

Implementing the digital dividend in European countries

- Licensing the 800 MHz band in Sweden

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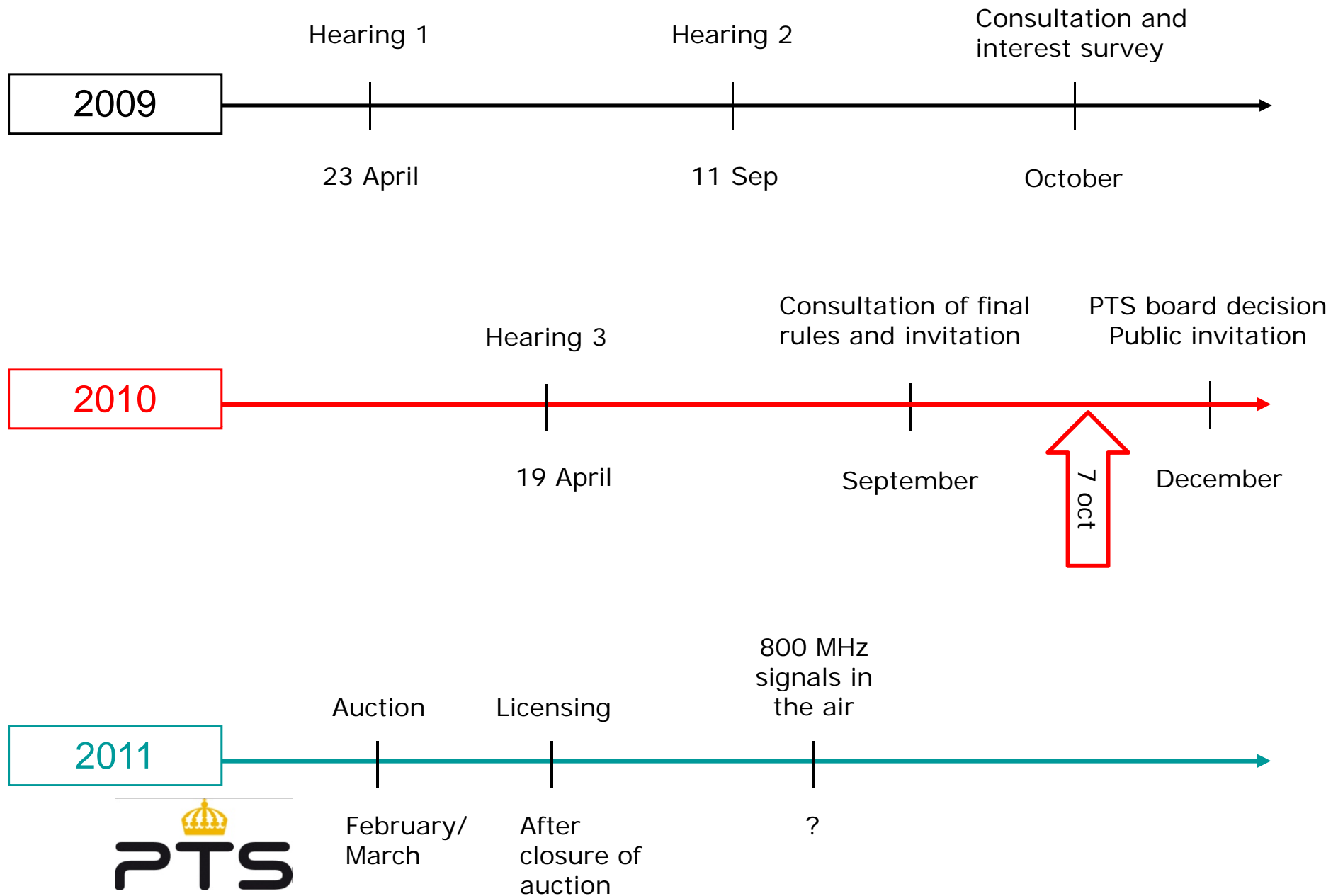
The PTS spectrum policy

- Licences to use radio transmitters shall be as **technology and service neutral** as possible
- When selection procedures are required, an **auction** should be applied in the first instance
- **Second-hand trading** (transfer of licences) shall be promoted
- **Licence exemption** should be introduced where there is little risk of harmful interference and there are no other impediments

Digital switchover in Sweden

- Start of digital terrestrial TV services 1999
- Government Bill on switch-over and analogue switch-off March 2003
- Analogue transmissions closed down in stages, discontinued by October 2007
- Government Decision 19 December 2007

Timetable award of 800 MHz in Sweden



Current status

- Consultation closed on October 5
- Currently analysis of replies
- All information on the award (as proposed in the consultation) available at:
 - <http://www.pts.se/en-gb/Documents/Consultations/200/Public-consultation-on-draft-auction-rules/>



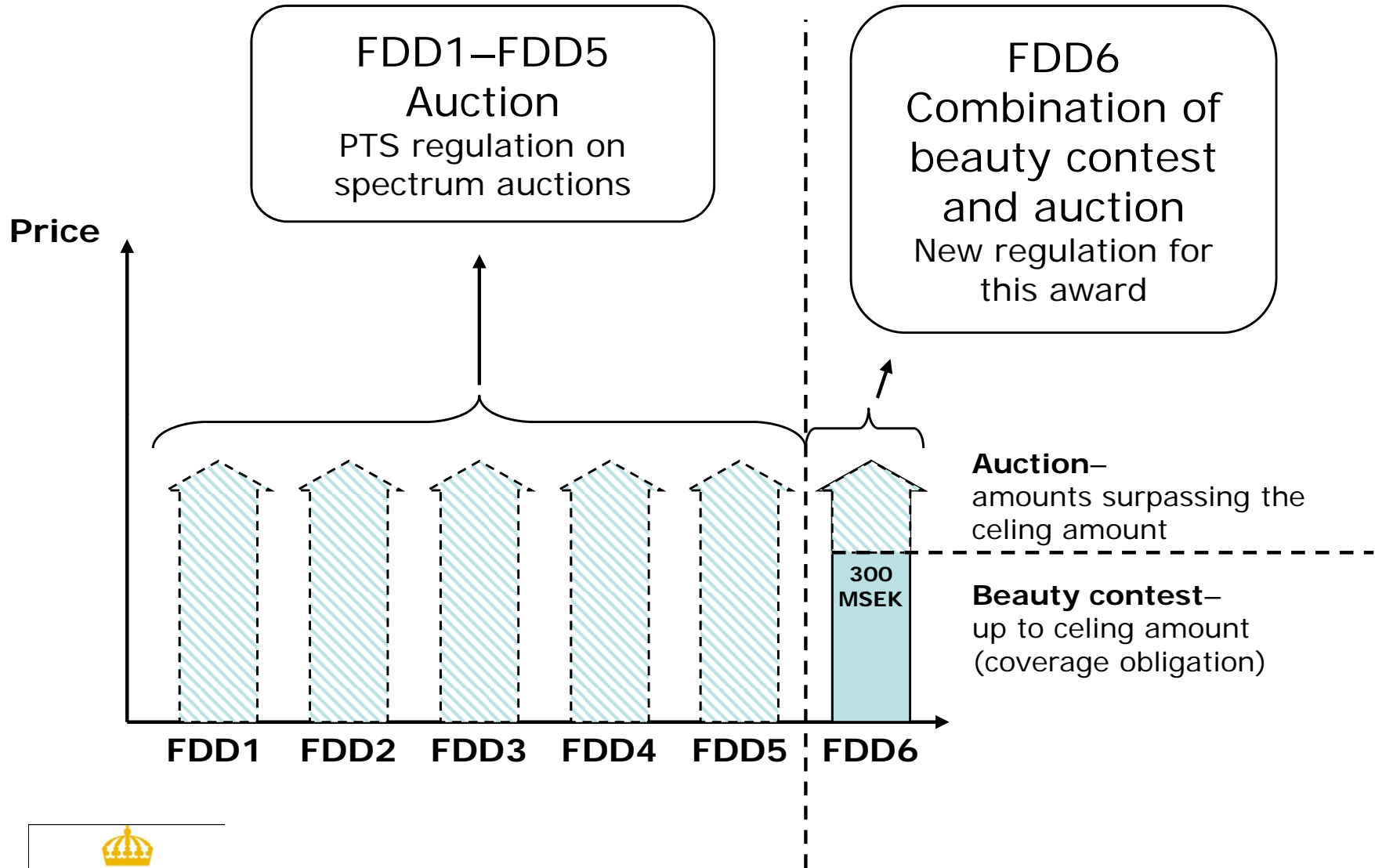
Proposals for the 800 award in Sweden

- National licenses
- Six licenses (2x5 MHz)
- Duration of licenses: 25 years
- Service and technology neutral license conditions
- Spectrum Cap: One bidder can buy a maximum of two licenses
- Technical conditions in line with international harmonisation
- License conditions to not cause interference to reception of terrestrial TV under 790 MHz

Proposals for the 800 award in Sweden

- Auction format similar to the Swedish 2.6 GHz auction (SMRA with switching)
- Starting bid proposed at SEK 150 M per license
- Coverage obligations for one of the licenses:
 - License holder shall cover households and working places that do not today have basic possibilities for broadband (today approx. 2800)
 - License holder promises to invest in coverage up to a certain level (in the range SEK 150 – 300 M)

The format for block FDD6 will be a combination of an auction and a beauty contest



Key license conditions

- Obligation not to cause interference to reception of terrestrial TV
- Sweden will implement the EU-decision on harmonised conditions for the 800 band
 - EC Decision (2010/267/EC)
- The decision describes the spectrum mask and in/out of band power levels
- Band plan

790–791	FDD1 791–796	FDD2 796–801	FDD3 801–806	FDD4 806–811	FDD5 811–816	FDD6 816–821	821 – 832	FDD1 832–837	FDD2 837–842	FDD3 842–847	FDD4 847–852	FDD5 852–857	FDD6 857–862
Otill- delat	Nedlänk						Mittengap	Upplänk					
1 MHz	30 MHz (6 block om 5 MHz)						11 MHz	30 MHz (6 block om 5 MHz)					

Technical conditions 800 MHz

- Use of the 800 MHz band causes some risk of interference to terrestrial TV
 - Studies show that reception of terrestrial TV below 790 MHz can be affected in areas around base stations in the 800 MHz band
 - The level of potential interference is dependant on the planning of an 800 MHz network

Technical conditions 800 MHz

- Interference and overloading/blocking
- The risk of interference is greatest in the frequency channels closest to the 800 MHz band
 - Greatest risk in areas close to the base station
 - Interference can be created by all blocks in the 800 band, the blocks closest to 790 will create more risk of interference
 - Channel 60 (782-790 MHz) is closest to the 800 MHz band
- Maximum emitted power 56/64/67 dBm/5 MHz
- Special conditions in geographical areas where channel 60 is in use for broadcasting

Obligation not to cause interference and conditions to remedy interference

- License holders are prohibited from causing interference to the reception of terrestrial TV in the 470-790 MHz range
- Interference is defined in the license conditions
 - Out-of-band interference and overloading/blocking
 - Based on studies by CEPT
 - Base case is reception with rooftop aerial, signal levels are measured 10 meters above ground at household

Obligation not to cause interference and conditions to remedy interference

- License holders have best knowledge of where and how rollout is planned and performed, i.e. they have the best possibilities to prevent and remedy interferences
- License holders shall jointly establish an organisation in order to coordinate reports on interference and distribute these for remedy

Examples of remedies to interference

- TV receiver filtering
 - Filters are seen as a solution in many cases
 - In channel 59-60 areas a filter solution may need to be combined with other solutions
- Adjustment of base stations
 - Vertical polarisation may improve compatibility, will affect MIMO antenna placements
 - Placing and elevation of antennae
 - Adjustment of emitted power
 - Planning of network based on structure of TV-networks
- Other solutions

Questions?

- For more information on the Swedish 800 MHz award see:

<http://www.pts.se/en-gb/Industry/Radio/Autctions/Licences-in-800-MHz-band/>

- Contact details

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