Broadband Facts, Fiction, and Urban Myths

Rod Tucker

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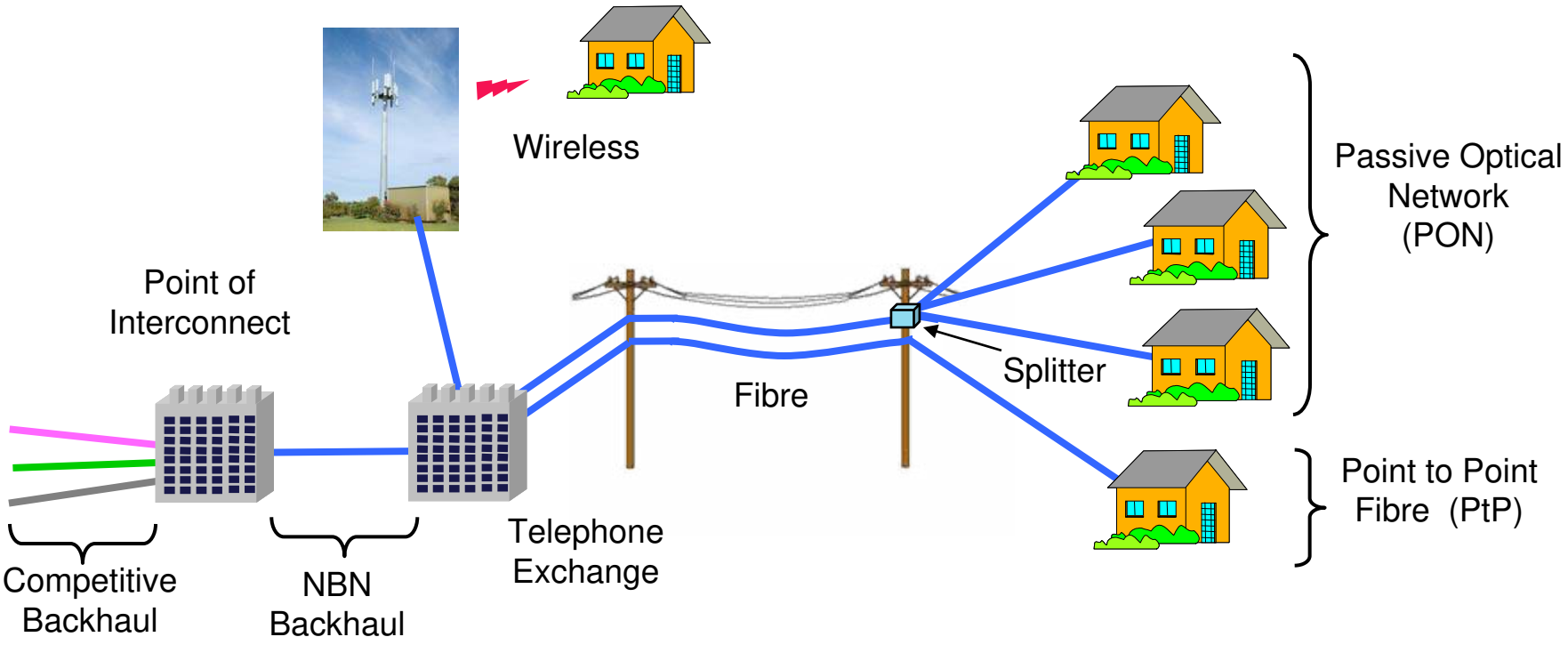
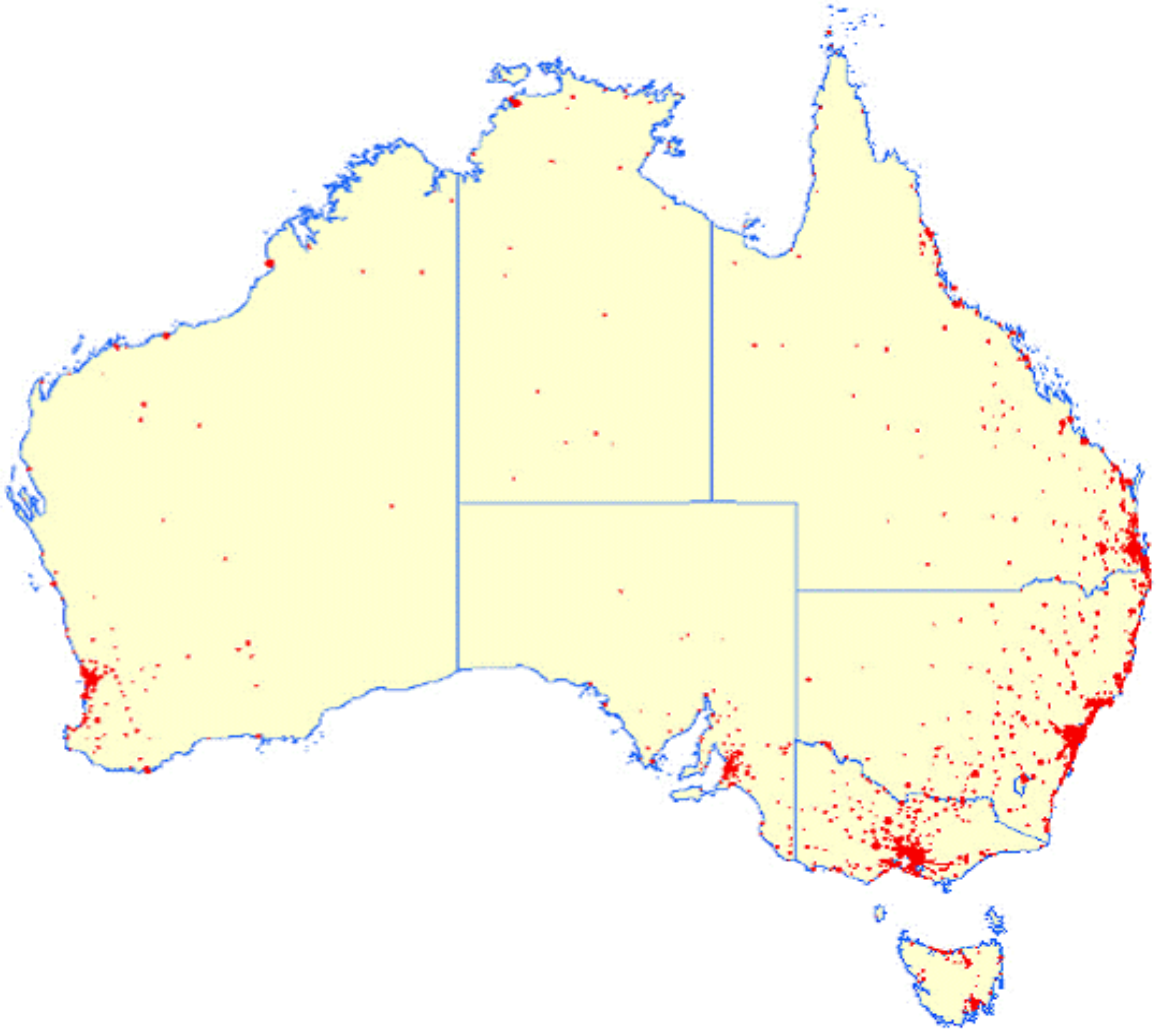
National Broadband Network



- 100 Mb/s to ~ 93% of Australia (fibre)
- 12 Mb/s to remainder (wireless and satellite)
- Fibre upgrade path to >1 Gb/s (PON) and >10 Gb/s (PtP)

93% Fibre Coverage

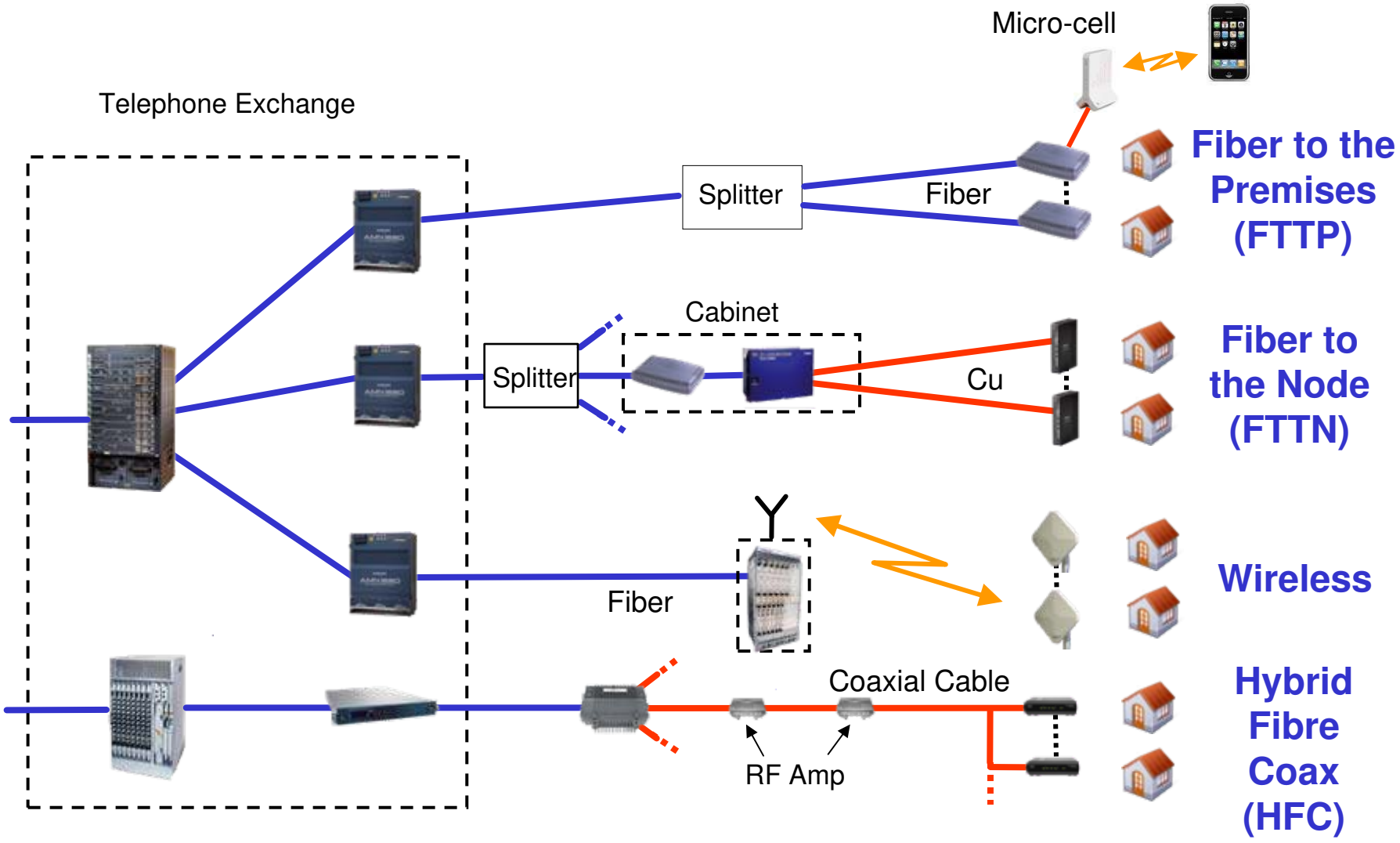


Source: NBNCo

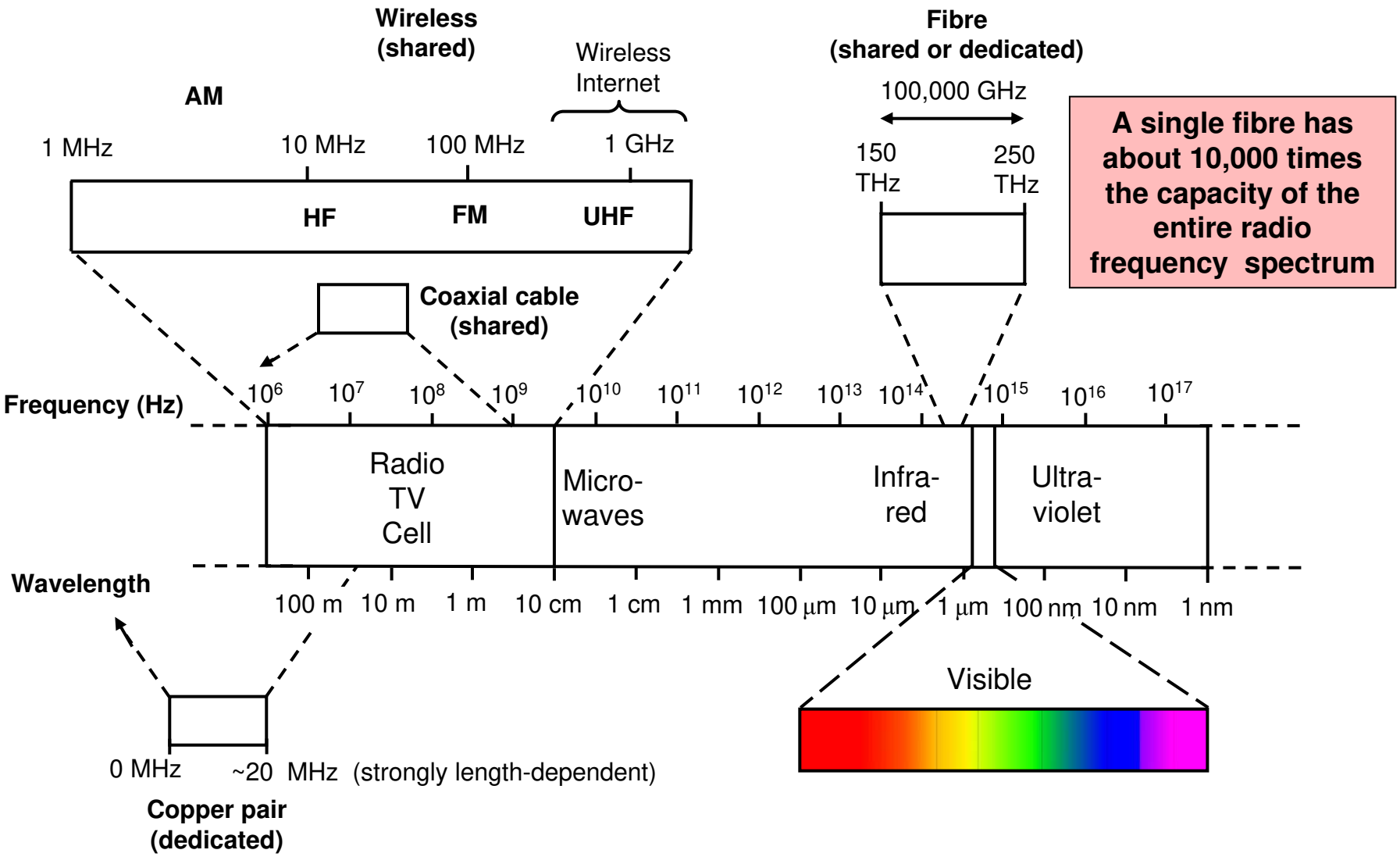
Summary

- Access technologies
  - Fibre
  - Copper
  - Hybrid Fibre Coax
  - Wireless
- Telecommunications 101
  - The electromagnetic spectrum
  - Shared media and contention
- Debunking some urban myths

Access Network Technologies



Electromagnetic Spectrum



Sharing the Wireless Spectrum

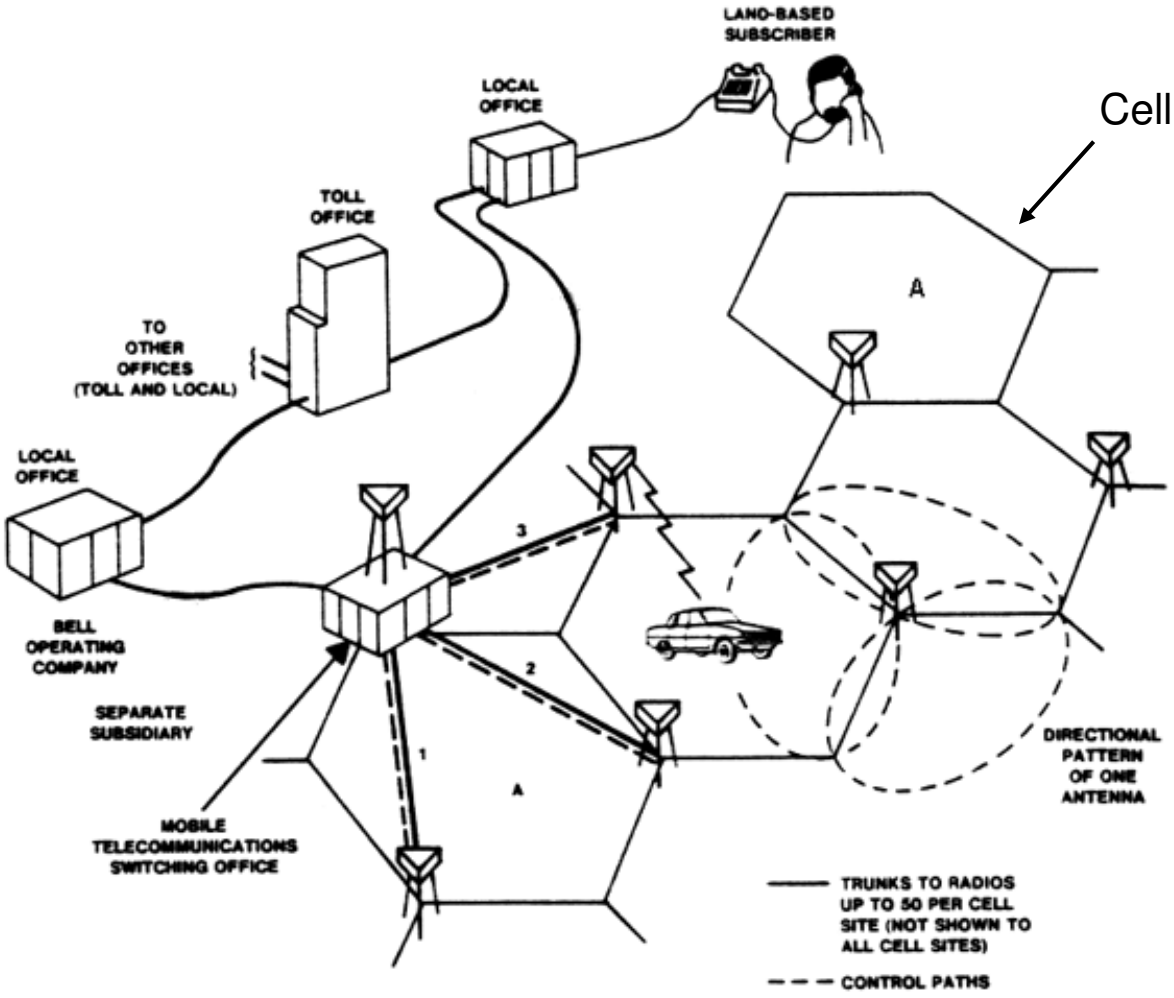


Figure 11-35. Advanced Mobile Phone Service system plan.

Source: Bell Labs, 1984

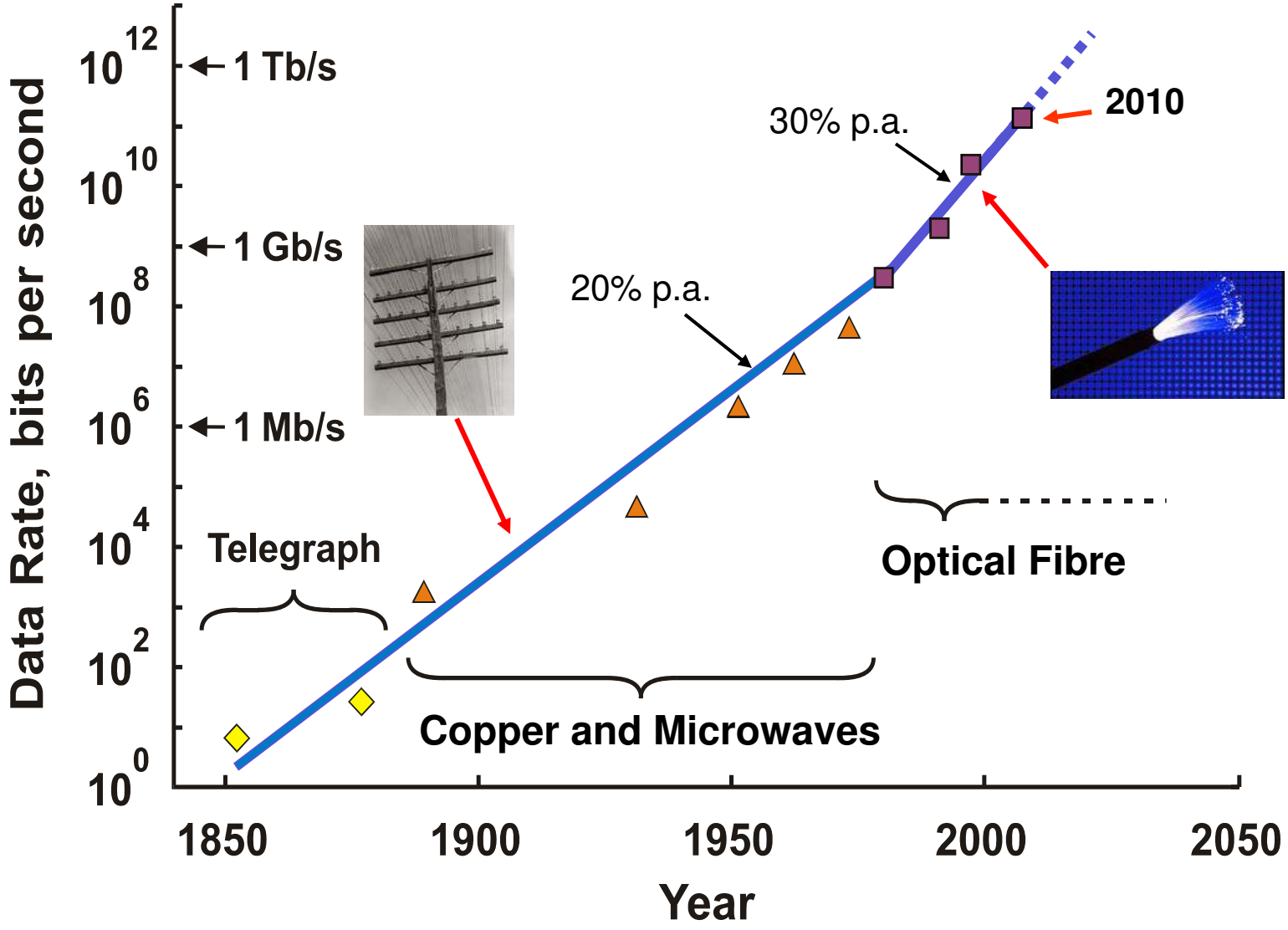
Shared Wireless Spectrum

3G Towers, 2010

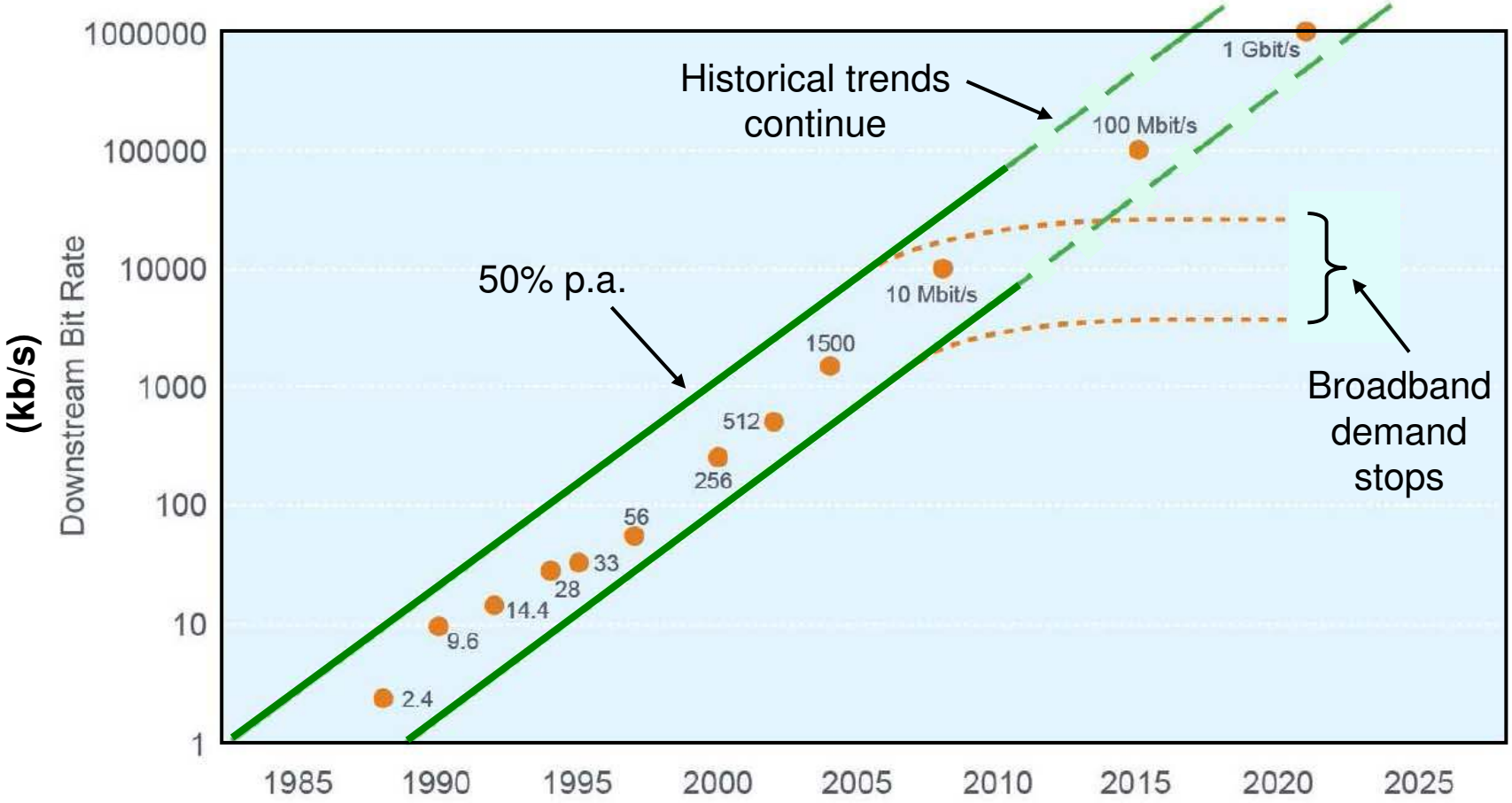
Some Urban Myths

- **No-one will ever use 100 Mb/s to the home**
- Wireless can provide 100 Mb/s to the home
- Future advances in wireless will make FTTP obsolete
- Advanced DSL will provide 100 Mb/s to the home
- FTTH is environmentally unfriendly
- Australia is taking a risk in going to FTTP before the rest of the world

Backhaul Progress over 125 Years



Fixed Bandwidth Demand



Source: NBNCo

No-one will ever….

"The Americans have need of the telephone, but we do not. We have plenty of messenger boys."

-- Sir William Preece, chief engineer of the British Post Office, 1876

"I think there is a world market for maybe five computers."

-- *Thomas Watson, Chairman of IBM, 1943*

"There is no reason anyone would want a computer in their home."

-- *Ken Olson, president and founder of Digital Equipment Corp., 1977*

"But what...is it good for?"

-- *Engineer at the Advanced Computing Systems Division of IBM, 1968, commenting on the microchip*

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100 Mb/s FTTP with Micro-Cells

100 Mb/s Wireless Broadband

Each tower is fed by a fibre

Beware the fine print!

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Wireless is nearing its fundamental limits. It is ideal for providing mobility, but its capacity is severely limited.

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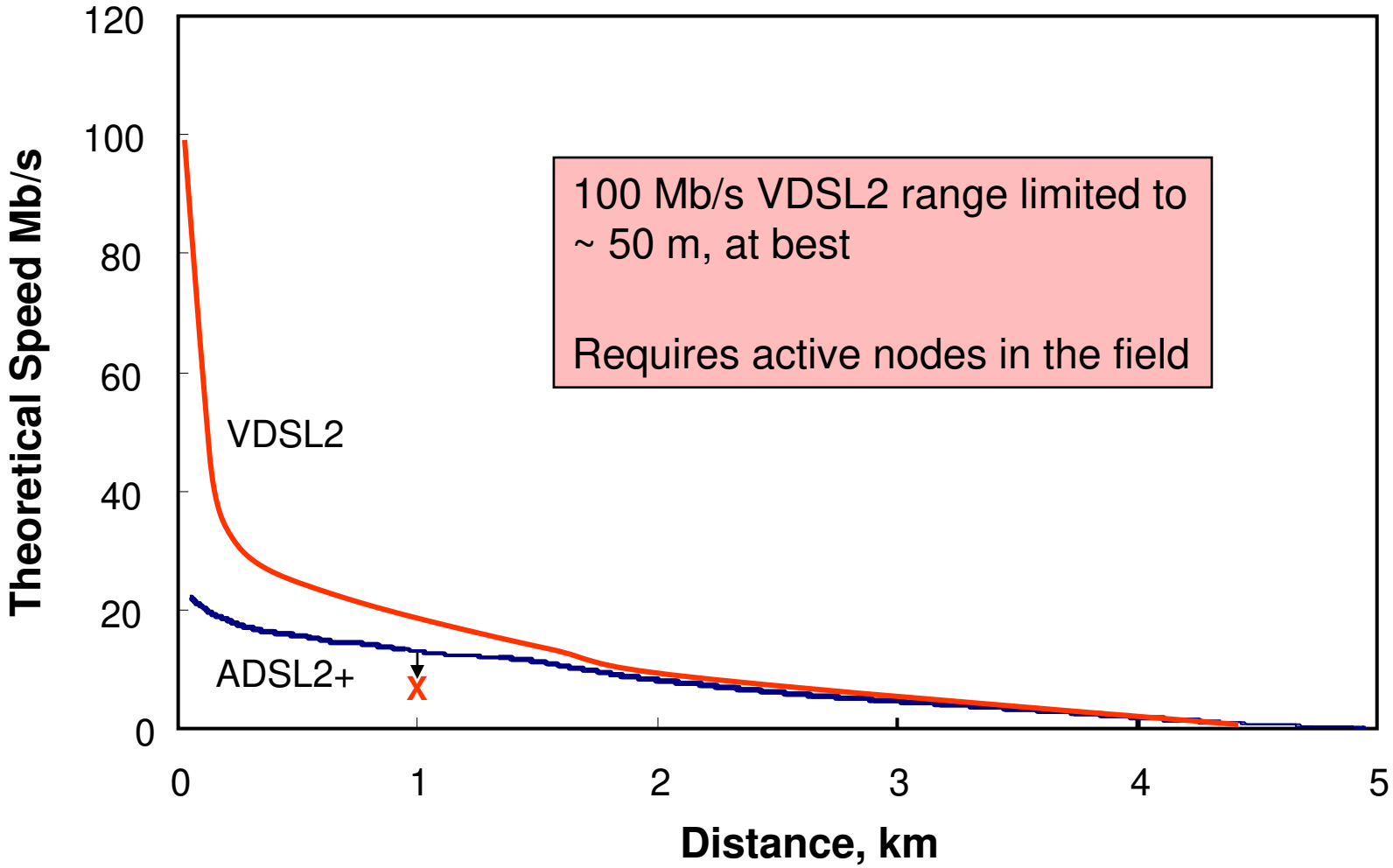
DSL Downstream Bitrate vs. Distance



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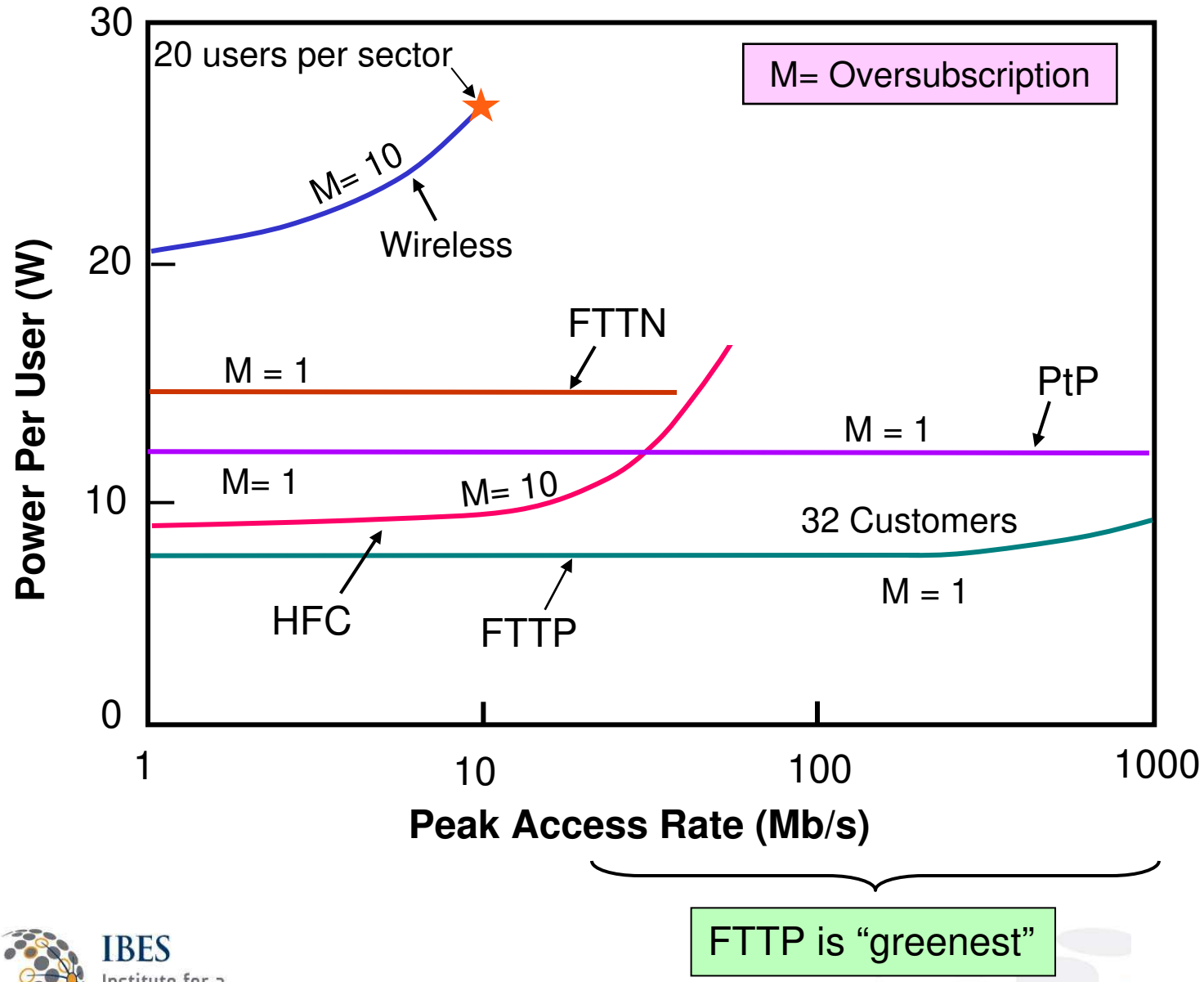
Power Consumption in Access Networks



FTTP is “greenest”

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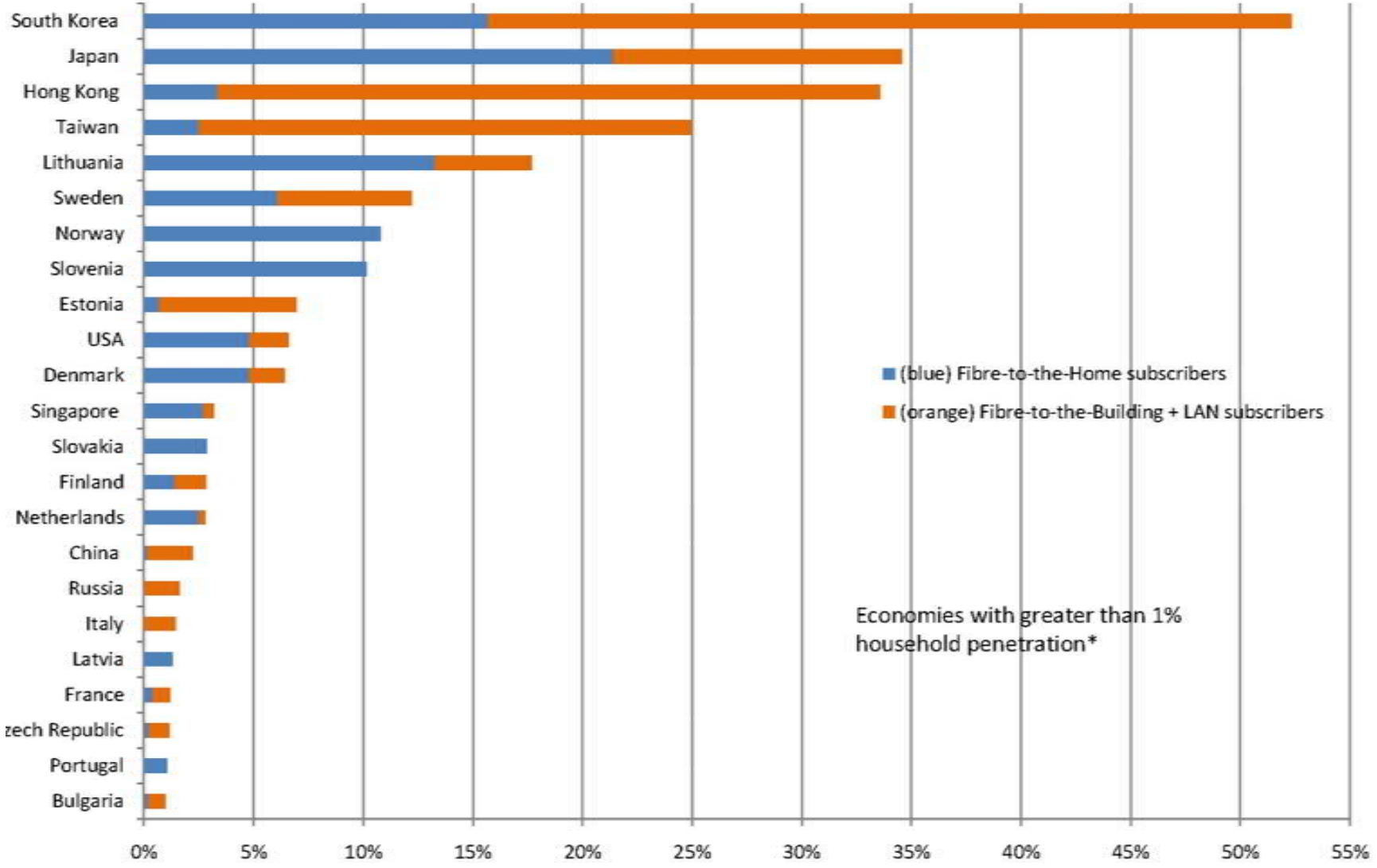
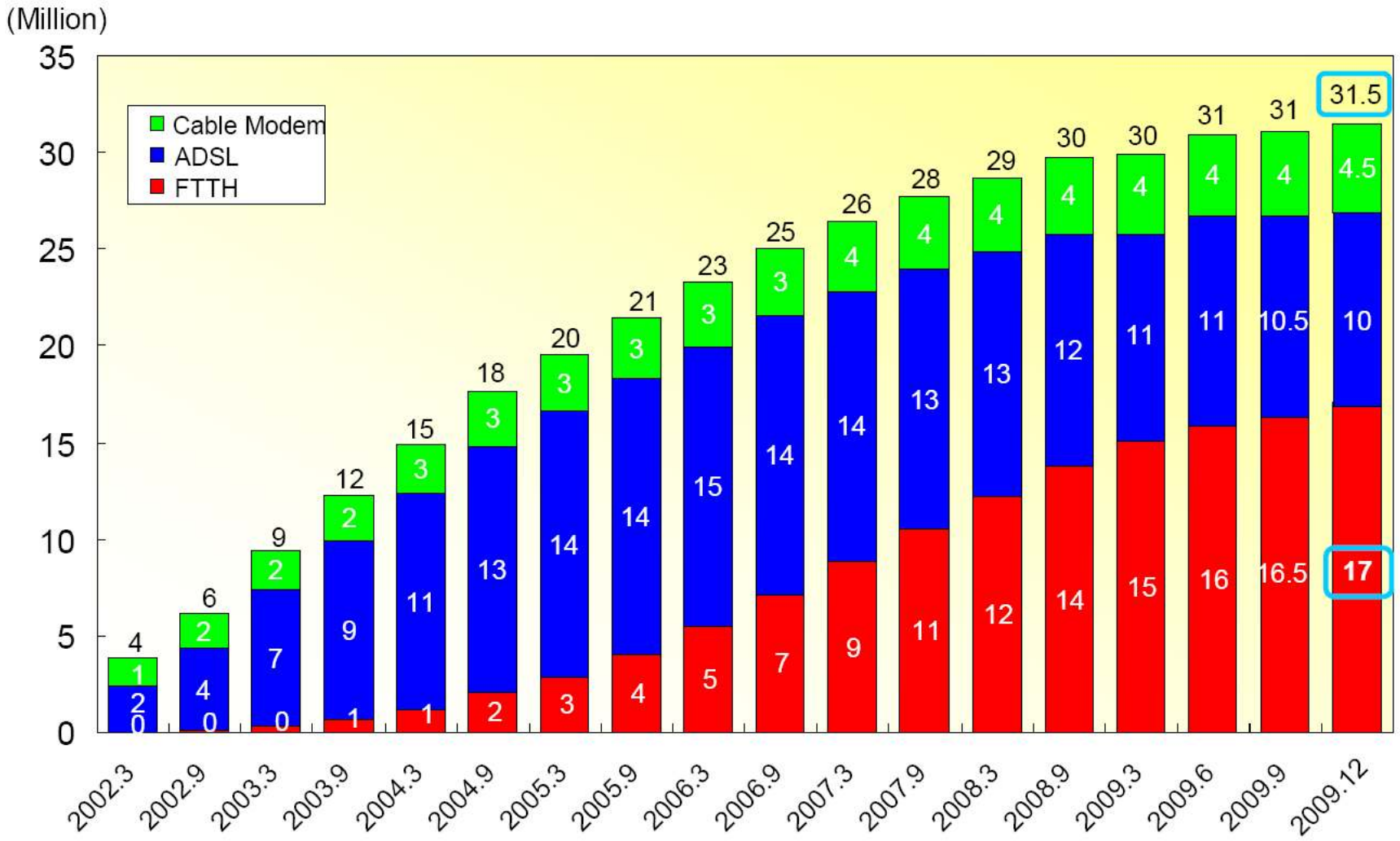
Fibre Penetration by Country



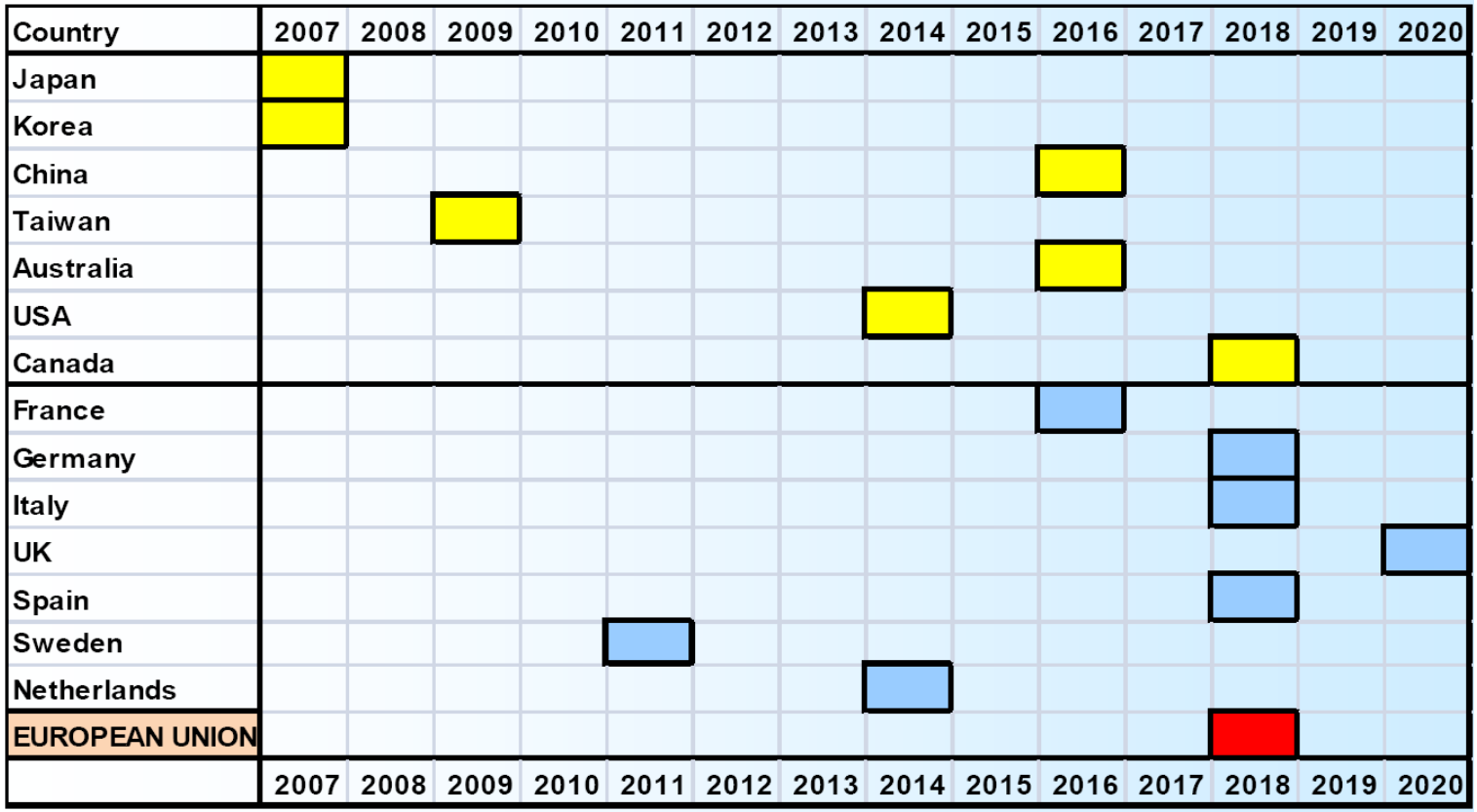
Source: FTTH Council AP, 2010

Broadband Deployment in Japan



Source: Japan Ministry of Internal Affairs and Communication, 2010

Time to Fibre "Maturity"



Note: chart shows the year in which each territory is expected on current trends and plans to achieve "fiber maturity", defined here as 20% household penetration of FTTH or FTTB

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IBES Research Themes

- Education and Learning
- Health and Wellbeing
- Network Deployment and Economics
- Social Infrastructure and Communities
- Service and Business Transformation

IBES Testbed lab

- Fully-functional FTTP test-bed, including core infrastructure
  - **Equipment donated by industry**
  - **Interconnected (nationally and internationally) through AARNet**
- Research &Development tool
  - ***For researchers*: Technology and application development and testing**
  - ***For industry*: Configure, test, optimize and customize applications**
  - ***For SMEs*: Incubator facilities**
- Integration and interoperability testing for higher layer technologies
  - **Configuration of applications vertically through the technology stack (> Layer 2)**
- Input to industry standards relating to broadband applications and services

Using the Internet for Travel Replacement

Video Conferencing

Source: CISCO, 2008

Travel Replacement – Greenhouse Impact

Air Travel

Business Meeting

Melbourne

~200 kg/person return

Sydney

Video Conferencing

2 X 0.1 Gb/s for 8 hours
= 1 TB

~2 kg/person

IBES Industry Partner Program

Enabling industry and academia to align interests and work more closely to drive innovation

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GreenTouch™

www.greentouch.org

- IBES is a founding member of the GreenTouch™ initiative
  - Global consortium, launched January 12
  - Bell Labs (Alcatel Lucent), Telifonica, Huawei, AT&T, China Mobile, Freescale Semiconductor, University of Melbourne (IBES), MIT, Stanford

- *Aim*: To deliver the architecture, specifications, roadmap, and key components needed to dramatically reduce energy consumption of telecommunications networks.

- Outcomes:
  - Reinvention of today's communications networks
  - Reductions in carbon footprint and operating cost
  - Opportunities to bring innovative new ideas, products and solutions to market