

# **Is Market-Based model the ultimate solution for spectrum management**

Eric Fournier

Director - Spectrum Planning and International Affairs

Agence Nationale des Fréquences

[fournier@anfr.fr](mailto:fournier@anfr.fr)

# Spectrum Management Objectives

- Spectrum is a scarce resource :
  - Spectrum use shall be efficient, innovation is to be promoted
  - Access to spectrum is key for industry
- Risk of harmful interference :
  - Rules have to be defined for avoiding harmful interference

# Why market-based model ?

- Main advantages of market-based model :
  - It enables access to spectrum without going to the regulator
  - It facilitates reshuffling of spectrum rights for operators to optimize their capacity/coverage
- Main difficulties from spectrum management side :
  - Harmonisation of spectrum is key to innovation and efficient use of spectrum
  - Difficult to reconcile rules for avoiding interference and flexibility necessary for spectrum market to develop

# Introduction of Spectrum Trading in France

- Spectrum trading is allowed in certain bands used for civil telecommunication with rules in line with the European Radio Spectrum Policy Group opinion (no change of use) :
  - FWA bands (3.5 GHz and 25 GHz) : The case of 3.5 GHz licences will be particularly interesting since they are allocated regionally and spectrum trading will enable reconfiguration
  - Several bands used for PMR, fixed service or fixed/mobile satellite services, where spectrum trading is mainly expected to simplify the transfer of the authorizations

# Harmonisation of spectrum

- Industry consistently asks for harmonised spectrum to ensure development of innovative systems (GSM, 3G, WiMax, WiFi...). Critical over Europe.
- In theory, with a full spectrum market, harmonisation can be market-led : Any industry player can do one's shopping over all national market and tailor the spectrum for its intended application/technology

# Is it realistic ?

- Harmonisation is required prior to the development of systems
- Rules for avoiding interference have been defined for the prior application/technology, tailoring spectrum may not work so well
- Existing usage of spectrum in different countries makes always difficult to do one's shopping of spectrum
- Issue of unlicensed usage of spectrum

# Flexibility required for market-based model

- Market-based model assumes flexibility in the authorization : technology neutrality, application neutrality, limited restrictions on spectrum use
- Technology neutrality and application neutrality are useful general principles but restrictions remain necessary to promote certain technology or applications (GSM, IMT-2000, DVB-T ...) and this should not be sacrificed
- Technical conditions : case-by-case balance to be achieved between the flexibility for the systems, the risk of interference and the spectrum efficiency

# Spectrum Mask is the solution ?

- Usual mistake : “any system A being able to comply with the same mask as system B will not create more interference to adjacent blocks than system B”
- Interference results from many parameters : spectrum mask, receiver characteristics, deployment and antenna characteristics, intermodulation ...
- Spectrum mask concept can only be applied in simple cases or at a price of spectrum efficiency loss (e.g. guard bands) or interference rise



# Spectrum Usage Rights are better ?

- Current OFCOM consultation : very detailed and globalizing technical analysis
- Attempt to generalize technical conditions for limiting interference : in-band, out-of-band and neighbouring areas
- Leaving possibility for negotiations : similar to existing situation in GSM or FWA bands
- However :
  - Complex to define and to apply
  - Conditions are based on assumed characteristics of interfering and interfered systems : not technology/application neutral !
  - Nothing guarantee that next generation system will fit in the SUR (ex : GSM/UMTS) : not flexible !

# Current Experience in Market-Based models

- So far, low number of transactions in countries having implemented spectrum trading : therefore, no hoarding, no anti-competitive behaviour ...
- Current experiences (NZ, Australia, USA, UK) are not really demonstrating a supremacy nor a redhibitory defect of market-based models
- Nextel case has highlighted difficulties with interference issues they are underestimated

# Conclusion

- Market-Based model :
  - is not a goal in itself
  - can be a tool for efficient spectrum management
  - has to be introduced progressively to experience in which cases it works properly
- Permanent negotiation on conditions of use of spectrum will always be necessary to guarantee for adapting spectrum use conditions to innovative applications and good level of harmonisation
- Assuming now that market based model is the ultimate spectrum management solution is purely theoretical