

# Wireless broadband communications in context:

*Needs, initiatives, opportunities, challenges  
in the context of radio spectrum policy*

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\* *Disclaimer: the views expressed are those of the author and cannot be regarded as stating an official position of the European Commission.*



# Overview

1. **Broadband communications  
in the general EU spectrum policy context**
  2. **State of implementation of broadband**
  3. **What role for *wireless* broadband ?**
  4. **Implications of wireless broadband for spectrum**
  5. **The Digital Dividend: Proposals for an European  
strategy**
  6. **The new spectrum policy environment  
at the outset of the review**
- references



# The value of broadband

- **Broadband communications constitute the basic infrastructure of knowledge base economies**
  - **ICT as a key driver for growth / jobs / competitiveness**  
(even more so at times of economic slow down)
  - **ICT bears a prime potential for innovation**
- **Broadband as central element of EU Information Society policy**



# The policy context for broadband

## Lisbon strategy

*ICT*

eEurope 2005

i2010

post i2010

*broadband*

"Broadband  
for all"

"Bridging the  
broadband gap"

Broadband  
strategy



# Organising the implementation of broadband

## “Single European Information Space”

- infrastructure deployment, interoperability
- harness benefits of convergence: new applications
- rich on-line content, quality of services
- “inclusive” policy



### Member States action

- national broadband strategies
- organising efforts to meet local needs
- financial support

### EU action

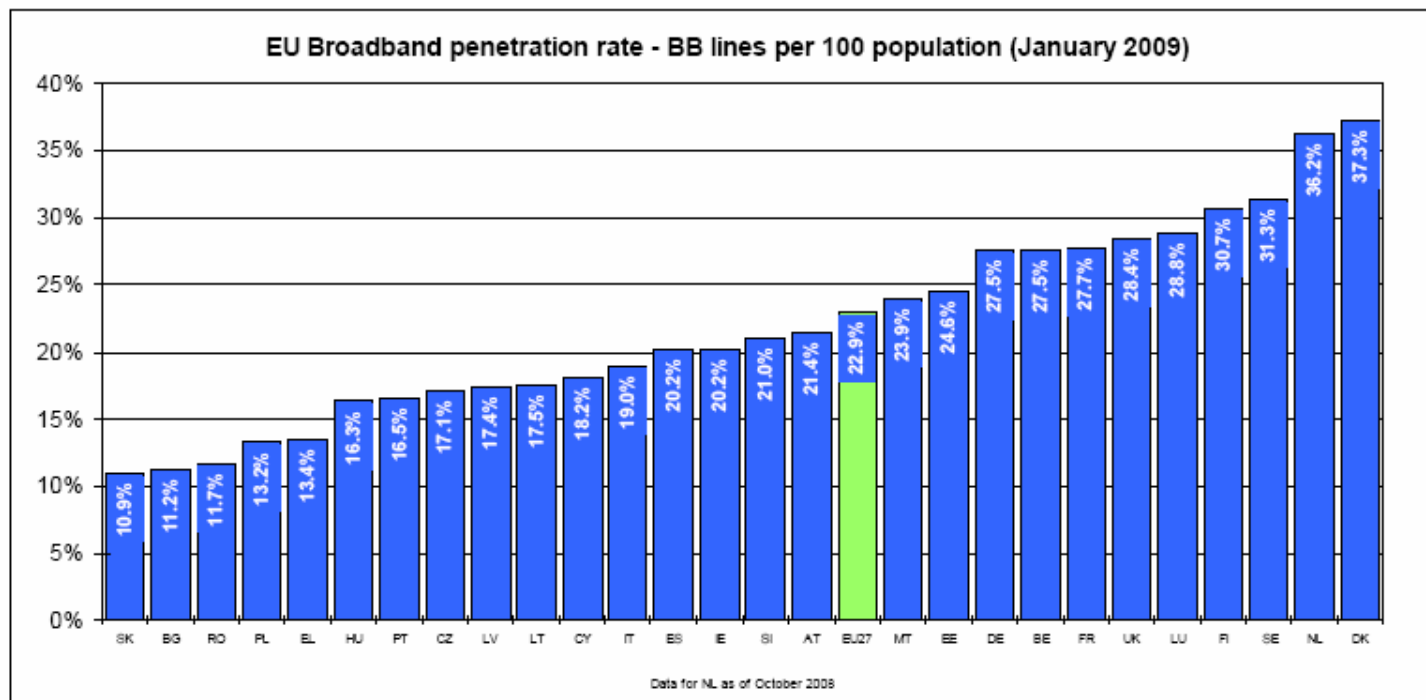
- coherence
- stimulating / flanking support
- best practices
- monitoring and benchmarking
- regulation
- financial support



# Where does Europe stand on broadband ?

## Take up of broadband:

- Broadband lines per population: **22.9%** (EU27 as of 1/09)
- tendency: **growth levelling**
- > 75% of fixed access lines capable of > 2Mbps download



# Where does Europe stand on broadband ?

## Broadband by technology:

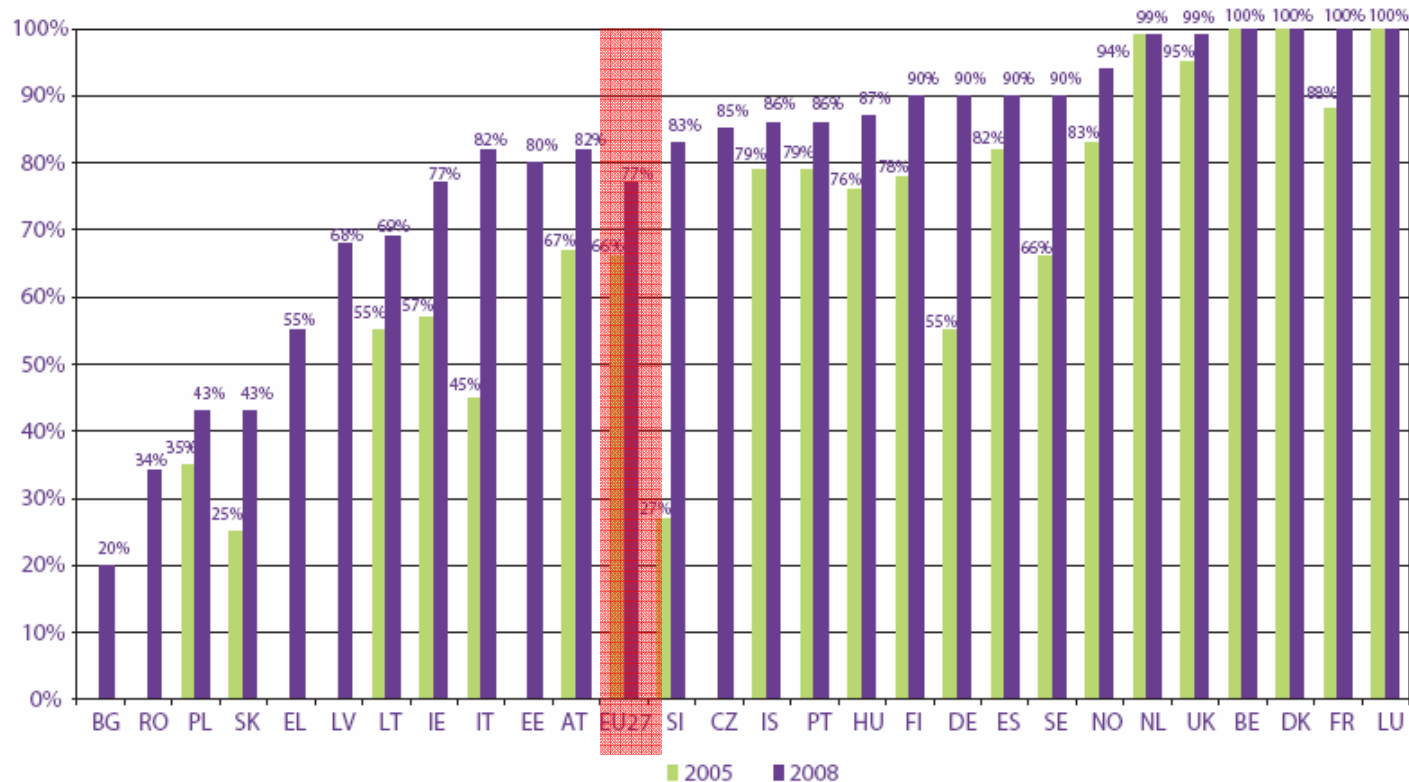
- Close to 80% of broadband access lines are DSL (declared performance)
- Other technologies: overwhelmingly cable
- wireless (terrestrial + satellites): no consolidated figures (indicators: 119% general 2G mobile penetration; 100% annual increase for 3G dongles)
- NGA (fibre, VDSL) : ~ 2-3 million customers (~2-3% of access lines) as of mid 2009 (EU27) (comparing with Japan: 49%, more fibre than DSL lines )



# Where does Europe stand on broadband ?

## Coverage of broadband: the geographical divide

- rural areas **77%** vs 93% at national level (averages EU level as of 1/09)  
i.e. **about a quarter of rural areas not covered by broadband.**
- several Member States: broadband coverage much below average.

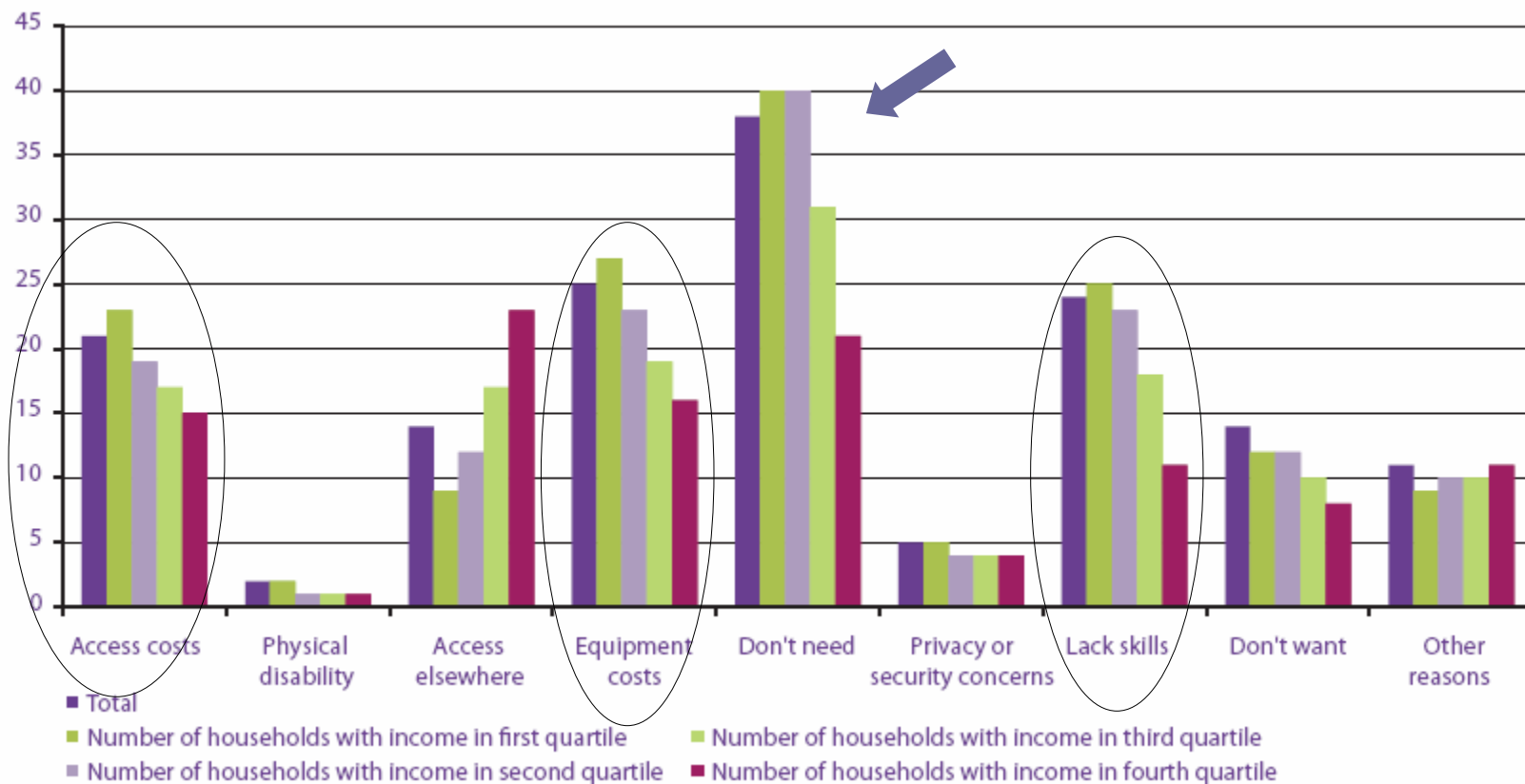




# Where does Europe stand on broadband ?

## Hurdles to broadband usage: the “second divide”

- Besides no geographical coverage other hurdles hamper spread of broadband: costs (access, equipment), digital skills, “no need”)



# Where does Europe stand on broadband ?

## Conclusions on current status:

- Current spread and acceptance of broadband “reasonable”, but **fragmentation persists**:
  - great differences between Member States
  - persisting divide rural / urban
  - “second divide”: costs / education/ acceptance by income classes
- *Immediate* task: **completing broadband for all**
  - still significant homework to be done
  - slowing down of broadband implementation a matter of concern
- **new challenge**: Next Generation Networks
  - Deployment is rapidly progressing in other regions
  - Europe risk to rapidly fall behind !



# From *completing* broadband to *NGN*

## Actions at national level:

- > new round of ambitious **national broadband strategy plans**
- > “filling gaps”, but also preparing for NGN

## Several actions proposed at EU level:

- > **100% broadband coverage in the EU between 2010-2013**  
(March 2009 – Competitiveness Council)
- > **support for developing broadband access in rural areas:**  
1 bn € made available
- > clarification of **state aid rules** applicable to national actions to promote broadband deployment (September 2009)
- > **“European Digital Agenda”**, including a new broadband strategy (Pres. Barroso, September 2009: “Political Guidelines for the next Commission”) → relaunch broadband strategy, post-i2010
- > **NGN regulatory environment:**  
Review; Recommendations (public consultation)
- > **spectrum policy actions**

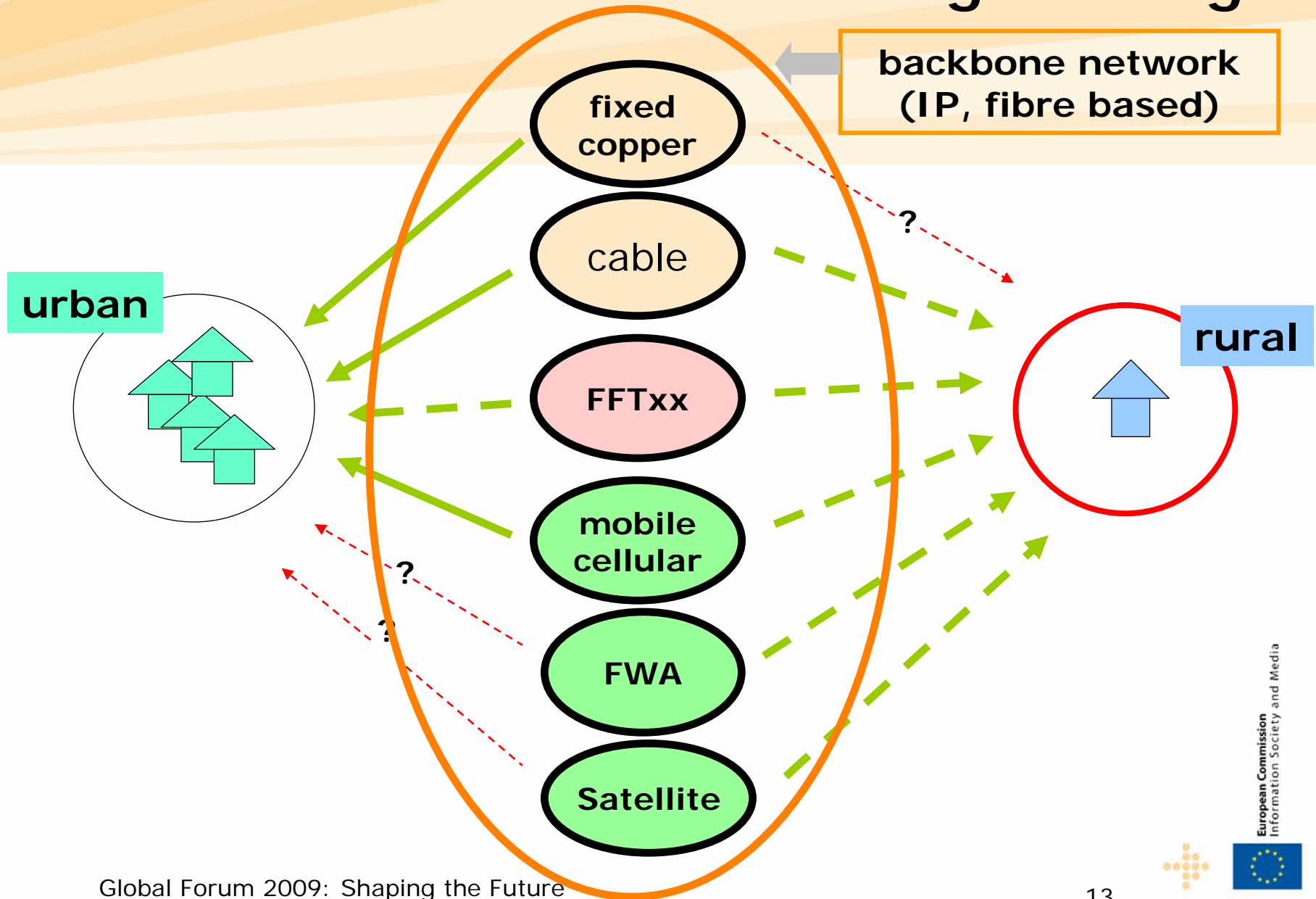


# Wireless broadband

- The different **roles of wireless broadband**
  - Wireless access will play a key role as integral part of the next generation networks (broadband access)
    - > societal demand for **mobility**
    - > **location based** services
    - > **substitution**: speed of wireless mobile access already today covering many standard applications, including “wireless internet access”
  - Wireless will be one of the **key technologies to realise full coverage**
    - > **rural areas**: fixed broadband wireless access, extending mobile networks, satellites where fixed networks cannot be deployed
  - **Anticipated: merge of mobile and fixed networks**



# Wireless broadband: achieving coverage



# Wireless broadband for rural coverage

- **No one-fit all solution** for realising rural broadband coverage, local choices may vary
  - Wireless has obvious advantages (e.g. cost of deployment, service convergence fixed/ mobile), but also handicaps (speed)
  - The **difficulty in assessing the future**
    - evolution of deployment speed / costs of fibre vs. mobile networks
    - potential of integration of mobile / fixed network: synergy effects and service consumption evolution, but also costs of restructuring/ integrating of networks
    - role of other access modes (satellites, cable) ?
    - **available spectrum ?**
- Need to be able to **monitor precisely the deployment, performance and acceptance of wireless broadband**



# Wireless broadband and spectrum

## Key issues:

- **Spectrum amount and spectrum quality:**
  - timely availability of sufficient spectrum resources
  - different spectrum bands suited to different purpose
- **Regulatory conditions**
  - harmonisation of usage conditions:  
economy of scales, flexibility of usage
  - competition



# Wireless broadband and spectrum

**Terrestrial wireless:** spectrum needs and usage conditions

- **spectrum is available !**
  - “legacy” bands are gradually opened to flexible usage
  - “fresh spectrum” is allocated or about to be
  - *“enough spectrum for the time being, if effectively made available, but need to be vigilant”*  
(RSPG Report on Wireless Broadband, May 2009)
- **technology neutrality, service neutrality:**
  - Commission generally agnostic on technology
  - WAPECS policy: all technologies , all ECS → gradual opening of spectrum bands
  - interference management and efficient use of spectrum: “block-edge mask” approach, flexible band channelling





# Wireless broadband and spectrum

<b>"800 MHz" (Digital Dividend)</b>	neutrality to be applied	"fresh spectrum"
<b>"900/1800 MHz" (GSM bands)</b>	gradually introducing neutrality	mostly legacy rights partly unused
<b>"2" GHz (UMTS bands)</b>	neutrality to be applied	legacy rights, partly unused
<b>"2.6" GHz (new)</b>	neutrality already implemented	"fresh spectrum"
<b>"3.4" GHz (new)</b>	neutrality already implemented	"fresh spectrum", shared with satellites

Total: ~800 MHz, of which ~140 MHz below 1 GHz



# Wireless broadband and spectrum

## Terrestrial wireless: assignment issues

- **Balancing legacy rights / refarming / new entrants**
  - impact on **competition** when liberalising spectrum usage
  - the variation of the **“quality” of bands available vs. legacy rights / new entrants**
- **Changing spectrum usage with service evolution**
  - example: meeting the needs of media streaming services
  - adapting the balance of capacity vs coverage over time
  - how to determine new licence durations ?
  - does tradability of spectrum offer enough flexibility ?



# Wireless broadband and spectrum

## Satellites

- **new generation of MSS:**
  - satellite + complementary ground component (CGC)
  - deployment currently under way
- **spectrum harmonised at EU level** (allocation)
- selection of spectrum right holders at pan-European level: 2 operators selected as of May 2009) →
- **coordinated assignment** at national level



# Digital Dividend

## The drivers towards digital broadcasting:

- **improving the quality of broadcasting:**
  - > picture quality, sound;
  - > more channels
  - > HDTV
- **technically efficient spectrum usage:**
  - > digital transmission uses less spectrum than analogue transmission per transmitted programme
  - > **spectrum becomes available**



# Digital dividend dossier: history

- **digitalisation of broadcasting:**
  - > 2005: *likely* target date for transition completion: 2012
  - > Member States submitting action plans for the transition
- **RRC-04, RRC-06:**
  - > 2005: call for flexibility of usage when planning broadcasting bands
- **WRC-07**
  - > 2007: proposal for changing allocation of UHF band
- **digital dividend:**
  - > Opinions by the Radio Spectrum Policy Group (RSPG)
  - > 2007: **Communication on the digital dividend**
  - > technical compatibility studies



# Current status of transition towards digital broadcasting



**SUMMARY**

**5 EU countries already switched-off**

- 6 more by 2010
- 14 more by 2012
- PL later
- IE no decision yet

**Legend**

- Switched off
- Switch-off by end 2010 or earlier
- Switch-off By 2012 or earlier



# Digital Dividend: main challenges

- **Fragmented situation of Member States:**
  - different reception modes for broadcasting
  - different legacies in using the UHF band
  - different speeds in migrating to digital broadcasting
- **Which usages for the digital dividend ?**
  - main demand for broadcasting and for wireless broadband, but uncertain future (evolution of terrestrial broadcasting, demand for wireless broadband)
  - legacy usage: wireless microphones
  - other usages: PPDR, license exempt spectrum
- **Interference issues:**
  - co-existence of high power unidirectional / low-power bi-directional networks
- **Legacy RRC06:**
  - a *broadcasting* spectrum plan
  - limited flexibility for other usages
- **International obligations**
  - EU harmonised approach vs UHF usage by bordering countries



# Digital Dividend: The EU dimension

- **Acting in coordination throughout the EU adds value**
  - synergy effect of markets (equipment, services)
  - paving the way to further development in terrestrial broadcasting
  - tackling jointly cross-border interference issues increases usability / availability of spectrum
  - benefits of coordinating action towards third countries
- **Provide enough flexibility to gradually align policies**
  - situation of individual Member States needs to be taken into account
  - convergence of policies over time
- **Quick reach of analogue switch-off is key to reap the benefits of the Digital Dividend**
- **Potential benefits of the Digital Dividend usage**
  - highly relevant in in the context of the economic revival
  - key element of the broadband approach for the EU





# Digital Dividend: next steps

- **Proposal for a “roadmap”**
  - Action frame for Member States and the Commission to implement a coordinated Digital Dividend approach
- **Methodology: Action options examined through a socio-economic assessment study**
  - 3 supply scenarios / 6 demand scenarios
  - Modelling incremental private value of EU actions over next 15 years
  - Estimating the incremental public value over next 15 years
- **Indicative finding:**
  - Potential economic **impact of coordinated EU action: 20-50 billion € incremental value over 15 years**



# Digital Dividend: next steps

## The digital dividend roadmap (pending Commission proposal)

- **Immediate actions:**
  - > reaffirming the **switch-off date** for all Member States
  - > mandatory **usage conditions of the 790-862MHz** band for wireless broadband, but no obligation to make band available  
*(note: Austria, Czech Republic, Finland, France, Germany, Spain, Sweden, Netherlands and UK already on track for this band)*
- **Actions to be decided in the context of the first Radio Spectrum Policy Programme (Q1 2010):**
  - > *mandatory* timeframe of availability of the 790-862 MHz band ?
  - > minimum efficiency level for the use of the digital dividend in the EU ?
  - > establishing common position for coordination with third countries



# Digital Dividend: next steps

- **Further actions to improve the usage of the digital dividend**
  - > preparing for **next generation transmission or compression technologies**
  - > ensuring **minimum specs for receiver interference resistance**
  - > **frequency agile wireless technology** development
  - > migration of **wireless microphones**
  - > usage of **white spaces**



# Spectrum in the Review of ECS Regulatory Framework

## Main expected results for EU spectrum policy:

- • **maintaining mechanism for harmonisation measures**
- • **neutrality principle** reinforced (WAPECS)
- • **introducing tools to allow for extended coordination, using comitology approach**
  - > trading (tradability, trading conditions)
- • **“Radio Spectrum Policy Programme”**
  - > strategic frame for EU action on spectrum
  - > **new institutional dimension (EP/Council, RSPG)**
- • **international aspects**
  - > policy objectives can be adopted by EP / Council to ensure effective coordination of EU interests



# Conclusions

- **Broadband** is and will remain a key chapter of the Information Society policy of the EU
- In striving for **broadband access for all**, encouraging results have been achieved, but **immediate further efforts are needed**. At the same time the **next generation networks are now a priority**.
- For both objectives, **wireless broadband is bound to play an essential role** given its intrinsic qualities and as a complement / substitution of other access modes.
- **Providing enough radio spectrum** of sufficient quality is an essential pre-condition for reaping the benefits from wireless broadband. Past political action needs to be continued / reinforced.
- **Regulatory conditions to access radio spectrum are crucial** to offer an enabling frame. The review of the regulatory framework offers a generic platform, but needs to be proactively used to deliver.



# Thank you for your attention !

## Some selected references:

- **General information DG Information Society and Media**  
(overview activities)  
[http://ec.europa.eu/information\\_society/index\\_en.htm](http://ec.europa.eu/information_society/index_en.htm)
- **Spectrum policy**  
(reference documents , on-going activities etc.)  
[http://ec.europa.eu/information\\_society/policy/radio\\_spectrum/index\\_en.htm](http://ec.europa.eu/information_society/policy/radio_spectrum/index_en.htm)
- **Radio Spectrum Policy Group - (RSPG)**  
(reference documents RSPG, on-going activities etc.; )  
<http://rspg.groups.eu.int>
- **i2010**  
(reference documents, on-going activities )  
[http://ec.europa.eu/information\\_society/eeurope/i2010/index\\_en.htm](http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm)
- **Broadband Gap policy**  
(reference documents, on-going activities )  
[http://ec.europa.eu/information\\_society/eeurope/i2010/digital\\_divide/index\\_en.htm#Broadband\\_Gap\\_Policy](http://ec.europa.eu/information_society/eeurope/i2010/digital_divide/index_en.htm#Broadband_Gap_Policy)
- **Digital Competitiveness Report**  
(reference documents)  
[http://ec.europa.eu/information\\_society/eeurope/i2010/key\\_documents/index\\_en.htm#EDCR](http://ec.europa.eu/information_society/eeurope/i2010/key_documents/index_en.htm#EDCR)
- **Digital Dividend public consultation**  
(consultation on proposal for a coordinated approach for the Digital Dividend; 15/7 -4/9/2009)  
[http://ec.europa.eu/information\\_society/policy/ecomms/radio\\_spectrum/topics/reorg/pubcons\\_digdiv\\_200907/index\\_en.htm](http://ec.europa.eu/information_society/policy/ecomms/radio_spectrum/topics/reorg/pubcons_digdiv_200907/index_en.htm)
- **Digital Dividend socio-economic study**  
(full study text to be published before the end of the month; summary of findings available on below site)  
[http://www.analysismason.com/EC\\_digital\\_dividend\\_study](http://www.analysismason.com/EC_digital_dividend_study)

