The politics of speed: An examination of national governments' policies for FTTX networks

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[3]

Abstract

The Australian Labor Government's National Broadband Network plan to fund the rollout of a fibre-to-the-premises network that will serve 93 percent of premises represents a level of government intervention towards achieving a goal of ubiquitous high-speed broadband that almost no other national government has been prepared to make. Its supporters, here and abroad, point to its national benefits and its international leadership. Its detractors, particularly the Australian Parliamentary Opposition, cite the uniqueness of the undertaking and its creation of a monopoly in fixed access infrastructure as evidence of its foolhardiness. This article examines the views of a selection of national governments on the desirability of ubiquitous high speed broadband and any plans or policies in place to achieve this. It concludes that most governments share the same goal of eventual ubiquitous high-speed broadband access for their citizens, and notes that 82 percent of investment in FTTX in 2012-17 in the world?s developed countries is estimated to be in fibre-to-the-home (FTTH). But their current policies reflect their starting points as much as their preferred time frames ? and their ideologically preferred means of achieving their national goals.

Introduction

Australia's Shadow Communications Minister, Malcolm Turnbull, has mounted a consistent attack on the Labor Government's National Broadband Network, in particular its plan to build a fibre-to-the-premises (FTTP) network that will connect 93 percent of homes and provide downstream bandwidths up to 100Mbps.

He has attacked on a number of fronts, including:

- there is no hard evidence to suggest demand for this bandwidth in the foreseeable future;
- the timeframe for the network rollout will leave many customers in urban areas who are presently unable to get adequate broadband by either DSL or cable in this situation for several more years;
- No commitment to the multibillion dollar investment required should have been made without a rigorous cost-benefit analysis.

Instead of an FTTP rollout, he proposes to use fibre-to-the-node (FTTN) technologies to bring improved broadband services to urban areas. This, he claims, would deliver sufficient bandwidth to meet demand for years to come, would be much cheaper than FTTP and would bring improved broadband to poorly-served customers much quicker than the scheduled rollout of the NBN FTTP network. He backs up his arguments by claiming that nowhere else in the world is any Government intervening in the upgrading of a nation's telecommunications infrastructure on such a grand scale, by citing countries where broadband network rollouts align with his vision for Australia and countries, like South Korea, which have extensive FTTH networks but where, he claims, there has been little demand for the bandwidth they can deliver.

This article will attempt to assess the validity of those claims by examining broadband policies and network deployments in a number of overseas administrations.

FTTP vs FTTN: A global perspective

According to research firm Analysys Mason, (Analysys Mason 2012 [5]) the bulk of access network investment between 2012 and 2017, globally, will go into FTTH networks.

It predicts that fixed operators in developed economies ? Central and Eastern Europe, developed Asia-Pacific, North America and Western Europe ? will spend $US53.5B on fibre access network rollouts in that period, $US25.9B in Western Europe alone; and that 82 percent will be on FTTH rather than fibre-to-the-cabinet (FTTC) and VDSL (very high speed digital subscriber line, using copper pairs from the cabinet to the premises).

On the other hand, in what would be music to Turnbull's ears, in April 2012 Analysys Mason issued a report *FTTx Roll-Out And Capex In Developed Economies: Forecasts 2012?2017,* saying ?those countries where the major operators are focusing on FTTC and VDSL will generally have much higher availability of next-generation broadband in five years? time? and it highlighted ?the dangers of a pure FTTH approach at a time when cable and 4G mobile operators are able to upgrade more quickly than telcos.?

Echoing Turnbull's claims, report author, Rupert Wood said: ?Sticking rigidly to FTTH runs the risk of delivering next-generation access to a largely urban or well-to-do elite, while delaying delivery to other users and potentially losing customers.?

However Australia's goal of ?sticking rigidly to FTTH? ? more positively expressed as ?striving to provide widespread FTTH? ? has come in for strong praise from several industry luminaries. ITU secretary general, Dr Hamadoun Tour?, on a visit to Australia in 2011, was reported in *The Age* as having ?given the government's national broadband network project a tick of approval.? He was quoted saying:

> *?Three to five years from now, Australia will be number one in broadband in the world. A large size country like this can be a test bed for any scenario that could happen anywhere else in the world and I can take that model to share anywhere else in the world.?*

Internet pioneer Vint Cerf told a meeting of the Internet Society of Australia (ISOC-AU) in Sydney in January 2011:

> *?I am so envious that you have a government that is willing to make the long term infrastructure investment of this magnitude and of this type* [in the NBN].?

National policies

The European Union

Under EU policy on public funding, no government amongst its member countries would be permitted to make an investment on the scale of Australia's NBN, or to limit competition in the provision of access network infrastructure as the Australian Government has done.

Nevertheless the EU's goals for broadband are similar to those for the NBN and the EU is examining its policy on public funding in the belief that these goals will not be met without FTTP and that FTTP rollouts into rural areas are unlikely without public funding.

The EU rules on government subsidies are complex but their aim is to ensure that no aid granted by a member state or through state resources will distort competition by favouring certain undertakings or the production of certain goods.

In July 2012, the EU invited comments (EU 2012 [6]) on the application of these rules to the public funding of broadband networks. The key issue for discussion was how the current guidelines on state funding could be adapted to the objectives of the EU's Digital Agenda for Europe [7] (DAE).

The DAE, released in May 2010, included a target of Internet access being available to all European citizens by 2020 at speeds of 30Mbps or above, and to have half of all European households subscribing to connections of 100Mbps or higher by that date.

The draft guidelines [8] note that the cost to achieve 30Mbps for all EU citizens by 2020 had been put at ?60B, and at ?270B to achieve 100Mbps for 50 percent. They state that these objectives ?cannot be reached without the support of public funds?, and they note that the Digital Agenda calls on member states to use ?public financing in line with EU competition and state aid rules in order to help meet these objectives?.

The draft guidelines allow state aid to roll out FTTP[6]. They state:

> *?In light of the Digital Agenda objectives, in particular achieving 50 percent penetration to Internet connections above 100Mbps, public intervention would still be possible in areas where existing or planned NGA [next generation access] networks do not reach the end-user premises with fibre networks."*

However there is a view that ubiquitous deployment of FTTH can be achieved throughout the EU by private investment if an appropriate regulatory environment is put in place. Consultancy firm Ventura Team, in a report commissioned by the FTTH Council Europe *Financing Stimulus for FTTH - Funding Europe?s ?260 billion access fibre upgrade: A rationale and specific recommendations for a new approach by industry, policy makers and governments,* claims that the telco industry could fund the switchover to FTTH itself over a period of 25 years with the right regulations.

The study has put the capex cost of providing fibre to every home in the EU at ?261B and says that with investment presently running at a mere ?3B a year, ubiquitous FTTH rollout will take almost a century.

The study advocates a coordinated program of regulatory change to drive the fibre switchover, claiming there is little incentive for fixed telecom operators to invest in FTTH because the cash keeps flowing from the old copper networks. However in some EU member countries aggressive FTTH rollouts are already underway without Government subsidies or targeted regulation.

United Kingdom

In December 2010 the UK's Coalition Government released a policy document,*Britain's Superfast Broadband Future*[9], in which it set out the Government's vision that ?[Britain] should have the best superfast broadband network in Europe by 2015?.

The UK Government's specific target is to provide 24Mbps to at least 90 percent of premises in the UK by 2015, and to provide universal access to standard broadband with a speed of at least 2Mbps by 2015. 24Mbps is hardly superfast and even if getting this to 90 percent of premises does give the UK the best broadband network in Europe by 2015, that status would likely be short-lived if other EU member states come close to realising the EU?s goal of half of EU citizens being able to get at least 100Mbps by 2020.

However there is no universal definition of broadband, let alone superfast broadband. Wikipedia defines broadband has anything in excess of 256kbps, and has no entry for ?superfast broadband? or any other variant. In the US the FCC presently defines a broadband service as one able to deliver, 3Mbps downstream and 1Mbps upstream, but has been reported as reviewing this with a view to increasing the bandwidth.

Given the intense focus around the world on boosting broadband speeds and the fondness of governments for setting comparison-based goals, universal definitions are needed.

*Britain's Superfast Broadband Future*examined the various technology options ? fibre, copper and wireless ? but made no recommendations. It simply concluded: ?All connectivity uses fibre and/or wireless elements. The only debate is where one finishes and the other begins and that will be driven by the costs.?

The documentsets out a series of policies ?intended to provide the best possible climate for investment and private sector development of our broadband networks?.

What Britons will actually get is largely what the former monopoly telco, BT, and Virgin Media ? operator of a cable TV network ? deem to be commercially viable.

Virgin Media's cable network covers around 50 percent of the UK population, around 13 million homes. It currently offers speeds to consumers of up to 100Mbps. Virgin Media has no current plans to expand its infrastructure footprint substantially.

Openreach, the structurally separated arm of former monopoly telco BT, has a role equivalent to that of NBN Co as provider of a nation-wide wholesale-only high speed access network (but without any restrictions designed to prevent competition at the access network infrastructure level).

Openreach is pushing copper to its limits and its CEO, Olivia Garfield, has been reported saying that Openreach cannot find any applications likely to drive demand for bandwidths in excess of 30Mbps. It is on target to have its FTTN network reach two-thirds of UK homes at a cost of ?2.5 billion by the end of 2014. BT has said that this investment is beyond what would be considered normal on a purely commercial basis.

Garfield has been reported saying:

> *?Our fibre business case has a pay-back period of about 12 years. That is to say we do not get our money back for 12 years, and that is on the assumption that we achieve the volumes of customers we hope to achieve in our business case. That is a long-term investment that most commercial organisations would not tolerate.?*

However BT has indicated that, in order to support the Government's policy objectives, it is ?willing to spend a further ?1 billion or so of BT's capital to match Government funding to do that, to roll it out into the final third, and to get as far as we possibly can into the final third...?

The company is however planning to offerFTTP 'on-demand' [10] from early 2013. If the Openreach wholesaler is prepared to provide it, an end user will be able to get a fibre link from the Openreach street cabinet delivering a bandwidth of 330Mbps downstream and 40Mbps upstream. The wholesale price of the service was set initially at ?60 per month but cut to ?38 per month on 5 December 2012.

BT says that the median distance of customer premises from its fibre termination is 500 metres. CSPs (Communications Service Providers) will be charged ?500 for installation and a distance-based component of around ?1,000. On this basis the 'cost' to serve the 90 percent of 28 million homes that BT expects to serve with its FTTN network (subject to receiving additional government funding) would be ?37.8B ($59.0B).

BT announced plans for the FTTP service in February 2012 and it was formally launched in July, with Openreach saying it would be available in areas served by its FTTN network from the northern spring of 2013.

?530m funding for rural broadband

Outside BT's planned FTTN rollout areas, the UK Government has allocated ?530m over four years to ?bring super-fast broadband to rural parts of our country that the private sector will take longer to reach?. (UK Treasury 2010 [11])

Broadband Delivery UK (BDUK) was created as a delivery vehicle for these policies. Local governments in the designated rural areas are primarily responsible for calling and awarding tenders for broadband networks. BDUK works with them and allocates funding form the ?530m pool.

In April 2011 Fujitsu announced that it would bid for this funding. (Fujitsu 2011 [12]). It formed a partnership with Virgin Media, TalkTalk and Cisco saying it hoped to build an FTTP network to serve five million homes in rural Britain. It planned to use underground ducts and poles owned by BT, a strategy made possible after UK regulator Ofcom forced BT Openreach to open up its infrastructure to other companies on fair, reasonable and non-discriminatory terms.

Fujitsu seems to have made little headway against BT's Openreach and its FTTN network. The*Financial Times* reported in July 2012 that the consortium ? one of only two picked to compete with BT for the funding ? had failed to win any bids, all of which had gone to BT (FT 2012 [13]).

An alternative vision of UK broadband

Meanwhile the Government's broadband policy has been given short shrift by the House of Lords Select Committee on Communications, in its July 2012 report ?Broadband for all ? an alternative vision.? (House of Lords 2012 [14])

The Lords acknowledged that the massive investment needed to achieve the goal set out in Britain's Superfast Broadband Future cannot be made by the Government and instead recommended a number of regulatory and policy initiatives along with limited targeted funding to accelerate progress towards it.

Its vision is aligned quite closely with the Australian Labor Government's NBN, and even goes beyond that in contemplating a network where sufficient dark fibre would be installed to street corner cabinets such that in the future each household could have its own dedicated fibre pair: a point-to-point fibre network.

 (*NBN Co is in fact rolling out sufficient fibre to provide point-to-point connections in the future, but this requirement was not specifically set out in Government policy.*)

The Committee called on the Government to

> ?bring national fibre-optical connectivity ? which would include, as a minimum, fully open access fibre backhaul ? within the reach of every community?,

 and to ensure that

> ?there is a clear path from any intermediate steps which may be taken to the rollout of point-to-point FTTP and that, crucially, these steps will not serve to hinder or hold back any future upgrade?.

It did not however take a position that FTTC might hinder such an upgrade, merely observing that:

> ?Critics of FTTC argue that while FTTC is cheaper to install in the short term, it may prove more expensive in the long run to upgrade FTTC to FTTP?.

The Committee made a case for ?a national broadband network which should be regarded as a fundamental strategic asset, to which different people can connect in different ways according to their needs and demands?.

The Committee saw no future for copper, saying its capacity ?is now being exceeded by demand for more data-intensive applications?. It recommended that Government policy ?should be ultimately directed towards universal, point-to-point FTTP as this is a technology not only able to accommodate current demand, but at current rates of growth, will be able to accommodate the UK's bandwidth demands for many decades to come?.

(However, the report?s views on the merits of FTTP are open to interpretation. A story on the Delimiter news web site saying that it vindicated Australia's NBN plan provoked a stern rebuke from Turnbull (Turnbull 2012 [15]) who claimed: ?There are three key takeaways from the study, each an unwelcome truth for supporters of Labor's NBN policy.? And he was able to find quotes from the report to back up this claim.)

USA

The goal of the US Government as set out in its National Broadband Plan (Connecting America 2010 [16]) is that at least 100 million homes should have affordable access to download speeds of at least 50Mbps by 2015, and 100Mbps by 2020.

The 376 page report made no recommendations on what fixed line technologies were preferred to achieve this goal, nor did it suggest any policy initiatives aimed at favouring rollout of any particular fixed access technologies.

However in recognition that market forces alone were never going to enable this target to be achieved in rural areas, the FCC in September 2011 launched the Connected America Fund

> *?to accelerate broadband build-out to the 18 million Americans living in rural areas who currently have no access to robust broadband infrastructure?.*

This is to be achieved by transforming the existing Universal Service Fund (USF) into the new Connect America Fund.

Massive subsidies for rural broadband

The FCC plans to bring broadband to 400,000 rural citizens in three years, seven million in six years and most of the 18 million by 2020. All up about $US10B in subsidies will be provided over the next five years.

The FCC was scheduled to make a decision on funding distribution by the end of 2012. The ABC Coalition, a coalition of large price cap telecommunications providers, has submitted a pricing model to the FCC, and based on this the FCC has released interactive national maps estimating the cost of build-out by census blocks under two possible scenarios: a model that assumes fibre to the premises (FTTP) (ABC Coalition 2012a [17]) build-out, and a model that assumes fibre to the DSLAM (FTTD) (ABC Coalition 2012b [18]) build-out.

Proponents of each of the two models presented the inner workings of their models and embedded assumptions. Many of these assumptions include key policy decisions that the FCC will need to make once it finalises its cost model. According to a report from the workshop, FCC staff did not reveal information regarding its position on any of these key model aspects.

FTTH & FTTN growing strongly

In the US the FTTH Council reported in September 2012 that the number of North American households connected directly into fibre networks had hit the nine million mark and that fibre connections were available to 21.3 million homes.

Rather than major players leading the charge, the FTTH Council said small incumbent telephone companies had been responsible for most of the growth. RVA, a company that tracks FTTH deployment for the FTTH Council, said that only eight of nearly 880 FTTH service providers had more than 30,000 subscribers and that 97 percent of them had fewer than 10,000. Verizon alone serves more than half of the FTTH households in North America and with 18 million households passed is close to stopping further rollout.

Verizon announced its plan for FiOS (a bundled [19] Internet access [20], telephone [21] and television [22] service which operates over a fibre-optic [23] communications network) in 2004 and launched services in 2005. At around the same time AT&T embarked on an FTTN strategy with its U-Verse service. By the end of 2011, U-verse had passed about 30 million homes and AT&T had called a halt.

However, that halt was short-lived. On 7 November 2012 AT&T announced Project VIP, a $US14B three-year wireline and wireless network expansion plan that included $6B to expand U-verse to pass 33 million customer locations. (AT&T 2012 [24]). The expansion is expected to be essentially complete by year-end of 2015. AT&T also plans an upgrade for U-verse to speeds of up to 75Mbps with a path to deliver even higher speeds in the future.

Market research and consultancy Ovum commented:

> *?U-verse played a role in AT&T's financial strength. Annualised revenues are now $9.5bn, up 38 percent YoY?The wireline portion of Project VIP is largely an expansion and affirmation of AT&T's existing strategy to push copper as far as it will go?The bulk of [AT&T's] wireline network will still support lower speeds per household even after the upgrade, in the range of 45?100Mbps. The speeds will be higher than the existing U-verse average range, but AT&T is hardly entering the gigabit era with these speed upgrades.?*

It added:

> *?Customer demand for 50?100Mbps speed tiers has lagged worldwide, especially at a premium price, and instances of FTTH payback are hard to come by. In light of U-verse's growing revenue impact, network synergy savings, and DSL technology advancements such as vectoring, AT&T's less-ambitious but incremental FTTN/DSL approach to network upgrades seems reasonable and pragmatic.?* (Ovum 2012 [25])

In 2010 Google announced plans to rollout a 1Gbps FTTH service in one US city, to be chosen through a competitive bidding process. Google said it had no intention of becoming a telco but simply wanted to encourage existing telcos to offer higher speed services. In March 2011, Kansas City Kansas was announced as the winner from over 1,100 contenders, and 17 days later Google announced that it would expand rollout to cover Kansas City Missouri ? just across the Missouri river from Kansas City Kansas. Services were launched in November 2012.

Thus at the time of writing (January 2013) US telcos have had almost two years to respond to Google?s ?encouragement?. It seems few have done so. *Wired* magazine reported on 11 January:

> *?Google Fiber was supposed to be a shaming exercise. But any shame felt by the country?s big-name ISPs has yet to produce the sort of ultra-high-speed Internet services we?ve all been hoping for.?*

Sources quoted for the article attributed this failure to respond to several causes: a focus on short term returns on capex; an absence of ?national drive? and ?national policy?, despite the existence of a national broadband strategy; and a focus by major telco Verizon on wireless broadband ?given the lower cost of deployment and the absolute killing that can be made charging users a significant amount per gigabyte.?

On a more positive note, it seems that Google?s initiative has spurred some of the 1,100 communities that missed out into action*Wired* reported:

> *?Chicago and Seattle, for example, have both announced partnerships with a new broadband provider called Gigabit Squared to bring fiber internet connections to residents.?*

Gigabit Squared is not solely a service or network provider. According to its web site, it is an advisory firm offering a range of services to provide

> *?facilities operators and communities with the expertise required to discover, transform and build digital broadband capacity for civic transformation and competitiveness in the 21st Century global economy.?*

China

China Daily in March 2012 quoted China's Industry and Information Technology Minister Miao Wei saying:

> *?The nation needs to improve broadband speed. Our aim is to install fibre-to-the-home (FTTH) broadband connections for 35 million families this year.?* (China Daily 2012 [26])

China Daily said this broadband development plan was a part of China's 12th Five-Year Plan (2011-15), which is to increase the country's average broadband speed to 20Mbps by the end of 2015. It reported Wang Xiaochu, chairman of China Telecom, saying that, as the major provider of China's Internet broadband infrastructure, China Telecom would invest 40 billion yuan ($6.13B) in FTTH networks in 2012, and attract 25 million new FTTH users, bringing the total number to 55 million.

Also in March 2012, the Economist Intelligent Unit reported:

> *?Over the past two years, the [Chinese] government has unveiled plans to spend a whopping Rmb1.6trn ($245B) by 2015 on the construction of a fibre to the home (FTTH) network reaching 200M households. China Telecom and China Unicom, two state-owned operators, have already pledged investments of Rmb150B ($23B) to build 'optic cities' in China that replace older, copper-line systems.?*

The EIU added:

> *?Yet in most areas where FTTH is already available, few homes have signed up to the service. Akamai and Ookla, two Internet traffic monitors, blame prices that are among the highest in the world for the lack of demand.?*

However it said:

> *?Beijing and Shanghai, China's two biggest cities, consumers look quite keen. Of the 4M homes in Shanghai able to get China Telecom's 8Mbps FTTH service by the end of 2011, 1.3m had subscribed to it. The operator plans to cover 90% of homes in the city by 2015, making 16Mbps services available by 2012 and 50Mbps by 2015.*
>
> *?In Beijing, China Unicom had passed 4M homes by the end of 2011 and signed up about 1M customers to its 8? 10Mbps offer. It aims to raise speeds to 20Mbps for most homes and between 100Mbps and 10Gbps for businesses by 2015.?* (EIU 2012 [27])

Among the reasons cited by the EIU for low take-up was:

> *?Many consumers also feel that copper-line DSL services of between 1Mbps and 2Mbps are good enough, and refuse to pay higher fees for a faster connection,?*

and somewhat surprisingly

> ?power-hungry optic modems - which convert light to electronic pulses on customer premises - are potential fire hazards.? (EIU 2012 [27])

Notwithstanding these remarks, the Chinese Government is reported to be ramping up its FTTH initiatives.*China Daily* reported on 9 January 2013 that from 1 April 2013 all new residences would have to have FTTH if built in an area where a public fibre optic telecom network is available.

That report also contradicted the EIU's figure for the Government's FTTH connection target. It said the Government aimed to have 40 million households with FTTH connections by 2015.

In a report on China's fixed broadband network plans published in June 2012, Ovum said:

> ?The Chinese government's national convergence plan is designed to accelerate broadband market growth, principally by raising the level of competition in the broadband market. In particular, cable operators and China Mobile will be allowed to break the broadband monopoly held by the two major fixed broadband telcos, namely China Telecom and China Unicom, in their respective territories.
>
> ?To maintain their competitive advantage, China Telecom and China Unicom have been increasing their investments in fibre infrastructure since 2010 and are committed to increasing fixed broadband network investment in the next three to five years.?

Ovum added:

> ?While xDSL is still the dominant Internet access technology in China, it is being challenged by FTTx. The year-on-year growth rate of FTTx connections was far greater than for ADSL connections in 2011?The number of FTTx connections in China is expected to overtake the number of xDSL connections in 2016.? (Ovum 2012 [25])

Ovum forecasts that China's FTTx subscriber base will reach 76.5 million in 2015, representing more than 50 percent of the worldwide FTTx subscriber base.

Sweden

Sweden boasts of having been one of the few countries in the world to have had a broadband policy since the late 1990s Broadband strategy 2009 [28]), and also to have been the driving force behind the EU's*Digital Agenda for Europe*. Its current broadband strategy dates from November 2009 (and has been supplemented with the release in December 2011 of a Digital Agenda for Sweden (ICT for Everyone 2011 [29]).

The goals set out in the Broadband Strategy are that 90 percent of all households and businesses should have access to broadband at a minimum speed of 100Mbps in 2020 and 40 percent at that speed by 2015. (The goal set by the Australian Government for its NBN is to have fibre reaching approximately 25 percent of premises by mid 2015 and 93 percent by mid 2021.)

Unlike the Australian policy, Sweden expects that its goals will be achieved largely by market forces. The policy states:

> ?The underlying principle is that electronic communication services and broadband are provided by the market. The Government should not control the market or technical development. Our task is to establish good market conditions and eliminate obstacles to development. This entails ensuring that there is a relevant regulation in place.?

However it plans to promote investment in more remote areas.

The Digital Agenda claimed that this strategy was largely on track.

> ?A survey of the market shows that the target for 2015 has already been met and that 44 percent had access to 100Mbps by the end of 2010. The expansion has largely been brought about by the market, but the clear political objectives with a high level of ambition have contributed to driving development forward.
>
> ?Market investments, together with work by the Government to establish a market that functions well, have contributed to this positive trend. Government efforts to expand broadband have also made a positive contribution.? (ICT for Everyone 2011 [29])

However, the policy has been less successful in bringing broadband to rural areas. According to the Digital Agenda,

> *?Certain sparsely populated parts of the country in addition have no access at all to a functioning ICT infrastructure? To meet the demand for high-quality broadband, there is a need for large investments in new infrastructure and more efficient technology.?*

Under the 2007-2013 rural development programme for Sweden, the government committed SEK100 million ($14.7M) to measures for reliable and robust electronic communications. The Digital Agenda says that, In addition to this, there are other public investments in broadband that are planned and carried out by municipalities, county councils and regional co-operation bodies.

Paul Schwartz, CEO of Swedish FTTH CPE vendor Icotera, interviewed by the FTTH Council Europe in August 2012, attributed Sweden's widespread FTTH rollout to a mixture of government policy and visionary network operators.

> *?In order to keep the less densely populated areas attractive and competitive, Sweden decided that a very strong and future-proof IT infrastructure was necessary. Furthermore, service providers were adventurous, offering FTTH as far back as 1998, even before there was a real need,?* Schwartz said.

Spain

Broadband infrastructure has been a key component of Spanish ICT policy since the release of its first ICT policy, Plan Avanza in 2005. This was superseded by Plan Avanza 2 in July 2010. Both have been subject to an unusual amount of external scrutiny by the OECD [30] at the request of the current Spanish Government. The OECD held a workshop on Plan Avanza in Madrid in November 2009 and Plan Avanza 2 was the subject of a 122 page OECD report, a preliminary version of which was released in May 2012.

According to the OECD report on Plan Avanza 2 [31], Spain expanded its universal service obligations as of 1 January 2012 to include broadband access at 1Mbps, "positioning it as one of the few countries to have achieved the ambitious aim of guaranteeing broadband access through universal service obligations.?

The strategy on NBN-type networks however has not been fully articulated, according to the OECD report. It called on the Spanish Government to ?provide a clearer interpretation of these targets and spell out what they actually mean in terms of communications infrastructure.?

The OECD report suggested that ?One approach might be to draw up a national broadband plan which should specify:

- the specific quality of service requirements for the targets;
- which technologies may meet the requirements for access, backhaul, and backbone;
- whether the targets are to be met by market players only or if public funding will be necessary and/or available.

The OECD's views ? which were not specific to Spain ? align with those of Australia's Opposition party. It said:

> *?Any public funding of the broadband network to meet the objectives should be clearly underpinned by a sound cost-benefit analysis.?*

And it noted that:

> *?Ultra high-speed fixed broadband networks require heavy investment, especially those that are fibre-based. A high policy priority is therefore to create a legal framework that provides incentives and certainty for investment in fibre broadband networks.?*

Meanwhile FTTP networks have been growing apace in Spain thanks primarily to investment by the dominant carrier, Telef?nica, and to a lesser extent by Orange. In June 2012 Orange Spain revealed plans to invest around ?300M over the next four years in a fibre-to-the-home (FTTH) network to deliver speeds of up to 100Mbps to around 1.5 million homes and businesses in the country?s biggest cities.

Figures released by the Spanish regulator CMT in January 2012 showed that FTTP penetration had more than doubled in a year to 158,204 premises at November 2011, almost all of these provided by Telef?nica.

Research firm Point Topic reported in December 2012:

> *?Sixty one percent of Spanish homes can already subscribe to superfast broadband services delivering at least 30Mbps of bandwidth.*

> *?In fact Spain has wider superfast broadband coverage than any of the other large European countries except Germany, and it is well ahead of the average for bringing superfast broadband to rural areas as well. In terms of the number of homes passed by superfast services, Spain, with 10.2m, is well ahead of Italy and almost equal with France. Nearly 10% of all the EU homes with access to superfast broadband are in Spain.?*

Conclusions

From 2012 to 2017 an estimated $US53.5 billion will be spent upon fibre access network rollouts across all the developed countries, of which an estimated 82 percent will be spent upon FTTH.

Table 1 summarises the results of comparing the policy goals (in terms of access speeds or FTTX technologies, and timeframes) and investment commitments of the six different national governments surveyed, together with the European Union?s policies, in this paper.

Country/ Region (with population)	Policy Statements	Goals (in terms of dates, minimum download speeds and penetrations)	Government Funding
Australia (23 million)	National Broadband Policy (April 2009); current National Broadband Rollout Plan 2012-15	By 2020: 100 Mbps via FTTH for 93% of premises; 12 Mbps via radio access for the rest.	AUD$30B over ten years.
USA (315 million)	National Broadband Plan (March 2010)	At least 100m homes to have affordable access to 50Mbps by 2015, and 100Mbps by 2020.	None
Connecting America Fund [32] (July 2012)	To bring broadband to 19 million unserved citizens in rural areas by 2020.	$US11M over three years to reach 400,000 homes and businesses. Total of $US10B over five years.	
China (1,358 billion)	None available	FTTH to 200m households by 2015	$US245b (unspecified portion through state-owned telcos)
European Union (503 million)	Digital Agenda For Europe (May 2010)	By 2020: 30Mbps for all and 100Mbps or higher for 50%, using any suitable access technologies	Heavily restricted under EU policy; under review
UK (63 million)	Britain's Superfast Broadband Future. (December 2010)	24Mbps to at least 90% of premises by 2015, using FTTC and FTTH	?530M for broadband in rural areas
House of Lords Broadband for all -- an alternative vision (July 2012)	Fibre within the reach of every community and a clear path to the rollout of point-to-point FTTP.	No specific recommendations	
Sweden (9.5 million)	Broadband Strategy (November 2009)	40% premises to have 100Mbps by 2015 with FTTH and 90% by 2020.	No central funding. Unspecified amounts from municipalities, county councils and regional co-operation bodies.
Spain (47 million)	Plan Avanza 2 (July 2010)	Universal Service Obligation of 1 Mbps, in addition to EU targets.	Not specified

Table 1 ? Comparison of national broadband policies and investments

Rapid development of a widespread FTTH network seems to be high on the wish list of many governments but none of those examined except Australia and China, where the investment is being made indirectly through government-owned telcos, has any intention of allocating the massive funding needed to achieve this goal.

Nor do most have policies designed to foster the rollout of specific high bandwidth fixed access technologies by the private sector. Instead most adopt, or advocate, policies that they hope will create a climate conducive to the achievement of their bandwidth goals by private investors and, for example in the UK and the USA, provide limited funding to improve broadband in rural areas where they know that it will not otherwise be delivered by the market.

The most striking difference between overseas policies and that of the Australian Labor Government is the attitude towards infrastructure-based competition. Many governments see encouragement of this as likely to accelerate the availability of FTTH and other technologies, wired and wireless, that will deliver improved broadband speeds. The Australian government is concentrating on competition in mobile broadband access, through the clearing of spectrum hitherto used for analogue TV and analogue radio to make more capacity available to mobile telecommunications operators (the most likely purchasers of the freed-up spectrum).

Even China, which is pumping funding into FTTH rollouts through state-owned telcos, is reported to be encouraging competition from wireless and cable operators. Competition in the provision of access network infrastructure is also a pillar of Coalition broadband policy in Australia.

In the interests of ensuring a return on its NBN investment the Australian Government is determined that its FTTH network will be the only fixed access network in areas it serves. Telstra's copper network will be shut down as FTTH rolls out, the HFC network owned by Telstra and used by Telstra for broadband Internet access and by pay TV operator Foxtel (50 percent owned by Telstra) for pay TV will be restricted to delivering pay TV services and a rival HFC network owned by Optus will be shut down. Furthermore there is legislation in place designed to prevent both Telstra and Optus from marketing wireless broadband services as direct competition to the NBN, i.e. as fixed access broadband services.

However, it would be overly simplistic to cite overseas attitudes alone to argue against the Australian Labor Government's access infrastructure monopoly approach. Every nation has arrived at its current position in broadband evolution from a different starting point.

In the UK, for example the major HFC network is not owned by the former monopoly telco, BT, which was specifically excluded from providing pay TV services when it was privatised in the mid 1980s. BT's access network arm has been structurally separated and the new entity, Openreach, is rolling out an open access FTTx network.

In the longer term Australia?s broadband may well be the envy of many other nations. While others will have a hotch-potch of broadband access technologies and providers, some competing in the same market and some with, effectively, local monopolies, Australia will have a nationwide FTTH network supplemented with integrated fixed wireless and satellite in rural and remote areas, all with common user interfaces, and with full retail competition.

One thing that all the national policies have in common is their acknowledgement of the need for universal access to high speed broadband. The differences lie in the timeframes to achieve this, the extent to which the more future-proof FTTH access technology is seen as critical to meeting this goal, and the extent to which national governments are ideologically willing (and financially capable) to subsidise the rollout of FTTH in order to achieve a perceived higher level of international competitiveness.

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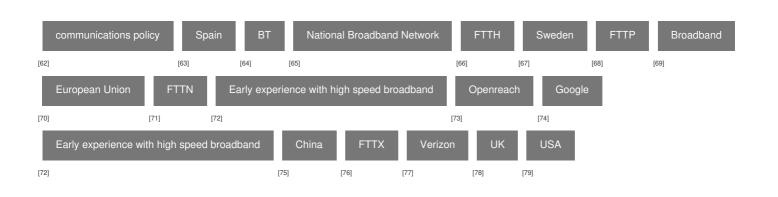

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communications policy	Spain	BT	National Broadband Network	FTTH	Sweden	FTTP	Broadband
[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]

European Union	FTTN	Early experience with high speed broadband	Openreach	Google
[70]	[71]	[72]	[73]	[74]

Early experience with high speed broadband	China	FTTX	Verizon	UK	USA
[72]	[75]	[76]	[77]	[78]	[79]

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