



# **Internet driven convergence: innovation and discontinuity**

**AGCOM-IIC Workshop, Rome**

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# The Internet is the “killer app”



- **The Internet is driving fibre and wireless (LTE) investment**
  - Demand for reliability, low latency, low error rate, symmetry, bandwidth
    - Web 2.0 and user generated content
    - Streaming video and video collaboration
    - VoIP on wireless networks
    - Cloud computing
    - Large database sharing and machine learning/pattern recognition
- **The internet is an open network agnostic platform for innovation**
- **The Internet is disrupting existing funding models**
  - New funding models (Google adds, Apps stores)
  - Displacing old (TV/radio linear interruption advertising, voice revenues)
  - Disintermediation, new relationships emerging

Think about the Internet first, then telecoms-media-network implications

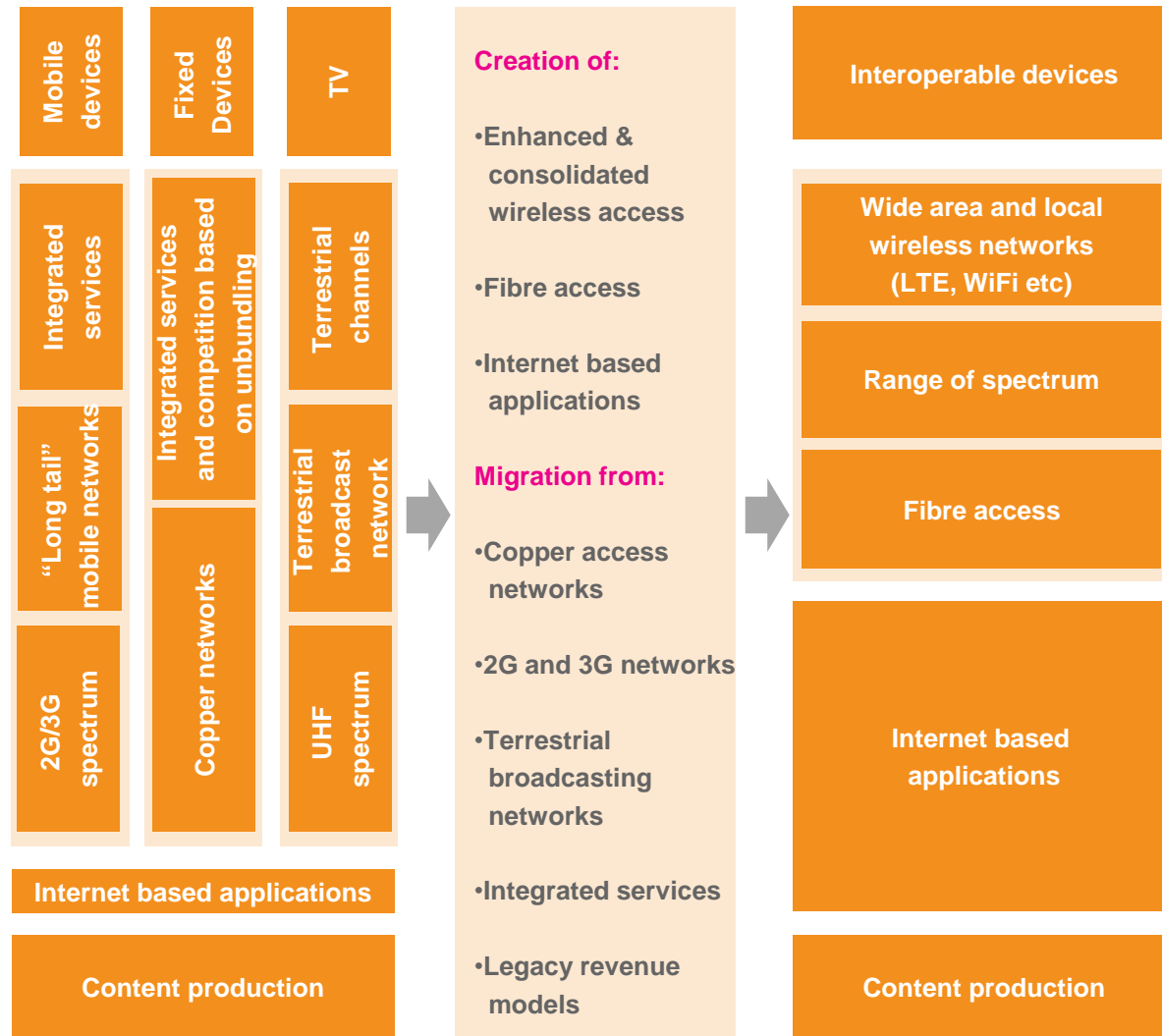
# Phases of convergence



- **Phase 1: Legacy market players enter one another's traditional markets and offered a range of services and service bundles.**
- **Phase 2: Internet based applications and content offered by non-traditional players in the communications and entertainment markets, for example Apple, Microsoft, Skype and Google.**
- **Phase 3: Applications and content delivered via the internet replace existing integrated platform specific services and drive network transformation leading to legacy network switch off.**
- <http://www.plumconsulting.co.uk/pdfs/Convergence%20May%202009%20update.pdf>

How fast and far will Phase 3 convergence go?

# Convergence – from left to right



# Evolution of mobile depends on...



- **UHF spectrum**

- Allows greater range lowering the cost of rural coverage
- Allows use of existing masts (similar frequencies to 900 MHz 2G)
- Offers much improved in-building coverage
- Lower network build costs, better service and lower environmental costs

- **Increased transmitter density**

- **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.

Wireless needs fibre, fibre needs wireless

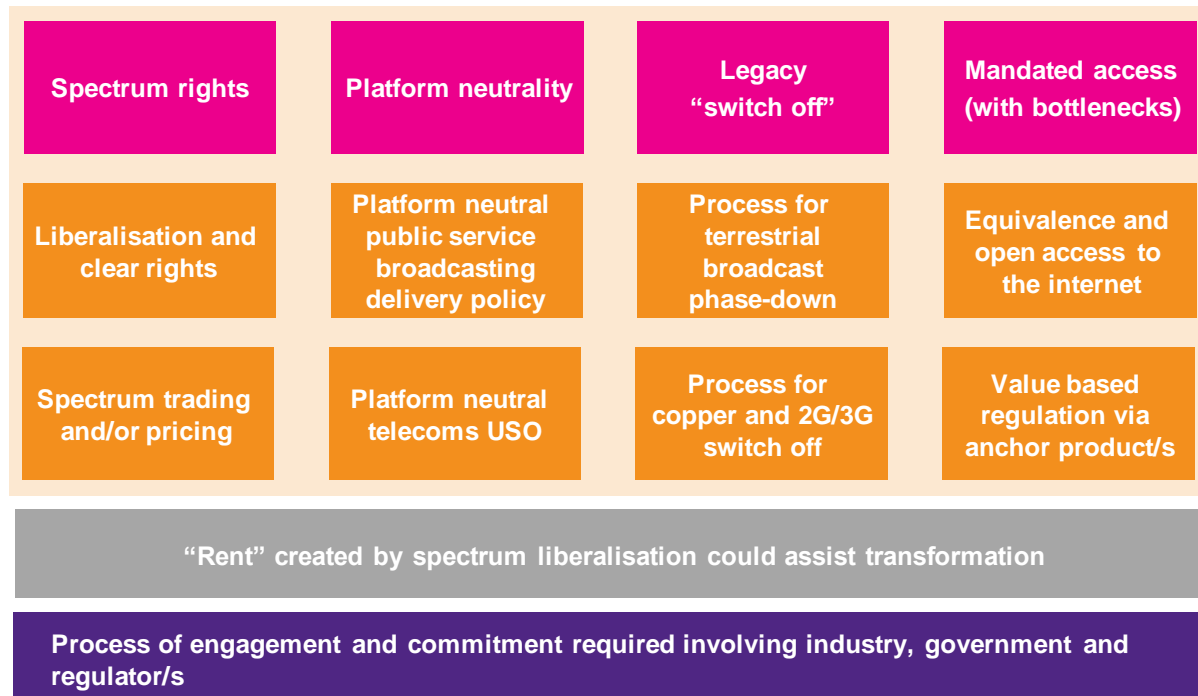
# Evolution of fixed depends on...



- **Making voice USO technology neutral to allow copper switch off**
- **Defining terms for copper switch off**
  - Notice period for line and exchange closure
  - Definition of service substitutes for customers
  - Definition of active access product for competitors
  - Resolution of detail - back up power, emergency VoIP calls etc
- **Allowing pricing to reflect value rather than cost**
- **Allowing co-investment and long-term contracts to emerge**
- **Allowing customer choice over fibre versus wireless “last mile”**

Enabling death of copper

# Facilitating convergence



The policy challenge goes beyond regulation

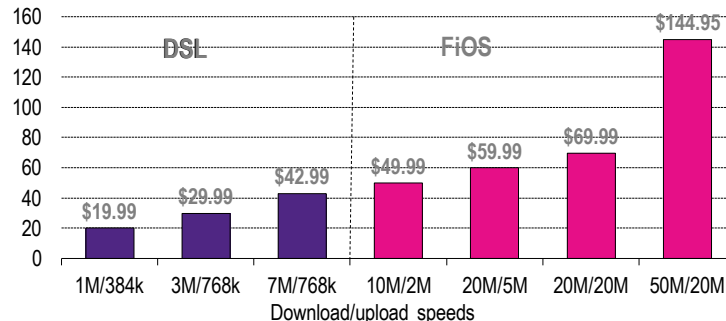
# Global policy experiments



# US: access deregulation



Verizon broadband DSL and FiOS pricing  
Monthly charge (USD)



Source: Plum Consulting. Pricing for one-year contract without phone service (\$5 less with phone).

- Verizon FiOS (GPON) investment
- Early deployment residential
- Now deploying in apartments
  - 'Bendable' fibre, smaller terminating cabinets
  - Negotiation with landlords
- FiOS penetration to Q1 2009
  - 13.2 million homes passed
  - FiOS available for sale at 10.4 million homes
  - FiOS penetration 27%
  - Most popular plan 20M/5M, some locations 20M/20M
- Cost have fallen to
  - US\$700 per home passed
  - US\$650 per home connected
- Significant operating cost savings
- Selling copper only network areas

# UK: pricing freedom & equivalence

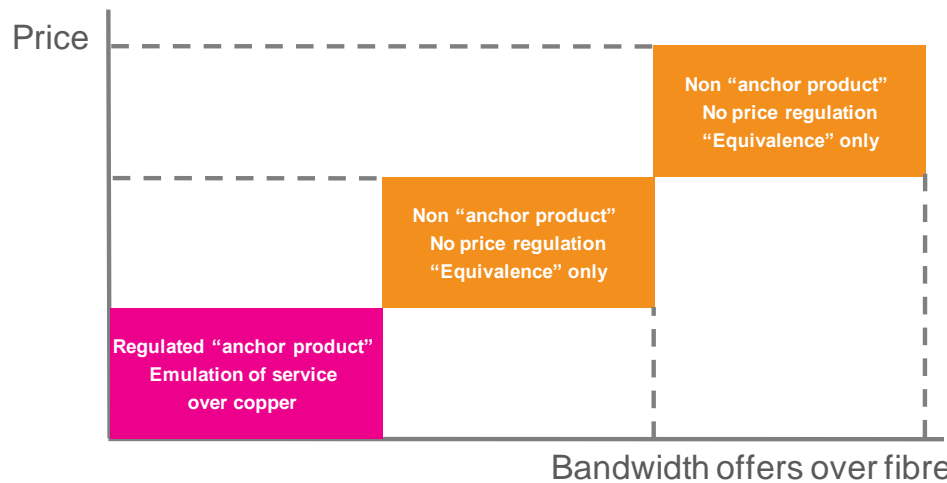


- **Ofcom decision in March 2009**

- Copper provides a discipline on next generation broadband pricing
- No price regulation, equivalence requirement

[http://www.ofcom.org.uk/consult/condocs/nga\\_future\\_broadband/statement/statement.pdf](http://www.ofcom.org.uk/consult/condocs/nga_future_broadband/statement/statement.pdf)

- **Longer term - virtual “anchor product”?**



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/](http://www.broadbanduk.org/component/option,com_docman/task,doc_download/gid,944/Itemid,9/)

# Finland: converged, forward looking

- **Analogue switch off completed September 2007**
  - UHF 790–862 MHz allocated for mobile broadband in June 2008
  - Considering making high coverage a condition of licences
- **TV licence fee payment decline, proposed household ‘media fee’**
- **Universal 1 Mbps average by 2010 using 450 MHz**
- **Fibre within 2 km of all, 100 Mbps to “virtually all” by 2015**
  - “The provision of an optical fibre or cable network close by, however, also has the effect of making very high-speed wired or wireless subscriber connections feasible...”
- **Anticipating network “switch off”**
  - Proposed 1 year notice period for withdrawal of copper line
  - Proposals in relation to back-up power for mobile
  - “...the issue of terrestrial television distribution in future could be examined and the necessary licence decisions taken effective at the beginning of 2017”

# Norway: net neutrality principles



- Internet users are entitled to an Internet connection with a predefined capacity and quality.
- Internet users are entitled to an Internet connection that enables them to
  - send and receive content of their choice
  - use services and run applications of their choice
  - connect hardware and use software of their choice that do not harm the network.
- Internet users are entitled to an Internet connection that is free of discrimination with regard to type of application, service or content or based on sender or receiver address.

<http://www.npt.no/ikbViewer/Content/109604/Guidelines%20for%20network%20neutrality.pdf>

# Government fibre investment



	Specification - all are open access	Cost and subsidy	Status
Australia – revised	Fibre to the home to 90% of households delivering 100 Mbps rolled out over eight years.	Cost A\$43 b. Funding unclear, 50% government ownership proposed with privatisation after 5 years.	Decision in April 2009, further evaluation phase with rollout planned from 2010.
New Zealand	FTTH to 75% over 6 years, concentrating on “priority users” such as businesses, schools, and health services.	Cost NZ\$3-6 b. Government funding of NZ\$1.5 billion.	Creation of Crown Fibre Investment Co announced March 2009.
Finland	1 Mbps <u>average</u> down by 2010 to all utilising wireless OFDM at 450 MHz. 100 Mbps to “virtually all” by December 2015 (fibre or wireless with 99% of premises within 2 km of fibre).	Funding up to 67% of cost (State 33%, regions 27%, EU 7%). Approved government funding of €66 million with revenue from spectrum auction, if insufficient from broadband operator levy. Customers pay for their own connection, though tax credits will be provided.	Government funding approved in November 2008. Regional councils and municipalities to lead initiative. Designation of universal service operator for each area by 31 December 2009.
Singapore	Passive optical fibre to the premise network offering 100 Mbps down and 50 Mbps up. 60% passed by 2010 and 95% by 2012.	Cost S\$1 b Funding S\$750 m grant.	Tender awarded to consortium (SingTel, the incumbent, owns 30%) in September 2008.

# Summing up the policy challenges



- **Reinventing regulation**

- New focus for competition and innovation
- New focus for consumer protection
- Cost reflectivity may no longer be workable principle
- Framework for shutting down legacy networks required now

- **Reinventing social obligations and funding models**

- Decouple voice universality from copper
- Government funds for unprofitable broadband coverage/take-up objectives
- Public service content: decide what we want and how to fund-purchase it

- **Reinventing institutional relationships**

- Internet is global (and local) rather than national *per se*
- Emerging policy issues require political choice

“The difficulty lies, not in the new ideas, but in escaping the old ones”

John Maynard Keynes