



Panel 5:  
**Regulatory Options and opportunities  
for Dynamic Spectrum Access**

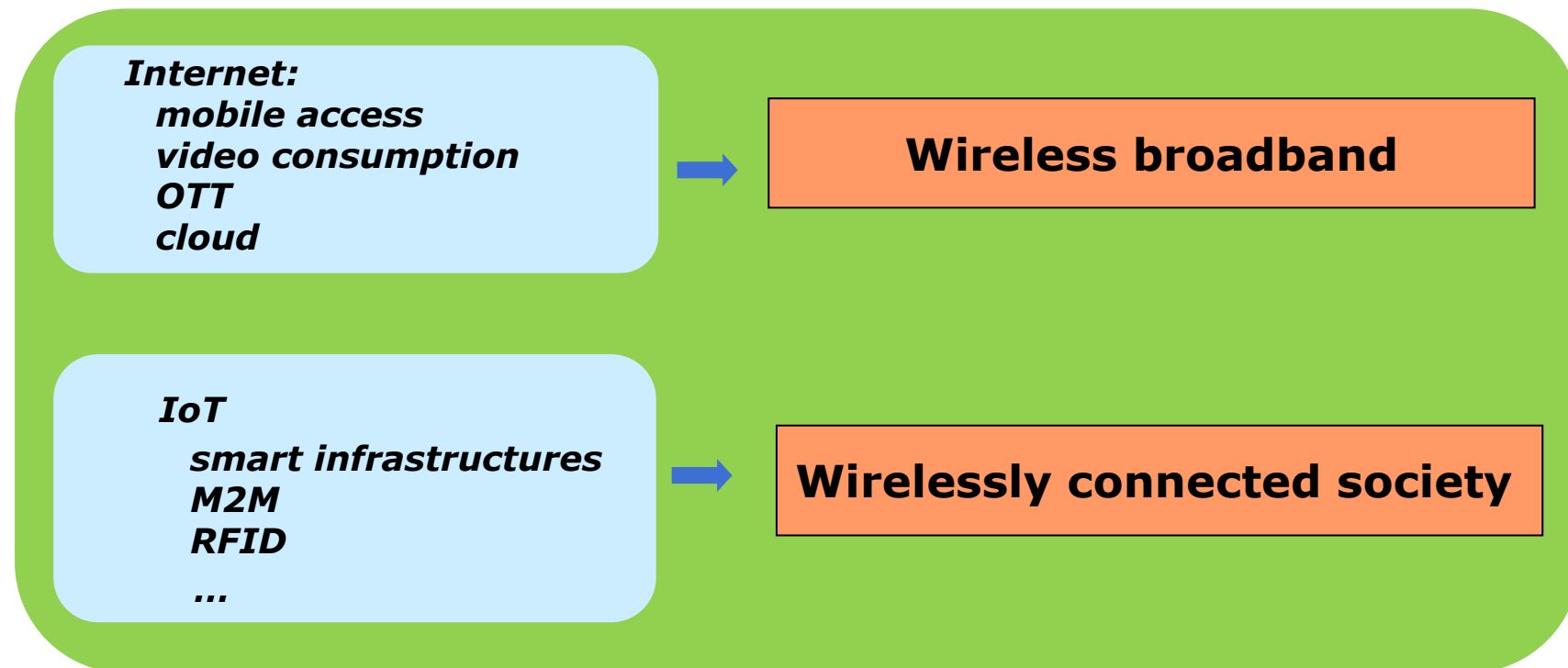
## **Europe's policy drive towards shared spectrum access**

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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.*

## ***Wireless traffic increasing !***



## ***Spectrum needs ?***

# The policy drivers

## ***Key EU policy objectives:***

- **Digital Agenda for Europe**
  - broadband targets, incl. wireless broadband
- **Sectorial policies**
  - Sustainable growth (smart grids, transport,...), PPDR,...
- **R&D → Innovation → competitiveness, growth, jobs**

## ***Strategic approach to radio spectrum:***

- **Radio Spectrum Policy Programme (RSPP):**
  - efficient spectrum use: "inventory"
  - 1200MHz for wireless broadband by 2015
  - Sustainable / energy efficient economy, PPDR, ...
  - Exploring the potential of share use of spectrum

# The changing usage paradigm

- **Spectrum scarcity ?**
  - Cost of exclusively spectrum increasingly prohibitive
  - Refarming spectrum time consuming
  - **Network densification: Re-use of spectrum, small cells**
  - **Dynamic spectrum assignment to match momentary needs**
- **Technology development**
  - CR / SDF technically *and* economically feasible
  - **Sharing enablers**
- **Mobility → Nomading consumption of BB**
  - Local wireless access to fixed broadband infrastructure
  - **Demand for small access cells facilitating spectrum re-use**
- **IoT: new communication "class"**
  - a fast growing "user population" (things)
  - greater interference tolerance, time uncritical communication
  - **sharing of spectrum resources matches needs: flexible / easy / scalable access to spectrum required at device level**

# Why does shared spectrum not happen?

- **Sharing is already a reality today!**

- R&D has delivered basic technologies
- IoT wireless access technologies are developed at industrial level
- **The heavy and successful usage of unlicensed bands**
- **Trials for geo-location database approaches take place (UK, IRL, FIN,...)**

- **Sharing is not leveraged to its potential!**

- Unlicensed bands lack "regulatory protection"
- Sharing associated with "second class" usage which must not interfere with dominant exclusive usage: lack of certainty of sharing rights.
- Little regulatory support (except in the UK) for sharing
- Forgone economic benefits of shared use (SCF study)

- **Improving regulatory environment for sharing:**

- from "*shared spectrum access = second best spectrum rights*" →
- to "*shared use of spectrum = recognised and established mainstream mode of efficient spectrum usage*"

# The regulatory challenge

## General **challenges to regulators:**

- Provide legal certainty for sharing rights
- Facilitate access to shared spectrum
- Give incentives for sharing
- Leverage technical innovation

## A particular **European challenge:**

- **EU wide coordinated approach to achieve scale (interoperability, markets, services & applications)**  
→ consistent and coordinated regulatory environment

## A policy initiative for shared use

*European Commission Communication of 3 Sept.2012:*

**"Promoting the shared use of radio spectrum resources in the internal market"**

**Objective: launching a debate and proposing action lines**

- Establishing a **common understanding of economical, technical and regulatory aspects of spectrum sharing**
- Setting out a **strategy to promote shared access to spectrum**
- Setting a **clear signal to innovators** of the EU moving towards an advanced regulatory environment for wireless innovations allowing sharing.

***EC Communication: starting a process of change***

# Terminology

## **Shared use of spectrum:**

*a number of independent users and/or device access the same range of frequencies (multi-dimensional spectrum space)*

## **Sharing arrangements:**

*applicable **conditions & rules** when authorising shared spectrum access*

## **Authorising of shared spectrum access:**

*Covers both **the license-exempt and the licensed case***

**Dynamic sharing:** *refers to agility of usage guaranteed by authorisation scheme*



# Fundamental approach

Introducing the notion of

## "Beneficial Sharing Opportunities"

**socio-economic benefits of *shared* use exceed benefits of *exclusive* use, taking costs of sharing into account**

Using the BSO test:

- **revealing objective opportunities to use spectrum more efficiently**
- **basis for shared spectrum access rights**

## **BSO test driven by regulators:**

- **Regulators' obligation to ensure efficient use → apply BSO test  
→ opening up spectrum resources**

## **BSO test driven by spectrum users:**

- **demonstrating BSO by spectrum users to obtain SSARs**
- **innovators: incentive to develop sharing technology**
- **win-win partnerships between spectrum users for sharing  
(mutual benefits, equitable sharing of costs)**

# Impact of proposed approach

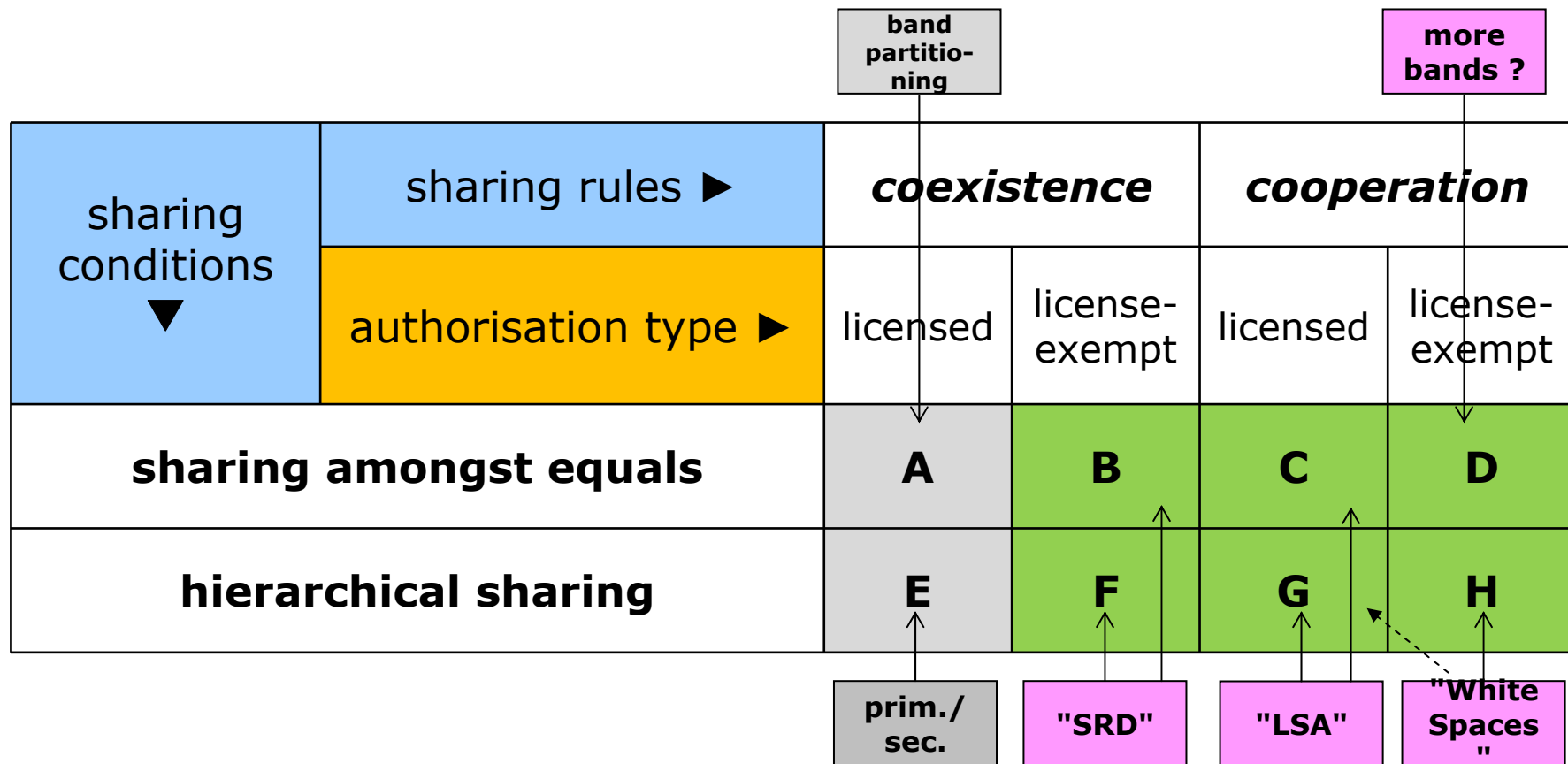
- **Shared Spectrum Access Rights (SSAR) recognised by regulators**
  - based on BSO demonstration
  - enshrining sharing arrangements (to ensure predictable protection against interference)
- **Common EU frame: BSO approach and SSAR format !**

# Next steps

- **Public debate on Shared Spectrum strategy proposal**
  - public consultation
  - Commission consideration of regulatory anchor in EU regulation
- **"Inventory": review of supply / demand 400MHz–6GHz**
  - opportunity of testing BSO concept
  - revealing BSOs
  - information on spectrum usage
- **Continued effort on R&D**
  - H2020
  - field tests for validation
  - facilitating implementation of R&D results
- **Supporting specific sharing scenarios →**

# Sharing scenarios

## *Eight basic sharing scenarios - six priorities:*



- **Licensed Shared Access (LSA)** [case G]
  - investigation of regulatory concept by Advisory Group (RSPG)
  - first applications expected: test cases for SSAR definition
- **Unlicensed shared access** [case D]
  - studying off-loading trend (assessing demand)
  - assessing degree of congestion of existing bands (assessing supply)
  - additional bands or review usage conditions of existing bands ?
- **"White Spaces approach"** [case H]
  - not limited to TV bands
  - promising new spectrum management approach: geo-location database
  - further field test for validation needed
  - formal mandates for standardisation about to be issued (mass market for CR devices, interoperability of databases)
- **Short range devices legislation: streamlining** [case B,F]
  - expanding bands and liberalisation
  - regulation on hierarchal rights for co-existing unlicensed

# Conclusions

- **Shared spectrum use:** the next unavoidable - and promising - paradigm in spectrum management !
- **Generic regulatory concepts are missing:**
  - legal certainty
  - incentives to sharing
- European approach: setting a signal !
  - **Create a forward-looking generic enabling environment**
  - **Support pragmatically sharing initiatives to learn from doing**
  - **Coordinated approach at EU level**

# Thank you for your attention !

## References

- **EU radio spectrum policy website**

[http://ec.europa.eu/information\\_society/policy/ecomm/radio\\_spectrum/index\\_en.htm](http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/index_en.htm)

- **Communication "Promoting the shared use of radio spectrum resources in the internal market"**

(COM(2012)478 of 2/9/2012)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2012:0478:FIN:EN:PDF>

- **EU Decision on a Radio Spectrum Policy Programme (RSPP)**

(243/2012/EU of 14/3/2012)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:081:0007:0017:EN:PDF>

- **Short Range Devices harmonisation Decision**

(COM(2006)771 updated by Decision 2011/829/EU); new update pending)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:329:0010:0018:EN:PDF>

- **Radio Spectrum Policy Group site**

(inter alia Opinions, Reports on collective use and shared use of spectrum)

[http://rspg.ec.europa.eu/index\\_en.htm](http://rspg.ec.europa.eu/index_en.htm)

- **CEPT (ECC) site** (inter alia Report 159 on shared use of spectrum)

<http://www.cept.org/ecc/>

- **EU R&D initiatives on Future Networks & Wireless** (overview information)

[http://cordis.europa.eu/fp7/ict/future-networks/projects\\_en.html](http://cordis.europa.eu/fp7/ict/future-networks/projects_en.html)





## **Breakout slide: The Radio Spectrum Policy Programme**

### ***Radio Spectrum Policy Programme (RSPP) on "shared use"***

- ❑ **Maximise the socio-economic and environmental benefits** that can be generated through the use of radio spectrum
- ❑ **Efficient management and use of spectrum** (inventory, including identifying opportunities for shared use)
- ❑ **Sufficient spectrum for wireless data traffic** ("1200MHz " target), contribute to broadband targets of the Digital Agenda for Europe (DAE)
- ❑ **Foster the collective use of spectrum as well as the shared use of spectrum**
- ❑ **Foster the development of current and new technologies**, for example, in cognitive radio, including those using "white spaces".
- ❑ **Support R&D in new wireless technologies**
- ❑ **Promote innovation through enhance flexibility in the spectrum use**
- ❑ **Support spectrum needs for specific EU policies**, notably for a sustainable, energy-efficient and competitive economy.

***"...harmonisation of use of radio frequencies across the EU"***



# Breakout slide: EU R&D Framework Programme "Future Networks projects" (call 1-5)

