

NGAN: regulation, development plans, migration to NGA

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Agenda

- ✓ **Decision 731/09/CONS: general aspects**
- ✓ **NGAN development plans : Agcom vision**
- ✓ **The migration of *wholesale* services from copper to fiber**
- ✓ **GPON vs P2P?**
- ✓ **Telecom Italia and OLO NGA development plans**

Decision 731/09/CONS: general aspects and Telecom Italia obligations

- ✓ Confirmed the obligation to provide unbundling of copper access network. No obligation to provide unbundling of fiber access network.
- ✓ Bitstream obligation extended to Telecom Italia optical fiber access network (FTTX)
- ✓ Obligation to provide access to dark fiber and ducts/cables.
- ✓ Obligations to be reviewed after the final version of CE NGA recommendation is issued.

NGA development plans in Italy: Agcom vision

- ✓ **NGA development and access to fiber carried out according to the following principles:**
 - ❑ *risk sharing* between investors;
 - ❑ Regulation of technical and economical access conditions;
 - ❑ Adequate *risk premium* included in wholesale prices;
 - ❑ Regulation of migration from old to new wholesale services;

- ✓ **Switch off/over of copper access network (according to a total replacement or overlay model), for migration to NGA, agreed with stakeholders (incumbent, OLOs, consumers) and subject to Agcom monitoring;**

- ✓ **Incumbent's and OLOs cooperation is essential for the good result of the entire process, even though architectural solutions proposed by stakeholders may be different;**

- ✓ **The main discussion related to architectural solutions to be adopted concerns the comparison between GPON and Point To Point (P2P) FTTH.**

Migration from copper to NGAN: TI vision

- ✓ **Reduction of the number of Local Exchange (LE) with OPEX saving;**
- ✓ **Communication to OLOs of LE dismissed for ULL 24-30 months before the switch off. Such time lag allows OLOs to:**
 - ❑ Amortize ULL co-location investments
 - ❑ Set up the new network configuration;
 - ❑ Migrate retail services to NGA.
- ✓ **Need to reduce, to the minimum necessary, the period of overlay between copper access and fiber access;**
- ✓ **Switch-off of singles LE areas to be approved by Agcom;**

Migration from copper to NGAN: OLO vision

- ✓ **Need to introduce the obligation for Telecom Italia to communicate, in advance, to OLOs the date of switch off of LE areas. The advance notice allows a reasonable time left to OLOs for investment recovery.**
- ✓ **Not less than 5 years of *overlay* between copper access and fiber access before copper access is switched off.**
- ✓ **Such period could be reduced in case that regulation envisages some compensation for investments;**
- ✓ **Such overlay period will guarantee a soft migration of customers from copper access to fiber access;**

GPON vs P2P

✓ OLO vision :

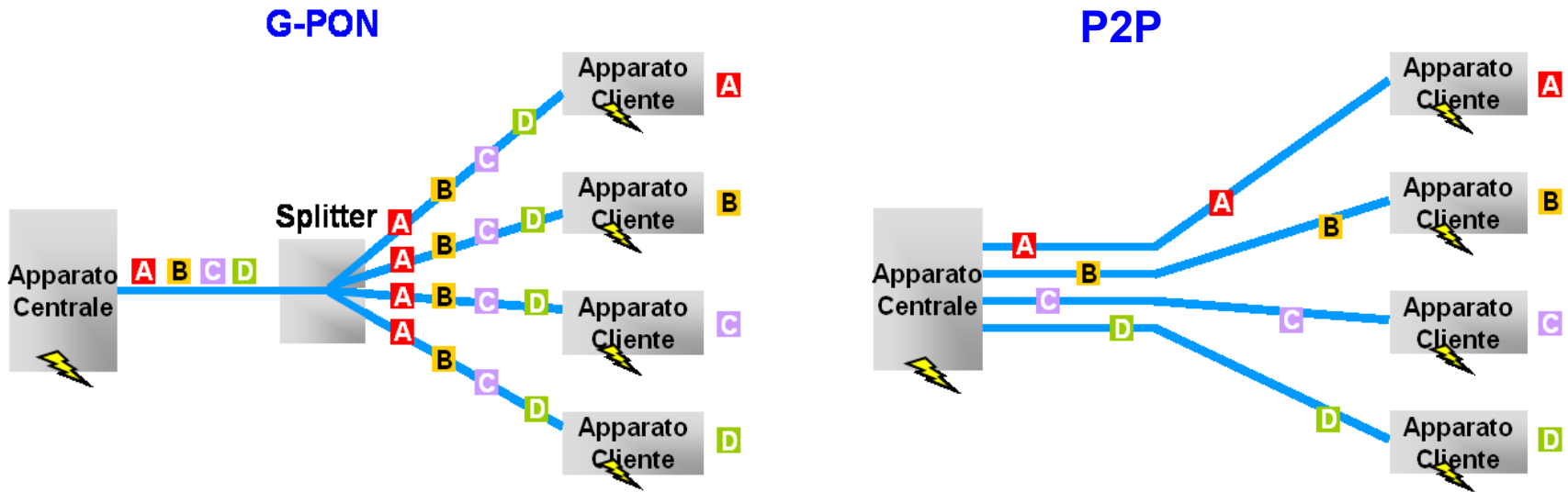
- ❑ Point to Point (P2P) FTTH allows full fiber unbundling;
- ❑ NGA investments carried out by a company called “Società per la fibra” with private and public capital.
- ❑ Service competition based on a single P2P FTTH open network;
- ❑ Gradual *switch off*, carried out for each LE area, allows to avoid duplication of costs for investment and maintenance;

✓ Telecom Italia vision

- ❑ Plans already approved by the board for GPON FTTH implementation;
- ❑ Current framework doesn't allow the imposition to a private company to implement a specific architectural solution, such as P2P
- ❑ GPON allows unbundled access to specific network elements such as dark fiber, ducts, other infrastructures.
- ❑ Rules should be symmetric between OLOs and Telecom Italia.

P2P vs GPON: TI vision

- ✓ P2P requires 50-100% investment increase;
- ✓ P2P requires 20-40% OPEX increase;
- ✓ P2P requires 10 times more increase of co-location space;
- ✓ P2P requires 20 times more increase of power supply;
- ✓ P2P requires less manpower for network management.



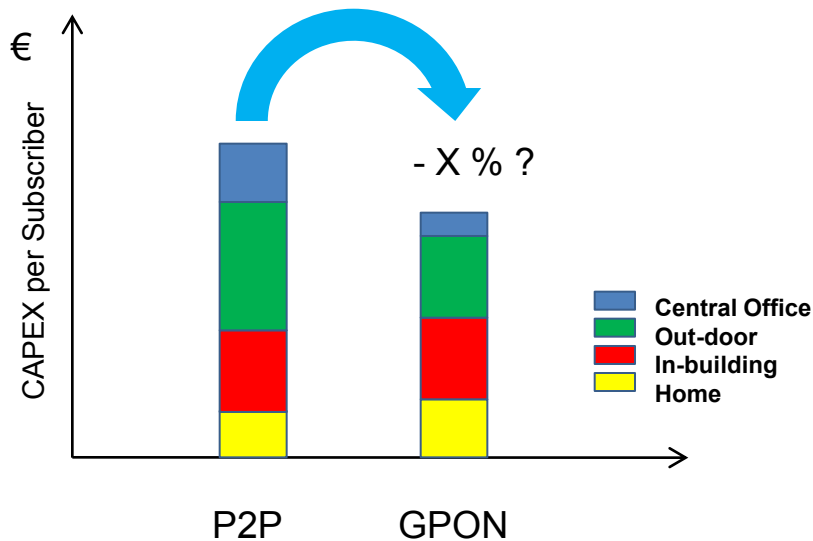
P2P vs GPON: OLO vision

- ✓ P2P bandwidth, per user, is not limited as for GPON;
 - ✓ P2P allows unbundling and the use of standardized interfaces; no standardization for GPON
 - ✓ P2P requires higher initial CAPEX and reduced OPEX;
 - ✓ P2P allows simpler migration of wholesale services and customers.
 - ✓ P2P requires less overall power supply if customer boxes consumption is included;
 - ✓ P2P requires less manpower for network management.
 - ✓ GPON is less resilient than P2P to malicious access
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GPON vs P2P : ISBUL outcome

- ✓ GPON allows OPEX and CAPEX reduction
- ✓ OPEX/Sub saving $\geq 20\%$?

CAPEX per Subscriber



OPEX per Subscriber

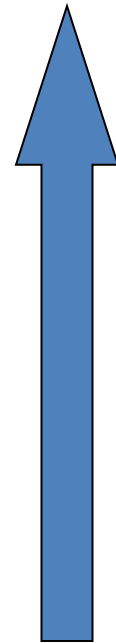
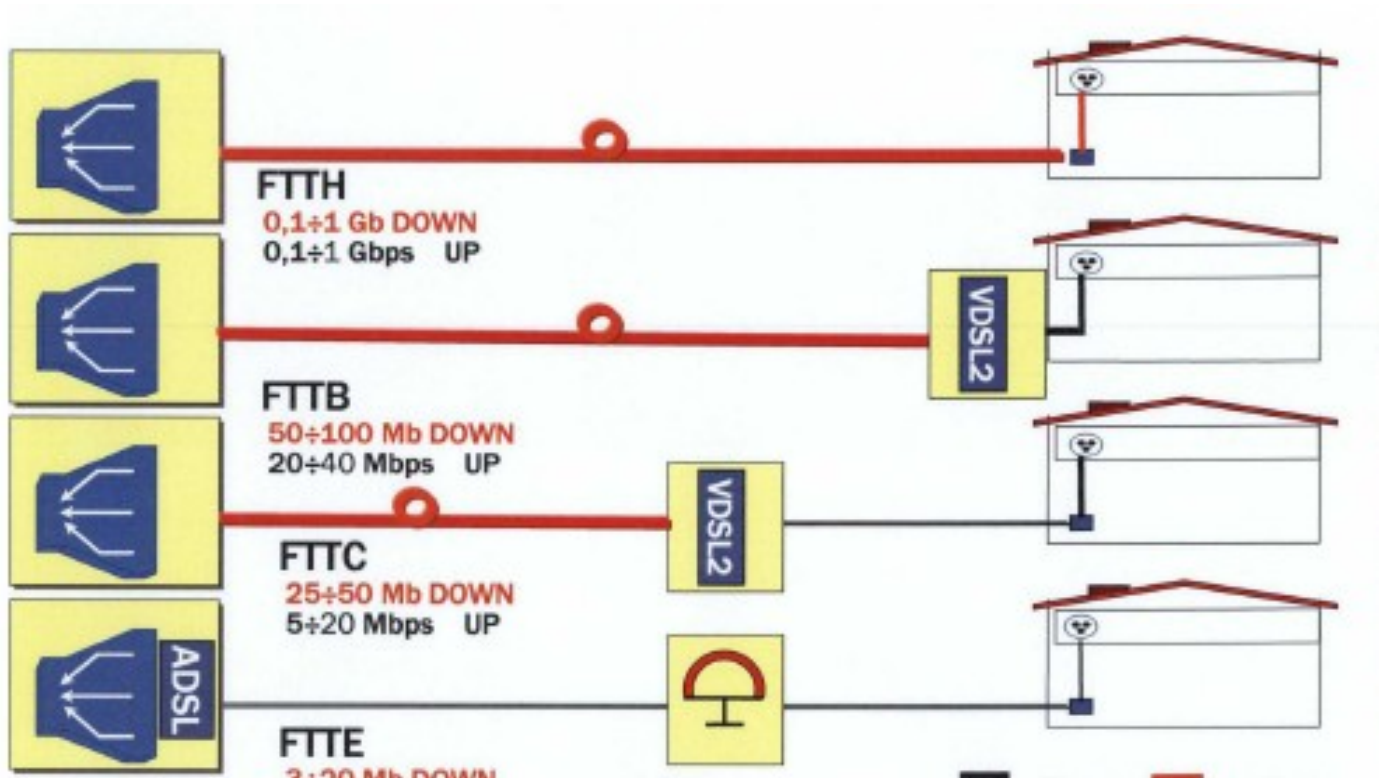
	P2P	GPON
Central Office	High Power - Big Floor Space	Low Power - Small Floor Space
Out-door Plant	1 Sub per fiber High duct reuse	≥ 32 Subs per fiber Low duct reuse
In-building Plant	Same	Same
Home Terminal	Fast Ethernet Standard - less cost	GPON Standard - higher cost
CO Consolidation	10 km - Max 20 k Subs/CO	20 km - Max 100 k Subs/CO

NGA Telecom Italia development plan

✓ Telecom Italia: 2010-2012 plan:

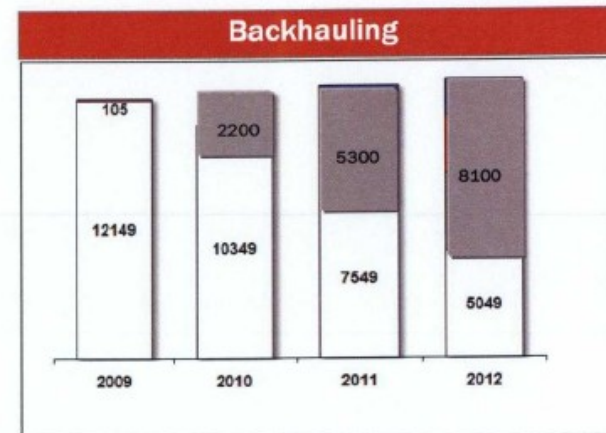
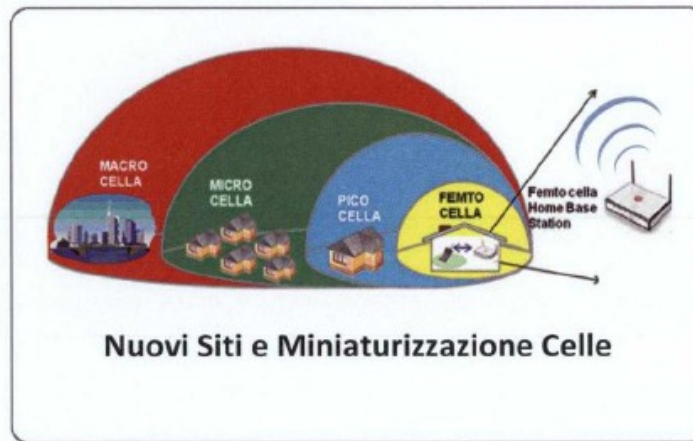
- ❑ GPON implementation in some important cities (such as Rome and Milan) and for a limited number of Local Exchanges.
- ❑ GPON FTTH architecture. FTTB in the cases where FTTH is not technically feasible.
- ❑ NGAN implementation in overlay with copper in the initial development phase.
- ❑ “*Total Replacement*” evaluated case by case according to market demand;

NGA Telecom Italia development plan: fixed access



Fiber development

NGA Telecom Italia development plan: mobile access



□ Rame ■ FIBRA/Ultrabroadband

- Replacement of copper with fiber in the backhaul
- Increase of HSPA performance
- Increase of the number of BTS
- Reduction of single BTSs coverage area

NGA OLO development plan

✓ Fastweb, Vodafone e Wind plan:

- ❑ Start up of “Società per la Fibra”, based on P2P FTTH open architecture. Service based competition and investment share paradigm.
- ❑ Total migration of customers from copper to fiber, scheduled for specific areas, starting from the 15 bigger Italian cities (10 mln customers).
- ❑ Total migration from copper makes NGA costs (Opex and Capex) less expensive than the equivalent copper costs.
- ❑ The business plan foresees a pay back period of 10 years, starting from the 15 major cities (10 mln of customers)

Thank you