

# Big-think strategies

-

## Plans for the transition of the US telecoms industry

An informal report by an informal group of  
international telecoms.

Paul Budde  
Bucketty, Australia  
November 2008  
[www.budde.com.au](http://www.budde.com.au)  
[paul@budde.com.au](mailto:paul@budde.com.au)

## Table of Contents

1. Introduction
  2. Structural telco changes are needed in the USA
  3. Regulatory sweet spot
  4. Does competition mean duplicating infrastructure?
  5. Regional duopolies
  6. Infrastructure a national asset
  7. Collaboration and cooperation
  8. National blueprint for regional and rural infrastructure
  9. How to fund ubiquitous infrastructure
  10. Economics will take over from regulations
  11. Background Reports
-

## Plans for the transition of the US telecoms industry

### 1. INTRODUCTION

This brief report was prepared by a dozen international telecommunications experts – from Europe, Canada, Australia and New Zealand. In addition, government representatives and international organizations have supplied information, and this has also been included.

The report aims to provide advice and commentary on the American telecommunications market from an international perspective. It is neither an academic nor a technical paper, but those who have contributed have indicated a willingness to provide further and/or more detailed information if this could be of assistance to the Team.

### 2. STRUCTURAL TELCO CHANGES ARE NEEDED IN THE USA

A key element of the American telecoms discussion is that changing the current environment will involve confronting issues such as open networks and structural changes to the industry.

This has been a ‘no go area’ for a long time. The AT&T divestiture in 1984 has largely been undone, with incumbent landline phone companies back in the long-distance business and AT&T and Verizon dominating the landline voice market. In addition, the current FCC has largely undone the seminal ‘Computer II’ requirements that kept the provision of pure transport services separate from the provision of content, computing, and other advanced services. These elements have been under discussion in most other developed countries since the early 00s and America could profit from lessons learned here.

Thinking on these issues will need to change to get to a world where Americans have the advantage of a competitive broadband environment. Nobody thinks that this is going to be easy, but there is general agreement that it is something the USA can’t avoid addressing.

### 3. REGULATORY SWEET SPOT

The regulatory sweet spot is effectively the position of maximum freedom of action for operators in the industry. In such a place, regulators have been neutralized sufficiently that they cannot interfere with the ability of industry participants to earn relatively high profits, even if those profits are created from the exercise of market power in one form or another rather than from providing innovative, or even revolutionary, services based on the full capabilities of current and near-term technologies.

Regulated firms will adjust to any new regulatory environment and will use their political power, over time, to modify that environment to their own advantage. And so there is a limited window for effective change in the industry when a new administration takes power or a new statute is passed. The key observation from overseas is that after the big Telecommunications Act changes around the world in the second half of the 1990s operators and their financiers, notably but by no means exclusively in the United States, have been able to find new regulatory sweet spots and push their investments via M&A in that direction. Thus the well-intentioned moves by US regulators immediately after the 1996 Act – to enable competition with incumbents via unbundled network elements (notably loops) and resale – may have made sense at the time, but were effectively gutted by the industry by the early 2000s, and are now largely obsolete.

A different approach is needed in the new environment that exists a dozen years on, in late 2008.

The central issue now is how a set of potential new policies will affect the regulatory sweet spot. One of the most profitable of these, developed in European mobile markets, was related to high mobile termination fees and expensive roaming; this created a huge incentive to roll out and get as many customers as possible. When the market became saturated the EU, as well as Canada, Australia and New Zealand, found out that their regulatory framework could handle high termination fees, but failed with respect to mobile roaming.

Also, in some European countries where cable operators took the lead in broadband, the telco incumbents were able to position themselves in the regulatory sweet spot as unregulated runner-up. They got pricing freedom in ADSL wholesale access rates. This, like the sweet spot in mobile, fostered an aggressive rollout.

In the USA the telco incumbents managed to use their runner-up position vis-à-vis cable modems to:

- leverage their broadband services to be (re-)classified as ‘information services’ (which minimized or eliminated regulations designed to protect competitors); and
- terminate regulation on their FttB (Fiber-to-the-Building, eg, homes and businesses) efforts.

And then they either slowed down their fiber plans (AT&T) or deployed fiber in such a way as to stymie efforts by competitors to have access to it on a technical level, even if regulations change in the future (Verizon’s FiOS). They then began striving for more profits from their regained market power by requiring payments from both end-users and content providers.

A different and new set of policies would be required to relocate or neutralize that sweet spot. Such policies could also lead to structural separation without necessarily enforcing this through regulation.

For example, the topology of NGN Access Networks is critical in maintaining the option of competition through access to equivalence of wholesale input. Regulation should ensure there is no foreclosure of competitive options by choice of technology/topology.

Based on some early international experience it can be concluded that government finance focused on fostering regional infrastructure (based on the national interest) could be a catalyst for change. The Australian government’s \$4.7 billion investment in its National Broadband Network is one such example, and New Zealand is set to follow this lead.

E-health, tele-education and smart grid policies could also instigate the required fundamental shift needed for the new digital economy. By far the best way forward would be synchronizing the social and economic digital applications with the rollout of FttB. Any government investments should come with an attached condition: open networks. This will necessarily lead to discussions on matters such as structural changes and reinvigorating Computer II.

Ideally the changes that will follow from these government investments will also reverberate through the rest of the telecoms market. Open network cost structures will be lower and competition will trigger similar developments in metro areas. While speed is important for the social, economic and media applications, affordability is most probably even more important. Just as the previous economy depended on dirt cheap energy, the digital economy will depend on dirt cheap broadband.

#### **4. DOES COMPETITION MEAN DUPLICATING INFRASTRUCTURE?**

The end state for broadband infrastructure is FttB, perhaps with large sections of the market having their own dedicated fiber ‘tail’ from their home/office out to a central aggregation point. The extremely high capacity of FttB, combined with its shrinking but still significant cost, suggests that a rational broadband policy would not include multiple competing fiber plants in the local loop.

Interestingly, countries who are leading in structural change are often also the countries with overbuilt infrastructures (telco, cable, wireless) such as the Netherlands, Sweden, Singapore and Hong Kong.

The reason for this is that, due to their heavy use of existing infrastructure, these countries have a much better understanding of the need for FttB. They quickly reach the conclusion that when HFC (cable operator plant) needs to be upgraded to FttB, an interesting economic situation will arise, whereby the content providers (cable operators) will need to decide if they want to duplicate telco fiber, or whether they will be able to use (open) networks of the telcos. In Europe some of the HFC networks are already struggling to survive. Recent regulation developments in the Netherlands are aimed at rapidly establishing an attractive mass market for FttB. This will become available for as little as €12 per month.

Obviously there will be densely populated areas that can sustain two FttB cables at current retail rates, but it defies basic logic that there will be all that many of them – especially as access to capital has become expensive (current EU and OECD data indicates that sustainable FttB requires 37%-40% subscription rate penetration).

We also don’t see overbuilt plant in electricity, gas, water, sewers, highways, HFC cable networks, etc. Telecoms engineers are indicating that most HFC networks are under-dimensioned to serve large-scale use of DOCSIS 3, and, even with DOCSIS 4, 5, 6 or 7 HFC, they will eventually be unable to compete economically with fiber.

The transition to competition based on pure broadband capacity is somewhat paradoxical for cable operators. The very high capacity of HFC networks, as compared to legacy telcos’ twisted pair copper, gave cable operators an early lead – one that they maintain – in residential broadband. Yet the basic cable business model entails selecting content for subscribers and delivering it either in packages (standard cable tiers) or individually (pay-per-view).

This business model is at odds with an end-to-end Internet in which users are essentially in sole control of the data they send and receive. So, in addition to ultimately facing the need to upgrade the pure capacity of their networks, cable operators face a challenge to their fundamental business model. If they want to be pure bandwidth providers their networks are no longer state-of-the-art. But if they want to be content providers looking into the future, there is no need for them to have a network at all – if there is adequate capacity available on an open fiber network, whether provided by legacy telcos or otherwise.

This shows that the reason we have two networks – cable and telco – is that in the past entertainment and telephony required vastly different technologies. But that is no longer the case.

Note that when we speak of FttB we are not particularly referring to shared-bandwidth passive optical network (PON) arrangements, which are obvious improvements over telco-based copper DSL solutions, but which can (depending on the particular PON architecture

selected) lead to congestion problems like those faced by cable systems if consumers, for instance by telecommuting, radically increase their parallel use of broadband. This is in the national interest but it is not in the individual interest of a network operator trying to minimize capital expenditure and foreclose competitors.

What we are referring to is dedicated or quasi-dedicated fibers to each individual home or business.

In this respect the OECD, for example, is strongly in favor of dark fiber solutions rather than municipally-run networks. They are the closest thing we have to unbundling on copper which has been successful. It does mean, however, that we need point-to-point connections in order to foster competition. A good example here has been provided by Dirk van der Woude from Citynet in Amsterdam (<http://tinyurl.com/5e7tdn>).

Note also that wireless broadband is a very different infrastructure, with different capabilities, and it will develop parallel to FttB. It has a totally different (fundamentally sound) business case, based on the distinctive benefits of mobility rather than raw capacity – so we don't see this as an 'overbuild'. Certainly, it is no alternative to, or replacement for, FttB.

That having been said, wireless broadband is going to play a key role in certain regional and rural areas where the cost of laying dozens or hundreds of miles of fiber to serve one or a few customers can be daunting. It also allows for a far more rapid rollout of midsize broadband which after time can be replaced by fiber when the business cases for such deployments are becoming clearer.

## 5. REGIONAL DUOPOLIES

The competitive nature of telco versus cable served America well in the early days of broadband (1998-2004), as both industries competed with each other to gain 'greenfield' broadband customers. However, this ceases to be true as the market becomes more saturated, resulting in regional monopolies and duopolies. Once that has occurred, each industry player is far more interested in protecting its own patch (for example, by using the net neutrality issue to limit content competition and maximise monopolistic rents) than they are in using the infrastructure to advance the national digital economy.

Duopolies can be as bad as, or even worse than, monopolies in terms of protecting customer interests. On the one hand, it is not all that challenging for both members of a duopoly to exert, in effect, joint dominance of a market. On the other hand, the existence of two competitors – who in many ways will indeed compete against each other to the benefit of consumers – can make it difficult to justify regulation, at least as a political matter, even if the economic case for it is relatively clear.

Monopoly infrastructure and services in community/municipality/brownfield developments needs to be carefully regulated to ensure continuing responsibility for service delivery if the sole provider defaults, and to ensure there is no limitation of access to content or services (including media).

Customer ownership of the local tail (final mile) and/or regulations allowing access to dark fibre are useful remedies.

Once Fttb is available duplicating the basic broadband transmission infrastructure with either another fiber or HFC no longer makes any economic sense.

## 6. INFRASTRUCTURE A NATIONAL ASSET

Many countries have begun to understand that broadband transmission infrastructure is not merely important for the direct social and economic use of citizens, but that it is equally important for healthcare, education and smart grids. In addition, because broadband infrastructure enables tele-work and simply makes day-to-day living more convenient for residents, there are clear indications that property values are positively affected by the presence of such infrastructure. Several countries (Norway, Netherlands) have initiatives whereby the home owners can become the owners of the fiber tail that ends in their homes.

INTUG commented that encouraging the ubiquitous supply of high-speed broadband infrastructure supporting competitively provided services and content will contribute significantly to growth, productivity and jobs. A study in which INTUG participated earlier in 2008 showed that this would add 1.6%-2.0% GDP in the EU within ten years.

Once these social and economic values are recognized the issue of network separation – either formal structural separation or Computer II-like regulatory separation – arises, because of a systemic divergence between:

- the interest of a network owner/operator in maintaining scarcity in transmission capacity to maximize its returns (both in selling access to the capacity and in propping up the retail price of services that depend on the artificially scarce bandwidth) and
- the interest of society as a whole in deploying abundant transmission capacity as widely as possible and at both the lowest cost and the lowest retail price feasible. Indeed, if we are correct that there are large positive externalities to the widespread deployment of such capacity that would support providing it on a subsidized basis in order to internalize those externalities to the price facing the end-user

At a minimum, socially critical services such as healthcare, education and smart grids need to be provided at the lowest possible cost, and their ROI models therefore need to be based on utilities-based costing. Otherwise, achieving the national goals associated with those services will require, in effect, the payment of a tax to network operators whose ability to assess the tax – in the form of high payments for cheap-to-provide connectivity – arises entirely from their occupation of the public rights-of-way to reach consumers and businesses and their own economic motivation to benefit from ensuring that the supply of bandwidth is limited.

It is hard to see the policy logic that would support granting rights to use the public right-of-way in order to achieve important public policy goals and then economically impairing the nation's ability to reach those same goals by permitting pricing at rates above the (very low) utility-based economic costs of doing so.

In situations where it is effective, competition – including full facilities-based competition – is definitely preferable to regulation. But where the market is dominated by a monopoly or a duopoly, either due to economies of scale or entry barriers (both of which appear to exist in local broadband infrastructure), it makes no sense to simply say that those who wish to compete can do so. Pursuit of competition as an end in itself, and an unthinking faith that it can and will develop regardless of the actual economic and engineering realities on the ground, has been a critically ill-informed cop-out on the part of the current FCC. The sheer dominance of the incumbents under the current regulatory and economic circumstances makes facilities-based competition of the sort the current FCC seems to idolize impossible in the long run and, in any event, economically unviable.

This has been – in our opinion – the main reason why America has fallen behind in affordable high-speed broadband access. The private interest of the network operators in minimizing capital expenditures and maximizing the returns they earn on the capital they do expend conflicts directly with the public interest in true broadband connectivity to all citizens and businesses.

We believe that there is no rational basis to think that within the framework of current American regulatory philosophy existing network operators have now, or will ever have, the incentive to deploy the kind of ubiquitous broadband connectivity that other nations have achieved, and that America should achieve.

## **7. COLLABORATION AND COOPERATION**

A critical element is a whole-of-government approach. This is most probably one of the most difficult things to achieve. Key government departments here include Energy (smart grids), Health and Human Services (e-health), Education (tele-education), and Environmental Protection (green broadband).

Furthermore, in the new Obama era the world is moving on, towards ‘change’ and more cooperative models. Governments should be shifting away from working **ON** the industry towards working **WITH** the industry, as well as with other entities outside government, both profit and non-profit – plus, of course, with the consumers. They should use the digital media to facilitate this collaboration through wikis, e-discussion groups, lists, maps, etc.

## **8. NATIONAL BLUEPRINT FOR REGIONAL AND RURAL INFRASTRUCTURE**

To properly address the challenge of deploying ubiquitous broadband in America, the vast distances and differences within the American market need to be assessed. It is therefore critical that existing network operators be required to provide information detailing where they have fiber already deployed, not merely on an inter-switch or inter-city basis, but on a much more granular level – because it is the ‘first mile’ from individual homes and businesses back to reasonable aggregation points that is most lacking. Existing infrastructure (telcos, utilities, municipalities, cablecos) needs to be mapped to see where the gaps are and to enable a technology-neutral approach to ensure that regional and rural users do receive service equivalent to that which is available in metropolitan areas.

## **9. HOW TO FUND UBIQUITOUS INFRASTRUCTURE**

Once the gaps are identified, the government can assist in the funding needed to fill them.

Many nations around the world have recognized the long-term benefits of extensive broadband deployment and have taken specific policy steps to achieve that goal. For example:

- In Australia, they have a Broadband Guarantee scheme providing broadband access to Australians, who currently are not served by broadband networks. Subsidies are based on individual cases but paid out to service providers (mainly satellite and WiMAX). The scheme is very successful. A further \$4.7 billion will be invested by the government in an **open access** National Broadband Network.

- The Norwegian government's objective is to offer all of its citizen connection to broadband through funding to municipalities and local businesses. State funds must be combined with at least 50% local funding.
- Korea is pushing forward with the development of a converged broadband network called the BcN. This includes the construction of infrastructure with the goal of promoting a ubiquitous network.
- The Italian government has set up a scheme for the developing broadband in Southern Italy.
- Ireland - Under its scheme, connections to users need to be an 'always-on' connection capable of 1 Mb/s downloads and 128 Kb/s uploads. The lowest possible bit cap on connections will be 10 gigabytes per month and the connections must support virtual private networks and VoIP applications. The project is technologically neutral and the service provider will be engaged for a period of five years.
- Spain - Of the public funds contributed, €1 million were structural funds and €3 million were in zero-interest public credits. Operators themselves invested an estimated €280 million. The funded projects use ADSL, WiMAX and satellite technologies. Prices were capped at a 'reasonable fee'. The project connected 3,700 communities in the first phase. As a related intervention, the government is also offering zero-interest credits to buy computer equipment and broadband connections for businesses and consumers.
- The Czech government put 1% of the proceeds from the privatisation of Cesky Telecom into a fund that will be used to co-finance infrastructure projects for metropolitan and local networks. Conditions on receiving the funds include participation by the relevant regions and that the network operated under '**open access**' rules.
- Hungary - Tax reductions of 50% on profits are provided as a way to support the construction of broadband infrastructure. The concessions are available only to telecommunication companies if their expected profits exceed HUF50 million and if they have invested at least HUF100 million.
- The newly-elected government of New Zealand campaigned extensively on a major injection of government funding (\$1.5 billion) to accelerate the rollout of ultra fast broadband to initially, 75% of New Zealand homes.

For more information on overseas examples please see:

[http://www.oecd.org/document/20/0,3343,en\\_2649\\_34225\\_40652436\\_1\\_1\\_1\\_37441,00.html](http://www.oecd.org/document/20/0,3343,en_2649_34225_40652436_1_1_1_37441,00.html)

We recognize that each nation's situation is different. The good news for the United States is that you already have an extensive universal service mechanism in place for voice services and have a long tradition of recognizing the benefits of ubiquitous connectivity. The challenge is re-positioning that program to meaningfully support ubiquitous **broadband** connectivity.

The costs of a national FttB network (or equivalent alternative solutions for non viable FttB connections) are estimated at \$171 billion (114 million households, \$1500 per household). Based on international experience roughly a third of these will not be economically viable to do in any timely fashion (let's say within 3 – 5 years). The USF or similar scheme would be mainly aimed at looking for solutions in this area.

We can look at some of the overseas examples what solution would best fit the US situation. The USF could also be used as an excellent vehicle to stimulate open access networks.

Wireless might be needed to speed up the roll out in regional and rural areas. Overtime this could be replaced by deeper fiber, based on the economics of individual cases. Unlike copper cable, fiber can carry broadband signals much further; copper 2 – 6 miles, fiber 30-40 miles.

At the same time, however, the government should enforce the notion of a national open network. The industry - supported by the government - should establish so called “meet-me-points” where the various infrastructures can be interconnected and where local communities can establish their local reticulation points. The Wholesale Access Principles as developed in Australia are a guideline in this respect (these principles have been provided to the Team at a previous occasion). Once the backbones are in place the development of local fiber loop networks (used by many service providers in common) becomes - in most situations - economic viable without much further financial government assistance.

Once FttB becomes more mass market (in metro areas) this will also have a stimulating effect on regional roll outs. So rather than just addressing the economically unviable areas a full national plan should be considered.

## **10. ECONOMICS WILL TAKE OVER FROM REGULATIONS**

Once the government has put the right regulatory framework in place economic commonsense will prevail and open network policies will become more accepted in the USA. When that happens the whole issue of telco versus cable infrastructure will, over time, resolve itself – simply because it makes economic sense to combine it in one fiber network.

Interestingly, now that BT has been operationally separated, and has acknowledged the benefits this has delivered, it is now considering full structural separation. Similarly, since KPN in the Netherlands has been forced to provide wholesale on an equivalent basis, the company has become far more supportive of open network principles, and its current positive attitude towards the fiber regulations is another indication that these structural changes can also benefit the incumbent.

However, none of these changes happened without strong government policies, and this equally applies to the USA. The debate in the USA is not going to be led by the telcos or the cablecos, both of whom have an economic interest in:

- maintaining a duopoly;
- maximizing their short- and middle-run return by limiting their capital expenditure on new bandwidth; and
- taxing new and innovative uses of the network by monetizing such wherever possible, based on the value of the use rather than the trivial cost such use imposes on a properly-designed, adequate-capacity FttB solution.

It is very likely that over the next few years America will invest between \$1 trillion and \$2 trillion to stimulate the economy. What a great opportunity for change that represents! America is now lagging behind in the development of the digital economy (including e-health, tele-education, smart grids) and it can't afford to be in that position. We believe America should be the leader here.

The question is where this money will come from? Already the American economy is in deep debt and it is likely to be more so in years to come. There is a deep aversion to increased taxes in the United States and, given that, the willingness of foreigners to continue to underwrite the US debt will be severely tested in the future.

President-elect Obama has reaffirmed his commitment to a cap and trade system in the US and many leaders in Congress are calling for a ‘green’ stimulus package. We know from past experience that ICT and broadband can have a direct and measurable impact on GDP and that a number of studies have indicated that ‘true’ broadband (that is, symmetrical bandwidth in excess of 100 Mb/s) can increase GSP by up to 5%.

The current US GDP is roughly \$13 trillion annually. If ubiquitous broadband availability were to add a mere one-tenth of 1% to GDP growth that alone would translate to more than enough to fund ubiquitous broadband over a 15-year build-out period.

Cap and trade has the potential to generate trillions dollars of revenue, based on the analysis of the Stern report in the UK. This is not money conjured out of the air or borrowed from international lenders; rather it is money that normally is sent to oil-rich states around the world and/or spent on wasted energy consumption. For further background information see Bill St.Arnoud's blog: <http://green-broadband.blogspot.com>

This leadership cannot be won by tweaking the current faltering telecoms systems. A profound transformation is required, and major structural changes will need to be made to the telecommunications industry. There is no doubt about that.

## 11. BACKGROUND REPORTS

The following background reports in relation to the issues addressed above.

- [\*Global - Investing in the Communications Revolution\*](#)
- [\*Global - Infrastructure - Structural Separation\*](#)
- [\*Global - Broadband - Regulating Fibre Access\*](#)
- [\*Global - Infrastructure - Open Networks\*](#)
- [\*Global - Internet - Net Neutrality Analysis\*](#)
- [\*Global - Smart Grids - Grid IT - where energy meet comms\*](#)
- [\*Global Analysis - The US Financial Crisis and the effects on Communications\*](#)
- [\*Europe - Structural Separation Developments - 2008\*](#)

### **The Expert Group**

This report has been produced by an international team of telecommunications experts from the following countries: America, Australia, Canada, France, Germany, Japan, Netherlands, New Zealand, Sweden and the United Kingdom.

This group is composed of strategists, economists, lawyers and attorneys, technologists, representatives of national and international telecommunication organisations and telecommunications company directors.