Technology neutrality and State aid implications

Madrid, 19 October 2017

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1. Technology neutrality: the general principles

A **technology** is a method to turn inputs into outputs and it competes for these inputs against other technologies.

Technology neutrality : main objective = committing to not picking the winner in the competition between technologies.

Technology neutrality is critical in **encouraging innovation and efficiency by stimulating technology competition.**

- Locking in certain technologies at the expense of other competing solutions may also be **influenced by strong industry players** who have the resources to lobby for a particular technological solution.

However, the principle **does not** per se **forbid the consideration of technological differences**.

2. Technologies & EU targets

BASIC BROADBAND:

- **Definition: Download <30Mbps** & very low upload speeds
- **Technologies**: asymmetric digital subscriber lines (up to ADSL2+ networks), non-enhanced cable (e.g. DOCSIS 2.0), mobile networks of third generation (UMTS) and satellite systems
- **DAE Target: 100% basic broadband coverage** –largely achieved in 2016

NEXT GENERATION NETWORKS (NGN & NGA):

- **Definition: Download >30Mbps** & significantly higher upload speeds (**includes >100Mbps -1Gbps** ; superfast, ultrafast, HCN)
- **Technologies:** FTTx (FTTN, FTTC, FTTs/DP, FTTB, FTTH); certain advanced fixed wireless (reliable high speeds per subscriber & step change); certain Upgraded cable networks (min. DOCSIS 3.0)
- **DAE Targets**: **100% 30Mbps coverage** by 2020 (76% achieved in 2016) and **50% 100Mbps uptake** by 2020 (11% achieved in 2016)
- **Gigabit Society Targets** complement DAE: by 2025:
  - schools, transport hubs, public service providers, digitally intensive enterprises: 1 Gbps upload/download
  - households, rural or urban: 100 Mbps download upgradable to 1 Gbps
  - urban areas, major roads & railways: uninterrupted 5G coverage, starting with 1 major city in each MS by 2020

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3. Implications for the mapping exercise

An appropriate **mapping exercise is key to secure the DAE target in the most efficient and targeted way**. It allows to clearly **identify the geographical area** which will be covered by the support measure and **minimize distortion of competition** with existing providers and with those who already have investment plans for the near future

Mapping of **existing and planned infrastructure** (not suppliers): next **3 years or adequate** period

Mapping only on download speeds (<30 Mbps; >30 Mbps).

As **result of the mapping exercise** the area can be defined:

- *NGA White*: no available NGA infrastructure
- *NGA Grey*: only one NGA infrastructure
- *NGA Black*: at least two NGA infrastructures

The **colour of the area impacts** the way the **public intervention** can be carried out:

- *NGA White*: public intervention can go ahead
- *NGA Grey:* public intervention can go ahead only if step change is demonstrated
- *NGA Black*: public intervention can go ahead only under certain conditions (no fibre network reaches end-users, wholesale only, step change, expected demand, etc.)

4. What is an NGA network?

NGA networks (>30Mbps) are access networks which rely wholly or partly on optical elements and which are capable of delivering broadband access services with **enhanced characteristics** as compared to existing basic broadband networks

NGA networks are understood to have at least the following characteristics:

- **deliver services reliably** at a very high speed (>30Mbps) per subscriber through optical (or equivalent) technology
- backhaul sufficiently close to user premises to guarantee the **actual delivery of that very high speed**;
- **support a variety of advanced digital services** including converged all-IP services
- have **substantially higher upload speeds** (compared to basic broadband networks).

Technology neutrality – implication on mapping:
all technologies matching these characteristic are considered to deliver NGA connectivity

5. Type of NGA networks

Type of NGA networks

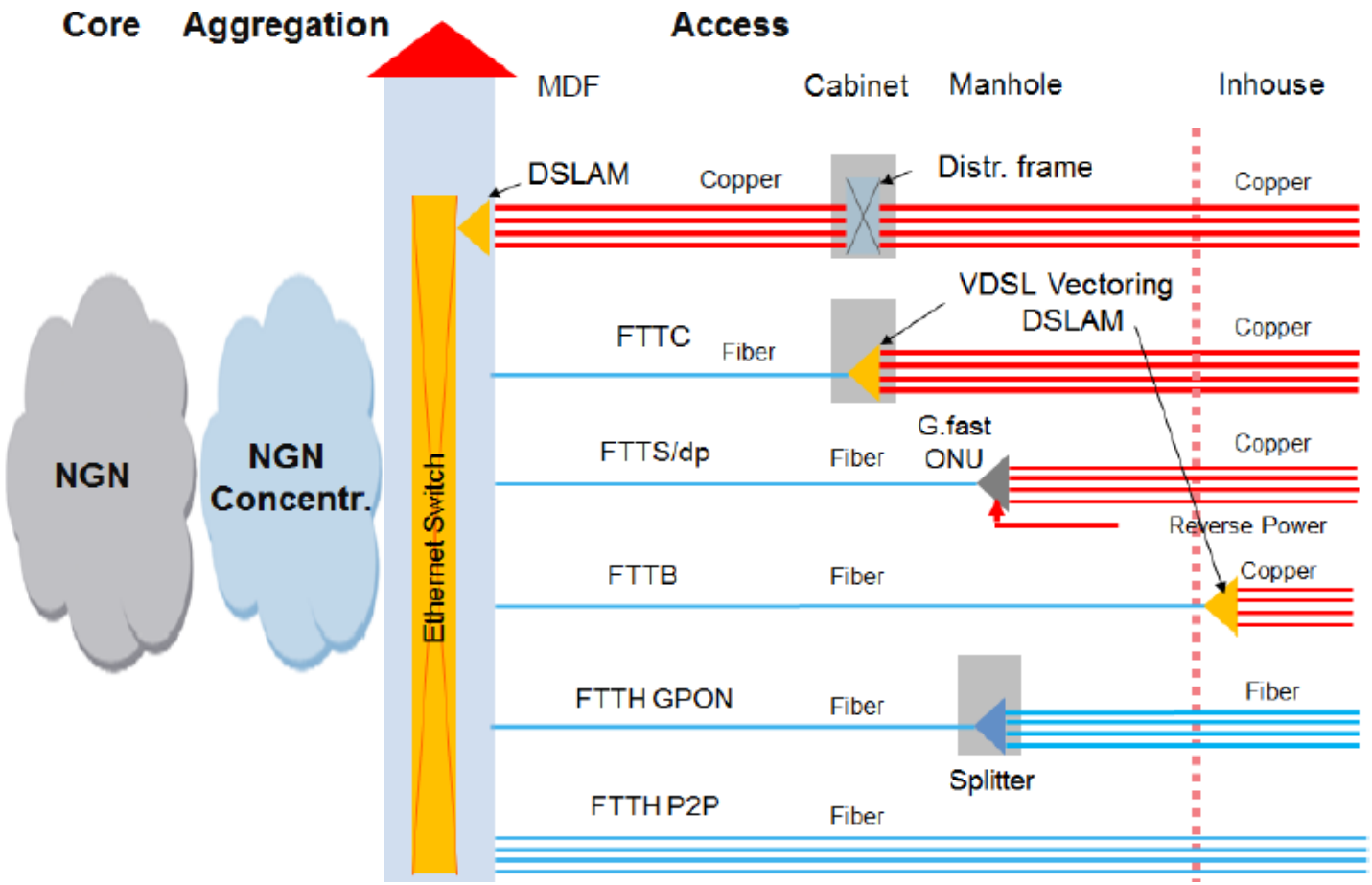
- **Wired**: FTTx (FTTN, FTTC, FTTP, FTTB, FTTH); cable networks (min. DOCSIS 3.0)
- **Wireless**: Fixed-Wireless & Mobile (LTE) under certain circumstances.

Cautious on wireless: not always able to deliver **reliable** NGA services (the area may be considered white) -> Need for in depth scrutiny

- The wireless medium is '**shared**' (the speed per user depends on the number of connected users in the area covered)
- The number of users could include **nomadic users**
- The medium is inherently subject to **fluctuating environmental conditions**

- **Fixed Wireless**: need to use licensed spectrum with adequate bandwidth, density of deployment and capacity planning, advanced configurations (such as directed and/or multiple antennas).
- **Mobile broadband (LTE):** must also ensure the required **quality of service level to users at a fixed location while serving any other nomadic subscribers** in the area of interest: e.g. **as part of FWA** (no case practice yet)

6. Fibre based NGA networks 1/2

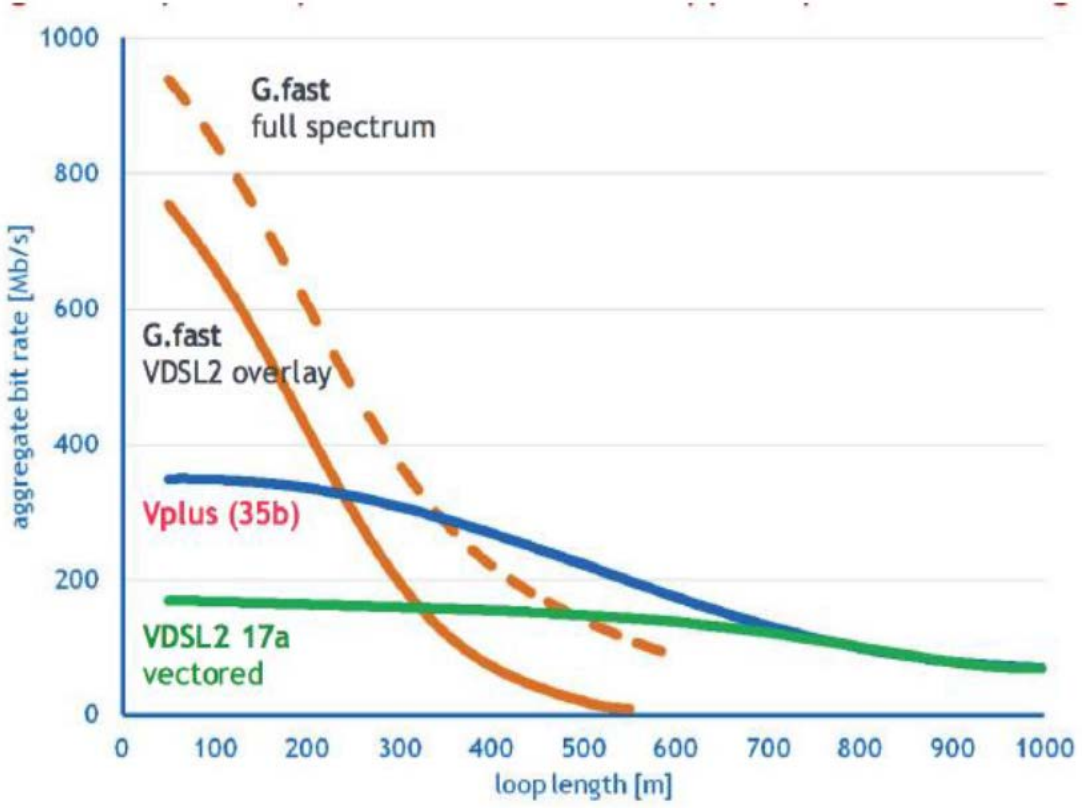


7. Fibre based NGA networks 2/2

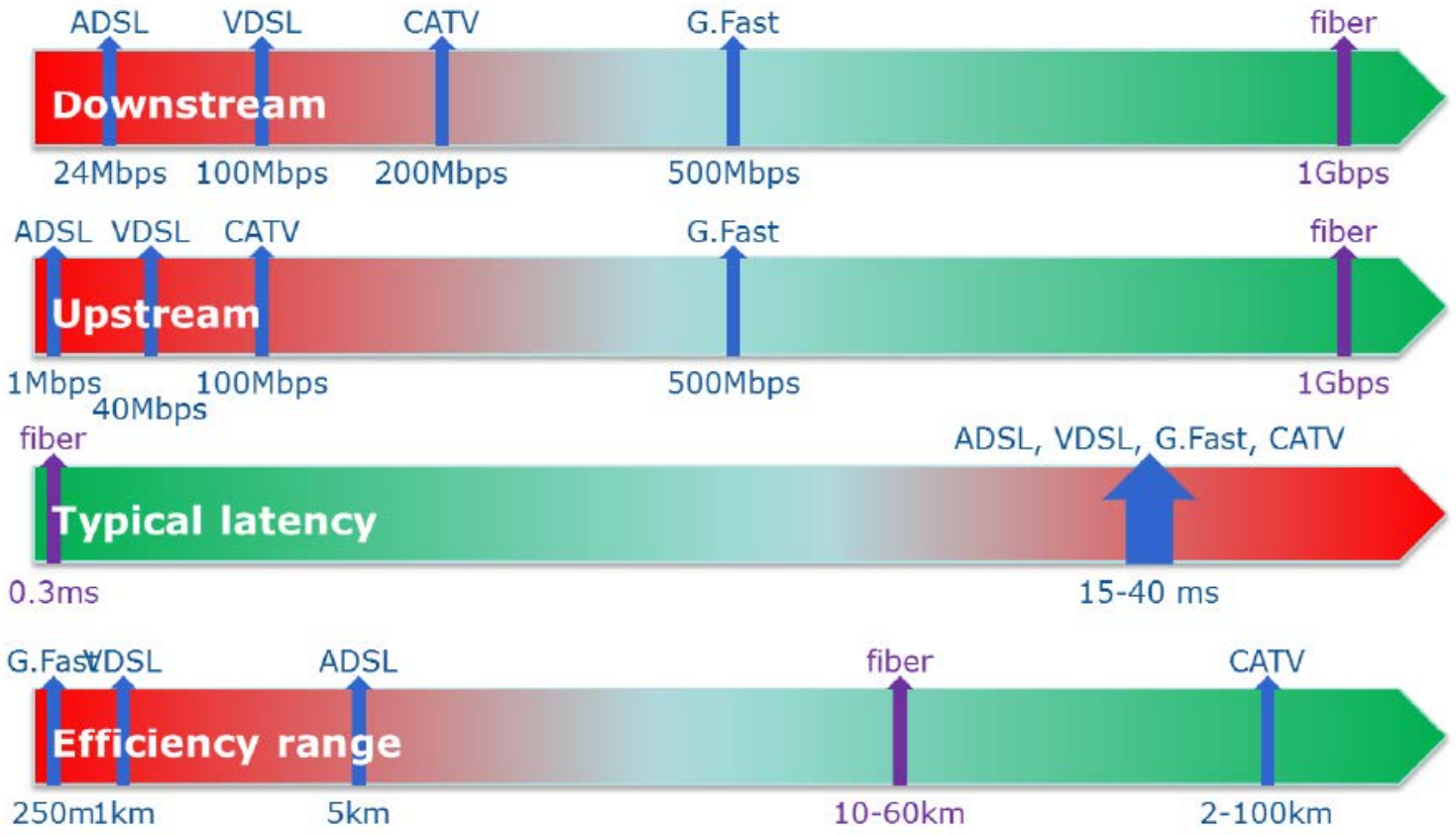
- **FTTN**: Fibre to the node (= local exchange or Main Distribution Point (MDF) location
- **FTTC**: Fibre to the cabinet, requires active components and power supply at the cabinet locations
- **FTTS/dp**: Fibre to the street/ distribution point requires distribution points capable of hosting active network nodes (elec. power), handholes or small cabinets
- **FTTB**: Fibre to the building needs active network components, which are devises which require external power source, changing from fibre to in-house copper line communication, no need for in-house fibre cabling coordination
- **FTTH**: Fibre to the home, in any flat, with either point-to-point (PtP) fibre between home and MDF or point-to-multipoint (PtMP) fibre, where the end customer fibres will be aggregated to one single fibre to the MDF location by splitters at distribution points in the field

8. Copper based sub-loop

For Copper based technologies need to take into account the sub-loop length



9. NGA networks: main features



10. Applications useing NGA networks

Table 1: Application categories with their capacity and quality requirements 2025

Application category	Downstream (Mbit/s)	Upstream (Mbit/s)	Packet loss	Latency
Basic Internet	≈20	≈16	0	0
Homeoffice/VPN	≈250	≈250	+	+
Cloud Computing	≈250	≈250	+	++
Media and Entertainment HD/3D	≈150	≈30	++	+
Media and Entertainment Ultra-HD, 4k-TV, 3D, ...	≈300	≈60	++	+
Communication	≈8	≈8	++	+
Videocommunication (HD)	≈25	≈25	++	++
Gaming	≈300	≈150	++	++
E-Health	≈50	≈50	++	+
E-Home/E-Facility	≈50	≈50	0	0
Mobile Services / Wifi-Offloading	≈15	≈12	0	0

0 = No specific importance
\+ = High importance
++ = Very high importance

Source: WIK-IDATE-Deloitte; Regulatory, in particular access, regimes for network investment models in Europe, SMART 2015/0002

11. Technical criteria for the assessment of the *step change*

Interventions in **grey areas**: **step-change demonstration needed**

Next to download speed, various technical criteria can be considered to assess the step change**:**

- Upload speed
- Jitter, Latency, Packet loss, etc.
- Reliability and robustness
- Future proof
- ……

12. Strict step change for black NGA areas

Interventions in **black areas**: Only with **>100Mbps -1Gbps (HCN); stricter step change requirements**:

- Existing / planned NGA networks **do not reach the end-user premises with fibre networks**
- Market situation **not evolving towards providing >100Mbps in the near future** by private investment
- There is **expected demand** for such qualitative improvements (including **Gigabit** targets)
- Subsidised network has **significant enhanced technological characteristics & performance**
- Subsidised network is **wholesale-only**
- No excessive distortion of competition regarding **recent NGA investments by private operators** in same areas

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13. The principle of technology neutrality in the BBGLs *(art. 78(e) BBGLs)*

- As different technological solutions exist to provide broadband services, **the tender should not favour or exclude any particular technology or network platform**. Bidders should be entitled to propose the provision of the required broadband services using or combining whatever technology they deem most suitable.

- On the basis of the **objective tender criteria**, the granting authority is then entitled to select the most suitable technological solution or mix of technology solutions. In principle, universal coverage of larger target areas can be reached with a mix of technologies.

14. Most economically advantageous offer (art.78(d) BBGLs)

- Within the context of a competitive tender procedure, the aid granting authority shall establish **qualitative award criteria** on which the submitted bids are assessed.

- Relevant award criteria may include, for instance, the **achieved geographical coverage**, **sustainability of the technological approach** or the **impact of the proposed solution on competition**.

- Such qualitative criteria have to be **weighed against the required aid amount**.

- ……

15. Examples of additional criteria

Footnote 103 of BBGLs:

- **network topologies allowing full and effective unbundling** could receive more points.
- a **point-to-point topology** is more conducive for long-term competition in comparison with point-to-multipoint topology.

On aid to ultra-fast broadband networks (art.84(a) BBGLs):

- the subsidised network exhibits **significant enhanced technological characteristics** and performance compared to the verifiable characteristics and performance of existing or planned networks.

16. Technology neutrality in the proposal for an Electronic Communication Code *COM(2016) 590 final*

"The principle that Member States should **apply EU law in a technologically neutral fashion** … that is to say that a national regulatory or other competent **authority neither imposes nor discriminates in favour of the use of a particular type of technology**

……, it does not preclude taking into account that certain transmission media have physical characteristics and architectural features that can be **superior in terms of quality of service, capacity, maintenance cost, energy efficiency, management flexibility, reliability, robustness and scalability, and ultimately in terms of performance**, which can be reflected in actions taken in view of pursuing the various regulatory objectives."

17. Technology neutrality principle in the context of the selection procedure: take-away concept

The granting authority in designing the selection procedure and the **award criteria should specify the performance goal** to be achieved but should then **leave the bidders free to offer any technology** that they find appropriate to achieve it.

Among the criteria to define the **performance goal** are:

quality of service, capacity, maintenance cost, energy efficiency, management flexibility, reliability, robustness and scalability, future proof, latency, jitter, download/upload speed, competition (e.g. wholesale access)…

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18. Technology neutrality: implication for the wholesale access obligations

Wholesale access: Due to the economics of NGAs, it is of utmost importance to ensure **effective wholesale access for third-party operators**. Especially in areas in which there are already competing basic broadband operators, in which it has to be ensured that the competitive market situation which existed before the intervention is preserved….. **The subsidised network must therefore offer access under fair and non-discriminatory conditions to all operators who request it and will provide them with the possibility of effective and full unbundling**.

Thank you!