

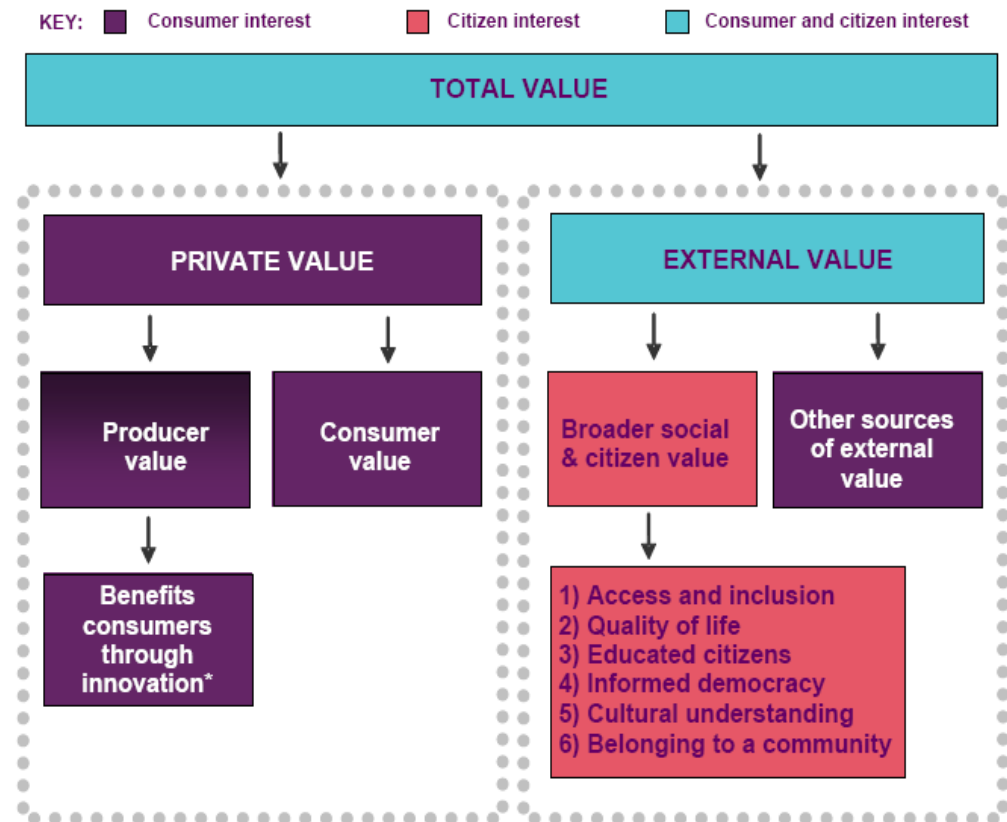
International Digital Forum 2010

# Reconciling various interests for DDR

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# Our approach to awarding the UK's digital dividend

- Objective to maximise the total value to society that using the digital dividend is likely to generate over time
  - Not revenue for the Government
- Market-led approach – minimum constraints on uses within international framework
- Clear benefits
  - Allows use to change with technology and demand
  - Gives innovative services the chance to use the spectrum
  - Promotes competition, choice and lower prices
- Do not believe in trying to pick winners



# Original post-DSO and DD channel plan

## The original UK DSO / DDR plan



- In 2003 the UK government decided to reserve **256 MHz** for six DTT multiplexes, expanding the coverage and capacity of DTT after digital switchover (DSO)
- 128 MHz spectrum to be used for new DDR services
- The UK's DTT service is free-to-air and known as Freeview. It has 3 PSB muxes and 3 Commercial muxes that will cover 98.5% and 90% of the UK population respectively
- DSO will be completed by end 2012 in the UK
- Freeview is a very popular service and at Q4 2009 it was being used in 18.6 million homes and it was the only digital TV platform in 10.1m homes (about 40% of UK households)



# Potential uses of the digital dividend

- There is a significant interest in new DDR services in both the “cleared” and “interleaved” spectrum
- Cleared spectrum will have no digital terrestrial TV (DTT) services and will be available for new uses
- Interleaved spectrum will have DTT services but it will also be able to support some new DDR services
- Example uses:
  - **Cleared spectrum:** more DTT, mobile TV, broadband wireless access
  - **Interleaved spectrum:** local TV, broadband wireless access, cognitive applications
- Many other uses are possible!

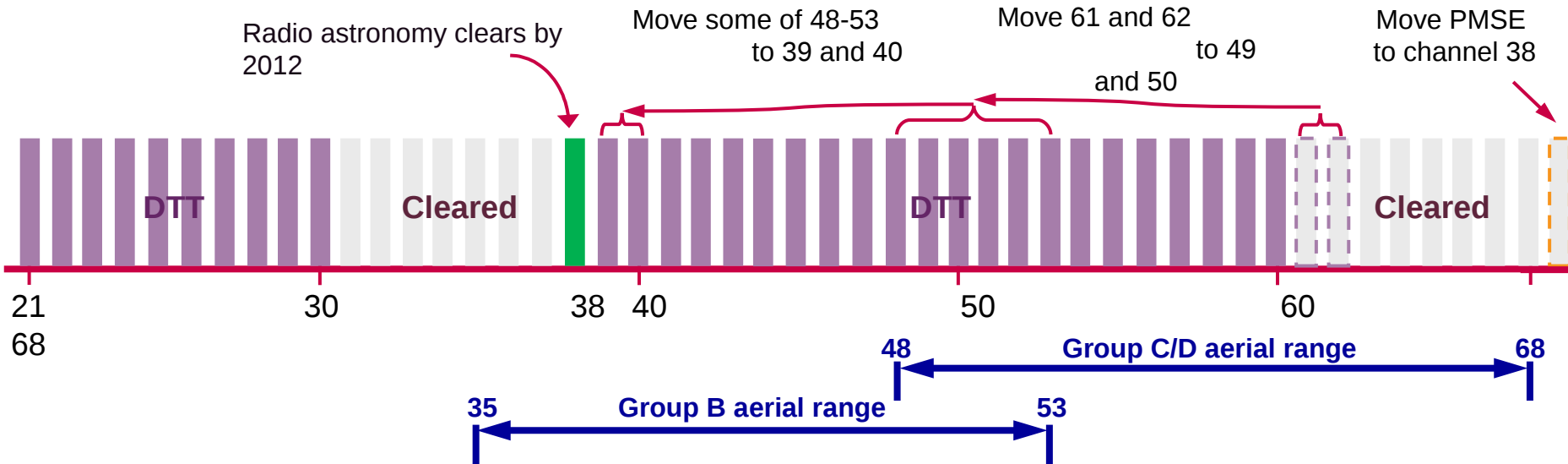


The original UK DSO / DDR plan

## Aligning the UK digital dividend with other European countries

- As a result of EC interest and study mandates to the CEPT several European countries are now creating digital dividends of their own in the 800 (790 – 862) MHz band
- We are aligning the spectrum to be released in UK
- Very large potential benefits – may be **€4 billion** (NPV) to the UK – mainly because better mobile broadband services can be provided at lower cost
- Implementation complex but achievable:
  - Move DTT and most wireless microphones
  - Ensure existing and planned users do not bear extra costs to clear the 800 MHz band
  - Avoid any disruption to digital switchover
  - Need to preserve DTT population coverage
  - Negotiate new coordination agreements with neighbouring countries

# Spectrum reorganisation: clearance of 790 – 862 MHz



- Initial transition of selected channels in the range to 39 and 40. Subsequently move channels 61 and 62 to 49 and 50.
- Try to integrate as much as possible with DSO roll-out. Remainder (majority) will be carried out post DSO.
- No loss of coverage to PSB multiplexes, the smallest reduction in coverage for commercial multiplexes.
- No need for receive aerials to change group.
- PMSE moves to Ch38 which will be free of all UK radio astronomy restrictions in 2012.

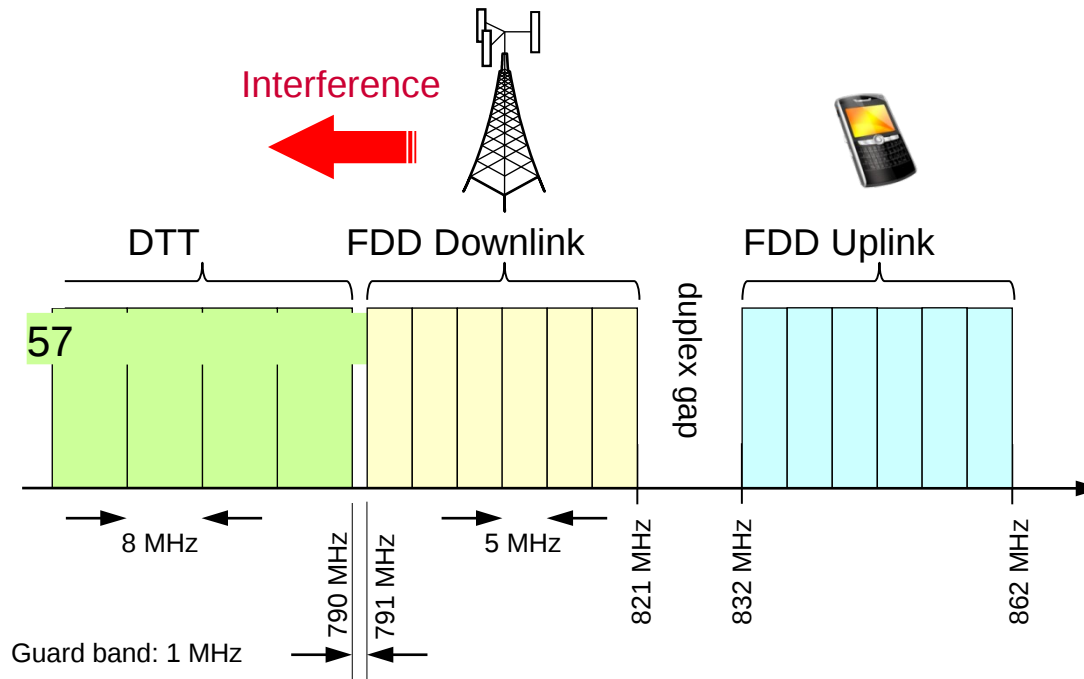
## The DTT platform capabilities

- No material loss of coverage of capacity for the Freeview platform as a result of 800 MHz clearance
- Capacity for high definition TV services on Freeview – Ofcom has been instrumental in the development and launch of HD services on the existing DTT platform with no increase in channel capacity using DVB-T2
  - T2 and MPEG4 gives 50% capacity increase per mux
  - Service launched in 2010 on 1 mux
  - Allows DTT to compete with cable and satellite TV services
  - 50% of UK population will be able to receive FreeviewHD by June 2010 and in time for the World Cup
  - iDTVs incorporating FreeviewHD already available
- An opportunity to bid for 600 MHz spectrum at auction for additional DTT capacity to grow Freeview



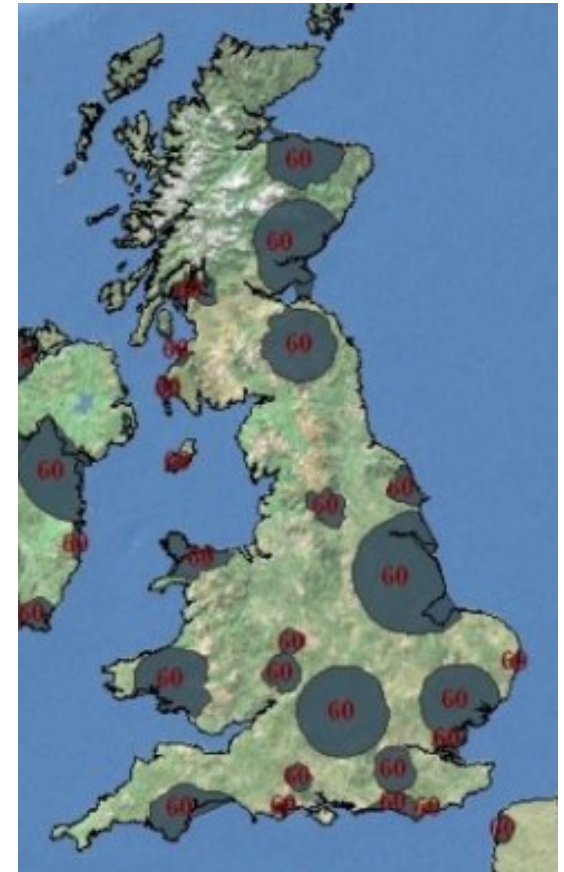
# The 800 MHz CEPT band plan

- In response to the EC mandate, CEPT project team PT1 specified the following European *preferred* harmonised band plan for 2 way mobile networks. CEPT group SE42 considered the interference potential of mobile services into DTT



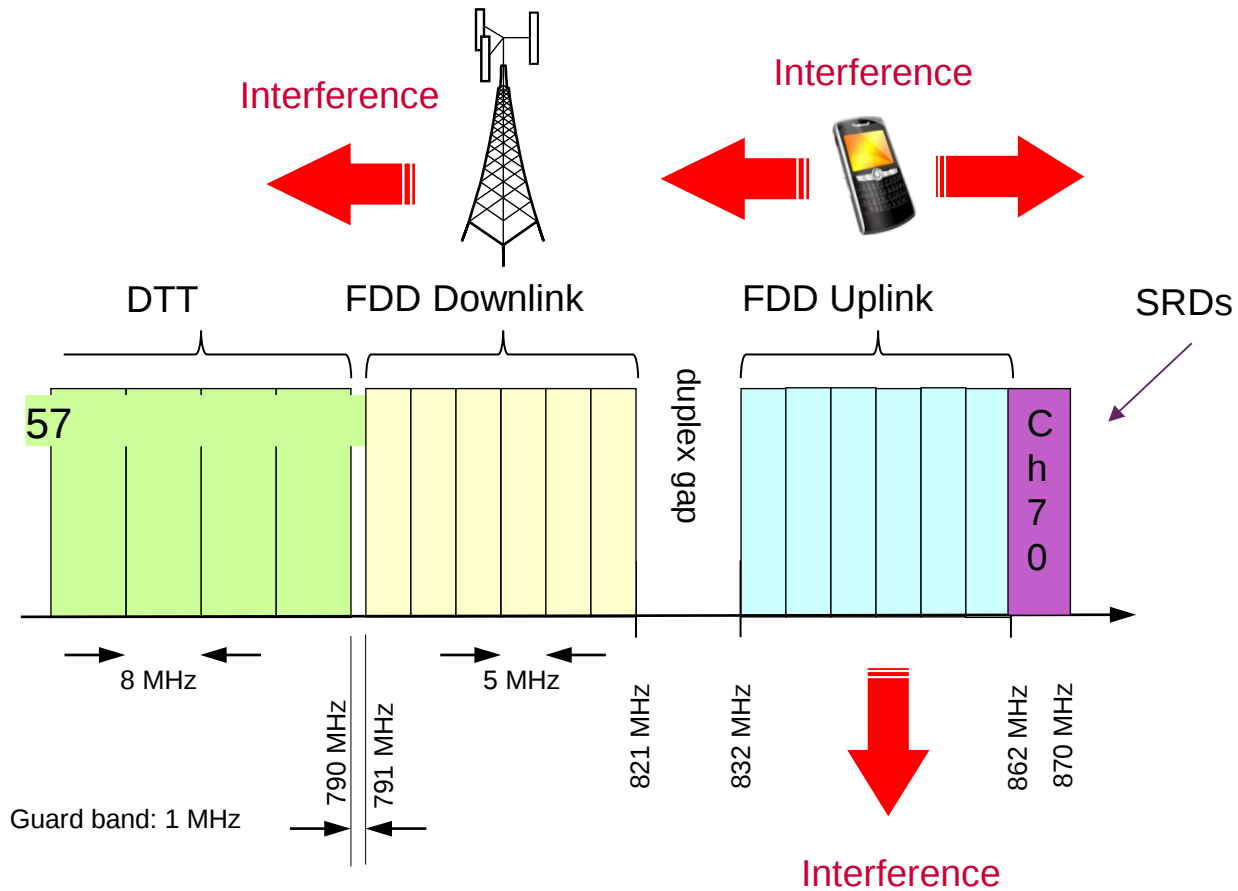
## Protecting DTT services

- Work by CEPT study group SE42 considered the protection of DTT by 800 MHz mobile services but it recognised that complete protection of DTT would not be provided and that additional protection measures should be considered. This view was endorsed by the EC Decision on harmonised technical conditions for the 800 MHz band
- Main interference potential is from downlinks (mobile base stations) into the higher DTT channels, particularly channel 60.
- In the UK we have been working on a protection clause that will add additional conditions to the new 800 MHz licences
- We are actively considering the use of filters in the DTT aerial lead and other mitigation methods to reduce interference potential although it is difficult to reduce the interference into channel 60



Channel 60 coverage area

# Interference potential of 800 MHz services



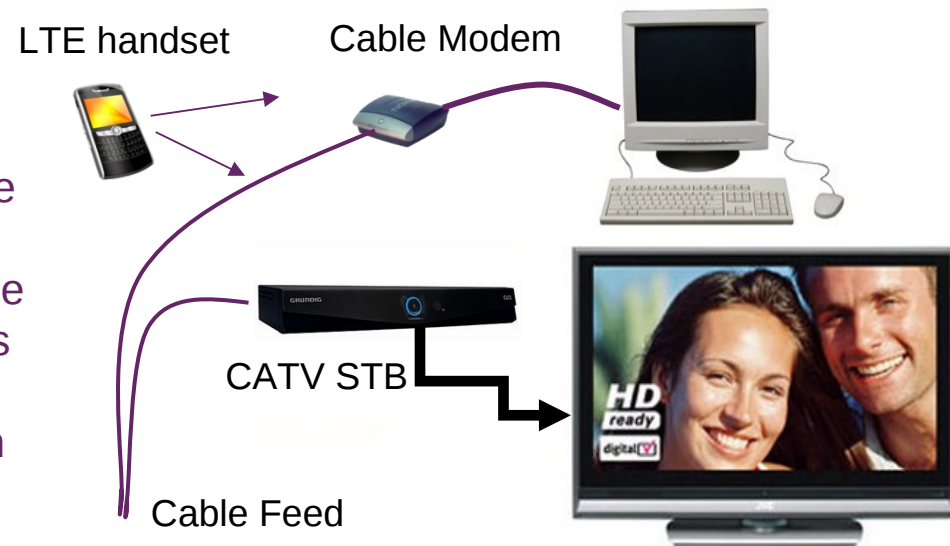
Cable television and broadband internet services

# Protecting cable TV services

- Interference potential of 800 MHz mobile services realised more recently as a serious issue:

- Problem is insufficient shielding of cable STBs and cable modems
- Poor screening of local distribution cable may also be a problem in some countries

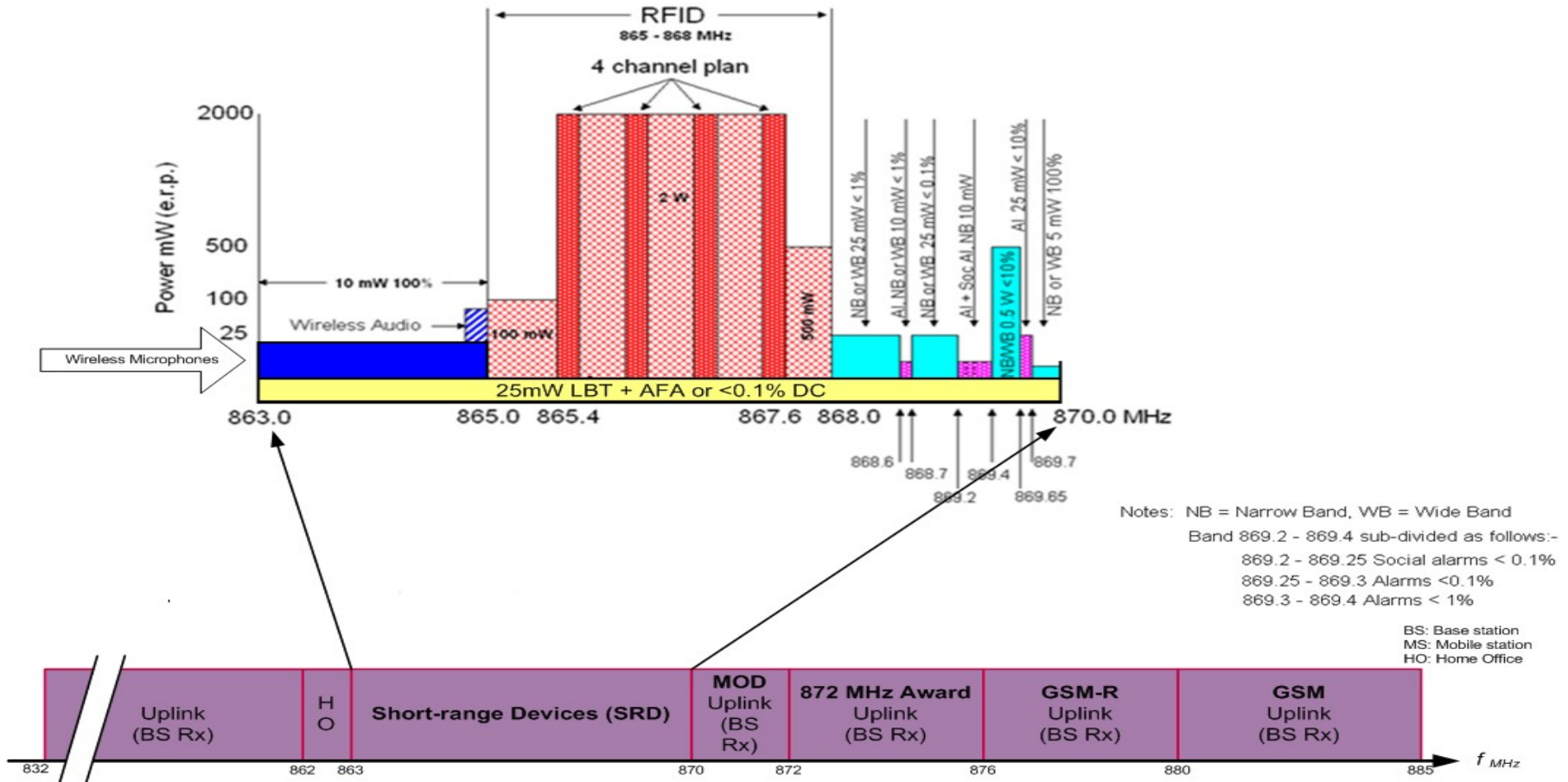
- Measurements show a wide variation in susceptibility between STBs



- Problem is mainly confined to local interference from mobile handsets located very close to the STB or cable modem
- Joint ETSI/CENELEC group formed at request of the EC to produce improved immunity standards for cable and DTT receivers – report expected in June 2010
- Existing STBs and cable modems may be vulnerable until gradually replaced over time
- Mitigation measures being considered to limit the interference potential
- We are conducting cable TV tests to assess the likelihood of interference in the UK

Wireless microphones and other wireless audio devices operate in 863 to 865 MHz.  
 Radio frequency identification devices (RFIDs) operate in 865 to 868 MHz.  
 A variety of narrowband devices and alarms operate in 868 to 870 MHz.

# Protecting services above 862 MHz?



## Protecting services above 862 MHz – SRDs

- Mobile handsets have a potential to interfere with services above 862 MHz
- Short range devices populate channel 70 (862 – 870 MHz). SRD sensitivity to mobile interference has received little attention but we are now carrying out practical and theoretical work to determine whether problems exist with any devices using this channel
- SRDs use the channel on a “no interference no protection” basis. However their use underpins many other activities that contribute substantial value to the economy (eg RFID use) and therefore they should not be ignored in considering the introduction of new 800 MHz services



## Conclusions

- The high economic and social value of new DDR services is such that they cannot be ignored
- Reconciling the interests of DTT and DDR users presents a number of challenges: it is a difficult but not impossible task to manage
- Introducing a digital dividend at 800MHz does impose some constraints on DTT in terms of reduced channel capacity but this can be offset by increasing the capacity of a multiplex by introducing new technologies such as DVB-T2 in conjunction with MPEG4
- Reconciling the interests of MNOs and DTT operators is a more complex task due to the level of potential interference into the higher DTT channels but it is manageable with carefully considered DTT protection measures
- Ensuring that cable TV services have sufficient immunity to 800 MHz interference is a manageable issue which will be satisfactorily resolved in the short-to-medium term with the measures that are being considered by ETSI/CENELEC as well as cable operators
- Short range devices operate immediately above 862 MHz and consideration should be given to the potential for interference into them from new 800 MHz services

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