Broadband infrastructure
Points of reference and Outlook

GLOBAL FORUM

Monday November 5th, 2007

Venice

Gabrielle Gauthey
ARCEP's Commissioner

ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION
des Communications électroniques
et des Postes

Broadband infrastructure

- **NGA access rollouts in the world and in France**
- **Major issues**
- **Mobile broadband**

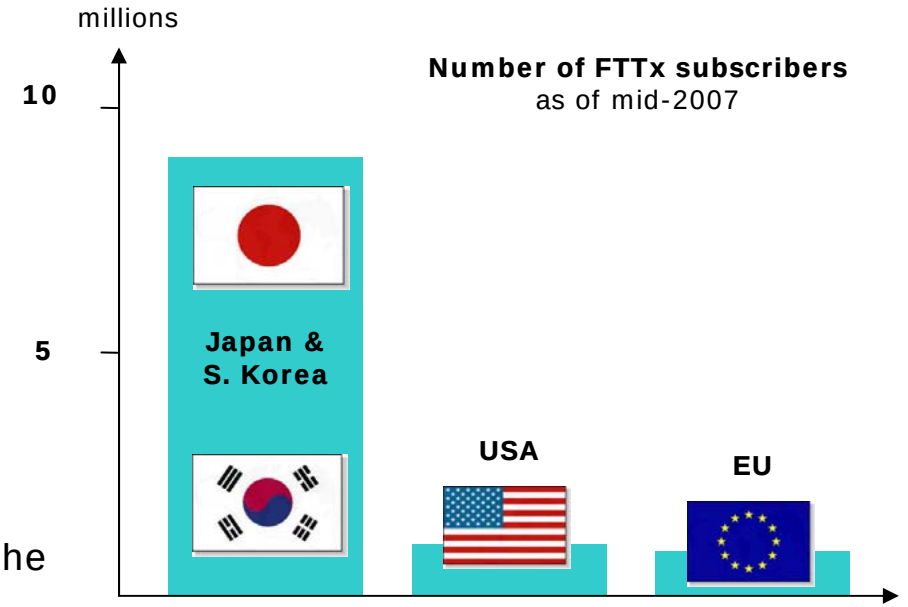
The first residential fiber rollouts are underway in the world…

- Asia (Japan, South Korea), is the pioneer, coming up on 10 millions subscribers. China is promoting fibre optic installations in new buildings.

- Leading telcos in the US have around 7 million homes passed for fibre and 1 million subscribers.

- In Europe, the main FTTH rollouts have been public initiatives (Sweden, Italy, Denmark), with the more recent projects initiated by local authorities (Amsterdam, Hauts de Seine). More recently incumbents are taking significant initiatives : Deutsche Telekom, Swisscom, Belgacom, KPN…

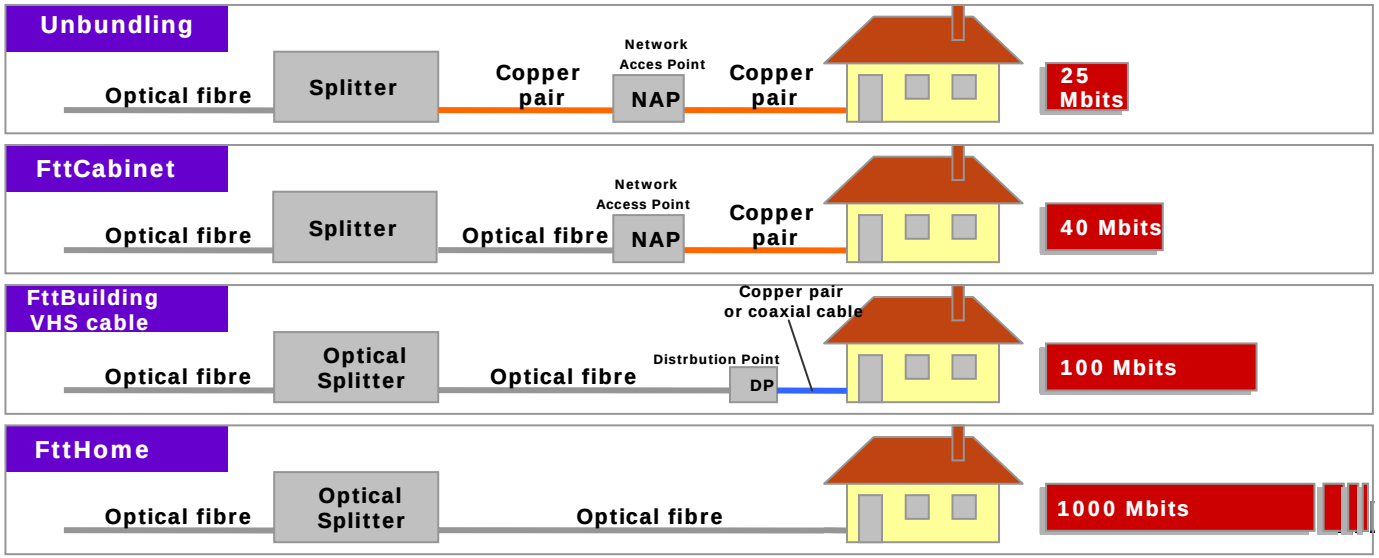
5 million homes passed, 820 000 subscribers



…differently according to national circumstances

- **Unlike France, cable development in US is a major characteristic, representing more than 60% of Internet access lines in 2004. Cable operators have invested heavily in the past 10 years (85 bio USD).**
- **Civil engineering cost is cheaper in US and in Japan because a lot of cables are aerial**
- **Copper cable quality is poorer in the US than in France where ADSL is more efficient and local loop length shorter**
- **Favorable habitat configuration in Japan and Korea**
- **Unbundling required in Japan, “regulatory holiday “in the US**

Fibre will be key for supplying higher bitrates



- The development of triple play offers (Internet, VoIP, TV) revealed households' appetite for multimedia content.

- Ever-increasing file exchange needs, the growing ubiquity of broadband, asynchronous consumption modes (downloading, HDTV, video on demand) are making fibre-based networks' development inevitable in the medium and long term.

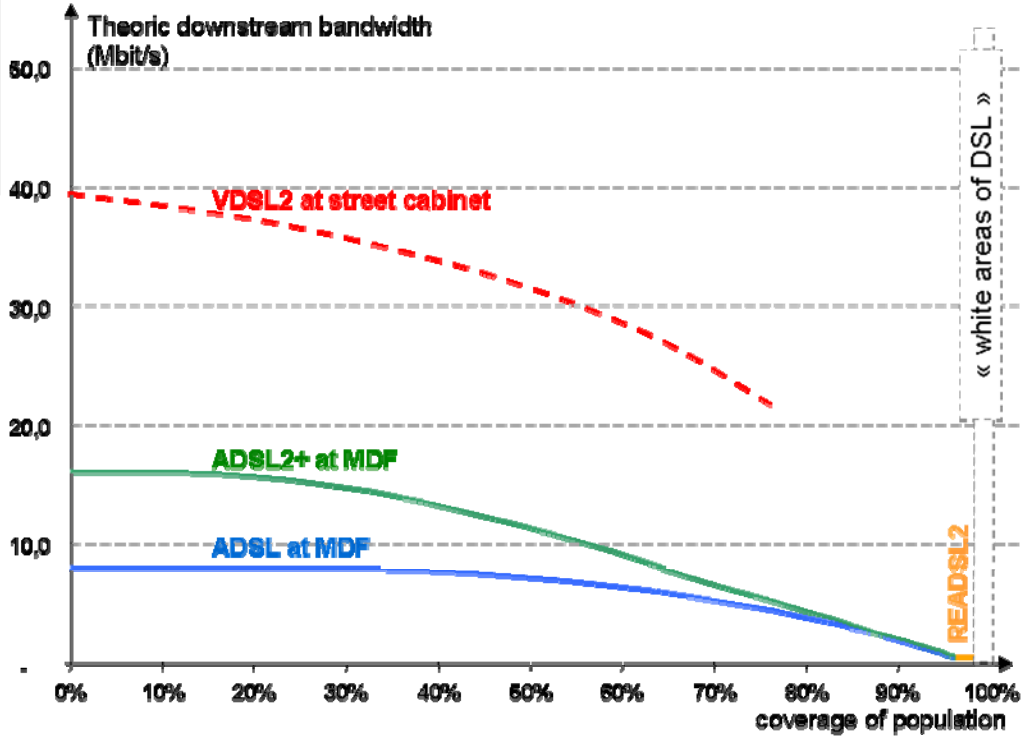
Fiber is a technological cut off

Technology	Downstream rate	Upstream rate
ADSL2+ at main distribution frame	8 - 16 Mb/s	< 1 Mb/s
Cable: tree structure	5 - 30 Mb/s	< 5 Mb/s
Wimax : shared bandwidth	10 - 20 Mb/s	10 - 20 Mb/s
VDSL2 floor distributor	20 - 40 Mb/s	5 - 20 Mb/s
FTTB (fiber to the building then VDSL2)	40 - 70 Mb/s	15 - 35 Mb/s
FTTH (fiber to the home)	**> 100 Mb/s**	**> 100 Mb/s**

Fiber is a technological cut off compared to copper pair and cable

The local loop of the future

In Europe mainly FTTN+VDSL scenarios…



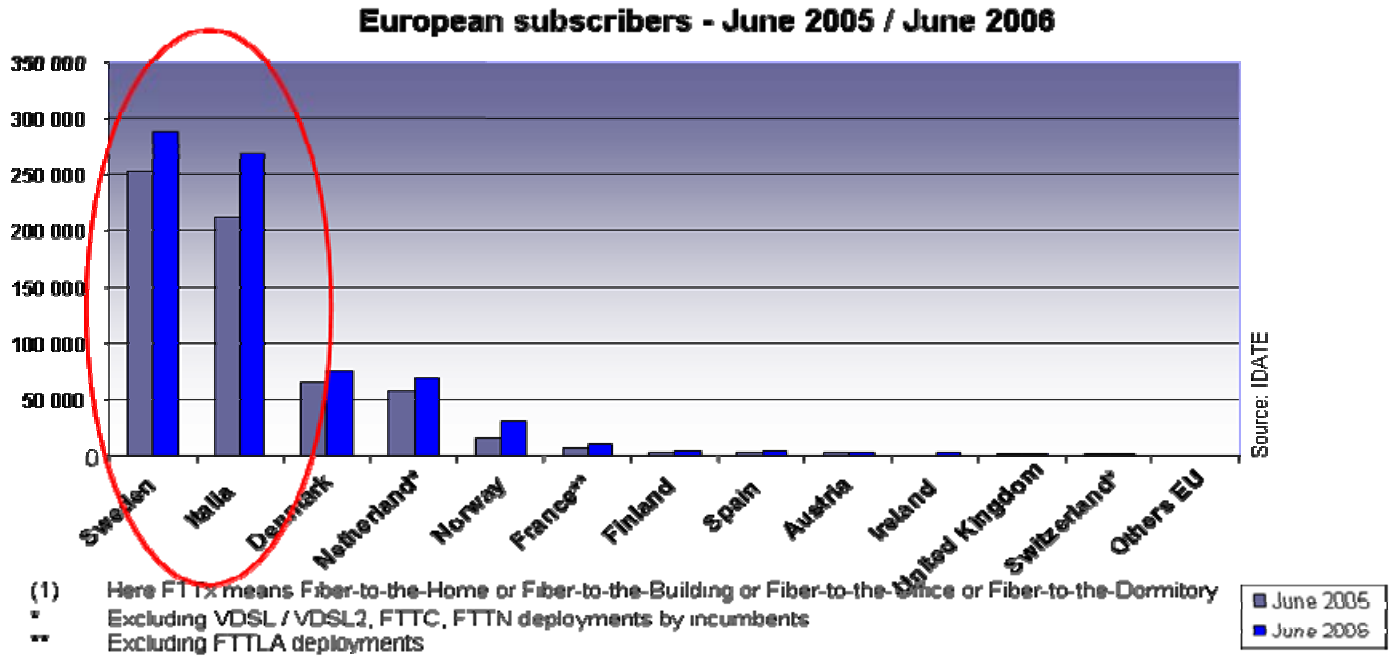
	France	Germany	Netherlands
nb of MDF	13.000	8.000	1.380
nb of SC	120.000	320.000	28.000

Density and ratio between the number of MDF and SC make FttCab scenario less relevant in France

ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

...with some FTTH rollouts

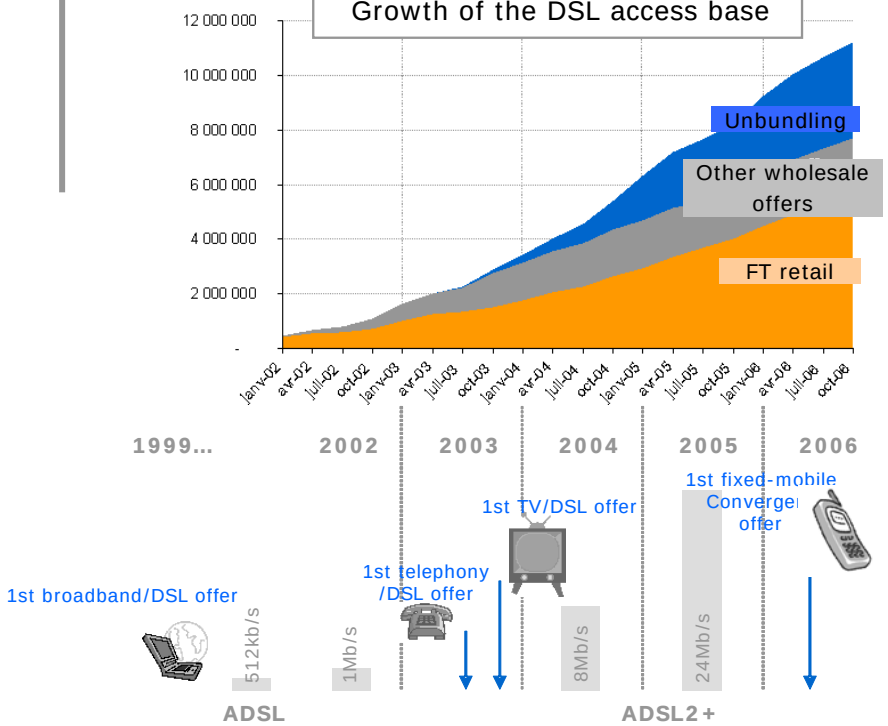
- Two leaders : Sweden and Italy
- Followed by Danemark and the Netherlands



ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

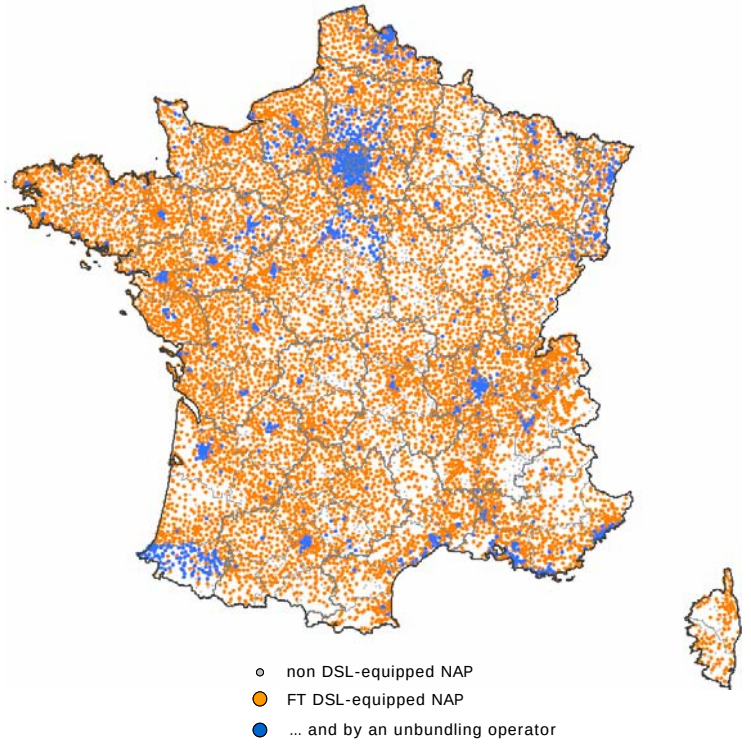
In France : the next step on the ladder of investment

Growth of the DSL access base



Evolution of DSL technologies and services

DSL coverage as of 1 January 2007



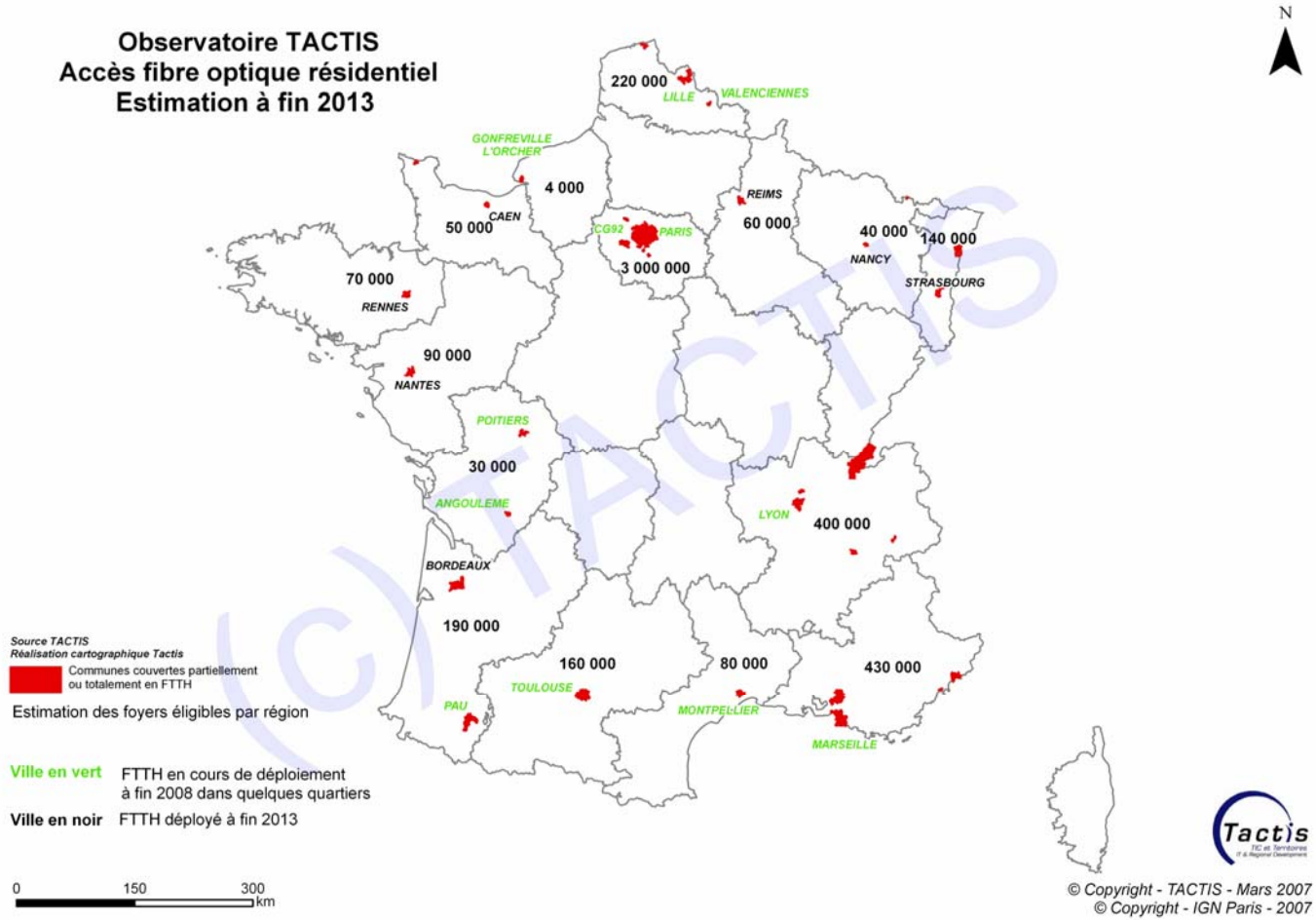
ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

Ftth rollouts in France

- Main residential operators:
  - **Illiad-Free** (FttH Point-to-Point) : 1 bn€ over 5 years; rolls-out in Paris + announcements for other cities with municipal ducts (e.g. Montpellier)
  - **France Télécom** (FttH PON) : 280 M€ over 18 months; rolls-out in Paris and several main cities (Marseille, Lyon, Lille, Toulouse)
  - **Neuf Cegetel** (Fttx) : 300 M€ over 2 years; FttB in Paris (transitory) and FttH PON with the local authority SIPPEREC (around Paris)
  - **UPC Noos** (cable operator) : 300 M€; rolls out FttLA in 12 main cities

- Major local authorities projects including FTTH:
  - Conseil Général des Hauts de Seine
  - SIPPEREC
  - Gonfreville l'Orcher (Seine maritime)
  - CU du Grand Nancy
  - Syndicat Mixte départemental de la Loire
  - CA du Pays d'Aix
  - etc.

What could the French situation be in 5 years?

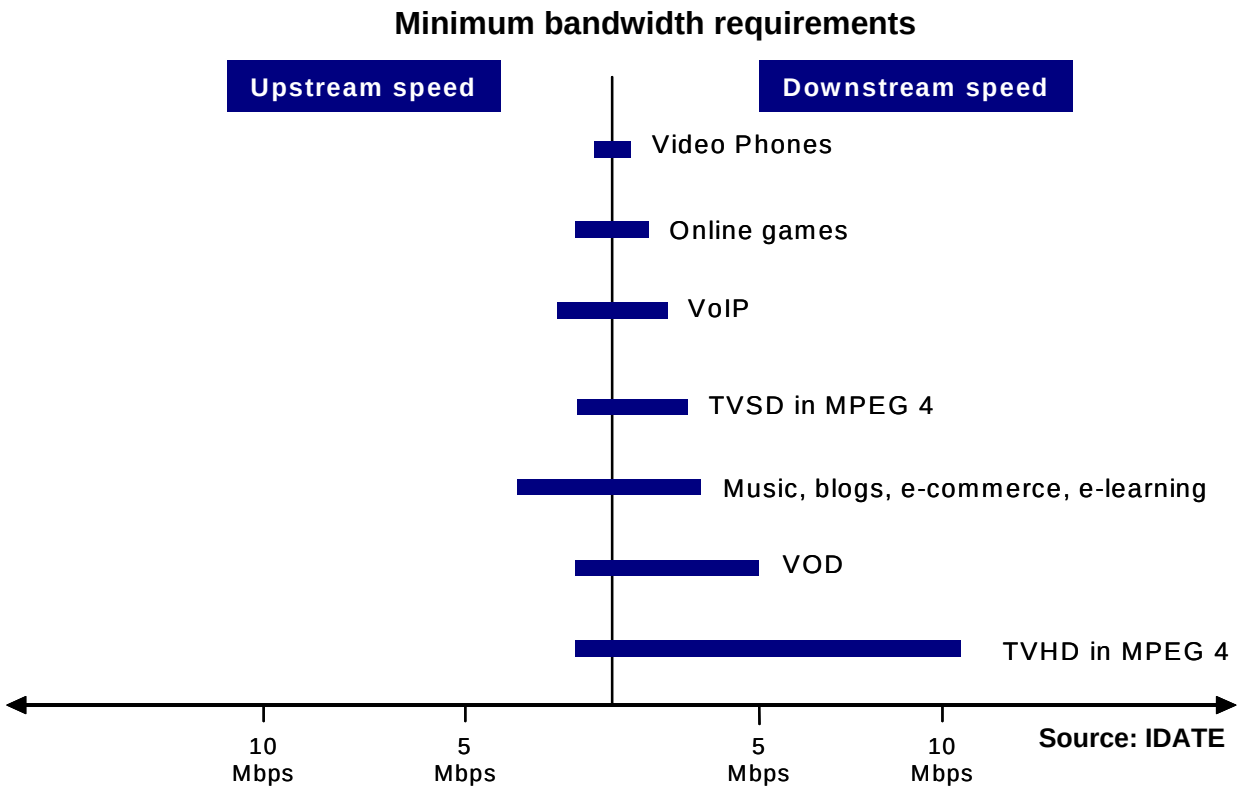


Broadband infrastructure

- NGA access roll outs in the world and in France
- **Major issues**
- Mobile broadband

What are the needs?

- **Today few applications require more bandwith**: TVHD, video services, blogs, exchange of personal content…
- **Tomorrow**: a constant growth of bandwith required, a need for **symetrical** bandwith, and simultaneous use at home, **Web 2.0..**



Which regulation?

- Investors need a foreseeable regulatory environment and a reasonable return on risky investments

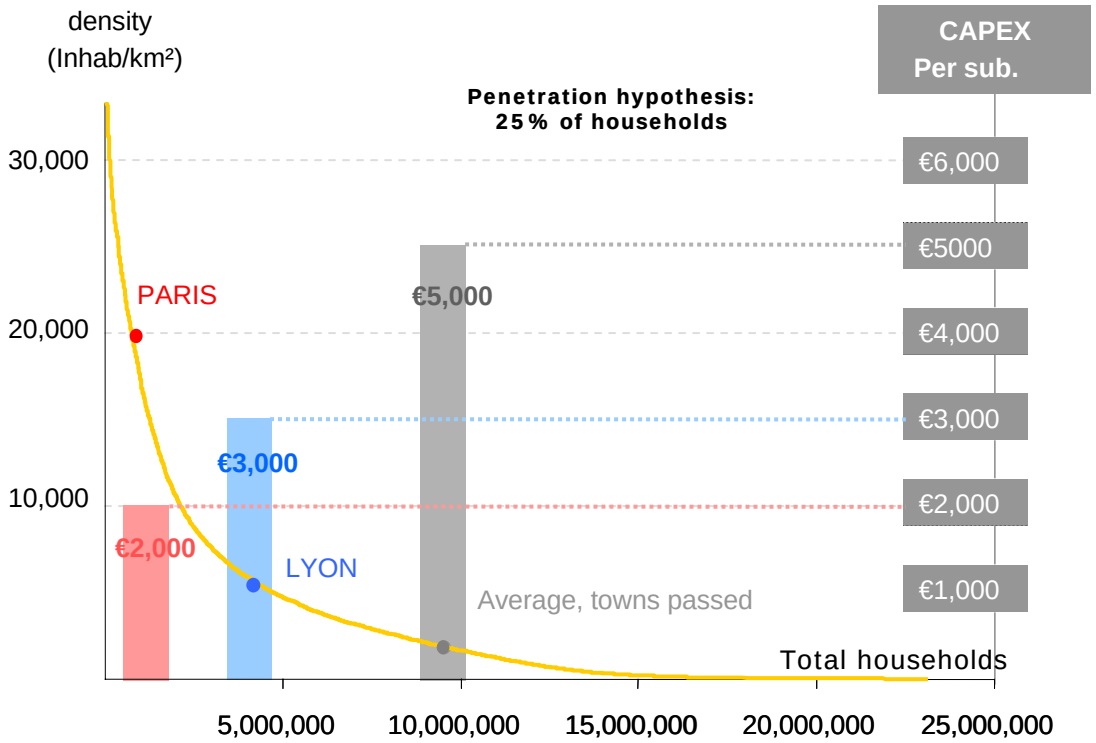
  …but the high risk of re-monopolization has to be taken into account
- There is no unique solution in the world… Regulation is not black and white

- Objectives :
  - keep new infrastructures open, while guaranteeing a reasonable return on all new investments whose financing should be shared
  - necessity to take today the relevant and proportionate measures
  - …in order to avoid to have to regulate heavily and in detail tomorrow

- Concentrate on the two remaining “bottlenecks”

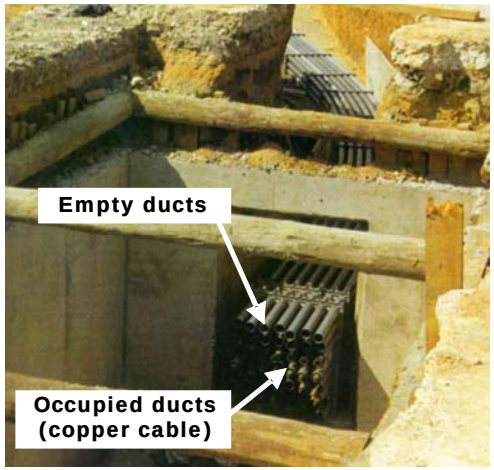
- Adapt the current European framework to face this new challenge

First bottleneck : Civil engineering-largest cost item



- Civil engineering (digging trenches and installing subsoil ducts up to buildings) is the single largest cost item in an FTTH network deployment. In Paris, where the population density is 20,000 inhab/km², infrastructure reconstruction costs would total €1,000 per subscribing household (given that reconstruction would not be necessary thanks to the sewer system open to visitors).
- The cost of engineering works, per subscriber, is inversely proportionate to urban density. Paris has twice the density of Lyon, three times that of Marseille, and six times that of Brest. Outside the major cities, trench reconstruction costs are prohibitive, and so likely to compromise, or severely limit, FTTH network deployments in France.

Existing infrastructures must be used…



- **Open access sewers are found only in a few cities in France (Paris, Lyon, Marseille)**

- **Need to access existing ducts (France Telecom, Local authorities' cable PSD, others)**

- **Arcep is already engaged in two types of projects:**

➢ Evaluation and negociation of a future duct rental offer from France Telecom (access to ducts is a possible remedy in the future recommandation of the Commission…)

➢ Experience sharing between local authorities, as part of the Public Initiative Networks Committee's ongoing work,

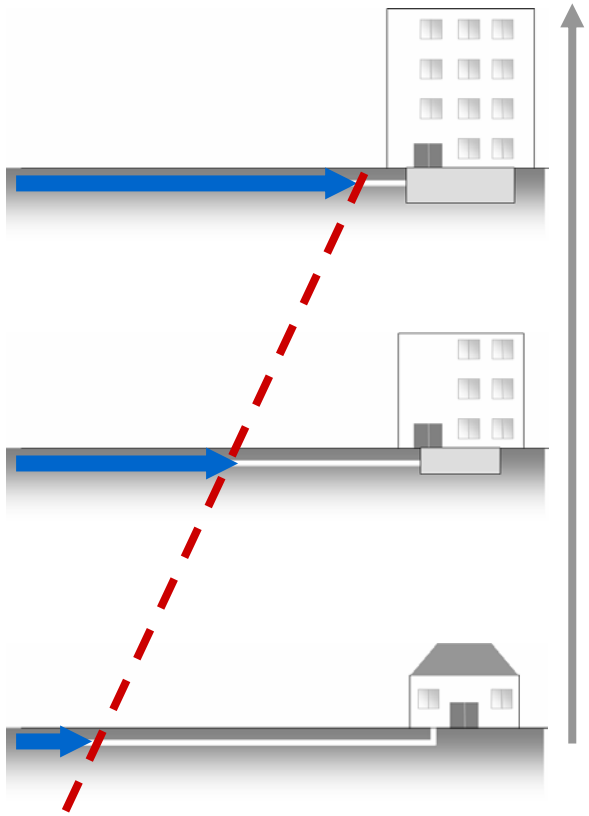
➢ Special work on the cable ducts

Would access to ducts be sufficient?

- Even if a duct sharing offer has been implemented, ducts may not be available everywhere, so that competitors may not be able to rely exclusively on this offer to roll-out their fiber networks in a given area.

- Furthermore, in low density areas, even if ducts are available, it may not be economically feasible for more than one competitor to roll-out in parallel several fiber networks to the end users.

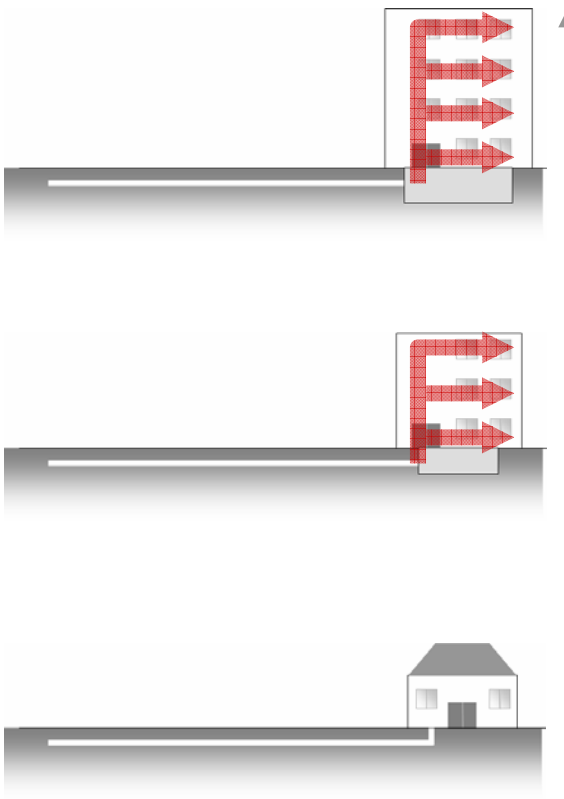
- A duct offer may therefore not be the only facility needed by competitors to roll-out their own fiber networks once a first one has been rolled-out.



Second bottleneck: in-house wiring+end part of the local loop

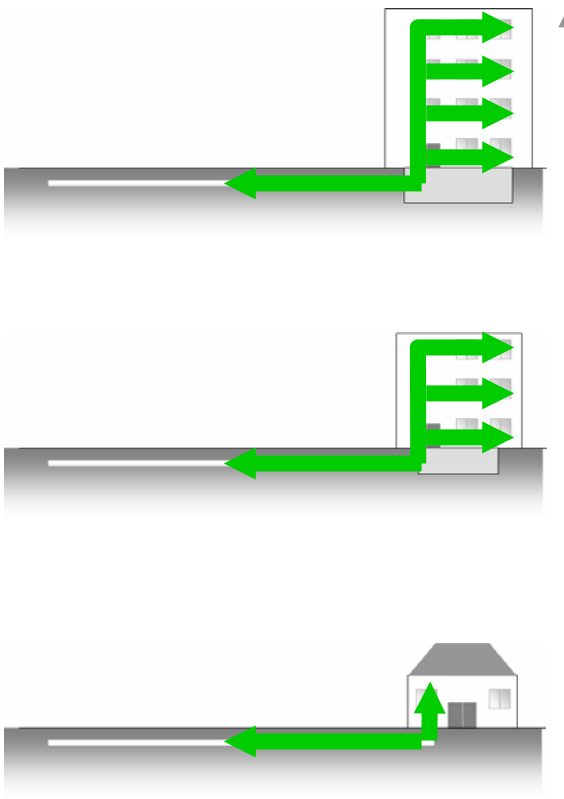
- It is doubtful there will be more than one rolling out of in-house wiring because:
  - costs
  - lack of space in cable trays
  - refusal of co-ownership property representatives to grant access to more than one operator
- There are risks of pre-emption of this facility by the first operator reaching the building

  => do we want that people have to move house in order to change operator?
- Sharing is crucial



Sharing of the end part of the fiber loop should be considered…

- At its end part, the fiber loop appears as a non easily replicable asset…
  - as a natural monopoly?
  - from the end user till where?
- The localisation of what could be considered as the adequate point of mutualisation depends:
  - on the topography and technical architecture chosen by the first operator reaching the area
  - economically on the density of the area, so as to have a reasonable number of access points
- if no access to passive facilities (either ducts or fiber), risk of downgrade of competition from unbundling to bitstream.



In the long run : less SMP regulation and clearer symmetrical rules ?

- A symmetrical approach could be put in place, by **clarification of article 12 of the Framework Directive**

- under art. 12 FD, NRAs “encourage” the sharing of facilities or property
- it could thus be considered to explicit symmetrical rules for facilities sharing for any operator that requires it, as it is already the case for interconnection

- therefore, Art 12 FD could be modified in order to:
  - impose a symmetrical obligation to any operator to negotiate sharing of facilities under reasonable requests from another operator, and allow operators to bring any refusal for sharing of facilities before the relevant NRA for settlement of disputes;
  - allow Member States to intervene in particular for promoting fair competition, and in that frame to impose the setting up of extra facilities.

Which investment model?

Passive investment (civil engineering works, fibre):

- Long return on investment
- Sharable

Active assets (main distribution frame, terminals):

- Shorter return on investment
- Operators' core business

Two investment models

Integrated operator

- **Currently preferred by incumbents**

Shared liabilities

- **Municipalities and/or utilities using liabilities**
- **Operators implementing active assets**

Local authorities as “facilitators”

- Adequate intervention of local authorities is likely to facilitate the rolls-out
- Their role of “facilitators” could be decisive:
  - encourage the sharing of ducts when granting rights of way
  - lays ducts and then rent them to operators
  - avoid inefficient duplication of basic infrastructures (ducts, even fiber) on reduced geographical areas, which can be shared among operators
  - Have a lever effect on private investments
  - promote the choice of a common optical loop topography by operators
  - facilitate negotiations with property owners
  - ensure the fair opening of the new optical loop

Access to content is crucial

-Content-related ARPU is not sufficient today (3€/ month/subscriber for DSL)

VOD catalogue too limited and too costly

-Need to establish a win-win relationship between operators, distributors and rights holders

NGN access networks must be seen as a new opportunity for increasing the value of contents, not as a threat

-Thus it is necessary to :

-facilitate access to contents, especially premium and sports contents

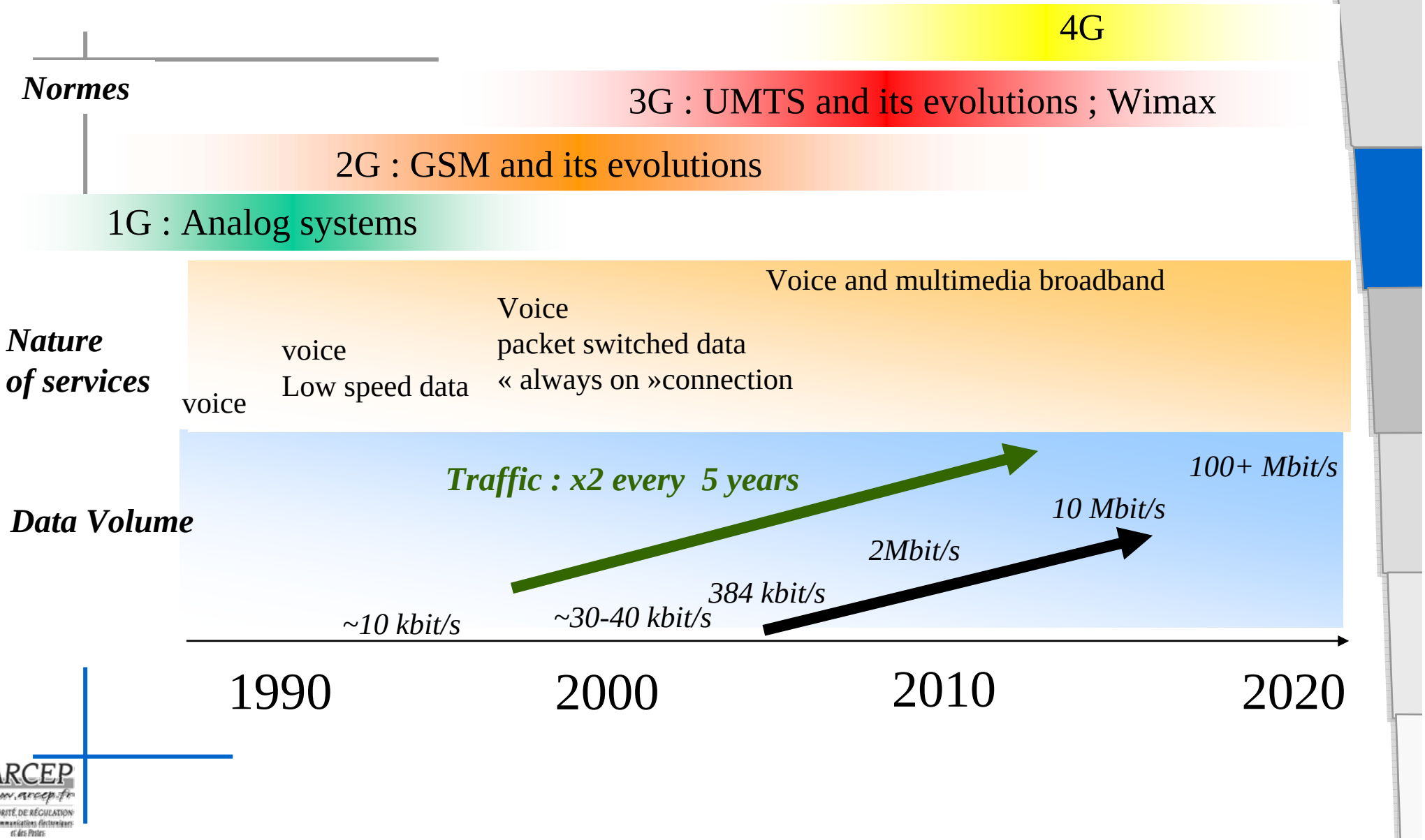
-insure an equitable revenue sharing

-and why not imagine a financing of content by operators?

Broadband infrastructure

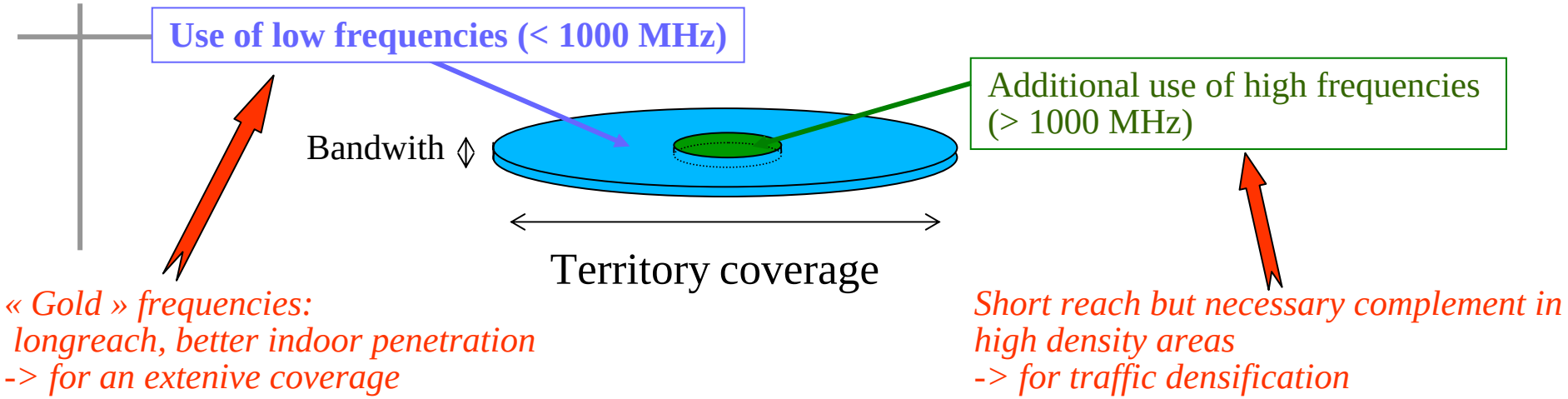
- NGA access rollouts in the world and in France
- Major issues
- **Mobile broadband**

The need for more frequencies

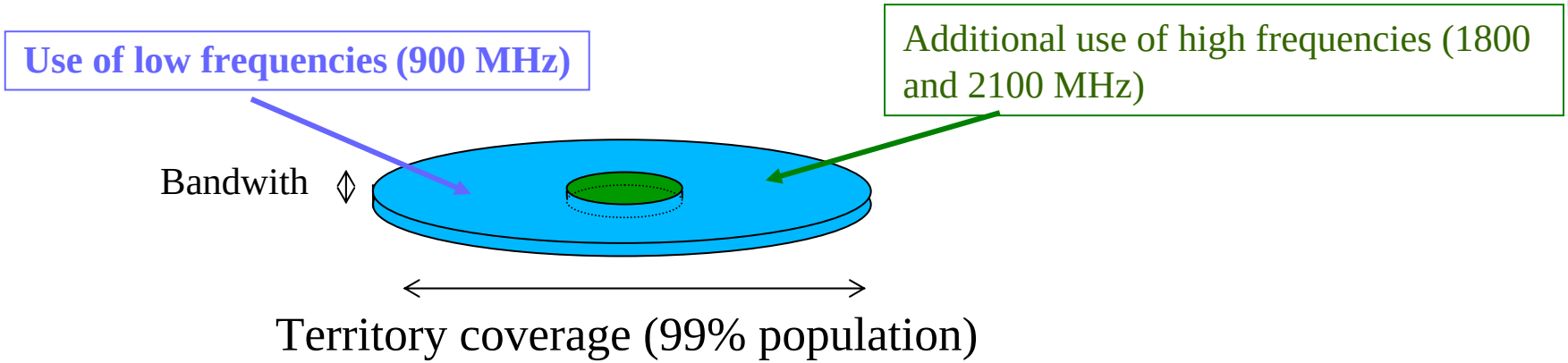


ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

Frequencies are not equivalent :
Low and high frequencies are complementary

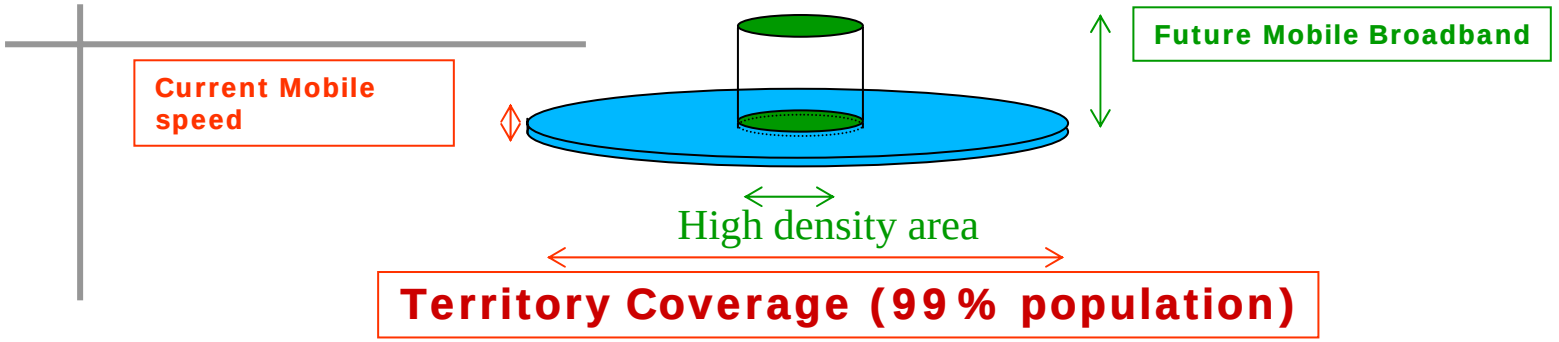


<u>Application</u> : today's situation for mobile service

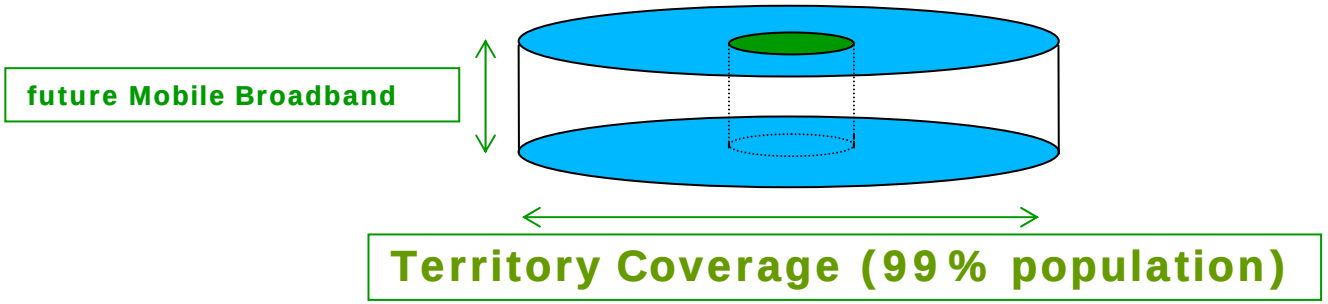


ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

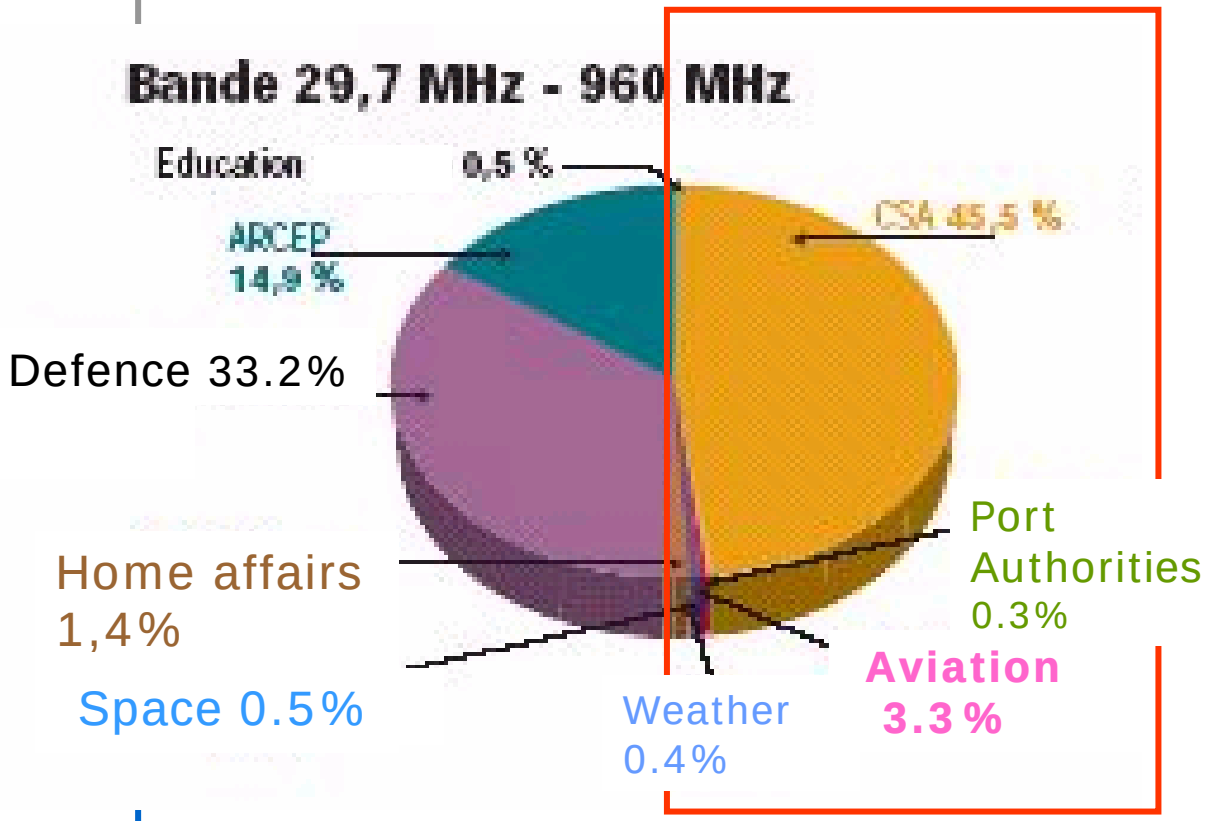
High risk of digital gap
if no low frequencies available for mobile broadband



Instead of :



An exceptional opportunity : the digital dividend



- 400 MHz used for analog broadcasting
- digitalisation reduces by 8 the needs for broadcast frequencies
- beginning of 2012, analog switchoff will automatically generate a digital dividend of about 100 mhz

ARCEP
www.arcep.fr
AUTORITÉ DE RÉGULATION des Communications électroniques et des Postes

CONCLUSION : which public action to promote fixed NGN access networks roll-outs and mobile broadband?

- Facilitate passive infrastructure sharing
  - Guidelines for new constructions
  - Guidelines and new powers for local authorities
- Adjust regulation : take the investment risk into account / avoid new monopoly
  - duct regulation
  - insure equitable access to the essential facility of the last end of the local loop
- Insure equitable value sharing between network and content
- Frequencies : anticipate new needs for mobile broaband in low frequencies
- A need for european harmonisation