



Do All Roads Lead to NGN?



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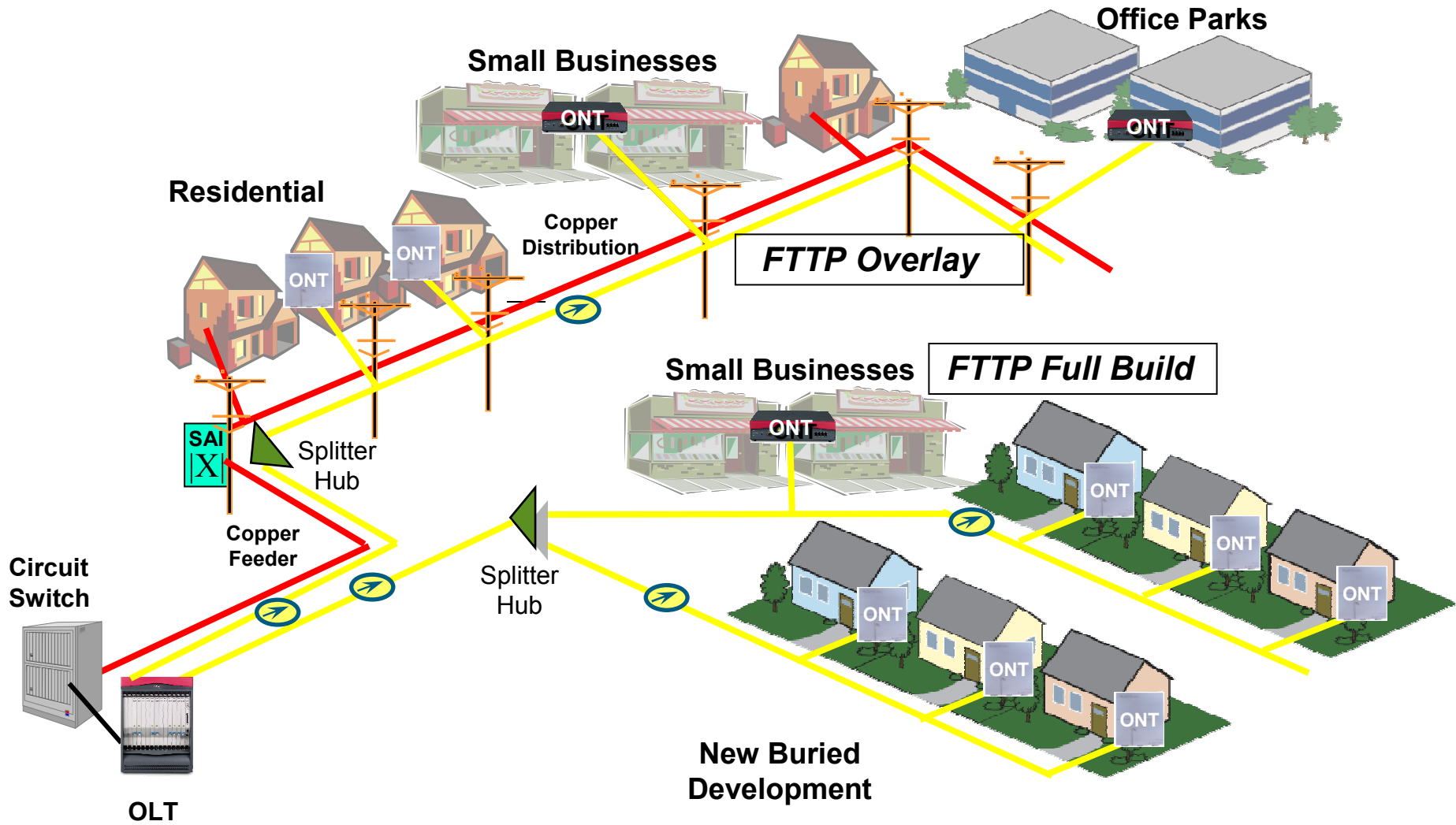
13 October 2008

Two Roads to NGN

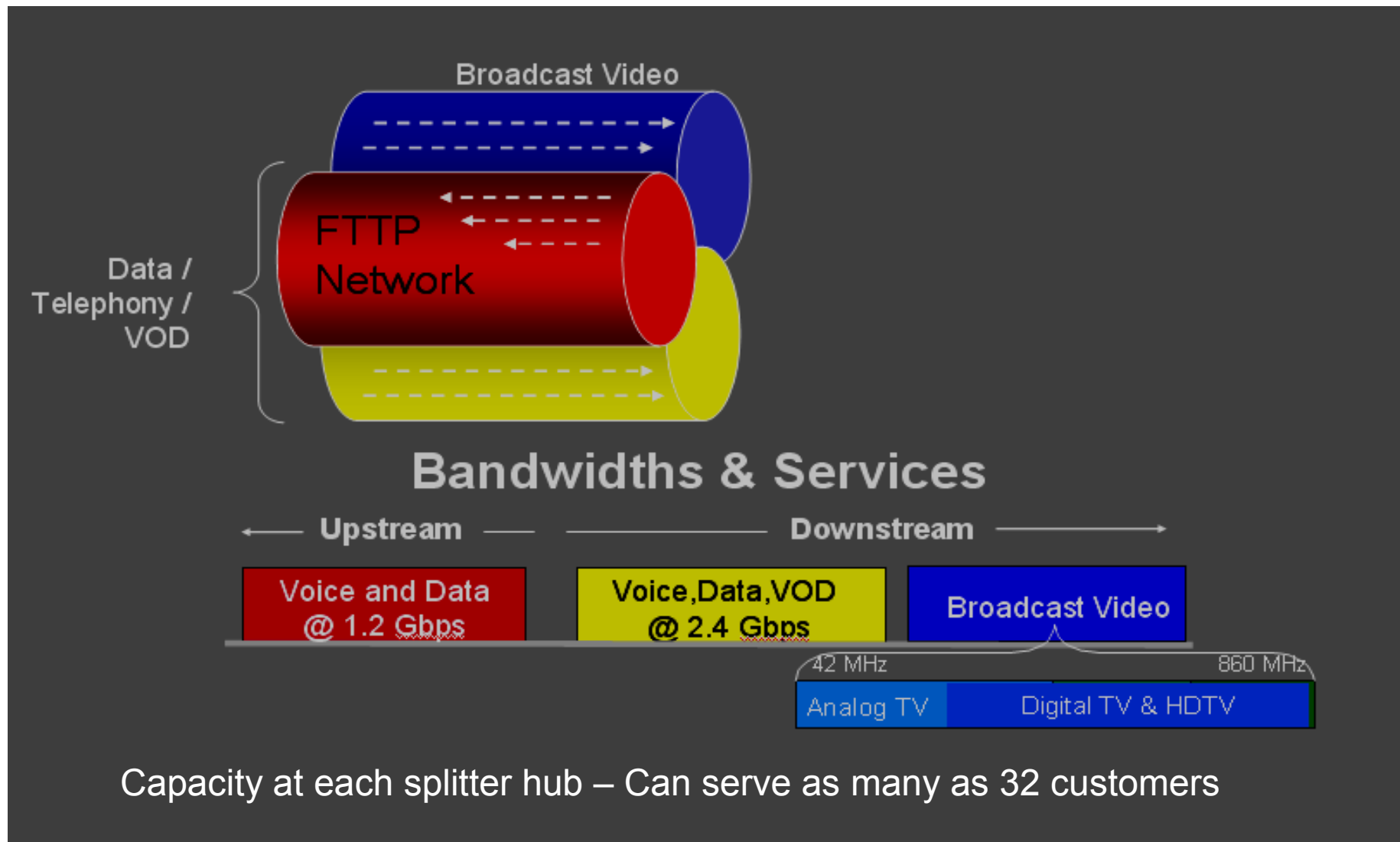


- **Europe and the US have followed different paths**
 - Starting points
 - Policies
- **Policy and market structure do affect NGN investment**
- **Outcomes are path-dependent**
- **We are all converging on an NGN future**
 - But our paths, and perhaps our end points, may differ

Deploying Fiber-to-the-Premises



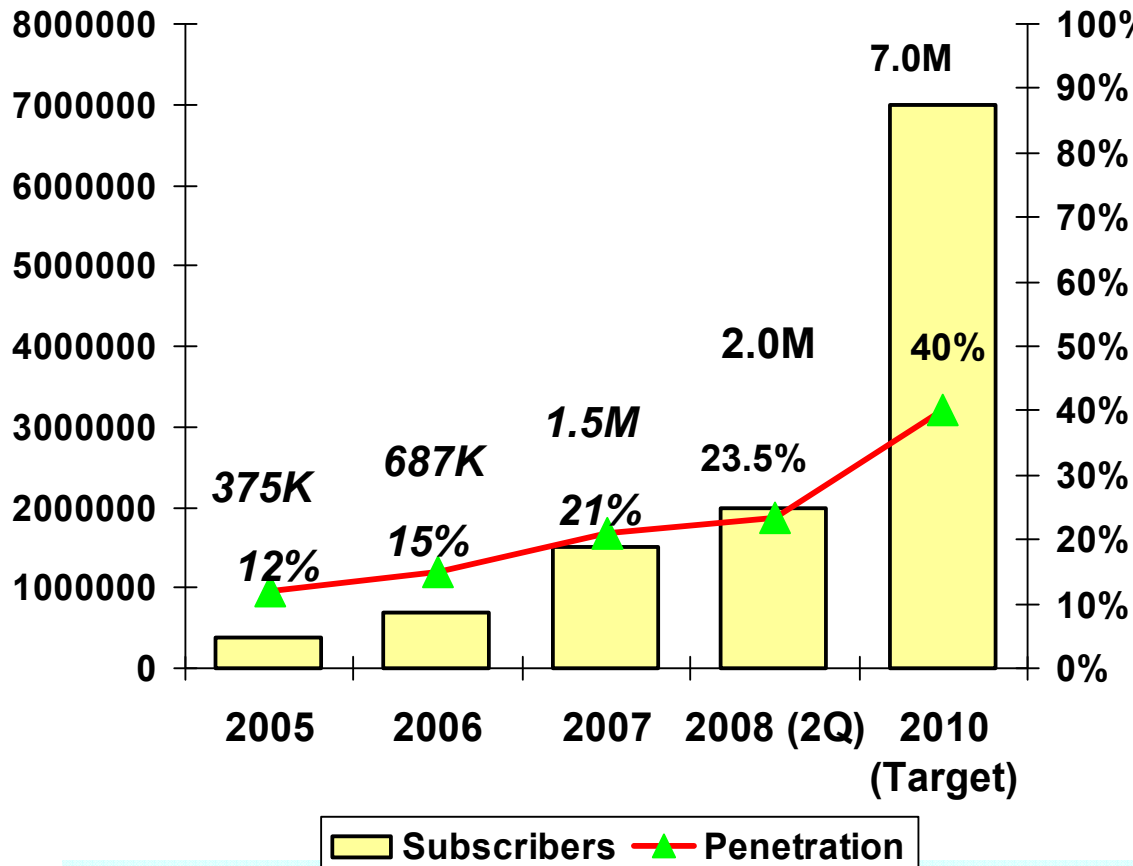
Capacity in the GPON Network: Three Laser Systems



Capacity at each splitter hub – Can serve as many as 32 customers

FiOS Internet Results

Verizon FiOS Internet Subscribers and Penetration



Offers at:

- 10/2 Mbps
- 20/5
- 20/20
- 50/20

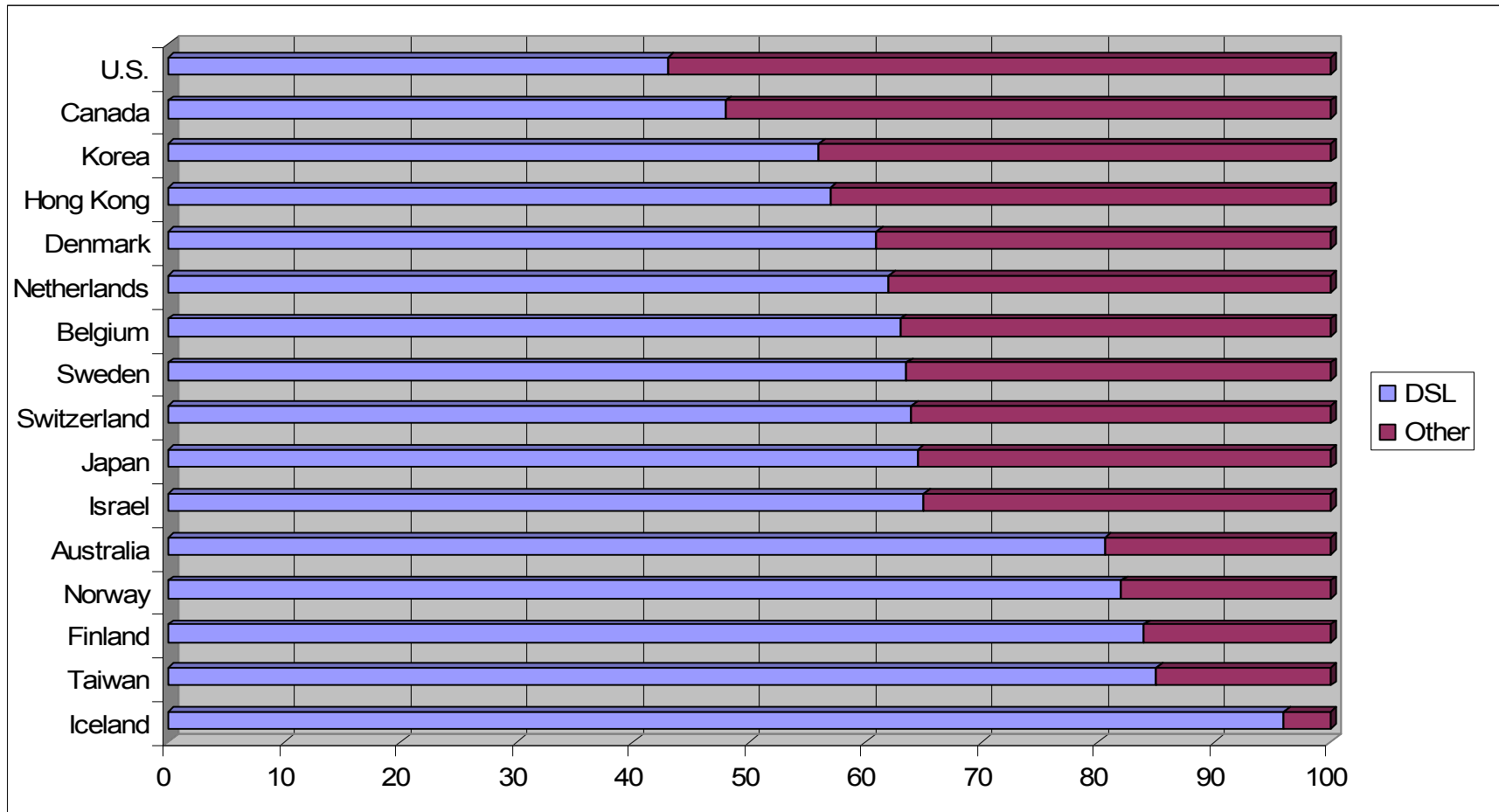
2010 Objective:

- 18 million homes passed
- 35-40% penetration

70% of subscribers are new to Verizon broadband

Comparisons – Platform Competition

Percentage of Broadband Market Composed of DSL versus “other” Platforms

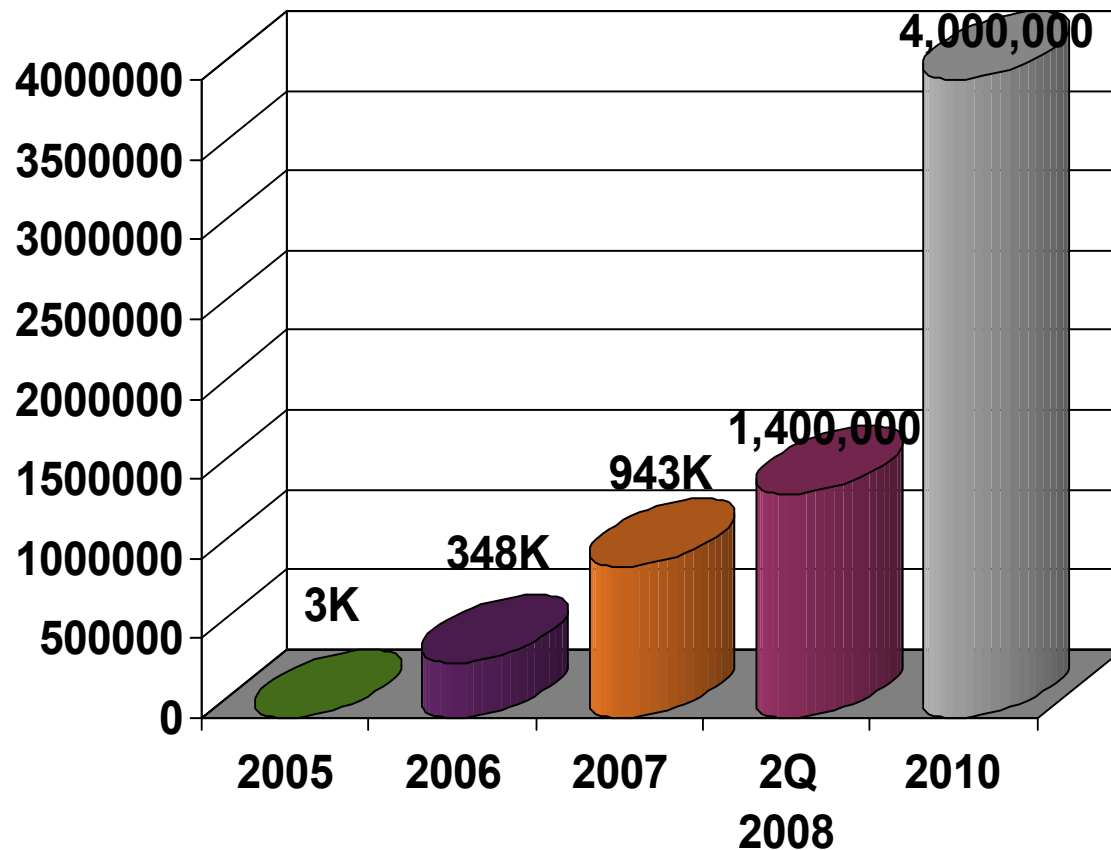


The category “Other” includes cable, fiber/LAN, and additional non-DSL platforms including satellite and BPL.

Source: ITU World Telecom/ICT Indicators Database (2006), supplemented by OECD Broadband Statistics (Nov. 2007).

FiOS TV Results

Verizon FiOS TV Subscribers

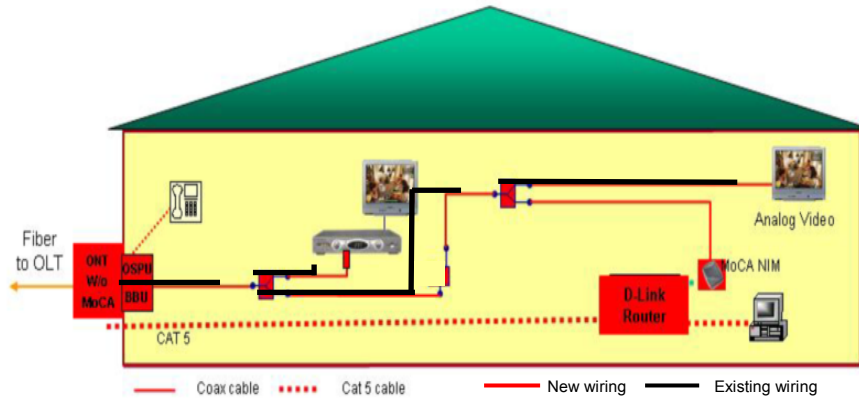


1.4 million FiOS TV customers (2Q2008)

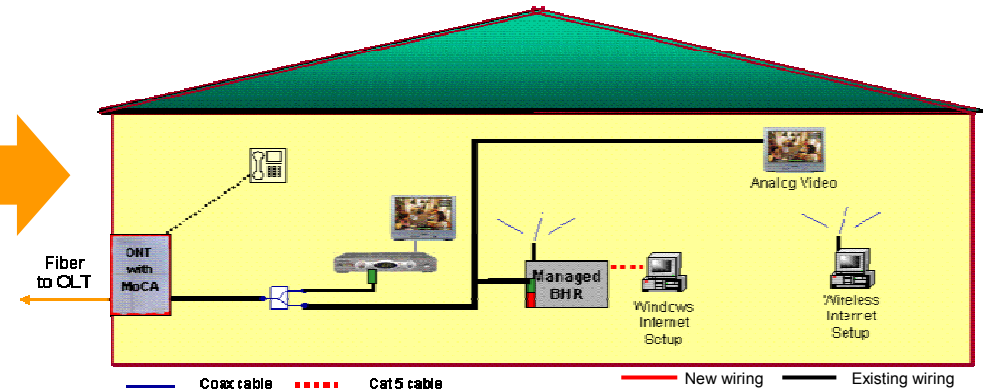
- 37.3% subscribe to movie or sports package
- About two-thirds came from cable
- **2010 Objective:**
 - 4 million customers
 - 25% of homes passed

Transforming the Home

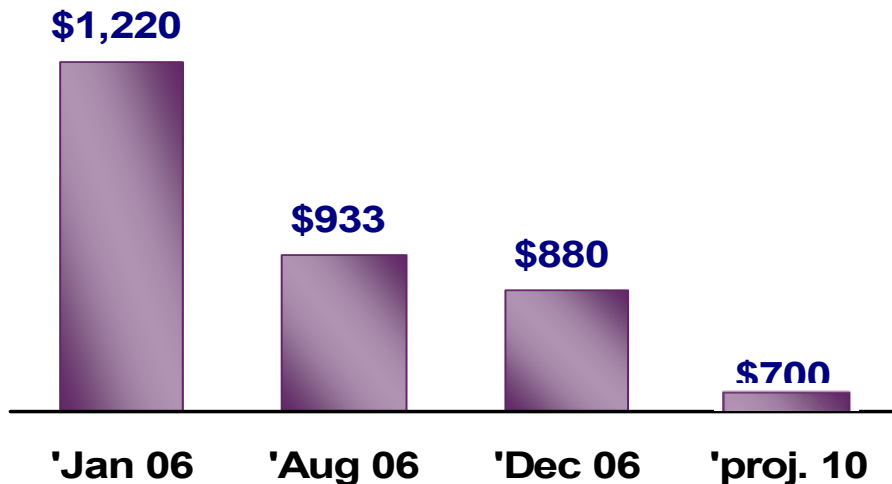
Prior FiOS deployment



2008 and Beyond

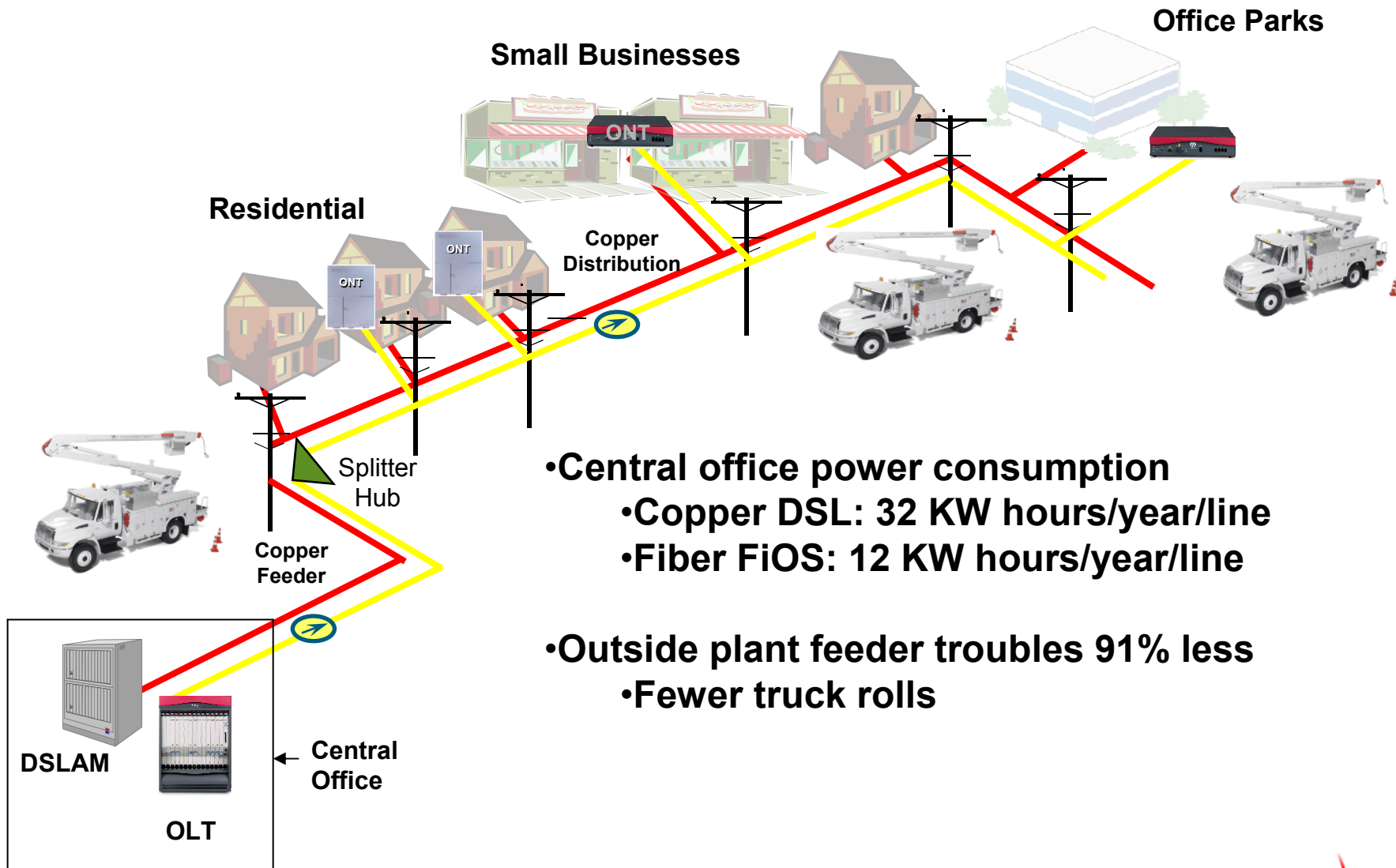


Cost Per Premises Connected



- Simplified in-home network - no new wires
- Enhanced customer experience & customer interaction
- Simplified installation process
- Evolution toward remote service activation and maintenance

Energy Use: Fiber vs. Copper



Next-Generation Wireless Broadband



- **Verizon Wireless has been US market leader in 3G**
 - A CDMA network. Broadband provided over EV-DO (Rev A)
 - 3G available to over 240 million in the US
 - Data revenues growing about 50% annually
- **Verizon has announced it will begin deployment of 4G in 2010**
 - Verizon's 4G will use the LTE standard
 - Fast becoming a global standard (AT&T, Vodafone, China Mobile)
 - Will use spectrum recently acquired in 700 mhz auction
- **LTE opens up new opportunities**
 - Much higher speeds
 - 10-20 mbps average, 50 peak. (DoCoMo reports 250mbps in test lab)
 - Reduced Latency
 - More devices
 - The "Internet of things" goes cellular
- **Will blur boundaries, increase substitution**
 - Wireless vs wireline
 - LTE vs Wimax
 - Accelerate shift to VOIP

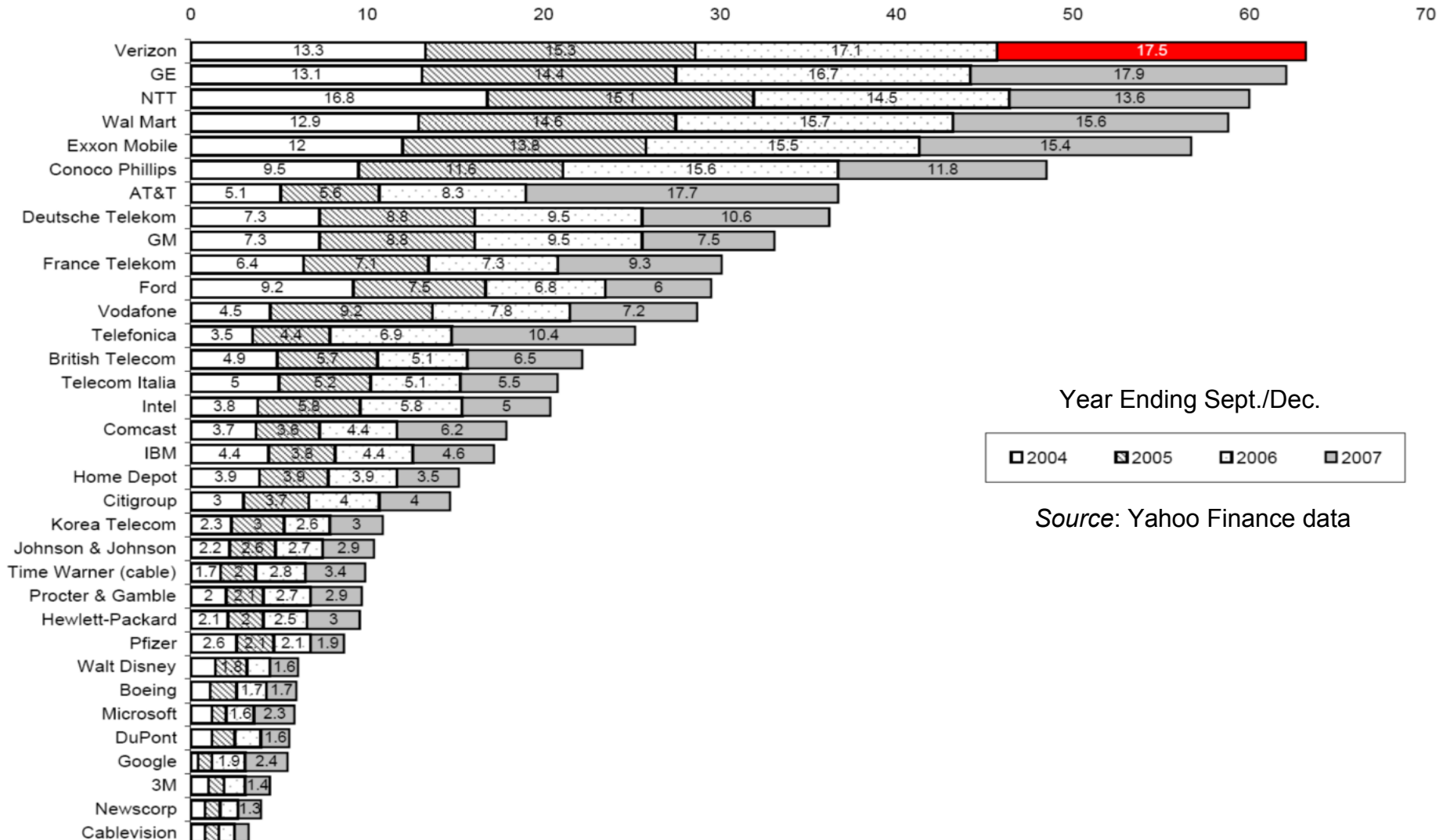
New Business Models For the US Mobile Market



- **On November 28, 2007, Verizon announced a new “open network” model**
- **All handsets that meet basic technical standards will be accepted on Verizon’s network**
- **Customers will be able to choose the model they prefer:**
 - A managed service, with subsidized handsets
 - Third-party handsets, applications
- **Provides a basis for a varied 4G marketplace**

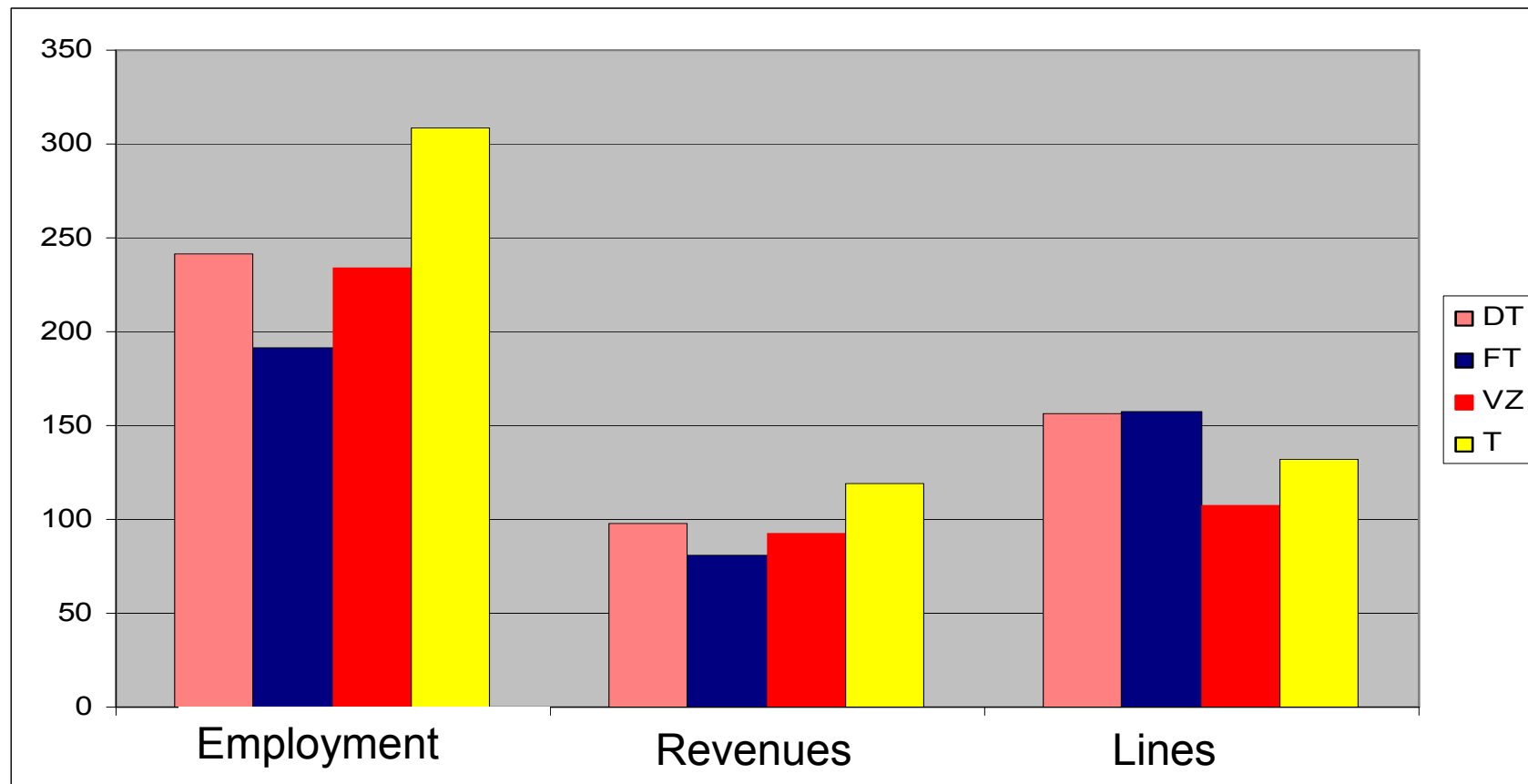
Investment by US Companies and OECD Telecoms 2004-2007

Capital Expenditures (in US\$ billions)



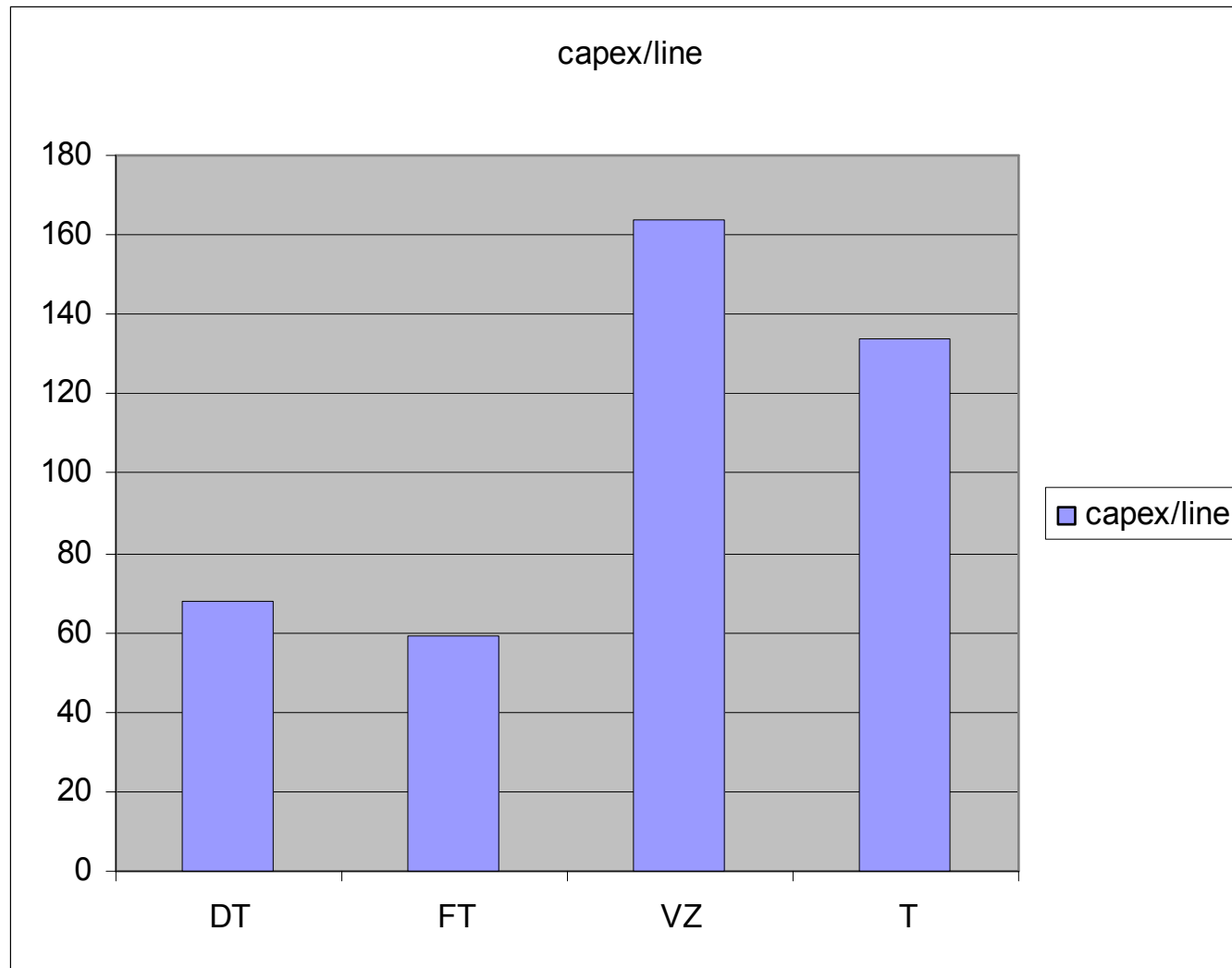
Source: Yahoo Finance data

Metrics for Major Telecoms



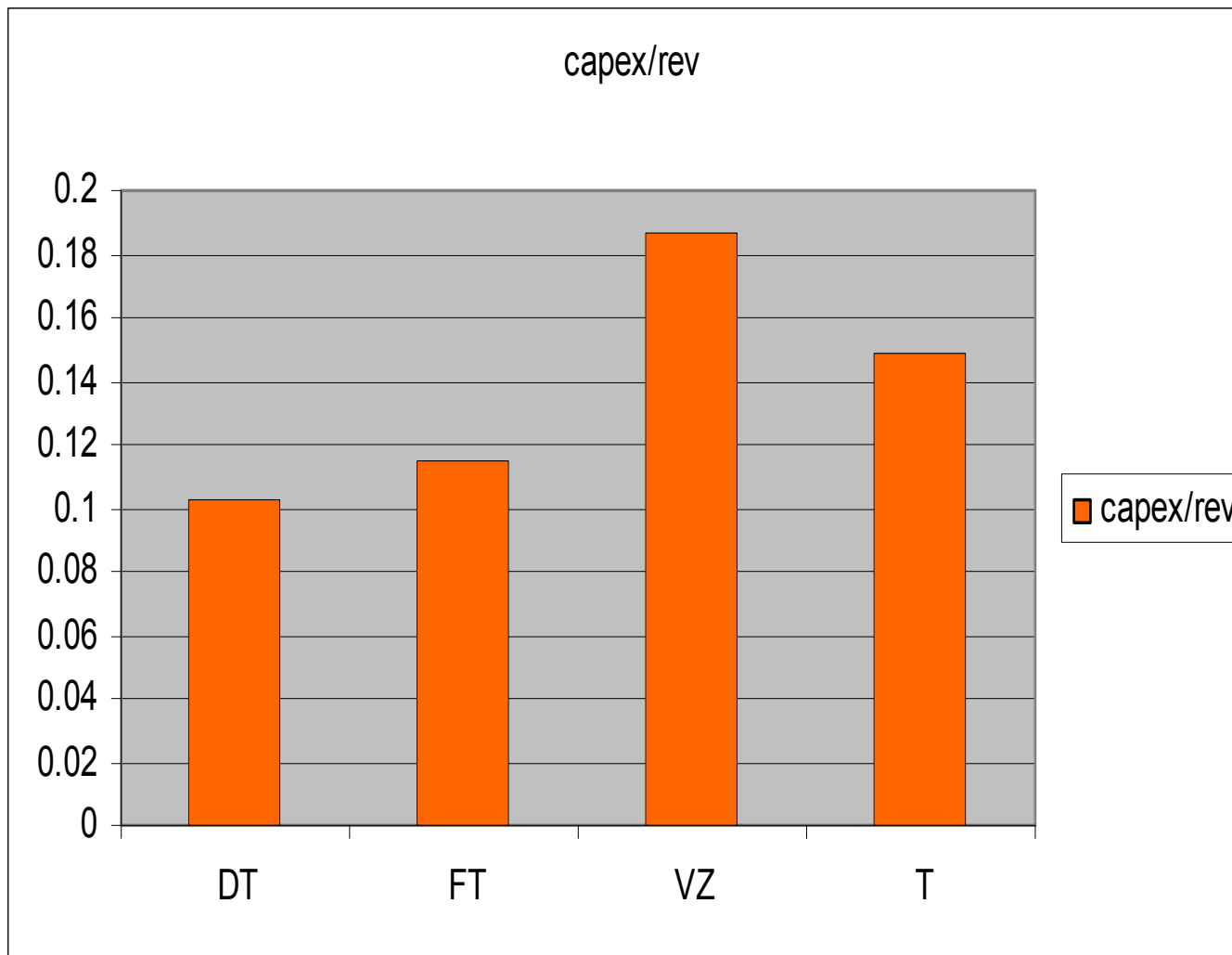
Figures in millions for 2007

CAPEX Per line, Major Telecoms



US dollars in 2007

CAPEX as Percentage of Revenue, Major Telecoms



Figures for 2007

Policy Goals



- **Competition**
- **Investment**
- **Innovation**
- **No single model will deliver best outcome for all countries**
 - Policy should adapt to market conditions

The US Policy Model



- **Based on existence of platform competition**
 - A product of:
 - Previous FCC policy
 - Investment by industry (particularly cable)
- **Still requires copper loop unbundling**
 - Not different from Europe in that respect
- **Eliminates unbundling requirement for new fiber**
- **Focus on incentives to invest**

Europe: Different Starting Points, Different Paths



- **Different existing market structures**
 - Telco copper
 - Cable in some places (about 15% overall)
 - Wireless 3G
- **Different stories with NGN**
 - Some success with new networks
 - Power company
 - Municipal
 - Little investment so far by incumbents
- **Policy geared toward service competition**
- **Tradeoffs with investment?**

Investment Drivers



- **Product differentiation in platform competition**
- **Ability to deliver on plan**
 - Meet expectations of financial markets
- **Real options value**
- **Integration of services**
 - Opportunity for synergies
 - Ability to compete for revenues in all markets NGN makes possible

Regulatory Challenges



- Franchise to provide video
- Access to apartment buildings
- Access to poles, ducts, conduits
- Policy toward competitive practices
- Requirements for sharing and/or separation

Options – What If No Platform Competition?



- **Can't make the same assumptions that FCC did**
 - Geographic segmentation of market?
- **What is minimum sharing necessary?**
 - Wiring in buildings
 - Ducts, conduits
 - What else?
- **What market alternatives?**
 - 4G wireless
 - New wired networks
- **Creative real options**
 - Siciliani: Auction access right to NGN
- **If all else fails, subsidize?**

Neutrality as a Market Outcome

- **Broad agreement that customers should be able to:**
 - Go wherever they wish on the Net
 - Reach any content or service
 - Attach any device
 - Use any software
- **Providers need:**
 - Ability to manage/price limited resources
- **Market needs:**
 - Ability to find best business models and commercial arrangements
- **US policy model:**
 - Principles proposed by US industry in 2003, adopted by FCC in 2005
 - Enforced ex post on an ad hoc basis as concerns are demonstrated
- **Technology and market continue to evolve**
 - Cooperative effort of “P4P” industry group
 - Enhanced efficiency through sharing of information
 - Resource needs for P2P reduced by a factor of six

Where Does the Road to NGN Lead?

- **We have arrived at our current positions by different paths**
- **We have each achieved good outcomes for our consumers, economy, and society**
- **The path forward for each of us will pose different challenges, and require different policies**
- **We hope to meet in an NGN future with unlimited possibilities**