Ireland: An International hub/sister zone for wireless innovation

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Agenda

1. **Overview**
   - Ireland, ComReg and the ECS Market
2. **The Importance of Radio Spectrum to Ireland**
3. **Innovation with Radio Spectrum**
   - Test and Trial Ireland
   - Ireland's Natural Advantages
   - Test and Trial Ireland's Users
4. **Summary**

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1. A brief look at Ireland

- **Small Island at North West of Europe**
  - One Land Border Neighbour, Northern Ireland (UK)
- **4.42 million people & growing**
  - 1.7 million people in Greater Dublin Area
  - Youngest workforce in Europe with 36% of the population under 25 years of age.
- **Member of European Union**
  - 493 million EU population, 27 member states
- **Member of Euro zone**
  - Single shared currency across 16 EU Member states
- **English Speaking**
  - *"Cead Mile Failte"* or *"One Thousand Welcomes"*

Ireland
Where inspiration flows

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About ComReg

- **Ireland's Communications Regulator**
- **Commission established in Dec 2002 – replacing ODTR (1997)**
- **Responsibilities in Electronic Communications and Postal sectors:**
  - Promote **Competition**
  - Contribute to development of the **Internal EU market**
  - Promote **efficient use of Spectrum**
  - Promote **Innovation** and **Investment** in the sector
  - Promote the **development** of the Postal Sector
  - Promote the **interests of End Users** and **protect and inform consumers of electronic communications services**
- **ComReg staff – analysts, accountants, engineers, economists, lawyers – 120 persons (maximum)**

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Ireland's Electronic Communications Service Market

- **Developed market with many Authorised Operators**
  - Fixed and Wireless (338), Mobile (7), Broadcasting (85)
- **€4.4bn ECS Service Revenues in 2008**
  - Fixed (49.6%), Mobile (46%), Broadcasting (4.4%)
- **Fixed Market**
  - Incumbent Operator: Eircom (68%)
- **Mobile Market**
  - Vodafone (41.1%) , O2 (37.9%) Meteor (18.2%), 3 Ireland (2.8%)
  - Three GSM & Four 3G Networks

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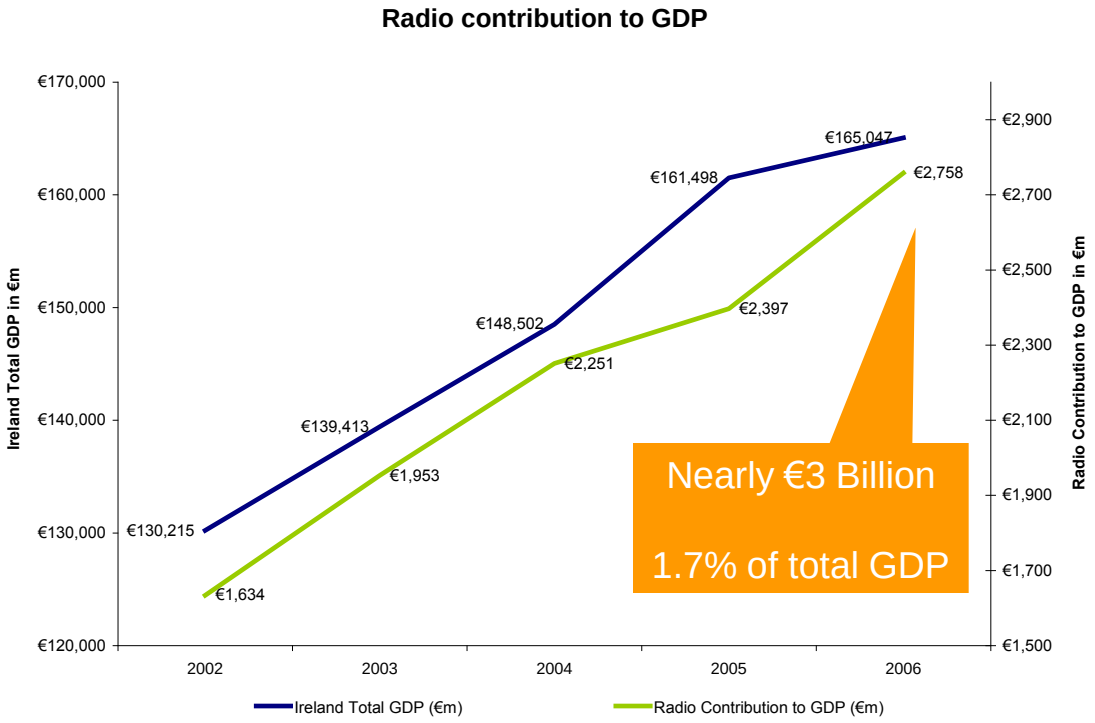
2. Radio Spectrum is Important … to Ireland's Economy

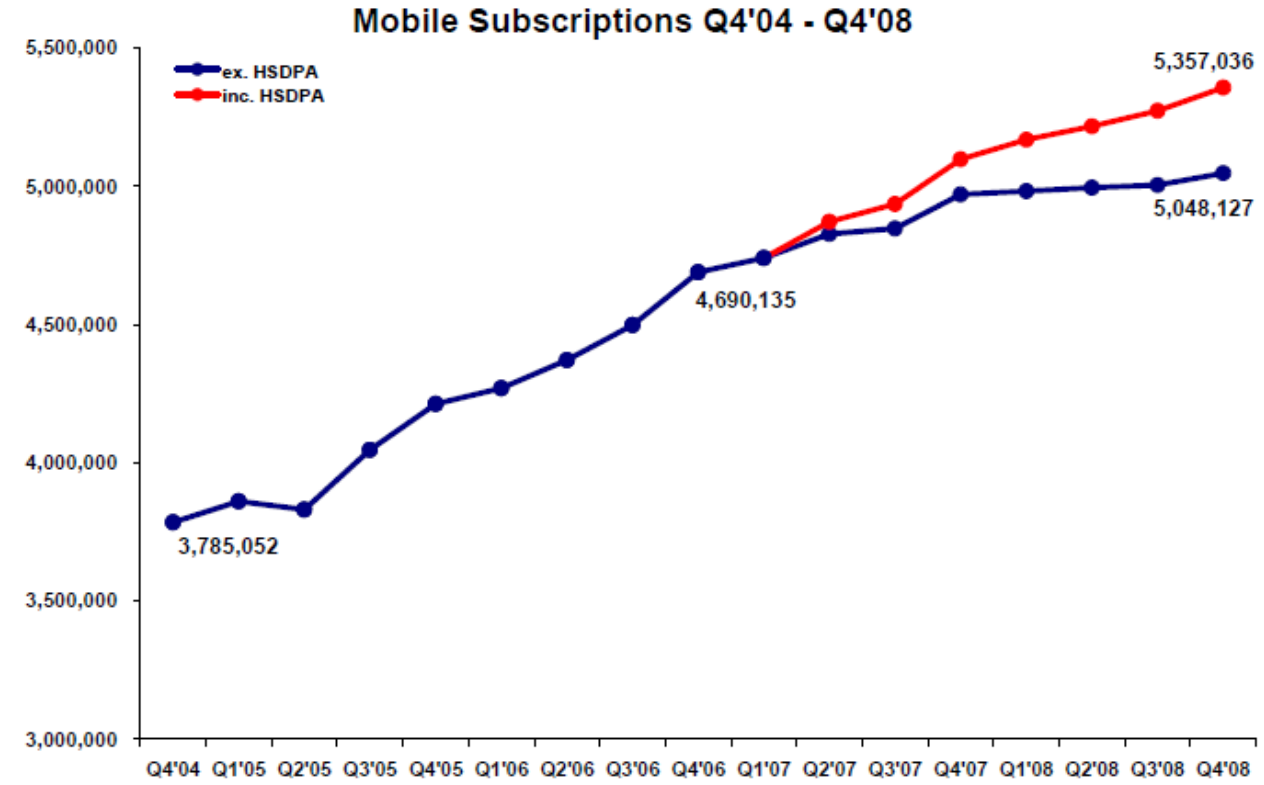
ComReg measurements indicated that for year 2006

- Radio Spectrum contributed nearly **€3 billion** or 1.7 of Ireland's GDP; and
- Nearly **31,000 direct jobs** were supported via Radio Spectrum use



… to Ireland's Communications Service

5.35 Million Mobile Subscribers or 121.1% Penetration



Source: Quarterly Key Data Questionnaire

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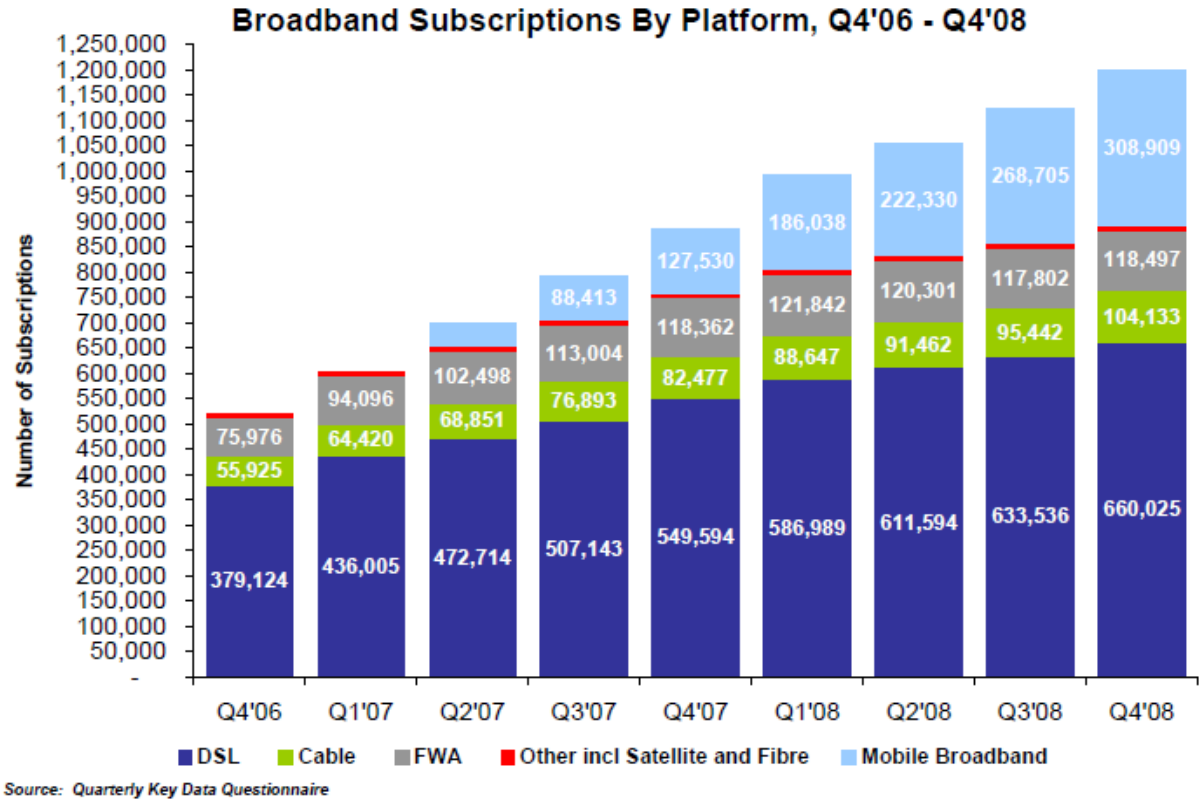
.... to Ireland's Broadband Service

427,000 Broadband subscriber provided with Radio Spectrum

- 142% annual growth in mobile broadband (HSDPA) – Q4'07 to Q4'08



Source: *Quarterly Key Data Questionnaire*

35% of Ireland's Broadband supplied via Radio Spectrum

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3. Innovation with Radio Spectrum …

ComReg's Wireless Test &Trial Licensing Programme

- Launched in 2005 & specifically designed for R&D and Innovation
  - Allows Test or Trial of Wireless devices in a live radio spectrum environment
  - Low Cost
  - Quick Access to Radio Spectrum for Test or Trial
  - Business & Consumer are able to participate in a Trial
  - In Ireland, **any available spectrum** at **any location is** considered

Test & Trial IRELAND
Ireland's Wireless Test & Trial Licensing Programme

*"ComReg has created a globally **unique international profile** for Ireland by permitting real innovation and experimentation on our national airways for broadcasting, narrow-casting and dynamic spectrum technologies"*

Dr Chris Horn, Co-Founder Iona Technologies

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Ireland's Natural Spectrum Advantage

- High Availability of Spectrum
  - Geographic Location
    - Only one international land border to co-ordinate with compared to other European countries which have many land borders
  - Low defence use of spectrum in Ireland
  - Relatively low population density
- Member State of EU and active member of CEPT
- Supportive Regulatory Environment
  - Test & Trial Ireland designed for R&D

Any available frequency band **at any location** is considered for Test or Trial purposes

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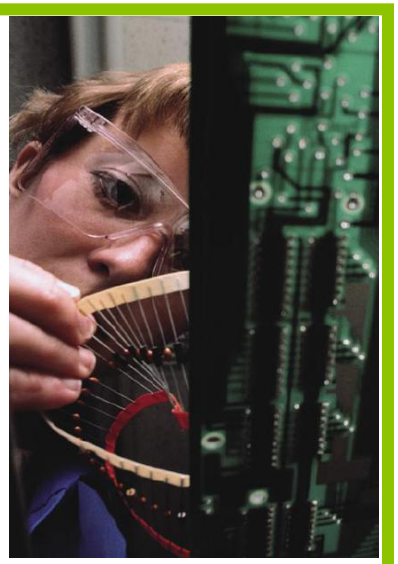
Test & Trial Ireland User Groups



1. Wireless Research
   - Universities and Research Centres can use the practical aspects of this programme to **advance their research**
2. Product Development and Testing
   - Manufacturers of wireless systems and components can use **test and develop new products**.
   - As all available spectrum is considered products can be tested for deployment in any global or regional market
3. Product Demonstration & Network Functionality Testing
   - Vendors of wireless systems can **demonstrate their product's** real-life functionality.
   - Service providers can **test the functionality** of these products on their network prior to vendor selection.
4. Trials of innovative new services
   - Service providers can commercially trial new innovative services to **garner valuable consumer feedback** before committing to a commercial launch.

Wireless Research

Universities and Research Centres have used this programme for:

- Trials of Wireless Broadband WiMAX Networks at 2.3 GHz
- Testing of reconfigurable software-based radio and dynamic spectrum management techniques.
- World's first joint trials of cognitive radio, cognitive networks, dynamic spectrum access and policy-based technologies in a real life environment for the IEEE DySPAN Conference 2007
- Ultra-wideband (UWB) location tracking system test evaluation
- Participation in EU project 'daidalos' (FP6 IST)

"The ability to realistically test our research ideas in clean, dedicated spectrum has enabled us to significantly advance our reconfigurable radio system and opens the potential for us to ***convert our high-quality academic output into exploitable Intellectual Property****."*

Professor Linda Doyle, Trinity College Dublin and CTVR

Product Development and Testing

Manufacturers of wireless systems and components have used this programme for

- Development and testing of GSM solutions for maritime, aeronautical and Remote communities markets
- Ground electromagnetic conformance measurement testing of GSM services on-board Aircraft (MCA)
- Testing of WiMAX, medical implants (900MHz band), Radio-frequency Identification (RFID) technologies, Ultra-wideband (UWB) technologies
- Verification tests of GSM and 3G mobile phones against Ericsson network infrastructure

"As Ericsson Ireland was granted test licences for the worldwide suite of GSM and 3G WCDMA frequency bands, this programme allowed us to undertake ***verification tests applicable to the global market****."*

John Hennessy, Country Manager, Ericsson Ireland

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Product Demonstration and Network Functionality Testing

Vendors of wireless systems and Electronic Communications **Service Providers** have used this programme to

- Test of WiFiber point-to-point wireless communications technology for multi gigabit- per-second transmission (71-76 and 81-86 GHz)
- Test GSM solutions for advanced charging and messaging products
- Test Demonstrate of Satellite and terrestrial mobile services in the S-Band
- Trial Wireless Broadband Technology and Services
- Trial 900 MHz spectrum for 3G Mobile Communications Technology

*"This trial helped Vodafone Ireland investigate the practical issues associated with introducing a new technology or vendor into our network, giving us an **early opportunity to resolve any interoperability issues**."*

Mats Svardh, Chief Technology Officer, Vodafone Ireland

Trials of innovative new services

Electronic Communications **Service Providers** have used this programme to:

- Trial digital terrestrial television (DTT) technology
- Trial digital radio (T-DAB) technology (private trial; limited duration)
- Trial digital radio (DRM) technology
- Trial 900 MHz spectrum for 3G Mobile Communications Technology
- Trial Mobile TV (DVB-H) Service and Technology

*"This trial allowed us to examine a range of technical issues including coverage, device interoperability, content security and access, while also allowing us the opportunity to **gather vital consumer feedback** on the trial service."*

Karl Aherne, DVB-H Project Leader, Telefonica O2 Ireland.

Summary

- ✓ Radio spectrum is a unique and important natural resource
- ✓ It creates significant economic, societal and cultural value and is the basis for many important services
- ✓ Innovation in wireless devices, services and application is continuous
- ✓ Test and Trial Ireland facilitates innovation

Thank you

Further information

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