Achieving the Negroponte switch: the challenge of escaping from old ideas and institutions

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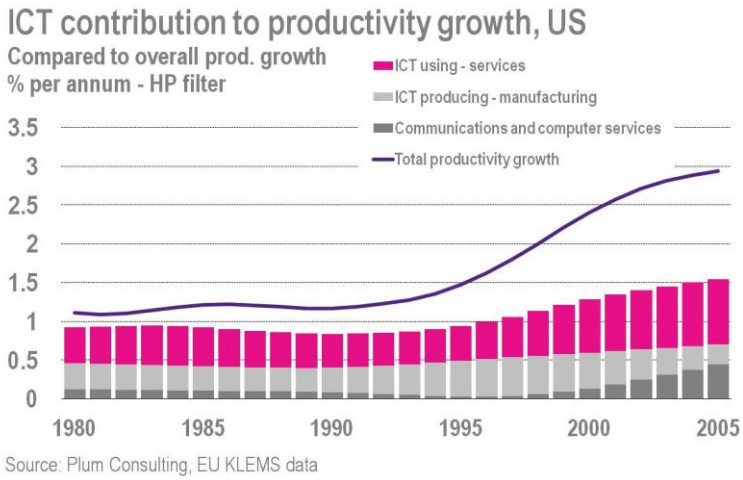
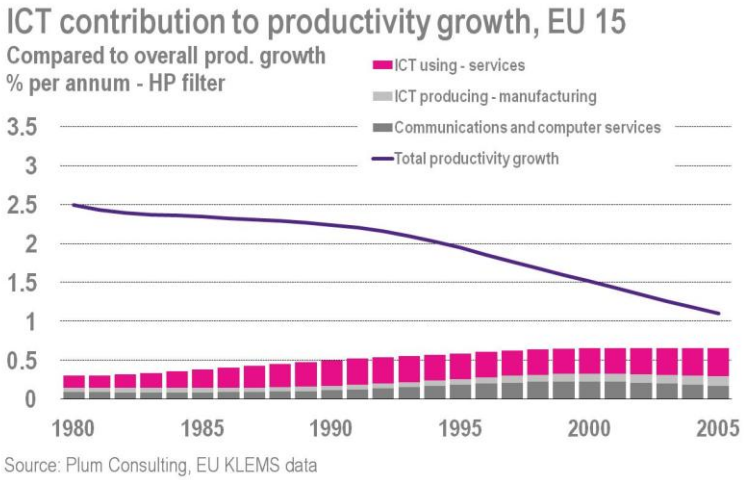
Europe has had a problem using ICT productively



Source: Plum Consulting, EU KLEMS data

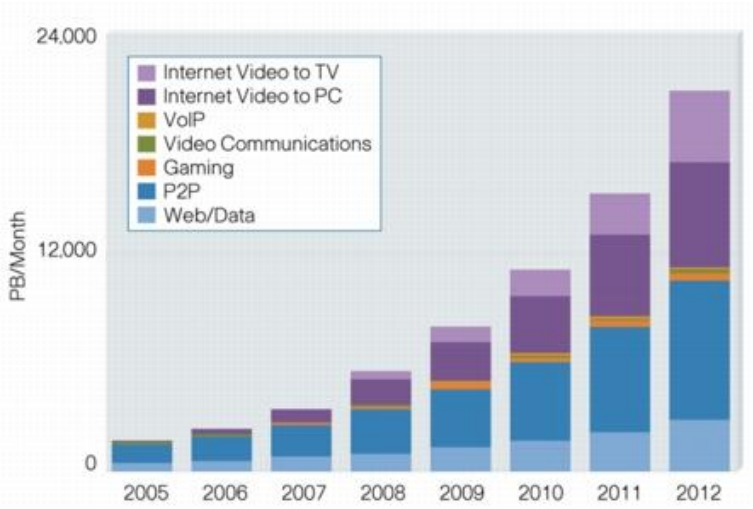


Source: Plum Consulting, EU KLEMS data

Past technology booms – rail and electricity – were associated with asset price bubbles!

Traffic growth is driving network transformation

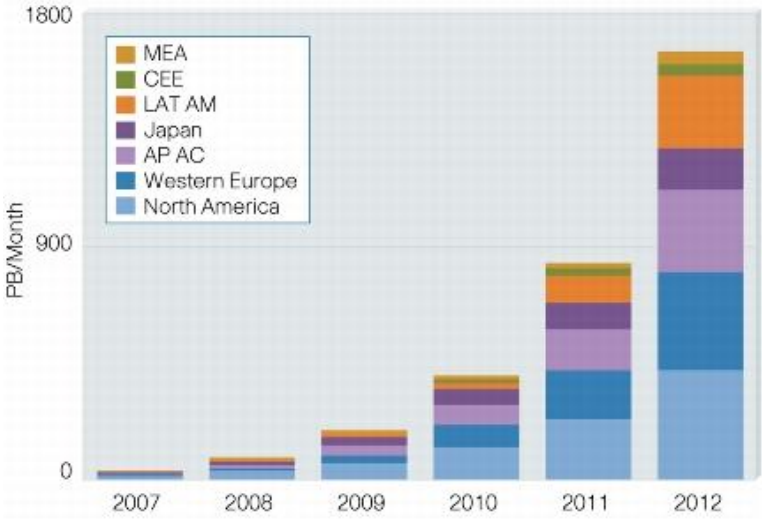
IP traffic growth 46% per annum



Source: Cisco (June 2008) "Approaching the Zettabyte era"

Fibre closer to end users driven by video and cloud computing

Mobile broadband to double every year



More spectrum (but finite)
More transmitters => more fibre

Fixed and wireless NGA networks will become complements, not substitutes

“Negroponte switch”

- **Everything wireless becomes wired and vice-versa**
  - Fixed voice => mobile voice
  - Terrestrial broadcast => fibre and satellite
  - Satellite exception since opportunity cost of frequencies used is lower than for terrestrial broadcasting
- **A visionary idea 20 years ago whose time has come**
  - Mobile broadband works, some devices work and it is affordable – at last!
  - Fibre rollout close to, or to the premise, is underway or anticipated
- **NGA-wireless requires denser radio transmitter network**
- **NGA-fixed required to support denser radio network**
  - To support traffic growth at WiFi hotspots driven by iPhone, G1 etc
  - To support dense base station and Pico-cell/WiFi network

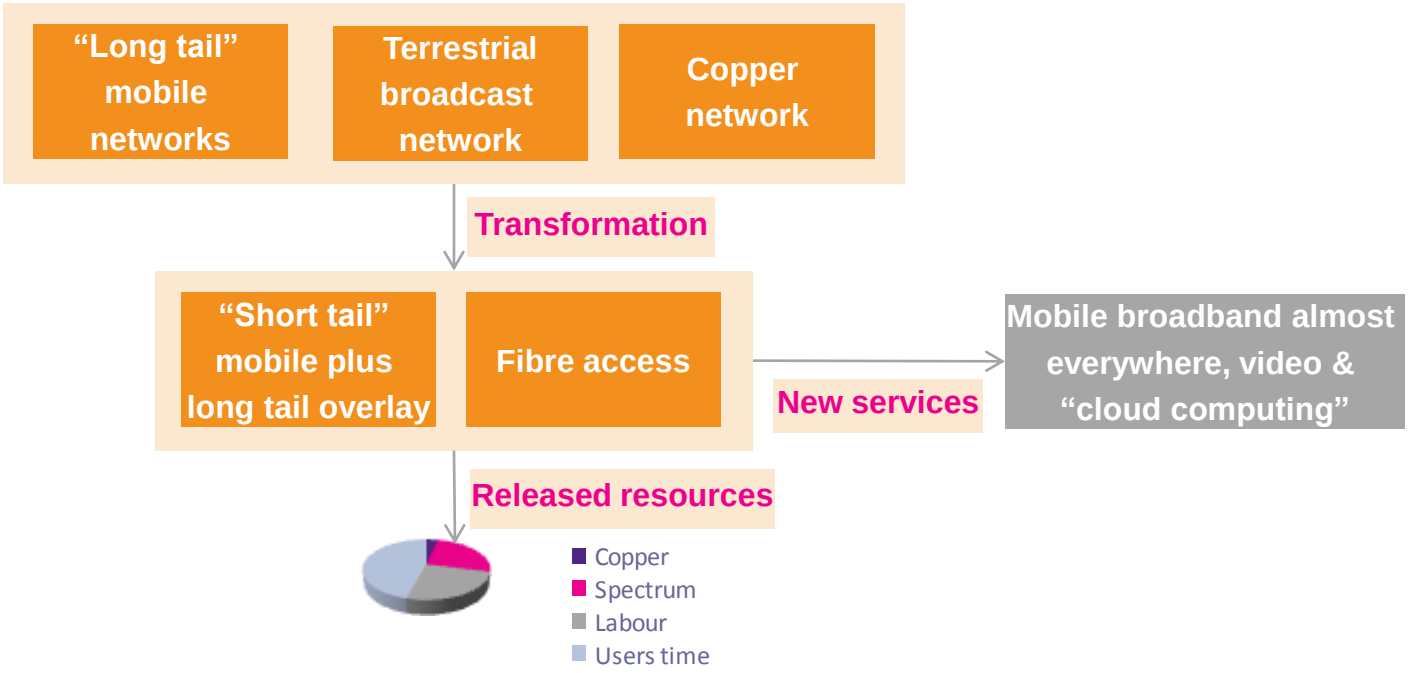
Allow “creative destruction” across fixed, mobile and broadcast value chains

Complementarity of wired, wireless and UHF spectrum

- **Wireless traffic increased 1 million-fold in 45 years (Cooper's law)**
  - Predominantly from increased transmitter density (1,600x)
  - Rather than technology (25x, but essentially exhausted); or
  - Additional spectrum (25x)
- **Next phase of evolution of wireless depends on**
  - UHF spectrum for 3G and LTE because
    - Allows greater range lowering the cost of rural coverage
    - Offers much improved in-building coverage and improved overall service
    - Lower network build costs, better service and lower environmental costs
  - Fixed network evolution
    - *"The extent to which fibre cables are brought within 100-300 metres of people's homes will determine the viability of massive upgrade of wider area mobile radio data speeds."*
      William Webb. 2007. "Wireless communications: the future." John Wiley. Page 209.

US auction receipts of $19.6 billion (around $0.85/MHz per pop) for 700 MHz spectrum in March 2008 points to the high value of UHF spectrum for NGA-wireless

Network transformation is required



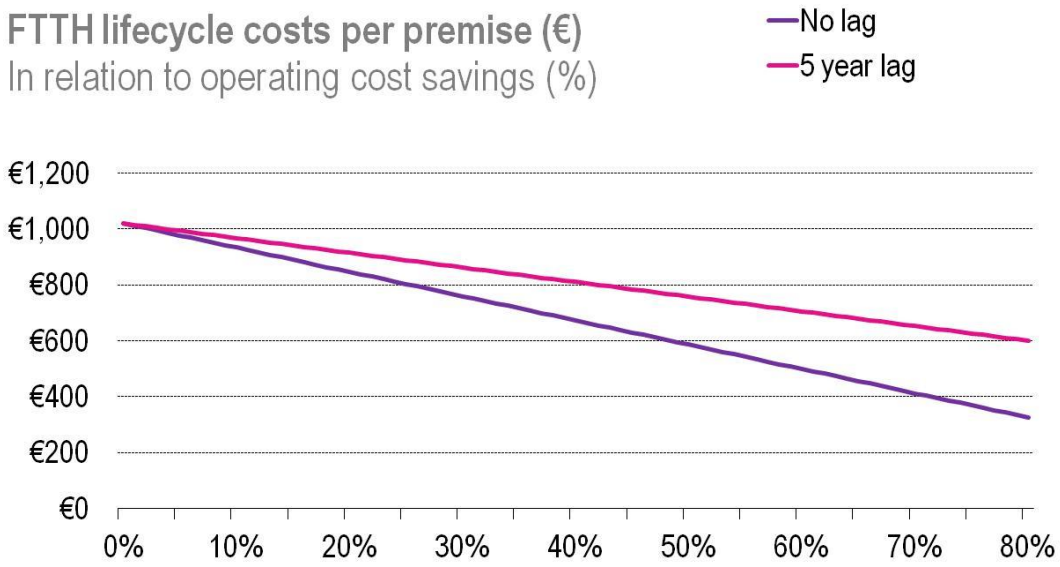
Value from released resources (including time) and new applications

Barriers to transformation

- **Mindset**
  - Silo thinking in relation to fixed, mobile and broadcast networks
  - Uncertainty over demand and willingness to pay
  - View that consumers will pay for bundled services but not quality bandwidth
- **Policy and regulatory barriers**
  - Uncertainty over spectrum property rights (re-farming and licence renewal)
  - Absence of pressure for reallocation of spectrum to high valued uses
  - Platform specific public service broadcasting policies
  - Legacy telecoms USO and wholesale product requirements
  - Focus on sunk networks rather than incremental network investment
  - Cost based rather than value based regulation
  - Focus on protection of local loop unbundlers rather than consumers

"The difficulty lies, not in the new ideas, but in escaping the old ones"
John Maynard Keynes

Copper switch off would lower net costs of FTTH

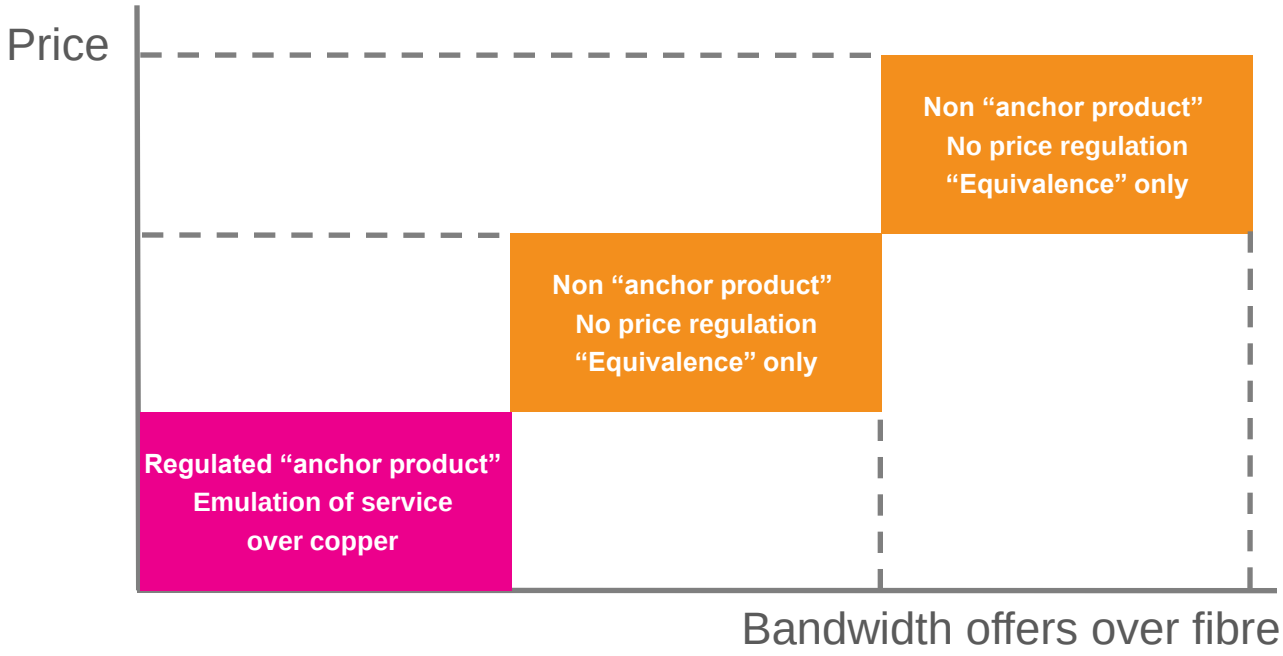


Source: Plum calculations for operating costs of €94 p.a. and 10% discount rate

Williamson and Marks. June 2008. "A framework for evaluating the value of next generation broadband." A report for the Broadband Stakeholder Group. http://www.plumconsulting.co.uk/

Unbundling has introduced barrier to copper switch off

“Anchor product” regulation allows value to be reflected in decisions



Brian Williamson. July 2007. “New regulatory approaches to next generation access”
http://www.broadbanduk.org/component/option,com_docman/task,doc_download/gid,944/Itemid,9/

“Anchor product” is a virtual legacy product combining consumer protection and flexibility

Complementary policy prescription

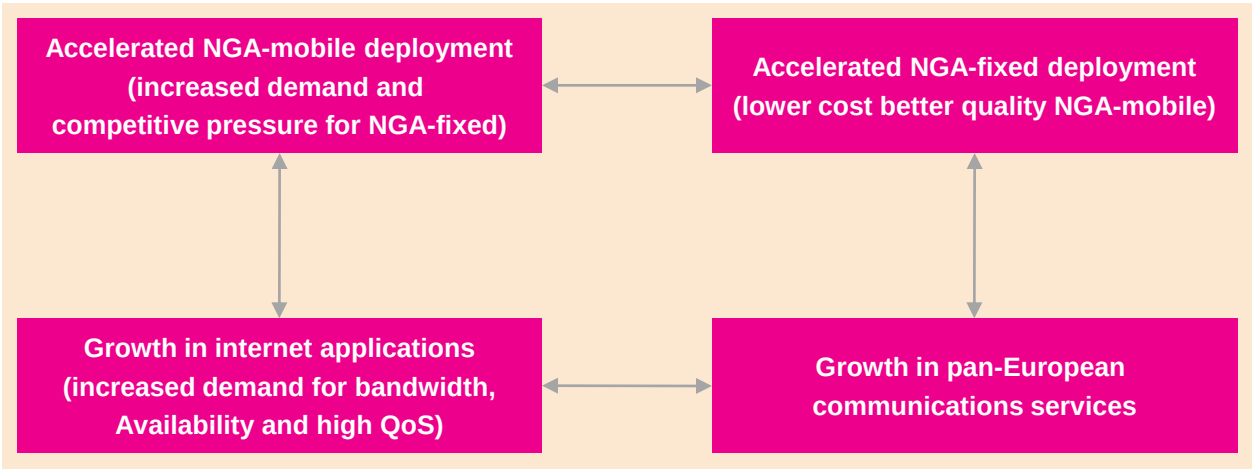
Complementary spectrum, broadcasting & telecoms policy reform

Spectrum rights	**Platform neutrality**	**Legacy "switch off"**	**Mandated access (with bottlenecks)**
Liberalisation and clear rights	**Platform neutral public service broadcasting delivery policy**	**Process for terrestrial broadcast switch off**	**Equivalence and open access to the internet**
Spectrum trading and/or pricing	**Platform neutral telecoms USO**	**Process for copper switch off**	**Value based regulation via anchor product/s**

"Rent" created by spectrum liberalisation could assist transformation

Process of engagement required involving industry, government and regulator/s

Complementary value drivers



Mobile, fixed, applications and trade in services are strategic complements