THE IMPLICATIONS OF WiMAX FOR COMPETITION AND REGULATION

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Agenda

• Introduction to WiMAX
  - Cost
  - Complementary and competitive technologies

• Regulatory issues
  - mobility
  - technical neutrality
  - QoS, interconnection, security and privacy and safety

• Country examples
  - France
  - United States
WiMAX

• WiMAX Forum hopes to encourage the widespread adoption of broadband wireless technologies under the WiMAX seal.

• The WiMAX Forum has a good deal of momentum and backing behind the certification process with 230 companies as members.

• Capable of sending high speed data over long distances (40 Mbit/s over 10 kilometers in a line-of-sight fixed environment).
WiMAX

• WiMAX-IEEE 802.16, began developing technologies for wireless metropolitan networks in 2000. (10-66 GHz)

• The current standard IEEE 802.16-20043 deals specifically with wireless connectivity between fixed devices.

• The new task groups (IEEE 802.16f) is working on incorporating mesh networking capabilities into the standard.
WiMAX - cost

- Cost estimation, USD 3 billion in equipment, tower sites, labor and set-up costs to build a national WiMAX network in the United States.

- Spectrum costs may or may not play a large role in the overall cost of the network.

- Flexibility in national spectrum policies may be important in keeping costs down.
Complementary and competitive technologies

- WiMAX is not the only choice for businesses.

- The evolution of 3G networks could pose a threat to the success of WiMAX.

- Upgrades to 3G networks and evolutions of these technologies are promising higher speeds, comparable to WiMAX, in roughly the predicted time frame for the rollout of mobile WiMAX equipment.
Regulation

• WiMAX is a complementary wireless technology to existing 3G, WLAN and wired broadband networks.

• WiMAX is believed to be more of a disruptive technology.
Regulation

• Factors influencing the success of wireless networks:
  - Availability of spectrum
  - Equipment performance/cost
  - Infrastructure costs
  - Customer penetration

• Spectrum used for WiMAX deployments may prove to be less harmonized (2.5 GHz, 3.5GHz and 5GHz).
# Regulation

<table>
<thead>
<tr>
<th>Frequency</th>
<th>2.5 GHz</th>
<th>3.5 GHz</th>
<th>5 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation</td>
<td>Licensed</td>
<td>Licensed</td>
<td>Unlicensed/Light licensing</td>
</tr>
<tr>
<td>Countries</td>
<td>US, Mexico, Brazil, South East Asia, Korea (2.3)</td>
<td>Most countries</td>
<td>Most countries</td>
</tr>
</tbody>
</table>
Regulation - *mobility*

- WiMAX may very well prove disruptive to traditionally telephony.

- Success of WiMAX – mobility, may depend on the implementation of voice services. (5 GHz, 3.5 GHz and 2.5 GHz)

- Different degrees of mobility including: stationary (0 km/hr), pedestrian (up to 10km/hr), vehicular (up to 100 km/hr) and high-speed vehicular speeds (up to 500 km/hr)

- 1 GHz range that could be made available for wireless broadband with the move from analogue to digital terrestrial television.
Regulation-technical neutrality

• Pertains to spectrum use.

• Mobile operators in some cases have been unable to roll out networks under the prescribed time schedule.

• Technologically neutral spectrum allocations may offer the best chance to adapt to the ever-changing technologies.
Regulation – QoS, Interconnection, SSP, Safety

- Determined by both physical and market characteristics.
- ISPs offering WiMAX connections need to interconnect to Internet exchanges, and likely to PSTN.
- WiMAX may pose more security risks than Wi-Fi is the reach of the signal.
- Mobile WiMAX may also bring with it additional safety concerns.
  - Distracting drivers
  - RF exposure
Country example - France

- ARCEP, adopted two decisions:
  - 3.4 GHz – 3.6 GHz
  - 3.6 GHz – 3.8 GHz

- 5.4 GHz – 5.7 GHz, the operation in this band must support DFS

- Altitude Telecom recently acquired a license in at 3.5 GHz which will be used for pre-WiMAX equipment
Country examples – *United States*

- WiMAX providers have focused on the 2.5 GHz and 5 GHz ISM bands.

- Clearwire is one of the first providers to offer pre-WiMAX services in this frequency band with its network in Jacksonville, Florida.

- New spectrum for wireless broadband (3.65 GHz – 3.7GHz).
## Country examples

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>License-exempt spectrum</td>
<td>2.4 GHz – ETSI power restriction</td>
<td>2.4 GHz – has to comply with Part 15</td>
</tr>
<tr>
<td>Licensed spectrum</td>
<td>3.4 – 3.8 GHz</td>
<td>2.3 and 2.5 GHz, 3.65 – 3.7 GHz</td>
</tr>
<tr>
<td>Licenses received</td>
<td>Altitude Telecom</td>
<td>N/A</td>
</tr>
<tr>
<td>License Process</td>
<td>On first come first served basis</td>
<td>N/A</td>
</tr>
<tr>
<td>Company Restrictions</td>
<td>No particular restrictions</td>
<td>No particular restrictions</td>
</tr>
<tr>
<td>Power Restrictions</td>
<td>No particular restrictions</td>
<td>Limits depends on particular band of operation</td>
</tr>
<tr>
<td>Service Restrictions</td>
<td>Must propose offer of access</td>
<td>Has to comply with Part 15 limits</td>
</tr>
<tr>
<td>Gov. subsidies</td>
<td>Yes – but not administered by ARCEP</td>
<td>No</td>
</tr>
</tbody>
</table>
Thank You

Questions?...