HELLENIC TELECOMMUNICATIONS & POST COMMISSION

Next Generation Access (NGA) Networks: regulatory issues and challenges

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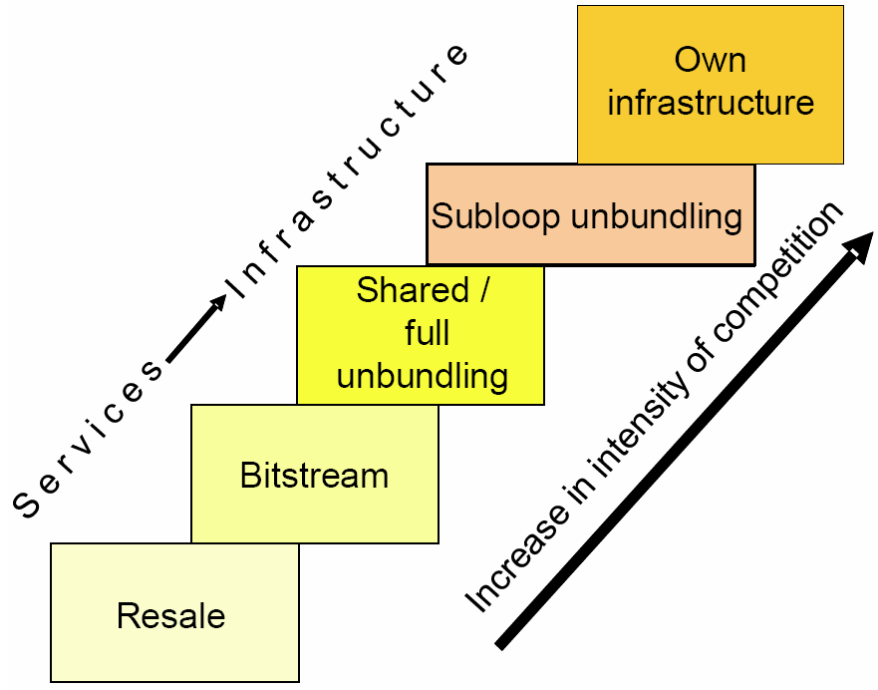
What are the NGA networks?

- Exponential increase of traffic demand related to broadband services (HDTV, real-time interactive applications, telemedicine, distant learning, interactive gaming)
  - End-user demand for capacity doubles every two years (Nielsen's law)
- The transition to NGAs appears therefore to be inevitable
- NGA options: Partial or full replacement of the traditional copper access network between Local Exchanges and end-user premises by optical fiber.
- Fiber To The Home (FTTH)
  - Full replacement of the traditional copper access network by optical fiber.
  - High CAPEX requirement but future-proof investment.
  - More friendly to the environment.
- Fiber To The Cabinet (FTTCab/VDSL2)
  - Partial replacement of the traditional copper access networks by optical fiber.
  - Replacement of passive outdoor cabinets by modern but more energy consuming cabinets (less "green" technology).
  - Technologically limited: cannot serve in the long term the anticipated increase in demand.
  - Typically asymmetric in terms of downstream-upstream capacities.

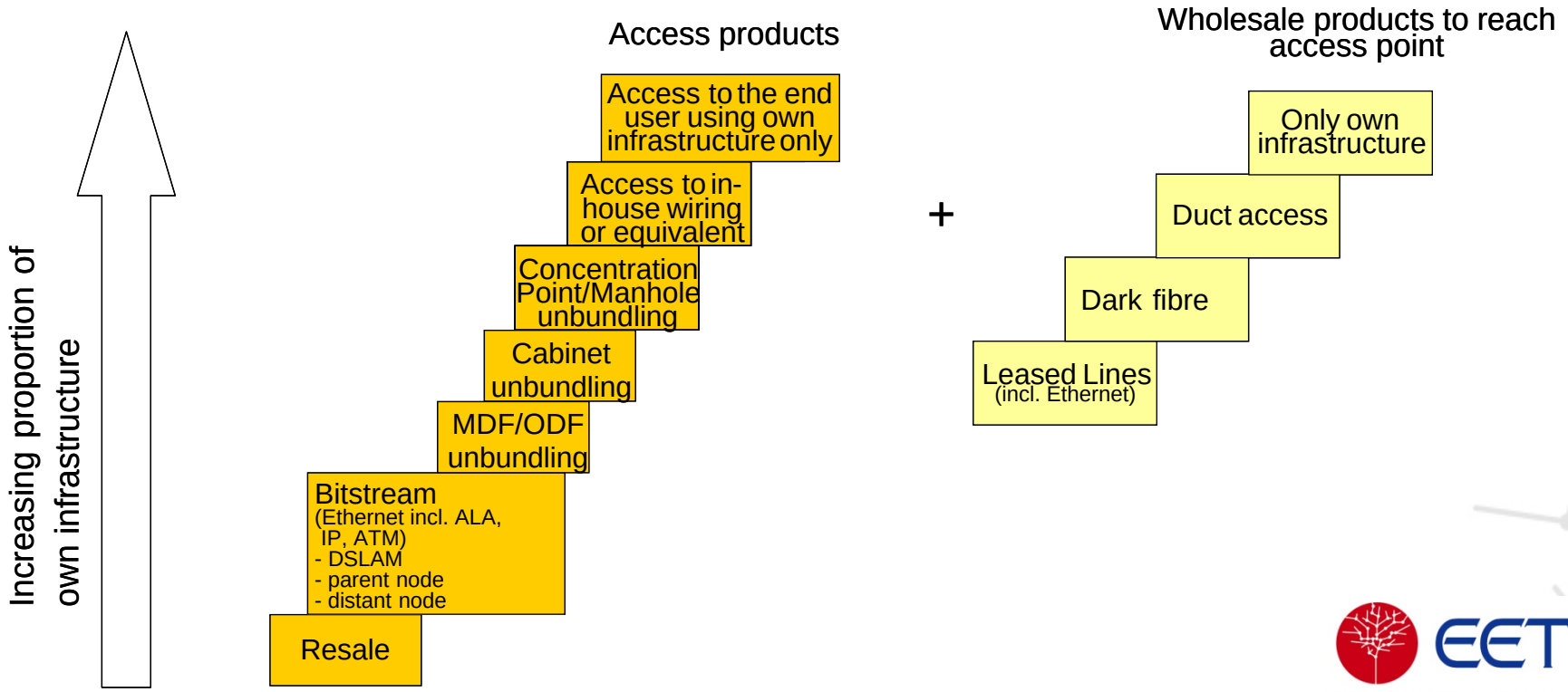
The ladder of investment of the alternative operators in traditional copper access networks

- Alternative operators usually start their activities utilising resale or wholesale broadband access (WBA or bitstream)
- When a critical mass of customers is created, then they start climbing up the ladder of investment …
- …and move to Local Loop Unbundling (LLU)
- …investing in collocation facilities and own equipment in order to be able to offer quality and competitive services to the end-users



The ladder of investment of the alternative operators in an NGA environment

- In an NGA environment, the traditional ladder of investment is modified, depending on the NGA access level (Local Exchange, outdoor cabinet, etc.)
- In order for the alternative operators to be able to remain in the market, significant modifications are required to the mandated wholesale products and facilities (compared to the "traditional" products, such as bitstream and LLU)



Source: European Regulators Group (ERG)

FTTH

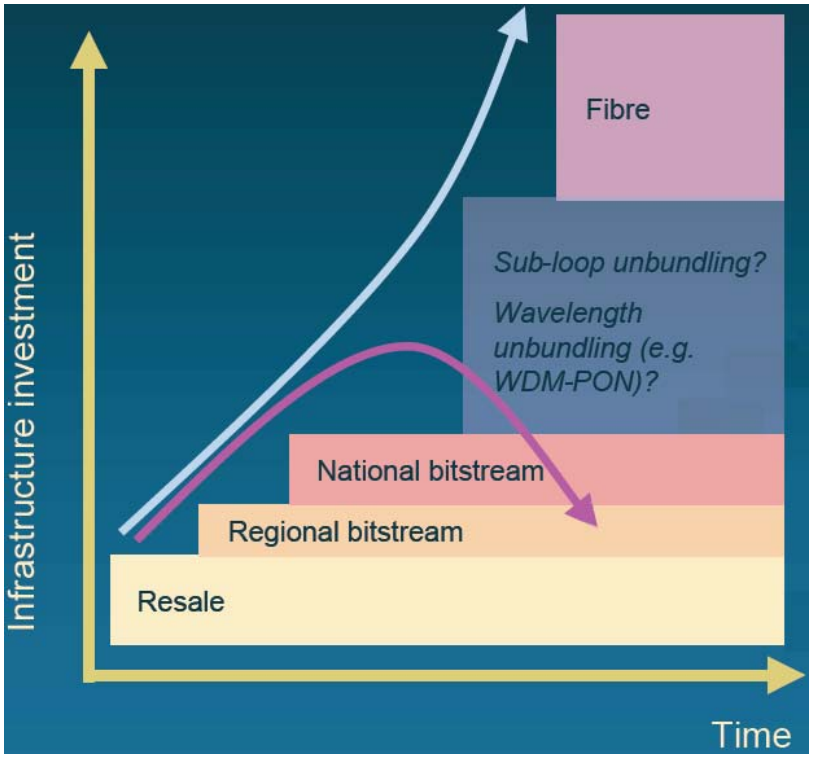
- State announcement: National plan for the deployment of a nation-wide optical fiber access infrastructure: Open access, active state participation (state-aid)
  - Other extensive projects: Singapore, Korea, Japan, Australia, New Zealand etc.
  - Other city-level projects: Stockholm, Amsterdam, etc .
- European Commission (EC) approval is required for a number of reasons:
  - It must be assured that the proposed measure does not distort or threaten to distort competition.
  - Compatibility with the (recently released) EC guidelines regarding broadband state-aid projects is required.
  - A number of important contractual obligations are introduced: open access, technology neutrality etc.
- For such a project, contractual obligations should be recommended and/ or approved by the EC.
- EETT guarantees that the operation of the new FTTH network will not distort competition and that it will be made available on equal access terms to all licensed network operators.

FTTCab / VDSL (1)

- Possible FTTCab/VDSL2 deployment by the incumbent is less demanding in terms of CAPEX but also incurs risk.
- In that case, the alternative operators are obliged to turn to collocation to outdoor cabinet level, if they want to retain access to the end user and full control of the quality of the offered service.
- The new investment required by the alternative operators incurs even higher risk due to:
  - Low customer density at the outdoor cabinet level
  - Multiplication of the procedures and delays related to the collocation process at the outdoor cabinet level
  - International financial downturn and competition status in the Greek telecommunications market
  - "Expiration date" of VDSL technology in its current form

FTTCab/VDSL (2)

- Therefore in an FTTCab/VDSL2 environment, Wholesale Broadband Access (WBA) can be used (at least in the early phase) as a means that will enable alternative operators to remain competitive in the broadband market.
- This means a step back in the ladder of investment (from LLU to WBA)



The regulator has to assure that the alternative operators will have access to the appropriate WBA products in order to be able to compete against the incumbent.

In a VDSL environment, the WBA market may be more important than the LLU market.

Conclusions

- The transition towards NGAs is inevitable due to the exponential growth of broadband traffic demand.
- The deployment of FTTCab/VDSL2 access networks increases the significance of wholesale broadband access (WBA, bitstream).
- In the long term, the FTTH option is more appropriate to serve future capacity demand.
- NGA deployment, whether based on state-aid initiatives or on private investment, cannot be allowed to distort competition.
- In any case, EETT guarantees a level playing field for all.