

Thinking ahead

thoughts when drafting the terms for the Romanian spectrum auction



CEE Regional WG meeting
9 may 2013, București

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What do you expect (following this auction)?

Prioritisation AND attempt to put weight on objectives helps a clear commitment from the part of the social planner

- Put as much spectrum as feasibly possible on the table ?
- Increase competition, service and/or infrastructure based ?
- Encourage entry, have more overlapping networks, what is the magical number? 3, 4, 5?
- How to best prevent hoarding ? Is prevention of hoarding enough to ensure economic efficiency in the use of spectrum ?
- How to best ensure technical efficiency in the use of spectrum ?
- Solve potential competition problems ?
- Address territorial imbalances (white/grey areas) ?
- “Sell” all the spectrum ?
- Bring as much money to the state coffers ?

What are your tools?

Leaving aside exogenous factors (e.g. spectrum availability, legal framework, int'l harmonisation etc.)

- Spectrum caps and/or floors
- Spectrum packaging
- Minimum coverage requirements
- Technical obligations
- Reserve prices
- Spectrum annual usage fees
- Use it/lose it clauses
- Incentives
- Minimum qualification requirements
- Others?

How to set reserve prices ?

In the **context** of other auction safeguards & mechanisms, designed to promote legitimate public interests:

- ✓ Infrastructure based competition (spectrum caps)
- ✓ Service-based competition (MVNO incentives)
- ✓ Facilitate efficient investments (temporary national roaming)
- ✓ Territorial imbalances in network coverage (minimum coverage requirements, white areas)
- ✓ Prevent hoarding (annual usage fees)

What “**performance criteria**” do reserve prices need to address?

- Prevent risks for strategic collusion during the auction
- Reflect technical & economical characteristics of each band
- Reasonable in relation to their purpose & to the market value of spectrum
- Proportional with the market’s competitive dynamics & circumstances
- Recover any eventual costs of spectrum release (e.g. DD)

Steps in deriving reasonable reserve prices

1. Discourage frivolous bidders
 - ✓ Not needed, significant bank guarantees requested (25%-50% of initial offer)
2. Recover the costs of spectrum release
3. Use various tools to estimate market value

(2) - Recover the costs of spectrum release

- **Joint recovery, from all spectrum bands subject to release** (bandwidth by bandwidth recovery is not economically possible)
- Since release should generate welfare, the costs of release should act as a floor for reserve prices
- How to distribute joint release costs among 3 heterogeneous bands (800 MHz, 1800MHz and 2600MHz)?
 - ✓ an approach which would simulate the differences in economic values btw bands
 - ✓ essentially, based on propagation characteristics, using a COST-HATA model & a **typical distribution of mobile sites per geotypes** in Romania
 - ✓ distribution of joint release costs based on the bands' capacities to provide nationwide **minimum coverage presence** (relative site numbers)

Typical cell radii used for minimum coverage presence

Geotip	800 MHz	1800 MHz	2600 MHz
urban	0.95	0.39	0.29
suburban	4.15	1.08	0.79
Rural	13.79	9.9	8.85

Typical site distribution in Romania (across 3 bands)

Geotip	%
urban	35%
suburban	20%
Rural	45%

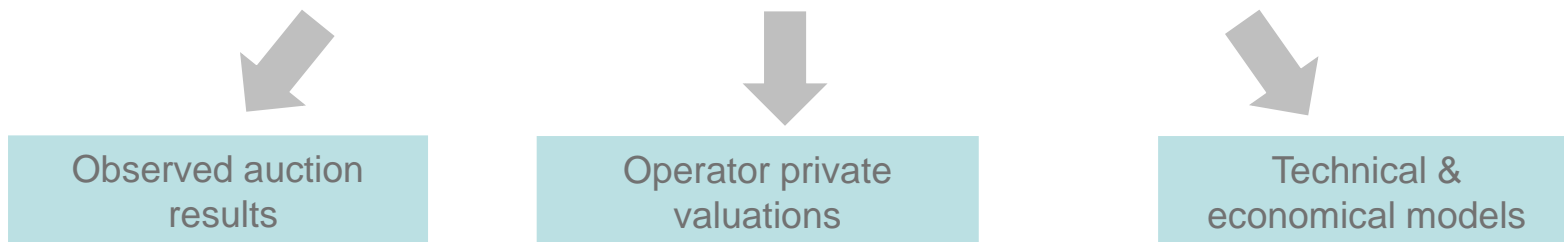
Relative site # for minimum coverage presence

Geotip	800 MHz	1800 MHz	2600 MHz
urban	1	5.9	10.7
suburban	1	14.8	27.6
rural	1	1.9	2.4

(3) - Market value of spectrum – criteria considered

- ❑ Physical properties of the bands
- ❑ Demand for spectrum
- ❑ Spectrum caps
- ❑ Existing rights
- ❑ Usage conditions (e.g. technologically neutral or not)
- ❑ International harmonisation
- ❑ Equipment availability and accesibility

Given information asymmetry with licence holders, we have explored **3 possible methods** to estimate reasonable market values

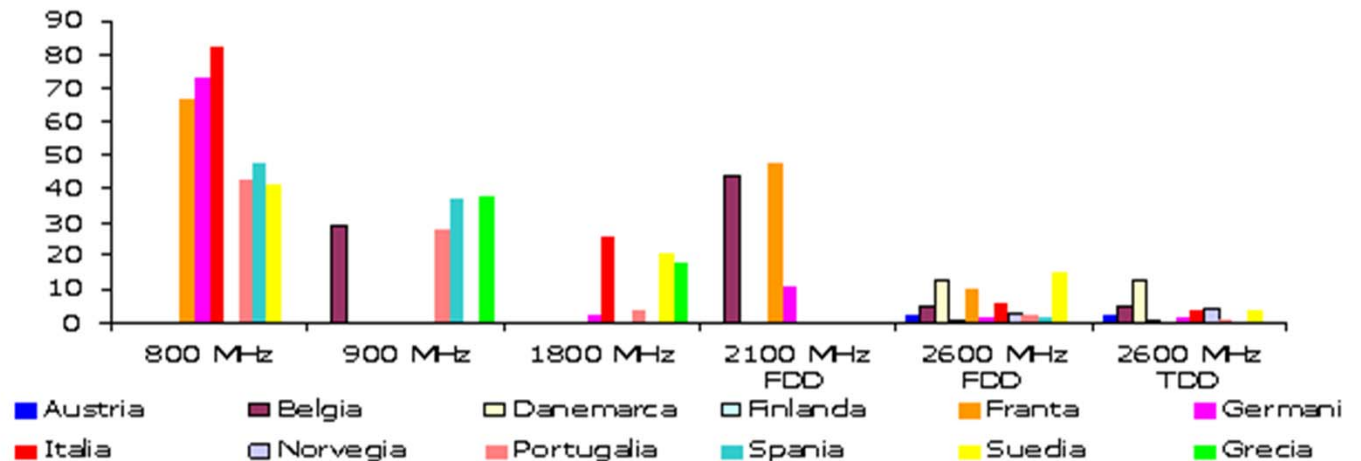
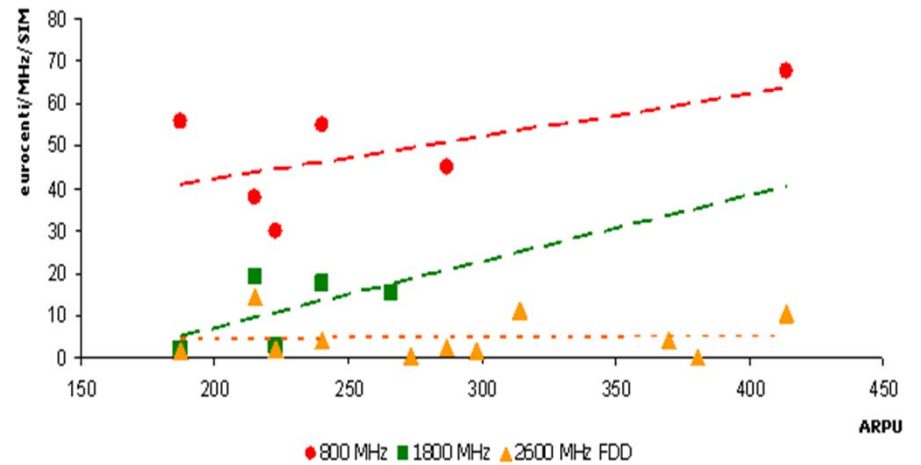


- ✓ Lte costing models not yet reliable, not recommended

(3.1.) – Observed auction results

- ❑ Observe and treat the differences btw jurisdictions and btw bandwidths
- ❑ # SIM more relevant than # inhabitants
- ❑ Adjusted for ARPU differential (Romania being a low ARPU country)
- ❑ PPP adjustment considered less relevant (single price law does not exist with licences)
- ❑ further adjustment of observed market values, in inverse relationship with the potential demand for spectrum (0%...50%)

Auction prices/MHz/SIM function to ARPU



(3.1.) – Observed auction results

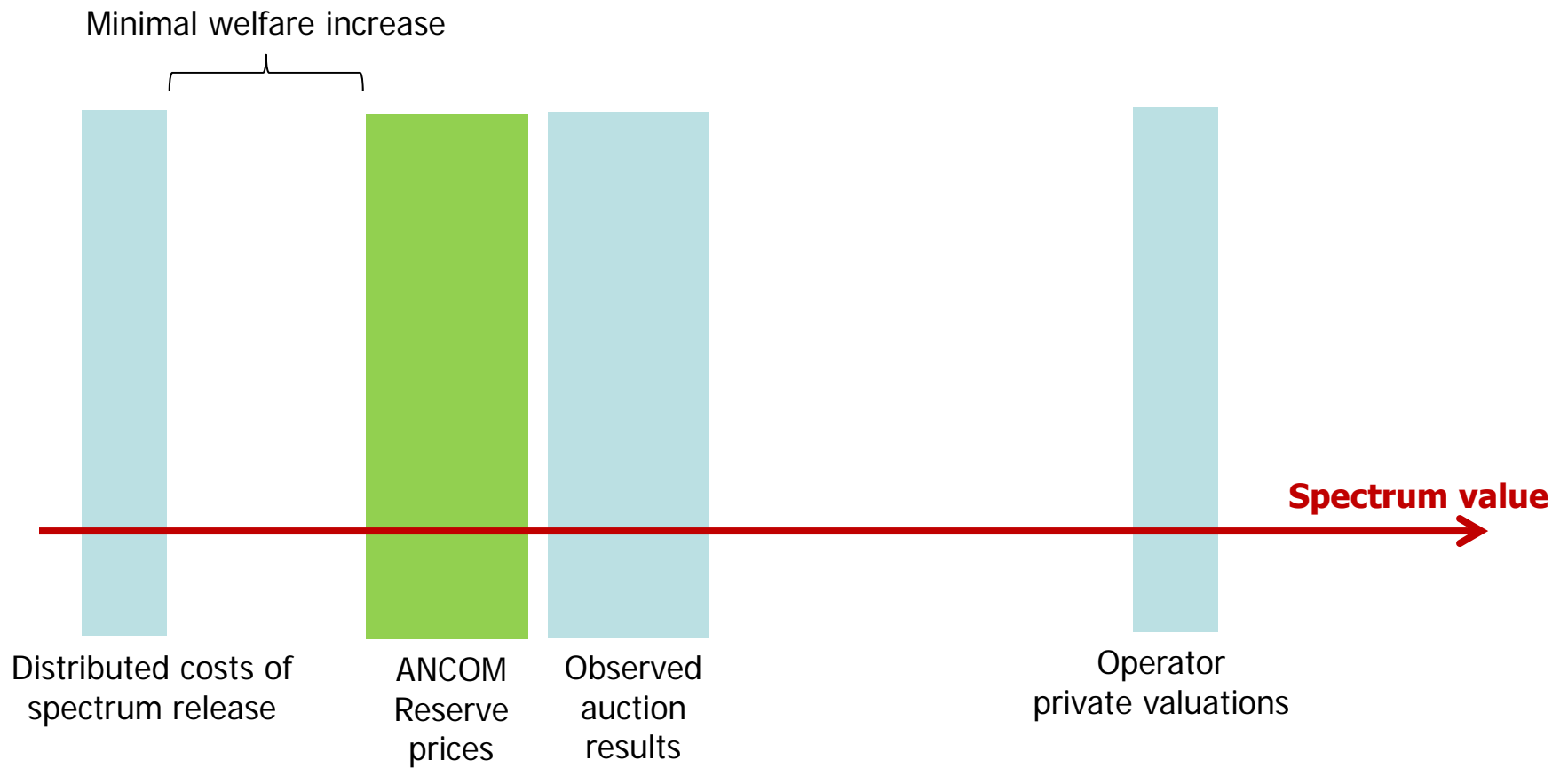
Recent auctions in the EU (eurocents/MHz/SIM) - march 2012

country	# national networks	800 MHz	900 MHz	1800 MHz	2100 MHz	2600 MHz FDD	2600 MHz TDD
Austria	4					1.76	1.76
Belgium	3		27.30		39.93	4.15	4.13
Denmark	4					11.08	11.08
Finland	3					0.21	0.38
France	4	67.64			48.64	10.28	
Germany	4	55.66		1.95	8.21	1.72	1.62
Italy	4	54.78		17.64		4.00	2.75
Netherlands	3					0.10	
Portugal	3	30.40	20	2.95		2.20	1.28
Spain	4	44.79	34.79			2.23	
Sweden	4	37.97		19.27		14.45	3.32
Greece	3		31.10	15.01			
Average		48.5	28.3	11.3	32.4	4.73	3.23
Median		49.8	29.2	15	39.9	2.23	2.26

(3.2.) – Operator private valuations

- ❑ On the occasion of private transactions, results of **fair value** evaluations are published in IFRS consolidated reports
 - ✓ Telemobil licences valued at **55** mil € on the occasion of its' acquisition by Cosmote group in oct 2009
 - ✓ Clear Wave N.V. licences in Romania and Czech Republic valued at **461** mil £ on the occasion of its' acquisition by Vodafone group in 2006
 - ✓ depending on group accounting policies, **goodwill** is sometimes distributed among assets, including licences
- ❑ However there are shortcomings
 - ✓ accounting policies may differ by group
 - ✓ mergers & acquisitions have been the only private transactions so far (buy/sell the entire company, hence the licence fair value may be impacted by the distribution of purchase price among acquired assets)
 - ✓ detailed information difficult to obtain information (evaluations are sometimes reported in consolidated accounts of companies outside the jurisdiction of ANCOM)
 - ✓ operators propensity to embellish (investment wise)
- ❑ Private valuations were ultimately being attributed limited use
 - ✓ For cross-check purposes
 - ✓ To act as ceiling to estimated market values

A thin red line for spectrum pricing



Setting annual spectrum usage fees (SUF)

- ❑ Legal performance criteria of SUF:
 - “ensure optimum utilisation, objectively justified, non-discriminatory and proportional to the purpose for which it is intended”*
- ❑ Assumptions
 - ✓ **Optimal utilisation** = spectrum to those uses & users which generate highest welfare for the society, “use it or lose it” clauses
 - ✓ **Non-discrimination and Proportionality** = due account to the economic & social value of spectrum, a public good characterised by inelastic supply
- ❑ Constraint

A change in SUF for 2,1 GHz in the middle of the licence period can raise competition issues and can indirectly impact demand for 2,6 GHz
- ❑ Competitively neutral approach
 - ✓ Alignment of SUF among frequencies for mobile communications, based on their capacities to provide **quality mobile services**, indoor and outdoor
 - ✓ Technical-economic model used under Extended COST Hata scenario
 - ✓ A number of scenarios investigated (coverage, throughput, traffic, etc.)

Annual spectrum usage fees (SUF) - II

Spectrum band	Annual SUF	
800 MHz	2,3	
900 MHz	2,3	
1800 MHz	1,4	
2000 MHz FDD	1,2	unchanged
2000 MHz TDD	0,3	
2600 MHz FDD	0,9	
2600 MHz TDD	0,25	

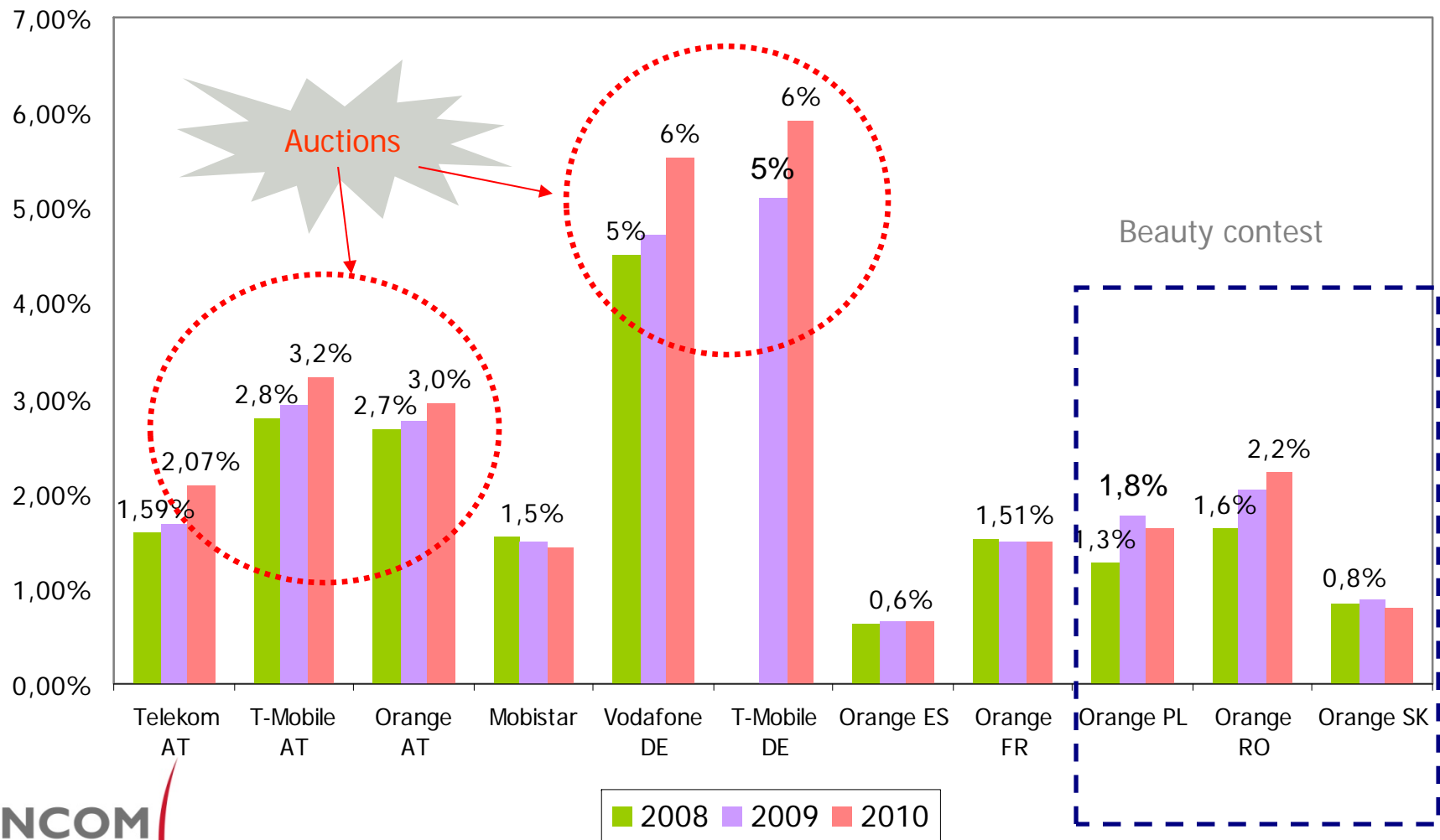
NB:

- All figures in millions EURO, per block of 2 x 5 MHz (FDD) or 1 x 5 MHz (TDD)
- Rates apply from April 2014 onwards

Explanatory paper on SUF (Romanian only)

http://www.ancom.org.ro/uploads/forms_files/proiect_decizie_TUS_expunere_motive1331729246.pdf

Reasonable administrative costs of spectrum (one off licence + annual spectrum fees)



Thank you! / Mulțumesc!

Questions ?