Regulatory models for Internet growth:

What way forward for South Africa?

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What way forward for South Africa?

- The Internet is widely recognised as contributing to societal welfare.
  - Increasing the overall performance of the economy by making markets more efficient.
  - Enhancing the access of the disadvantaged to information.
  - … and far, far more.
- What can regulation and public policy do to foster healthy growth of the Internet?
- What can South Africa learn from international best practice?

Agenda

- Introduction
- Regulation and public policy in the EU and US
  - Authorisation / licensing
  - Access
  - Interconnection
  - Spectrum policy
  - Universal service: basic service for all
  - Industrial policy: ultra-fast service for many
- “Managed liberalisation” in South Africa
- What way forward?

Introduction: What drives Internet growth?

- Physical availability to all.
- Affordable prices.
- Applications and content of interest.
- Prerequisites:
  - Suitable devices: PCs, smart phones, whatever
  - Educated consumers
- Consumer privacy, security, and trust

Introduction: What drives Internet growth?

- Competition is crucial
  - Widespread availability
  - Consumer choice
  - Affordable prices
- Promote widespread availability of fast services
- Avoid bottlenecks to applications and content
- Ensure that users have access to suitable devices, and know how to use them to access the Internet
- Promote a culture of security and privacy
- … but how????

Introduction: What drives Internet growth?

- As conventional networks migrate to IP-based NGNs, the technological basis is essentially the same as that of the Internet.
- Substantial practical differences remain between (closed) NGNs and the open Internet.
- All in all, it is increasingly clear that the health of the Internet is closely linked to that of the electronic communications sector overall.

Regulation and public policy: Key principles

- Let the market operate unimpeded wherever it is likely to generate appropriate results.
- Intervene to address likely market failures:
  - Market power
  - “Public goods”, universal service, and related challenges
  - Management of scarce public resources (spectrum, numbers)
- Prefer wholesale remedies over retail.
- Prefer *ex post* competition law over *ex ante* regulation in those cases where *ex post* would likely be effective.

Regulation and public policy

- Authorisation / licensing
- Access
- Interconnection
- Universal service: basic service for all
- Industrial policy: ultra-fast service for many
- Spectrum policy

Regulation and public policy

- The US and the EU represent two increasingly divergent approaches.
- Through the nineties, liberalised US approaches were widely admired and emulated.
- Since 2001, pro-business US regulators radically deregulated, with mediocre results.
- The EU system put in place in 2002 should be viewed as representing best practice today.

Regulation and public policy: Europe

- In the past, nearly every European country had a government-owned telecoms operator (PTT).
- Fixed, mobile, and in many cases cable television were all a single government monopoly.
- Comparisons with (especially) the US convinced most European experts that these government monopolies were inherently inefficient, and were impeding technological innovation.
- A period of privatisation and liberalisation followed, culminating in a European framework in 2002-2003.

Regulation and public policy: Authorisation / licensing

- Intense licensing regimes are often put in place in order, ostensibly, to protect consumers.
- There is a cost! They impede competitive entry.
- European practice:
  - Set low thresholds for the maximum burdens that national regulators (NRAs) can impose.
  - The ECS can be required to notify the NRA.
  - If, however, the NRA fails to quickly respond, *the ECS can proceed as if a licence had been granted*.

Regulation and public policy: Access

- The wired last mile is a competitive bottleneck in nearly all countries.
- In the absence of regulation, last mile market power leads to:
  - Inflated prices
  - Lack of consumer choice

Regulation and public policy: Access

- Mitigating factors need to be considered.
- Portions of the national territory might support some facilities-based telecoms competition.
  - High density of subscribers.
  - High disposable income.
- Cable television and wireless may, where present, provide an alternative means of access.
- The degree to which these represent meaningful competition needs to be carefully and objectively assessed by means of competition economics.

Regulation and public policy: Access

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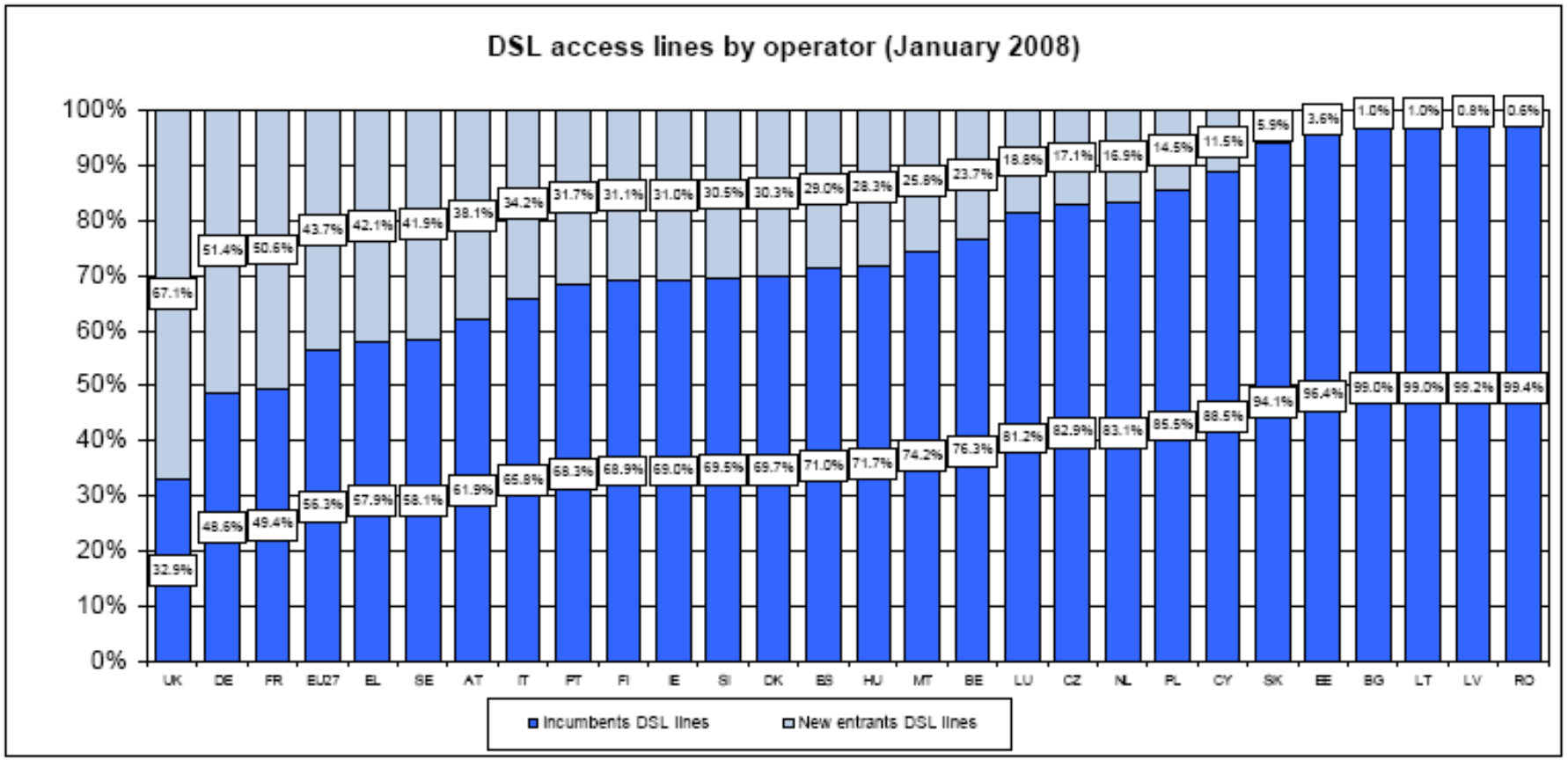
Regulation and public policy: Access

- Europe is characterised by a systematic approach where the European Commission initially identifies markets that are potentially problematic.
- National Regulatory Authorities then analyse:
  - The market definitions in their national context
  - Whether any market players have Significant Market Power (SMP)
  - What remedies should be applied to those with SMP
- The Commission then reviews the results.
- The process is public and very transparent.

Regulation and public policy: Access

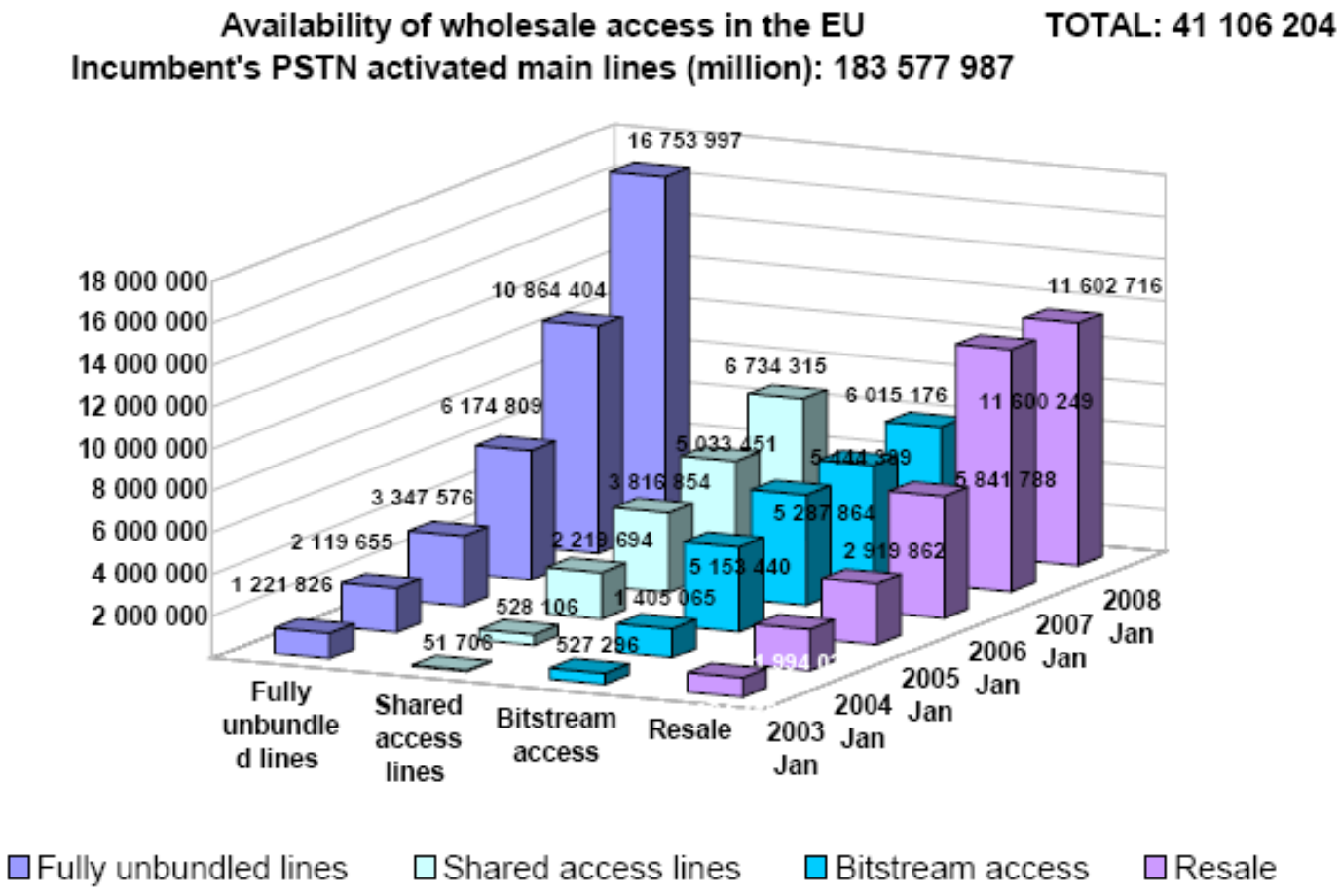
- Last mile fixed network access has been a central focus in Europe.
- A range of remedies, enabling competitive entry with different levels of investment and different risk/reward profiles, comprise a “ladder of investment”.
  - Simple resale
  - Bitstream access (ATM or IP)
  - Shared access
  - Full Local Loop Unbundling (LLU)
- As you move downwards, greater investment is required, but there is greater opportunity as well.

Regulation and public policy: Access



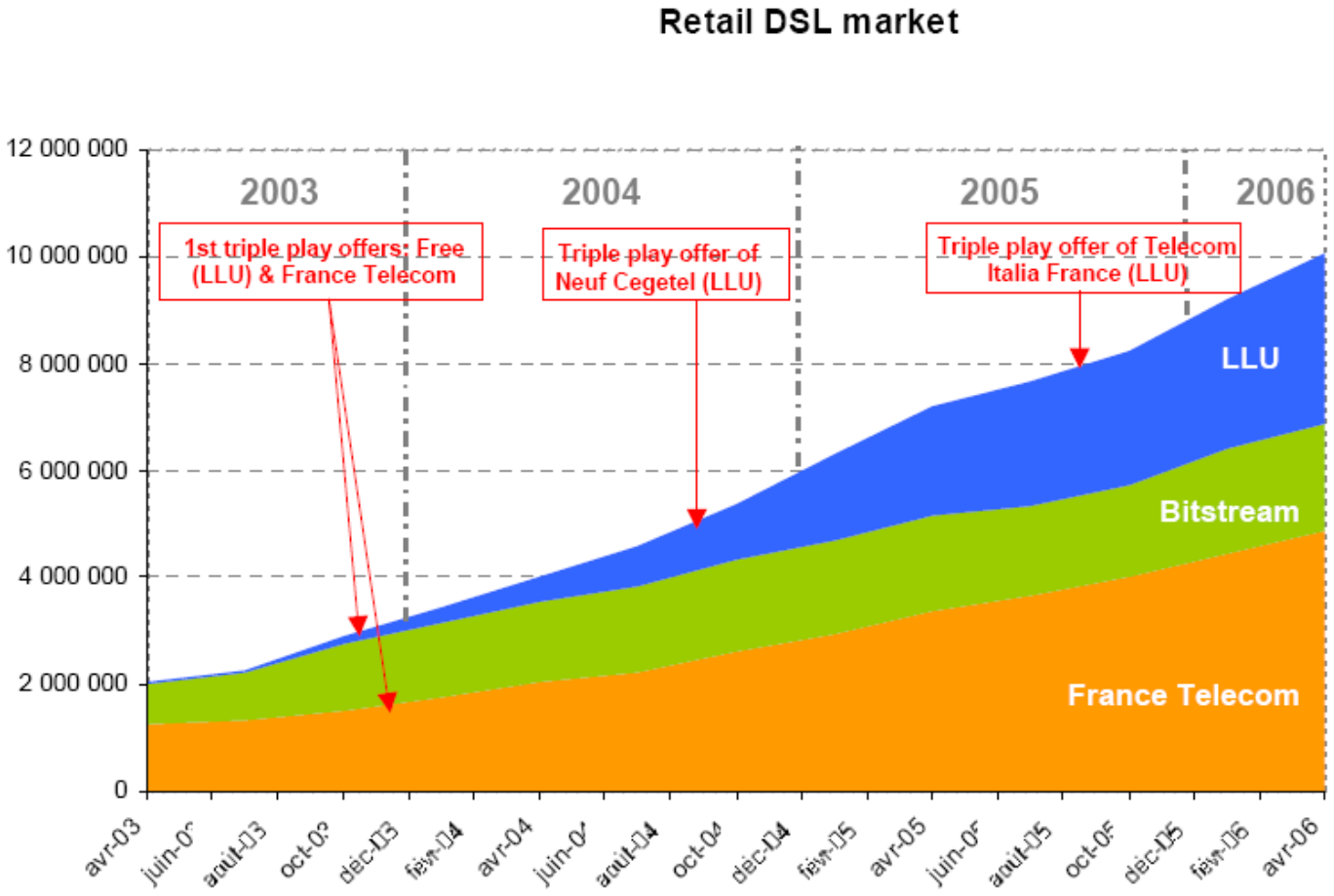
Source: European Commission 13th Implementation Report

Regulation and public policy: Access



Source: European Commission, *13th Implementation Report*

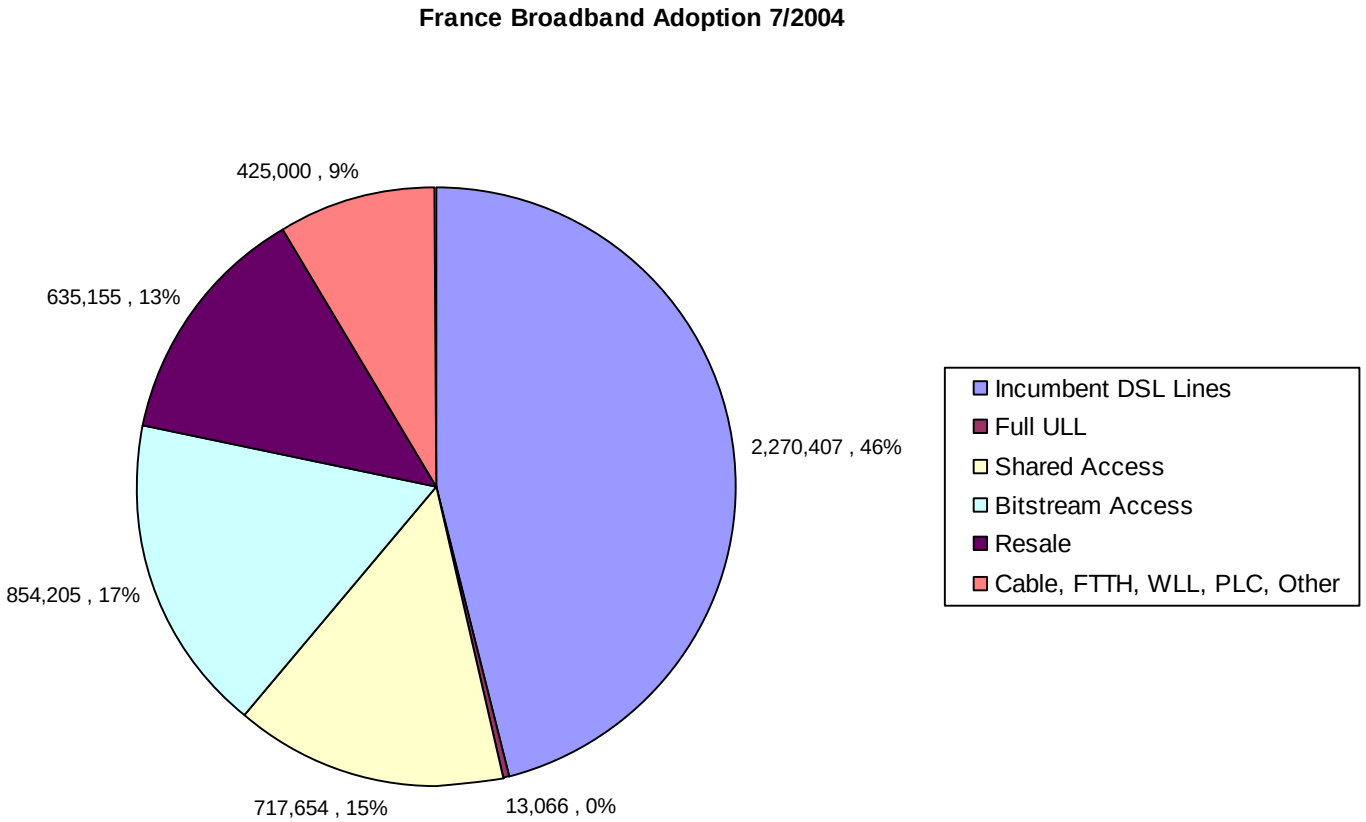
Regulation and public policy: Access in France



Source: European Regulators' Group (2006)

Broadband market competition report - French Case Study

Regulation and public policy: Access in France



Source data: European Commission, *10th Implementation Report*

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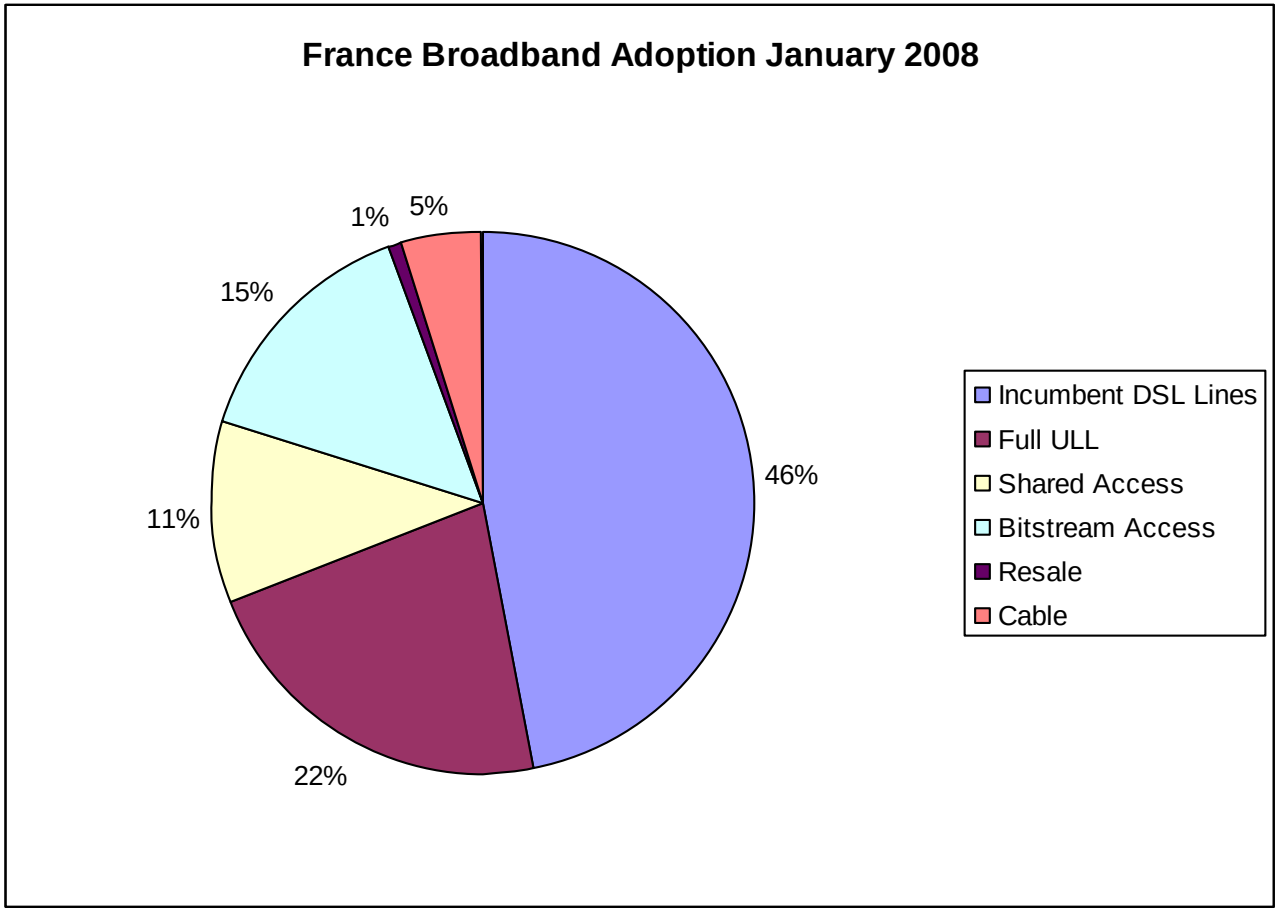
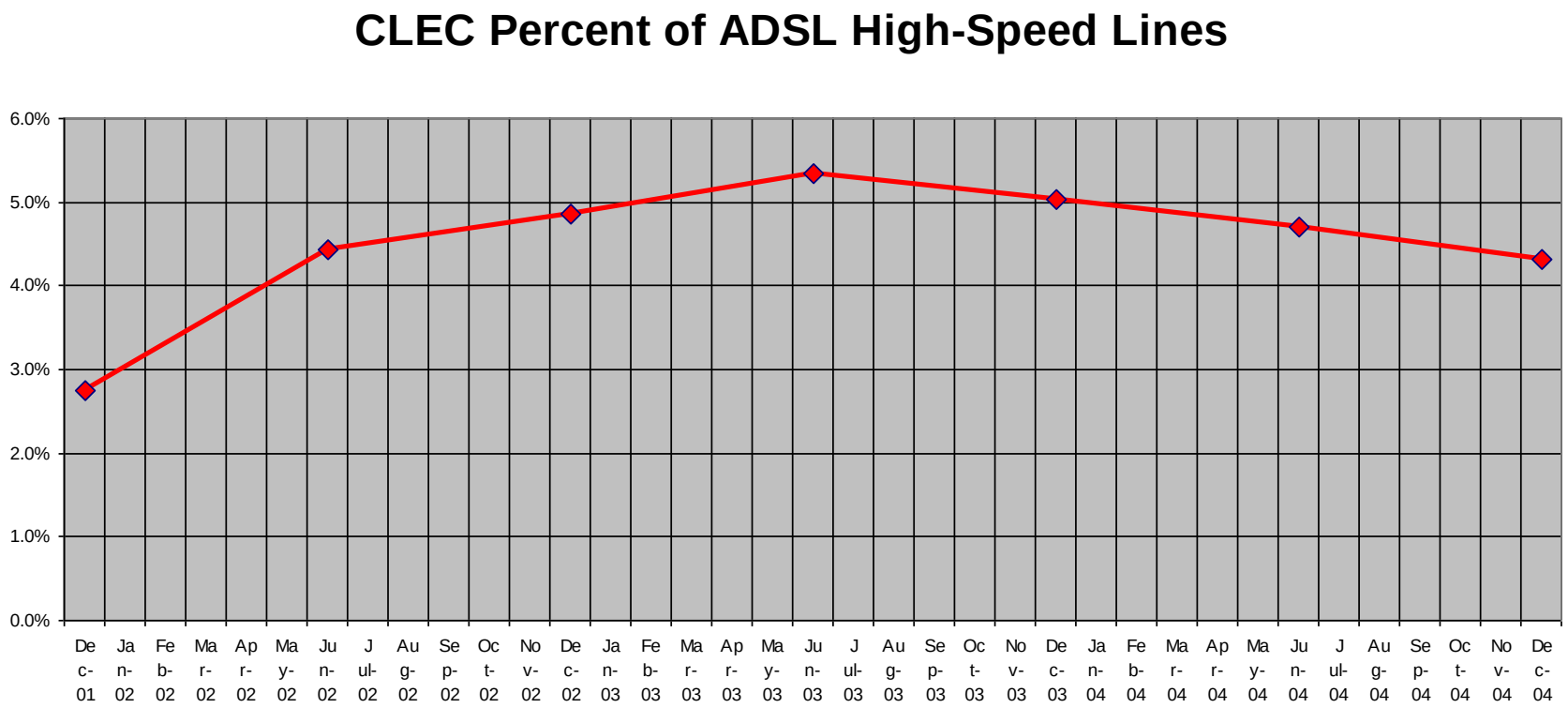


Source data: European Commission, *13th Implementation Report*

Regulation and public policy: Access in the United States

- The US was on a similar trajectory in the nineties, but has now taken a very different course.
- Historic recognition of market power, but little or no explicit market power analysis.
- No over-arching technological neutrality.
- Competition law mutually exclusive with regulation.
- Radical deregulation during the period 2001-2008.
- Increasing market concentration.
- Collapse of competitive network operators.

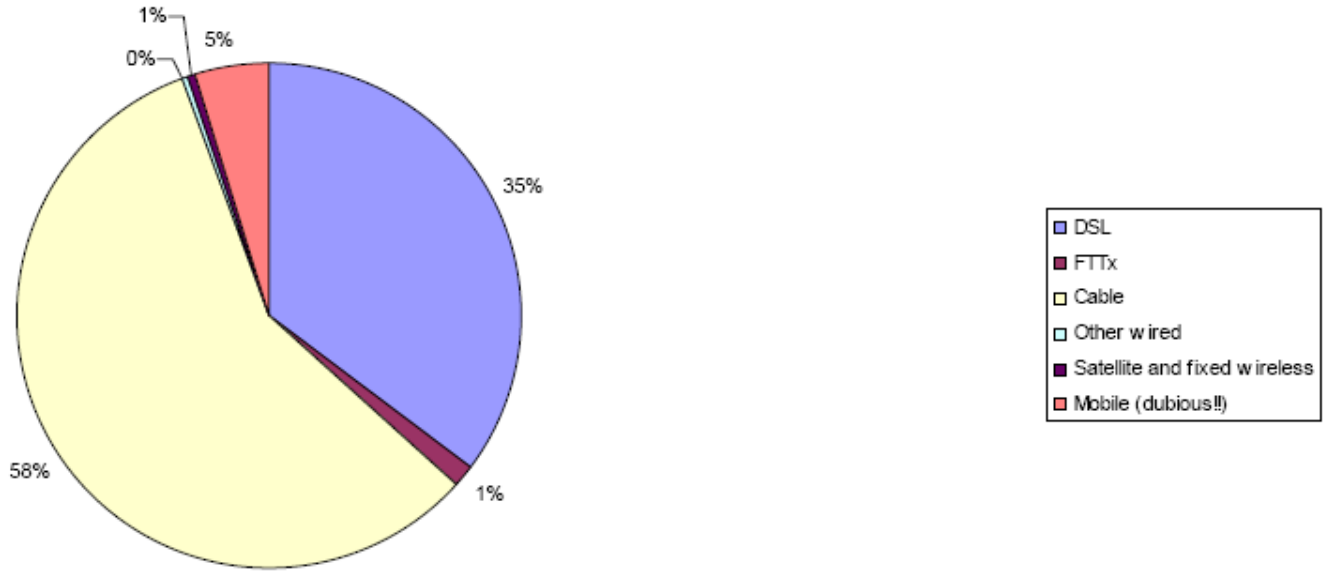
Regulation and public policy: Access in the United States



Source: FCC reports based on Form 477 carrier data

Regulation and public policy: Access in the United States

US Residential Broadband
(at least 200Kbps both directions, December 2006)



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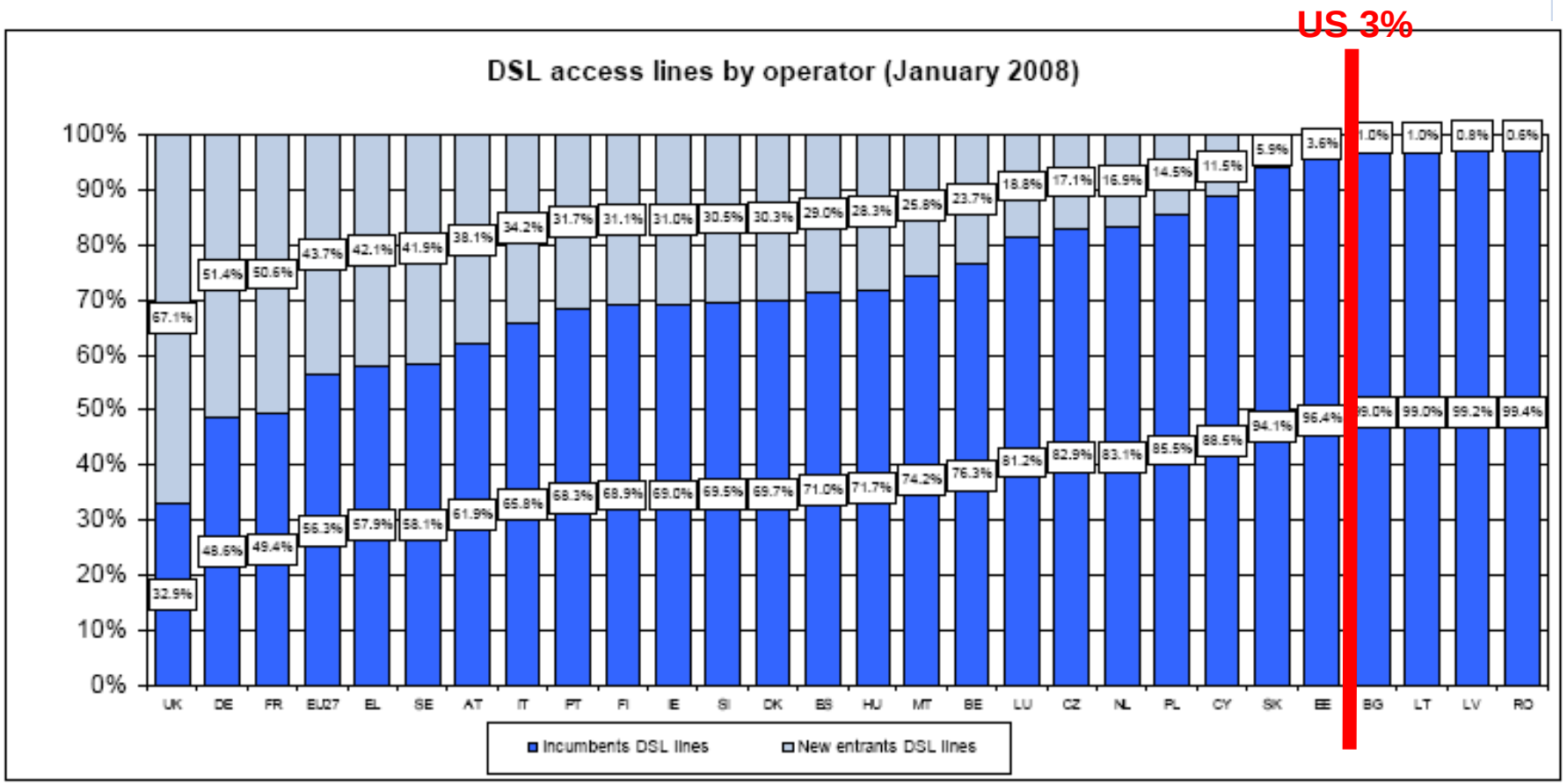
Regulation and public policy: Access in the United States



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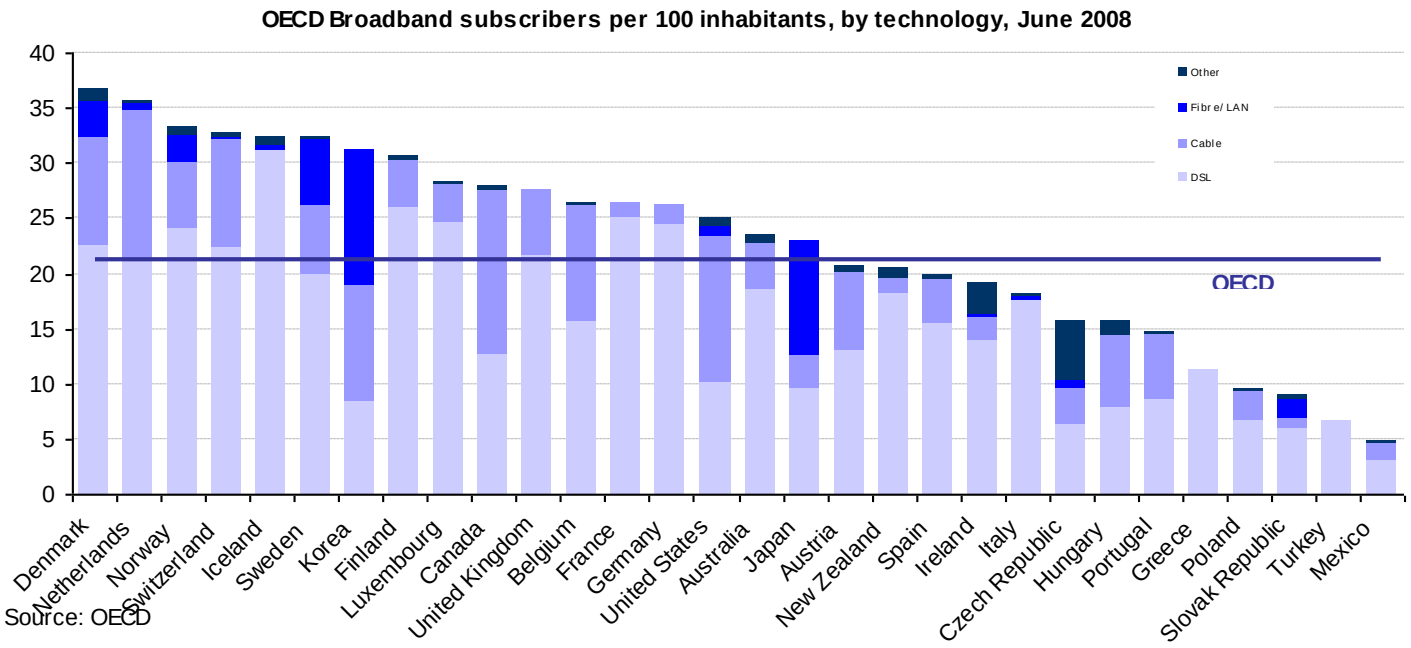


- Apologists for US incumbents will say that the US is not doing all that badly.
- Possibly true but irrelevant. US performance is vastly inferior to what it *could have been*.

Regulation and public policy: Access in the United States

- United States had an enormous head start on broadband deployment over everybody else.
- Ubiquitous cable television: A second pipe to nearly every home.
- High GDP, high disposable income.
- The US arguably should have been in the top 3 in the OECD in broadband adoption.
- The actual mediocre performance constitutes “snatching defeat from the jaws of victory”.

Regulation and public policy: Access in the United States

- Slower-than-expected roll-out and adoption of broadband.
- Loss of consumer choice.
- Higher retail prices?
- Network neutrality problems that are likely to necessitate highly intrusive re-regulation.
- Possibly some acceleration of fibre deployment by incumbents, but at the cost of greatly impacted deployment by competitors.

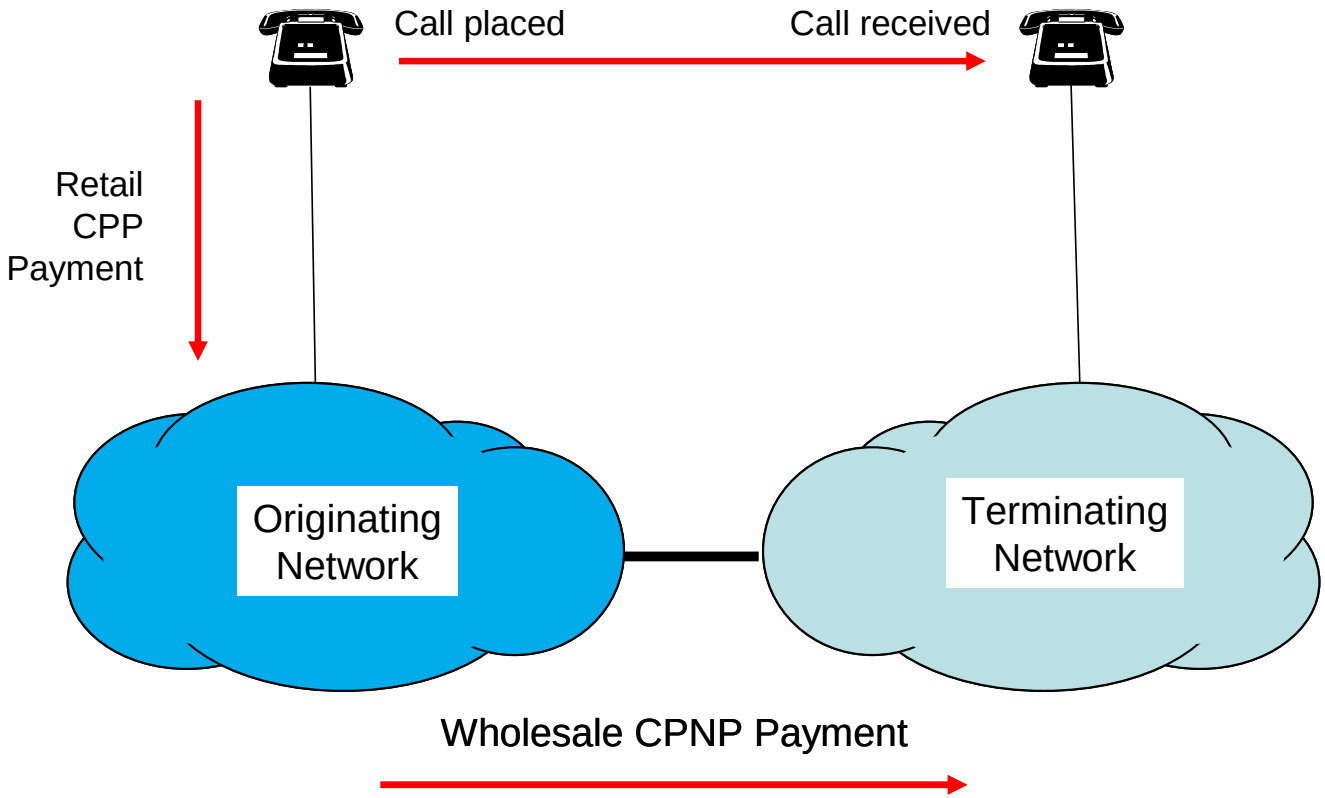
Regulation and public policy: US versus EU

- Network Neutrality only a minor concern in the EU.
  - The more robustly competitive environment discourages anticompetitive discrimination.
  - Richer palette of regulatory tools.
- Most Europeans have access to multiple broadband providers (not all of which are fully facilities-based).
- EU regulatory reform seeks minor changes to ensure e.g. that consumers are informed, and can switch without cost if their network operator changes its policies.

Regulation and public policy: Interconnection

- Internet interconnection globally takes place primarily through two main mechanisms:
  - Peering: ISPs exchange traffic destined for their respective customers (or customers of their customers), often without explicit payment.
  - Transit: An ISP carries another party's traffic to third parties, possibly to the entire Internet, generally for pay.
- These arrangements typically do not depend on any regulation.
- Interconnection in the telephony network, by contrast, tends to be highly regulated and highly focused on voice minutes.

Regulation and public policy: Interconnection



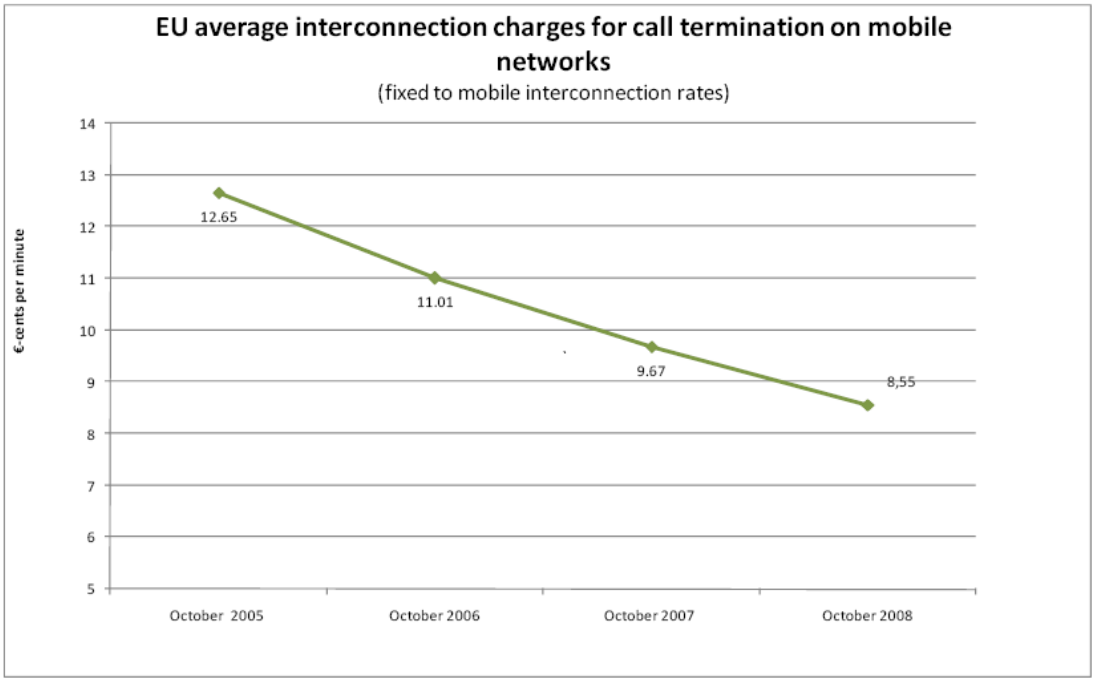
- Termination rates represent *wholesale* payments between network operators under the Calling Party's Network Pays (CPNP) arrangements.

Regulation and public policy: Interconnection

- A substantial economic literature tells us to expect high termination fees (from small operators as well as large) in the absence of regulation.
- These prices result from the *termination monopoly*.
- Termination rates for the *fixed* network have long been constrained by regulation in European Member States so not to exceed the terminating network operator's marginal cost.
- *Mobile* termination rates were, however, unregulated in most Member States until 2003 or so.

Regulation and public policy: Interconnection

- European experience supports the expectation of high MTRs in the absence of regulation.
  - MTRs before regulation (2002): € 0,187.
  - MTRs after regulation (2008): € 0,086.



Source: 14th Implementation Report, Annex 2, 2009,

Termination Rates

- A substantial economic literature argues that termination rates should be set at the level of the terminating network operator's cost (however determined).
- An alternative school of thought argues that there should be no wholesale payments (Bill and Keep).
- There are some arguments for setting TRs *lower* than cost, but few if any have argued that TRs should be *higher* than cost.
- There is no perfect price.

Mobile Termination Rates (MTRs):
How low should they go?

Regulation and public policy: Interconnection

- The MTR affects MNOs in two very different ways:
  - For calls Mobile-to-Mobile (M2M) calls, a lower MTR represents a *reduced wholesale cost* for the originating MNO.
    - In a competitive market, a reduced cost should lead to a reduced price.
    - A reduced unit price will tend to lead to increased consumption.
    - The impact on ARPU depends on the relative magnitude of these effects, since they push in opposite directions.
  - For calls to the mobile network from either fixed or mobile, a lower MTR tends to mean *reduced wholesale income*.
    - However, as noted above, it is also likely to result in reduced retail unit price, both for F2M and for M2M.
    - Again, reduced unit price for calls to the mobile network should result in increased call volumes.
    - The increase in call volume pushes ARPU in the opposite direction as the reduction in MTRs, such that the combined effect is not easy to predict.

Regulation and public policy: Interconnection

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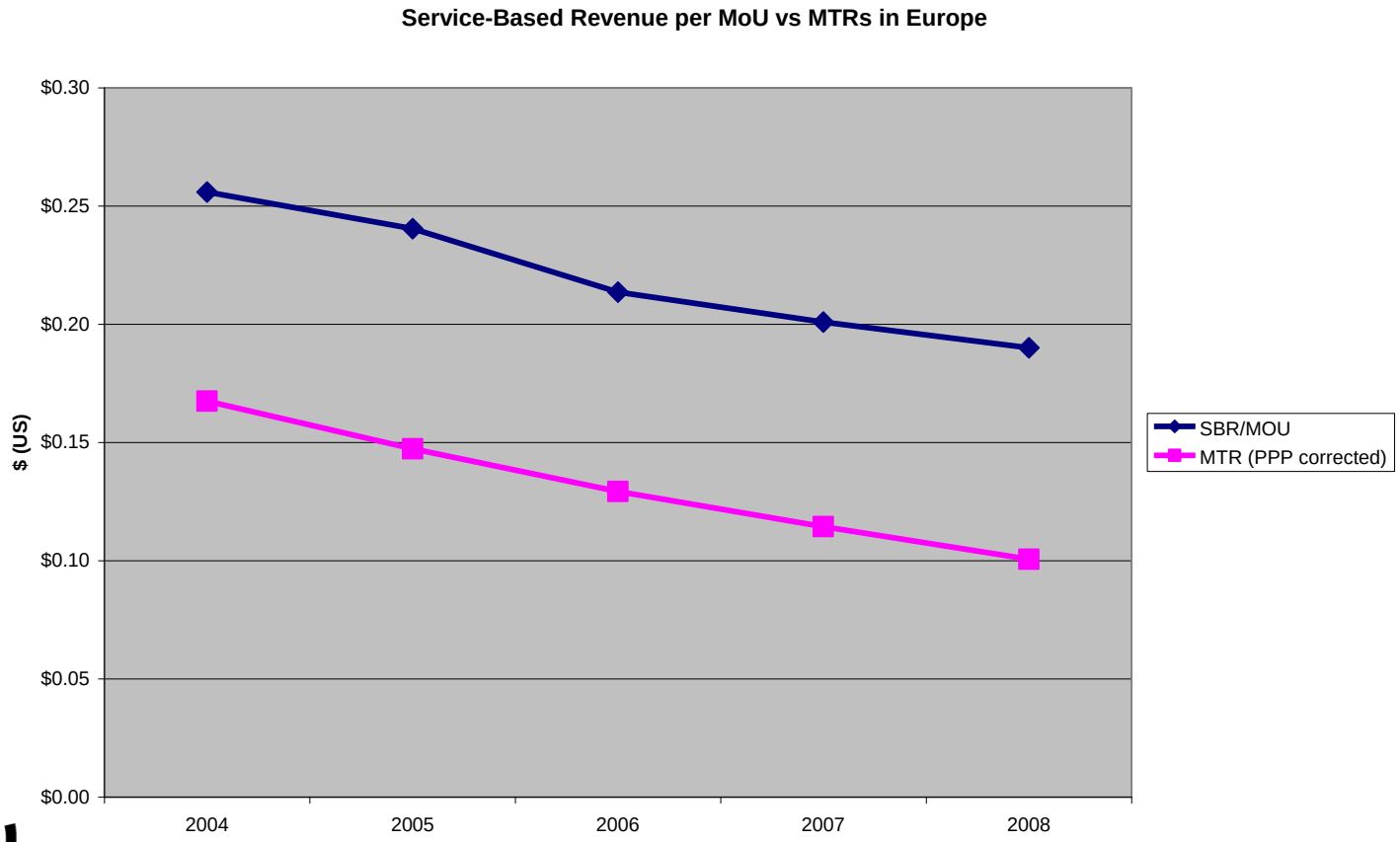
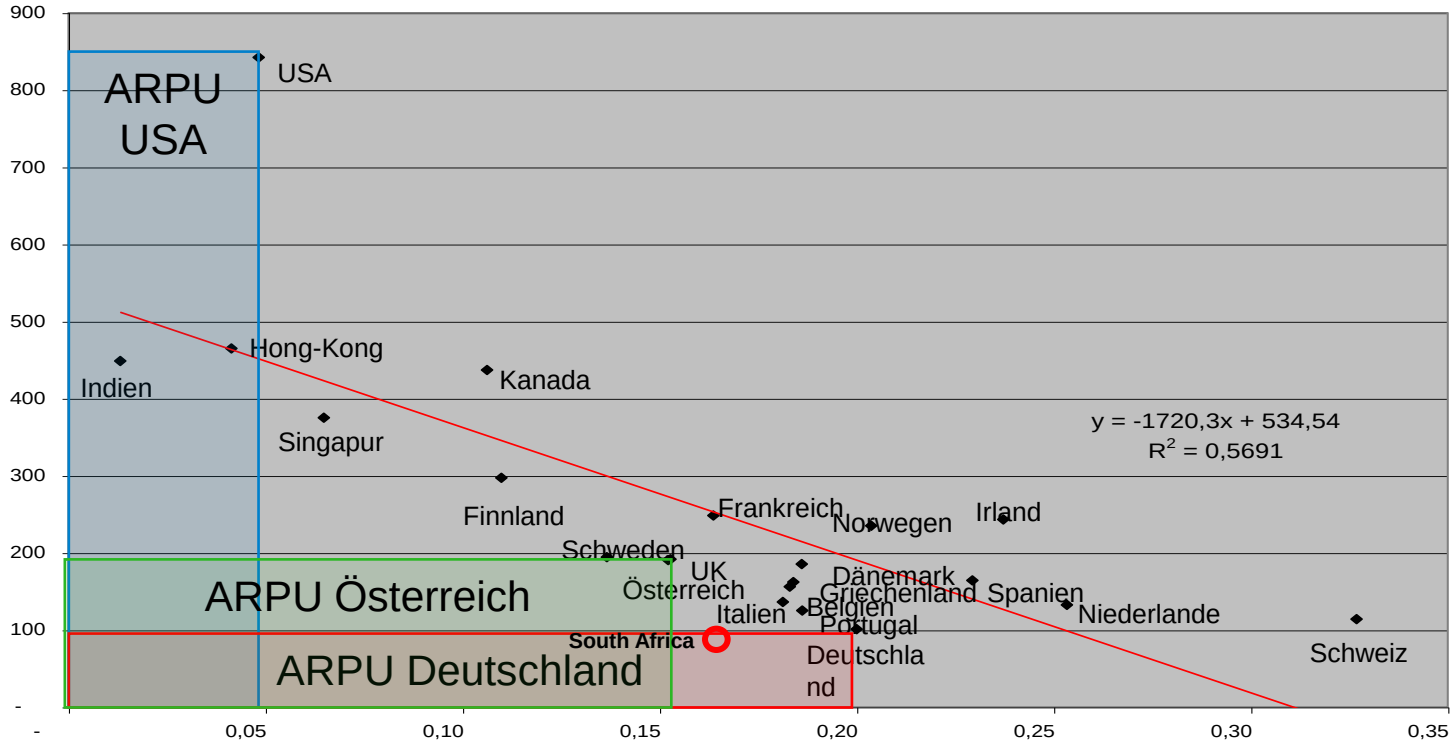
- Historical experience is that overall European unit prices for mobile voice service move in parallel with MTRs.



Source: ERG (for MTR data), Merrill-Lynch

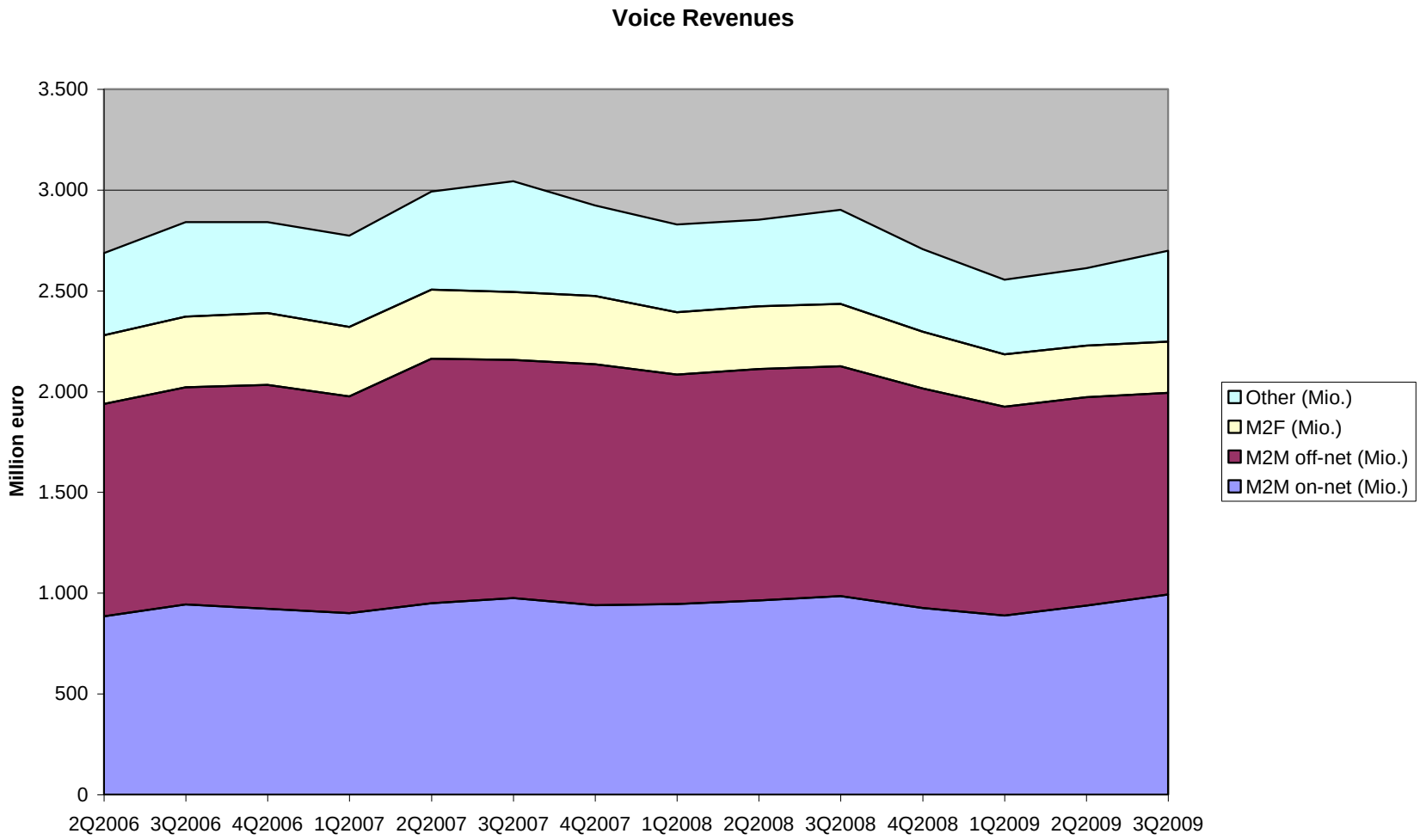
Regulation and public policy: Interconnection

- One would expect high unit price to be associated with low demand and vice versa (price elasticity of demand).



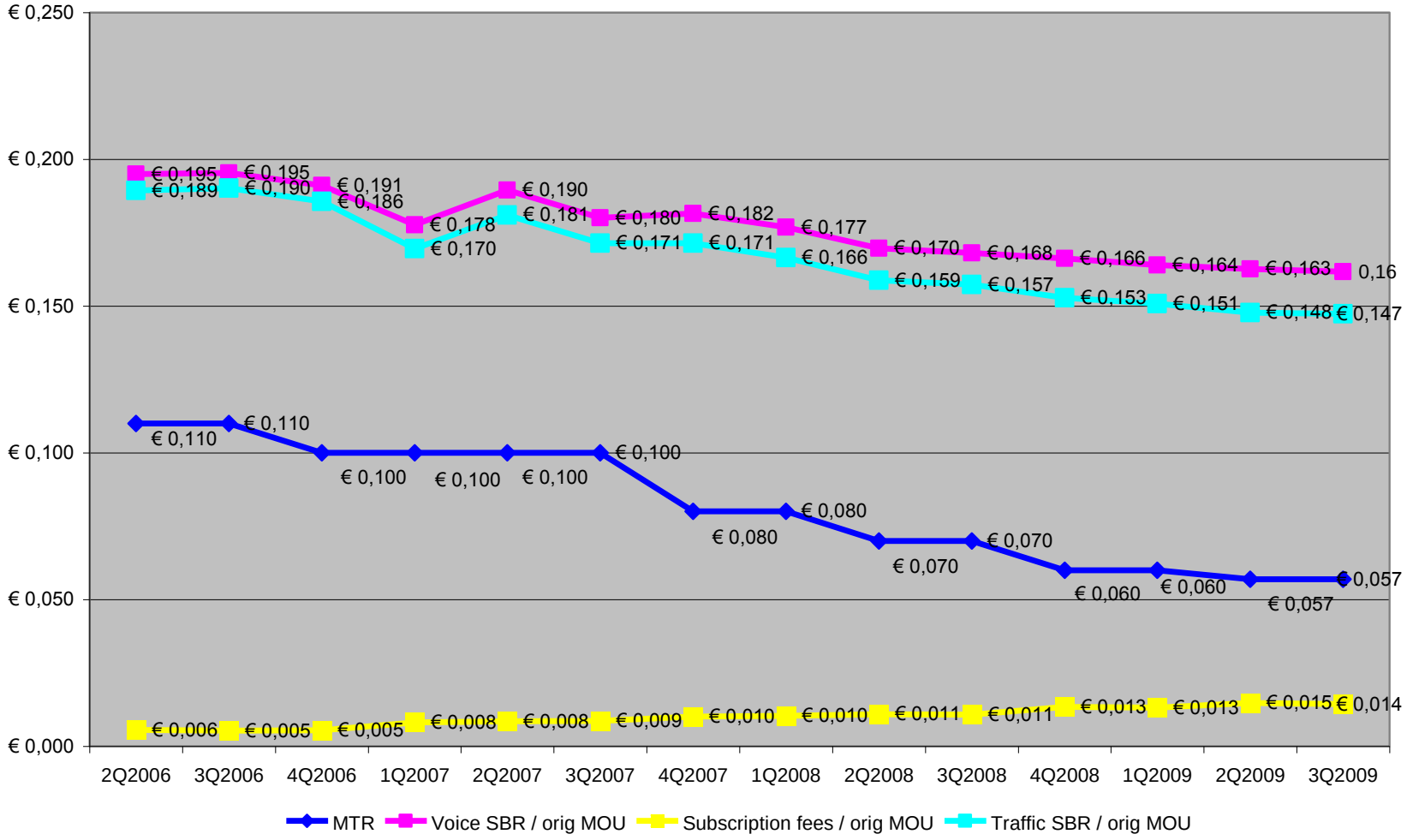
Source: WIK. based on Merrill Lynch 3Q2008 data.

Regulation and public policy: Interconnection



Source: Spanish CMT Data

Regulation and public policy: Interconnection



Source: Spanish CMT Data

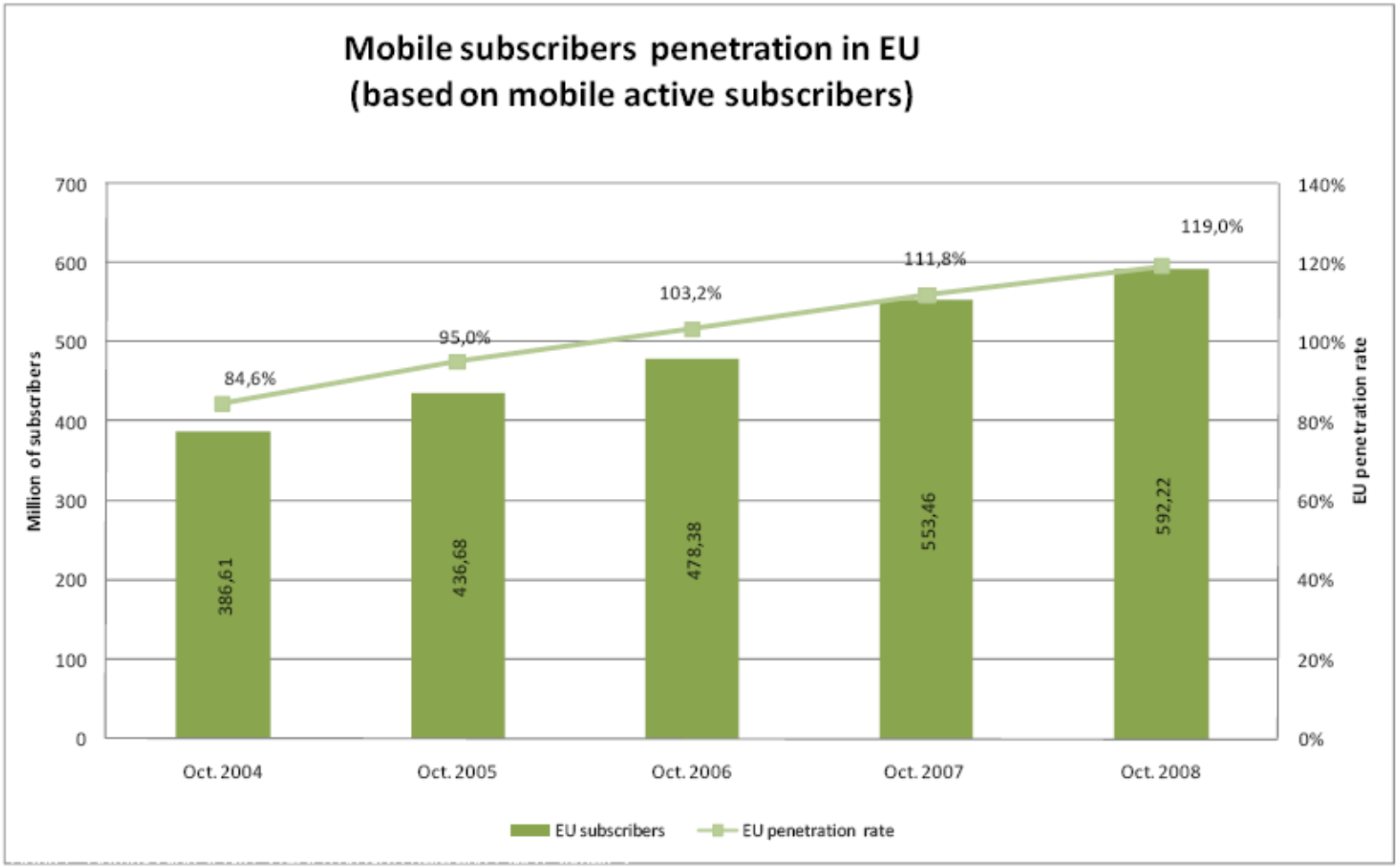
Regulation and public policy: Interconnection

- Our data for Europe show the following relationships to MTR:
  - Retail price per minute: +0.7
  - Minutes of use per month: -0.5 to -0.6
- The instrumental variable used to represent retail price (Merrill Lynch Service Based Revenue per Minute of Use) is about 85% retail and 15% wholesale revenue.

Regulation and public policy: Interconnection

- Most studies (not all) find that high MTRs encourage more rapid mobile adoption.
  - Lower initial fees.
  - Higher handset subsidies.
  - Lower monthly fees.
  - All result in a lower cost to acquire and retain service.
  - Cost to *use* the service, however, can be higher.
- Does penetration greater than 100% represent a benefit to public welfare?
  - Are multiple subscriptions a response to different roles and responsibilities (work versus leisure)?
  - Or are they a response to charging anomalies (on-net off-net price discrimination, roaming charges)?

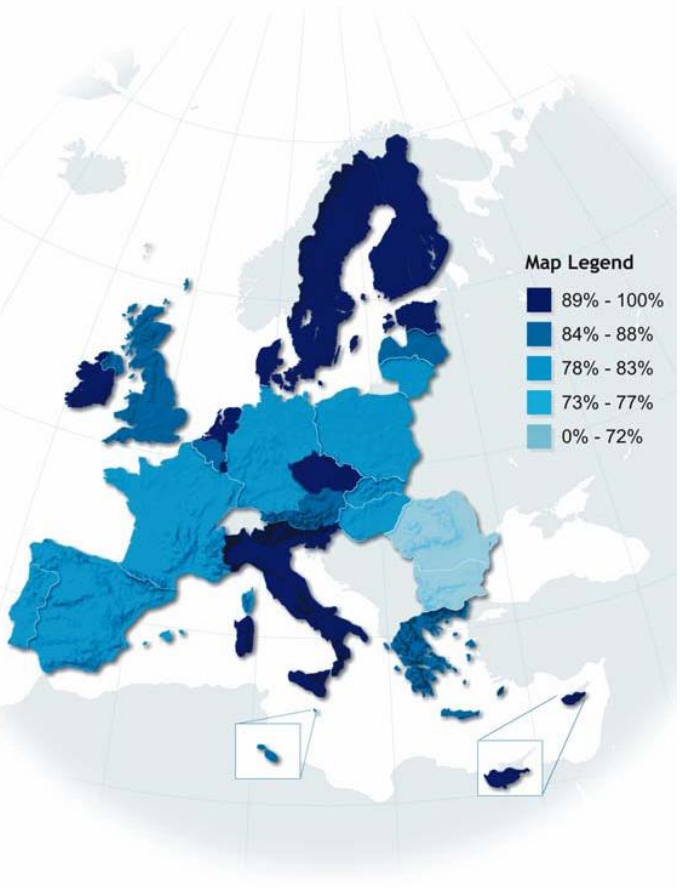
Regulation and public policy: Interconnection



Source: 14th Implementation Report, Annex 2, 2009,

Regulation and public policy: Interconnection

Country Results	
The Netherlands	94%
Finland	93%
Denmark	92%
Luxembourg	92%
Czech Republic	92%
Italy	91%
Sweden	91%
Cyprus	91%
Slovenia	91%
Ireland	90%
Estonia	89%
Latvia	88%
Malta	88%
United Kingdom	87%
Greece	86%
Austria	86%
Belgium	84%
European Union (27)	83%
Lithuania	83%
Portugal	82%
Hungary	82%
France	81%
Slovakia	81%
Spain	80%
Poland	79%
Germany	78%
Bulgaria	68%
Romania	66%



Source: Eurbarometer June 2008, data from Nov-Dec 2007

Regulation and public policy: Interconnection

- Mobile penetration in South Africa was about 101% as of 3Q2009 (Merrill Lynch), about 81% of them pre-paid.
- Actual adoption of cell phones is highly variable from one province to another, ranging from 43.2% (Western Cape) to 80.8% (Mpumalanga). (Source: Statistics South Africa, 2009 Household Survey)
- Compare this also to roughly 10% fixed penetration (or 18% of households).

Regulation and public policy: Driving widespread broadband

- Separate approaches are often needed to driving
  - Deployment
  - Adoption
- Two interrelated but distinct programmatic aspects
  - Universal service
    - Ensuring that anyone who wants a basic service can get it.
    - Typically addressed as a regulatory matter.
  - Ultra-fast broadband
    - Ensuring that high speed (e.g. fibre-based) broadband is available to as much of the population as possible.
    - Generally treated as a matter of industrial policy.
    - Typically driven by a ministry, not by the regulator.

Regulation and public policy: Driving widespread broadband

- Universal service recognises *network effects* – the more people are connected, the better for all.
- Twentieth Century universal service emphasised *voice* service over the *fixed* network.
- Twenty-first Century universal service must recognise:
  - That in a country like South Africa, where the fixed network reaches only 18% of households, that mobile service is of enormous importance.
  - That in an increasingly IP-based world, the meaningful wired universal service is a broadband access.

Regulation and public policy: Driving widespread broadband

- Concepts of best practice emerge in studies by the ITU and by the World Bank (cf. Bjorn Wellenius)
- The national territory can be viewed as consisting of three kinds of areas:
  - Those where commercial incentives are sufficient to ensure deployment and ongoing viability of services.
  - Those that require subsidy indefinitely.
  - Those that could be self-sustaining once initially "jump started".
- An analogous categorisation into white, black and grey areas appears in European State Aid rules.

Regulation and public policy: Driving widespread broadband

- Important to avoid needless subsidies to services that could sustain themselves. Not only is it wasteful, but it also distorts competition.
- “Reverse auctions” are a best practice means of providing no more subsidy than necessary.
- Reverse auctions are not trouble free:
  - The winner may be unwilling or unable to actually complete the build-out at the agree-on price. Encourages “bid to win”.
  - Does not automatically adjust to changing circumstances.

Regulation and public policy: Driving widespread broadband

- WIK report on Next Generation Access for ECTA (2008)
- Sophisticated models of fibre roll-outs in France, Germany, Italy, Netherlands, Portugal, Spain
- No country likely to achieve full coverage without public stimulus/subsidy.
- Only limited prospect of replicating infrastructure.

Regulation and public policy: Driving widespread broadband

Investment per home connected (in Euro), market share 50%, urban cluster, stand alone first mover **

Network Type	Country [in €]					
	DE	FR	SE	PT	ES	IT
VDSL	457	n.v.	352	218	254	433
PON	2,039	1,580	1,238	1,411	1,771	1,110
P2P	2,111 (54%)	2,025	1,333	1,548	1,882	1,160

** Based on the investment of the urban cluster and a market share of 50%. If other marekt shares are used, it is mentiond in brackets.

Regulation and public policy: Driving widespread broadband

Viability of NGA roll-out for incumbents across countries and technologies

Network Type	Country					
	DE	FR	SE	PT	ES	IT
VDSL	71.5%	n.r.	18.3%	39.0%	67.4%	100.0%
PON	25.1%	25.2%	18.3%	19.2%	12.2%	17.6%
P2P	13.7%	18.6%	18.3%	19.2%	12.2%	12.6%

Regulation and public policy: Driving widespread broadband

Replicability of NGA roll-out for a second mover, 80 % access to existing ducts at current cost-based prices

Network Type	Country					
	DE	FR	SE	PT	ES	IT
VDSL	18.5%	n.r.	n.v.	39.0%	n.r.	17.6%
PON	0.3%	6.8%	n.v.	n.v.	n.v.	1.6%
P2P	0.0%	6.8%	n.v.	n.v.	n.v.	0.2%

Regulation and public policy: Driving widespread broadband

- Important initiatives to drive ultra-fast broadband are under way in a number of European countries, Singapore, Australia, New Zealand, and the United States.
- Australia' National Broadband Network:
  - Connect 90-93% with high speed fibre at 100 Mbps.
  - Connect the remainder at 12 Mbps (peak) with some combination of fixed or mobile wireless and satellite.
  - Cost initially estimated at $43 billion AUD; recently revised to $26 billion AUD (about 171 billion ZAR) taking substantial advantage of aerial fibre.

Regulation and public policy: Spectrum policy

- An enormous area in its own right. In the interest of time, we will make only brief comments.
- A global consensus has emerged for commercial spectrum allocation and assignment:
  - Allocations and assignments should have as few restrictions as possible, consistent with the need to avoid harmful interference.
  - Technological and service neutrality are desirable.
  - Market mechanisms, exemplified by auctions, help to ensure that spectrum is assigned to those who value it most (and thus are most likely to put it to good use).
  - Second markets (trading, leasing) are a useful complement to auctions.

Relevance to South Africa

- **Observation:** ICASA seems to have enormous difficulty in bringing proceedings to a definitive conclusion. MTRs are a case in point.
- **Observation:** Interminable delays cause uncertainty that harms businesses, and ultimately consumers.
- **Suggestion:** I would respectfully suggest that ICASA's institutional arrangements need analysis and probably some serious re-thinking.
- **Suggestion:** ICASA may be in need of capacity building.

Relevance to South Africa

- **Observation:** The South African government owns 37.7% of Telkom, which has a 14% direct shareholding in Vodacom.
- **Observation:** Experience in Europe and elsewhere strongly suggests that a share this large distorts the government's own incentives.
- **Recommendation:** Most of this share should be sold off.

Relevance to South Africa

- **Observation:** Licences for competitive new fixed and mobile entrants have been delayed for years.
- **Observation:** European experience demonstrates that lengthy licensing procedures and/or onerous conditions and unnecessary and unproductive.
- **Recommendation:** Licensing procedures should be simplified and streamlined, and maximum conditions firmly limited. ICASA should make a firm commitment to make a decision, up or down, within a short period of time (e.g. 60 days).

Relevance to South Africa

- **Observation:** Policies for ensuring that competitors gain access to bottleneck facilities are ineffective, and have languished.
- **Observation:** There are large parts of the country that are not served by the fixed network; nonetheless, it is vital in key metropolitan areas.
- **Recommendation:** Detailed rules for a basic ladder of investment need to be put in place, using rules in a country where they are effective as a template.
- **Recommendation:** ICASA's ability to promptly enforce such rules needs to be assessed.

Relevance to South Africa

- **Observation:** MTRs in South Africa continue to be high, despite commitments to lower them.
- **Observation:** High MTRs are apparently leading to high unit prices in South Africa, and to low usage (MoU).
- **Observation:** The high MTRs are also likely inhibiting effective competitive entry (e.g. by on-net off-net price discrimination).
- **Observation:** MTRs in Europe are about to decline 80% or more (e.g. to € 0.006 in the UK in 2015).

Relevance to South Africa

- **Observation:** Changes need to implemented with care. High MTRs probably also lead to high penetration, and to widespread availability of pre-paid plans.
- **Recommendation:** MTRs urgently need to be brought to much lower levels, but perhaps not quite as low as the target rates in Europe.

Relevance to South Africa

- **Observation:** Broadband deployment initiatives in South Africa needs to take an integrated view of multiple potential bottlenecks:
  - Submarine cable
  - Back-haul between metropolitan areas
  - Back-haul into the countryside
  - Last mile (or last air mile)
- **Observation:** Submarine cable, at least, appears to be in a promising state.
- **Recommendation:** need to think more about this

Relevance to South Africa

- More needed …

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