



Case Study on sustainable national broadband proliferation The costs of doing nothing

SESSION 4: Bridging the Digital Divide by Broadband

Christoph Legutko
Regulation and Standardisation Manager
Intel Global Public Policy

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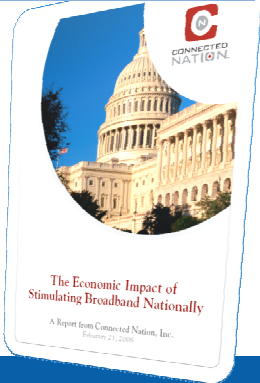
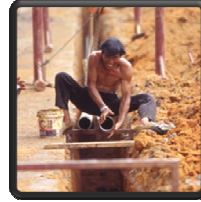
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Broadband economic opportunity ... why spectrum policy is CRITICAL to Central Eastern Europe

OPPORTUNITY

7% increase in penetration ...
\$92 billion - 2.4 million jobs
created or saved p.a.



...the Central Easter Europe CHALLENGE
50 % of the population lives
outside metro cities. Cables in non-Metro
in all areas are either
not there, or poor
quality



*"Telecoms have the upside
to become the primary contributor
to economic recovery...the recovery catalyst"*



**Cesar Alierta – President, Telefonica Group
Mobile World Congress, 2009**



US Spectrum Policy History

Before

- Historical command & control
- Cumbersome, politicized
- Locked in old tech & services

Inflexible

Now

- Technology & Service Neutrality
- Aggregate subject to antitrust review
- Technical flexibility if no interference to "Neighbors"
 - Geographic
 - Frequency

Flexible

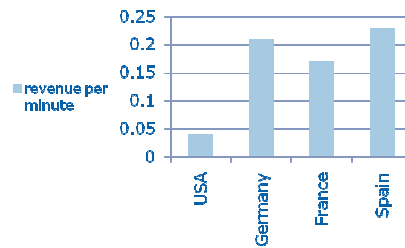


Economic Implications: Flexible Policy Approach Driving Consumer Value



- ALL WRONG
 - Analog standard mandated
 - Fragmented, non contiguous licenses
 - 2 licenses only 25 MHz each
 - Heavy technical regulation

- Reversed Approach:
 - Improved consumer value



David Horne, "Market-Oriented Spectrum Policy Evolution in the U.S.: Regulatory History from Cellular to PCS," February 2009



Economic Implications: Flexible Policy Approach Enabling Highest-Value Use: US 2.5GHz band – case study

Situation:

- 190 MHz given flexibility to move from high power 1-way video to low power 2-way data.

FCC approach:

- Changed service parameters
- Re-banded to create contiguous licenses
- Didn't take back spectrum, charge fees
- Permitted long leases with non profit neighbors

clearw^{ire}
wireless broadband

Attracted 3.2 billion in new capital

Deploying WiMAX aggressively

Are your policies attracting capital ?



Capital is scarce ...

AFP
Asian Development Bank wants capital tripled: president
 TOKYO (AFP) — The Asian Development Bank hopes to secure a three-fold capital boost in 2009. May so it can help emerging nations through the economic crisis and support environmental projects, its head said.

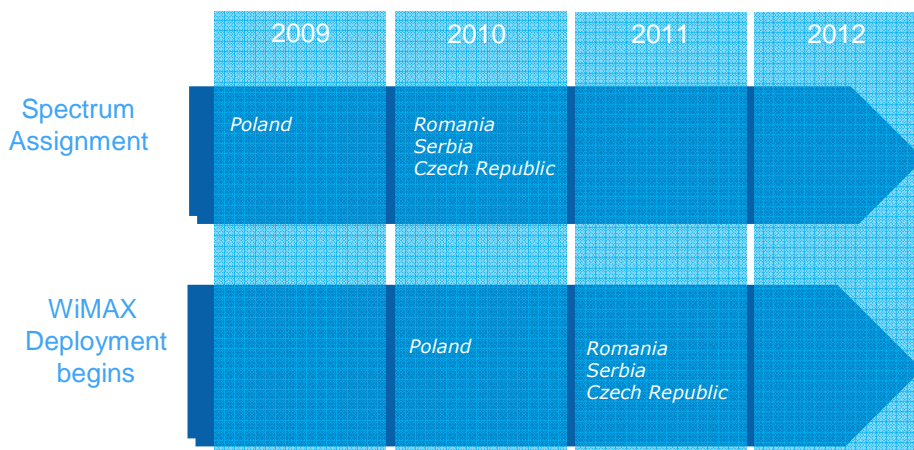
Bloomberg.com
Bank Danamon Said to Seek \$336 Million From Investors (Update1)
 Bank of Japan to Buy \$11 Billion in ...

Crash & Recovery
China's slump dethrones the Asian tigers
 YOUR GUIDE TO THE ECONOMIC CRISIS

Asian Stocks Closed Down On Credit Crunch Fears; Nomura
 February 9, 2009 7:26 a.m. EST
 Mayur Pahitajani - AHN News Writer
 Tokyo, Japan (AHN) - Asian markets closed on a mixed note on Monday, as Japan's index led the charge after Nomura Holdings Inc. said it will raise capital through share sales.

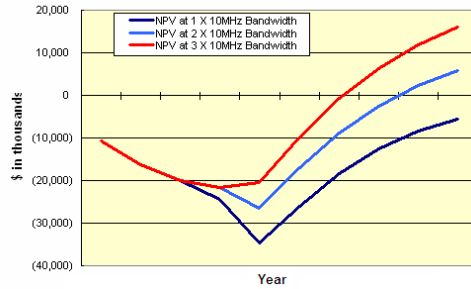
PT Bank Indonesia Tumbles 21%
 (Bloomberg) -- PT Bank Indonesia, backed by Bank Holdings Pte and the Bank AG, plans to raise 4 trillion rupiah (\$336 million) from existing shareholders to raise capital, two people familiar with the matter said.

National Spectrum Assignment and Deployment CEE WiMAX Networks

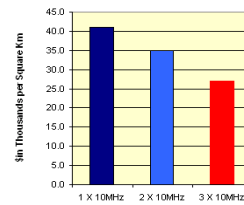


Economic Implications: Assignments Size Policy

Sensitivity to Total Available Bandwidth



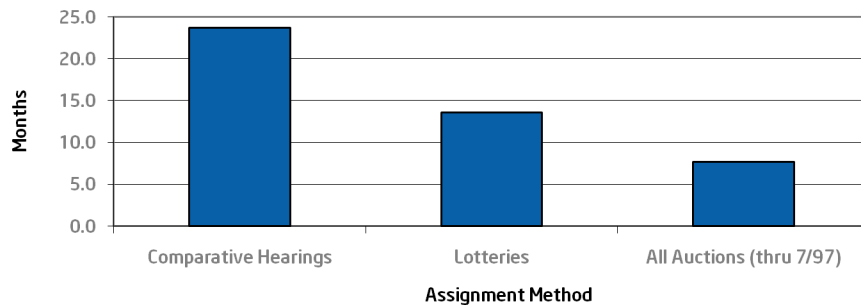
Cumulative CapEx/Km²



Good assignments attracts capital



Economic Implications: Slow Assignment Method



Average duration in granting licenses for the various assignment methods.
 (Note that auction averages above include the time to file and process bidder applications, not just the auction duration.
 Also note the average for lotteries does not include delays for the aftermarket transactions which transferred licenses from speculators to those intending to deploy networks.
 Source: "The FCC Report to Congress on Spectrum Auctions," Document No. FCC 97-353, Sept. 30, 1997)



Two ways to pitch & assess 'value'

Value Realized by purchase decision

- Convenience
- Freedom
- mode of driving
- luxury



Cost of doing Nothing (value foregone)

- Cost of other transport
- Lost time
- ...

*9 out of 10
sales pitches
only focus here*

*Indecision
... also costs!*

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Economic Implications: No Assignments

Basic economic concepts

Consumer Surplus...

...the benefits a consumer derives from a 'good' – over and above the price paid for it.

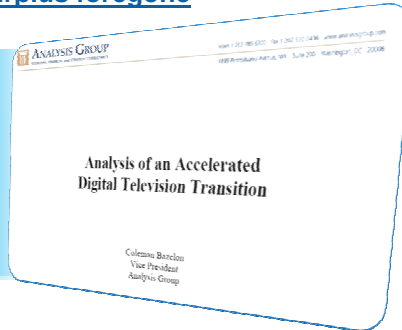
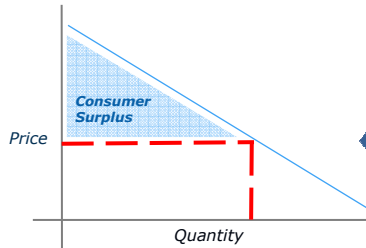
Producer Surplus...

Profits. The price operators pay for spectrum is a good indicator to the expected profits to be made.

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Economic Implications: No Assignments Cost of Doing Nothing - Consumer Surplus foregone

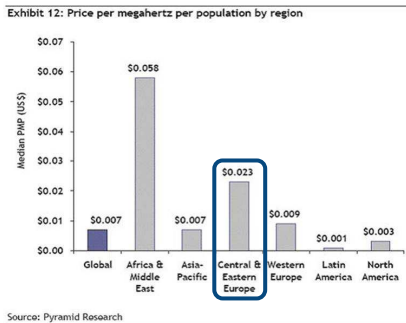


Examples	Spectrum Auction Value (Reflection of Expected Profits by Operator)	Consumer Surplus Value (NPV)
 2.5GHz Romania	USD 50 Million	USD .5 - 1B
 700MHz USA	USD 20Billion	USD200-400B

10-20X



Economic Implications: No Assignments CEE Estimations - Unrealized Consumer Surplus values



Country	Population '08 estimates	Estimated Consumer Surplus Value (from 2.5MHz band) USD
Serbia	8.03 m	185 m
Cz Republic	10.2 m	235 m
Romania	21.5 m	496 m
Poland	40 m	920 m

Spectrum value assumption: $cost/mhz/pop \times pop \times spectrum$
Spectrum 100mhz
Consumer surplus: License value x 10X

The lack of assignment of 2.5 GHz band in Romania – is likely to be costing the region over \$0.5 B in economic value

Question: are your 2.3 & 2.5 bands optimized for highest value use ?



Cost Of Delay: Consumer Surplus Forgone

Lost value: Spectrum and Consumer Surplus values

Spectrum License Assumptions:

- Annual consumer benefits = \$X
- Time value of money (discount factor) = 5%

Then the spectrum's NPV for all time = \$20X

And NPV of benefits of first 3 years = \$2.7X

...therefore a 3Yr delay = 14% loss in value

Spectrum Value

Country	Lost Value (Millions)	Remaining value (Millions)
Poland	13	79
Romania	7	43
CZ Republic	3	20
Serbia	1	16

Consumer Surplus Value

Country	Lost Surplus (Millions)	Remaining Surplus (Millions)
Poland	258	1,582
Romania	5	653
CZ Republic	3	404
Serbia	2	318

(NPV Formula = Annual benefit/discount factor)

Spectrum Indecision

...evolved pitch to 'cost of doing nothing'

Broadband economic opportunity
... why spectrum policy is CRITICAL to ASEAN

OPPORTUNITY
Triple digit population... \$52 billion - \$4.4 million jobs created for ASEAN

...the ASEAN CHALLENGE
83% of the population lives outside metro cities. Cities in Southeast Asia are either not there, or poor quality

...the only option is Wireless comms*
...which needs spectrum...now

➔

National Spectrum Assignment and Deployment South-East Asia WiMAX Networks

	2007	2008	2009	2010
Spectrum Assignment	Singapore, Malaysia, Philippines, Cambodia		Indonesia, Philippines, Vietnam, Thailand	
WiMAX Deployment begins		Philippines, Malaysia, Singapore, Cambodia		

Economic implications: No Assignments
Lost value Spectrum and Consumer Surplus value

Economic implications: Delayed Assignments
Lost value Spectrum and Consumer Surplus value

Experience...

- **Regulatory appetite for this is high,**
- **Press (public) interest – is very high**

PORTUGAL EXAMPLE



Success factors

- Started with a national technology plan
 - (Plano Tecnologico)
 - Comms, Edu Ministries and Intel
- Investment in comprehensive education program that improves education through new technology, software and educational content, training and support.
- Create a local sustainable economic model that generates jobs and trade opportunities
- Form Partnerships that lower costs and utilize the experience and resources of both public and Private sectors
- Innovated funding model – 3G license



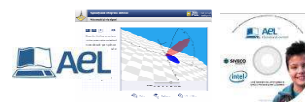
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Romania Education Transformation

Intel® Teach Program
60.000 teachers trained by 2010

EURO200
200EURO vouchers towards a new PC for students



World class educational content – AeL (SIVECO)

Opening spectrum for WiMAX wireless connectivity



Intel "Unwire Romanian Universities" Program serves over 300,000 students



Launched EURO PC: shared access program for rural areas



One-to-One eLearning with Classmate PC



Summary

- Broadband belongs to the basis infrastructures of a country enabling new industries and resulting economical growth
- Not deploying of broadband it costs also money - these are the costs of lost chances
- Establish broadband friendly regulatory framework and release sufficient amount of spectrum to enable new industries
- Central Eastern Europe need to assign 2.5 GHz and 2.3 GHz spectrum and start deploying WiMAX
- Wireless Industry is critical in providing economic stimulus
- Administrations should set public and measurable goals
 - 90% of schools with BB
 - Teacher training
 - Widespread PC proliferation in the schools
 - Affordable & reliable BB
 - Tax relief for BB & ICT