** to follow the market demand evolution towards new bandwidth-hungry services (3Play);
5. Realization of **“NGN2 Project”** with “ALL-IP” architecture, Broadband .and Ultrabroadband connectivity;
6. Implementation of many **Regional Data Centres for “Net-Centric” – based services and platforms** to host and provide innovative ICT services and vertical applications.



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