Big Think Strategies

Trans-Sector Thinking

Leading to Smart Communities

A report by a group of international infrastructure and broadband experts for:

- **The Hon Stephen Conroy, Australian Federal Minister for Broadband, Communications and the Digital Economy**
- **Hon Frank Heemskerk, Dutch Minister of Economic Affairs**
- **The Hon Steven Joyce, New Zealand Minister for Communications**
- **Susan Crawford, special assistant to President Obama for science, technology and innovation policy and a member of the President's National Economic Council**

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Table of Contents

1. EXECUTIVE SUMMARY

This paper suggests that trans-sector thinking will be needed to help guide us through the next stage of economic and social development. We are emphasizing the importance of looking across sectors to create synergy.

Trans-Sector-Thinking implies the use of broad scope systems thinking and systems engineering techniques as the tools for design, engineering, planning and implementation as well as an entity capable of accomplishing or coordinating this.

We consider that the economic recovery will be slower if we stick to traditional systems and approaches. It is arguable that traditional thinking and systems of decision-making, often in 'silos' have been among the main reasons we arrived here in the first place. Trying to fix what is broken without addressing the underlying causes would be the wrong approach.

We need to ensure that the stimulus investments are maximized by ensuring we create economic multiplier effects for the infrastructure investments we are making. This can be done if apply the trans-sector concept, and if we can engage people in local communities.

Trans-sector policies need to be led by the political leader and his office. The President/Prime Minister/Premier needs to invest political capital in the interests of the people. He/she is the only person who operates with a cross-sector perspective and can see across the silos. Trying to lead trans-sector policies from any of the silos – even with the best intentions in mind – is unlikely to be successful.

The Big Think Strategies Group has previously discussed the opportunities within the ICT industries of utilizing new 'open access' telecoms infrastructure for e-health, tele-education, smart grids, etc. This report discusses a new way of thinking which can apply to cross-infrastructure projects – looking at the potential synergies between the building of roads, sewerage systems, water and gas pipe networks, as well as telecoms and electricity networks – in short, building smart communities.

At a time when the financial crisis is upon us, and confidence is lacking, people are in fear for their livelihoods. This fear makes people cautious and careful, avoiding risks and saving for the future. While entrepreneurial activity is needed more than ever, as Keynes noted, we are in danger of entering the 'thrift Paradox' where the more we save the less confidence is created. The stimulation of confidence is now recognized as being needed to re-establish growth, jobs and prosperity.

Stimulus cannot be implemented without reform of the regulatory systems that failed in the past. By comparison with financial services, telecommunications provides a better model for regulation, but itself needs to be radically reviewed for best practice across the globe. In no country is the existing system perfect and the re-establishment of vertically integrated monopolies, particularly in the US threatens to significantly impede the pace of recovery. Trans-sector thinking will work best where there is open infrastructure with well regulated wholesale access and connectivity.

2. INTRODUCTION

All around the world there is dissatisfaction about the level of availability of healthcare, education, energy and many other essential services provided by governments. At the same time, the cost, both to the individual and to society overall, has increased just as sharply and a piecemeal approach will not suffice. These issues will be at the top of the political agenda for some time to come.

It is widely recognized that stimulating the economy through new public works programs and public infrastructure investments will help to improve the rate of growth at the present time. We believe that the method for making that intervention needs to be based on a trans-sector approach, looking for the multiplier effect that those investments will have in relation to healthcare, education, energy independence and efficiency, environment, public safety, civic participation as well as economic growth.

The outcomes of the process should lead to the development of smart interconnected and sustainable communities, cities and buildings. This report aims to provide guidelines on what can be done.

3. GLOBAL RECOVERY PROGRAM

The economic, social and environmental crises we are presently facing are creating four forces, all offering different solutions, coming from different directions:

- technocracy – solving a societal problem by (preferred) implementation of a technical solution and implementing change by design reviews;
- bureaucracy – solving a societal problem by (preferred) implementation of a regulatory solution from an existing baseline of existing structures and existing system of thought and due process dispute resolution;
- econocracy – solving a societal problem by (preferred) instituting financial (dis)incentives and allocation of property rights and entitlements; and
- sociocracy – solving a societal problem by (preferred) exemplary behavior and fostering social (peer) pressure (from gentle 'winks' up to naming, shaming and ostracizing).

It seems that we have, or are very close to, a 'perfect storm' with all these forces pushing in the same direction. When that happens we tend to get far-reaching change very quickly. If we want to create 'true change' we need to work with all the people concerned to engage them in a common vision and marshal their creativity and energy under a common program to achieve a better result.

4. GLOBAL WELLBEING DEPENDS ON A TRANSFORMED WORLD VIEW

It becomes clear that the trans-sector concept potentially extends much further than what we have discussed so far. It could apply to the broader global solutions we need to find for the larger problems being faced by people worldwide. A transformation of our world view is possible and the approach we outline here could shape the way we organize our perceptions of the world and the way things work.

More and more, society's leaders – both thought leaders and those holding formal leadership roles – are understanding that there are significant links between the various crises we are experiencing.

We know that climate change and the associated environmental problems are linked to our insatiable appetite for resources and this in turn is driven by our desire for economic growth – and we need to recognize that economic growth is a positive force for social benefit, lifting millions out of poverty worldwide.

At the same time ever-increasing growth will create ever-increasing environmental problems, and sustainable growth, through which respect for the environment and delivery of progress are combined, has to take the place of economic growth without thought for the consequences.

If we look at the financial crisis we see a similar picture – the quest for more wealth regardless of cost or social consequence. And a ruthless pursuit of that goal has plunged the world into its most severe economic crisis ever.

Greater trans-sector thinking can help improve general welfare for both producers and consumers. In simple terms it can lead to a global improvement of people's lives. One only has to look at the transforming nature of mobile communications in developing countries – within five years mobile penetration in many of these countries went from under 10% to close to 80%, and micro-finance and access to information is transforming these societies. Greater trans-sector thinking about an integrated approach to healthcare and education can be anticipated to improve people's lives even more.

5. WE HAVE BECOME A SOCIETY OF SILOS

Both the environmental problems and the financial crisis are linked to a lack of coordinated management and governance at a level above that of the environmental, economic and financial systems.

Slowly but surely we have changed into a society of silos, with very few people (if any) being in charge of the complete process. We have 'outsourced' our activities to a range of sectors: healthcare, education, energy, communications, business, finance, transport, trade and so on. Economists have identified twenty such sectors (see below).

This system has served us reasonably well until recently, but the problems we are now facing in nearly all of the sectors indicate that something is wrong with the overall management of system – not just with the individual sectors.

6. A DIGITAL WORLDVIEW

It is well recognized that the information technology revolution has made a substantial impact on productivity, growth and jobs both in the developed and less developed economies over the past 25 years. The effect of this communications revolution on business processes, enhancing productivity and improving the quality of work has been established elsewhere. There are many who believe that we are in the early stages of the adoption of these technologies to many different activities and the benefits and opportunities are enormous.

Over the last few years this has been understood in many places – from financial services and treasury departments into the broader consciousness of industry more generally. The potential for a digital worldview to change the way we think about processes and systems and approaches to issues and solutions is something that can be used as a lens through which to examine much of our approach to date.

For example CO^2 production could be both significantly reduced and costs of transport and travel saved if greater use were made of the latest telepresence technology. To do this would require government thinking to adopt the approach of output-based specification (as required under the latest pan-European legislation) rather than 'give me something else which does the same at a lower price'. The existing system all too often assumes the technology of today will meet the requirements of tomorrow, without allowing suppliers to meet the real need in a variety of ways. The economic crisis has furthermore stimulated governments to start looking at infrastructure investments that can create new economic activity and, as a result, new value-added jobs.

The digital economy will only work if both governments and industry embrace trans-sector thinking. Infrastructure developments such as broadband, smart grids and other smart infrastructure need to be developed in such a way that they generate an economic multiplier effect. Accordingly, the broadband and smart grid stimulus packages in the USA, UK, Germany, Australia, New Zealand, Japan and China need to be understood, accepted and promoted in a coordinated way.

It is essential that the various sectors and national and local communities become key 'owners' as anchor tenants of the new infrastructure, not for the sake of the success of that infrastructure itself, but in order to reap the associated financial and social benefits.

With visionary plans for these broadband and smart grid packages now in place it is no longer just a theoretical affair – the success of these packages now depends on actually achieving a trans-sector status. If we are unable to get a trans-sector buy-in it will indeed be a very expensive infrastructure for just the delivery of fast Internet or so called smart meters (which often are not much more than dumb meters).

The most important strategy that governments can now implement to transform the vision into a reality is to take that trans-sector approach and show government leadership to ensure that the Departments of

Health, Education, Energy, Communications and Climate Change, to name some of the most important sectors, operate in a coordinated way at a local, national and, if possible, on a more global basis.

It is crucial that at a local and national level a whole-of-government approach should be taken and that those anchor applications are developed and introduced on the new infrastructure.

It is also essential that the economic stimulus packages are used to develop the infrastructure and the applications in parallel with each other, so they can be introduced simultaneously.

As suggested at the outset this is a role for the highest political leadership in a country. This level of policymaking naturally has the information, and the capability to take an approach beyond the narrow boundaries of more traditional government departments, provided it has the vision.

7. HOW MANY STIMULUS PACKAGES CAN WE AFFORD?

Affordability needs to be reviewed on a cross-sector view as well as a departmental or siloed approach. If nothing else this sort of horizontal cross-checking of vertical approaches and vertical decision-making should identify synergy and cost savings and lead to greater efficiencies. This is a pragmatic and desirable complement of the visionary leadership and provides a governance mechanism as well as independent oversight of silo decision-making.

8. DESIGN PRINCIPLES OF A TRANS-SECTOR MODEL

Whether we are talking about predictable regulation or predictable intellectual property right enforcement, we think that one issue that is important at a time of fragility in the economy is the generation of confidence. This means even more emphasis on certainty and predictability to encourage investors to come back out into the daylight. Publication of policy, transparency and the giving of reasons for decisions, as well as a predictable decision-making system in practice, are important principles.

For this to happen, it is clear that the government first has to create a system of coordination, but one that is dynamic and can be flexible to alter priorities with changing circumstances. Any risk of analysis paralysis or stifled decision-making can be overcome by allowing initiatives to be taken by putting in place a cross-checking facility against the digital vision to guarantee the multiplier effect of the economic stimulus packages in relation to infrastructure.

Coordination needs to be directed at securing key anchor tenants (government departments and others such as local governments or municipalities) to use the infrastructure. This in turn will create confidence for investors. Examples here include letting long-term government contract by local/state/provincial government for fiber networks. The anchor tenant can be hospitals and schools and with that revenue funding is made possible for roll out to other members of (rural) communities. Similar examples of municipality or local government/community led public/private partnerships are available in a range of countries and are clearly the way forward.

Critical in these projects is that first of all, the best people must be at the helm of these projects. Also a long-term view needs to be formulated, one that will ensure political and financial stability. At least a five-year planning horizon needs to be fostered, although we recognize that centralized planning is not efficient or effective. Encouraging governments and industry to think beyond the very short term is to be encouraged.

There need to be well defined goals regarding where we want to be in five years' time, but at the same time this plan needs to have sufficient flexibility to benefit from the rapidly changing environment that will be the result of the four forces mentioned above. Defining these goals in relation to healthcare, education, environment etc would be an excellent starting point.

A key risk factor is that we know that such complex programs can easily derail or end up in chaos, eventually splintering into smaller outcomes that bear no relation to trans-sector solutions. To prevent this from happening a sound hierarchy and a level of modularity need to be in place in any trans-sector model. It will be crucial to break the complex system into more or less independent modules, still managed from within the one hierarchy. Smaller more manageable modules are an essential element here.

We suggest that under the leadership of the President/Prime Minister horizontal trans-sector projects be established with the various sectors that include people who can interface with the other relevant sectors. And, to ensure full trans-sector coordination, each of these groups should also have a senior person from the department/company in charge of the national (broadband) infrastructure.

9. PRO-COMPETITIVE TRANS-SECTOR ARCHITECTURAL PRINCIPLES

Open access on cost-related, non discriminatory terms to underlying monopoly components are a common feature of regulatory regimes that apply to water, gas, electricity and energy production and more generally to pipelines, telecommunications infrastructures, airlines slots, ports, and railway systems. This is to name only a few essential inputs into supply chains and underlying products that have a societal benefit.

The issue is not whether to regulate but how to regulate and much of the recent debate has been mischaracterized by a debate between ideologies on the left and right with little or no knowledge of the facts and the current system of regulation worldwide. The above list of monopoly components is drawn from well-known regulatory regimes and systems that operate in hundreds of countries worldwide, and is led by the US which has pioneered a system of regulation and anti-trust designed to achieve this result for over 100 years. Over the past few years however, it has lost its way and needs to re-establish both credibility and leadership.

In the area of financial services it has been noted that there are certain potential similarities between public interest components of public utilities and the provision of mortgages to the general public. In more than one country the taking on of mortgages is now regarded as a low-risk utility type business that should not be combined with higher risk and more exotic financial services products, or at least that regulation should ensure that capital adequacy should be strictly related to the provision of the service to the general public and separated from the provision of more exotic financial services and financial instruments.

An architectural principle can be established that those essential inputs which have been identified as being of such importance to society should be required by all on open and non-discriminatory terms, under the oversight of an independent regulatory agency operating to best practices of transparency predictability and certainty for investment. This represents nothing more than the restatement of existing practices and principles but its value is in recognizing their application on a trans-sectoral basis.

These schemes and regulatory regimes seek to achieve a common end result, but the methods, process, and at a level of detail the facts and factors that are taken into account, are inconsistent. Best practice should be achievable and capable of being identified in systems that cross the traditional boundaries and a more coherent and simpler approach may be foreseen. For example, the underlying economic theory that requires open access to telecommunications infrastructure is the same as with energy origination and pipeline access but different departments and regulators have grown up adopting variations on a theme: when looked at from a trans-sectoral perspective these variations may be inefficient and could be improved in the public interest.

In the end the lower passive layer of the digital infrastructure needs to adhere to common standards to achieve full interoperability. The layers on top need to have common interface rules and regulations. Such a configuration allows for local or independent initiatives, evolution and change to take place without undermining the overall structure or being subject to ongoing decision-making processes from the bureaucracy.

Concepts like 'open network provisioning' or its US equivalent of common carriage, have unfortunately been twisted away from their purpose (to serve end users into inter-operator dealing). The main method employed in the past by opponents has been to propose many alternative architectures and just declare them as 'open' as well.

Policies that allow for a trans-sector use of the infrastructure need to reduce the amount of wriggle room when redefining open access to the simple components made available at wholesale. It also restates the original guiding principles behind 'open network provisioning. (As described in our report: *Big Think Strategies - Open Access Policies*)

There should be a clear view to maximize the number of firms and persons who will be eligible to get access to those components at wholesale rates. Restricting access to a limited set of 'industry insiders', appointed by regulatory fiat of registration or licensing, will severely obstruct the freedom of rational 'make-or-buy' decisions by most end users, as well as force them into the role of 'service takers' at a raised price level. Maximizing access will accelerate the evolution of the trans-sectoral benefits.

10. THE NEED FOR BEHAVIORAL CHANGE IN TRANS-SECTOR THINKING

It is often said that the successful implementation of technology solutions has only 20% to do with technology – the remaining 80% has to do with people.

In the case of adopting new technologies such as those proposed in a trans-sector approach, a range of issues need to be addressed, such as:

- Acquiring a knowledge and understanding of the capabilities of the proposed technologies;
- Understanding the new value propositions that each technology could realize;
- Identifying what existing business processes a new technology could support;
- Specifying what new business processes could be developed to exploit the use and capabilities of new technologies;
- Identifying what personal or business behaviors would need to change to make use of the introduction of new technologies; and
- Identifying what degree of control a person or organization could gain or lose from the use of these technologies.

From this list it can be seen that the effort to change personal, group or business behaviors and processes is a key issue.

Governments that are considering a trans-sectoral approach to developing a common communications infrastructure should not underestimate the effort that will also be required to influence behavioral change across multiple industries. Developing a common technology approach will in fact be only one small part of the equation. What will be required will be a strategy that develops a concerted and coordinated effort relating to:

1. the education of all stakeholders;
2. listening to and understanding stakeholder pain points; and
3. identifying a range of value propositions that will ensure stakeholder buy in and support the trans-sector approach.

11. SMART CITIES, SMART BUSINESSES AND SMART COMMUNITIES

11.1 THE MULTIPLIER EFFECT

To return to the ICT industry, we have mentioned the multiplier effect that an FttH network can offer to solutions in healthcare, etc. Multiplier effects will also be generated at many other cross-sector points.

If we were to take this further we should look at smart houses and smart cities. This notion must be considered more seriously, not viewed as some sort of futuristic scenario.

We must create a sense of urgency, move from pilots into actual deployment. These projects will take decades to build and we may not have too many decades left before we see a more serious collapse of the existing systems.

We need to grab every opportunity to move into deployment. We can't afford to keep on running the old systems as if nothing has happened. Obviously, early projects should focus on greenfield developments where is an opportunity to introduce new technologies and trans-sector solutions from the ground up.

11.2 SMART BUSINESSES

While not all elements in the business market are strictly trans-sectoral it is important to highlight the role that that this market will play within this context. In the overall supply chains of the corporate market represent 35% of the economy. They are therefore an essential sector within this concept and critical in terms of GDP growth, productivity and jobs.

A good example of the old (upside down) thinking in the telecoms policies is that this result in pursuing infrastructure-based competition as an end in itself (reaching the top rung of the ladder of investment), when this actually destroys value by in-building inefficiency where there is an inevitable natural bottleneck resource. Regulation must not force this inefficiency.

The same argument against forcing duplication of infrastructure also applies to wireless. A functionally separate wireless infrastructure equally accessible to competing service operators has the same logic as for fiber. We are facing a serious risk in Europe, USA and Asia Pacific that companies will simply be unable to obtain end-to-end seamless networking; linking their own sites and those of their business partners from consolidated contracts and will have to deal directly with a myriad monopoly local access providers with inconsistent service specs.

12. WE LACK THE STRUCTURES TO IMPLEMENT TRANS-SECTOR VISIONS

In our silo utility-based society it is so much easier to let telecoms companies solve the broadband problems. Similarly, the electricity companies will just replace the network with another dumb grid. Each utility will be able to do so, no doubt with great speed and efficiency, as we have become adept at rolling out the same standard solution for decades operating in their independent silo systems.

At present our society would appear to be unable to implement trans-sector solutions.

In the meantime, we are missing the opportunity to multiply the extra money that is necessary, and available, for home and community infrastructure for bushfire protection or flood protection – and to go that one step further to create smart houses and smart communities that take into account other infrastructure systems such as transport, energy and telecommunications.

But maybe we will learn, and perhaps governments will start implementing trans-sector policies to look for those critical cross-sector points so that next time we will be better prepared to grab the opportunities to build smarter communities as soon as the opportunity arises.

13. TRANS-SECTOR COSTING MODELS

13.1 THE ECONOMICS OF TRANS-SECTOR MODELS

Economists quite rightly look at the economics based on what they have in front of them. They don't like to model on what the economics should look like. But economically validate a national infrastructure that, for example, would provide an FttH (or equivalent) connection to all premises it is essential to take into account the new services that will have to be delivered over that network.

FttH alone does not provide the solution; the economic and social benefits can only be achieved if it is deployed in the context of a trans-sector approach. Within that context it can provide the infrastructure for a collective intelligence; unprecedented in human history. In some countries this dynamic is already underway (e.g. nationally in Australia and in some municipality networks).

To make this work anchor tenants from across the various sectors will need to make a commitment to participate, and to specify what type of applications they will develop over this infrastructure.

With that information economists will be able to develop costing models.

The way this all will work could unfold in the following way ….

The use of new technical solutions such as FttH linked to trans-sector models will alter the economic pay-offs. This, in turn, will induce a change in social behavior and alter the laws and regulations. That, in its turn, will take into account the financial gains and/or savings to these sectors. This, then, will make it possible to cost model the economic gains.

Many sectors have been developing e-applications for more than a decade, but they have been mainly between institutions – more like a B2B model. This will now have to be extended to end users and there will be many new elements. They can also build on the knowledge that they have gathered developing these B2B models.

The purpose of this report is not to provide costing models, but to provide ideas and suggestions for areas that need to be further developed so that economists can work with them in their costing models.

To make the model work to attract these anchor tenants it is important that the entire population is able to be connected. Getting the last few people is expensive – not too bad when blended into an entire operation, but astronomical if left as a separate project at the end.

Initial indications from the French FttH operators are that once access to public services reaches virtually 100% there are two major positives:

- Those people who are more expensive to reach via fiber are also more expensive to reach via road, etc. And so, one less hospital visit and you have paid for one or several years of fiber extension.
- Certain services have to be available to virtually everybody (by law, custom, etc). If the circumstances are that some have fiber and some do not, certain services either cannot be offered or must be offered in several forms. But once you have virtually 100% coverage, you can use just the one, presumably low-cost, method of delivery.

Even if some people choose not to sign up for (commercial) data services, if the connection is there others can count on it for their own purposes – eg, healthcare monitoring services and smart grid connections for smart meters.

13.2 TRANS-SECTOR TAXES

Trans-sector thinking should not lead to hidden (trans-sector) cross-subsidies which could misrepresent the real cost of social services. There should be a conscious decision to spend x dollars per year on health or education, etc and not to try and cheat the system by burying some of it in other buckets to hide the real cost. Connectivity should be funded by part of the state budget from general taxation.

13.3 EXAMPLES FOR COST MODELLING

One scenario is for government to agree on the need for a trans sectoral approach to some defined problem (for example addressing the hospital bed crisis; continuous education, managing distributed renewable energy) but then ask how an organization is going to do this, what tools will they use, and how they can track progress in a meaningful way.

A few examples for trans-sector cost modelling …..

13.3.1 E-Health

What does it cost for a doctor's visit that might be replaced by 'remote diagnostics' some of the time? We already have a range of self-test tools for blood, urine etc. Currently these are limited to the diagnostics that can cost-effectively be built into a remote device. But if we used broadband to expand the distance between the data-gathering device and the analysis device (just as we use video to expand the distance possible between patient and doctor), far more sophisticated devices might become cost-effective.

13.3.2 Tele-education

What does it cost to bus a child to school every day? If broadband helps with tele-education, we should be able to count the busing saved. We might also add the cost of classroom space per student. There might still be classroom and transportation expenses some of the time (just like part-time telecommuting) but the net could still involve considerable savings.

13.3.3 Transport

Transport to and from appliance repair, private music lessons, language, dance, tutoring, etc. Remote does not work for all things at all times, but each time it does work there should be a savings calculation – travelling to a library, the cost of maintaining the library's public access, etc.

13.3.4 E-meters

Savings on the cost of human or 'drive-by' meter readings, to report on usage of power, water, gas, or to report the system status of fire, lift, safety, security, and environmental monitoring systems, etc.

Exhibit 1 - Section that benefits from trans-sector approach

- Retail trade
- Manufacturing
- Health care and social assistance
- Public education
- Services
- Business services
- State and local government
- Wholesale trade
- Construction
- Finance and insurance
- Forestry, fishing, hunting and agricultural support
- Transportation and warehousing
- Arts, entertainment and recreation

- Computer programming services
- Utilities (communications included)
- Federal government
- Private educational services
- Real estate, rental and leasing
- Hotels and other lodging
- Personal services
- Mining

13.3.5 Monetizing e-benefits

The trick will be to monetize these benefits. Once we have a national infrastructure secured we will see that, as in our current economic model, some of the providers will actually pay for the costs of services/devices.

Again only for the purpose of providing a few examples look at some of the current cities/states/provinces/federal subsidies:

- School travel, a subsidy for e-services instead of school bus subsidies would not be out of place.
- Parents pay school fees and some of that could be directed to tele-education services.
- There are a range of social subsidies for disabilities, single parents, child care, and immigrants and so on. Again it will mainly be a redirection of money to new e-applications.
- Smart grids and smart meters will save 25% energy, and reduce the demand upon an already overburdened existing power infrastructure.
- Monitoring services for aged citizens will reduce the number of retirement villages that need to be built to cater for a rapidly aging population.
- In Australia the healthcare department has indicated it can save $30 billion in ten years using e-health systems to streamline the paperwork (plus saving 130 lives per annum).

So investing in a national FttH infrastructure in order to reduce the costs attached to delivering some 'unrelated' service is done in the traditional economy as well. This will at least give us a starting point from which to build a case for the funding of the infrastructure needed to deliver these e-services.

In addition we have to make sure that those who bear the cost of developing and supplying these new services are also those who benefit, and that the social pressures to make this happen are in line as well.

14. GLOBAL COOPERATION

14.1 EARLY LEADERSHIP FROM AUSTRALIA

The lead-up discussions to what is now the Australian government's National Broadband Network (NBN) has been a catalyst to this trans-sector thinking report. It began at the BuddeComm Roundtable in Sydney, in October 2007, when the then Australian Shadow Minister for Communications Senator Conroy invited the industry to prepare a telecoms infrastructure vision paper.

Under the auspices of the Australian sister group of Big Think Strategies (the Digital Economy Industry Work Group – DEIWG) and based on previously developed open access principles, an industry discussion took place over a number of months. This provided the basis for a collaborative industry paper, prepared for the now Minister for Broadband, Communications and the Digital Economy, Senator Stephen Conroy.

This group took the decision to start looking at the importance of the new infrastructure for the broader (digital) economy, taking a trans-sector approach to the investment the government is going to make in

digital economy infrastructure. This resulted in face-to-face meeting with the key minister involved in this trans sector approach (Education, Health, Energy, Finance, Environment and Climate Change).

Key elements in these discussions were the need for trans-sector government thinking and the development of the digital economy parallel to any new infrastructure (telecoms, smart grids, transport).

In May 2009 the government announced a $100 million subsidy for a trans-sector project, the building of a smart grid demonstration project linked to the NBN. The project will be run by the Department of the Environment, with the Department of Energy and the Department of Broadband as its trans-sector partners.

14.2 USA

Separately, between November 2008 and February 2009 the Big Think Strategy group produced four BigThink reports for the Obama Transition Team.

The new policies introduced by President Obama certainly do have a trans-sector approach attached to them. They might not have been formulated as such but the next step surely will be to put the various stimulus packages into a trans-sector framework. A great deal of interest is being shown in the USA in a Big Think Strategy on this topic.

There are now also discussions underway in America on open networks. This is supported by the US$7.5bn broadband and the $20 billion smart grid stimulus packages that President Obama has introduced. This has also stimulated the debate in this country on trans-sector thinking.

14.3 NETHERLANDS

An excellent paper has also been written by Professor Nico Baken, and his colleagues titled: *Broadband Infrastructure and Services. Trans-sector thinking, the difference between A Beneficial sector or Tower of Babel* (FITCE, Berlin 2003). And more recently *Unravelling 21st Century Riddles, Universal Network Visions from a Human Perspective* (for the centennial of the British Engineering Society TCN).

At the Delft University of Technology, a research group TRANS, Transsector Research Academy for (complex) Networks and Services has now been established, in association with the Dutch incumbent KPN and the institute TNO (5,000 researchers in all kinds of sectors).

In this group the focus is on the theme Smart Living from a trans-sector perspective, alongside topics such as ‘transactions’. The research plans support a master plan that aims at the rollout of nearly seven million smart houses in the Netherlands, and it is again supported by TNO and Netherland Entrepreneurial Innovation Country that is initiated by the Ministry of Economic Affairs and Education.

14.4 AUSTRALIA – USA – DUTCH COOPERATION

The USA and Australia have their size in common, while Australia and the Netherlands have the size of their economy in common. Their political and social systems are also very close and the people of both countries have an open and pragmatic view, an entrepreneurial outlook and a rather egalitarian social structure.

Over the last few years there has been an increase in ICT exchange between Australia and the Netherlands. A Broadband Mission from the Netherlands was led by their Prime Minister Pieter Balkenende, followed by a Mission to the Netherlands, supported by the then Minister for

Communications Helen Coonan. There have been follow-up meetings at government, regulatory and industry levels.
People from all three countries (and beyond) have contributed to this report and the report will be presented to the governments of these countries as well as to any other country interested in the trans-sector concept.

14.5 PEOPLE POWER

We also see that in many ways the citizens, rather than the politicians, are leading these developments. The examples in both Australia and the USA make that clear. People want change, expect a vision and, above all, want delivery on that vision from the newly-elected politicians. There is no doubt that the voters support concepts such as smart houses and smart communities.

We have the tools and we still have the money. It is a matter of having the vision and the will to carry it out.

The ICT industry can show leadership here. It is one of the few sectors that can facilitate trans-sectoral thinking. This industry is in a prime position to assist governments in building these new platforms – the systems that will enable us to obtain the economic benefits of maximizing the use of digital infrastructure.

14.6 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 organizations and telecommunications company directors.

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15. CONCLUSIONS/ACTION PLAN

- If we are serious about using the current economic crisis to move our economy, and our society in general, in a more sustainable direction we need to ensure that any developments are based on a trans-sector model.
- We will not maximize the economic recovery process if we cling to traditional systems and approaches. This is what got us into the present predicament in the first place. Trying to fix broken systems would be the wrong approach.
- Stimulus money is not infinite and we need to maximize the stimulus investments by ensuring we create economic multiplier effects for the infrastructure investments we are making. This can only be done if we apply the trans-sector approach.
- Trans-sector policymaking can only be led by the President/Prime Minister/Premier. He/she is the only person who is not operating within a silo. Trying to lead trans-sector policies from within any individual silo – even with the best of intentions – will not work.
- It is essential that a governance model and architecture will be designed which decreases complexity and interrelations.
- Common open standards and easy access to simple wholesale products and/or services will liberate the energy and innovation-potential that now has to depend on the goodwill of 'industry-insiders'
- Within the national policy the sectors need to be directed to develop joint trans-sector teams to look at how new systems and structures can be created using the new infrastructure that becomes available through the stimulus package – and, more importantly, new government policies (see below). Critical here is for the large, complex trans-sector model to be divided into manageable projects. The smart grid project in Australia is a good example of this.
- Look for low-hanging fruit – in particular in greenfield projects.
- The Secretary/Minister in charge of the infrastructure (ie Communications, Broadband, and Economic Affairs) should take on the coordinating role. He/she should second senior people from the Department to the other sectors and assist in the infrastructure elements of the trans-sector coordination. He/she will also lead the plenary activities/meetings of all involved.
- It is also important to take into the trans-sector benefits to the business market. The trans-sector supply chains of the corporate market represent 35% of the economy.
- None of the above can be implemented around the broken regulatory telecom systems (vertically-integrated monopolies) that are based on how things operated in the past.
- Trans-sector only works on open infrastructure. Any interface/protocol used in a trans-sector model must be open.
- Each sector must be able to remain completely in control of their end-to-end activities, with well-regulated access and connectivity; the end-to-end principle must be used as much as possible This can only be achieved if we make the national infrastructure available to these sectors on an open wholesale basis.
- Such government policies can be implemented along the lines of the Australian example but models based on a more gradual transition could also work, as long as they are constructed according to that all-important open network wholesale principle.
- There is widespread industry agreement that FttH should be the infrastructure end goal. It provides close to infinite bandwidth and the incremental costs are very low.

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http://www.budde.com.au/presentations/Digital_Economy_Industry_Group.asp