



The Digital Dividend

Challenges in Implementing the Digital
Transition

To the Information Society

John Alden
Freedom Technologies, Inc.
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Overview

- What is the Digital Dividend?
- Expanding Demand for Info Society services
- Internet & Broadcasting
- Repacking and Relocation
- Spectrum “white spaces”
- Voluntary Incentive Auctions



The Digital Dividend

- **What is the “digital dividend”?**

- Transition to digital broadcasting
- Consolidation of broadcasting channels
- Allowing BWA networks in UHF range

- **What are the bands?**

- 698-862 MHz in Regions 2 & 3
- 790-862 MHz in Region 1, including Africa

- **Why is this spectrum important?**

- These bands have excellent propagation characteristics

- **What is the development potential for BWA**

- Enormous ability to use WiMAX, LTE to reach rural markets



The days of “Uncle Miltie”
are over.



Context: The Info Society

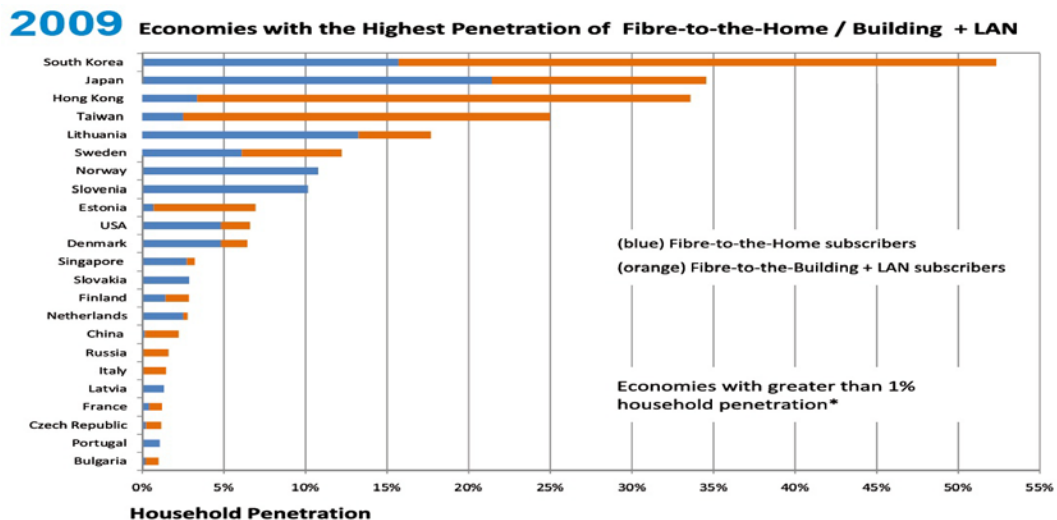
- Affordable and ubiquitous access to the Internet is increasingly available through mobile and fixed broadband networks
 - This enables more use of smart phones and mobile applications
 - Today's innovations are in smart phones and social networking
 - Intelligence and computing power are at the edge of networks
- Growth markets are broadband and mobile – and their nexus
- The Information Society is driven by:
 - **Networks**: NGNs, 3G & 4G BWAs
 - **Devices**: laptops, netbooks & smart phones
 - **Applications**: social networking, 'augmented reality'



Which platform will capture the video market?

Nets, Dongles & Apps

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 - **Applications**: social networking, location & ‘augmented reality’








Source: IDATE, RVLL, OVUM for Global FTTH Councils



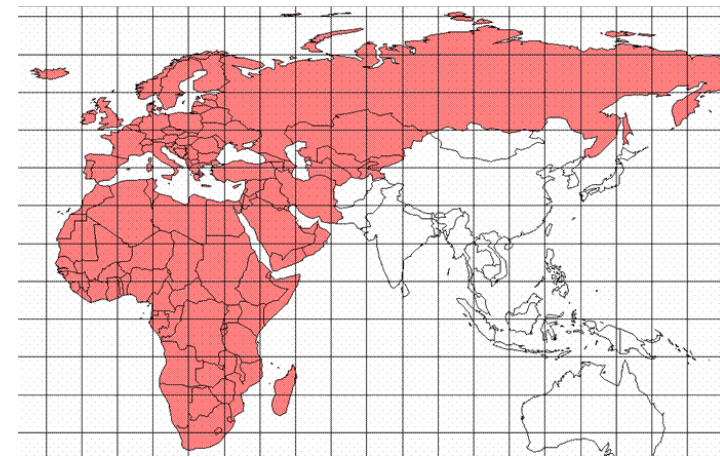


Convergence

- Platform convergence – one device providing many services  
- Service convergence – one company, providing many services (i.e., triple play)   
- Industry convergence – vertical or horizontal integration
- Addressing convergence through economic regulation:
 - Do you regulate the company, the service or the platform/device?
 - Considering possible taxonomies for regulation:
 - Regulating by **provider** (existing paradigm)
 - Regulating by **service or functionality** (technology neutrality)
 - Regulating by **responsibility for content** (dividing common carriers from content generators)
 - Regulated v. “**not regulated**” (e.g., license-exempt or consumer devices)

GE06 & WRC-07

- GE06 Agreement
 - Set a plan for broadcasting service in Region 1
 - Covered terrestrial digital broadcasting in 174-230 MHz (Band III) & 470-862 MHz (Bands IV & V)
 - Digital transition to last until 17 June 2015
- WRC-07
 - 698-862 MHz proposed for identification as an IMT band
 - Favored by some Region 2 and 3 countries (e.g., U.S.)

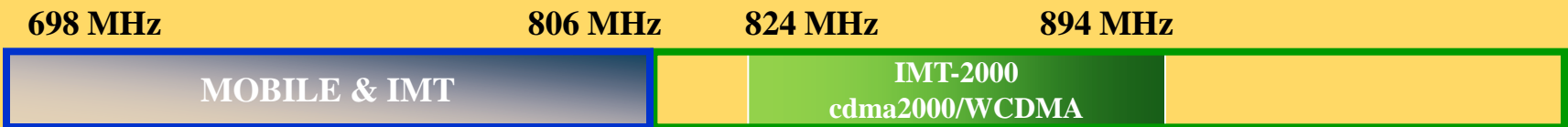




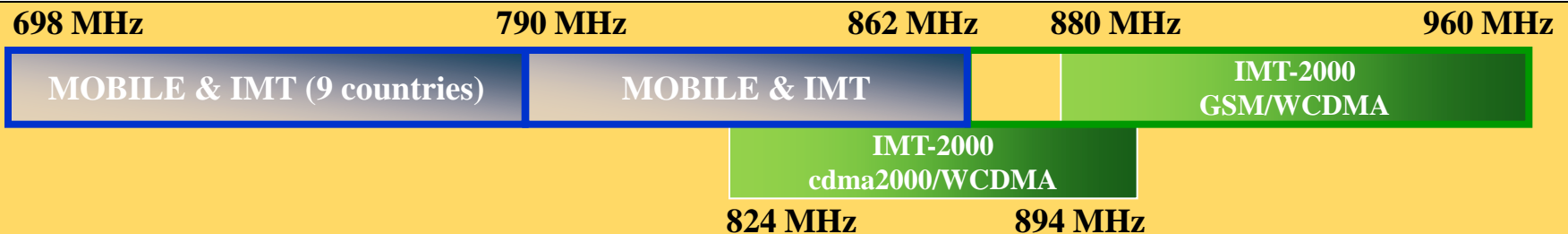
The Digital Dividend Bands 700-800 MHz



REGION 1 (EMEA)



REGION 2 (Americas)



REGION 3 (APAC)



Broadcasting V. Internet

- **Turning up the Contrast**

- BWA (streaming video, downloads) already is already in the market (e.g., YouTube, Facebook)
- Mobile TV, IPTV slower to market
- Efficiency argument – P2P or P2MP?

- **Digital Dividend = negotiating coexistence**

- IMT will enter upper bands (i.e., 790-862 MHz or 698-862 MHz)
- Digital transmission allows more efficient broadcasting in Bands III, IV

- **Spectrum remains a contested terrain**





Spectrum Repacking

- DTV can be “repacked” into smaller segment of the band (i.e., lower UHF band)
 - Stations could multi-cast across existing channels
 - Stations could share channels & infrastructure
- There are alternatives:
 - “White spaces” being implemented by US and UK
 - “Incentive Auctions” for spectrum discussed in US

Note: In US, only estimated 15% of population relies on terrestrial, over-the-air broadcasting to receive video service – even after DTV transition. So there is strong pressure to auction remaining broadcasting spectrum for BWA.



White Spaces

- **“White Spaces” = unused spectrum or channels that lie fallow in some or all geographic areas**
 - Unused spectrum can be utilized through overlay sharing
- **Dynamic Spectrum Access**
 - Can allow “opportunistic” and **unlicensed** access on non-interference basis
 - Current uses employ geographic frequency databases
 - Would eventually employ cognitive sensing technology
- **Authorized in the US, considered elsewhere (e.g. UK)**
 - US completed DTV transition in June 2009, after extended period
 - Upper part of UHF band (698-806 GHz) was auctioned in March 2008
 - US transition involved subsidized coupons for digital converter boxes



Voluntary Incentive Auctions

- **Would provide incentives for broadcasters to voluntarily clear spectrum**
 - They would get a “cut” of auction proceeds
 - Results could pay for broadcasting station changes
- **Idea developed in US**
 - Wireless industry driving spectrum reclamation
- **The challenge:**
 - How much should be retained by broadcasters to induce “voluntary” spectrum release
 - Inherently involves a valuation exercise of the spectrum



Digital Dividend -- Africa

- Possibilities for African nations
 - UHF propagation = reach to areas with lower population density
- Digital transition scheduled for 2015
 - Some countries (e.g., Kenya, Uganda, Nigeria, South Africa, Tanzania)
 - CDMA 800 allocations could pose a problem for 790-862 MHz band
 - Choice: Follow Region 1 approach (790-862 MHz), or Region 3 (698-802 MHz)



Issues To Discuss

- Is the spectrum “crisis” for broadband universal?
- What is the difference between *spectrum* and *network capacity* ?
 - Can technologies such as femtocells and picocells, plus WiFi overflow, handle spot capacity shortages?
- Infrastructure issues
 - Are backhaul and international connectivity the real issues for developing economies?
 - Need for developed power sources and efficient grid



www.freedomtechnologiesinc.com

John Alden: ja@ftidc.com

+1-703-516-3020