



SPC Network

**Efficiency, Quality and Innovation
in an NBN Environment
A Report for Optus**

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SPC Network

Strategy and Policy Consultants Network Ltd
Chapel House
Booton
Norwich, NR10 4PE
United Kingdom

Tel: +44 1603 871162
www.spcnetwork.eu

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1 Executive Summary

1.1 Introduction

The Australian government is investing public funds, initially AUS\$27.5 billion, in a National Broadband Network to be owned and operated by NBN Co. Ltd until the company has sufficient cash flow to support private sector debt. NBN Co. will be a vertically separated company, providing services in the upstream, wholesale market only.

Optus, Australia's second largest electronic communications network operator, is largely supportive of the NBN initiative, but does have concerns that NBN Co. could take on the negative characteristics of a monopoly operator, in particular poor customer service and inefficiency. It is also concerned that NBN Co. could become subject to undue political pressure.

Optus has therefore commissioned this report from SPC Network Ltd to examine:

- i) Methods of ensuring that monopolies are efficient and customer focussed; and
- ii) Corporate governance of public sector bodies that set a fair balance between political and market objectives.

1.2 Legal and Regulatory Background

NBN Co. is a Government Business Enterprise (GBE), responsible to two shareholder ministers, and is subject to certain obligations that may affect its efficiency, customer responsiveness and operational independence. It has agreed key objectives with the government in its Corporate Plan for 2011-2013 as follows:

1. The network should be designed to provide an open access, wholesale only, national network.
2. The technologies utilised should be Fibre to 93% of premises, fixed Wireless to 4% of premises (delivering at least 12 Mbps) and Satellite to 3% of premises;
3. NBN Co should offer uniform national wholesale pricing over the network, from Point of Interconnection to a premises, on a non-discriminatory basis; and

4. The expected rate of return should, at a minimum, be in excess of current public debt rates.

Other legal and regulatory matters affecting NBN Co and relevant to this report are:

- i) The government's expectation that NBN Co.'s approach to pricing will recognise the importance of affordability.
- ii) The objective set in the Corporate Plan to have uniform pricing across the different forms of access.
- iii) The government's intention to reduce its shareholding in NBN Co. after the network is fully operational.
- iv) The fact that as a GBE NBN Co is subject to the Freedom of Information Act 1982 and is therefore subject to the Information Publication Scheme requirements.

1.3 Objectives for the Regulation of NBN Co. Ltd.

Government has a legitimate role to play in the broadband market as broadband can be considered to suffer from two market failures. First, economic and social benefits are maximised when availability is ubiquitous and secondly, the economies of scale of the broadband infrastructure mean that the market is a natural monopoly.

Three stakeholder groups can be identified as having both short term and long term interests in the NBN: citizens, consumers and Service Providers. Consumers, for example, may have short term interests that are satisfied by choice, quality and value for money, but in the long term wish to see innovation both of the NBN and the services that operate over it. Bearing the interests of the different stakeholders in mind, we have developed a proposed objective for the Australian Competition and Consumer Commission for the regulation of the NBN Co.:

When applying its statutory functions, the ACCC should incentivise NBN Co. to provide access to the NBN for Service Providers at the lowest feasible cost commensurate with the quality expectations of Service Providers and their users (including disabled users, elderly users, and users with special social needs) whilst ensuring that NBN Co. is adequately financed. NBN Co.'s wholesale access products should be provided to Service Providers on a non-discriminatory basis and should allow Service Provider customers of

the NBN to develop broadband products and services to meet the current and future needs of consumers and citizens.

1.4 Incentivising the Achievement of its Objectives

There are a number of regulatory approaches that can be used to encourage cost efficiency in a monopoly market including: competition for the whole market, competition for parts of the market, yardstick competition and incentive regulation.

Competition for the market refers to the franchising of a monopoly service to either the highest bidder or the firm that offers the lowest end price. Whilst such franchising transfers monopoly rents either to society or to consumers, there are also disadvantages, in particular that the incumbent has an enormous information advantage when the franchise is re-let. For this approach to be effective also requires a sufficient number of potential bidders. We do not consider competition for the market to be appropriate for the NBN.

Competition for parts of the market refers to outsourcing those parts of the monopoly business that can be provided by an external supplier. Glas Cymru, the water utility in Wales, has successfully used this approach. We consider such outsourcing to have potential as a means of delivering productive efficiency but only as part of a broader policy of incentive regulation designed to incentivise efficiency.

Yardstick competition involves benchmarking the utility against comparable businesses and has been used in many sectors and countries. The advantage of yardstick competition is that it provides information to the regulator about the relative efficiency of the regulated firm, but it relies on a reasonable number of comparator companies to benchmark against. This is a major drawback of yardstick competition in the context of NBN Co.

Incentive Regulation has traditionally been a price or revenue cap, where the regulated firm may raise its prices by inflation plus or minus an X factor. It has the advantage of setting prices externally and giving the regulated firm the incentive to lower costs, but can lead to a focus on short term cost reductions. The energy regulator in the UK has introduced a more balanced form of incentive regulation where the revenue energy companies are allowed to earn is based on incentives for innovation and output.

Our proposal for NBN Co is that it is subject to a form of incentive regulation that links its ability to set price according to its quality performance in addition to inflation. The structure of the price cap should be such that NBN Co has the incentive to deliver the welfare maximising level of quality, in particular where quality and quantity are complements. This incentive will be particularly important when NBN Co. moves into the private sector. Quality should not only be measured against the previous year's performance, but also against changing customer expectations and against service quality in other countries.

Specifically, we make the following recommendations;

- That the ACCC develops appropriate cost models to ensure that the NBN has been built and is operated efficiently, given the service quality levels demanded by the market and to ensure that the network does not become over-capitalised
- On the assumption that the proposed ACCC model finds that the NBN is efficient, then a price cap of CPI-0% could be used to protect SPs and consumers from unjustified increases in price.
- Where the ACCC finds persistent inefficiency, it should have the authority to require NBN Co. to put out for tender those parts of its operation found to be inefficient.
- Existing services delivered over the NBN (for example, voice telephony) should be offered at no more than the current price level.
- ACCC and NBN Co. should establish appropriate Quality of Service targets which should be built into the price cap; and
- Price flexibility should be allowed to encourage genuinely new product innovation.

1.5 Governance and Monitoring

The Organisation for Economic Co-operation and Development has pointed out that state owned enterprises face distinct governance challenges including undue political interference and a complex chain of accountability. The governance arrangements of Government Business Enterprises in Australia were set out in 1997. Whilst the arrangements in Australia may well be effective, we propose some additional arrangements designed to increase the transparency of decision making. Our proposals are:

- i) That a “Register of Contacts” should be published on a quarterly basis listing all contacts between the company and its shareholder ministers. Such a register would deter ministers from seeking unduly to influence the firm;
- ii) There should be a public consultation on any material changes to NBN Co.’s corporate plan, in particular if such changes are proposed by shareholder ministers; and
- iii) Minutes of NBN Co. Board meetings should be published after a reasonable delay. Only matters related to personnel or customers should be redacted.

2 Introduction: Objectives and Scope of the Report

The Australian government is making an initial investment of AUS\$27.5 billion in a National Broadband Network (NBN) over the next eight years to deliver high-speed broadband access to all Australians. The network will be designed, built and operated by a state owned monopoly, NBN Co. Ltd., that operates only in the upstream (wholesale) market and is precluded from providing retail services. The Department of Broadband, Communications and the Digital Economy (DBCDE) sets out a number of key benefits that the NBN is expected to deliver:

- Better health care;
- Better learning opportunities;
- Boosting the economy and creating jobs; and
- Connecting communities.

Singtel Optus Pty Ltd (Optus) is the second largest electronic communications network in Australia and is largely supportive of the NBN initiative. It expects that considerable benefits will be delivered to Internet Service Providers (ISPs) and ultimately to Australian consumers by an industry with a vertically separated natural monopoly (NBN Co) providing wholesale services to a competitive ISP market.

Nevertheless, Optus is concerned that NBN Co.'s status as state owned monopoly may result in NBN Co. taking on the negative characteristics of a monopoly: inefficiency and poor customer service. Optus recognises that the Australian government has a legitimate interest in the performance of NBN Co., especially given the substantial investment being made. However, Optus is also concerned that without good governance procedures, NBN Co. may be subject to confused messages about its priorities and so subject to a conflict between political and market/economic objectives.

Optus has therefore commissioned this report from Strategy and Policy Consultants Network Ltd. (SPC Network)¹ to examine:

- i) Methods of ensuring that monopolies are efficient and customer focussed; and

¹ See Annex C for a brief overview of SPC Network Ltd.

- ii) Corporate governance of public sector bodies that set a fair balance between political and market objectives.

This report is divided into four further sections. Section 2 sets out the legal and regulatory framework within which NBN Co operates. Section 3 examines potential formal objectives for NBN Co, given the legitimate interests of three principal stakeholders: citizens as the ultimate owners of NBN Co and also as economic beneficiaries of a next generation broadband; business and residential consumers² as the users of the NBN; and ISPs who will be the direct customers of NBN Co. Section 4 addresses the question of incentivising a monopoly to be efficient and responsive to customers. We examine approaches adopted in other countries and other sectors and makes suggestions from Australia. Finally, Section 5 examines structures of corporate governance and again draws on international experience to make proposals for NBN Co Ltd.

In making our proposals, we have sought to ensure that they can be implemented within the existing legal and regulatory framework governing NBN Co.

² From hereon the word “consumers” refer to both business and residential consumers of the NBN.

3 Background

3.1 Legal and Regulatory Environment

This section reviews the legal and regulatory environment of the NBN and NBN Co. Ltd. At the end of this section we highlight several aspects of the environment that are relevant to current and future regulation of NBN Co and its governance arrangements.

3.1.1 The Legal Status of NBN Co and its Obligations as a Government Business Enterprise

NBN Co.³ is defined as a Commonwealth company⁴ and has been prescribed as a Government Business Enterprise (GBE), under s4(2) of the Commonwealth Authorities and Companies Regulations 1997⁵. It is wholly-owned by the Commonwealth, which is represented in NBN Co. by two “Shareholder Ministers” – the Minister for Broadband, Communications and the Digital Economy and the Minister of Finance and Deregulation.

As a Commonwealth company, NBN Co. is subject to a number of obligations; these include an obligation on the company to give interim reports to the Finance Minister if so requested by him and an obligation to keep the responsible Minister informed of developments at the company, and to inform the Minister “immediately” of certain specified material events.

The directors of NBN Co are required to comply with any specific direction of the Minister of Finance (s47A 1997 Act) and any General Policy Order; the latter “specifies the general policy of the Australian government” (s48A(1) 1997 Act).

Section 42 of the 1997 Act sets out details of the obligations of GBEs with regard to informing the relevant Minister of their corporate plans. GBEs are required to prepare a corporate plan at least

³ Schedule 1 of the NBN Companies Act explains that there are 3 separate NBN companies: NBN Co, NBN Tasmania and any company over which NBN Co is in a position to exercise control. For the purposes of this note, I shall use the term NBN Co to include all 3.

⁴ s34(1) Commonwealth Authorities and Companies Act states that “Commonwealth company means a Corporations Act company that the Commonwealth controls”.

⁵ <http://www2.finance.gov.au/property/gbe/index.html>

once a year and give it to the responsible Minister. The plan must cover a period of at least 3 years.

3.1.2 The role of the national government in the running of NBN Co

The Australian Government's relationship to its GBEs is similar to the relationship between a holding company and its subsidiaries⁶. Thus, for example, in December 2010, the relevant shareholder ministers sent a detailed Statement of Expectations to NBN Co.⁷, setting out what the government expected of NBN Co. Two relevant examples of the government's expectations of NBN Co. in the 14-page Statement are:

"In progressing the rollout, the government expects that NBN Co. will take into account the Government's commitment that fibre will be built in regional areas as a priority."(p.3)

"The Government expects NBN Co.'s approach to pricing will recognise the importance of maintaining affordability to drive take-up rates". (p.7)

A useful overview of the corporate governance of NBN Co was provided by the Chairman of NBN Co. in a speech on 7th June 2011, entitled "The governance of NBN Co."⁸. He stated that "we are apolitical and subject to the control and direction of the Government of the day."

3.1.3 The financing of NBN Co

The December 2010 Statement of Expectations from the relevant shareholder minister ministers to NBN Co. also states:

"NBN Co. will be funded with Government equity until NBN Co. has sufficient cash flows to support private sector debt without explicit Government support. The Government expects that during the rollout period defined in the Corporate Plan private sector debt raised by the Company will complement Government equity to fund rollout activities. Following completion of rollout, the Government will consider the optimum capital structure for the

⁶ <http://www2.finance.gov.au/property/gbe/index.html>

⁷ http://www.dbcde.gov.au/_data/assets/pdf_file/0003/132069/Statement_of_Expectations.pdf

⁸ <http://nbnco.com.au/wps/wcm/connect/main/site-base/main-areas/publications-and-announcements/announcements/The-governance-of-NBN-Co.html>

Company following which private sector debt should be applied to repaying the Government investment, consistent with that structure.

The Government will enter into an equity agreement with NBN Co for the rollout period with equity funding based on the expected \$27.5 billion funding requirement advised by NBN Co. This agreement will be reviewed annually. The Government envisages that this will provide NBN Co and the market with the certainty required to enter into the long term commercial contracts needed to deliver the Government's NBN policy objectives. The Government envisages that any equity agreement entered into with NBN Co. will be linked to the performance and coverage objectives agreed as part of the NBN Co. Corporate Plan. Any variance to equity requirements will require Government approval.”

3.1.4 The objectives of NBN Co

The objectives of NBN Co are not set out in any primary legislation. However, the NBN Companies Act does restrict the scope of NBN Co.’s activities. In particular, this Act provides that NBN Co may only supply to carriers and service providers (s.9; ss10-16 contain limited exceptions in relation to supply to certain utilities); it may not provide content services (s17) or non-communications services (s18) or goods (s19).

NBN Co.’s Corporate Plan for 2011-2013⁹, published in December 2010, states:

“NBN Co’s understanding of its objectives has been enhanced by correspondence from the Government. NBN Co’s objectives can be summarized as follows:

1. The network should be designed to provide an open access, wholesale only, national network.
2. The technologies utilized should be Fibre to 93% of premises (including Greenfields developments) (defined in this Plan as the Fibre Network), fixed Wireless to 4% of premises (delivering at least 12 Mbps (defined in this Plan as the Fixed Wireless Network or Wireless Network) and Satellite to 3% of premises (defined in this Plan as the Satellite Network);

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<http://www.nbnco.com.au/wps/wcm/connect/eea11780451bd3618ebfef15331e6bbb/101215+NBN+Co+3+Year+GBE+Corporate+Plan+Final.pdf?MOD=AJPERES>.

3. NBN Co should offer uniform national wholesale pricing over the network, from PoI to a premises, on a non-discriminatory basis; and
4. The expected rate of return should, at a minimum, be in excess of current public debt rates¹⁰.

3.1.5 The supply obligations on NBN Co

NBN Co. may not supply a telecoms service unless the service has been “declared” or it is covered by a standard form of access agreement that is available on NBN Co.’s website or it is subject to a Special Access Undertaking (SAU).

The Australian Competition and Consumer Commission (ACCC) can impose *ex ante* conditions on operators if they provide are “declared” services. In the case of NBN Co, the services it is to provide are, in essence, “declared” services.

At the time of writing, NBN Co. had lodged a draft SAU with the ACCC. The draft SAU sets out the details of NBN Co.’s price and non-price terms for the supply of its products. Under the statutory process the ACCC has 6 months to review the SAU and it must engage in a public consultation.

The ACCC must be satisfied, amongst other things, that the SAU will “promote the long-term interests of end-users of carriage services or of services supplied by means of carriage services”. It may not, however, reject any undertaking, on the basis of the pricing terms it includes, to the extent that these pricing terms are “reasonably necessary to achieve uniform national pricing”.

NBN Co. is also consulting on an industry-wide Wholesale Broadband Agreement¹¹.

3.1.6 Freedom of Information Act

On 11 June 2011, NBN Co. became subject to the Freedom of Information Act 1982 and, in particular, its Information Publication Scheme (IPS) requirements, which include an obligation on NBN Co. to draft an IPS plan.

¹⁰ <http://www.nbnco.com.au/assets/documents/nbn-co-3-year-gbe-corporate-plan-final-17-dec-10>, at p.12.

¹¹ <http://www.nbnco.com.au/wps/wcm/connect/downloads/publication/wholesale-broadband-agreement/NBN%20Co%20WBA%20Consultation%20Paper%20May%202011%20Final.pdf>

In June 2011, NBN Co. issued its first IPS¹², which states that “NBN Co. is committed to operating in a manner that is open, transparent and consistent with good corporate governance practices”. Also, “our company will aim to provide information that is regularly requested through [freedom of information] requests. More generally, NBN Co. will identify other information that is of public interest, while balancing the terms of the [Freedom of Information] Act”.

These transparency constraints are likely to have an impact on how NBN Co. conducts its business, including, for example, its relations with the government of the day.

3.2 Conclusion

A number of aspects of the regulatory and legal environment are relevant to the current and future regulation of NBN Co. and its governance. These are:

- i) The government’s expectation that NBN Co.’s approach to pricing will recognise the importance of affordability.
- ii) The objective set in the Corporate Plan to have uniform pricing across the different forms of access.
- iii) The expectation that NBN Co.’s rate of return should exceed the current public debt rates.
- iv) The government’s intention to reduce its shareholding in NBN Co. after the network is fully operational.
- v) The fact that NBN Co. is subject to the Freedom of Information Act 1982 and is therefore subject to the Information Publication Scheme requirements.

¹² <http://www.nbnco.com.au/assets/documents/ips-document-11-jun-11.pdf>

4 Setting Objectives for Regulation of NBN Co. Ltd.

As the Australian government is asking the nation to fund, directly or indirectly, a projected AUD27.5 billion investment in the NBN, it is self-evident that clear objectives should be set to ensure that the investment delivers valuable outcomes to Australian citizens. In this section of the report we explore what the interests of different stakeholders – consumers, citizens and service providers¹³ – are likely to be, and therefore what the objectives should be. We then set forward a proposed objective for the Australian Competition and Consumer Commission (ACCC) for the regulation of NBN Co. We start, though, by discussing why a national broadband network is a subject for public policy.

4.1 Why a Public Policy for a National Broadband Network?

There is a general consensus amongst researchers and policy makers that broadband Internet access will bring both economic and social benefits¹⁴. Broadband is expected to support economic growth and social cohesion and to facilitate the more efficient production and distribution of certain goods. These goods may be divided into two categories: those that exhibit some kind of positive externality and those that do not, even though there may be a network effect¹⁵. An example of the former is the delivery of health services via the Internet, where there is a wider social benefit from the improved health of an individual consumer of e-health¹⁶. An example of the latter would be the on-line delivery of video content (such as a Blu-Ray film) with the network effect arising from increased numbers of users attracting an increased choice of films.

However, broadband can be considered to suffer from two market failures. First, if the economic and social benefits are maximised when availability is ubiquitous (within a country) then social

¹³ In limiting our analysis of stakeholders to citizens, consumer and service provider, we are not precluding other groups, such as employees, who have a stake in NBN Co. However, for the purpose of this report it is these three stakeholders that are most relevant.

¹⁴ See, for example, this discussion in Firth and Mellor (2005) and Picot and Wernick (2007).

¹⁵ The distinction between a positive externality and a network effect is subtle. A positive externality arises if one consumer derives additional value from consumption of a good by others. For example, the more people are connected to a telephone network, the more valuable that network is to each consumer. A network effect comes from greater availability of associated products, e.g. more films attracting more users attracting more films, but one user gains no extra value from a film just because many others also download it.

¹⁶ See <http://www.ahcwa.org.au> for example of e-health services

benefits in particular will not be realised if there is a “digital divide” that prevents some consumers from accessing broadband. Secondly, if the economies of scale of the network are such that the market for the infrastructure, though not the services than run over it, is a natural monopoly.

Government may, therefore, be able to improve market outcomes in two circumstances:

- First, where there is a positive externality, but where the market on its own would fail to internalise that externality as socially optimal availability and consumption are greater than privately optimal availability and consumption; and/or
- Secondly, where even in the absence of a positive externality, economies of scale of network provision mean that a national broadband network would be a natural monopoly, and that the monopolist would be likely to restrict supply so as to maximise profits. In this instance, government has an interest in ensuring appropriate investment in a single network and in using regulation to prevent the monopolist from exploiting its dominant position¹⁷.

From the above, we can identify three groups of stakeholders with an interest in the NBN.

- i) Citizens who fund development of the NBN and derive social benefits from positive externalities, even if they do not consume the NBN;
- ii) Business and residential consumers who derive utility from the consumption of private goods; and
- iii) Service Providers who use the NBN to provide services to citizens and consumers.

4.2 Stakeholders: Citizens, Consumers and Service Providers

In this section of the report, we consider the interests of citizens, consumers and service providers. Before doing so, however, it is worth first discussing the difference between consumers and citizens. This matter has been extensively considered by the UK’s electronic communications markets regulator, Ofcom, which has a legal duty to further the interests of both citizens and consumers¹⁸.

¹⁷ In the absence of regulatory commitment, potential investors in a single network may fear *ex post* appropriation of assets or profits through regulation (See Newbery 2001, pp 30 – 38)

¹⁸ Communications Act 2003, Section 3(1)

Consumers have choice in a market place, are concerned with what is good for them individually and are generally thought to want lower prices, increased choice and improved quality. Citizens participate in society, which includes the market, but also extends beyond the market. Citizens participate in a wide range of social, cultural and political activities that are not subject to commercial contracts¹⁹.

Ofcom suggests that the market left to its own devices will not always deliver the broader public or citizens' interests and provides the example of faster broadband access than is commonly available. It suggests that ensuring nationwide access to higher speed broadband may be at odds with the interests of at least some consumers, but may be in the interests of all citizens, as "it would promote a more inclusive, interconnected society"²⁰.

The interests of citizens, therefore, can be considered as the public interest in electronic communications markets, whereas the interests of consumers are their private interests.

Australian citizens have a multifaceted interest in NBN Co. First, they are being asked to fund the initial investment of AUD27.5 billion, either directly from taxation or by buying Aussie Investment Bonds. They therefore have a clear and legitimate interest in the economic success of the project and can be expected to want a return on their investment.

Given the magnitude of the investment, citizens also have an interest in the NBN delivering value to them as citizens, rather than as consumers. The Department of Broadband, Communications and the Digital Economy (DBCDE) has set out the key benefits of the NBN as:

- Better healthcare
- Better learning opportunities
- Boosting the economy and creating jobs; and
- Connecting communities.

These are benefits for citizens as a healthier and better-educated society is in the interests of all, and so society (through the government) is willing to subsidise beyond private benefit.

¹⁹ Ofcom (2008) Paras. 2.19 – 2.20

²⁰ *ibid.* Para. 2.32

Citizens can be said to want to internalise the positive externalities of the NBN, that is they want to capture the value of the externalities for society as a whole, rather than for individual consumers.

The Australian government can be considered as the agent of citizens, acting on their behalf to ensure the delivery of the NBN and that the NBN works in the interests of citizens. Government therefore has a legitimate role in setting the broad policy objectives of the NBN, and in creating incentives for NBN Co. to deliver these objectives.

Consumers of the NBN are those people who use the NBN either at home or at work (or both) and so derive some private benefit from it and the services available over it. Consumers are heterogeneous and want a wide choice of products at the lowest price commensurate with the level of quality they desire. In normal markets, consumer interests are generally best met through active competition, but this is not the case in the presence of a natural monopoly, such as the NBN.

Consumers have both short term (best choice, price and quality at the time of purchase) and long term (innovation leading to new products and services to meet future needs, or current needs in new ways) interests. This is an important consideration in regulated markets, as the regulatory body needs to encourage both static and dynamic efficiency in any regulatory constraints it places on firms.

Service Providers are direct customers of NBN Co. and can be expected to want means of access to the NBN that allows them to offer a variety of prices and service features to consumers. The NBN itself is subject to long innovation cycles and will depend on the development of technological standards internationally to offer new services. Service Providers' products, by contrast, are subject to much shorter life-cycles and may be developed locally. Service Providers are likely to want as neutral an input product as possible to allow them to compete with each other on both product features and price. However, Service Providers are also likely to want to compete on a level playing field and thus will want non-discriminatory access conditions, such that no service provider has an unfair advantage over its rivals²¹.

²¹ It has been argued that forbidding price discrimination in intermediate product markets can be welfare reducing (see O'Brien and Shaffer 1994 and Inderst and Valletti 2009). Whilst these arguments have merit,

The structure of the NBN market in Australia will be that while NBN Co. will be the monopolist in the upstream access market, the downstream service provision market will be competitive. To a large extent the services provided over the NBN will be dictated by NBN Co, in that it controls quality of service and the timing of enhancements to the NBN. Service providers, however, will have to respond to the needs of consumers in a competitive market, and will therefore be looking to NBN Co. to be equally responsive to their needs. An NBN Co. that is sensitive to the changing needs of its direct and indirect customers is therefore likely to be a crucial need of service providers.

Such responsiveness can also be said to be an interest of citizens as the international competitiveness of Australia, and therefore its ability to boost the economy and create jobs, will be enhanced by the quality of the NBN.

4.3 Objectives of NBN Co and the ACCC

The objectives of NBN Co. are set out in its Corporate Plan and the government's Statement of Expectations and have been discussed in Section 2 of this report. The Australian Competition and Consumer Commission (ACCC) has the responsibility to regulate electronic communications markets and is therefore responsible for regulating NBN Co. In this section, we propose a regulatory objective of the ACCC specifically in relation to the NBN that takes account of citizens' and consumers' short and long term interests.

In the short-term, citizens have an interest in ubiquity of the NBN such that all Australian residents gain the social and economic benefits that come from wide participation in the digital society and economy, whether or not they individually decide to use the NBN. In a country with the geography and demography of Australia it may not be in citizens' interests, that all residents are offered the same access technology and therefore the services the NBN can provide on a ubiquitous basis may need to be "equivalent" rather than the same.

we believe that there an over-riding policy objective of ensuring that all competitors are able to compete on equivalent terms and that one Service Provider should not have an advantage over any rival on subjective grounds. At the time of writing this report, the ACCC was consulting on draft guidelines governing non-discrimination on the NBN.

What we mean by “equivalent” is that citizens in a city or a remote rural area should receive equivalent services recognising that their circumstances are not the same and that therefore the cost of providing the same service for all may be prohibitive. This would mean, for example, that whilst a fibre to the home (ftth) solution may be appropriate in a city, wireless or satellite would be appropriate in remote areas. Neither wireless nor satellite can offer the same access speeds as ftth, but this should not preclude citizens from accessing equivalent services so that they can participate in the digital society and economy and gain equivalent benefits.

In the longer term, citizens have an interest in seeing the development of the NBN to ensure that Australia remains internationally competitive both as an economy and as a society. They therefore have an interest in investment conditions being right for future development of the NBN and services that run on it.

Consumers’ short term interests are choice, price and quality. In the long term, their needs are similar to citizens’, in that they will want to see the NBN and the services provided over it to evolve to meet their changing needs and tastes. In an outward looking country like Australia, consumers are also likely to compare what they can buy in Australia with other countries and so will want the NBN to be internationally competitive.

We therefore propose the following objective for ACCC’s regulation of NBN Co. designed to serve the interests of different stakeholders.

When applying its statutory functions, the ACCC should incentivise NBN Co to provide access to the NBN for Service Providers at the lowest feasible cost commensurate with the quality expectations of Service Providers and their users (including disabled users, elderly users, and users with special social needs) whilst ensuring that NBN Co. is adequately financed. NBN Co.’s wholesale access products should be provided to Service Providers on a non-discriminatory basis and should allow Service Provider customers of the NBN to develop broadband products and services to meet the current and future needs of consumers and citizens.

We refer to this as the “Efficiency, Quality, Innovation” (EQI) objective.

5 Incentivising Achievement of Objectives

In this Section of the report, we consider different approaches to incentivising the management of NBN Co to meet the EQI objective proposed above. In doing so we draw on approaches adopted in other countries and industry sectors where an essential input is a *de facto* or *de jure* monopoly.

5.1 The problem

The monopoly problem is clearly understood by economists and can be regarded as leading to losses of allocative, productive and dynamic efficiencies:

- Allocative efficiency is reduced as a profit maximising monopolist is expected to price above marginal cost leading to a deadweight loss. At the extreme, a monopolist will restrict production to a level where price equals marginal revenue, maximising its own profit and reducing consumer surplus. An unconstrained monopolist is under no competitive pressure to reduce prices below the profit maximising level.
- Productive efficiency may be lost as the monopolist is under no external pressure to reduce its costs and so it may employ inefficient production methods and technologies. Productive inefficiency may reduce profits and so may be considered as irrational even for a profit maximising monopolist, but if cost reducing measures involve management effort, such profit reduction may be a transfer from shareholders to managers.
- Dynamic efficiency refers to the extent to which a firm innovates with new processes and products. As with productive efficiency, a firm that faces no competitive threat has no incentive to reduce its short-term profits by making such investments²².

A privately owned firm in a competitive market faces the ultimate cost of failure of bankruptcy (the “bankruptcy constraint”). A publicly owned enterprise, especially one with the importance and profile of NBN Co. is not subject to such a constraint as it is highly unlikely that the state would allow NBN Co. to go out of business. Thus managers of NBN Co. are not under the threat of this ultimate failure, at least whilst it is in public ownership.

²² See Motta (2004) Chapter 2 for a further discussion on welfare losses and market power.

The challenge, then, is to establish a methodology that incentivises managers to behave as if they were subject to the rigours of the product and financial markets whilst retaining the economy of scale benefits of monopoly production of the NBN.

5.2 Methodologies

The question of incentivising monopolies has been addressed by regulators and researchers in many sectors and countries. In this section, we consider some of the key methodologies.

5.2.1 Competition for the Market

In an industry sector with economies of scale, the government may determine that the market is best provided for by an efficient monopolist, as for example has traditionally happened in parts of the water sector. The state may establish a franchise and then auction that franchise, where the winner is the firm that offers either to buy the franchise for the highest up-front fee or to offer the lowest price to consumers on a per unit basis. Regardless of the relative merits of the up front fees versus lowest per unit prices²³, the theory behind franchise bidding is that firms will bid away expected monopoly profits to win the contract. Under an up-front fee system firms will bid their entire expected profit to win the contract, whilst under a lowest per unit price system, firms will bid a unit price equal to average or marginal cost²⁴.

One of the advantages of franchise bidding is that it can replace regulation as a means of ensuring prices are similar to those that would be seen in a well functioning market. Another advantage is that monopoly rents are transferred either to consumers, through average cost pricing, or to citizens in general through a lump sum payment to the government.

However, the system also has several drawbacks. Perhaps the most significant drawback is that when the franchise is re-let, the incumbent has considerable advantages over any rival bidder. First, the incumbent is privy to information about costs and demand levels that rivals do not have and is therefore in a better position to judge what is a reasonable price for the franchise. Secondly, the incumbent may depreciate completely any assets used in the delivery of the service during the first franchise period meaning that it can re-use at least some assets at zero cost. Rival

²³ Under an up-front fee system, monopoly rents are transferred from the franchisee to the franchisor, but may still result in monopoly market prices. Under the per unit price system, monopoly rents are transferred to consumers.

²⁴ Dependent on whether the price is a one or two part tariff.

bidders would have to include the cost of depreciation in their price and so are likely to set a price higher than the incumbent's, or bid an up-front fee that is lower.

The incumbent's superior information about a franchise also gives it an enormous advantage when the franchise is renewed as few entrants will want to bid against it. If an entrant is prepared to undertake a franchise for a lower price than the incumbent, it may truly be subject to the 'winner's curse'. Some of these disadvantages can be overcome using developments in auctions (Harstad and Crewe 1999), but in practice renewal of franchises for a single major investment of this kind are likely to cause problems in producing sufficient bidders with enough knowledge of the market to make competitive bids.

For a franchising system to work, there needs to be sufficient number of franchisees bidding to make the process truly competitive. The fewer the number of firms that are genuinely able to bid to operate the franchise, the higher resulting prices are likely to be.

5.2.2 Competition for parts of the Market

Competition for parts of the market recognises that whilst the core facility may be a natural monopoly, there can be competition for supply of services to the monopolist. Key services can be contracted out, on a competitive basis, to outsourcing firms for a contract period. This model has been followed by national and local governments in many countries and, in the utility sector, by Glas Cymru, the owner to Dwr Cymru (Welsh Water) in Wales (see Box 1).

The rationale behind outsourcing functions of a public enterprise is that the outsourcing supplier may be more efficient than an in-house team at supplying the service. Domberger and Jensen (1997) point to three theoretical conditions under which contracting out is likely to be successful:

- i) When the magnitude and specificity of the physical assets required to provide the ultimate service are smaller. The contractor may skimp on maintenance and avoid relationship-specific investments.
- ii) When the quality characteristics that are non-contractable are less significant. Domberger and Jensen point to evidence in Hart et al (1997) that private contractors have a stronger incentive to reduce costs and quality than a public service provider.
- iii) Whenever the availability of competitive supply in the market is large.

Contracting out of services has been found to generate cost savings. The Industry Commission (IC) conducted a major review of contracting out in 1996 that included a review of international studies on the savings generated through contracting out. The IC found that 75% of the 200 individual services examined yielded savings and just over half yielded savings of between 10% and 30% with others reasonably evenly distributed either side. Cost increases were found to range up to 28% and savings up to 84%²⁵.

Box 1: Glas Cymru

Glas Cymru was founded in 2000 when it bought the water industry assets from Western Power Distribution (WPD), an American firm that owned Hyder (the former Welsh Water Authority) and SWALEC, a local electricity company. Glas Cymru is a Company Limited by Guarantee with no shareholders and is entirely debt funded. Profits are retained by the business for investment. The company presents itself as being run in the interests of its customers, and as a “custodian” of a Welsh national asset, rather than as a business owner seeking to maximise profit.

Glas Cymru owns Dwr Cymru, which is the operating company providing water and sewage services in Wales. Glas Cymru’s business model involves the outsourcing of most of its work to specialist service providers in a bid to reduce costs and therefore customer bills. Approximately 85% of its total costs are outsourced (Thomas 2001).

Glas Cymru’s governance arrangements are discussed below in Box 3.

5.2.3 Yardstick Competition

Yardstick competition, or benchmarking, compares the performance of the regulated firm with its peers. The principal objective is to compare the efficiency of firms and to highlight the best performing as the yardstick against which other firms should be measured.

There are a number of different methods of yardstick competition from partial, or uni-dimensional, measures to frontier methods using parametric or non-parametric techniques²⁶. Uni-dimensional techniques include simple measures such as the number of access lines per employee. This is a

²⁵ Industry Commission (1996) pp 127 - 129

²⁶ The difference between parametric and non-parametric is not easy to define. At its simplest, parametric statistics are normally distributed and non-parametric statistics are not.

simple technique, often using easily available public data, but may be too crude. Frontier methods seek to establish the most efficient firm, or region within a firm, across a number of dimensions and uses statistical techniques such as Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis²⁷. Frontier methods take account of the multiple inputs and outputs of regulated firms.

According to the Netherlands Bureau for Economic Policy Analysis, there are four necessary conditions for the application of yardstick competition: market failure, comparability, private information and verifiability²⁸. The market failure requirement is met in the presence of a natural or statutory monopoly where the monopoly has low incentives to promote static cost efficiency. The comparability requirement reflects the necessity to be able to compare firms, which means that the subject firms should be largely similar with respect to technology and other cost determinants. The private information requirement refers to the information asymmetry between the regulated firm and the regulator, where the firm holds information about how it can improve efficiency that the regulator does not. Verifiability requires that the relevant costs and profit data must be observable and verifiable before an independent referee, such as a court.

Yardstick competition has been used in many sectors and in many countries. The UK water regulator, Ofwat, used to perform yardstick competition between the various regional monopoly water suppliers in the UK to help it to obtain information to set periodic price controls. Yardstick competition was also used in the Scandinavian electricity distribution market²⁹, in the US telecommunications and healthcare sectors, for price regulation and budgeting respectively, and in the Israeli secondary education sector³⁰.

Yardstick competition has been found to be an effective way on encouraging static efficiency gains where monopoly conditions exist. However, its efficacy with respect to other objectives is less clear-cut. Again drawing on the work of the Netherlands Bureau for Economic Policy Analysis, the following comments can be made:

- i) Yardstick competition is likely to promote dynamic efficiency, although gains are more likely to accrue to individual firms rather than sectors;

²⁷ For a more detailed, but brief, description of these techniques see Competition Commission (2003 - Appendix 5.3)

²⁸ Netherlands Bureau for Economic Policy Analysis (2000)

²⁹ See Agrell et al (2005) for a technical discussion of yardstick competition in Scandinavian electricity distribution.

³⁰ Netherlands Bureau for Economic Policy Analysis (2000) p50, Table 4.1

- ii) It is important to construct a “quality index” with financial penalties to prevent firms cutting unobservable aspects of production, supply and service to become more efficient;
- iii) Greater heterogeneity between firms means higher regulatory cost for lower efficiency gains. Excessive heterogeneity may damage the application of yardstick competition; and
- iv) Yardstick competition is not appropriate if regulatory costs are greater than efficiency gains. Costs include direct costs, but also costs of collusion, information rents and regulatory capture³¹.

5.2.4 Incentive Regulation

Where some form of actual or quasi-competition is not feasible, incentive regulation may be the appropriate method. Under incentive regulation the regulator imposes pricing restrictions on the firm, and the firm can reap profit increases from cost reductions. Incentive regulation makes use of the firm’s information advantage and profit motive allowing the regulator to reward outcomes rather than control behaviour³².

The principal direct form of regulation for efficiency gains has been price-cap regulation where the regulated firm is required to limit price increases for a basket of services by inflation plus or minus an “X factor”, where the X factor represents the year-on-year efficiency gains the firm is expected to make. Price caps are usually set in place for a period of three to four years and incentivise cost savings in the early part of a review period as firms are allowed to retain excess profits made from efficiency savings³³.

One concern with simple price cap regulation is that the regulated firm can achieve cost savings through a reduction in quality of service, and there is some empirical evidence to support this³⁴. Another concern with price caps is that they encourage the regulated firm and its competitors to focus on the charge control, rather than on customers.

³¹ See Jamasb et al (2004) for a discussion in strategic behaviour

³² Vogelsang (2002)

³³ We do not explain price caps in detail here. For a good introduction see Cowan (2006) and Crew and Parker (2006) pp 49-50

³⁴ See for example Ter-Martirosyan (2003) and Box 2

An alternative to price cap regulation is a revenue cap where the firm's total revenue or its average revenue per customer is capped. Like price caps, revenue caps are designed to encourage improvements in efficiency by allowing the firm to retain additional profits.

However, concerns might still exist that price and revenue caps, whilst effective at driving out productive inefficiency, do not promote dynamic efficiency in that the regulated firm's incentive is to reduce cost rather than innovate new services. When an industry is faced with a need for substantial investment, a price cap may therefore not be the right instrument. It was this concern that led the UK gas and electricity market regulator, Ofgem, to launch a review of price caps known as "RPI-X@20"³⁵.

Box 2: Price Caps and Quality Reduction

When price cap regulation was introduced to newly privatised network industries in the UK, there was initially a fall in standards, for example with non-maintenance of public telephone boxes by British Telecommunications (Ofel, 1988), and a dramatic rise in disconnections amongst residential gas consumers (Markou and Waddams Price 1999, p385). This led regulators to introduce specific quality measures that increased both in number and level over the years; compensation was originally given only when requested, but low levels of requests led to increasing mandatory compensation. Quality improvements have been directly incorporated in the price caps for both water and electricity, culminating in the RIIO project in energy transmission (see below).

Following the introduction of specific quality targets, the typical pattern was that measured quality first seemed to decline (as measurement became more accurate) and then to improve, in line with, and often exceeding, the quality measures (Chau, 2002). As the regulation process matured, it became clear that informal regulatory measures, such as league tables of relative performance, were often as important as formal targets, particularly where the companies had interests in bidding for overseas projects (Waddams Price et al., 2008).

In the initial consultation, Ofgem set out its concern with price cap regulation. It wrote: *"The existing 'RPI-X' regulatory framework has served consumers well over the last twenty years. But it was designed for a different era. If Britain's energy network companies are to rise to the sustainable development challenge, the way we regulate the networks needs to change"*³⁶.

³⁵ See the RPI-X@20 home page (<http://www.ofgem.gov.uk/Networks/rpix20/Pages/RPIX20.aspx>) for a complete set of documents.

³⁶ Ofgem (2010a) Page 1

The principal concern that Ofgem had was that price cap regulation encourages regulated firms to concentrate on: the five year price control period; Ofgem and regulation rather than current and future customers; and on tried and tested technologies rather than investment in infrastructure. Given the need for electricity networks to invest in sustainability, Ofgem perceived that price caps were providing the wrong incentives for the future. Ofgem therefore wanted to change the emphasis of regulation to reward desired outputs with incentives for delivery and penalties for non-delivery.

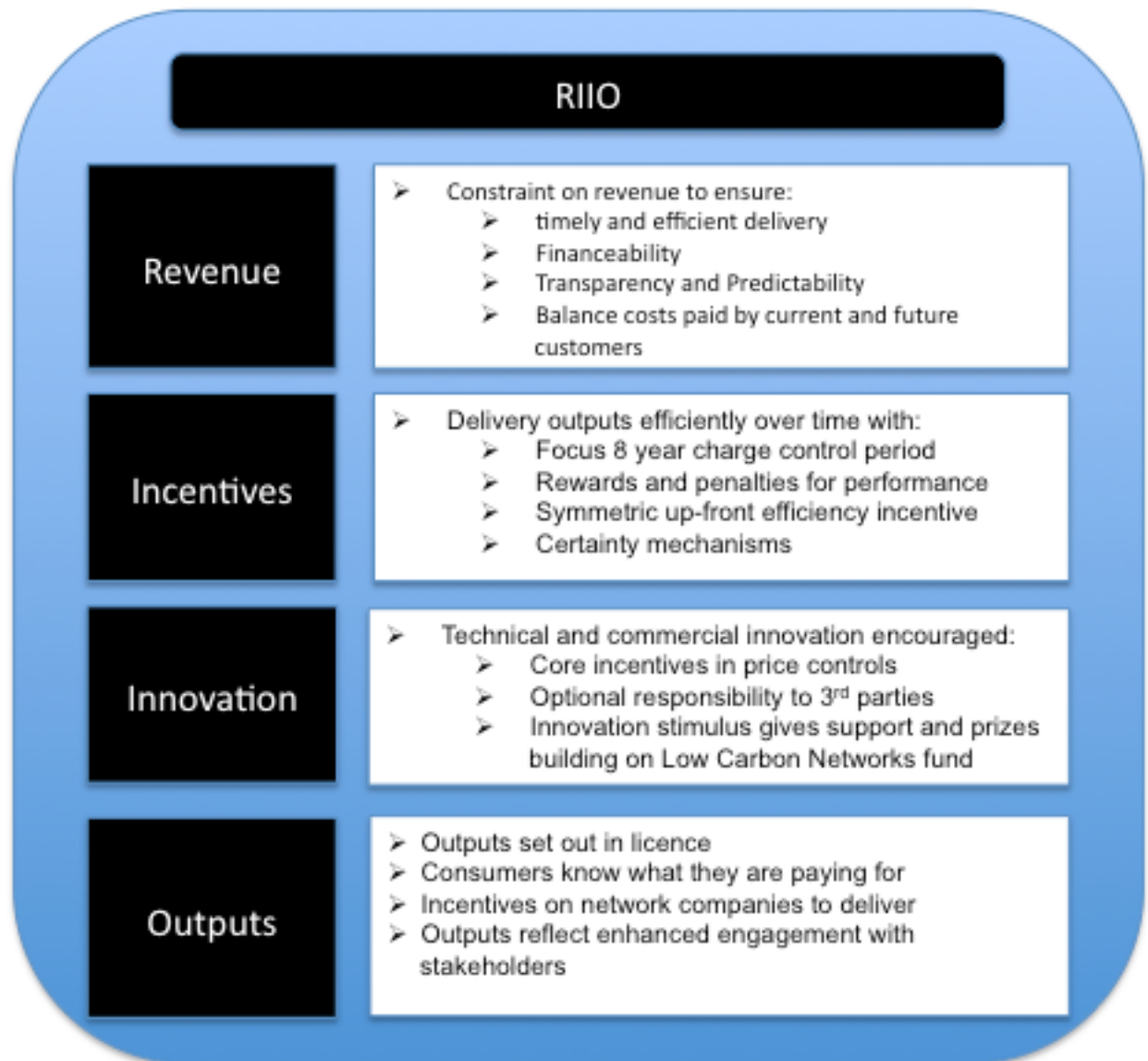
After a relatively short consultation, Ofgem published its decision document in October 2010³⁷ setting out its decision for “Sustainable Network Regulation” using a model known as RIIO: Revenue equals Incentives plus Innovation plus Outputs. The components of the RIIO model are set out in Figure 1 overleaf.

The principal idea behind RIIO is that Ofgem commits to a price control framework that encourages network companies to deliver in response to commercial incentives with the potential to earn higher returns and to face less regulatory scrutiny if they innovate and outperform. Companies that fail to deliver will earn lower returns and face more intrusive regulation. The ultimate sanction would be licence revocation.

³⁷ Ofgem (2010b)



Figure 1: Components of the RIIO Model



One of the key features of the RIIO model is the longer period of the price control: eight years as opposed to the five years of the old RPI-X model. The reasoning behind the longer price control period is that it should provide better incentives for investment and cost reduction, as it allows the firm a longer period to reap the benefits of such cost reduction. However, the longer gap between controls also means that there is less frequent sharing of cost reductions with consumers. It is expected that encouraging longer-term thinking will support the needs of current *and* future customers and reduce the regulatory burden on network operators. The eight-year price control then sets out what network companies are expected to deliver and what potential revenue they

can earn from existing and future customers for delivering those outputs. The revenue element is made up of three parts.

- i) Base revenue: consisting of the expected efficient costs of delivering agreed outputs plus finance-ability; plus or minus
- ii) An adjustment for performance; plus or minus
- iii) Revenue adjustment for uncertainty mechanisms.

5.3 Applicability to NBN Co.

Where there is some form of market failure, various market, quasi-market and regulatory techniques have been used to prevent firms exploiting their market power. The effectiveness of each technique varies and may be applicable in different circumstances. Figure 2 summaries the four forms of regulation discussed above and, as a counterfactual, also includes normal competition, i.e. competition in the market. In this section we now consider the four options discussed and its applicability to NBN Co.

5.3.1 Competition *for* the Market

Franchising the entire NBN to a third party would require sufficient potential franchisees to create a valid supply market. We would not expect there to be enough companies to meet this condition. We have also seen that there are a number of issues with franchising, particularly towards the end of the franchise period, as well as the information advantage that the incumbent has when the franchise is re-let.

In the particular context of the NBN, Telstra is likely to be the only domestic firm with the size and expertise to operate the NBN and would be in a strong position to win the franchise contract. However, franchising the NBN to Telstra would negate the benefits that are expected to arise from vertical separation of the NBN from service providers.

We therefore reject the option of a complete NBN franchise.

5.3.2 Competition for parts of the Market

On the basis of the evidence above, contracting out parts of the NBN operations is likely deliver cost reductions. To be effective, there would need to be several potential suppliers, to ensure genuine competition, and those operations that could be franchised out would need to meet the criteria described in Section 5.2.2 above. The exact operations that could be franchised may therefore need to be considered on a case-by-case basis.

Competition for parts of the market provides the means for NBN Co. to be efficient even though it may not provide the incentive for efficiency. Where internal provision of a service is inefficient, having that service supplied by a suitably qualified external firm may both reduce costs and improve quality if sufficient firms compete for the business. Franchising out is, therefore, a potential tool for the ACCC to ensure efficient delivery of services, a point we return to below. The potential threat of franchising out would also provide NBN Co. with the incentive to ensure its own operations are efficient so that the ACCC does not require tendering of the operation in question.

5.3.3 Yardstick Competition

Yardstick competition has a number of attractive qualities, in particular that it compares the relative efficiency of firms and their quality of service. If the regulator then sets efficiency and quality targets based on the second best firms, i.e. not the most efficient, then firms have an incentive to be the most efficient and highest quality as they can keep the rewards of their superior performance, just as would happen in a competitive market.

Figure 2: Summary of Regulatory Techniques

Delivery Goals	Efficiency, Quality, Innovation (EQI)				
Form of Competition/Regulation	Competition <i>in</i> the market	Competition <i>for</i> the market	Competition <i>for parts</i> of the market	Yardstick Competition	Incentive Regulation
Description	Normal market competition	Entire operation franchised out. Occasionally put out to competitive tender	Firm owns assets but some operations put out to tender (e.g. Glas Cymru)	Benchmarking with other operations or within group regions.	Price/revenue control used to reward EQI. (e.g. RIIIO)
Strengths and Weaknesses	Not applicable where normal market mechanisms deemed to have failed	Franchising entire business subject to complications especially at end of franchise period. Incumbency advantage.	Similar franchise issues. Who has risks – if with contractors will raise price. Is there a supply side market?	Can be difficult to establish reasonable comparators. Internal benchmarking would require discrete management processes	Regulator may be involved in micro-management. Information asymmetry.
	Monopoly profits competed away. Firms have incentives to meet customer quality demands and to be innovative to retain customer contracts/franchises				
Carrots & Sticks	Profit or bankruptcy	Winning or losing entire market	Sub-contractor winning or losing contract.	Mostly moral pressure unless licence can be withdrawn.	Direct reward to managers: bonus vs. sacking?

However, there would be a number of practical problems if yardstick competition was used for the NBN. The first, and most obvious, would be finding suitable comparators. Few countries have plans for a structurally separated, nationally available, next generation broadband network. Only Singapore is known to have one, and the geographic and demographic conditions of Singapore and Australia are so different that comparison would be very difficult. Having a reasonably sized sample of firms to include in the benchmarking exercise is, of course, important to provide confidence that the firms in the group are representative of the industry. Despite this limitation, there may be some general lessons that can be learnt from technological developments in other countries.

A possible alternative would be for NBN Co to be run on a regional basis, with autonomous management in each region and then each region to be benchmarked against each other. A system of internal rewards and punishments would need to be created so that the most efficient region receives a pay-off for its efficiency, and the weaker regions are punished if they fail to improve their efficiency.

The benchmarking process would need to include some measures of service quality as well as productive efficiency to ensure that regions are not just being rewarded for low cost operations. It would also need to allow for the obligation of uniform pricing and the potential requirement to cross-subsidise from regions with a higher proportion to fibre to regions where higher-cost satellite and wireless technologies are more prevalent.

The practical difficulties of yardstick competition for the NBN mean that it could only play a small, supporting role, in incentivising efficiency, quality and innovation.

5.3.4 Incentive Regulation

Incentive regulation is progressing beyond simple price caps that drive improvements in productive efficiency. Ofgem's RIIO, whilst yet to be fully implemented, provides a more balanced set of incentives for the firm to invest in product and service quality as well as cost reduction. Incentive regulation by its nature imposes a regulatory burden on both the regulated and regulator, and perhaps even wider society, and can become the subject of intense lobbying by interests groups. Nevertheless, it is our view that incentive regulation that meets the following criteria continues to have a valid role:

- i) Provides strong incentives to meet quality of service as well as cost reduction targets.
- ii) Ensures the regulated firm can retain rewards from genuine innovation, not simply further exploitation of its dominant position.
- iii) Adequately punishes the regulated firm if it fails to meet its balanced efficiency, quality and innovation objectives.

The third criterion above may cause a real problem, not just for incentive regulation, but for all the techniques discussed in this paper. As a GBE, NBN Co is extremely unlikely to face the bankruptcy constraint. It cannot be expected that the government will permit NBN Co. to go into liquidation should it fail to be profitable or to deliver poor quality of service. Whatever form of regulation is adopted needs to present a genuine risk that management will suffer if targets are not met.

5.4 Recommendation

Our recommendation is that a balanced form of incentive regulation is introduced for NBN Co. The GBE would be required by the Australian Competition and Consumer Commission (ACCC) to meet a balanced set of targets covering efficiency, quality and innovation with suitable rewards and punishments for over and under achievement designed to maximise welfare.

5.4.1 Efficient operation of existing services

The first dimension of Incentive Regulation is to ensure that the NBN is designed, built and operated efficiently. We propose that the ACCC should use appropriate cost models³⁸ to ensure that the NBN has been built and is operated efficiently, given the service quality levels demanded by the market.

On the assumption that the proposed ACCC model finds that the NBN is efficient, then a price cap of CPI³⁹-0% could be used to protect SPs and consumers from unjustified increases in price.

³⁸ Cost modelling techniques of electronic communications network are well understood and we do not discuss the merits of different models here.

³⁹ Consumer Prices Index

There are three other important issues with regard to a price control.

First, in addition to providing advanced broadband services, the NBN will replace the existing copper network to provide the services currently provided on the PSTN. In a competitive market, a firm would only change technology if it delivered the same quality at a lower cost, which could be passed on to consumer, or enhanced quality. The firm would not be able to recover any additional cost of the new technology from existing services. We therefore propose that existing services delivered over the NBN (for example, voice telephony) should be offered at no more than the current price level.

Secondly, NBN Co. is required to earn its cost of capital. At the time any price control is set, the regulated price would be set to allow it to earn a Return on Capital Employed (ROCE) equivalent to the cost of that capital. This may provide NBN Co. with an incentive to over-capitalise, i.e. to employ an inefficiently high level of capital so that it can earn higher profits⁴⁰. Although this is normally associated with “rate of return” regulation, it can affect price cap regulation when a new price is set. It will be necessary therefore for the ACCC to use the cost model discussed above to ensure that the network is not overcapitalised.

Finally, as a GBE, NBN Co. is funded by the government and so may have a lower cost of capital than an equivalent private firm. It is the government’s intention at least partially to privatise NBN Co. once the company is cash flow positive. It might be argued that moving the firm into the private sector would raise its cost of capital and that therefore, once privatised, NBN Co. should be allowed to recover this higher cost through higher prices. However, as NBN Co. will continue to be a monopoly and not subject to either technology or demand-side risks, there should be no reason why its cost of capital would rise.

Franchising out of operations can be an important means of ensuring efficient delivery, as discussed above (Section 5.3.2). We therefore further propose that the ACCC should have the authority to require NBN Co. to put up for competitive tender parts of its operation, with the option of an internal bid, where the ACCC finds that part of the operation to be persistently and excessively costly. The evidence presented earlier in this report suggests that such a tendering process will establish where inefficiencies lie and could thus help NBN Co. ensure an efficient operation.

⁴⁰ A problem known as the “Averch-Johnson Effect” (Averch Johnson 1962)

5.4.2 Quality of Service

Costs should not be reduced at the expense of suboptimal Quality of Service (QoS), which can be a problem with a simple price control. Balanced incentive regulation would therefore need to ensure that NBN Co. is adequately incentivised to meet appropriate customer expectations of QoS.

Establishing suitable QoS targets would not be simple, as there are multiple dimensions of quality and different customer groups, each of which may have different valuations of quality⁴¹. A simple approach would be to link the price control to changes in quality over time as per the equation below:

$$\frac{\Sigma[P_i^2(Q)_i^1]}{\Sigma P_i^1(Q_i^1)} \leq \frac{CPI_2}{CPI_1} - X + \alpha \frac{q_1}{q_0}$$

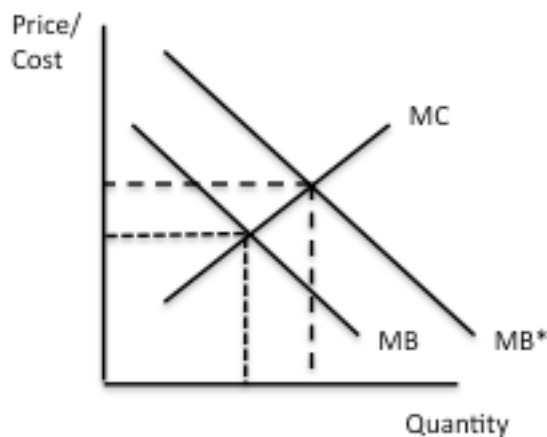
where P= Price Q = Quantity and q = quality. Price in period 2 in this equation is set based on the change in CPI between periods 1 and 2, an X factor for efficiency gains, and the change in quality between periods 0 and 1 adjusted by the coefficient α that would need agreement with the industry, but is likely to be greater than 0. The subscript i refers to each product in a regulated tariff basket.

In principle, the regulated firm would increase or reduce quality to the welfare-maximising level: that is where the marginal benefit of additional quality equals the marginal cost of supplying that additional quality (Sappington 2005).

If quality and quantity are complements, that is if an increase in quality leads to an increase in demand (as might be the case if access speed is a quality dimension where consumers demand more from higher speed networks) then an increase in quality and therefore price would not lead to a decrease in demand for NBN Co or the Service Provider.

⁴¹ See Sappington (2005) for a survey on regulating service quality.

Figure 3: Demand Effects of an Increase in Quality



One potential weakness of this approach is that it would only measure quality changes and may not therefore capture changes in SPs' and consumers' expectations of quality.

A complementary approach designed to capture such changes in expectations could also be built into the regulation. At the start of a control period, NBN Co. and the regulator could agree a target improvement in quality over the period that reflects changes in expectations. Where quality and quantity are complements, that is where an improvement in quality results in a rightward shift in the demand curve, such improvements in quality may result in an increase in price over the period to a new welfare maximising equilibrium. NBN Co. would then be required to make these quality improvements and allowed a price increase to reflect increased costs. A system of rebates would need to be put in place should NBN Co. not meet the quality targets.

We should emphasise that this approach is only relevant if an increase in quality leads to an increase in demand, *ceteris paribus*.

We do not under-estimate the challenges involved in ensuring that NBN Co. is incentivised to deliver the levels of QoS that SPs and end-users could expect in a competitive market, especially as NBN Co.'s incentives to under-deliver on QoS may change as it brings in private capital. Further detailed work would be required to design a means of ensuring it is effectively

incentivised. Nevertheless, a QoS dimension to a regulatory regime, with an effective form of carrots and sticks to encourage the delivery of welfare-maximising QoS, which is capable of changing to reflect consumers' evolving expectations, should form an integral part of the regulation of NBN Co. There are, however, precedents in various sectors and countries of implementing QoS regulation for private sector companies, including the RIIO discussed in this report.

5.4.3 Innovation

The primary innovation is the, government funded, NBN itself. As it is replacing the copper network and taking on services and revenues from that network, the demand-side risks often associated with innovation largely disappears. Nevertheless, there may well be a need for NBN Co. to have incentives to invest in further new developments over the medium to long term, and balanced incentive regulation should encourage this.

Our first proposal is to follow the RIIO model and re-set price caps every eight years rather than every five years. This would allow NBN Co. to focus on innovations early in the charge control period that can deliver returns over a longer period before a new charge control is adopted. Secondly, whereas we propose above that existing products should be priced no higher than then current level, some flexibility may be allowed for genuinely new access products at least over the short term before they become established. As new products mature, pricing flexibility should be reduced to prevent the earning of monopoly rents.

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6 Governance and Monitoring

In this final section of our report, we consider governance and monitoring arrangements. We first briefly set out what we see as the problem and then examine the approach taken in some other sectors where a public or privately owned monopoly has some form of external governance.

6.1 Problem

A privately owned firm is responsible to its shareholders and is ultimately expected to pursue profit maximisation, rather than the agenda of management, consumers or politicians. Public ownership of utilities, such as the NBN, may free management from such a constraint, permitting the pursuit of non-economic objectives⁴². The absence of competition for NBN services may result in management focusing more on the interests of stakeholder lobbyists than on meeting the objectives of efficiency, quality and innovation.

Further, like other state owned utilities in Australia and elsewhere, the NBN will be an important part of the social, political and economic life of Australia used by many, perhaps all, sections of society. In these circumstances, the OECD⁴³ has pointed out that “the governance of State Owned Enterprises (SOEs) will be critical to ensure their positive contribution to a country’s overall economic efficiency and competitiveness”⁴⁴.

The OECD also points out that SOEs face some distinct governance challenges, including: undue hands-on and politically motivated ownership interference; dilution of accountability as SOEs are often protected from bankruptcy and take-over; and a complex chain of agents to whom the SOE is accountable without clearly and easily identifiable, or with remote, principals.

To counter these problems, a governance structure has to be put in place that ensures that the management of NBN Co remains focussed on its objectives and is protected from undue interference from stakeholder groups who may privately gain from particular decisions at the cost of a greater gain for society and the economy.

⁴² Kwoka (2002)

⁴³ Organisation for Economic Co-operation and Development

⁴⁴ OECD (2005)

6.2 Other countries and Sectors

Annex A and Annex B compare the governance arrangements of various public sector corporations and private regulated monopolies in the UK (Annex A), New Zealand and Singapore. We have also included the same information for NBN Co (all in Annex B). The tables show: the purpose of the organisation; its ownership status; the name of the regulatory body; the duties of the regulator; governance arrangements; and the role of government.

One interesting form of governance arrangement is the use of public and stakeholder “Members” whose function is to act as shareholders. Glas Cymru and Network Rail in the UK both have Members as does NavCanada, the owner and operator of Canada’s civil air navigation service. Although we ultimately reject Membership as a governance structure, Box 3 below briefly describes Glas Cymru’s use of Members.

Box 3: Glas Cymru Members⁴⁵

Glas Cymru (see Box 1 above) has no shareholders, but instead has a panel of “Members” whose function is to act as if they were shareholders: holding the Board to account at the Annual General Meeting. Members also have a high level of engagement between AGMs. The company regards Members as its “critical friends” interested in long term and strategic development issues.

Glas Cymru’s Members have a key role in approving certain transactions; appointing and re-appointing Directors; and appointing and re-appointing auditors. A key difference between Members and shareholders in a normal firm, however, is that Members have no financial stake in the performance of the firm. This may mean that they lack adequate incentives to monitor management as there is no external threat of takeover and they have no direct interest in the performance of the company. However, the company regards this relationship between Glas Cymru and its Members as a strength, as it means that Members can concentrate on longer term issues rather than on share prices and dividends.

Members are interested members of the public with no particular stake in the water sector. When Glas Cymru was first formed, there was a large degree of public goodwill towards its establishment and therefore recruiting Members was relatively easy. However, ten years later, appointing new Members has been reported as a “challenge”, although from December 2010 a full complement of 82 Members have now been appointed.

Network Rail’s Board is also accountable to its Members, but in this case the Members include stakeholders, such as the Train Operating Companies, as well as members of the public. Glas Cymru regards its entirely non-stakeholder membership as a strength because its Members can have a detached view of the interests of the business and its customers.

6.3 Governance of NBN Co Ltd

The governance arrangements for GBEs in Australia were set out by the government in 1997⁴⁶. In considering the governance of NBN Co. a number of arrangements set out in this document are worth highlighting. These are set out below with the relevant clause in brackets.

- The directors of a GBE shall ensure that GBEs are managed in the best interests of the shareholders (1.3(d)(ii)).
- A principal objective of each GBE is that it adds to shareholder value and so is required to:
 - Operate at minimum cost
 - Price efficiently, taking into account economic forces, subject to price conditions imposed by the government
 - Earn at least a commercial return, covering the full cost of the resources employed, including the cost of capital (1.6)
- The Government may impose quality standards (1.8(a))
- Shareholder Ministers will ensure that the objectives of the GBE include any requirements to meet explicitly stated social and economic objectives (1.8(b))
- All GBEs are required to add to shareholder value with a view to at least meeting a financial target agreed by the Shareholder Ministers (4.13)
- Setting an appropriate financial target aims to replicate the discipline that the threat of takeover would exert over a private sector firm (4.14)
- For trading GBEs the financial target is the Weighted Average Cost of Capital (WACC).

NBN Co. is governed by a Board of Directors consisting of eight directors: seven non-executive and one executive, with a non-executive Director in the role of Chairman. The Board is responsible for corporate governance and for the strategic direction of NBN Co. The Board also ensures NBN Co. meets its accountability obligations to the Government by submitting Corporate Plans and Annual Reports, ensuring compliance with Government policies.

⁴⁶ Dept. of Finance and Deregulation (1997)

6.4 Proposals

In this section we make some proposals for governance of NBN Co. that are designed to complement existing arrangements as set out in the 1997 document and in the legislation creating NBN Co. as a GBE.

The existing formal structure of a Board is, in our view, sufficient to ensure adequate oversight of the company. The introduction of an additional layer of oversight, such as the Members of Glas Cymru or Network Rail, would only add distance between Australian citizens, who own NBN Co., and the company. We are also concerned that although Members may be easy to recruit in the early stages of the NBN, once it becomes established, recruiting new Members will be more difficult. Finally, Membership could be subject to a “selection bias”, whereby Members are not representative of consumers or citizens.

Nevertheless, it is our view that some further protection may be needed to ensure that the company operates in a commercially driven, rather than a politically driven, manner even allowing for the legitimate interests of the government in advancing the interests of citizens as investors in NBN Co. We believe that this protection can be provided by ensuring adequate transparency of dealing between Shareholder Ministers and the company. We make three specific proposals.

i) Register of Contacts.

We propose that all contacts between Shareholder Ministers and the company should be made public in a quarterly report. The Freedom of Information Act would already allow individuals to request such information on an ad-hoc basis. However, our proposal is that Shareholder Ministers should publish this information regularly without being requested to do so.

Such transparency would, in our view, deter Ministers from seeking unduly to influence the company in their own narrow political interests.

ii) Consultation on Material Changes to the Corporate Plan.

NBN Co. is required to produce a three-year corporate plan every year, setting out its investment and financing programs and its price control and quality control. We propose that where material

changes to the Corporate Plan are proposed, in particular where such material changes are requested by the Shareholder Ministers, then these changes should be subject to a public consultation and the Minister should be required to explain publicly why he or she has requested these changes. The proposed changes should also be subject to an Impact Assessment showing how they will affect NBN Co.'s achievement of its objectives.

Our reasoning behind this proposal is that such a requirement would make it difficult for Shareholder Ministers to exercise undue-control over the operations of NBN Co in their own short-term political interests. Whilst most Ministers would probably act in an entirely honourable manner, the possibility of a Minister acting to try and favour a particular constituency cannot be excluded. Consultation and justification would probably deter such behaviour.

iii) Publication of Board Minutes

As a GBE and a *de jure* monopoly, we propose that Minutes of NBN Co. Board meetings should be published at a suitable interval after the event⁴⁷. Some matters should be redacted, for example any discussion concerning personnel or individual customers.

Once again, the objective of this proposal is to ensure that undue influence is not being brought to bear on the Board to act in a manner that may be against the broad consumer and public interest, whilst in the narrow interest of stakeholders.

As NBN Co. is a state owned monopoly, we do not believe there can be any argument that says such information needs to remain confidential for commercial reasons.

⁴⁷ In the UK, the Bank of England minutes of monthly meetings of the Monetary Policy Committee are published after a two week interval.



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APPENDICES

Annex A: Governance Arrangements: Selected UK Examples

Organisation	Network Rail	Glas Cymru	British Broadcasting Corporation
Purpose	<p>The purpose is to secure:</p> <ul style="list-style-type: none"> (a) the operation and maintenance of the network; (b) the renewal and replacement of the network; and (c) the improvement, enhancement and development of the network, <p>in each case in accordance with best practice and in a timely, efficient and economical manner so as to satisfy the reasonable requirements of persons providing services relating to railways and funders, including potential providers or potential funders, in respect of:</p> <ul style="list-style-type: none"> (i) the quality and capability of the network; and (ii) the facilitation of railway service performance in respect of services for the carriage of passengers and goods by railway operating on the network. <p>(Licence, Part III, Para 1.1)</p>	<p>Glas Cymru is a single purpose company formed to own, finance and manage Welsh Water. Welsh Water's assets and capital investment are financed by bonds and retained financial surpluses. The Glas Cymru business model aims to reduce Welsh Water's asset financing cost, the water industry's single biggest cost.</p>	<p>The BBC exists "to serve the public interest" and its main object is "the promotion of its Public Purposes", which are:</p> <ul style="list-style-type: none"> (a) sustaining citizenship and civil society; (b) promoting education and learning; (c) stimulating creativity and cultural excellence; (d) representing the UK, its nations, regions and communities; (e) bringing the UK to the world and the world to the UK; (f) in promoting its other purposes, helping to deliver to the public the benefit of emerging communications technologies and services and, in addition, taking a leading role in the switchover to digital television. <p>The BBC's mission to "inform, educate and entertain" (BBC Charter Paras 3, 4 & 5)</p>

Status	Privately owned by Train Operating Companies (its customers). Debt financed.	Private company – debt financed	Public Corporation
Regulator	Office of Rail Regulation (ORR)	The Water Services Regulation Authority (Ofwat)	BBC Trust and Office of Communications (Ofcom)
Duties of Regulator	<p>“Our principal economic regulatory functions are set out in the Railways Act 1993 (the RA 1993).</p> <p>In short, they are:</p> <ul style="list-style-type: none"> regulate Network Rail's stewardship of the national rail network licence operators of railway assets approve track, station, light maintenance depot access <p>We also have <i>concurrent jurisdiction</i> with the Office of Fair Trading to investigate potential breaches of the Competition Act 1998 in relation to the railways.”</p>	<p>(2A) The Secretary of State or, as the case may be, the Authority shall exercise and perform the powers and duties mentioned in subsection (1) above in the manner which he or it considers is best calculate</p> <p>(a) to further the consumer objective;</p> <p>(b) to secure that the functions of a water undertaker and of a sewerage undertaker are properly carried out as respects every area of England and Wales;</p> <p>(c) to secure that companies holding appointments under Chapter 1 of Part 2 of this Act as relevant undertakers are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of those functions; and</p> <p>(d) to secure that the activities authorised by the licence of a licensed water supplier and any statutory functions imposed on it in consequence of the licence are properly carried out.</p>	<p>The principal duty of Ofcom is “(a) to further the interests of citizens in relation to communications matters; and (b) to further the interests of consumers in relevant markets, where appropriate by promoting competition.” (Communications Act 2003, Section 3(1))</p> <p>Specifically in relation to the BBC, it is the “function of OFCOM [...] to regulate the provision of the BBC’s services and the carrying on by the BBC of other activities for purposes connected with the provision of those services.” (ibid Section 198(1))</p>

		<p>(2B) The consumer objective mentioned in subsection (2A)(a) above is to protect the interests of consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the provision of water and sewerage services.</p> <p>(Water Act 2003, Section 39, 2(A) and 2(B))</p>	
Governance	<p>Network Rail is accountable to its “Members” who act like shareholders of a Public Limited Company (PLC). Members are drawn from the TOCs and from the public. The Department for Transport (DfT) is also a member with special rights. Public Members must consist of 50 – 80% of Members.</p> <p>http://www.networkrail.co.uk/aspx/721.aspx</p>	<p>Glas Cymru is accountable to 82 Members. “A key role of the Members of Glas Cymru is to ensure that the business remains focused on its primary purpose of providing high quality water and sewerage services to the communities served by Welsh Water. In doing this, Members carry out an important corporate governance role, and for this reason membership is personal and Members are not appointed to represent any particular group or stakeholder interest. Members do not receive a fee. We welcome applications from a diverse and full range of backgrounds in terms of gender, ethnicity, age, sexual orientation and differently abled.</p>	<p>The main roles of the Trust are in setting the overall strategic direction of the BBC, including its priorities, and in exercising a general oversight of the work of the Executive Board. The Trust will perform these roles in the public interest, particularly the interest of licence fee payers. (BBC Charter, Section 7)</p> <p>The independence of the BBC is guaranteed by its Charter: “The BBC shall be independent in all matters concerning the content of its output, the times and manner in which this is supplied, and in the management of its affairs.” (Section 6)</p>



		<p>Members are appointed by the Board under Glas Cymru's published Membership Policy on the advice of an independent membership selection panel.</p> <p>(http://www.dwrcymru.com/English/Company/Glascymru/Membership/index.asp)</p>	
Role of Government	<p>"to provide strategic direction and to procure rail services and projects that only it can specify." Day-to-day delivery rests with the industry.</p>	<p>Water is the responsibility of the devolved Welsh Assembly Government (WAG), which ensures that Glas Cymru complies with EU and UK legislation by making regulations and issuing statutory guidance. The Assembly also issues guidance to the Director General of Ofwat on the drinking water and environmental quality programmes to be taken into account when setting price limits.</p>	<p>The government sets the Licence Fee that must be paid by all viewers, appoints Trustees and periodically renews the Charter.</p>

Annex B: Governance Arrangements: Selected International Examples

Organisation	Transpower (NZ)	Opennet (Singapore)	NBN Co
Purpose	Ownership and operation of the national electricity grid	To build, manage and operate an open fibre network to deliver the “Next Generation National Broadband Network” (Next Gen NBN)	<p>The Constitution of NBN Co states:</p> <p>“the Company's objects are to roll out, operate and maintain a national wholesale broadband network while working closely with the Commonwealth during the implementation study in order to facilitate the implementation of Australian Government broadband policy and regulation.”</p> <p>More specifically:</p> <p>“The Government expects that NBN Co will design, build and operate a new NBN to provide access to high speed broadband to all Australian premises. The Government’s objective for NBN Co is to connect 93 per cent of Australian homes, schools and businesses with fibre-to-the-premises technology providing broadband speeds of up to 100 megabits per second, with</p>



			<p>a minimum fibre coverage obligation of 90 per cent of Australian premises. All remaining premises will be served by a combination of next-generation fixed wireless and satellite technologies providing peak speeds of at least 12 megabits per second.”</p> <p>(December 2010 Government Statement of Expectations: http://www.dbcde.gov.au/_data/assets/pdf_file/0003/132069/Statement_of_Expectations.pdf)</p> <p>NBN Co’s purposes are not set out in primary legislation,. The National Broadband Network Companies Act 2011 does, however, limit the scope of NBN Co’s activities. In particular, NBN Co may only supply to carriers and service providers (s.9; ss10-16 contain limited</p>
Status	State Owned Enterprise	Private Consortium	Government Business Enterprise. It is wholly-owned by the Commonwealth, which is represented in NBN Co by two “Shareholder Ministers”

Regulator	Commerce Commission	Infocomm Development Authority (IDA)	Australian Competition and Consumer Commission (ACCC)
Duties of Regulator	<p>“... to promote the long-term benefit of consumers [...] by promoting outcomes that are consistent with outcomes produced in competitive markets such that suppliers of regulated goods or services—</p> <p>“(a) have incentives to innovate and to invest, including in replacement, upgraded, and new assets; and</p> <p>“(b) have incentives to improve efficiency and provide services at a quality that reflects consumer demands; and</p> <p>“(c) share with consumers the benefits of efficiency gains in the supply of the regulated goods or services, including through lower prices; and</p> <p>“(d) are limited in their ability to extract excessive profits.</p> <p>(Commerce Amendment Act 2008. Part 4, Section 52A)</p>	<p>The IDA has 21 statutory objectives, of which the two most relevant are:</p> <p>(a) to promote the efficiency and international competitiveness of the information and communications industry in Singapore;</p> <p>(b) to ensure that telecommunication services are reasonably accessible to all people in Singapore, and are supplied as efficiently and economically as practicable and at performance standards that reasonably meet the social, industrial and commercial needs of Singapore.</p> <p>(INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY OF SINGAPORE ACT 1999 (CHAPTER 137A)</p>	<p>The ACCC is established under the Competition and Consumer Act 2010 (previously, the Trade Practices Act 1974). A core function of the ACCC is to enforce this 2010 Act.</p> <p>Under s2 of this Act, “The object of this Act is to enhance the welfare of Australians through the promotion of competition and fair trading and provision for consumer protection”.</p> <p>Also, the National Broadband Network Companies Act 2011 (“NBN Companies Act”) and the Telecommunications Legislation Amendment (National Broadband Network Measures—Access Arrangements) Act 2011 (“NBN Access Act”) set out a range of circumstances in which the involvement/approval of the ACCC is required.</p>
Governance	Transpower is governed by a Board of Directors appointed by the shareholder ministers. The Board’s duties are set out in	Opennet is governed by a Board of Directors appointed by the consortium members.	NBN Co is accountable to its two Shareholder Ministers.

	<p>its Charter. The charter sets out, inter alia, the powers and authority of the Board.</p> <p>“The Board is responsible for the performance of Transpower and guiding and monitoring Transpower on behalf of the Shareholding Ministers to whom they are accountable.”</p> <p>Ministers do not sit on the Board.</p>		<p>NBN Co also has various reporting requirements to underpin its governance. In particular, it is required to provide its Shareholder Ministers with annual Corporate Plans; also, it is required to issue annual Statements of Corporate Intent, which are tabled in Parliament.</p>
Role of Government	Shareholder.	<p>The government is the contractor. Opennet won the contract to develop the Next Gen NBN following a competitive bidding process.</p>	<p>NBN Co is subject to certain government controls as a Government Business Enterprise (GBE). As noted on an Australian Government website⁴⁸:</p> <p>“The Australian Government’s relationship to its GBEs is similar to the relationship between a holding company and its subsidiaries, features of which include:</p> <ul style="list-style-type: none"> • a strong interest in the performance and financial returns of the GBE; • reporting and accountability

⁴⁸ <http://www2.finance.gov.au/property/gbe/index.html>



			<p>arrangements that facilitate active oversight by the shareholder;</p> <ul style="list-style-type: none">• action by the shareholder in relation to the strategic direction of its GBEs where it prefers a different direction from the one proposed;• management autonomy balanced with regular reporting of performance to shareholders; and• boards that are accountable to shareholders for GBE performance, and shareholders that are accountable to Parliament and the public”.
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Annex C: SPC Network

Strategy and Policy Consultants Network (SPC Network) undertakes Strategic Policy Development for clients by combining in-depth knowledge of the telecoms sector with experience and the analytical rigour that come from advanced academic training. Our goal is to undertake rigorous analysis to offer exceptional advice.

SPC Network was established in 2003 and has since worked for over 25 clients all round the world. The scope of our work, and the clients we have worked for are best shown through examples. The table below shows some typical issues we have been asked to address, example projects and the some clients for whom we have worked.

Issue	Sample Projects	Clients
How to ensure firms with market power cannot harm competition and consumers	Benchmark regulation and develop regulatory strategy for market reviews and draft responses	ECTA, UKCTA, Zain, BT, Virgin Media, Cable & Wireless, Easynet
How to deter specific anti-competitive behaviour by dominant firms	Research and write policy “White Papers” on specific competition problems	BOT (Margin Squeeze) BTGS (Discrimination) Optus (Discrimination)
How to promote investment in regulated sectors	Write policy paper based on economic assessments	ECTA, Virgin Media, Arqiva
How do consumers help markets work effectively?	Consider consumer behaviour in light of policy changes	Virgin Media Ofcom
How to regulate competition in small economies	Draft papers on general and specific issues of smaller countries	Cable & Wireless Government of Bermuda

Our core consultancy team, each educated to at least MA level and having over twenty years' experience in business, have worked for a wide variety of clients on many different projects.

SPC Network connects with specialist individual consultants and firms to complement the core team so that we can deliver best value to our clients. Our Associates bring a wealth of experience and knowledge covering:

- Cost Modelling
- Regulatory Accounting
- Applied econometrics
- Competition Law
- Technology
- Executive Interviewing

"SPC Network produced a cogently argued and well informed analysis of the background to the adoption of Equivalence and Functional Separation in the UK and the circumstances in which they would be appropriate elsewhere. SPC Network's paper makes a significant and valuable contribution to the debate about these remedies and we are very pleased with the work they did."

BT Global Services

"SPC Network's model of rural broadband rigorously analysed the comparative costs of the three access methods. We have shown the model to various independent parties who have been as impressed as we were. We are therefore very happy with the results of the project"

Arqiva

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