



# Can spectrum auctions deliver universal access to next generation wireless broadband?

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# Promoting universal access to wireless broadband



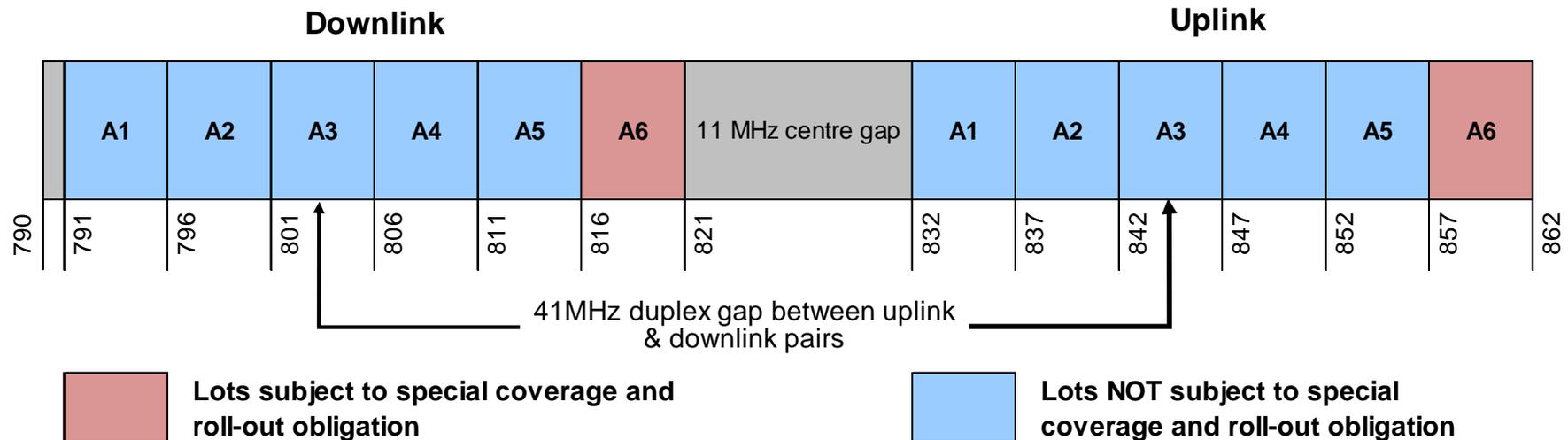
- Recent trend towards regulators attaching significant coverage obligations to mobile broadband licences
- Departure from trend away from policy intervention in spectrum markets seen in early 2000s:
  - Auctions of technology neutral licences
  - Few licence obligations
  - Let the market decide
- Reflects policy focus on broadband availability and recognition of LTE as cost-effective alternative to fixed line, especially in rural areas:
  - Coverage obligations focused in scarce sub-1GHz frequencies
  - Increasingly creative methods for:
    - allocating obligations to specific operators
    - ensuring coverage of most remote regions

# Examples of tools available to policy makers



- Denmark 800 MHz (CCA)
  - Full package bid auction
  - Coverage exemptions are available for three rural “regions”
  - Winner determination restricted such that at least one operator covers every region
  
- Germany 800/2100/2600 MHz (SMRA)
  - Restricted use of 800 MHz blocks in urban areas until coverage obligations in rural areas have been met
  - 800 MHz operators share rural rollout obligations
  
- Romania 800/900/1800/2600 MHz (variant of Clock Auction)
  - Obligation to cover 100s of rural regions divided up amongst 800/900 MHz winners based on number of blocks they win
  - Some scope for winners to choose coverage regions, provided none left out

# Another example: Sweden 800MHz auction



- Styled as **hybrid ‘auction-beauty contest’** format
  - More properly, an **auction with multiple characteristics** (price and promised expenditure on rural coverage obligation)
  - For lot 6, **first SEK 300m of any bid is commitment to spend on roll-out to households in rural areas** (as defined by the regulator)
- SMRA with switching format:
  - ‘Switching rule’ to manage bidder exposure to winning non-contiguous spectrum
  - Cap of 2 lots (2x10MHz) per bidder
  - Restricted transparency aimed at preventing tacit coordination

# Sweden 800MHz - outcome



**NERA**  
Economic Consulting

\* SEK 300m expenditure on rural coverage

	H3G	H3G	Telia	Telia	Net4	Net4	11 MHz centre gap	SEK 165m	SEK 266m	SEK 386m	SEK 468m	SEK 420m	SEK 49m + 300m*	
790	791	796	801	806	811	816	821	832	837	842	847	852	857	862

- Five bidders for 6 lots with leading bidders all targeting 2 lots each
- Three incumbent bidders each won 2x10MHz, but at very different prices
- Some interesting features:
  - Two incumbents - Telenor and Tele2 - formed a JV (Net4), which won lot 6
  - Lowest two lots sold at significant discount
    - These lots significantly cheaper than coverage obligation lot
    - Can only partially be explained by concern about interference from DTT in lot 1
    - SMRA switching format only partially mitigates aggregation risk, so this may also drive uneven prices (end blocks are more risky as only join one other block)

# Two common themes in Europe

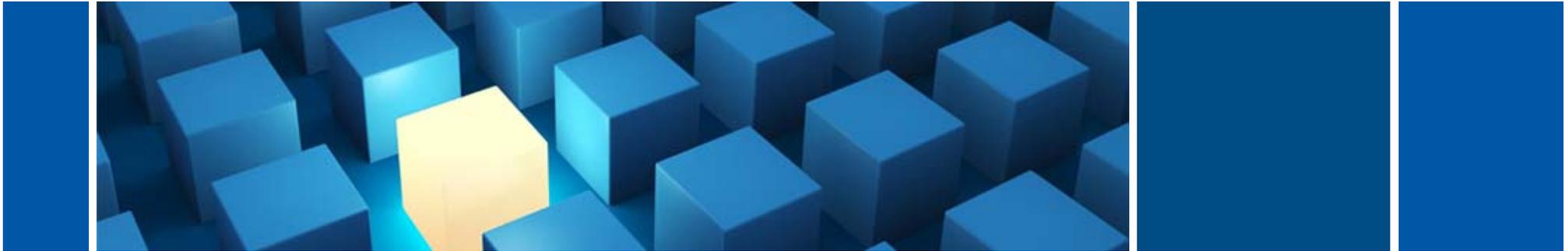


- Integrate coverage obligations into spectrum auction rather than run separate process to allocate funds to rural coverage
  - Contrast to USA, where FCC exploring scope for reverse subsidy auctions, which are separate from spectrum allocation
- Avoid expensive duplication of infrastructure roll-out in rural areas
  - In the Sweden 1800 MHz auction this was achieved by lot design (only coverage requirements on one lot)
  - In the German multi-band auction, this is done through co-ordination between operators
  - In the Danish 800 MHz auction, this is achieved by restrictions on winner determination in a CCA
  - In the Romanian multi-band auction, this is achieved by a mix of voluntary selection of coverage areas and obligations imposed by random selection

# Topics to explore



- Is there a best approach to coverage obligations in auctions – or should they be specific to local conditions?
  - How do you define broadband speeds and availability in a meaningful way?
  - Is universal mobile coverage a realistic goal?
  - What is the best way to avoid duplication of expensive infrastructure in rural areas?
- Does the best approach vary depending on:
  - Whether this a single or multi-band auction?
  - The choice of auction format – e.g. CCA vs SMRA?
- Can coverage obligations distort choice of deployment across different spectrum bands?
- What impact do coverage obligations have on auction revenues?



# Thank you!

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