

FTTH Council Europe

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Europe at the Speed of Light
www.europeftthcouncil.com



Outline

FTTH-Council Europe

FTTH Worldwide

FTTH in Europe

FTTH and Regulation

FTTH and Bandwidth

FTTH Market-Drivers

FTTH and Environment

FTTH: European Success-Stories

Trends through Europe

Closing



FTTH-Council Europe

FTTH-Council Europe

The Organization

- Founded in 2004, non-profit-Organization
- 70 Members
- Members: Manufacturers, Construction & Engineering Companies, NPO, Academia

The Idea

- Accelerate FTTH deployment by education and promotion, to enhance Quality of life in Europe

The Mission

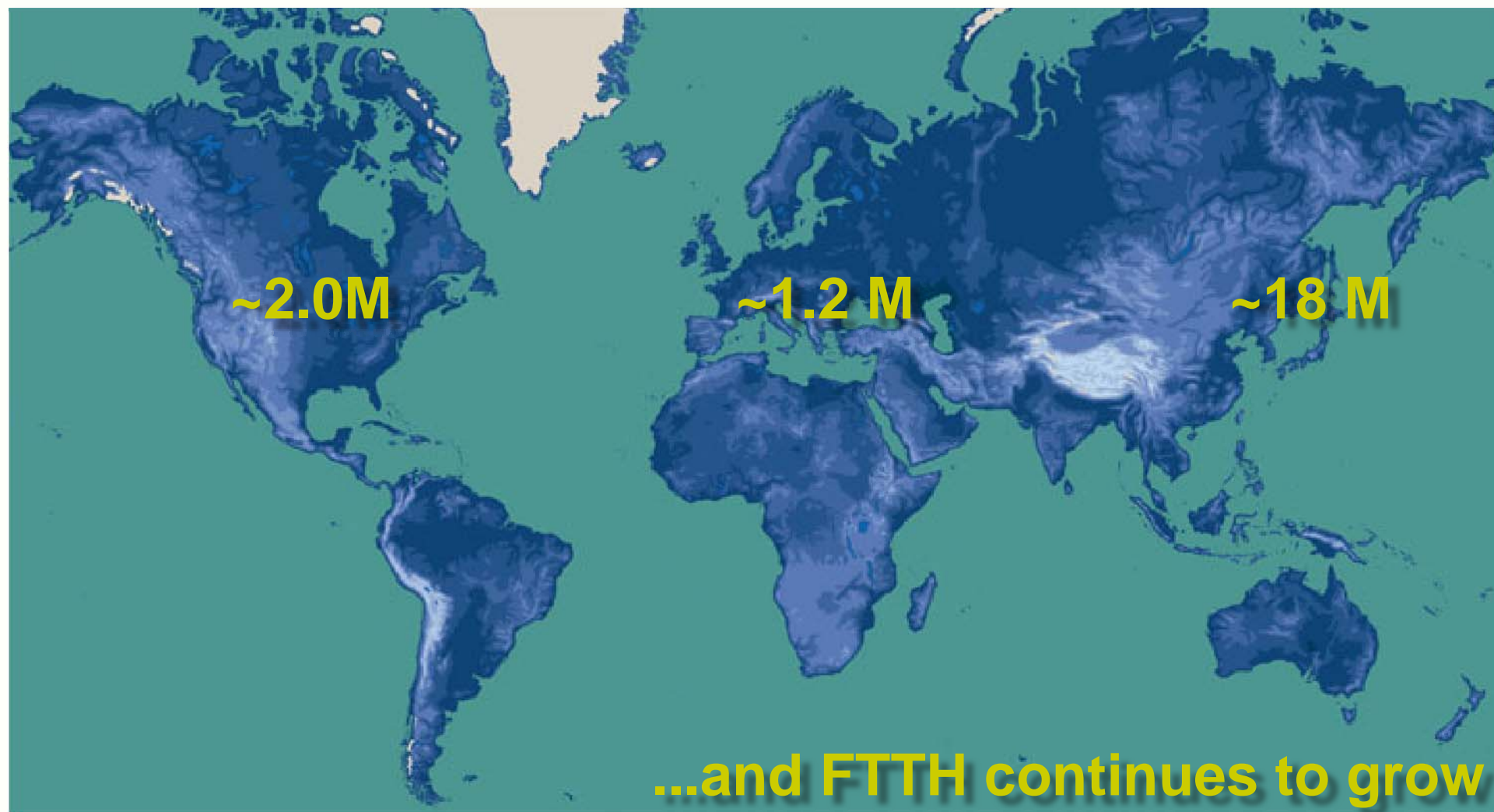
- Ensure that **all** network **investors** choose **FTTH**, resulting in a **10 fold** increase of new connections in the coming **3-5 years**

FTTH Council Europe Members

3M Telecommunications - Acome - ADC KRONE - AFL Europe -
 Agilent Technologies - Alcatel-Lucent - Allied Telesyn - BAM
 Infratechnik - Bechtel - BKTel Communications - Broadlight -
 Catway Lan System – Channel - Cisco Systems - Comptoir des
 Signaux - Corning - Dantex Plastrør - Dätwyler Cables - Ditch
 Witch/The Charles Machine Works - DKT - Draka Comteq -
 Duraline - ECI Telecom - EMC Electronic Media Communication -
 Emtelle - Ericsson - Exfo Europe - Fibox Oy - Fraunhofer Institut -
 Freescale Semiconductor - Genexis - Gerald Glaise - GM Plast -
 GNS - Huber+Suhner - Ignis Photonyx - IMC Fachhochschule
 Krems - Intel - JDSU - j-Fiber - Kabel-X - Kathrein-Werke - LEONI
 NBG Fiber Optics - Mitsubishi Electric - Motorola - Mulder-
 Hardenberg - NetAdmin Systems - Nexans - OFS - Optral -
 PacketFront - Plumettaz - Preformed Line Products - Prysmian -
 RDM - Senko - Nokia Siemens – Silec Cable - Sterlite Optical
 Technologies - Teleste - Tilgin - Triax - Twentsche Kabelfabriek -
 Tyco Electronics - Uponor/Radius - Volker Wessels Telecom -
 Wavin - World Wide Packets - ZTE Corporation

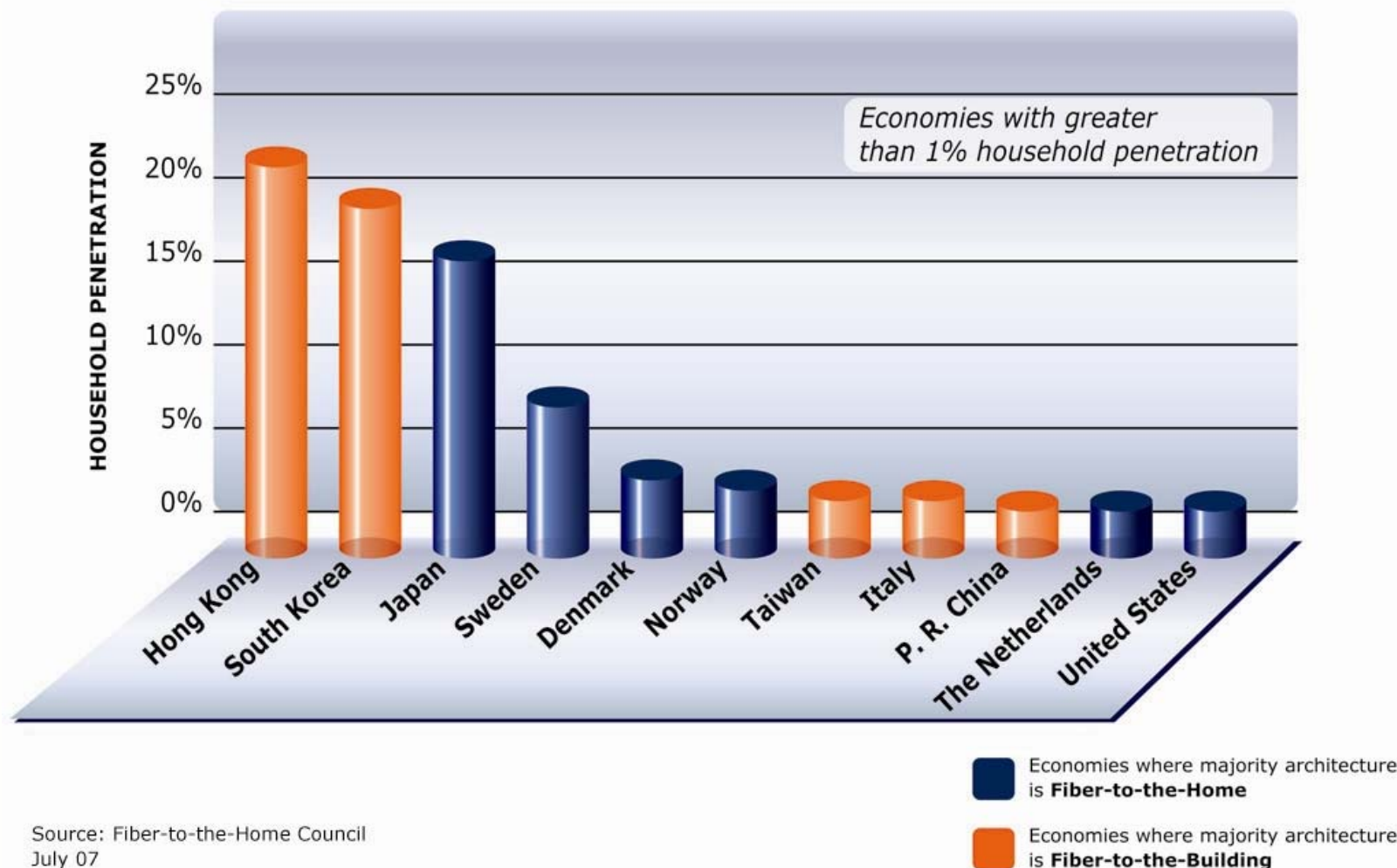
FTTH-Worldwide

FTTH Worldwide Mid 2007



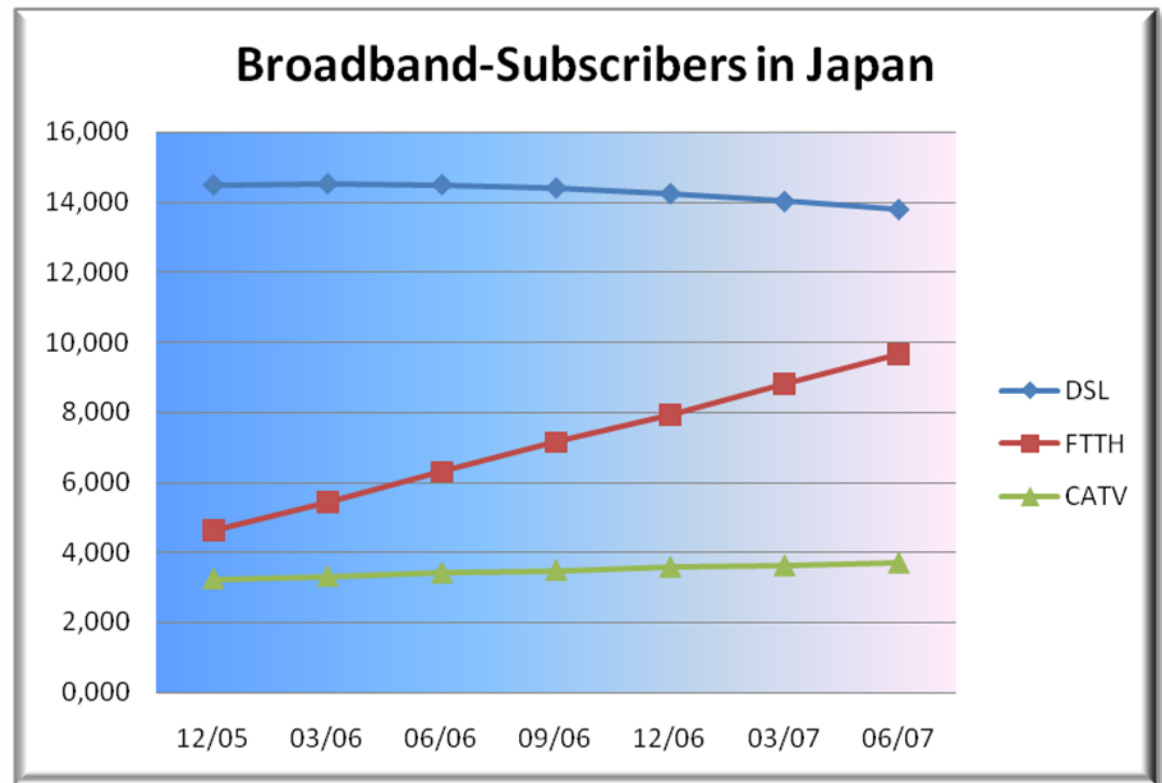
Global FTTH/FTTB Ranking

Economies with the Highest Penetration of Fiber-to-the-Home / Building



FTTH in Japan

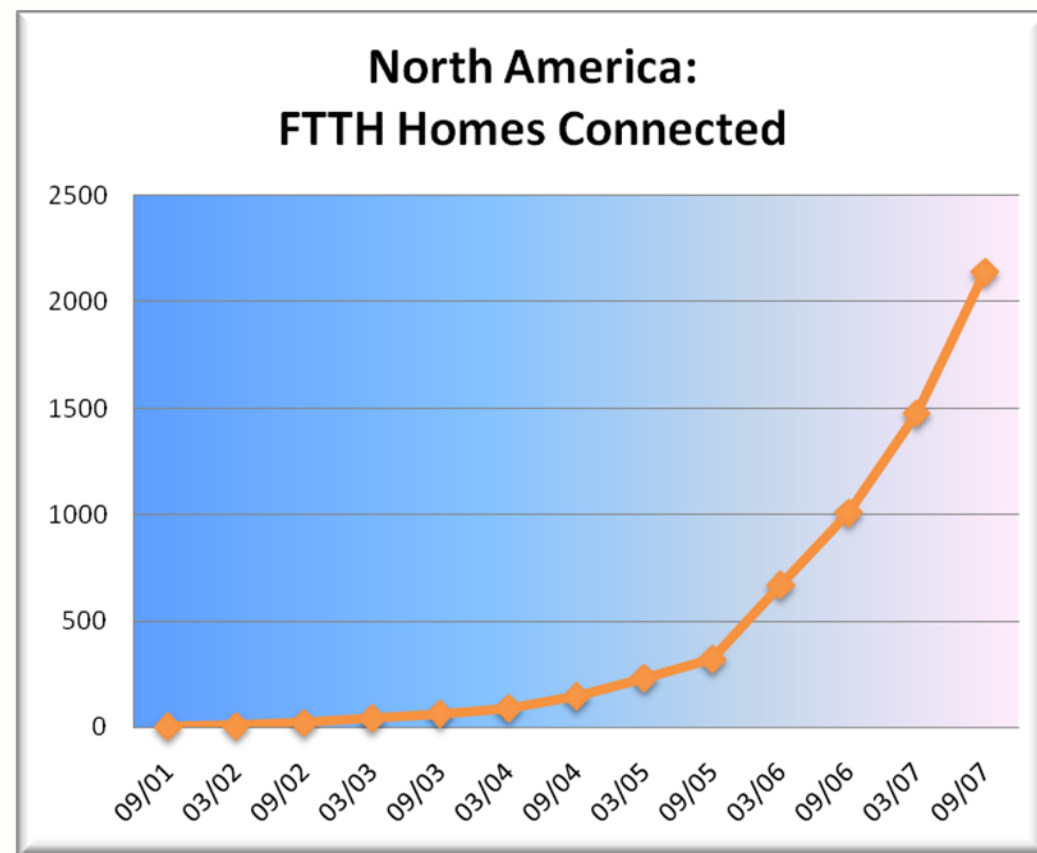
- FTTH-subscribers exceed 10 million households
- Nearly 300.000 new subscribers per month
- DSL migrates to FTTH: number of DSL-subscribers decrease since Q02/06
- Nearly 60.000 subscribers per month switch from DSL to FTTH



Source: <http://www.soumu.go.jp>

FTTH in USA

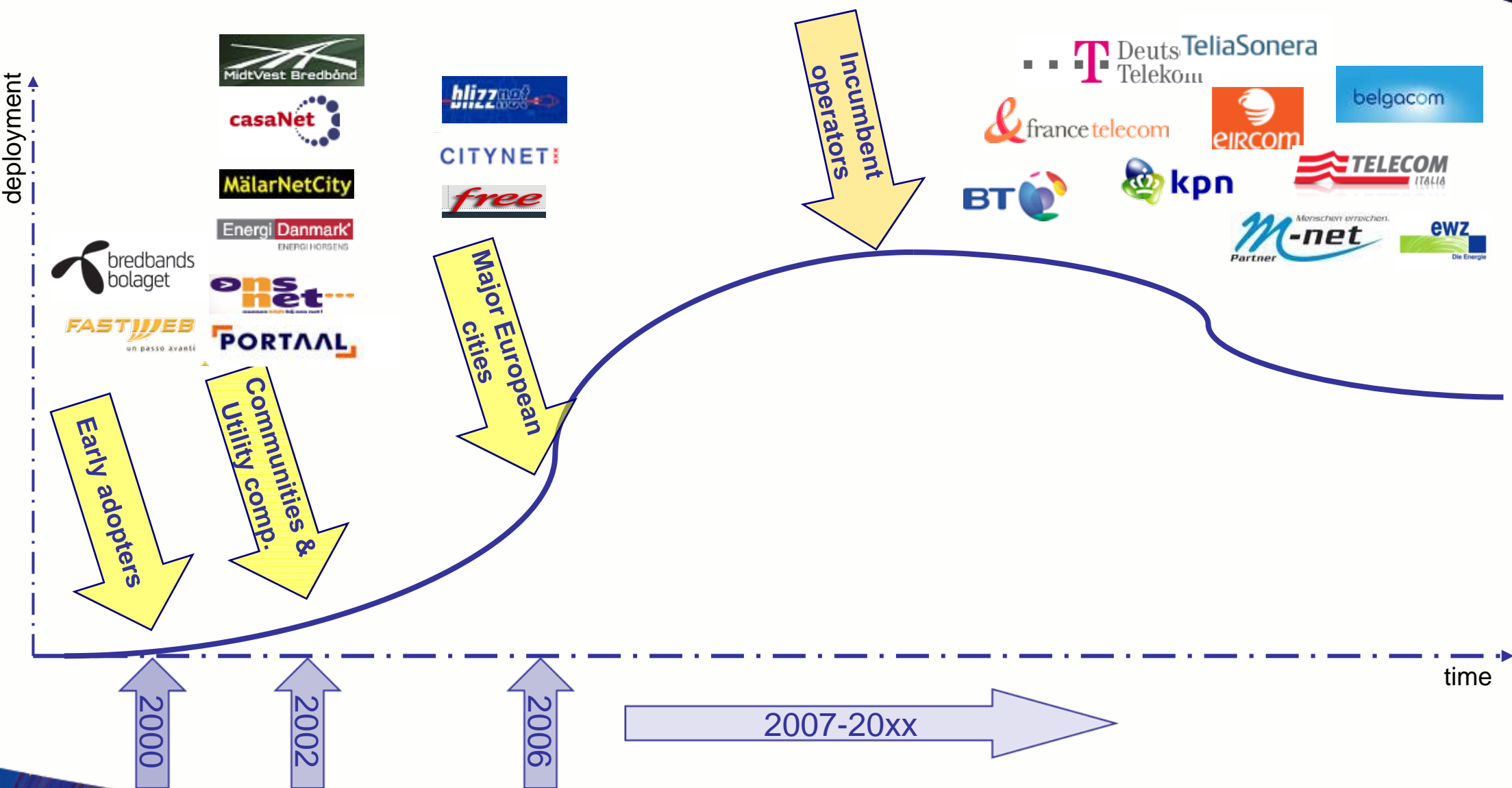
- FTTH-subscribers exceed 2 million households
- Nearly 10 million households passed
- FTTH-growth-rate more than 100%



Source: RVA Render & Associates, LLC 2007

FTTH in Europe

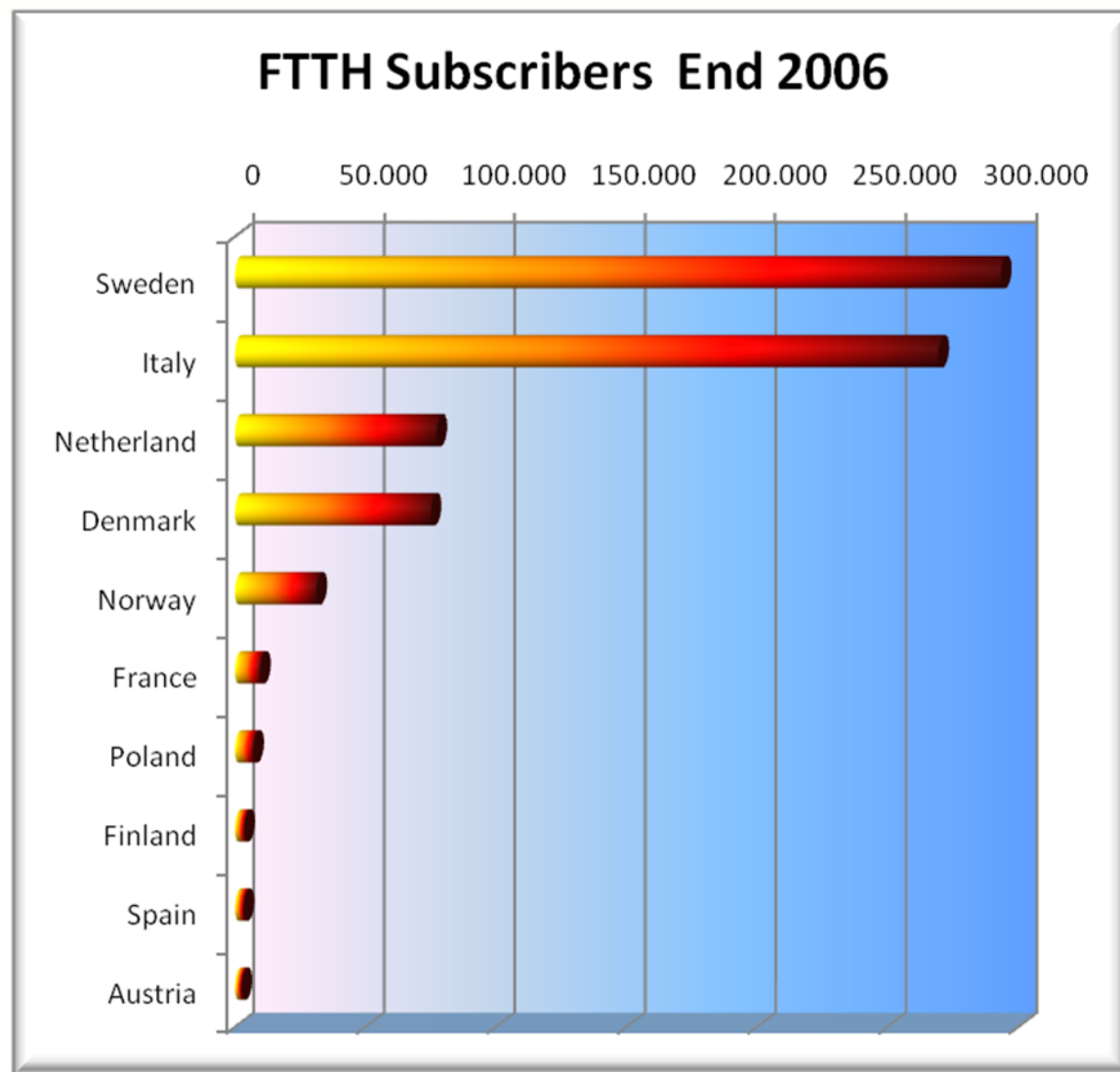
FTTH WW developement Europe



FTTH in Europe

Status End 2006:

- 1 Mio. subscribers, 3 Mio. Homes passed
- >90% of subscribers in just four countries
- Majority of projects are driven by municipalities and utility-companies



FTTH in Europe

2007: Europe moves forward

- **France:** four operators start to deploy fibre in Paris
- **Netherlands:** Amsterdam CityNet starts mass-deployment and Reggefiber 150.000 houses/year
- **Denmark:** utility-companies continue to deploy their FTTH-networks
- **Switzerland:** EWZ, the power-utility-company in Zurich starts to deploy fibre after more than 2/3 of the citizens have voted for FTTH in a referendum
- **Germany:** municipalities, utility-companies and operators start to deploy FTTH
- **Spain, Italy, Slovenia:** Telefonica, Telecom Italia and Telecom Slovenia announce FTTH-plans
- **European Commission:** New regulatory framework planned to be ready by end of 2007
- **Europe:** Number of FTTH-subscribers should exceed 1 Mio. by end of 2007



FTTH in Europe 2007: Situation Analysis

Positive

FTTH-deployments accelerate

Incumbents start to deploy FTTH

Customer-demand for bandwidth is increasing

Investors start to investigate FTTH

Negative

Partial Regulatory framework

No real “broadband-vision” in Europe

FTTH-growth-rate still quite low

FTTH and Regulation

Regulatory Framework

- Regulation vs. Public policy
- A stable and predictable regulatory and public policy environment is key to enabling FTTH investment
- The current Regulatory Framework is being reviewed – to conclude in Summer 2008?
- We are pleased to see that Next Generation Access is a major component of the Review
- The Council has developed a strong pro-investment position

FTTH-Council Europe calls on the EU to:

Focus regulation on encouraging investment

- starting from the passive infrastructure (ducts)
- vs. focussing on Replicability issues alone

Place a renewed emphasis on Geographic Segmentation Approach:

- (i) market driven (metropolitan areas)
- (ii) policy driven (rural areas)
- (iii) grey areas

Definition of a new market for physical passive infrastructure

- Ducts primarily

Use a Gradation of Remedies approach:

- When ducts available, fibre relieved from regulation;
- When ducts not available (for any reason) access to fibre mandated taking into account the investment

Clarification on indoor cabling rules

Wireless is not a long-term-solution for rural areas!

FTTH and Bandwidth

The Story of Bandwidth

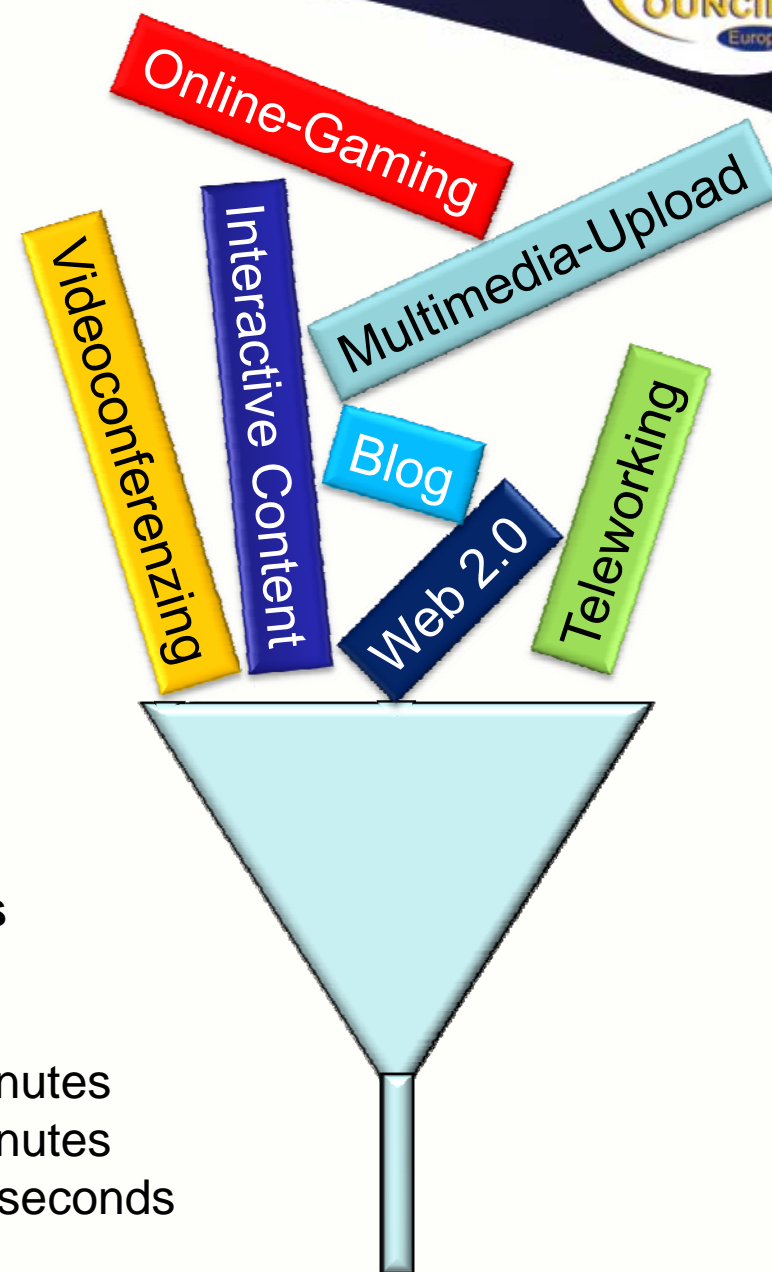
- Average Speed of Broadband-Customers (Verizon, US):
 - 2,5 Mbit/s DSL-Customers
 - 5,2 Mbit/s FIOS (FTTH) – Customers
 - → is FTTH necessary for 5,2 Mbit/s?
- Average Speed of a car
 - 39,11 km/h in US (University of California)
 - 24,5 km/h in UK (Oxford University)
 - → are modern cars necessary for 24,5 km/h?

- Download of a 6,5 Gbyte DVD-film:
 - 10 Mbit/s DSL: 1,44 hours
 - 100 Mbit/s FTTH: 8,6 min
- Download of af 25 Gbyte HD-film:
 - 10 Mbit/s DSL: 5,5 hours
 - 100 Mbit/s FTTH: 33 min



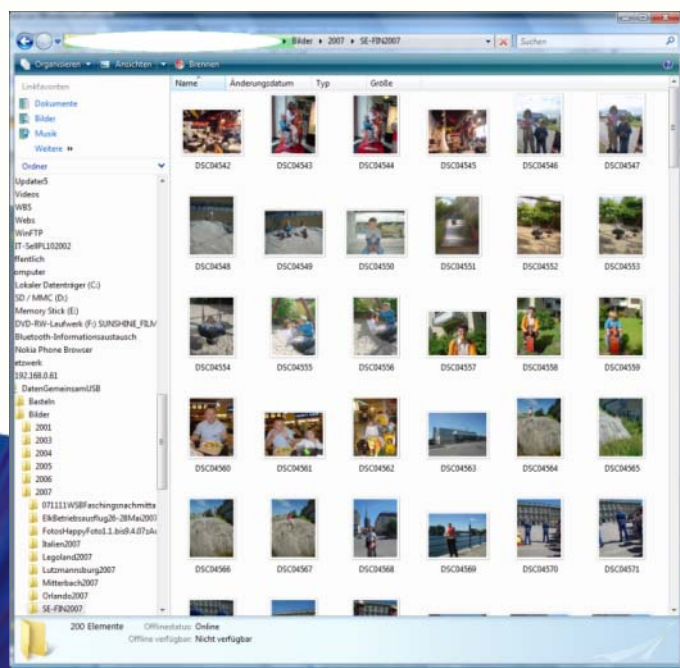
Symmetrical Bandwidth

- Too much focus on downstream
- Upstream is needed for a growing number of applications
- FTTH offers symmetrical bandwidth/high upstream-rates



Upload of 300 holiday-photos (700 Mbyte):

- 1 Mbit/s Upstream: 92 minutes
- 10 Mbit/s Upstream: 9 minutes
- 100 Mbit/s Upstream: 56 seconds



FTTH Market-Drivers

FTTH impacts our Life

Web 2.0



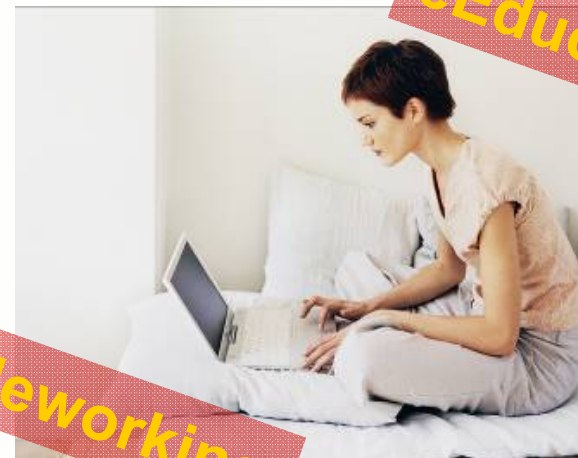
eLeisure

eHealth



eHome

eEducation



Teleworking

eBusiness



eGovernment

Societal



Environmental



FTTH and Leisure

Standard-Package:

- Unlimited, symmetrical high-speed-internet
- VoIP
- IPTV with multiple (HD)-Channels
- Video on Demand
- Local content
- Interactive TV
- The connected home: more than just "Triple Play"



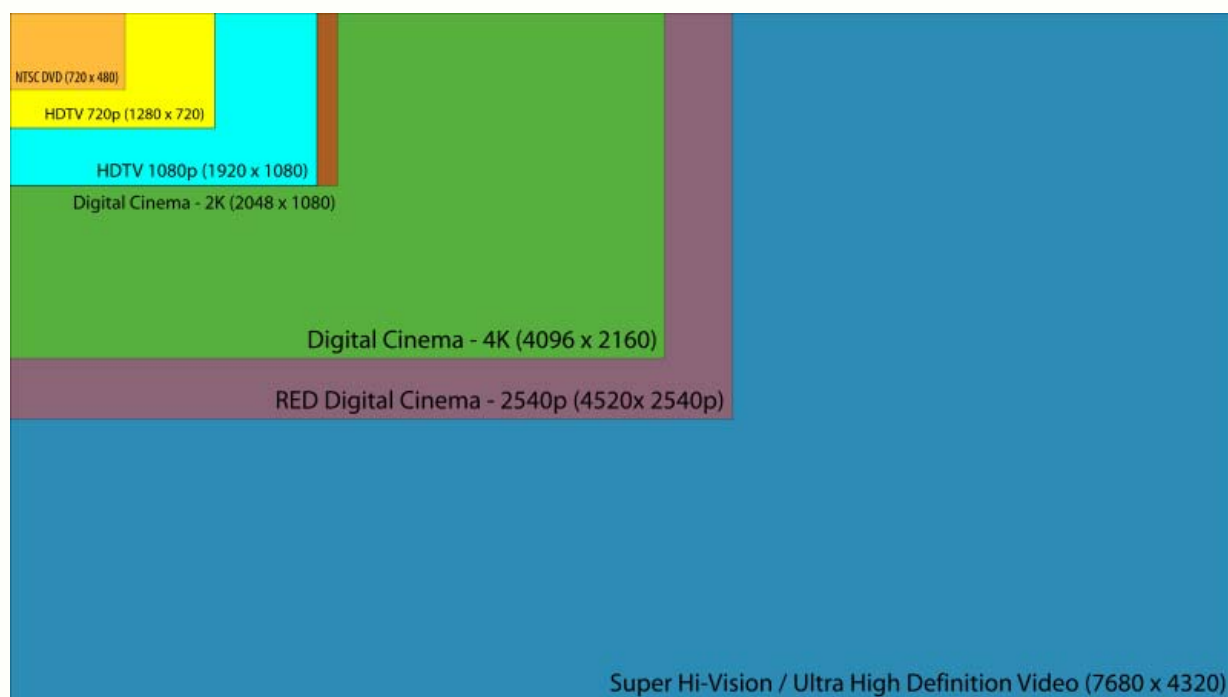
The "Triple-Play-Family" on Friday evening - TODAY:

Service	Mbit/s
HD-Stream for Living-Room-TV:	9,0
HD-Stream recorded in parallel	9,0
Standard-TV-Stream in daughters room	2,5
VoD-Music-Clips streamed to PC of son	2,5
Download of MP3-files to PC of son	2,0
Mother having a video-chat with Grandma	1,3
Total	26,3
+20% puffer for permanent video	31,6

source: IMC 2007

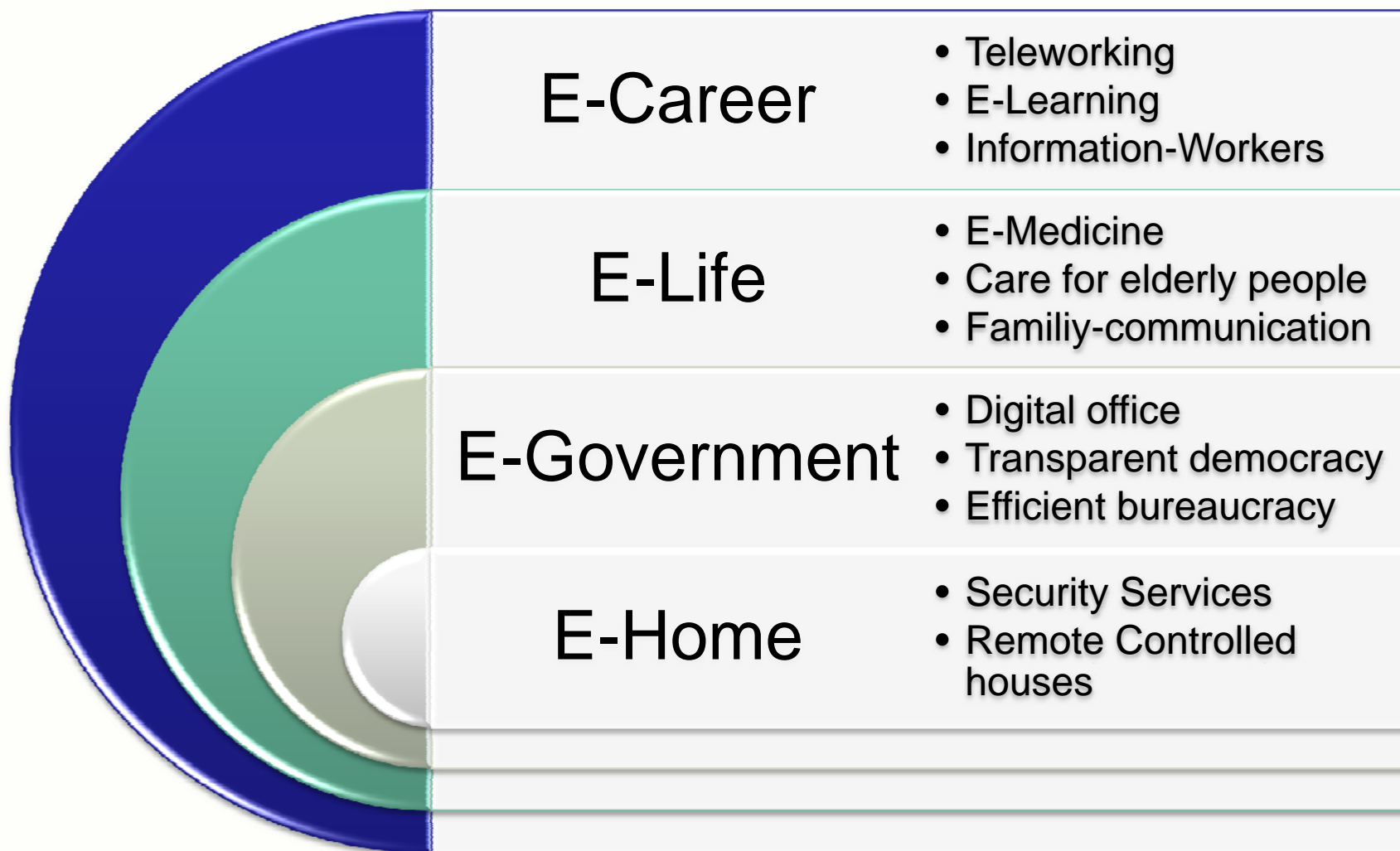
- Short peaks for internet-surfing, download of software-updates etc. are not taken into account
- Bandwidth has to be available stable and with sufficient QoS
- Picture in Picture or other interactive features would increase bandwidth

The Future of IPTV



- HDTV is just the start
- Why re-encode 2K and 4K digital movies?
- Japan already works on UHD-Video
- Which BB-technology other than FTTH will be able to stream 150-200 Mbit/s?

FTTH enables Knowledge Economy



FTTH: Communities & Web 2.0



- User-Centric Content demands Symmetrical Bandwidth
- Unlimited bandwidth gives unlimited possibilities to the communities
- Give the bandwidth to the users and they will use it



del.icio.us



- YouTube
- MySpace
- Flickr
- Blogging
- Online-Gaming
- Google-Applications
- Wikipedia

- “Give us the Glass and we will break it!”

Sony Online
Entertainment



- “We will consume every bandwidth you give to us!”

Wald Disney
Corp.



- “Forget Gigabyte and Terabyte we have to handle Exabytes!”

Bret Swanson



FTTH and Environment

FTTH and Sustainable Development ?

Sustainable development is a must objective for the planet
Greener solutions for the 21th Century!

Broadband demand will continue to increase and to impact
governance, leisure, family, enterprise, society in general

FTTH solutions and their use may be an opportunity to
contribute to this objective

The FTTH Council Europe has launched a detailed study

- Analyze positive direct and indirect impact of FTTH
- Use this demonstration to stimulate development plans across EU
- More at the FTTH Council Europe conference in Paris

FTTH = a chance for sustainable development

More

- Teleworking
- Videoconference
- Medicine, care
- Governance
- Training, education
- P2P, exchanges
- Video surveillance

Less

- Life constraints & stress
- Inefficiencies of services
- Intense operations
- Infrastructures/transport
- Environmental changes
- Collective costs

- Business creation
- Family life balance
- Local development
- Safety & nurturing

FTTH and the Future of Europe

Is FTTH necessary?

Global Trend

- Next Generation Broadband is the foundation (and driver) of knowledge economy, the next industrial revolution

Local Conclusion

- We believe that Fibre-to-The-Home infrastructure is critical to the long term competitiveness of Europe.

Need to Act

- Europe must act now to make it happen!



FTTH European Success stories

Malarenergi

- Charging users directly for the actual cost of connecting them (\$3430)
 - Also shares revenue for all services offered (between 5% and 50%)
- Vasteras city council grounded rules
 - non-discrimination and ensuring availability basic services
- 30k households and 2k businesses connected
- Not just an open network, but one in which it actively helps users to find what they want,
 - Portal MalarNetCity, to serve as the entry point
 - ISPs to offer contracts that allow users to change after one month. Banned operators from charging a connection fee
- Availability of 62 separate services from 20 service-providers
 - 100-Mbit/s Internet service from \$46 per month



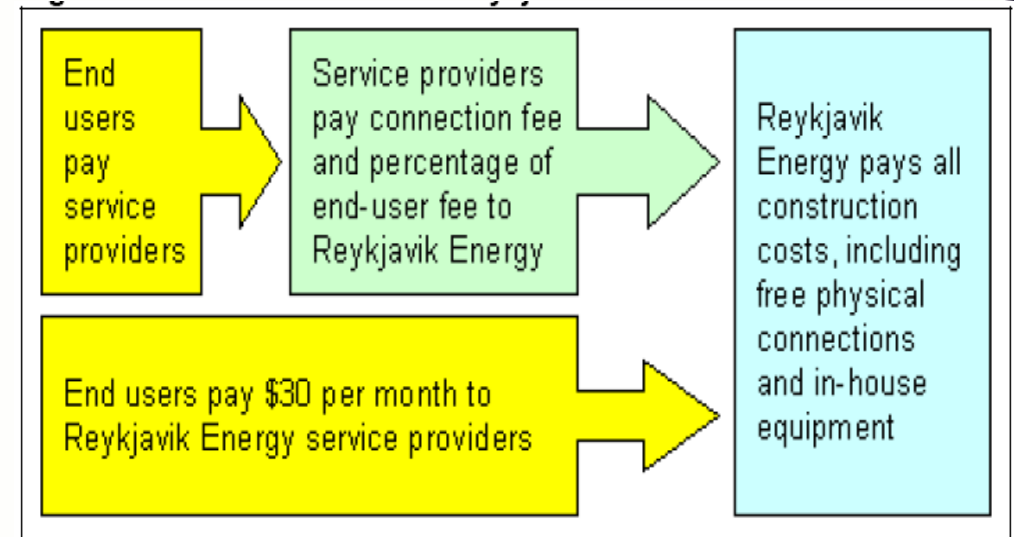
FTTH Nuenen, The Netherlands

- December 2003
 - Approval of the project
 - Negotiations
 - Financing
- July 2004
 - Start project organization
 - Marketing and Communication
 - Start of the Network Build
- August 2004
 - 7300 subscribers (97%)
- December 2004
 - 7500 broadband connections operational
- December 2005 use of services
 - Internet: 90%.
 - IP Telephony: 80%
 - IP TV: 75%



Reykjavik Energy

- **Independent service company owned by municipalities**
 - RE is able to synchronize its digging with other groups such as the roads department
- **2004 – 2011- FTTH Deployment**
 - 300 companies connected and 2.000 homes connected in 2005
 - 70.000 -80.000 homes (4-6 years)
- **Equal access network, RE as an enabler – not service provider.**
- **Overbuild strategy**
- **Low connection fee (€25)**
 - Basic 100-Mbit/s connectivity
 - Free-to-air TV, Gateway and set-top box
 - Connects customer for free

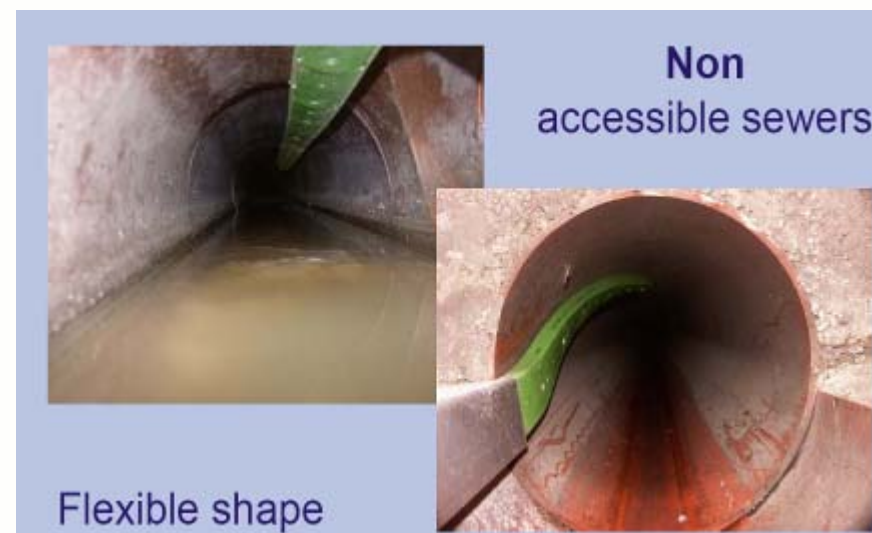


Source: Heavy Reading

- **Network funded entirely by RE**
 - connecting about 50 percent of homes for a total cost of \$100 million,
 - connection cost per household of about \$2,000 to \$2,500
 - not expect a positive return on its investment for 14 years

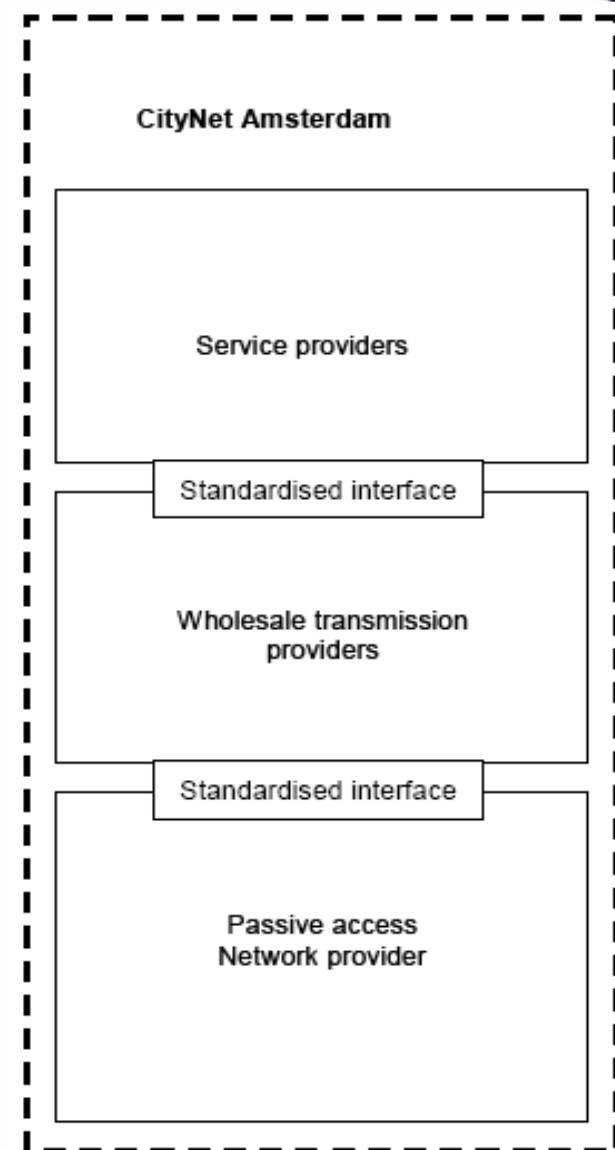
Vienna

- First construction phase will include 50.000 household passed within 2 years: 100 Mbit/s – 1 Gbit/s
- Open access functionality
 - in cooperation with other interested market participants – that ensures access for all users under equal and fair conditions. This principle applies to hardware and content alike.
- 950,000 households and some 70,000 SMEs are to be linked up to the network by the end of the project.
- Universal access to information – without any digital divide – is a “service of general interest” just as the provision of local traffic networks, water, electricity, gas and other municipal services.

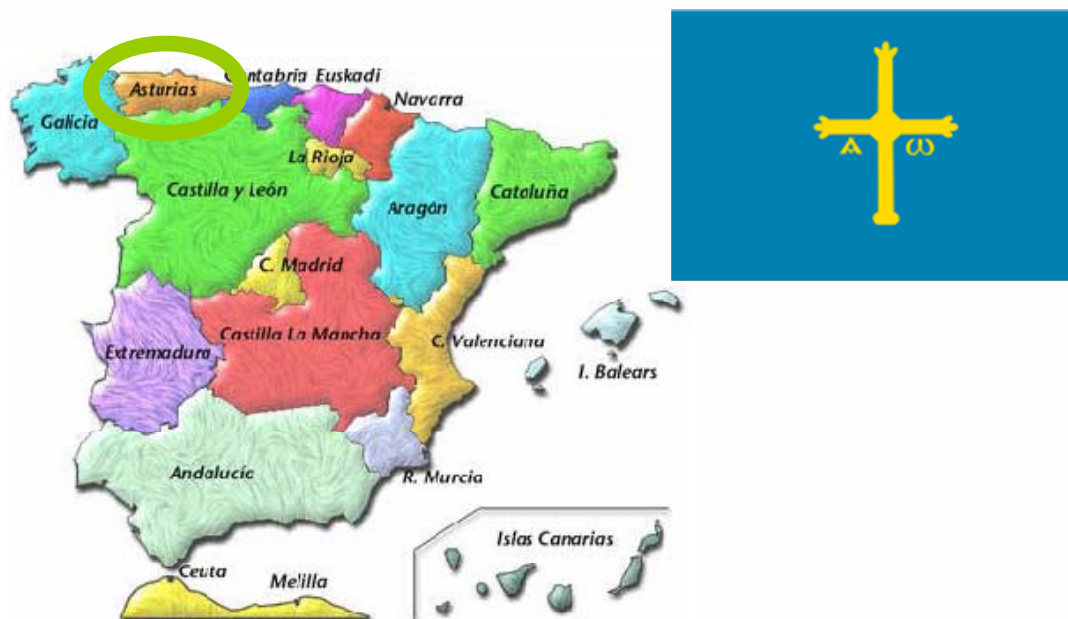


Amsterdam

- first phase: 40.000 households
- 420.000 homes and businesses by 2013
- partners involved:
 - City of Amsterdam
 - Housing Associations
 - ING Real Estate
- deployment-work already started



Principality Asturias, Spain



Why?

- Economic attractiveness (job losses in mining and steel)
- Lack of broadband coverage by any major operator

What?

- FTTH & FTTB
- Telecable first service provider

How?

- 35 small towns
- > 10,000 homes
- European Structural Funds

Más de 50 canales de tv
+
Llamadas gratis a teléfonos fijos
+
Internet 4Mb/640Kbps

TeleCable

Velocidades máximas disponibles

Trefor

- "Broadband for everybody": the future IP network must be available for all
 - no connection fee
- Implement Equal Access Network, with access for all service providers (no de facto monopoly)
 - does not compete with the SPs on the network
- Use external financing resources (TRE-FOR has a capital foundation of 225M Euro)
- Economics
 - Connections and installation are for free, if you sign on from the start –value 600 Euro
 - Customers must buy or rent a router (100 Euro)
 - Set-top box is included when broadband-tv is ordered
 - Subscription is 13 Euro/month

Free, Paris/France

- replacement of ADSL2+ by FTTH
- planned in Paris and everywhere in France where Free/ADSL2+ has a high market-share
- Free-customers will be upgraded for free, no change in monthly fees
- investment planned: 1 billion Euros until 2012
- free also announced to open network to other operators



France Telecom

- **why was FTTH chosen:**
 - no longer reachability issues and thus enabler to expanding customer demand for speed
 - improved QoS leading to less OPEX
 - only future proof technology
- **what**
 - FTTH in France in dense areas
 - FTTH in Slovakia in dense areas
 - other FTTX not excluded depending on country market and local loop topology
- **where and how**
 - leopard skin pre-roll-out in progress
 - 2006 : 14,000 home passed in Paris / vicinity and 14,000 home passed in Bratislava
 - 2007 :
 - on-going roll-out in Paris & suburbs and in biggest French cities (Lyon, Lille, Marseille, Toulouse)
 - on going roll-out in 10 major Slovakian cities
 - 2007-2008 150 to 200 k connected customers and 1 M home passed



MidVest Bredband

- MidVest Bredband aims to offer Genuine Broadband to everybody in the central and western Jutland by 2012.
 - MVB is owned by 7 utility companies
 - The first 20 employees started on February 1st, 2007
 - First customer got connected as from October 1st, 2005
 - Customers potential 175K
 - 155K households
 - 20K businesses
 - The Multiple IP services are provided through Smile content and net offering an open network platform
 - Key figures:
 - 30.000km trace SM fibre
 - 18million km of fibre
 - Budget DKK 2.500M (€334M)
 - 40% passive equipment
 - 40% active equipment
 - 20 BSS and OSS



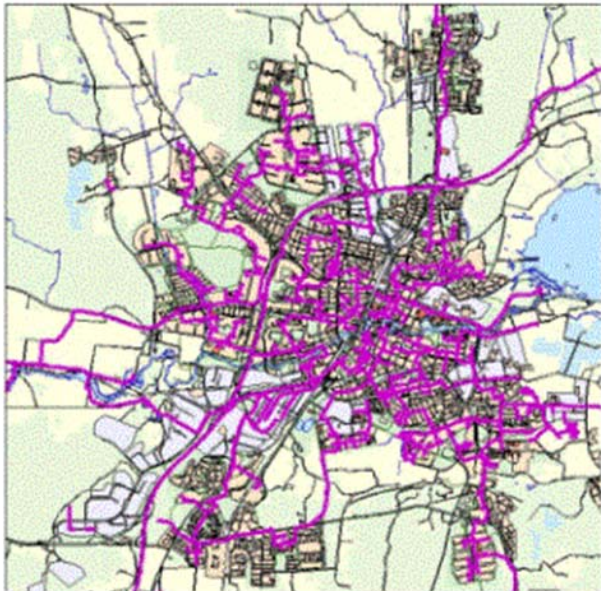

Trends throughout Europe

Connecting Networks

- several “open acces”-Networks in on country
- a “connecting provider” connects them
- service providers can access more customers
- examples:
 - OpenNet in Sweden
 - Reggfiber in Netherlands

City Networks in Sweden

Case Örebro City Network : Fiber structure

- ~ 25M€
- 30,000 dwellings
- Still being deployed
- Also city of Kumla
- Fiber owned by city

fiberdata
OPERATIONS

tidanet.se
EN DEL AV TIDAHOLMS ENERGI AB

stadsnät
www.stadsnat.se

thalamus
— networks ab

VÄNNÄS
KOMMUN

Vannas.net

TRANSIT
BREDBAND

Why?

- Upgrade of city-owned network
- Expansion to SME/businesses
 - Stimulate local economy
- Broadband services of citizens
 - lack of existing BB services

What?

FTTH & FTTB

How - example of Orebro City

- 30000 dwellings
- 25Mio € city investment

Reggefiber

- Reggefiber, the Dutch investment company responsible for the roll-out of major FTTH projects, owned by Dik Wessels.
 - Targeted
 - 150.000 homes to be connected per year within the next years
 - 33% investor in Citynet Amsterdam
 - Projects rolled out:
 - FTTH Nuennen (7.000homes connected)
 - FTTH Eindhoven (14.000homes connected)
 - Portaal (65.000homes passed)
 - Lybrandt Telecom (15.000homes connected)
 - Projects in roll-out
 - FTTH Deventer (40.000homes connected scheduled by Q1/2008)
 - Projects Scheduled:
 - FTTH Eindhoven (100.000homes connected)
 - Arnhem –Nijmegen (16.000 homes connected)
 - FTTH Almere (partnership – 40.000 homes connected)



Closing



More at FTTH Council Europe Annual Conference

Paris - Palais des Congrès
27-28 February 2008

“Crossing the Chasm to Mass Market Fiber”

Where the European FTTH community meets



Thank you for your attention!

