

broadband

a global user perspective

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broadband priorities



- access to incumbent operator networks
 - advocacy of local loop unbundling
 - support for wholesale broadband products
- infrastructure competition
 - separation of the ownership of potentially competitive networks, such as cable television and the PSTN
 - ensuring that licensed and unlicensed spectrum is available for operators and users
- statistics
 - rapid reporting of numbers of lines and users
 - regular reporting and review of quality of service

benchmarking



- UK against the rest of the
 - G7 and OECD
 - European Union
 - Japan and Korea
 - China and India
- technologies and services:
 - teledensity and growth
 - prices and line speeds
 - advanced technologies
 - revenues

africa



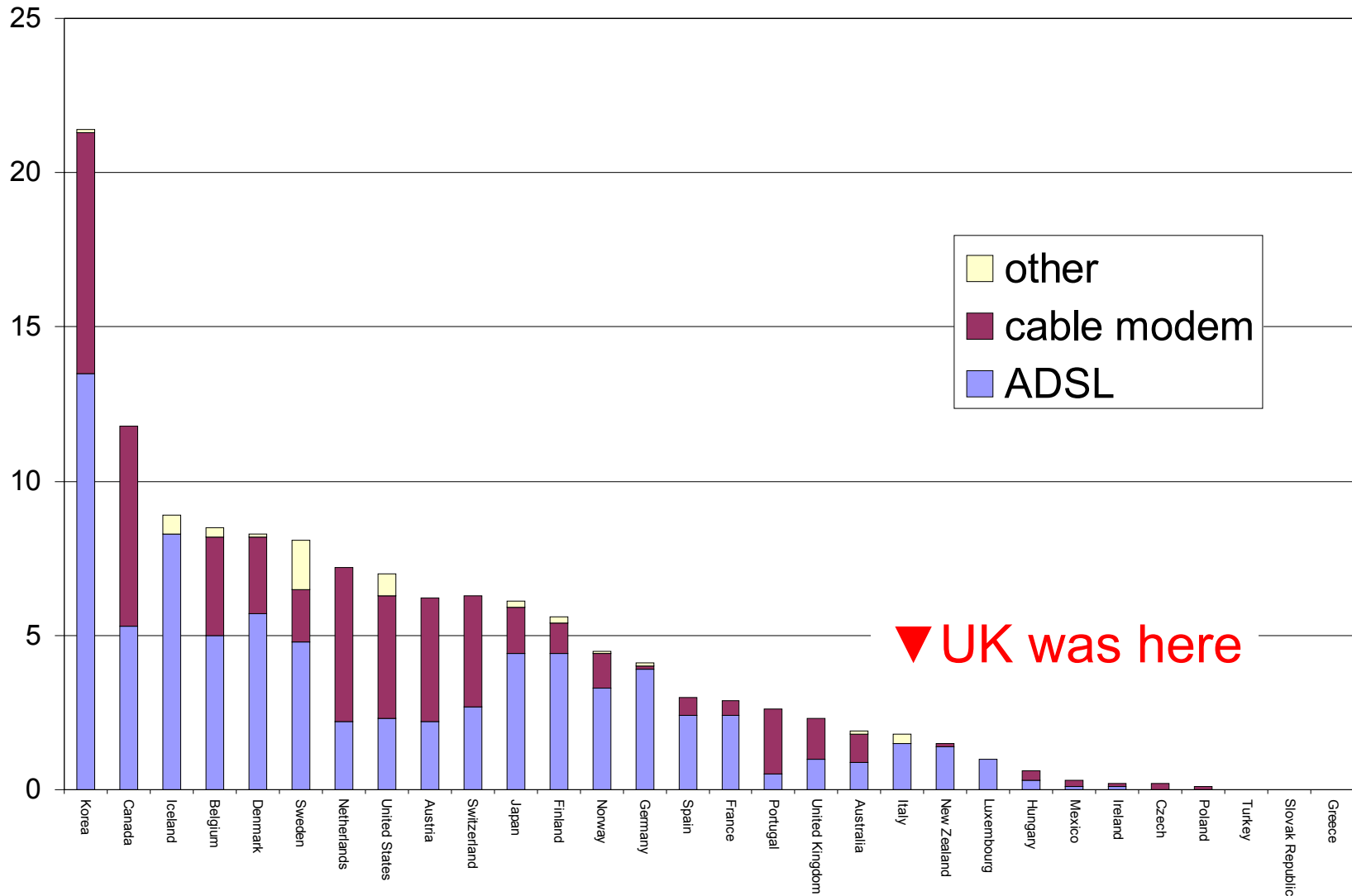
- fixed network growth has been minimal
- GSM with pre-paid cards has driven growth, but how could it migrate to broadband?
- traditionally long delays in adoption of new technologies and services
- high cost of International Internet Connectivity (IIC) because of:
 - lack of competition in international leased lines
 - incumbent operators overcharging or blocking access to submarine cables

ADSL now available



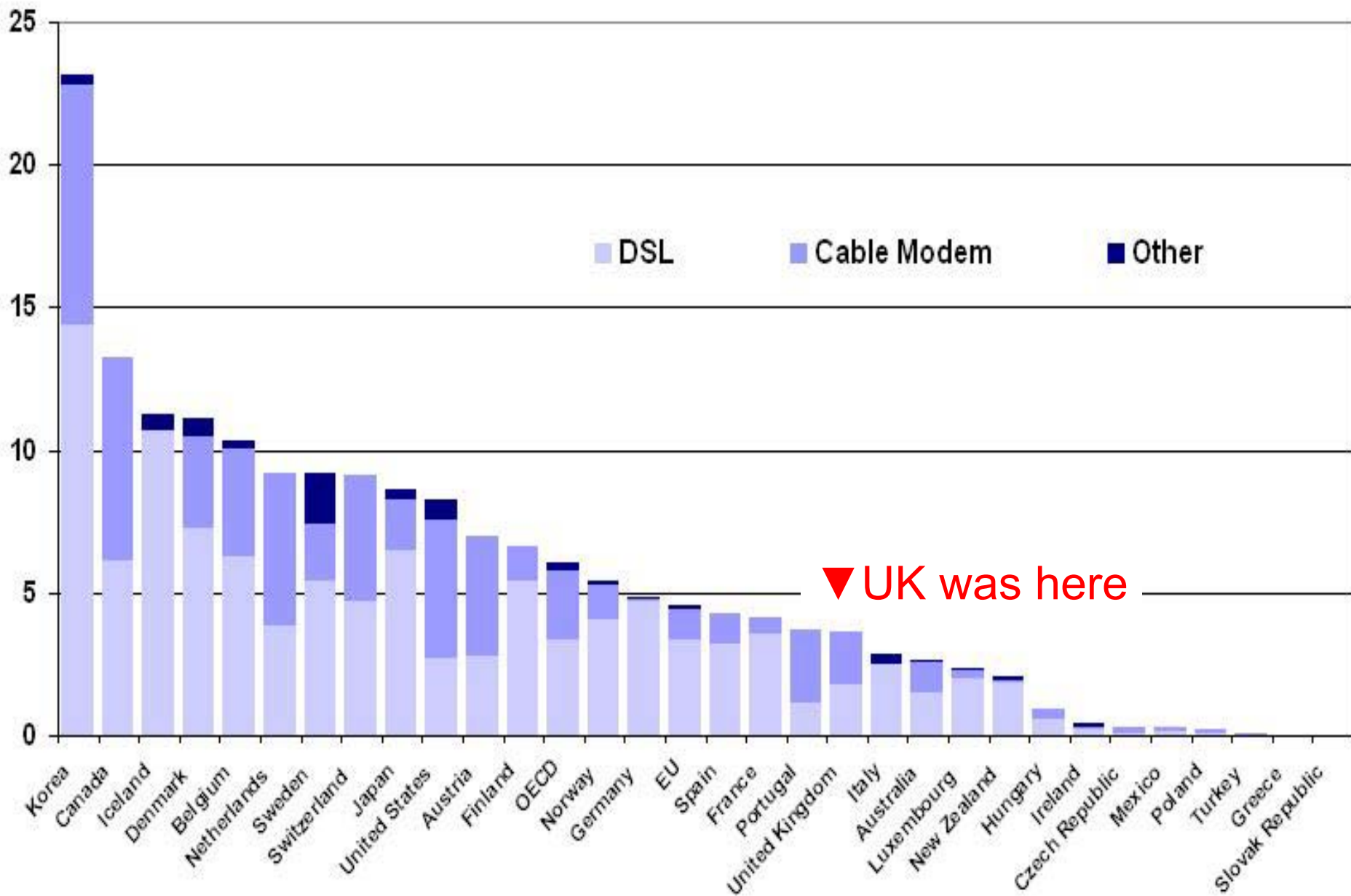
- Morocco
 - Maroc Telecom and Wanadoo
- Algeria
 - Wanadoo & Asila (Telecom Algerie + Daewoo)
- Tunisia
 - TopNet ADSL and Tunet
- Egypt
 - Glory “Don't Slow Life” (DSL)
 - Mena ADSL and Internet Egypt ADSL
- Libya
- Senegal

OECD at end of 2002



Broadband access in OECD countries per 100 inhabitants, June 2003

Source: OECD

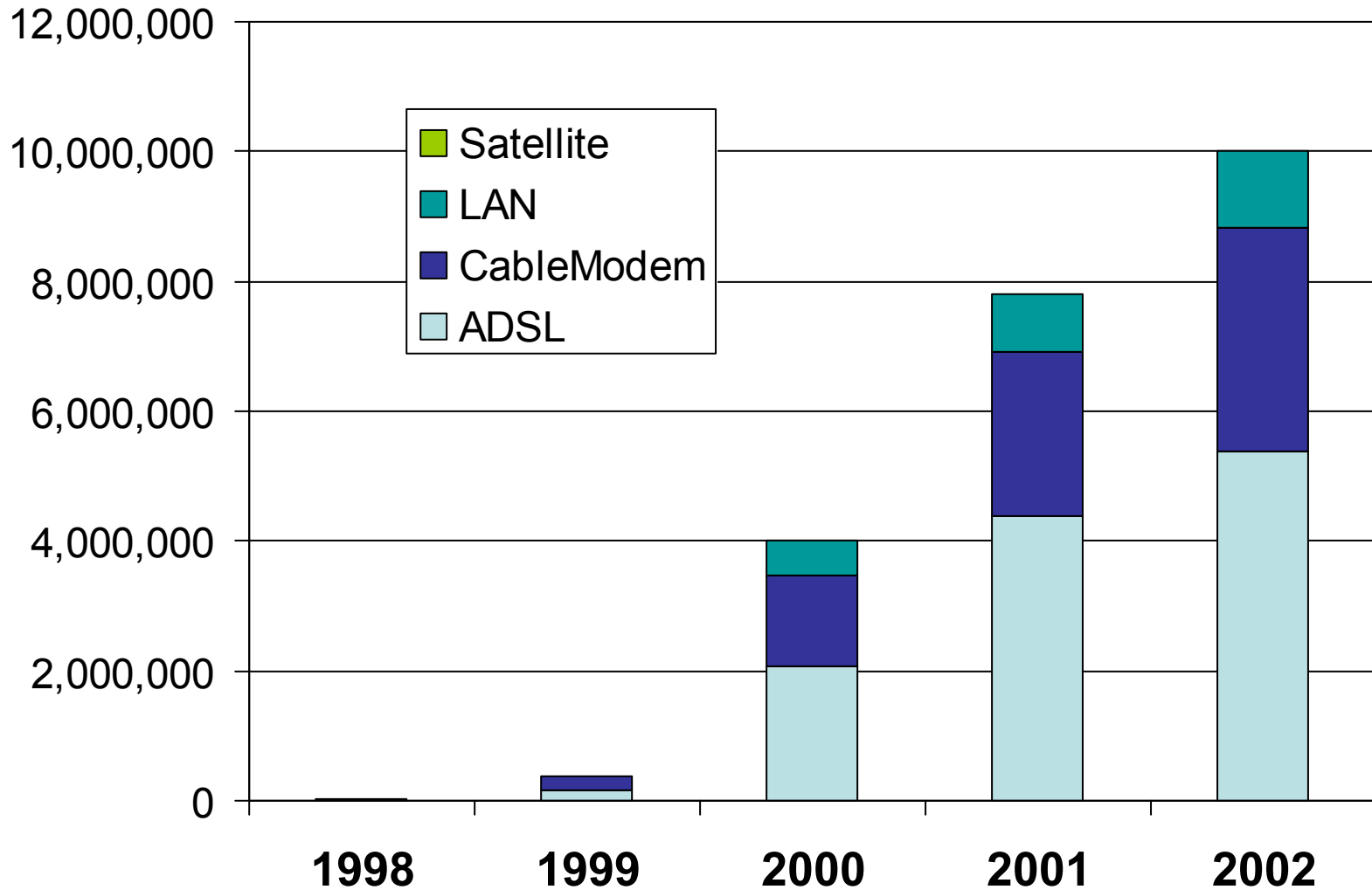


Republic of Korea



- economic growth since Korean War
- strength and depth in electronics
- cellphone exports in 2003 were US\$ 50Bn
- global broadband leader:
 - market saturated Q4 of 2002
 - 11M lines at 8Mbps at US\$ 25 per month
 - very high proportion of high-rise apartments
 - very high level of home PC ownership
 - plus 25,000 WLAN hot spots

Korean broadband growth

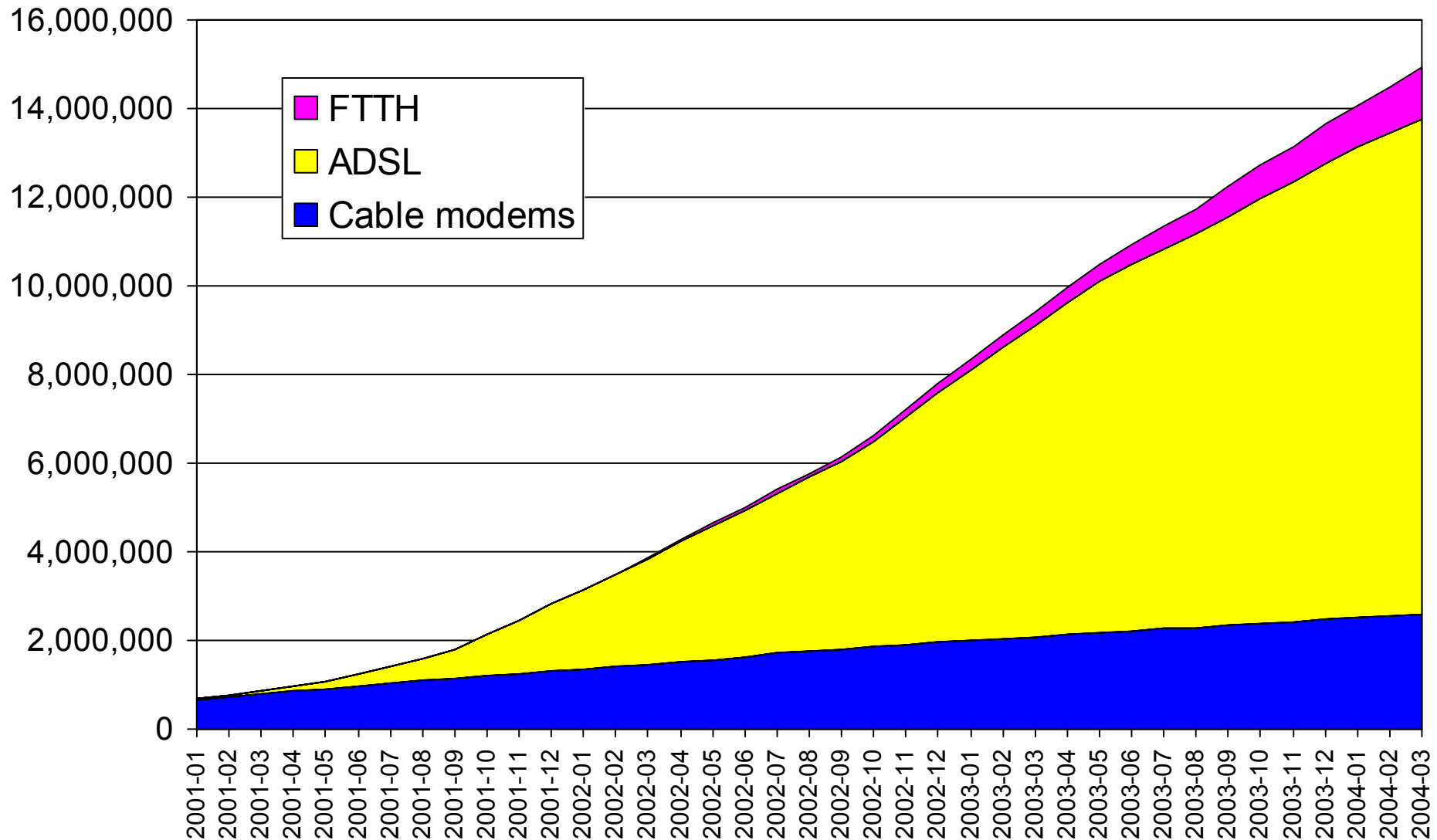


Korea next generation



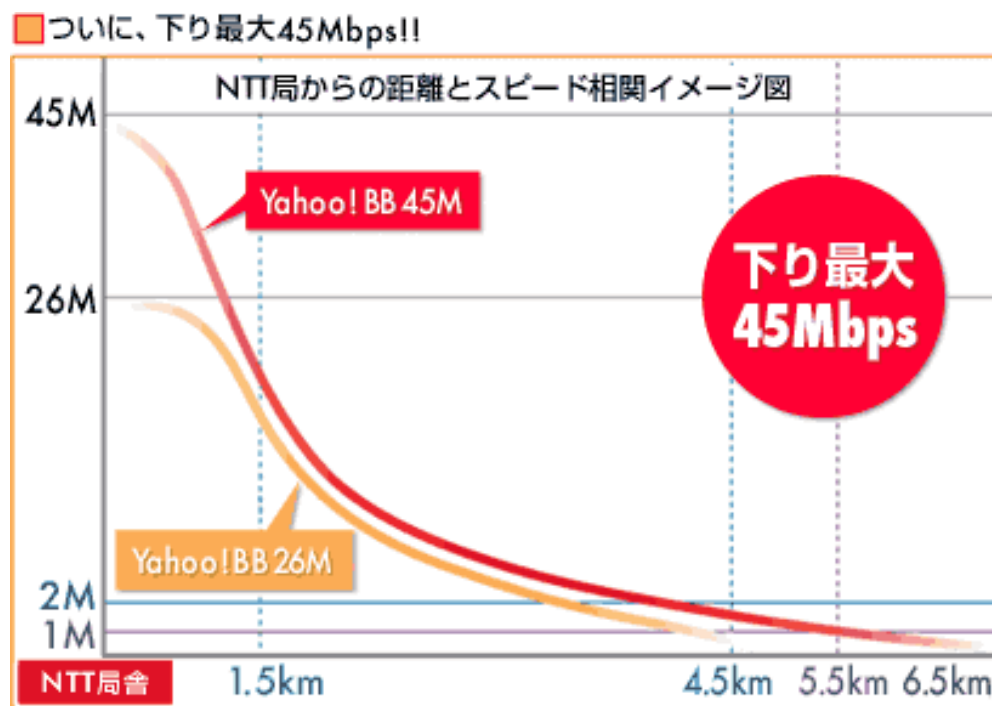
- 3G deployed and fully operational
- ADSL migrating to VideoDSL (20+ Mbps)
 - KT Megapass
1.4M VDSL lines at end of 2003 (of 5.5M)
 - Hanaro Hanafos (20M down, 6M up)
0.2M VDSL lines at Feb 2004 (of 2.7M)
- broadband convergence networks
 - 2.3 GHz
 - 100Mbit/s
 - national coverage by 2008?

Japanese broadband



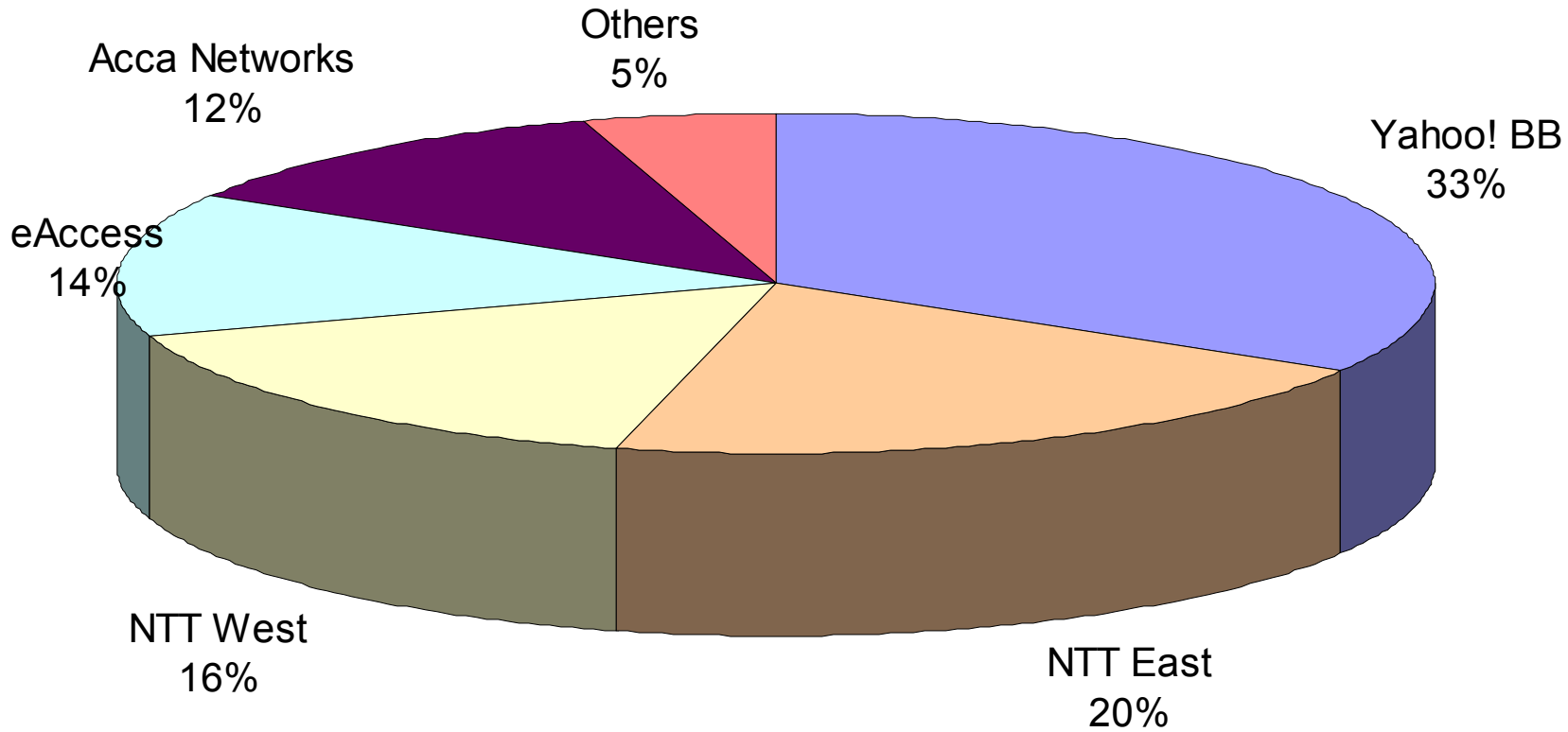
some monthly charges

- Yahoo! BB ADSL
 - 45Mbps ¥ 3,938
 - 26Mbps ¥ 3,838
 - 12Mbps ¥ 3,538
 - 8Mbps ¥ 3,138
- eAccess + InterQ
 - 40Mbps ¥ 3,880
 - 8 Mbps ¥ 3,680



£ 1 = ¥ 202

ADSL market shares



FTTx



- fibre in incumbent backhaul network opened to competitors
- Fibre To The Home (FTTH)
- Fibre To The Building (FTTB)
- entry of TEPCO
Tokyo Electric Power Company
 - 100Mbps
 - FTTH ¥6,480 per month

£ 1 = ¥ 202

japan - overview



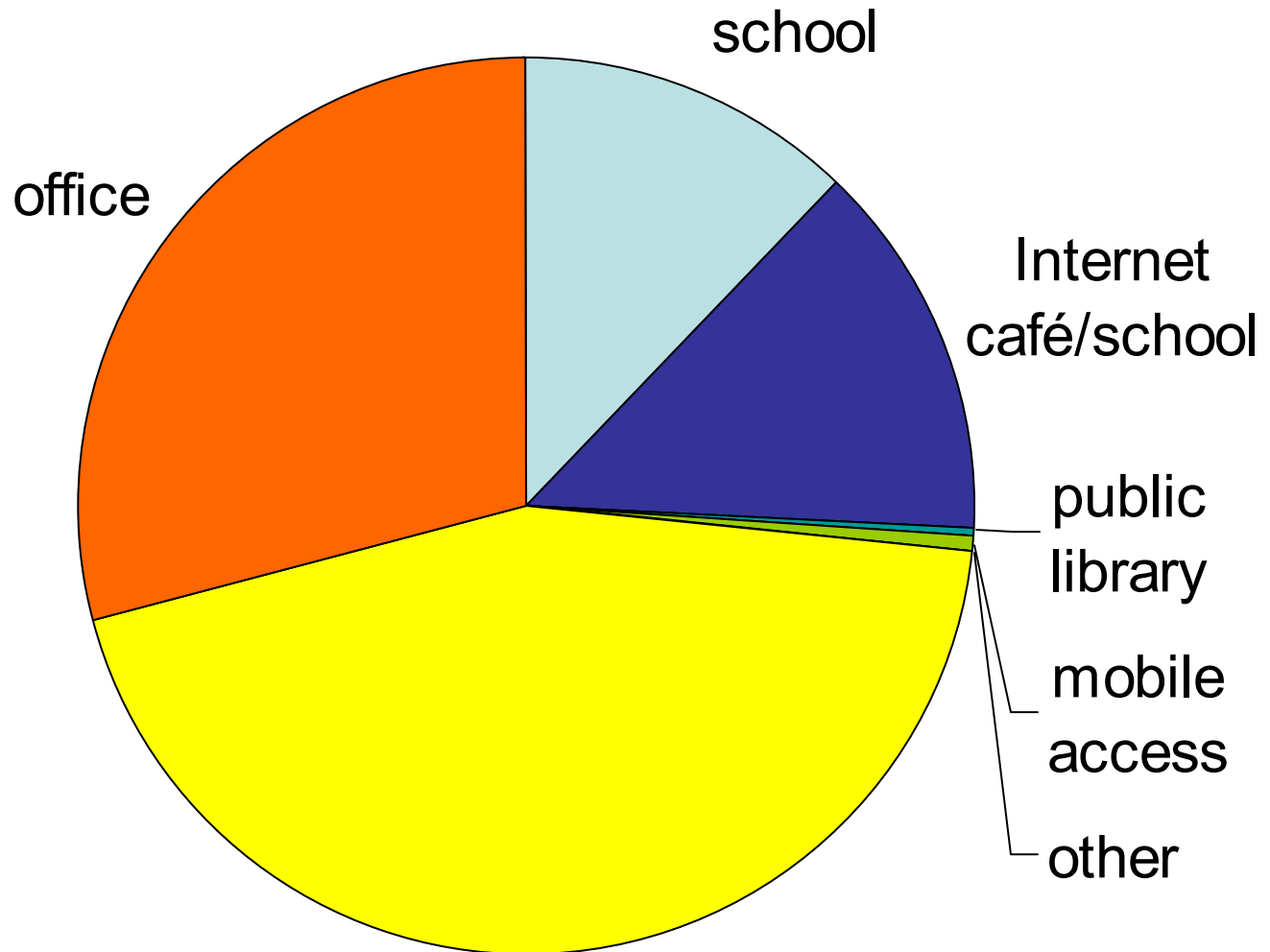
- chasing Korea very hard
- economies of scale:
 - network operators
 - manufacturers
 - modems
 - broadband appliances
 - application and service providers
- finding out what innovative customers and service providers are doing
- creating an economic cluster

china



- very rapid growth
- huge economies of scale
- cheap domestically manufactured equipment
- using many different technologies
- multi-storey apartment blocks easily connected
- huge regional disparities

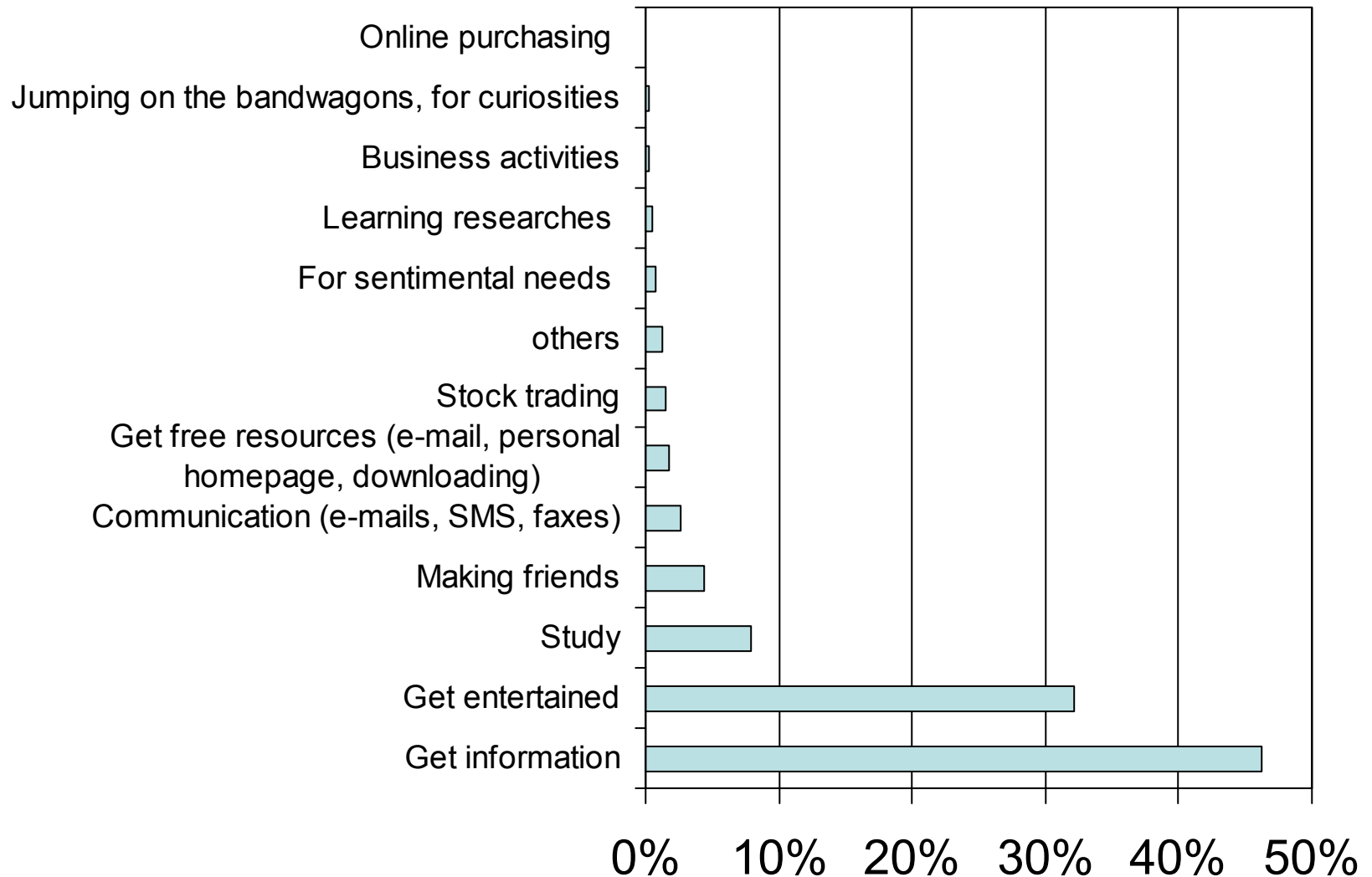
china - place of access



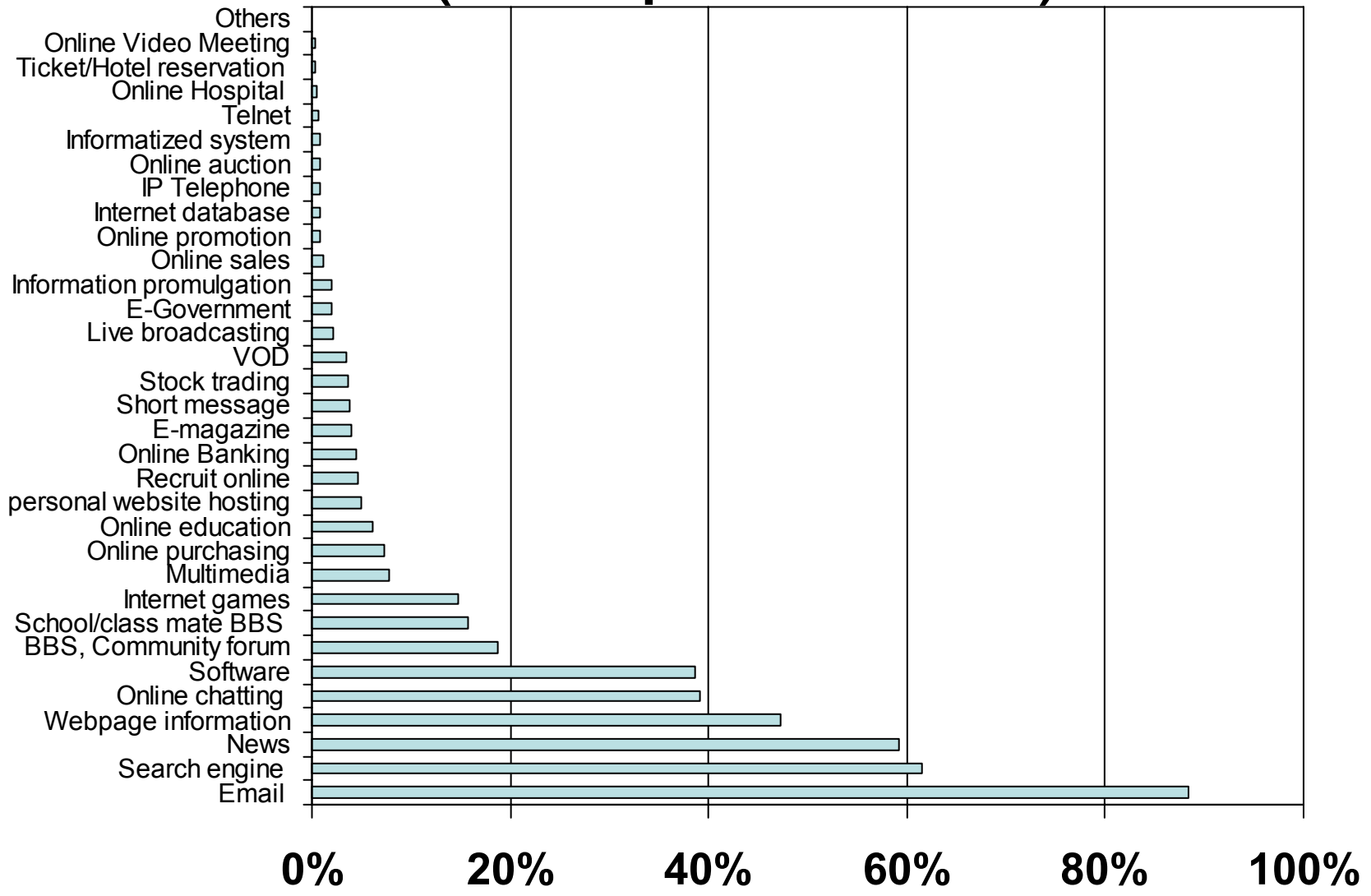
13th Statistical Survey on the Internet
Development in China (Jan. 2004)

home

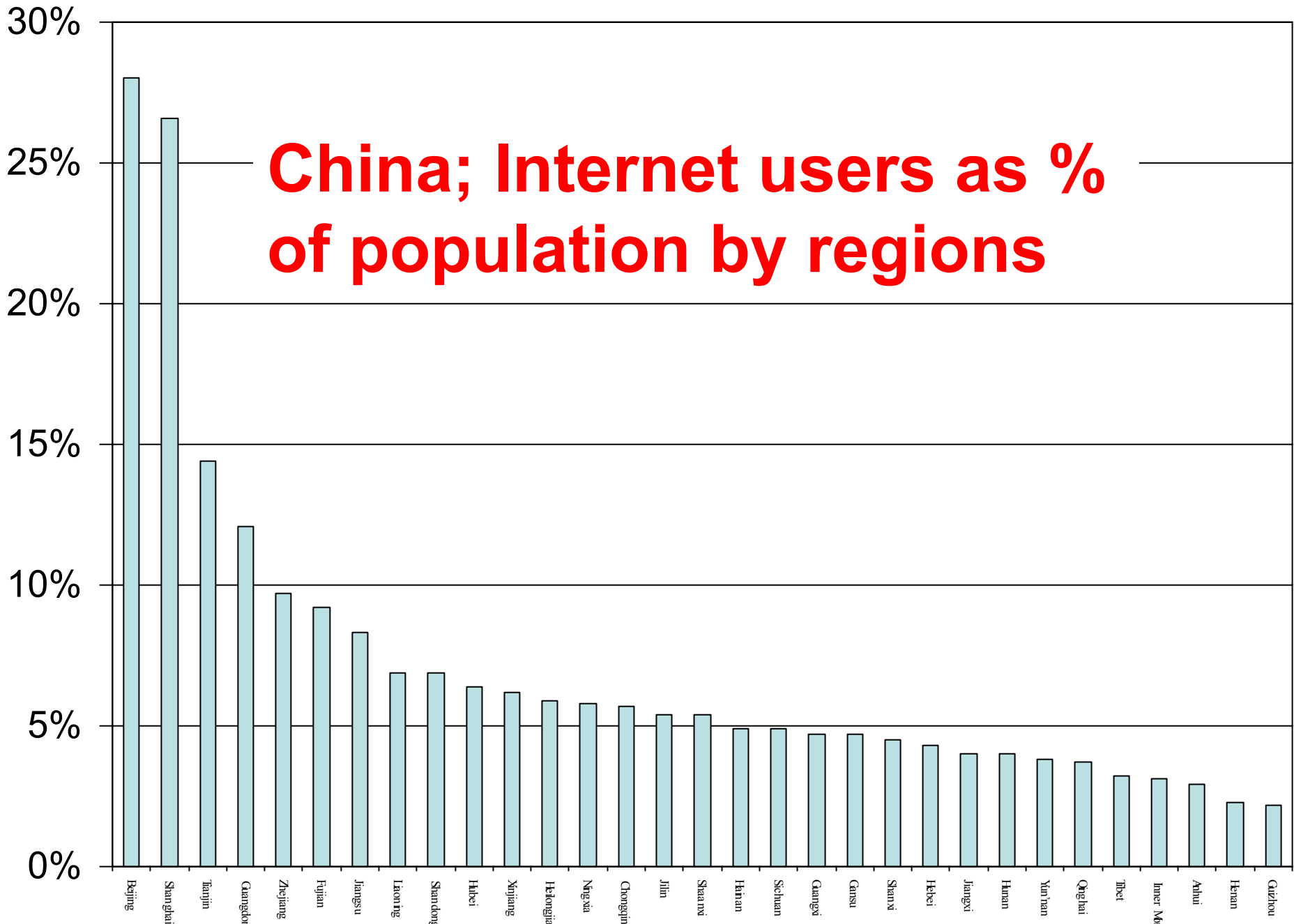
primary goal in accessing the Internet



most frequently used services (multiple choice)

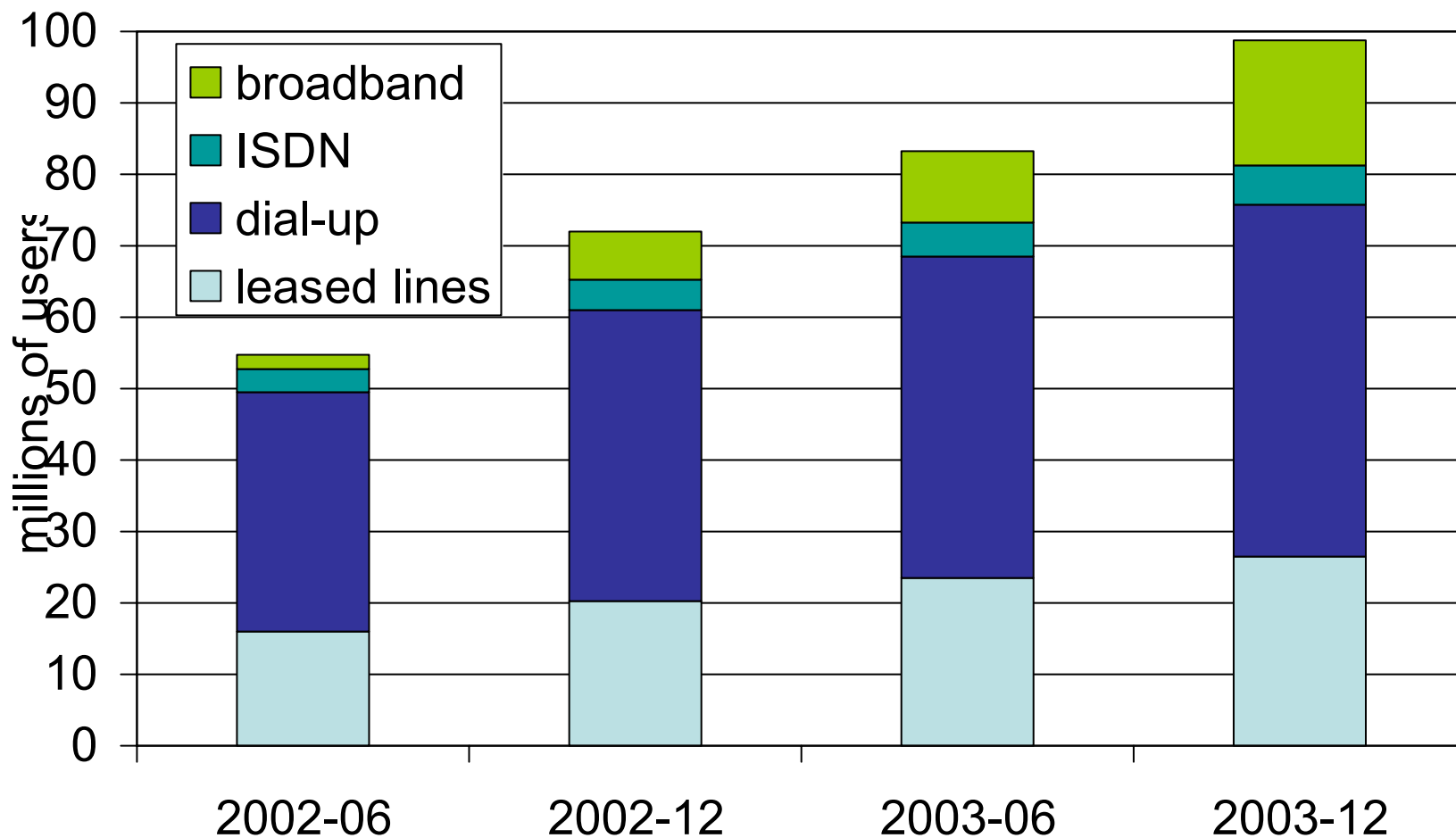


China; Internet users as % of population by regions



13th Statistical Survey on the Internet Development in China (Jan. 2004)

china – users' access methods



china broadband



- 11 million ADSL lines at end of 2003:
 - 7.4M China Telecom Group
 - 3.5M China Netcom
 - 0.3M China Railcom
- will add:
 - 11 million in 2004
 - 15-20 million in 2005
- cable modems (1M?)
- BWA on 3.5GHz (1M “lines”?)
- still adding a lot of dial-up users

Should overtake EU in number of lines during 2004/5

singapore



- early push on core infrastructure
- Singtel ADSL:
 - 256k SG\$ 57.75 or 512k for SG\$ 78.75
- Starhub cable modem:
 - 1.5M for \$58.80 or 3M for \$79.80
- government as Temasek Holdings controls:
 - SingTel
 - ST Telemedia which owns 50% of Starhub
 - SMRT (railway company)
 - a number of electricity and gas companies
- cannot get competition

SG\$ 3 = £1

india

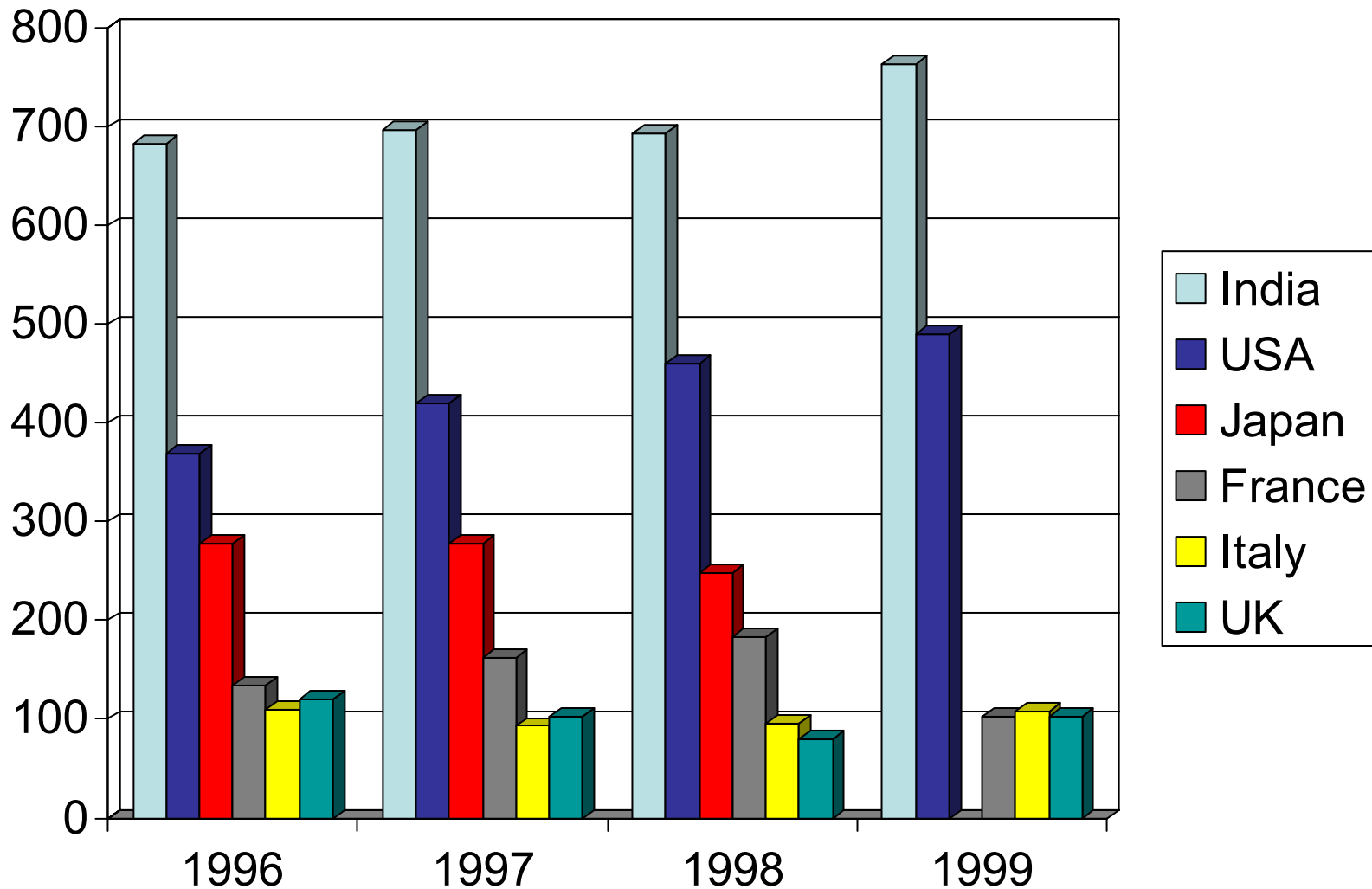


- rivalry with China
- competition worked with GSM (adding about 1.5M per month)
- likely to be repeated in broadband
- aiming at an initial 10 million lines
- ISPs authorised to build own last mile
- likely to be second largest English language broadband market by 2005

indian prospects

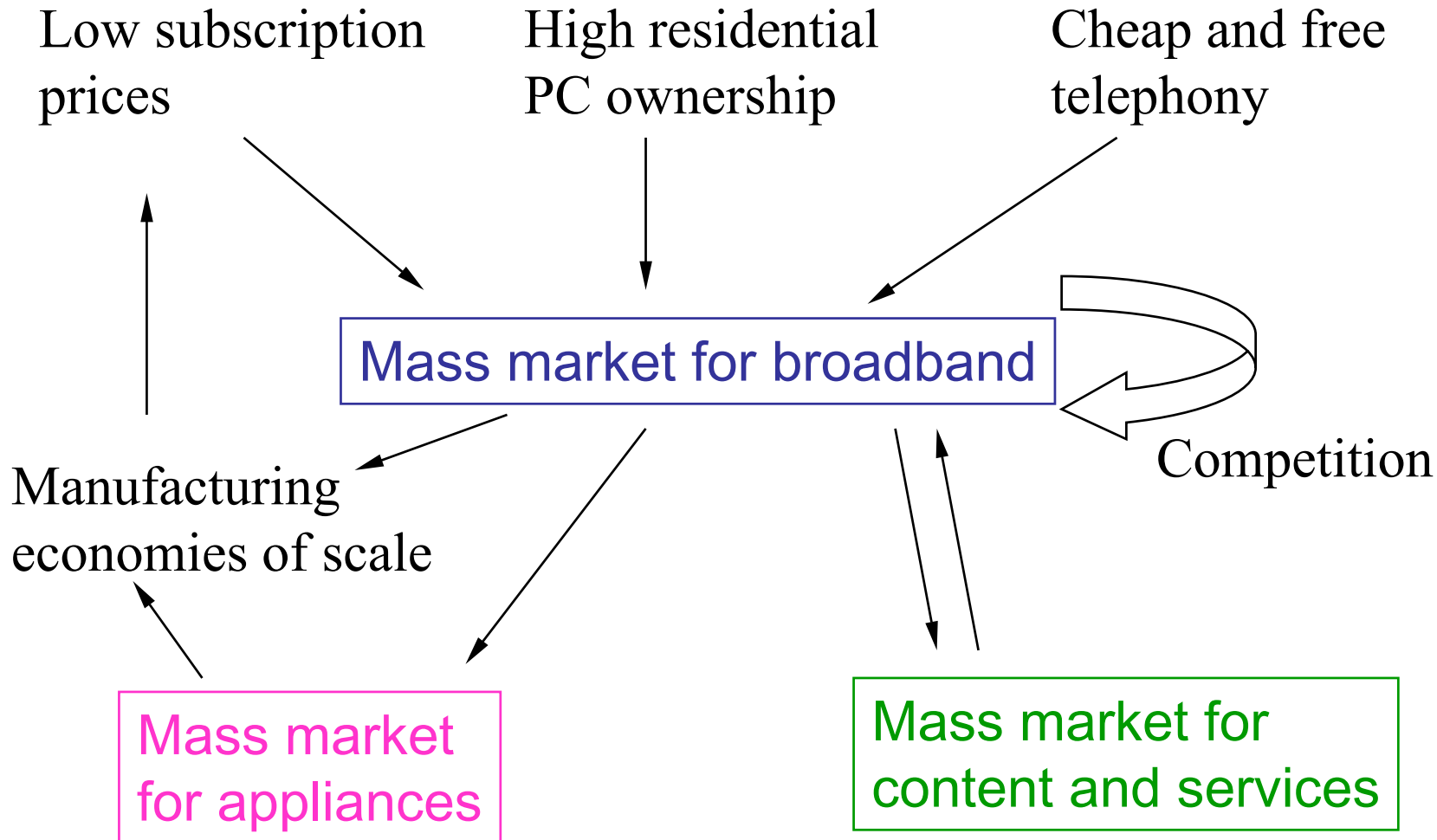
- new TRAI policy
- fixed incumbent and mobile operators
- cable operators
- ISPs
- national backhaul:
 - incumbent operators
 - IPStar (satellite)
 - Tata Power (carriers' carrier)
- international cable capacity
 - FLAG, i2i and SEA-ME-WE 4
- truly massive content industry

movie titles produced



Source: UNESCO.

drivers



NE Asia *versus* Europe



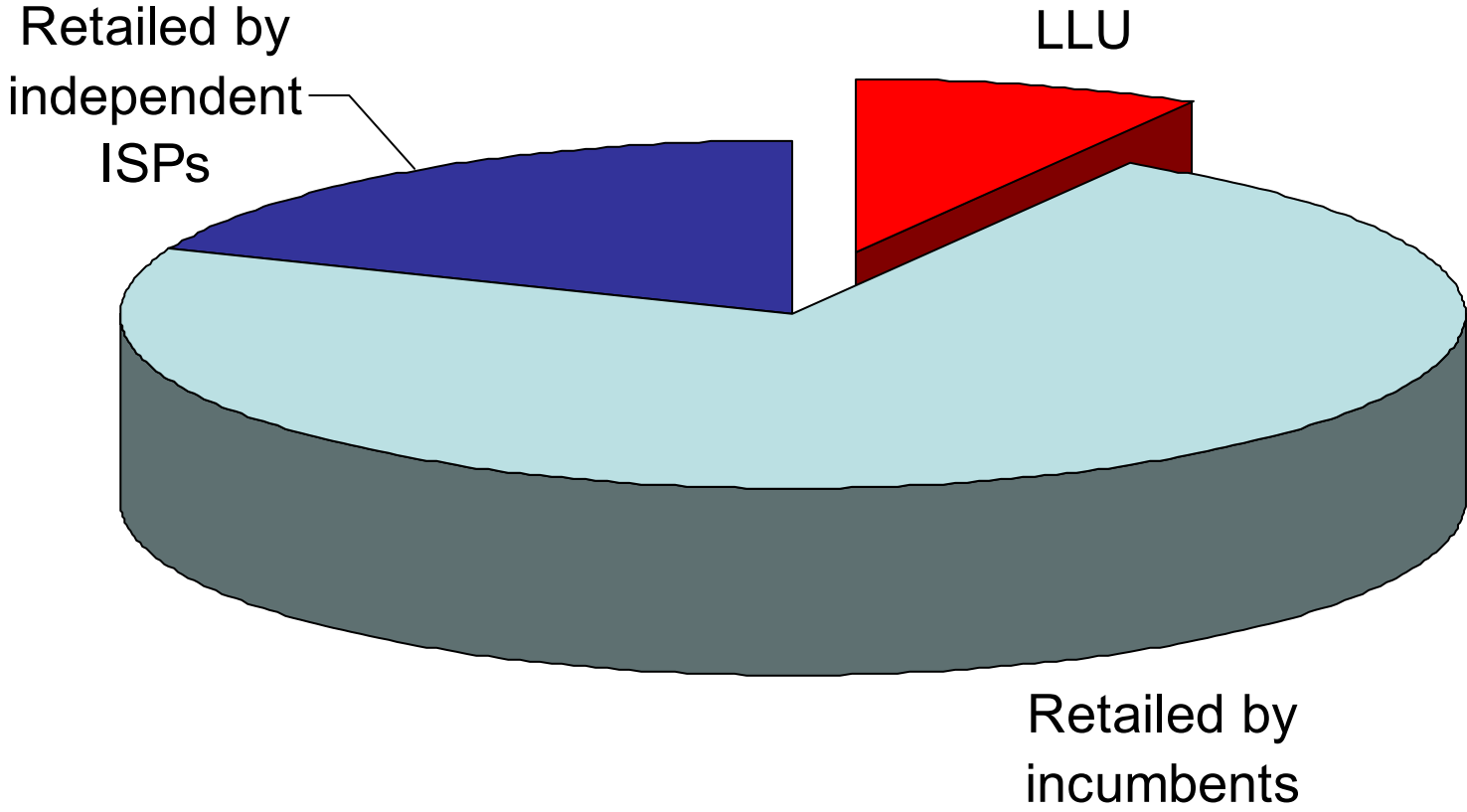
- very high bandwidth
 - access
 - to all content
 - from all networks
 - massive scale for
 - operators
 - manufacturers
 - service providers
 - competitive market structure
- mostly “bonsai”
broadband: < 1Mbps
 - protecting leased line revenues
 - incumbents
deny/delay/degrade LLU
for rivals
 - incumbents bundle to
block/stifle rivals
 - VoIP to protect telephony
market share
 - content to control path to
VDSL

european union



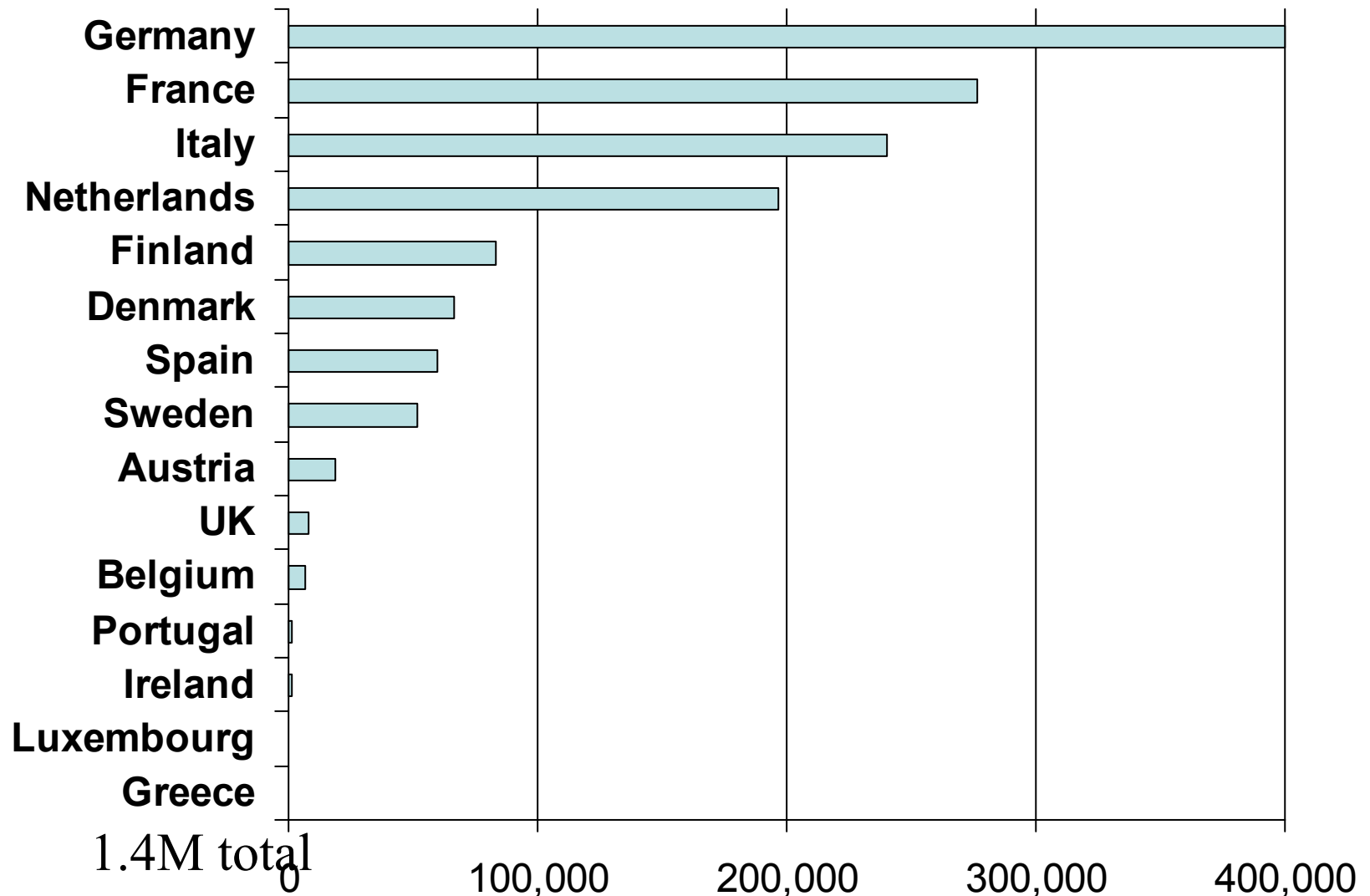
- goal is to be the most dynamic knowledge-based economy
- local loops unbundled in January 2002
- results mediated by performance of
 - (weak) national regulatory authorities
 - (strong) incumbent operators
- absence of cross-border market entry
- new regulatory framework very slowly being put into place

EU-15 ADSL

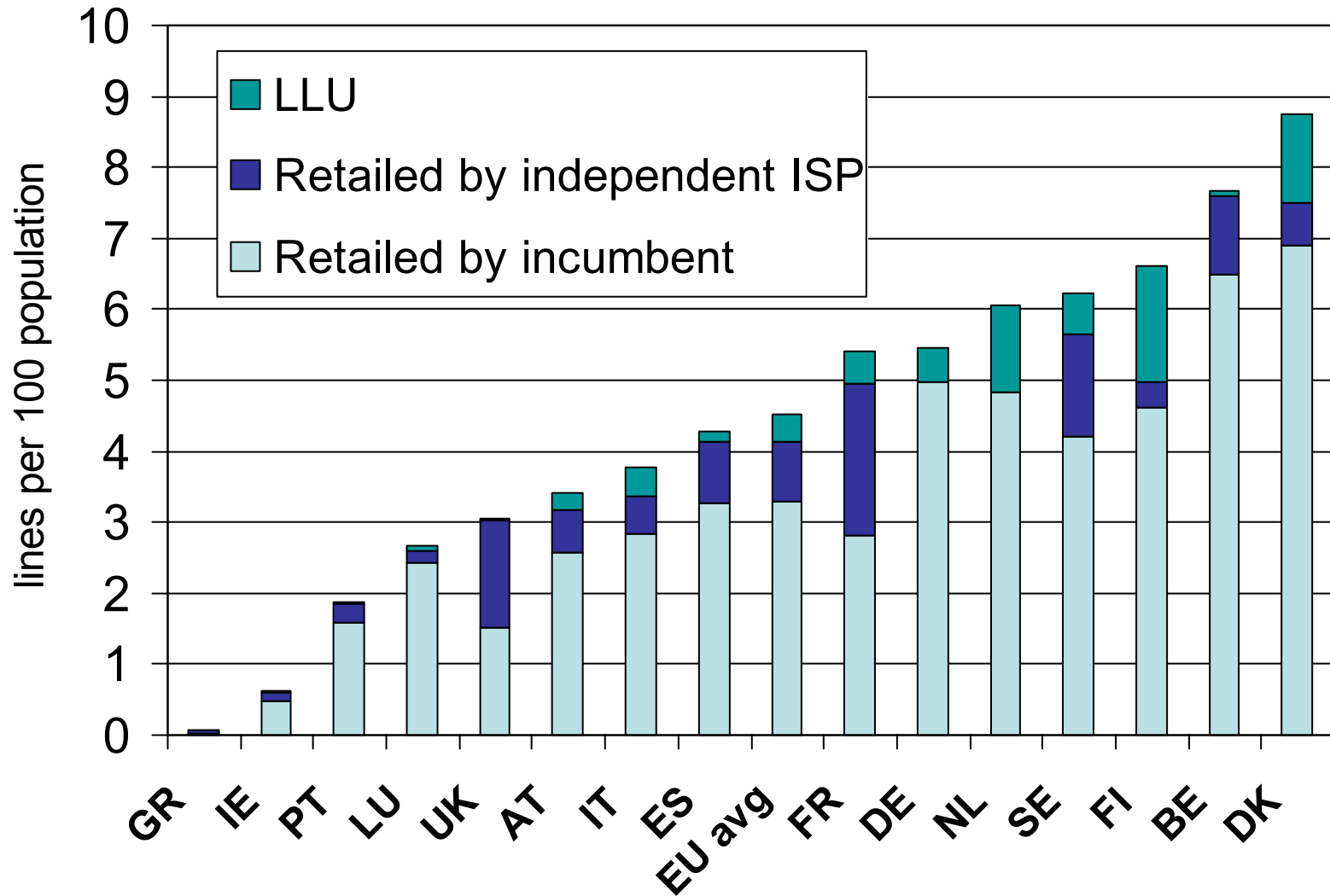


Source: ECTA.

unbundled lines in EU15

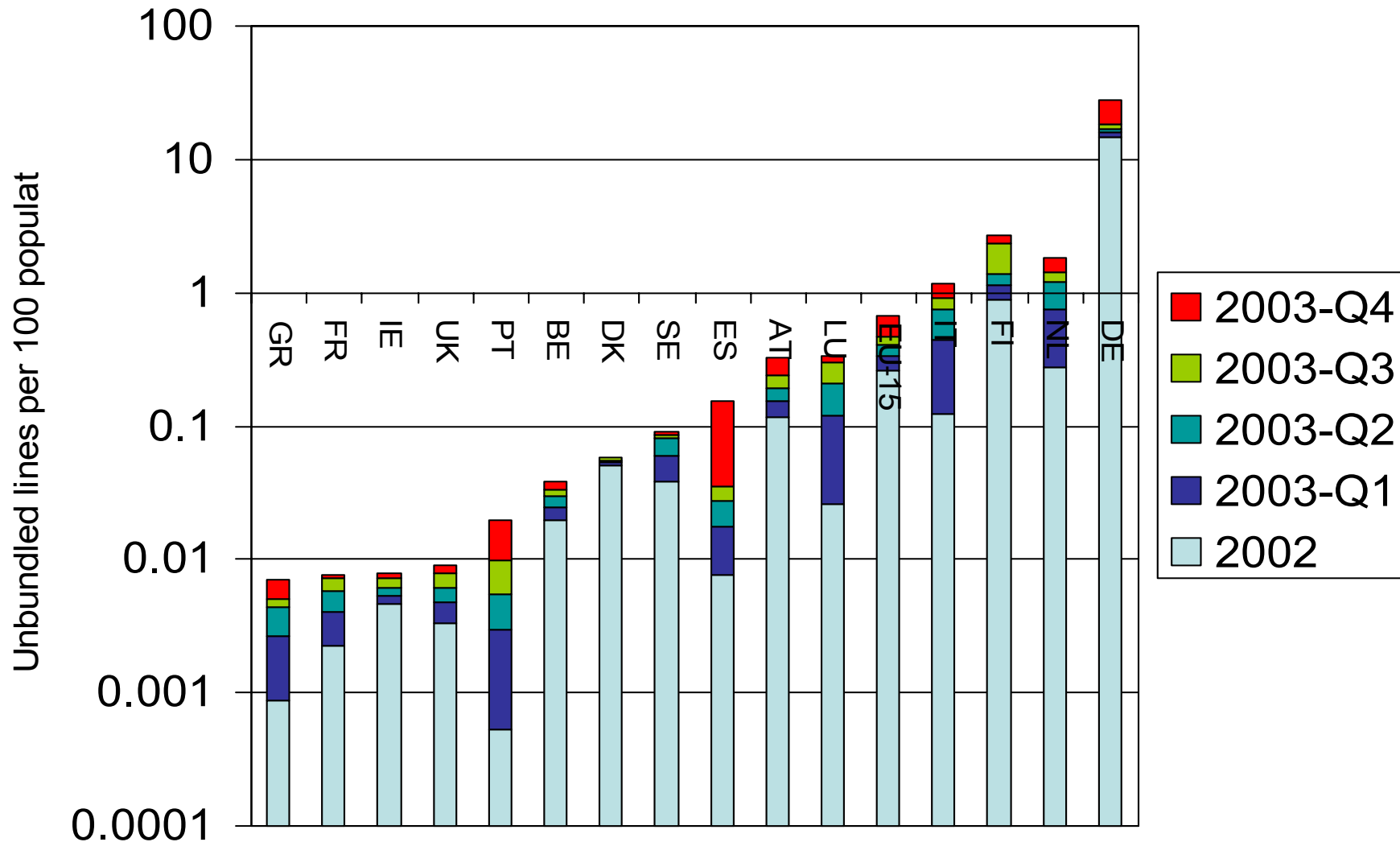


EU-15 ADSL by country



Source: ECTA

growth of LLU in EU-15



european union



- no trace or hope of a single market
- some countries slow-starters or no-shows
- few countries have robust competition
- deeply divided national markets and regulation
- minimal cross-border market entry
- mostly “bonsai” broadband
 - 256k or 512k offers
 - EUR 15 to EUR 25 per month
- steep price gradient to higher speeds
- price competition rather than line speed competition

the good boys

- Belgium
 - 3Mbits/s ADSL and 4Mbits/s cable modems
- Denmark
 - lots of “bonsai” broadband 256kbits/s
 - some interesting municipal initiatives
- Sweden
 - Bostream 26Mbits/s ADSL
 - Bredbandsverlaget 10 and 100Mbits/s
 - now TeliaSonera is speeding up
- Italy
 - Fastweb FTTB in some major cities

rural and remote



- very little patience
- yet no clear target!
(technology, speed, market structure, etc)
- no business model yet
- wild enthusiasm for money from:
 - HM Treasury (after 20 years of liberalisation)
 - European Union structural funds
- OECD report says let markets work
- evidence of success of Wireless ISPs

Analysys report



- helps the evasion of public service obligations
- emergency services
 - unhelpful proposal for a standard for 112 access for business premises (c.f. Article 137 of EC Treaty)
 - unacceptable assumption of reduced access (c.f. positive efforts of NENA)
- assigning geographic numbers would
 - mis-present sub-standard services
 - reflect distorted tariffs of MNOs
- such numbers would not be portable

towards 100Mbits/s



- it will not be one specific technology
- it will not be one network
- Korea is already pushing ahead with Video-DSL 20-50Mbits/s (2M lines)
- Japan has 1M FTTH lines 100Mbits/s and growing at ~70,000 per month
- some high capacity radio technologies are being deployed

Fibre To The Home



- cannot consider this alone
 - interacts with ADSL and radio
 - tricky questions of fibre in the PSTN
- will it be competitive?:
 - not in rural areas
 - not if incumbent operators can help it
- opening for utility companies
- how do you regulate access regime; “must carry” and “must have”?

conclusions

leadership around East

China Sea:

- Korea (11M)
- China (11M + 11M)
- Japan (14M + 5M)

economic clusters:

- hardware
- applications
- services
- research

drivers:

- growth
- low prices
- content
- VoIP
- broadband appliances
- network effects
- peer-to-peer

government roles



- national ICT strategy
- ensuring real competition
- raising PC home ownership
- supporting local and linguistic content
- keeping a steady course

looking ahead



- target is **not** ADSL
- but the stage after!
(and the one after that)
- certainly **not** 0.25 to 2Mbit/s
- ubiquitous networks
 - wireline and wireless
 - 50 to 100 Mbits/s (and more)
- revenue from content and services