Infrastructure for Australia's Digital Economy:

Politics confront Technology

The story of Australia's National Broadband Network

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Australia's National Broadband Network

- **April 2009**: Announced by Federal Government
- 93% fibre to the premises (FTTP)
- Investment of AU $43 billion
- The "single biggest infrastructure decision in Australia's history"
- **September 2013**: New Government resets key parameters
- FTTP largely replaced by fibre to the node (FTTN)

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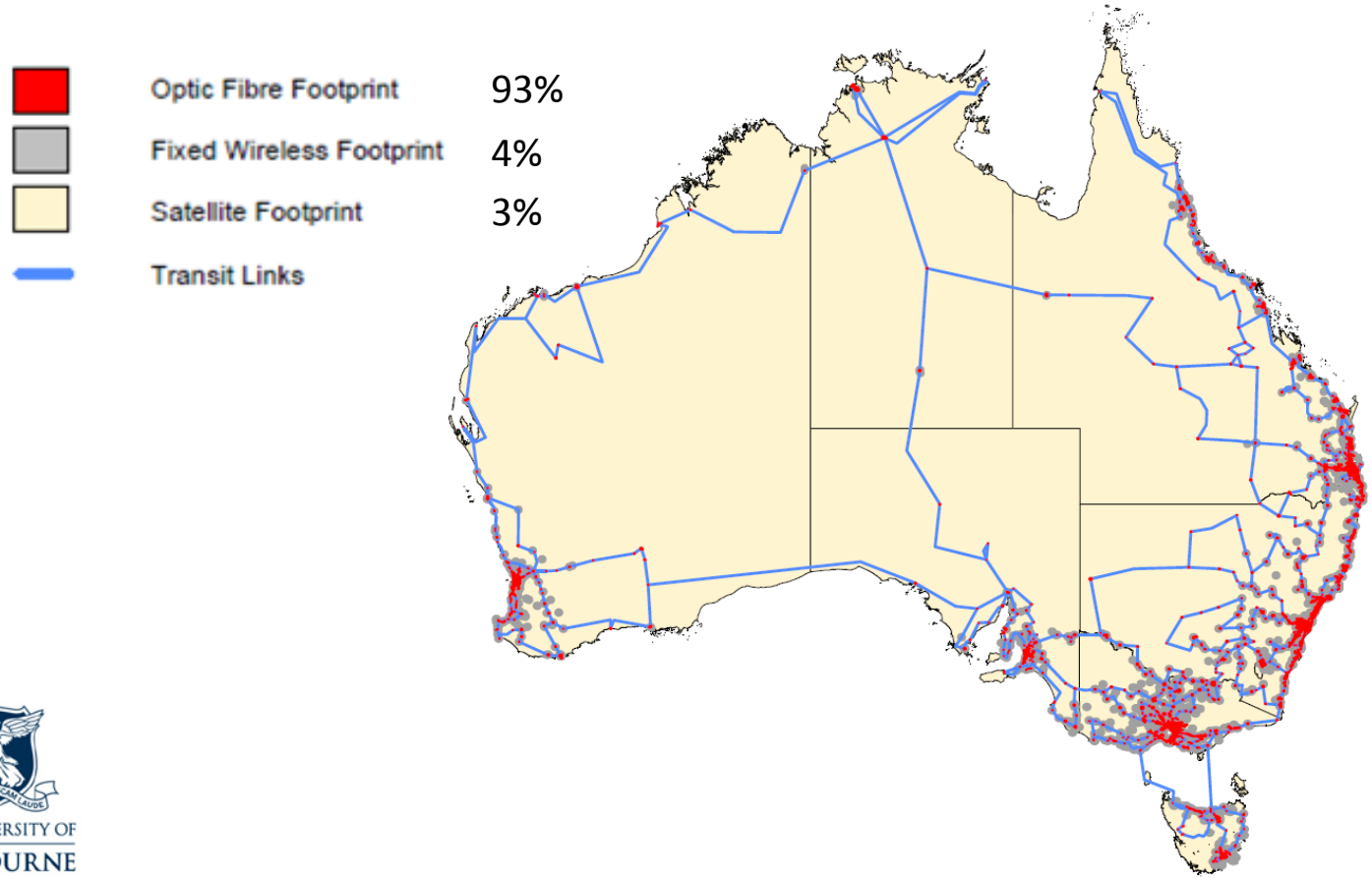
Original Technology Footprints



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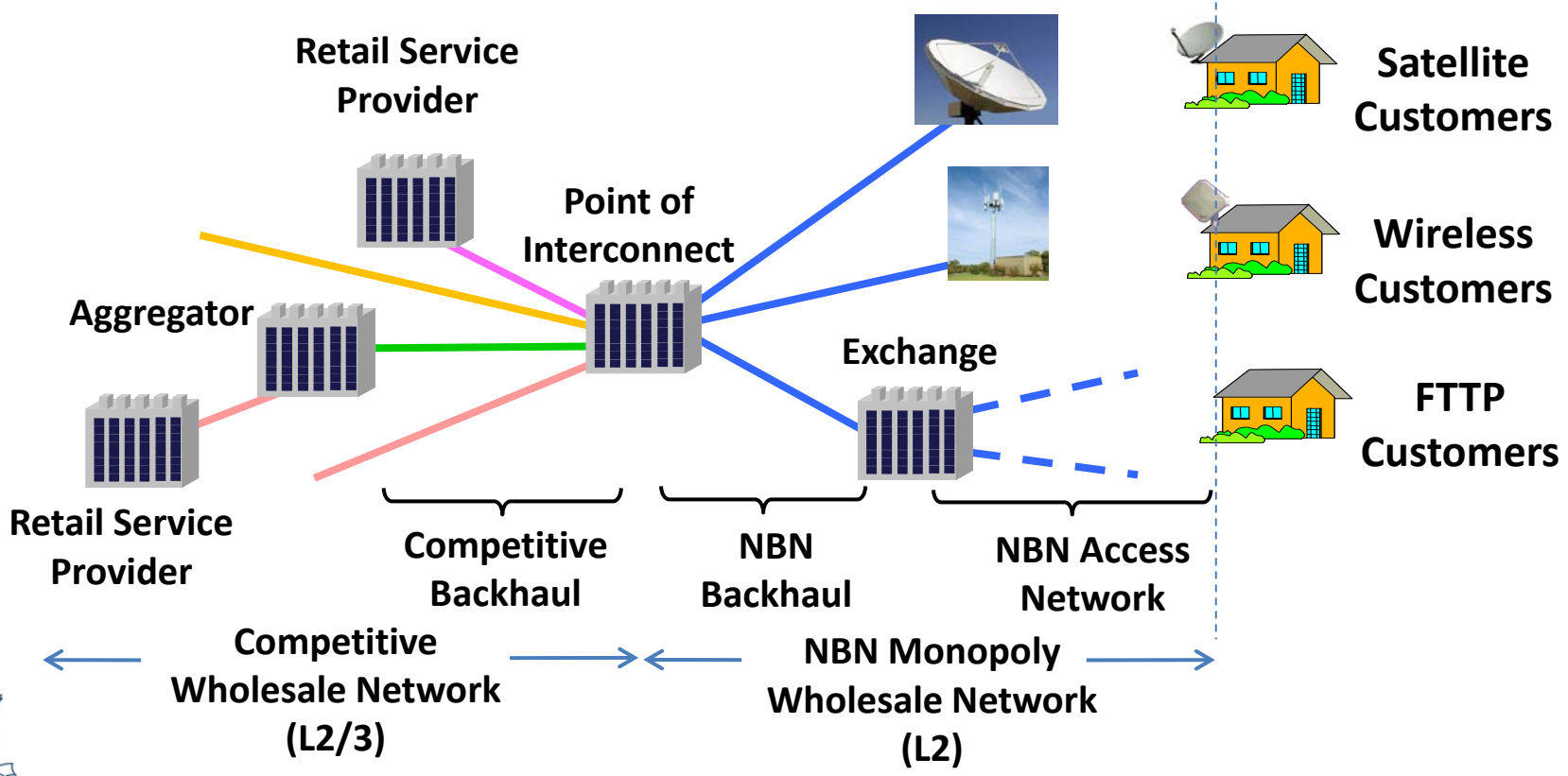
Source: NBNCo

NBN Structure



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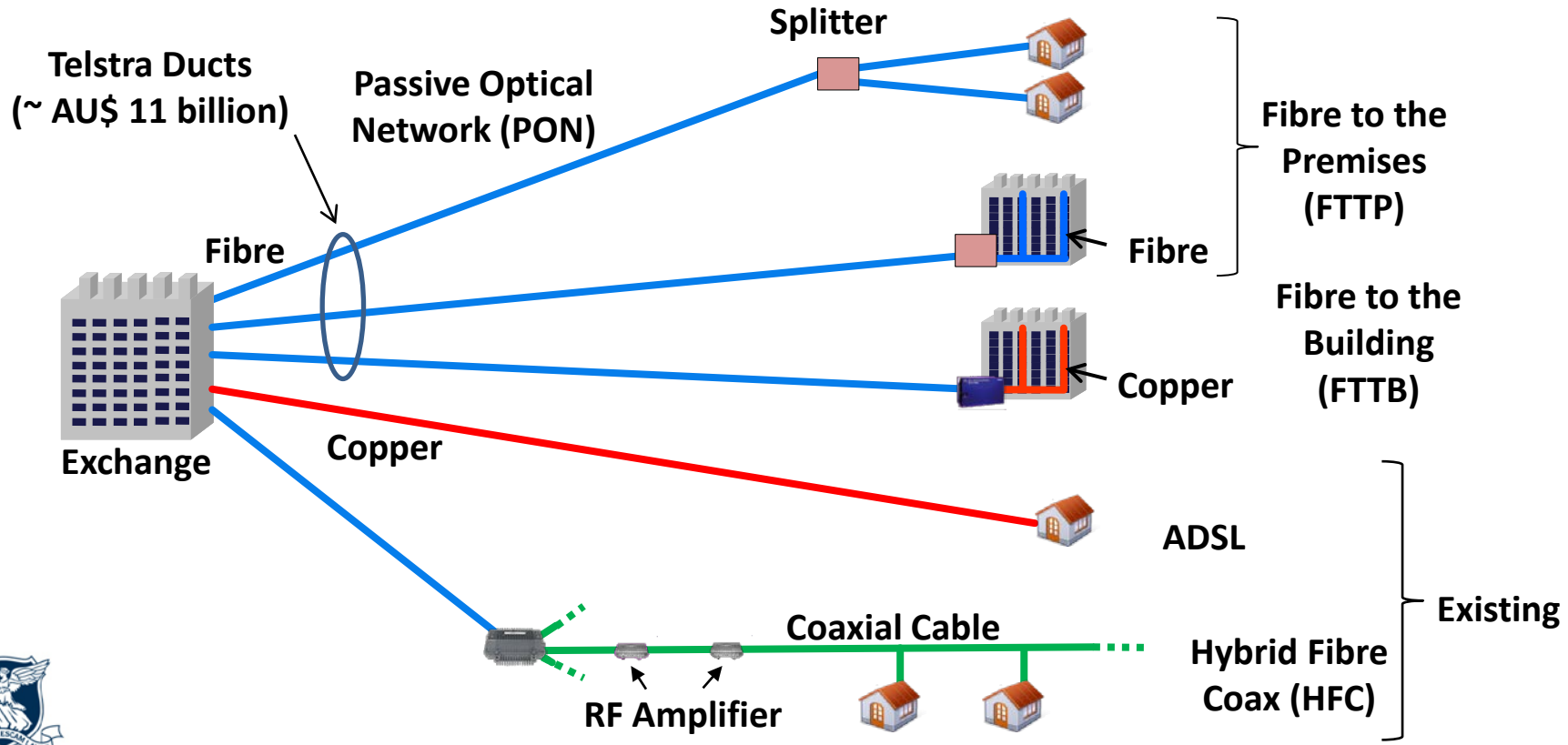
Wireline Technologies



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Pricing Principles

- *Uniform Pricing*
  - Uniform wholesale pricing across Australia irrespective of the delivery technology and location
  - Price depends only on product-specific bitrate

- *Avoidance of Cherry Picking*
  - Protections against cherry picking for low cost / high revenue regions
  - Business plan dependent on NBNCo monopoly

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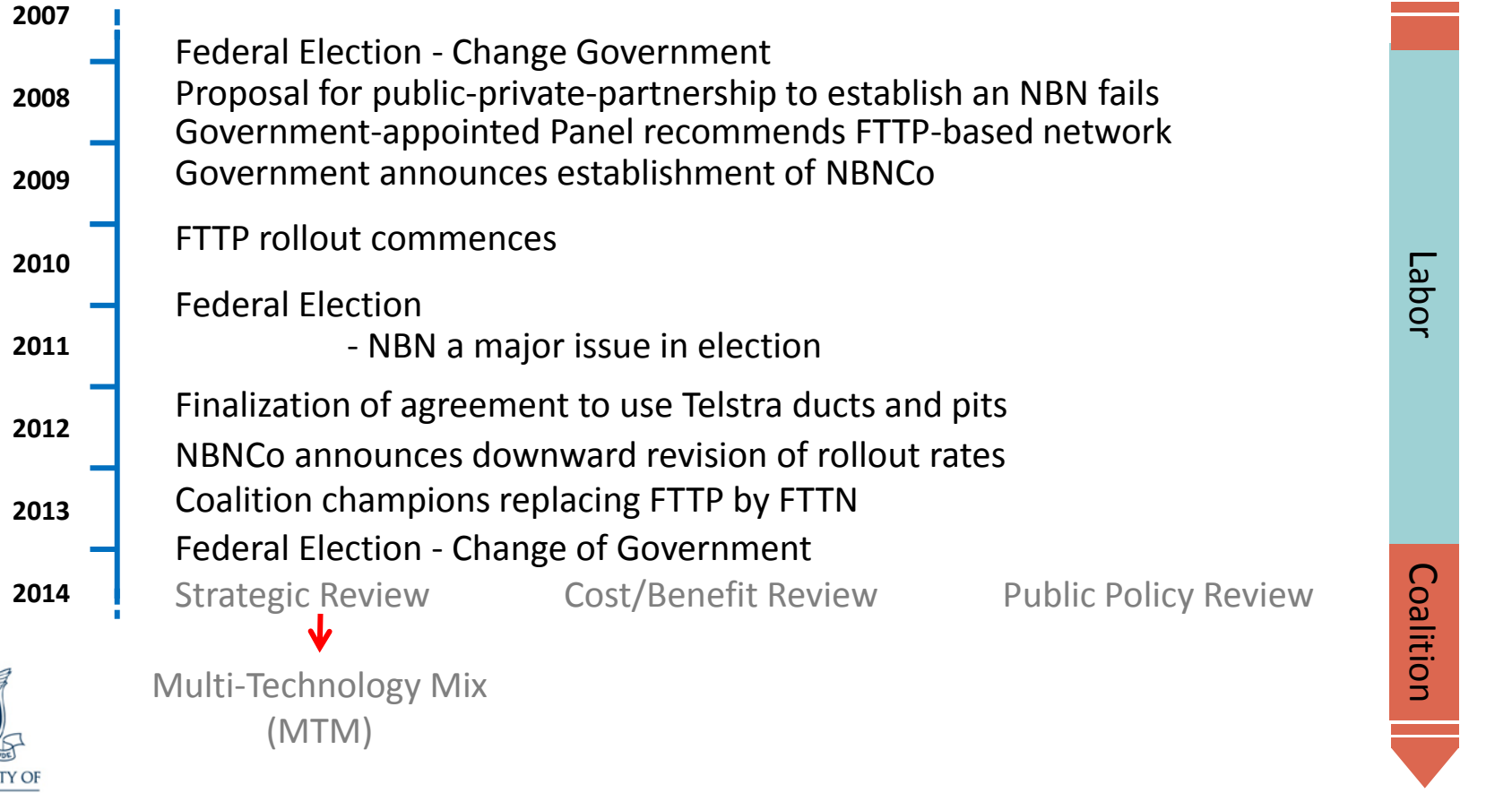
Seven Years of Flux



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Issues in the Political Debate

- Overall project cost
  - Cost-benefit analysis
- Choice of technology
- Speed of rollout
- Monopoly versus facilities-based competition

Cost

- AU $43 billion over 8 years (~ AU $5.5 billion per year)

  ~ AU$ 300 per person per year

- Some commentary:
  - a “shockingly misconceived, wasteful exercise in public policy”
  - a “dangerous delusion”, cost/benefit analysis required
  - a “brilliant initiative that will transform Australia”

- *Annual spend on roads: AU $16 billion*

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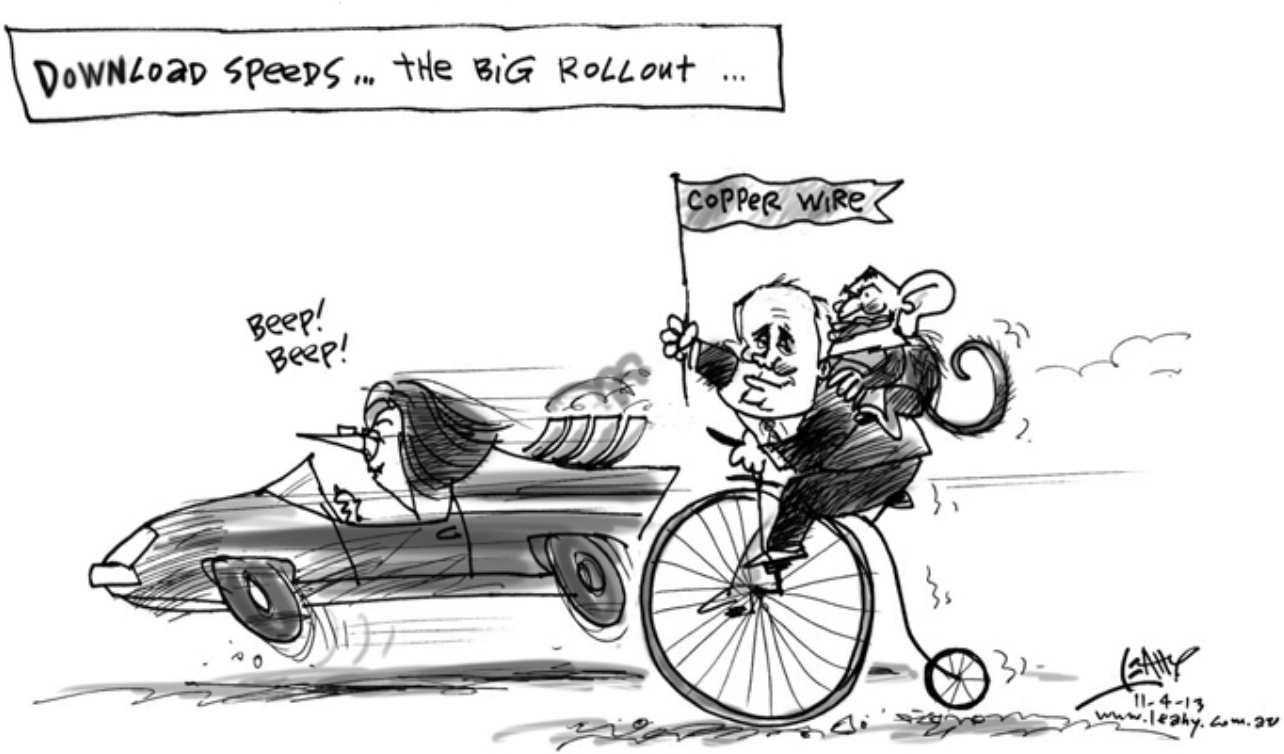
Cost

Source: www.nicholsoncartoons.com.au

Choice of Technology

- Many ill-informed opinions in the press, e.g.:
  - Replace FTTP by “mobile technologies and existing fibre”
- Strong political statements, e.g.:
  - a “dangerous delusion”
  - a “white elephant on a massive scale”
- Dearth of informed technical debate

Technologies



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Technologies

Source: Cathy Wilcox. Reproduced with Permission

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Speed of Construction

- Delays caused by factors such as:
  - Difficulties in mobilizing a large workforce
  - Delays in finalizing agreements with Telstra
  - Asbestos in Telstra pits
- Much political debate about these delays and reports of “cost blowouts”
- Labor has since admitted it underestimated the difficulties in ramping up the project

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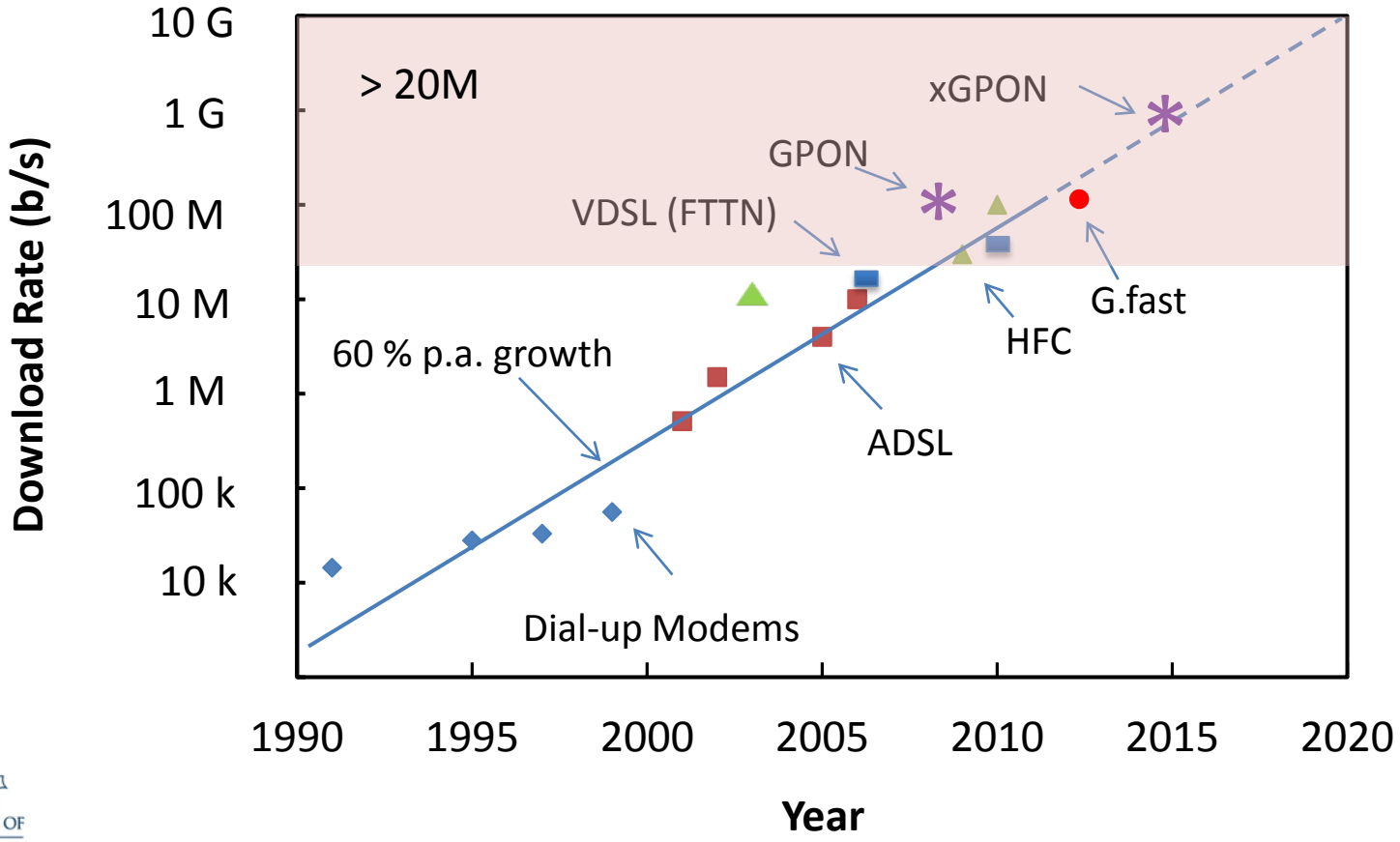
The Debate around User Demand



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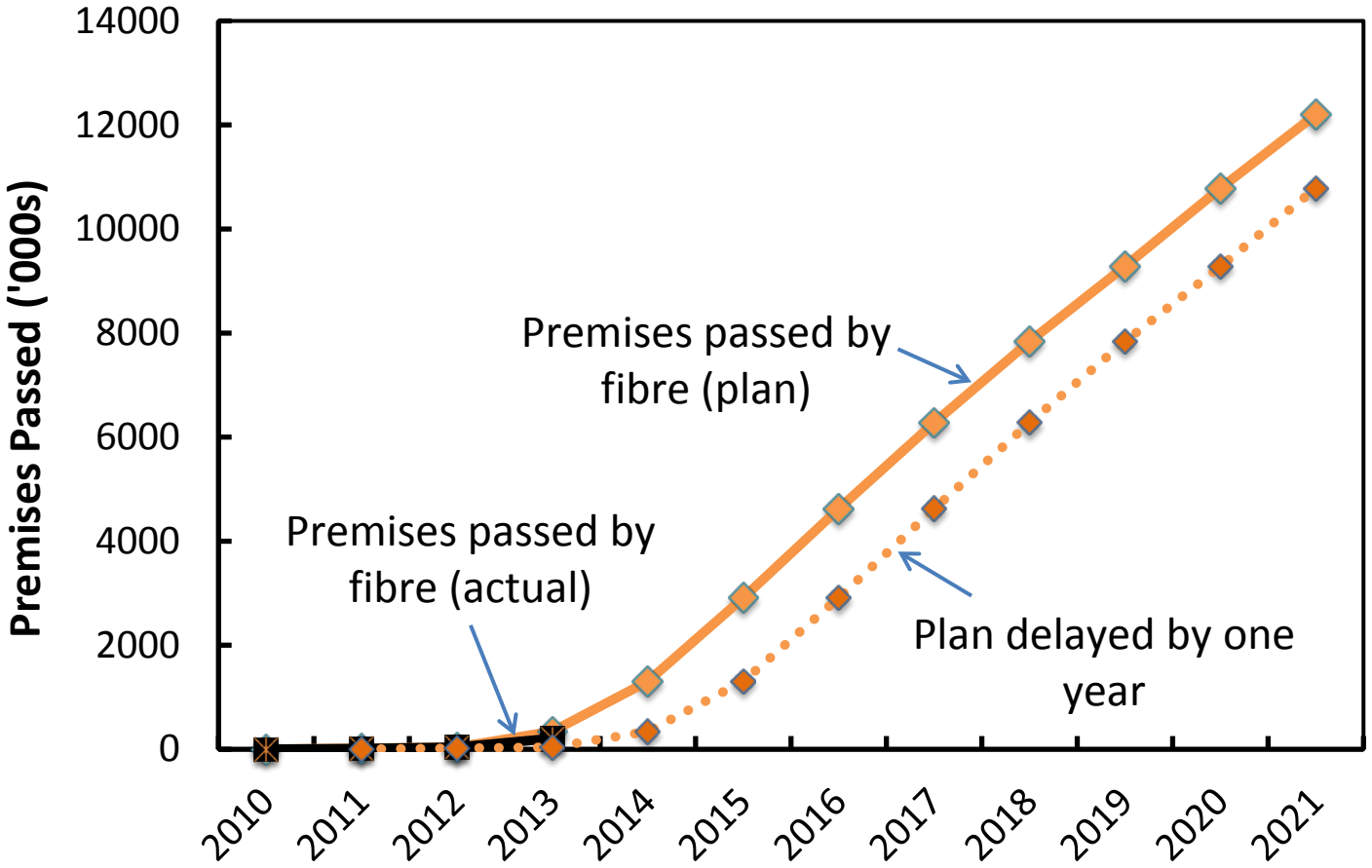
Delays



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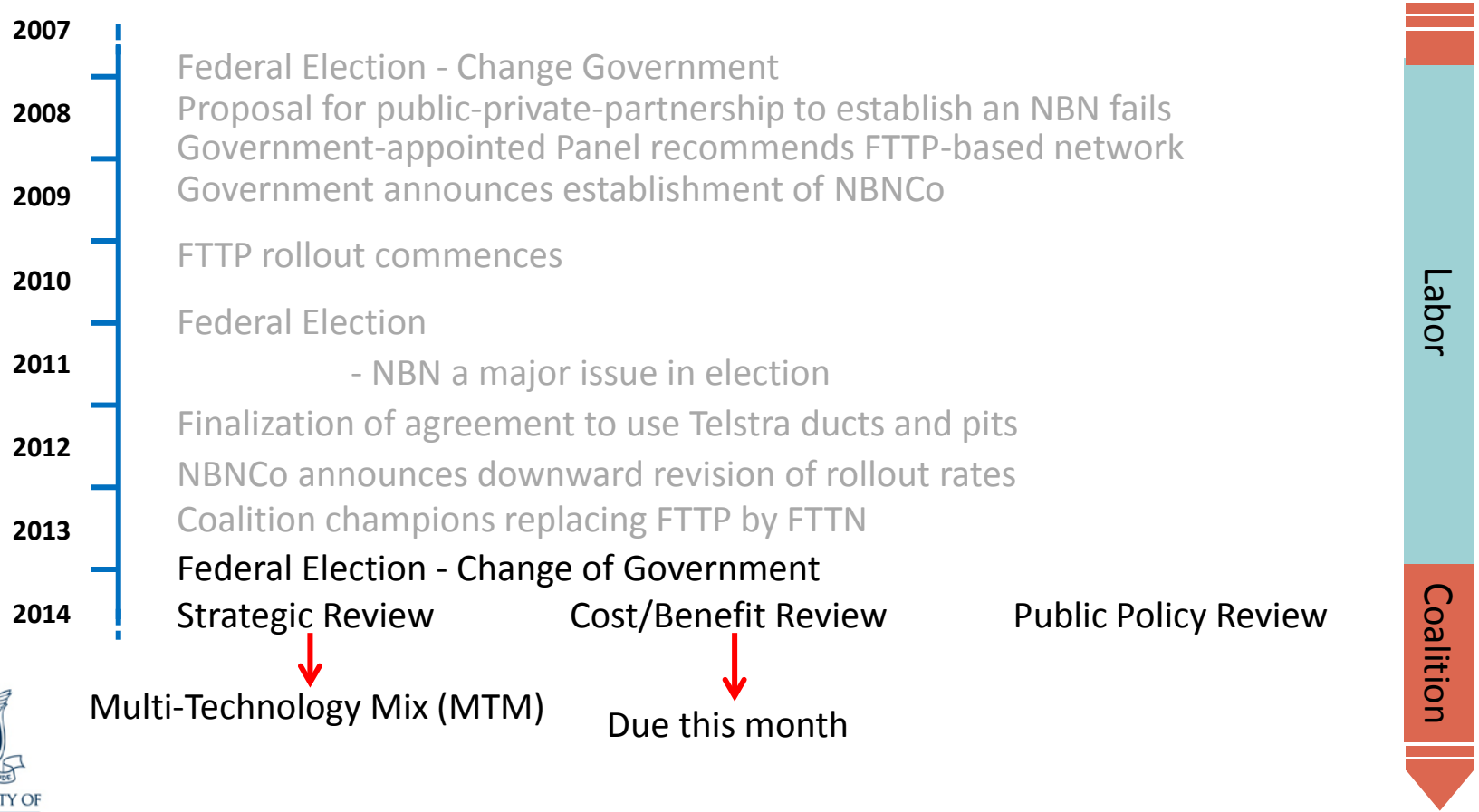
Seven Years of Flux



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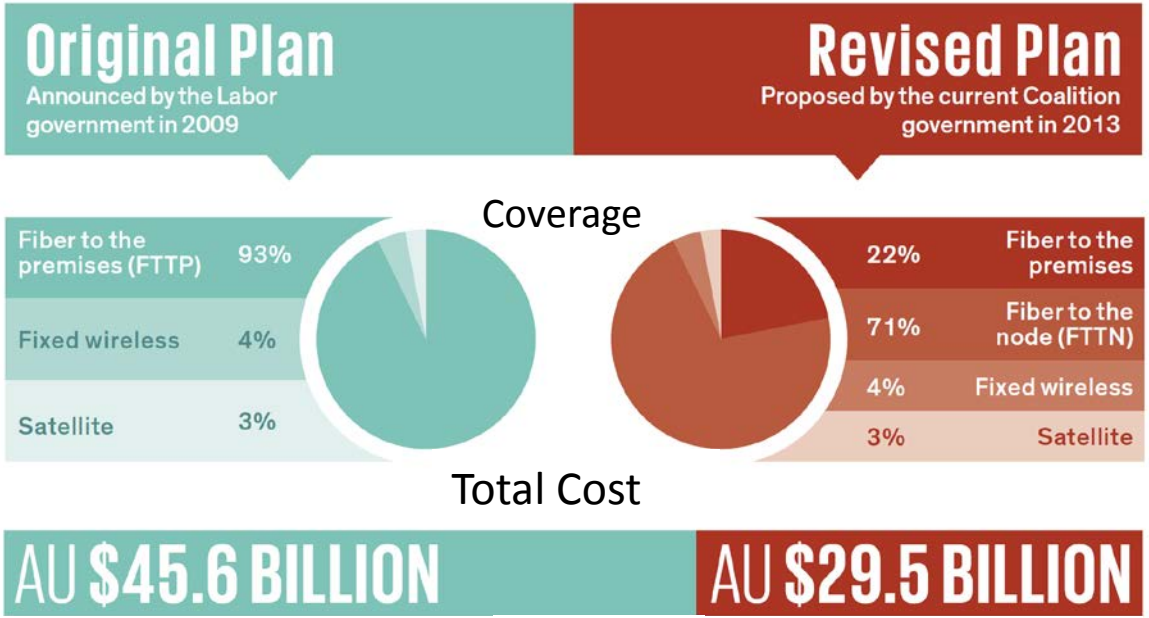
2013 Election and Beyond



"Fast, Affordable, Sooner"

Strategic review (December 2013):

Multi-Technology Mix:

FTTP: 20-26%
FTTN/dp/B: to 44-50%
HFC: ~ 30%

> 98% of footprint to achieve > 25 Mbps by end of 2020

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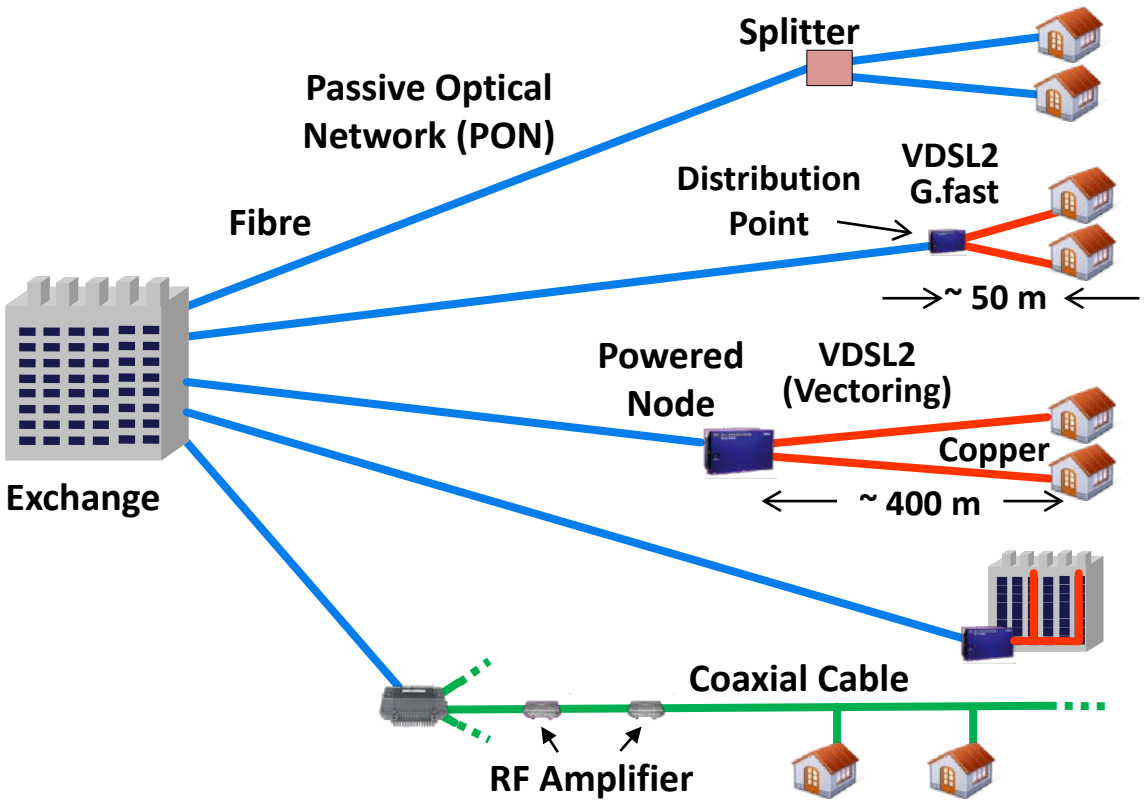
Multi-Technology Mix



Fibre to the Premises (FTTP)

Fibre to the Distribution Point (FTTdp)

Fibre to the Node (FTTN)

Fibre to the Building (FTTB)

Hybrid Fibre Coax (HFC)

"Faster, Sooner, Cheaper"

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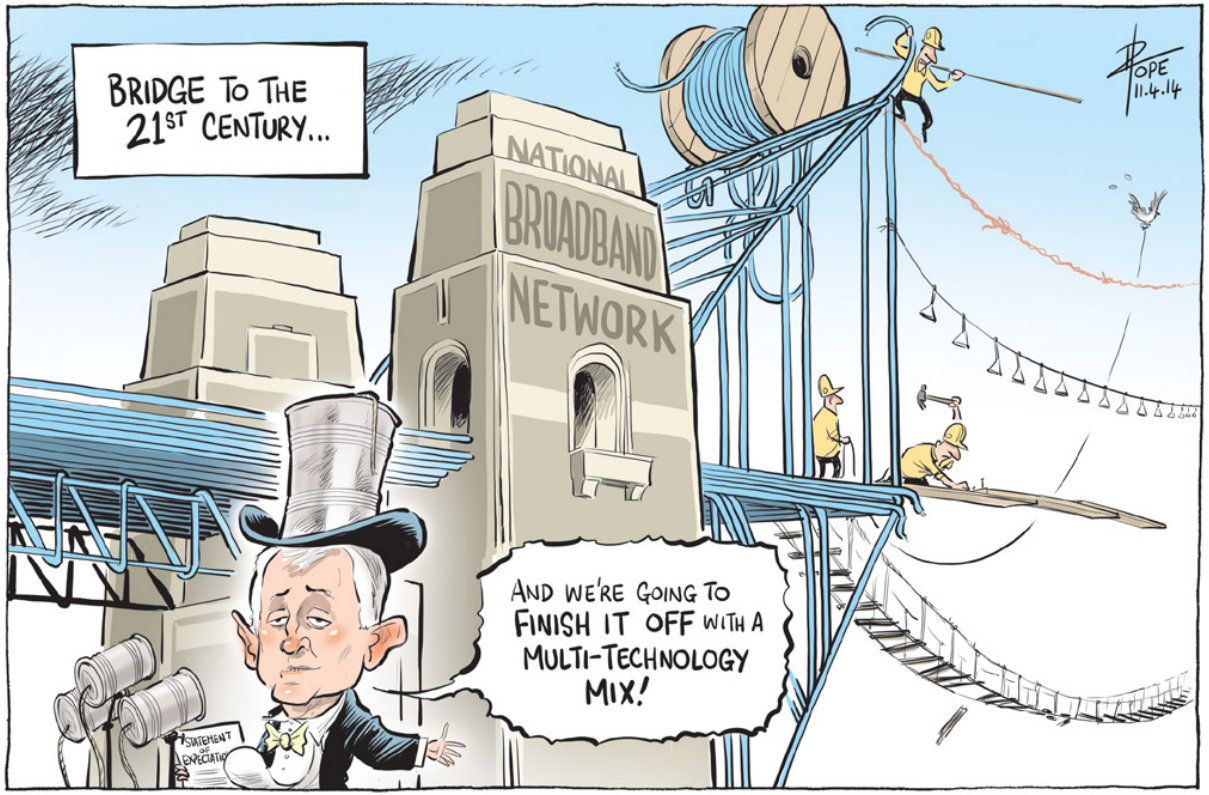
Multi-Technology Mix



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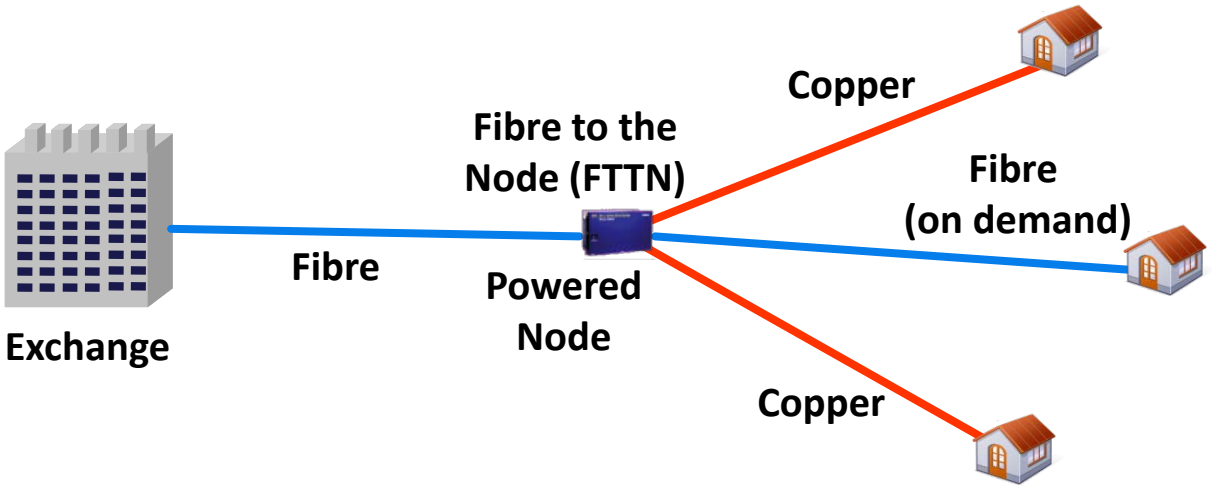
Fibre on Demand

If a user needs more bandwidth

- Fibre installed on user-pays basis
- Cost depends on distance to node etc.



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Worldwide FTTP Developments

- FTTP rollouts in more than 100 countries
- Most of Scandinavia, the Netherlands, and many of the Arab oil states have FTTP penetration levels of more than 50%
- In developed economies FTTP is predicted, over the next 5 years, grow to around 30% - 50% of the population (*Budde*)
- Google: Offering 1 Gb/s to cities such as Kansas City and Austin
- AT&T: Tentative plans for 1-Gb/s to ~ 100 cities in 21 metro areas
- By the end of 2014 China aims to have 100 million households connected to fibre

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Final Words

- Telecommunications is essential infrastructure
  - c.f. roads, rail, water, electricity, sewer systems
- Engineers need to become more involved in political debate
  - Counteract technical confusion and misinformation
- FTTP will eventually come to Australia
  - But by a circuitous route

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