

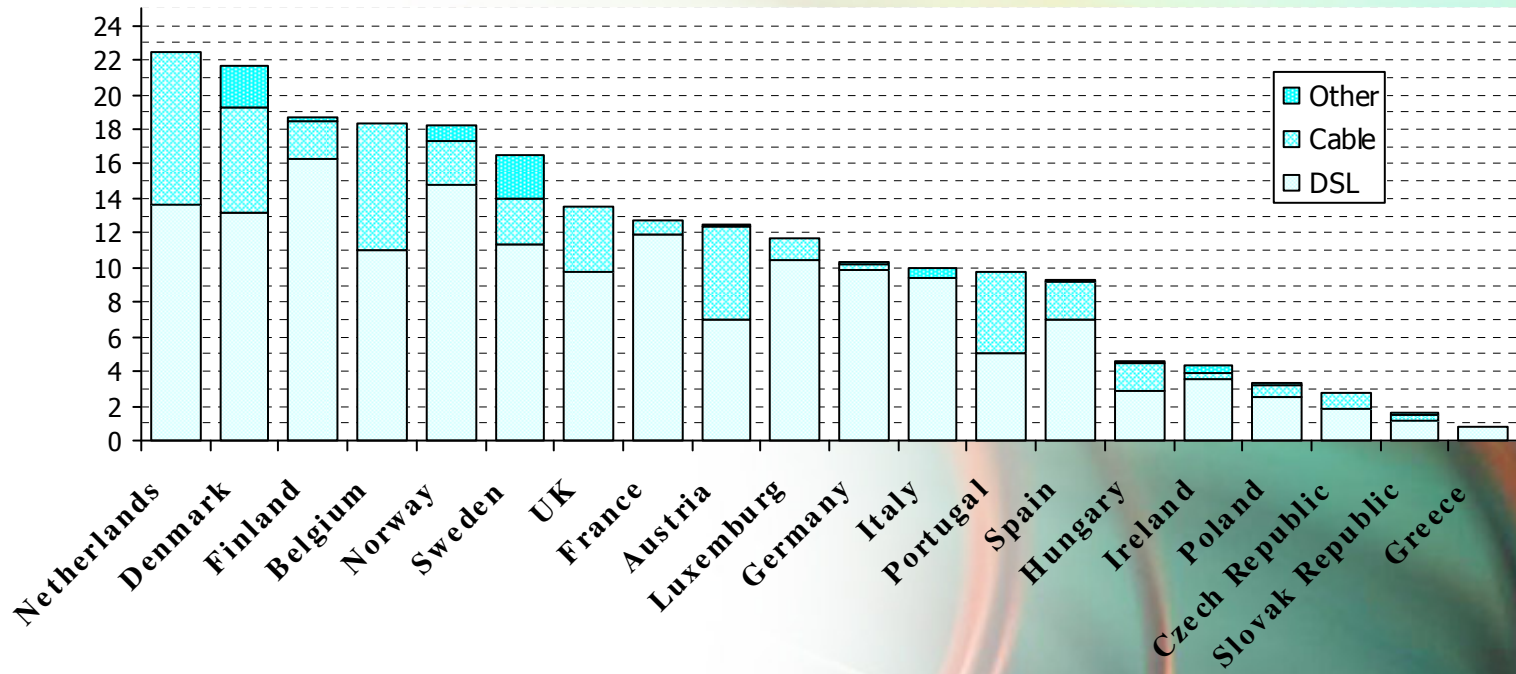
Business Models for a Broadband Operator

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- **The existence of modern high speed telecommunications infrastructure is imperative for every country.**
- **Greece is last among its peers in the European Union and the OECD in broadband penetration.**
- **True broadband connectivity must be able to transmit MPEG-4 encoded video streams (at least 2 Mbps).**

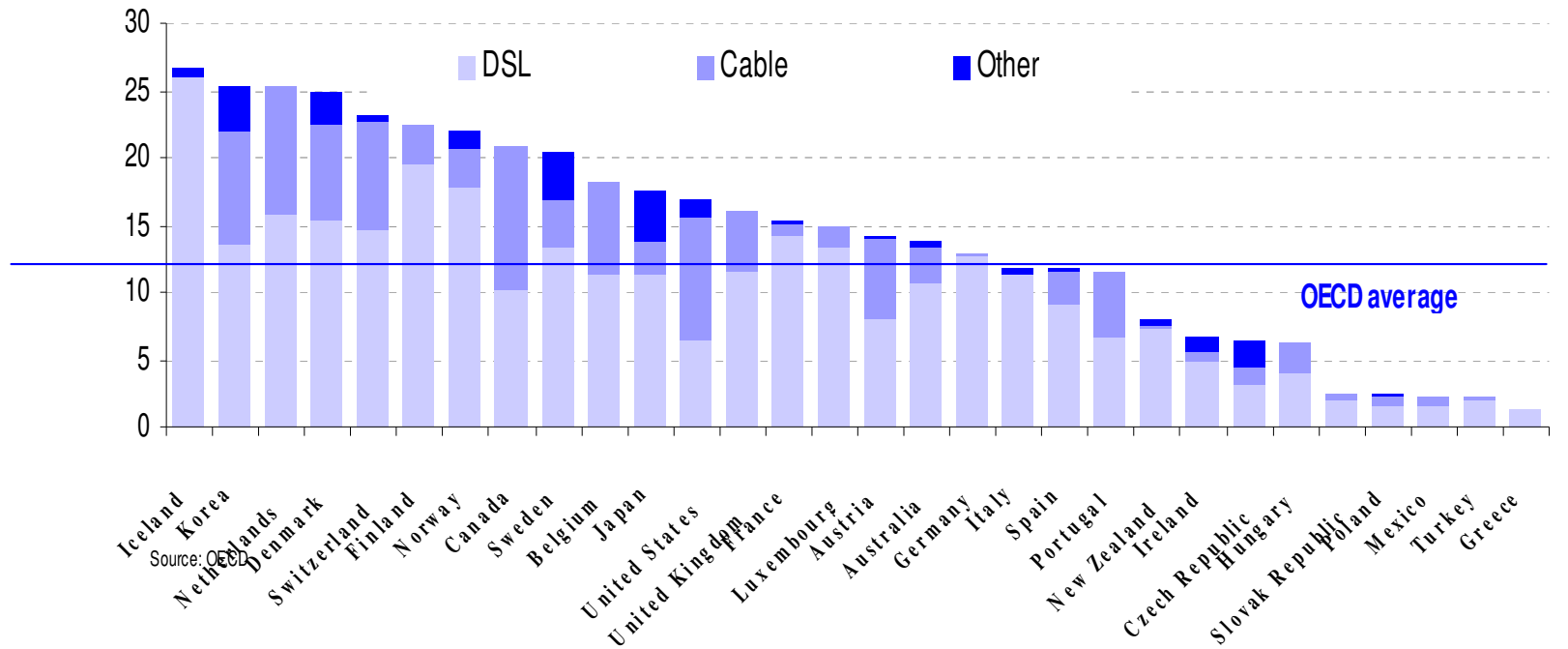
Broadband Penetration in EU

Broadband subscribers per 100 inhabitants, June 2005



Broadband Penetration in OECD

OECD Broadband subscribers per 100 inhabitants, by technology, December 2005



Reasons:

- **Late market liberalization in 2001 in contrast with other EU countries that started 5 or more years earlier**
- **Low PC penetration both in enterprise (public mainly) and home users**

Remedies:

- **New law for electronic communications 3431**
- **NRA (EETT) to “neutralize” the ownership of the copper cable plant**
- **“Sizefksis” project for the Public Administration networking**
- **EU Info society programs for deployment of Broadband networks in the prefectures (excl. Athens & Thessaloniki) and boosting service requests**

The alternative operator faces:

- **uncertainty in regulation (RIO & RUO under ‘construction’)**
- **Biased competition to the LLU (delays in co-location and loop delivery)**
- **Obstacles or delays from local authorities (municipalities) for the rights of way or cabinets installation**

- **Incumbent considered as the ‘national’ operator thus easier to install, use any public facility**

- **The operations of the existing copper network should be carried out by a third company and not within the incumbent’s organization because of substantial conflict of interest.**

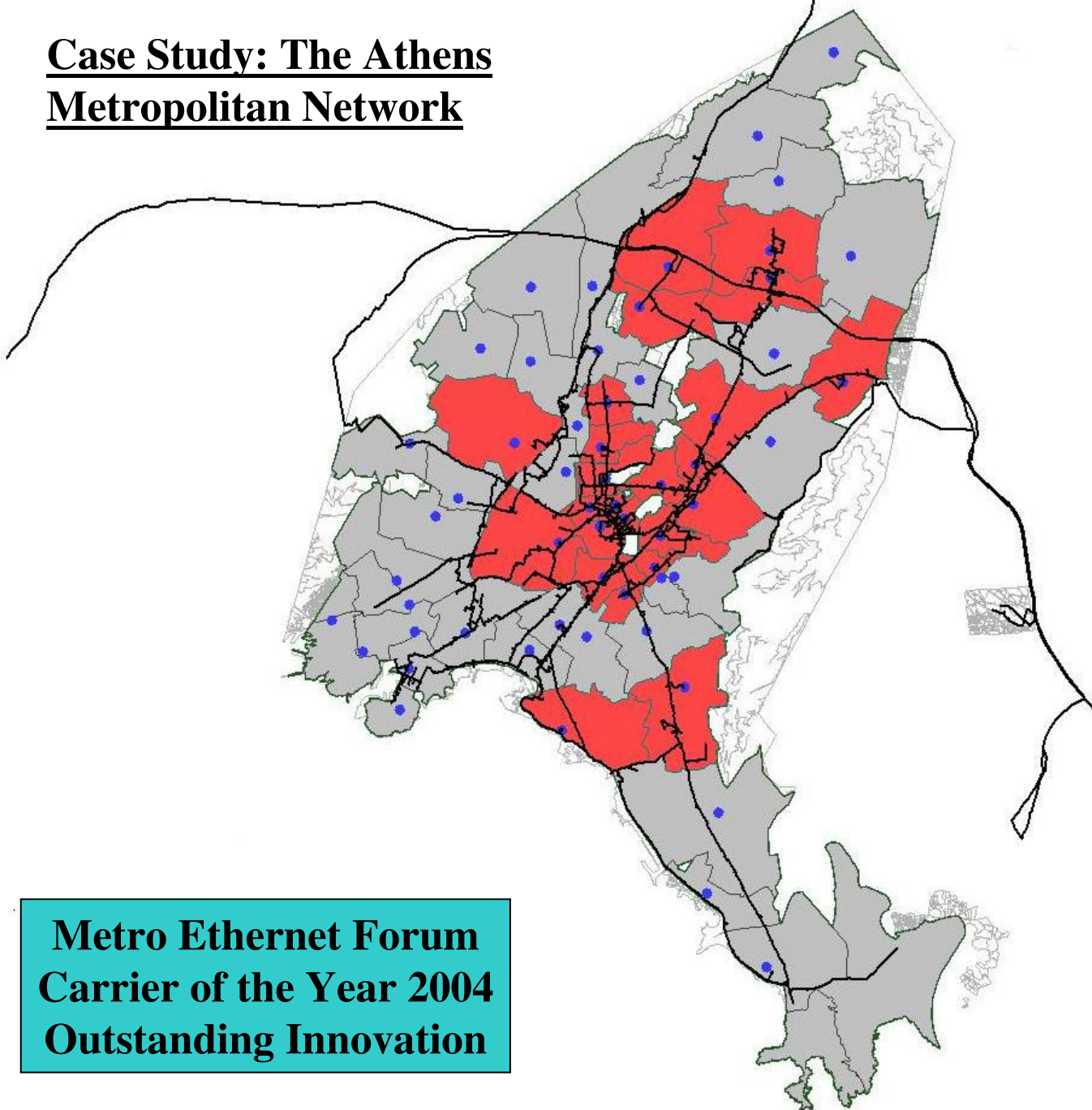
- **Broadband is not enough without quality (QoS).**
- **We need quality of experience which means that the operator has to control the whole path from content source to content reception.**
- **The store and forward internet model is challenged by the requirements of real time video and audio transmission.**
- **Cheap internet access without QoS is rapidly becoming a commodity with thin margins if any.**
- **Operators must decide whether they will get higher margin business through value added services or through quality broadband.**

- **One business model is the “walled garden” approach whereas the operator places the content in its network and delivers it to its customers with QoS, charging the service and not the “pipe”.**
- **This approach can potentially limit the free choice of the consumer in relation to content selection and changes dramatically the skill set of the operators since they are forced to deal with the media business.**
- **An alternative model would be to stay out of the content business and simply charge an extra fee for QoS on the pipe. This approach is more straightforward for a telecom operator but is not yet proven financially since there is a risk of also losing the traditional voice revenues to server based VoIP delivery.**

- **Fiber based technologies (WDM, Optical Ethernet) are the *de facto* solution for the backbone where there is need for high transmission speeds and absolute reliability.**
- **Fiber is also indispensable for mission critical applications for large corporations.**
- **The more IP is used for voice and video transmission the need for QoS increases (MPLS, sub-50 ms restoration, jitter suppression) and the packet networks (Ethernet) emulate concepts from legacy networks (TDM, ATM).**
- **Present day Carrier Ethernet has little resemblance to the good old Ethernet we all have in our offices.**

- **The ADSL2+ technology is the most cost effective solution for the access network for the next few years.**
- **For true interactive broadband services we need to bring fiber to the curb and onwards to the end customer either by fiber (FTTH) or by copper with VDSL2.**
- **Wireless technologies will supplement the broadband access network in nomadic and mobile applications but are not likely to prevail in the delivery of full screen home entertainment any time soon.**

Case Study: The Athens Metropolitan Network



- **500 km of fiber optic network**
- **500 buildings connected with fiber (FTTB)**
- **The only Carrier Ethernet network in Greece**
- **25 DSL nodes in operation**
- **50 DSL nodes within 2006**

**Metro Ethernet Forum
Carrier of the Year 2004
Outstanding Innovation**