The economics of universal broadband

Spectrum and the New Economy – joint DCKTN & FWAW SIG Event

Phillipa Marks – 24/9/09

Plum Consulting 17-19 Bedford Street, Covent Garden, London, WC2E 9HP
T +44 (0)20 7868 5340 **www.plumconsulting.co.uk**

Questions considered

- **Why do we want universal broadband?**
- **What does it cost- wired and wireless?**
- **Our focus is on:**
  - Broadband availability not affordability, capability and relevance
  - Policy issues not business case
- **What are the policy issues?**
  - Is broadband to the home the appropriate objective? Or will universal access to the "user" be required by say 2015?
  - What should be the focus of universal broadband funding – wired or wireless? Middle or last mile? What is the broadband specification – statistical or not?
  - Voice USO regulation – does it need to change?
  - What are the implications for spectrum release priorities?

Why do we want universal broadband?

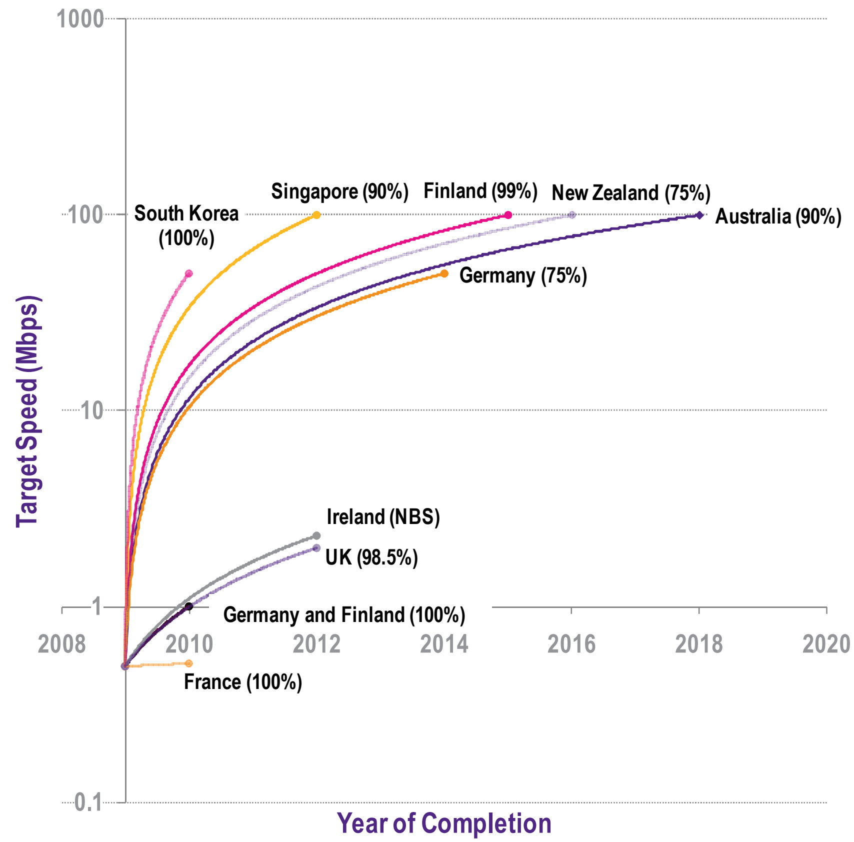
- **Plum has surveyed universal broadband policy in 10 countries:**
  - 5 EU member states - Finland, France, Germany, Ireland, UK
  - 5 others - Australia, New Zealand, Singapore, South Korea, US
- **This policy is driven primarily by economic development, regional development and government transformation objectives**
- **Presumption is universal broadband to premises (not anywhere) so follows a "fixed" model**

	Universal Broadband	Universal voice
Goal	Economic & regional development	Social inclusion, emergency use
Geography	Varies by country	Uniform across EU
Technology	Wired and wireless	Wired
Financing universality	Government	Industry (cross subsidy)

Differences in national targets

- **Most EU countries**
  - Focus on universal first-generation broadband at ***1 to 2 Mbit/s***
  - Leave second-generation broadband to the market
- **Developed Asia-Pacific countries**
  - Focus on universal second-generation broadband at ***100 Mbit/s***
- **In both cases there are thought to be public benefits**
  - Green issues – transport substitution
  - Support for and service delivery of government services especially to an ageing population
  - Productivity gains (increasing economic growth)

Targetted download speeds and coverage over time



Source: Plum Consulting, various country websites

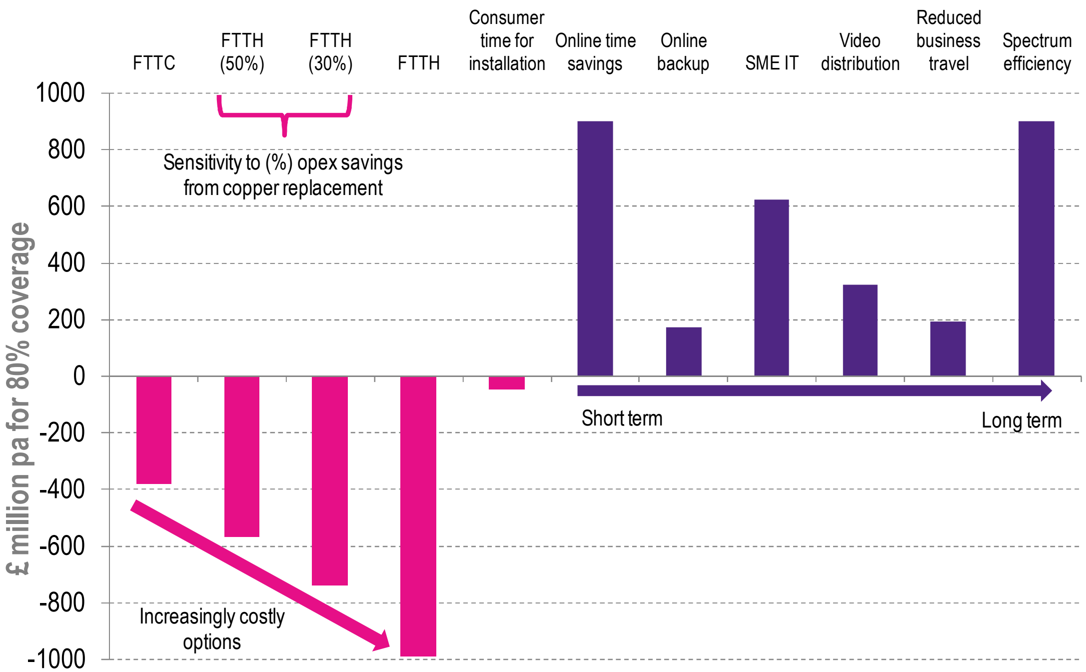
Big differences in levels of public funding and approach to universal broadband

Country	Public funding (€ per household)	Approach
Australia	1650	National FTTH 90%, wireless for the rest (2nd Gen)
Finland	65	Initially fibre core, last mile technology neutral; Then fibre/cable to within 2km of home (2nd Gen)
New Zealand	600	National FTTH (75%) plus rural middle mile
Singapore	500	Technology neutral but 90% FTTH (2nd Gen)
S Korea	50	90% FTTH + wireless to unserved areas (2nd Gen)
Germany	5	Technology neutral (1st Gen)
Ireland	60	Unserved areas – mainly wireless (1st Gen)
UK (Scotland)	3+ (2)	Unserved areas (1st Gen) – wireless
US	50	Rural, unserved and underserved. Technology neutral (1st Gen)

Note: Cost calculations exclude any EU funding in case of EU countries

What are the incremental net benefits of NGA?

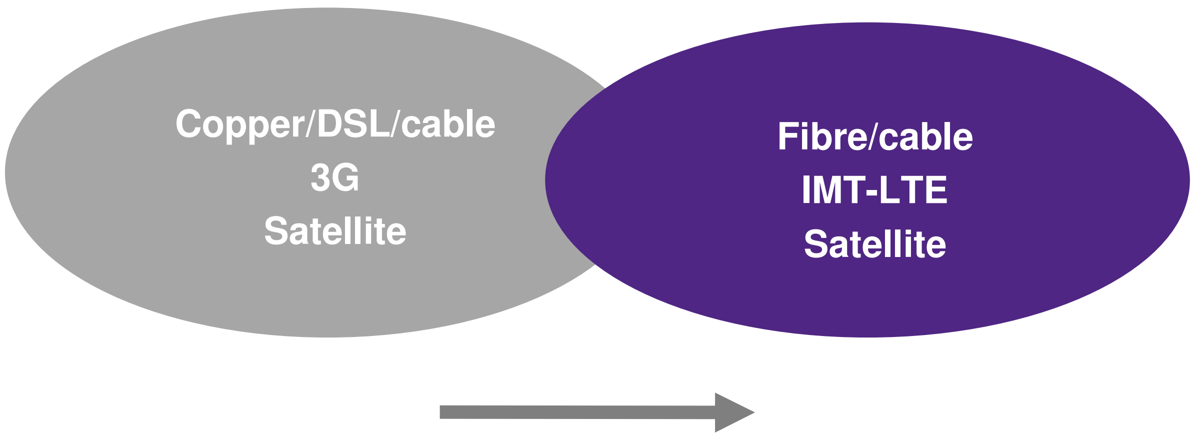
Indicative incremental annual costs and benefits



Does not count numerous wider social/economic benefits for example:

- Increased resilience e.g. in a pandemic virtual visits by doctor potentially saving lives
- Impact on health and care services (up to $1000bn for the US over the next 20 years)
- Virtual agglomeration – benefits thought to be large
- More home working reduces traffic peaks and so congestion, pollution & emissions

How do fixed vs mobile broadband compare?



- Issues to be considered
  - Functionality
  - Relative costs
  - Payment models (pre-pay or not, variation by usage)

Speeds and coverage intentions...

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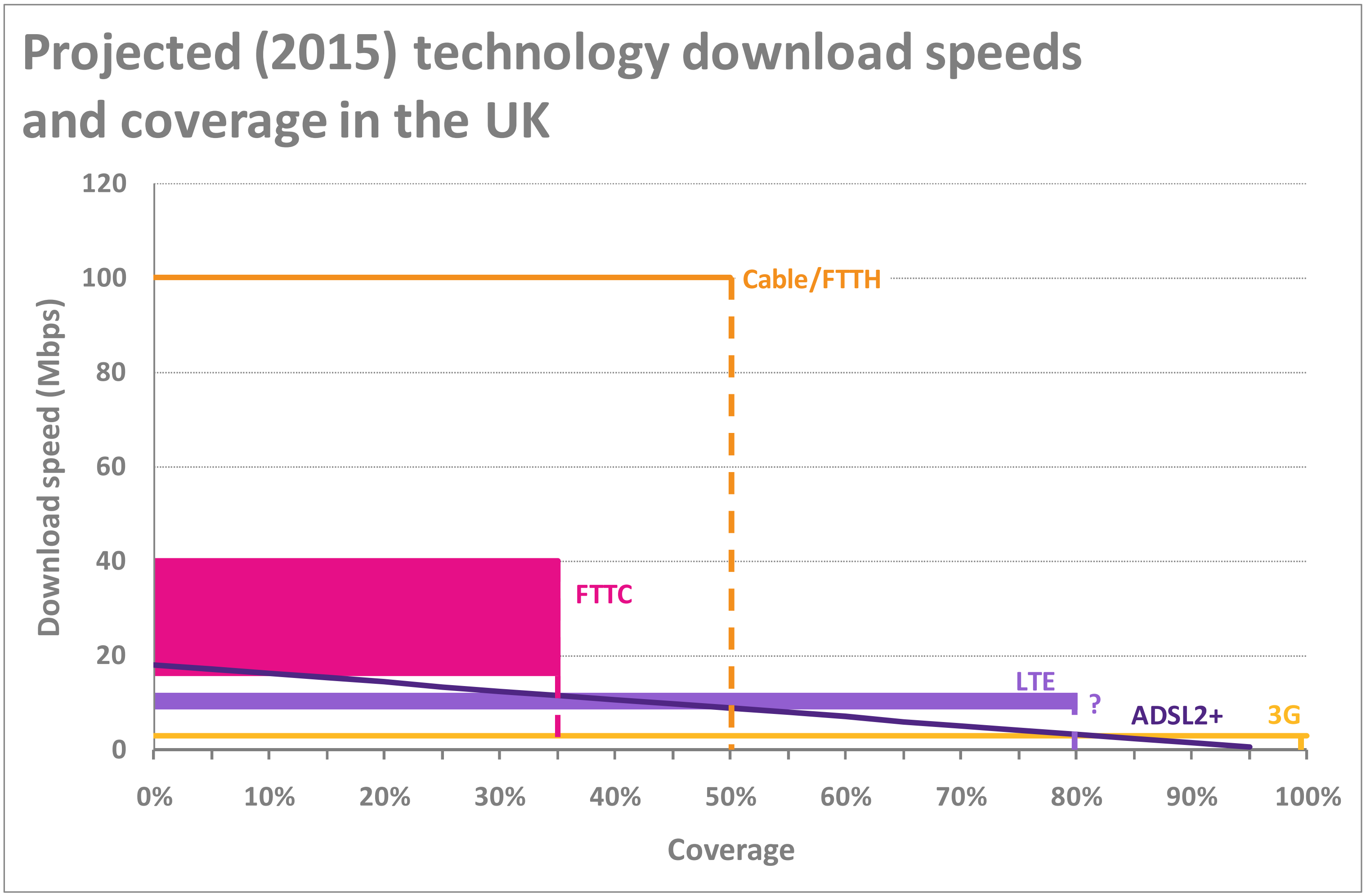
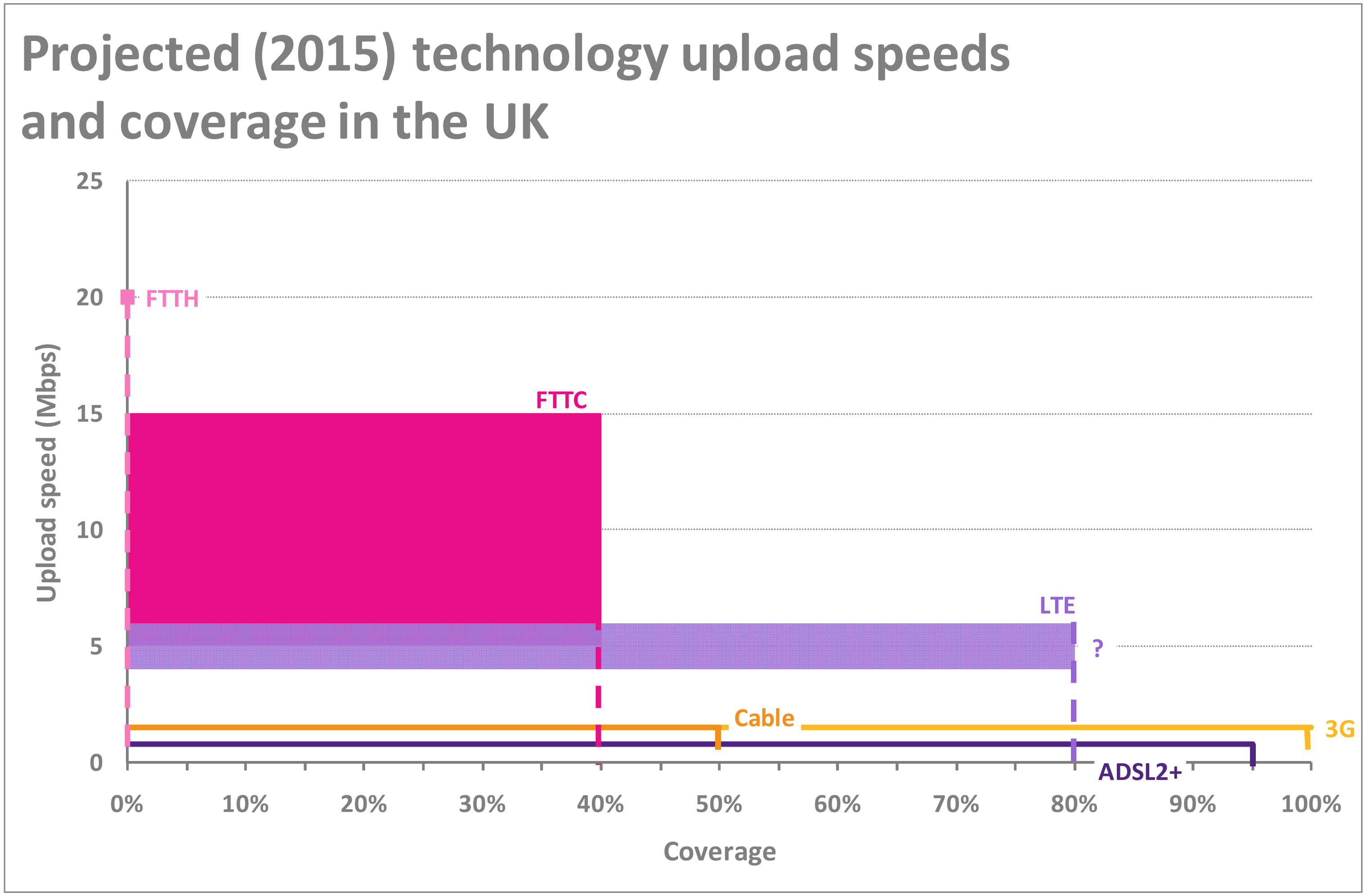
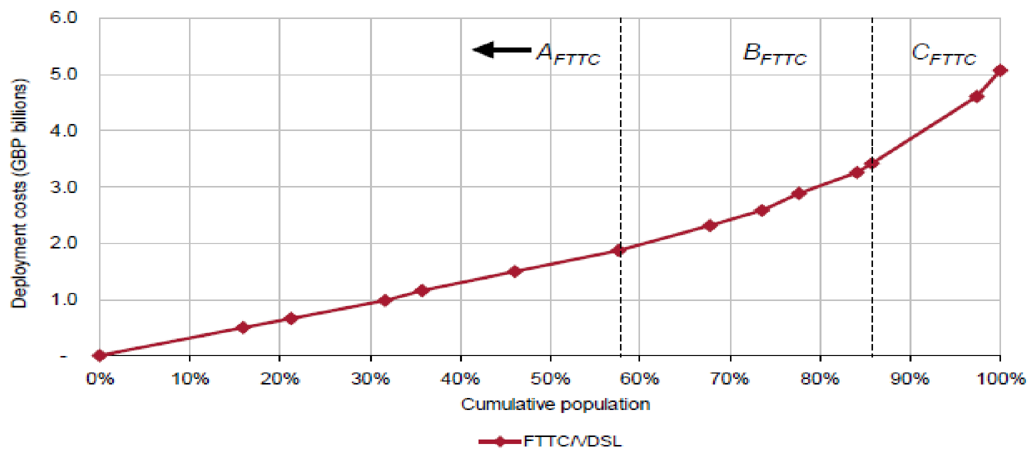


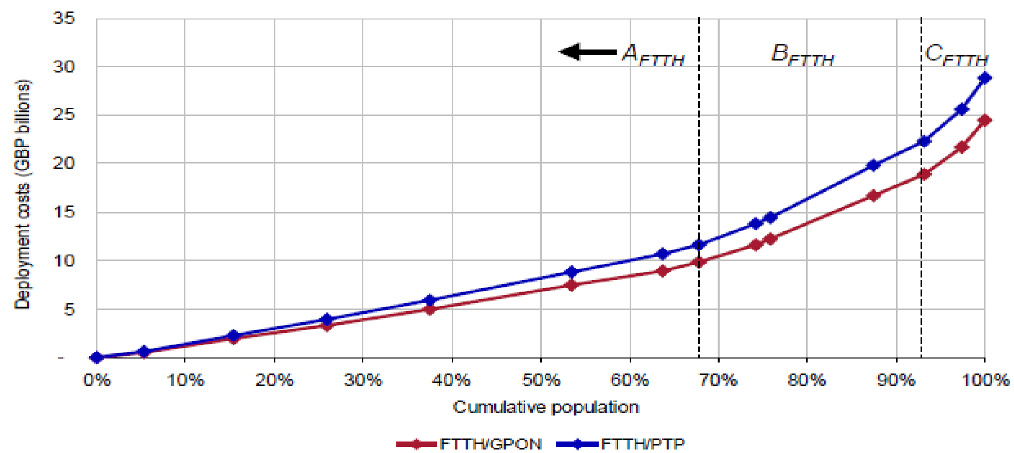
And upload speeds ....



Costs of fibre – the market might not deliver to the most costly third of the population



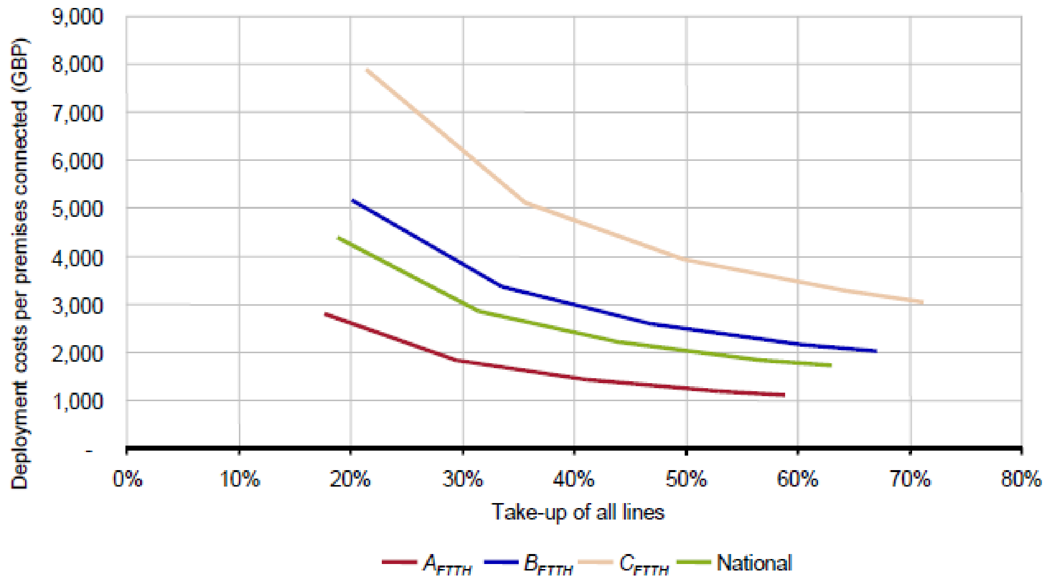
FTTC/VDSL: Total cost £5bn – last third ~£3bn



FTTH: Total cost up to £30bn – last third £15-20bn

Source: Analysys Mason 2008

But this depends on take-up .....



And assumptions about the copper network......

If copper removed then operating costs fall substantially

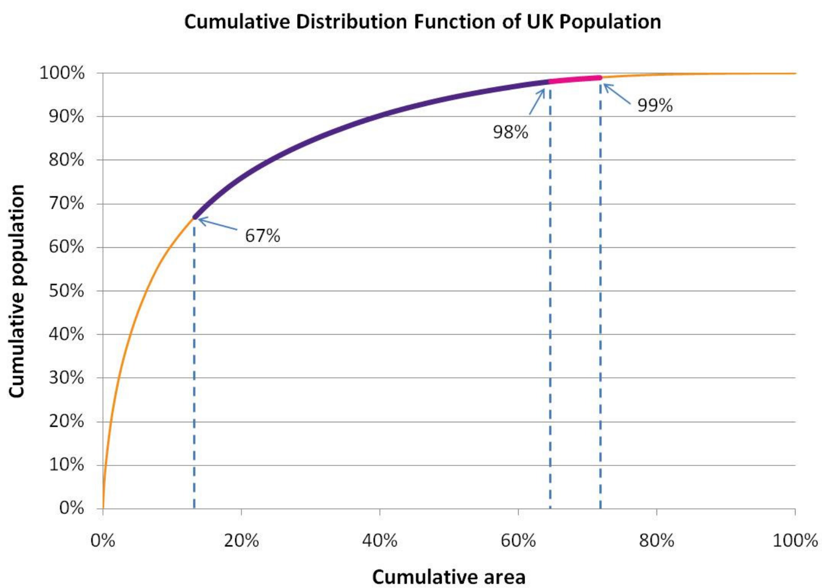
Estimates range from 30-70%

Fault rate falls 80% (Verizon)

Wireless approaches

Broadband delivery using LTE

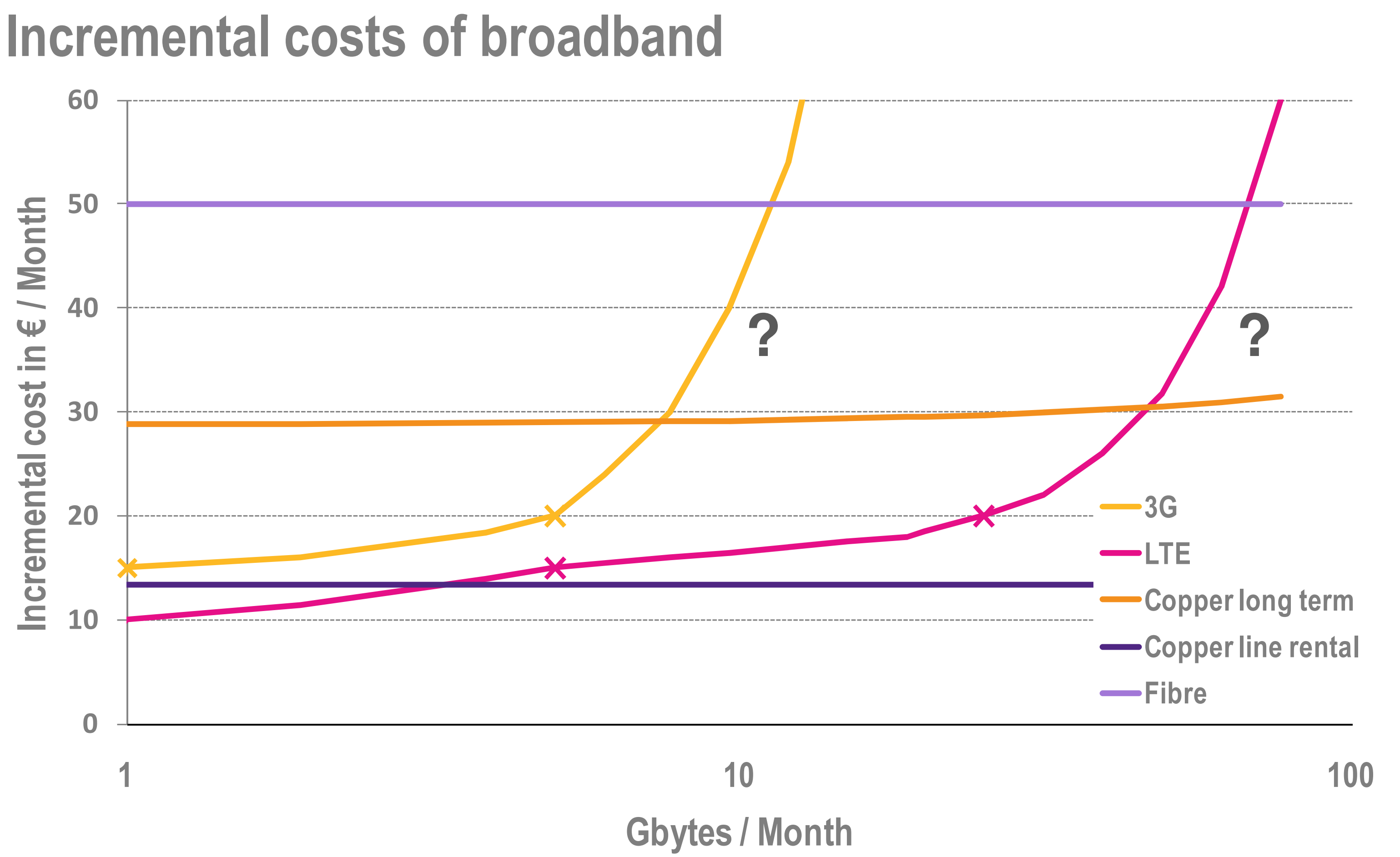
- **Assuming "final third" is 67 to 98%**
- **Area comprises 127,000 km^2**
- **Network lifetime costs***
    - **Assuming ~15k sites (for indoor coverage)**
        - **£2.8bn** to £3.3bn**
    - **Assuming ~5k sites (with use of outdoor antennas)**
        - **£0.9bn** to £1.1bn**



** Based on 10 year NPV of site costs of £190k to £220k per site at a discount rate of 10%*

*** Without site acquisition costs*

Costs could be much lower with LTE than fibre or copper for some users



Source: Analysys Mason, Telektronikk, European Commission, Verizon

Technology neutral voice USO

- **If voice USO is tied to copper potential revenues for fibre/cable/wireless operators reduced – could be a particular issue in rural areas where economics least attractive**
- **But there are issues in removing the copper**
  - Need for a basic voice products for those who do not want broadband
  - Removes opportunities DSL competitors unless replacement products offered
  - Fibre is not powered unlike copper so services like traffic lights lose power supply
  - Entry to every household for terminating equipment

Concluding comments

- **We need to reconsider whether we have got the policy objective for universal broadband right**
  - Should it be to the home or elsewhere?
  - Should it be focused on the middle mile or the final mile?
  - What is the speed, variability requirement?
- **To address these questions**
  - Government objectives for funding need to be clearer
  - Better cost/performance data on fixed vs wireless is required
    - From operators or
    - Government/regulator studies
- **Technology neutrality is not enough as the specification of the broadband requirement in a tender for public funds will affect the technology that is used.**

Thank you!

- A Framework for evaluating the value of next generation broadband, Plum for the BSG, June 2008 http://www.broadbanduk.org/component/option,com_docman/task,doc_view/gid,1009/Itemid,63/
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- The Need for Speed: The Importance of Next-Generation Broadband Networks, Information technology and innovation foundation, March 2009 http://www.itif.org/index.php?id=231
- The costs of deploying next generation fibre based infrastructure. Analysys Mason for the BSG, September 2008, http://www.broadbanduk.org/component/option,com_docman/task,cat_view/gid,21/dir,DESC/order,date/limit,10/limitstart,10/