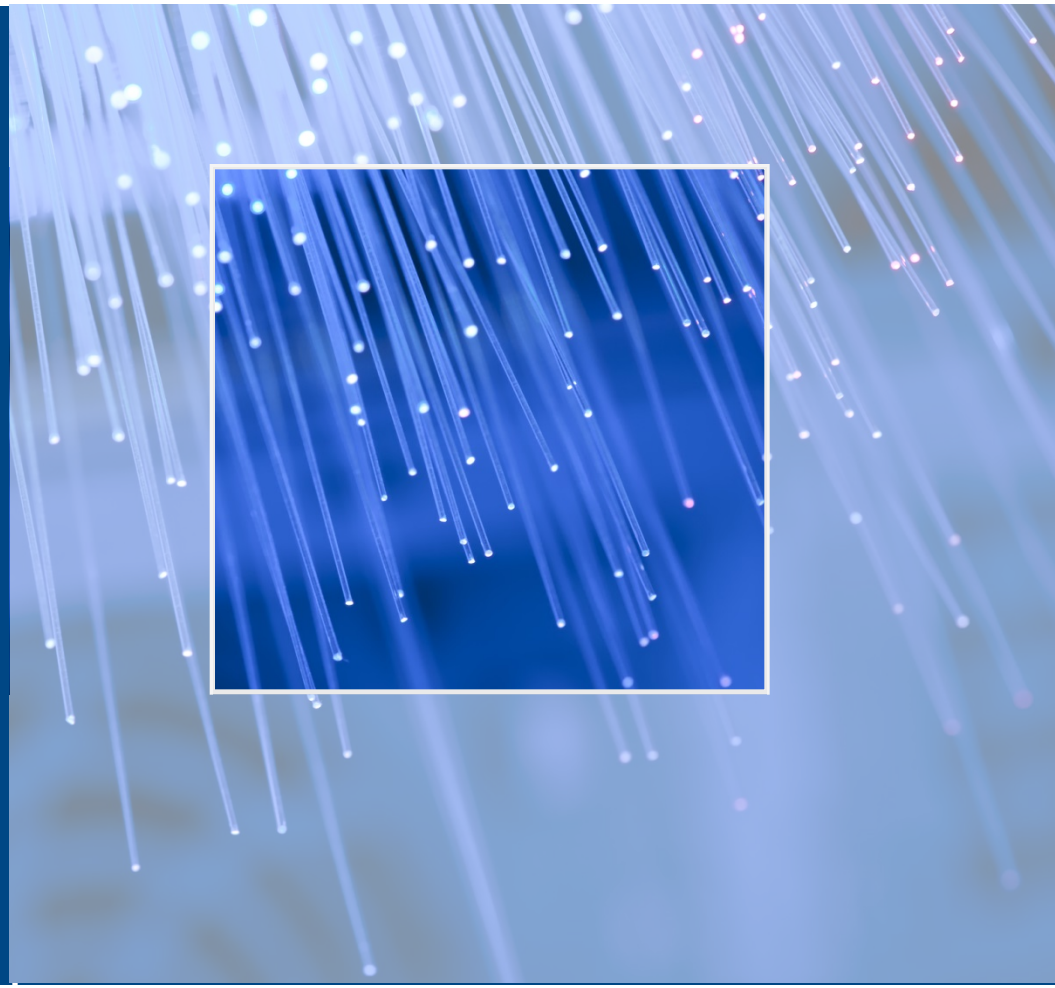
Arthur D Little

Dilemmák és kihívások – nemzetközi kitekintés

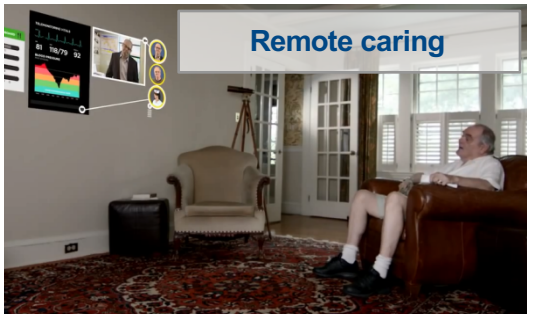
HTE Infokom 2016 „Utazás 30M felett”

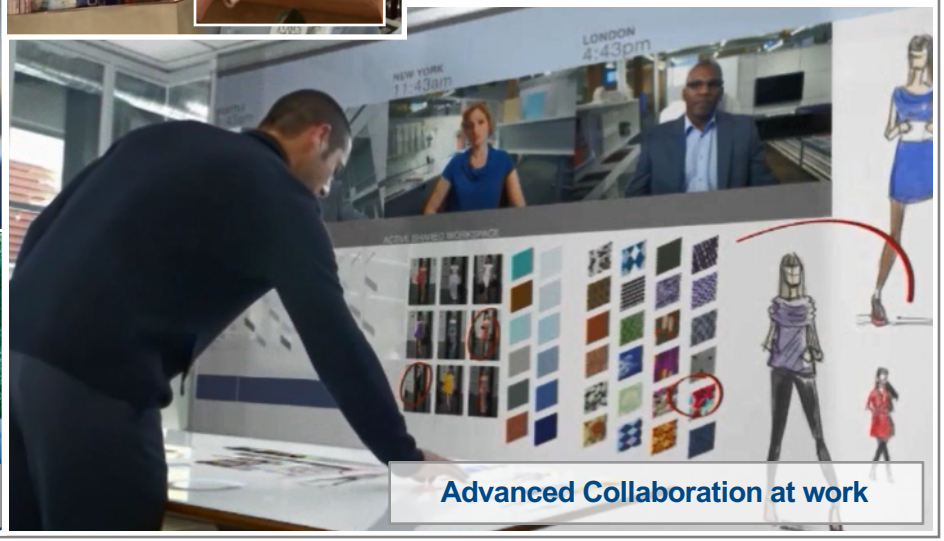
2016. október 12.



Future services will continue to drive demand for high bandwidth, reliable, resilient connectivity to homes and businesses…

Examples of innovative contemporary applications

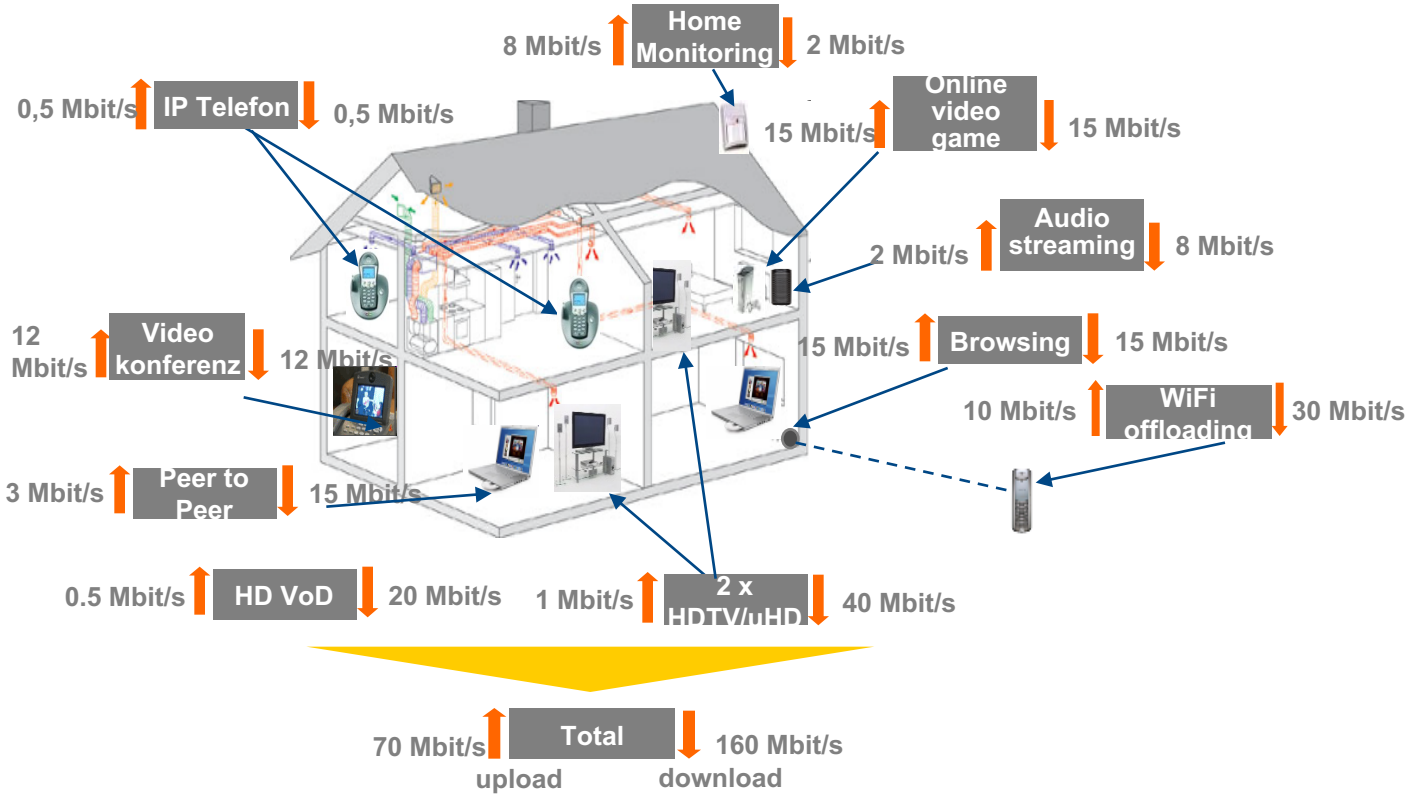




Source: Corning, Microsoft, Sprint, Arthur D. Little analysis

‘Simultaneity’ is reality for many homes already today

Our homes are connected, many times



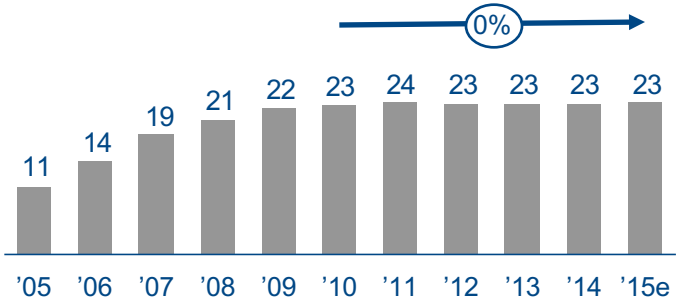
Source: Arthur D. Little Analysis

On the demand side from customers tasting high speeds and expecting more

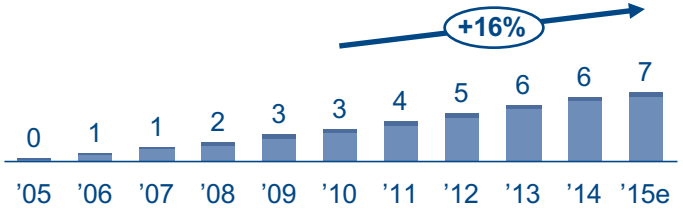
Demand push for high speed fixed broadband

The success story of xDSL has ended, while cable/ fiber subscribers are still growing…

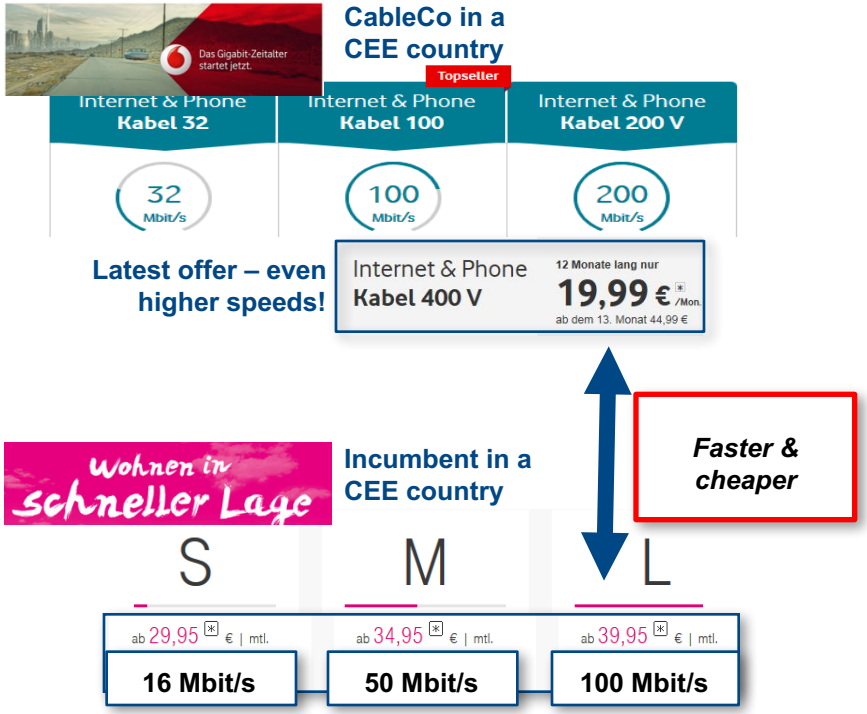
xDSL customers in a large CEE country (Mil HHs)



Cable/ fiber customers in a large CEE country (Mil HHs)



… cableCo's continue to launch higher speeds, and consumers demand more

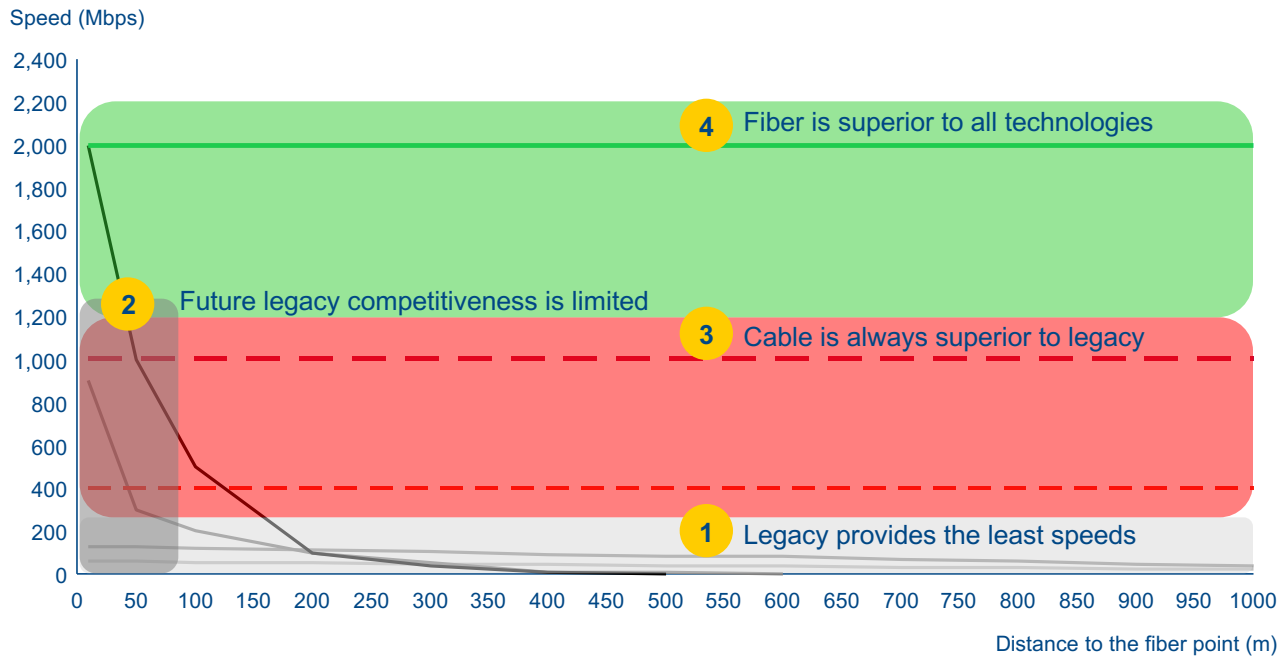


Source: Arthur D. Little analysis, Publicly available information on the respective TelCos

DSL Cable Fiber/ other

A strategic shift in thinking is required – Incremental upgrades to legacy network do not solve the long term problem

Speeds delivered by incremental upgrades to legacy network



1. **VDSL/ Vectoring** can deliver speeds up to 200 Mbps, but up to 1000m from the fiber distribution point
2. **G.Fast/ XG.Fast** - Future upgrades to legacy is constrained - can deliver speeds up to 1000 Mbps but also up to very short distances – 100m only
3. **Cable Docsis 3.0/ 3.1** can deliver Gigabit speeds +1000 Mbps up to much longer distances +1000 m from the distribution point
4. **Fiber/ FTTh** can deliver Gigabit speeds +1000 Mbps over longer distances

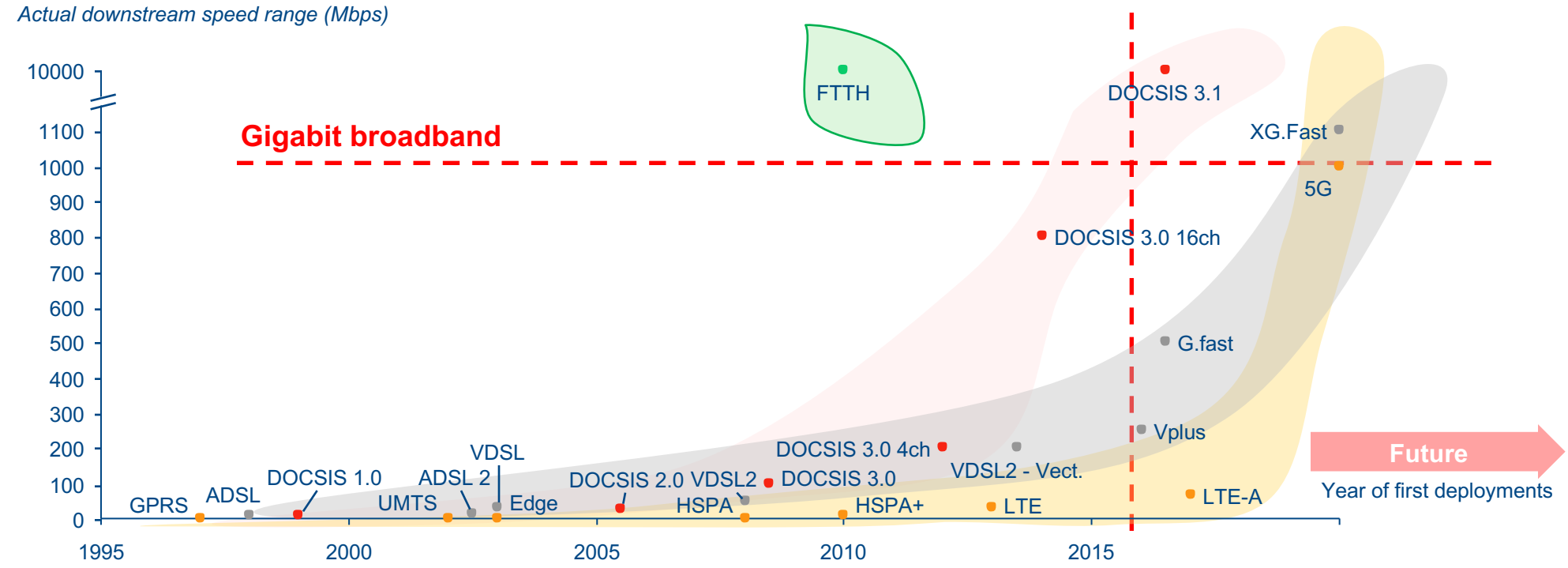
Incremental upgrades to legacy network - Vectoring, G.Fast, XG.Fast come with many constraints
Cable will always be ahead of any legacy based technology upgrade

Source: Arthur D. Little analysis, Alcatel, Cablelabs, equipment vendors, ITU

VDSL2 Vectoring G.Fast XG.Fast Docsis 3.0 Docsis 3.1 FTTH

A strategic shift in thinking is required – Fiber is the only long term fix for incumbents

Broadband access technology roadmap



Incremental upgrades to legacy network - Vectoring, G.Fast, XG.Fast come with many constraints
Cable will always be ahead of any legacy based technology upgrade

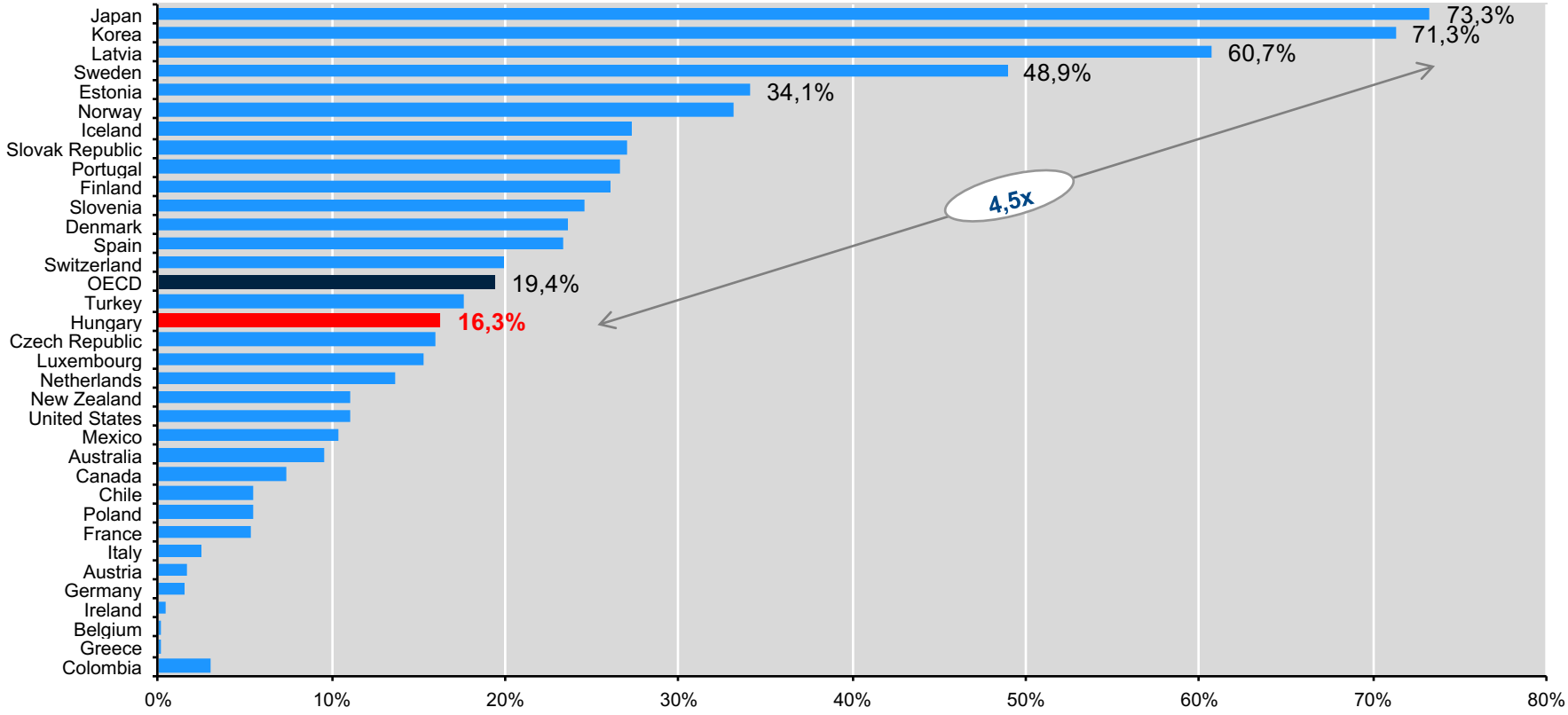
Source: Arthur D. Little analysis, Alcatel, Cablelabs, equipment vendors, ITU

● Cable ● Mobile ● Copper ● Fiber

Leading countries have over 70% of fiber connections in total broadband…

International benchmarks and statistics

Percentage of fibre connections in total broadband subscriptions in OECD, Dec. 2015

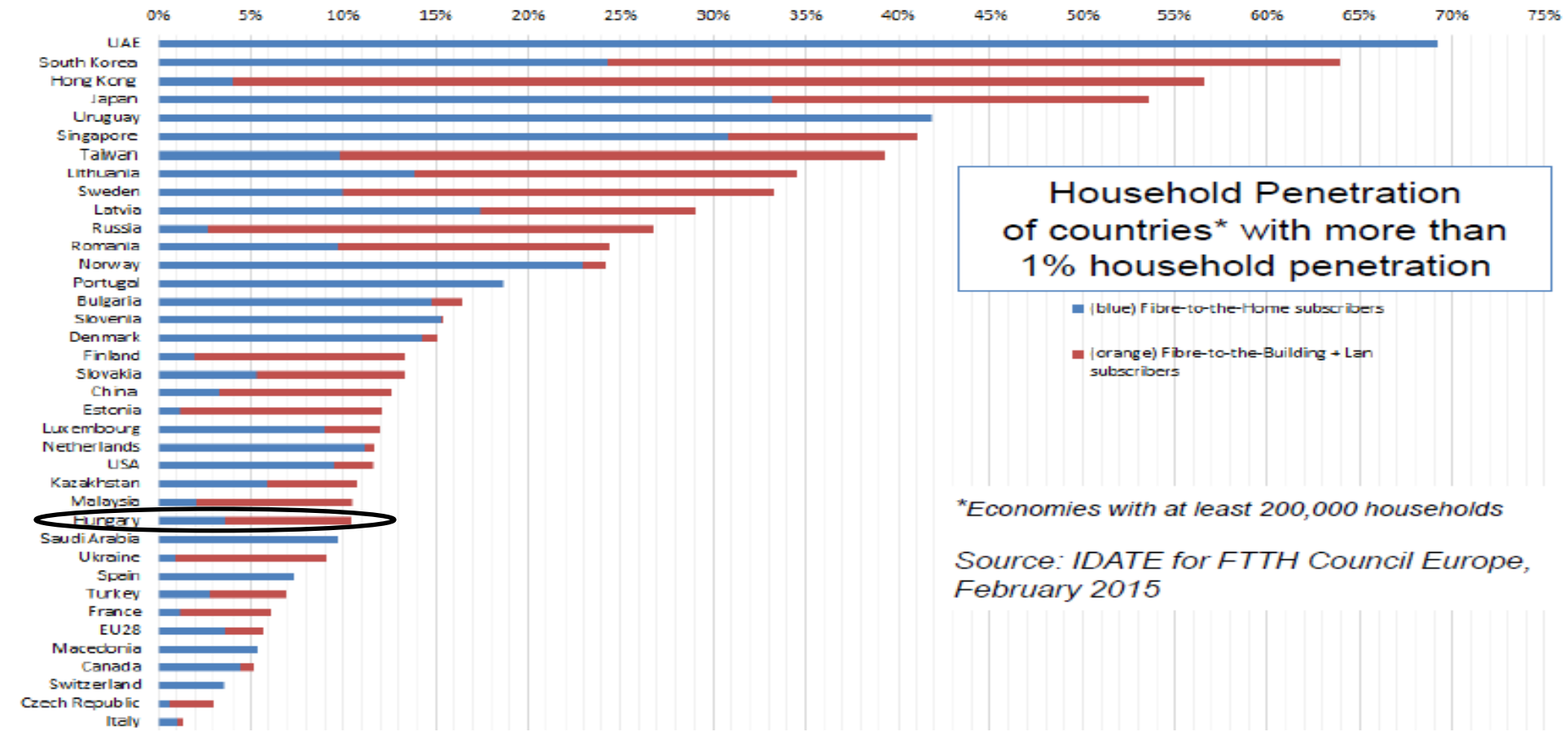


Definitions: Fibre subscriptions data includes FTTH, FTTP and FTTB and excludes FTTC

Source: OECD, Broadband Portal, www.oecd.org/sti/broadband/oecdbroadbandportal.htm

UAE, South Korea, Hong Kong and Japan are clearly the frontrunners in FTTH/B penetration

International benchmarks and statistics



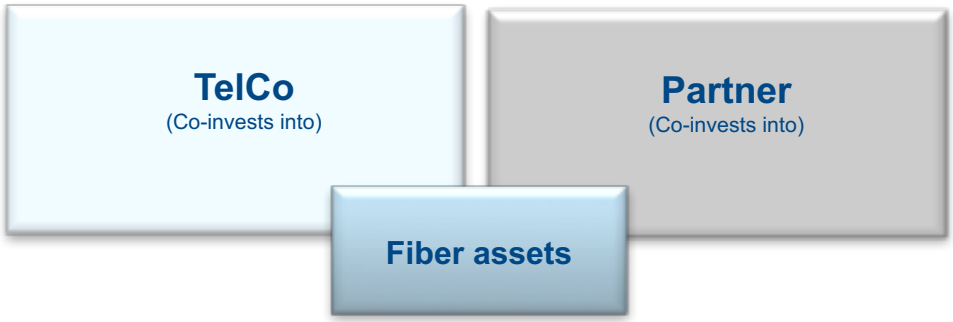
There are smart infrastructure methods to invest in fiber

Traditional vs. Smart Infrastructure approaches to fiber investment

Traditional fiber investment

- TelCo funds **entire capex** and owns whole fiber infrastructure
- **Strain on Balance Sheet**, high amount of funding
- **Self use**, little or no open access
- **Long term payback** of over 10 years, does not fit shareholder funding expectation

Smart infrastructure investment

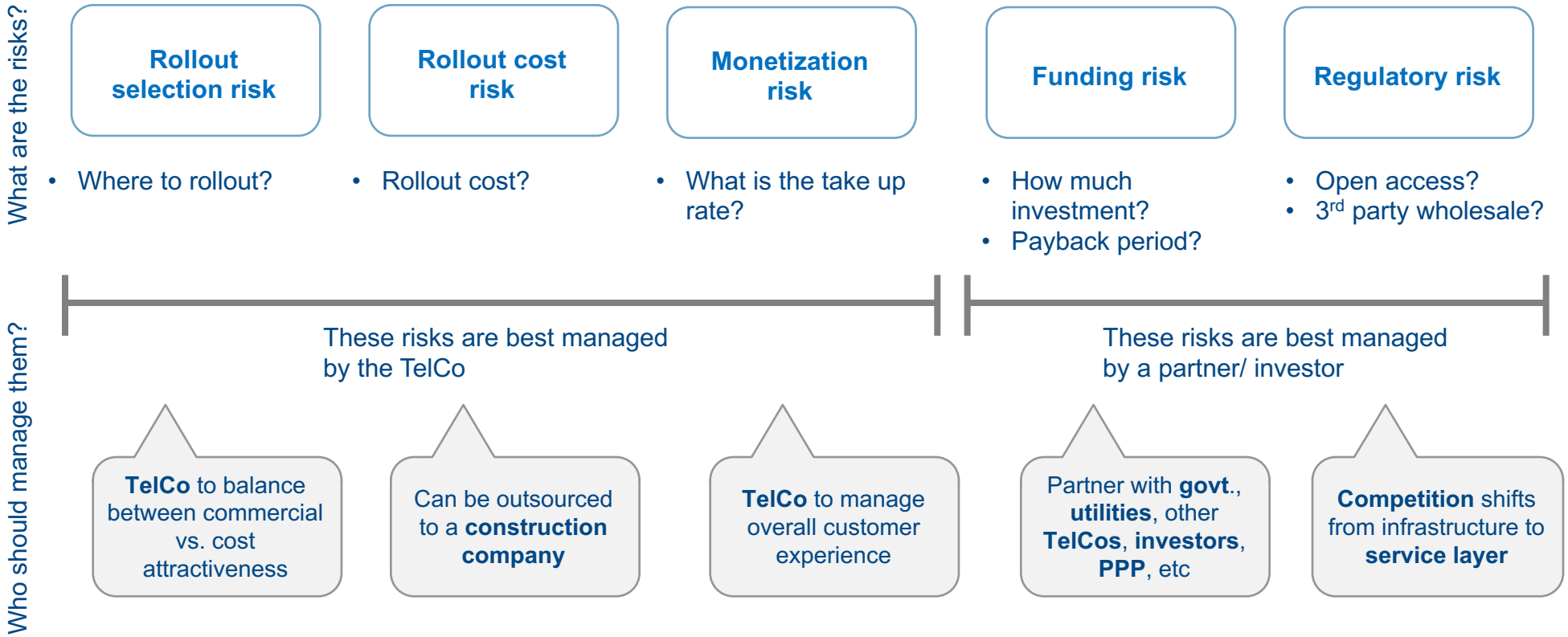


- Partnership model – Partner puts in **part of funding**
- **Risk sharing** – pay back period, utilization, monetization
- **Off balance** sheet model – Partner owns assets
- Use of **call options** to transfer ownership
- **Open access**/ 3rd party revenues/ better asset utilization
- Multiple use of same asset – FTTH, mobile back haul, future **5G, small cells**, etc

Source: Arthur D. Little analysis

The right partnerships and the right risk sharing models are the basis of a smart infrastructure fiber investment

Key risks to be managed through smart infrastructure models



Source: Arthur D. Little analysis

Success stories of smart infrastructure based fiber investment models from around the world have demonstrated that - partnership models for fiber do work

Case studies

Country	Operator	Partner	Key learning
Switzerland	Swisscom	70 local utilities	• Partnered with **70+ local utilities** to roll out open access fiber, **13% fiber take up** (2016) • Swisscom maintains leadership through superior **customer experience**
Singapore	SingTel	StarHub (CableCo)	• SingTel operates infra. layer, StarHub operates active network, **60% take up** (2016) • SingTel maintains leadership through superior **customer experience**
Netherlands	KPN	ReggeFiber	• KPN partnered with investor to roll out FTTh. Used **call options** to buy back ownership • Meanwhile, KPN is also rolling out vectoring to maintain short term competitiveness
New Zealand	Chorus	Govt of NZ	• Chorus gets 30% govt. funding to roll out nationwide fiber on budget and on time • Successful fiber rollout program, preceded by a successful **structural separation**
Sweden	Telia	150+ municipalities	• Telia partnered with 150+municipalities to roll out nationwide fiber • More than **50% fiber take** up (2016)
France	Orange, SFR, Free		• Competition shifted from mobile to **converged offering** (50% 4P for Orange and SFR) • Three main MNOs all rolling out fiber through infrastructure sharing model
Australia	Telstra	Govt of Aus.	• An **unsuccessful** model. Government and incumbent Telstra **did not partner**. • Govt. tried to roll out fiber independently of Telstra and ran into 2x cost problems

Source: Arthur D. Little analysis

As the world's first consultancy, Arthur D. Little has been at the forefront of innovation for more than 125 years. We are acknowledged as a thought leader in linking strategy, technology and innovation. Our consultants consistently develop enduring next generation solutions to master our clients' business complexity and to deliver sustainable results suited to the economic reality of each of our clients.

Arthur D. Little has offices in the most important business cities around the world. We are proud to serve many of the Fortune 500 companies globally, in addition to other leading firms and public sector organisations.

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