Australian Government
Department of Communications

Bureau of Communications Research

NBN non-commercial services funding options

Consultation paper

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Contents

Useful terms and abbreviations

ACCC	Australian Competition and Consumer Commission
Access network	The network or technology used to deliver broadband to end users
ACMA	Australian Communications and Media Authority
BCR	Bureau of Communications Research
BTRE	Bureau of Transport and Regional Economics
CSO	Customer Service Obligation
EBITDA	Abbreviation of the phrase *'earnings before interest, taxes, depreciation, and amortisation'*, is an accounting measure calculated using a company's net earnings, before interest expenses, taxes, depreciation and amortisation are subtracted
EU	European Union
FY	Financial year
HFC	Hybrid Fibre Coaxial
ICRA	Initial Cost Recovery Account
ICT	Information Communication Technology
IP	Internet protocol
LEO	Low Earth Orbit
Mbps	Megabit per second
MTM	Multi-Technology Mix
NBN	National Broadband Network
NBN Co	NBN Co Limited ACN 136 533 741
NPV	Net Present Value
NRS	National Relay Service
OECD	Organisation for Economic and Co-operation and Development
Ofcom	Office of Communications (UK)
OSS/BSS	Operational and Business Support Systems
Policy Paper	Refers to the *Telecommunications Regulatory and Structural Reform* policy paper released by the Australian Government in December 2014
PPP	Public-private partnerships
PSTN	Public Switching Telephone Network
RSP	Retail Service Provider. A provider of retail broadband services to end users
TIL	Telecommunications Industry Levy (Australia), imposed under the *Telecommunications (Industry Levy) Act 2012*
TUSMA	Telecommunications Universal Service Management Agency
TUSMA Act	Telecommunications *Universal Service Management Agency Act 2012*
SAU	Special Access Undertaking
UNWP	Uniform National Wholesale Pricing
USF	Universal service fund
USO	Universal service obligation
Vertigan Review	Collectively the *Statutory Review under Section 152EOA* of the *Consumer and Competition Act 2010* (July 2014), *NBN Cost-Benefit Analysis* (August 2014) and *NBN Market and Regulatory Report* (October 2014)
VoIP	Voice over internet protocol

1. Introduction

The Bureau of Communications Research (**BCR**) is an independent, economic and statistical research unit within the Department of Communications. The Australian Government has asked the BCR to consider economically sound ways to fund the rollout of the National Broadband Network (**NBN**) to regional Australia. Specifically, the BCR will assess the non-commercial losses expected from building and operating satellite and fixed wireless services and consider options for funding these losses via contributions from owners of high-speed broadband access networks.

Under current arrangements, NBN Co funds non-commercial services through an internal cross-subsidy. This approach gives rise to issues of transparency, sustainability and contestability.

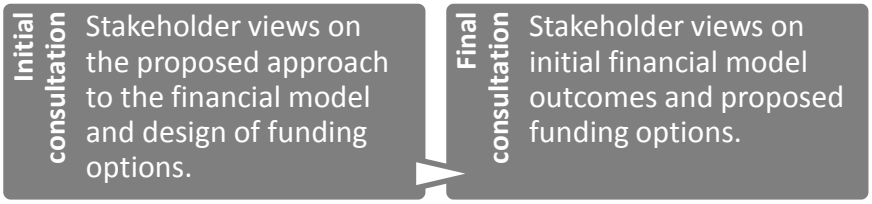
Put simply, an NBN non-commercial service is a service delivered by NBN Co Limited (**NBN Co**)[1] where costs exceed revenues over time. NBN non-commercial services occur as a result of NBN Co's requirement to provide high-speed broadband to all Australian premises at affordable prices, independent of the cost of provision in particular areas. In conjunction with market conditions, this requirement means that NBN Co must fund the deployment, activation and maintenance of wholesale broadband services that in some areas of Australia, will not generate sufficient revenue to cover costs.

The BCR is seeking input from the telecommunications industry and all other interested stakeholders, on the approach used to:

1. quantify the losses from NBN non-commercial services, and
2. develop transparent funding arrangements that support competitive market outcomes.

This consultation paper is the first of a two-part consultation process. The BCR will conduct a further consultation process on its draft conclusions in the third quarter of 2015.

Figure 1. Consultation process



This paper is for consultation purposes only and does not represent Government policy.

Further information on the BCR consultation process can be found on page 33 of this consultation paper, including instructions on how to make a submission.

1.1 Background

As part of its NBN reform agenda, the Government commissioned a series of reviews which examined economic and social costs and benefits of the availability of high-speed broadband using different technologies. The reviews also considered the role of Government support and a number of other

[1] In April 2015, NBN Co announced a re-brand from NBN Co to nbn™. This consultation paper uses the term 'NBN Co' for the purpose of company description.

longer-term industry matters, including to what extent NBN Co should compete with other network operators.

In December 2013, the Government appointed a panel of experts chaired by Dr Michael Vertigan AC to undertake an Independent Cost-Benefit Analysis of the NBN and Review of Regulation. The panel's work resulted in the publication of the following volumes: *Statutory Review under Section 152EOA of the Consumer and Competition Act 2010* in July 2014, *NBN Cost-Benefit Analysis* in August 2014, and *NBN Market and Regulatory Report* in October 2014 (**Vertigan Review**).

In considering existing funding arrangements for NBN non-commercial services, the Vertigan Review identified substantial concerns with the use of internal cross-subsidies by NBN Co. The panel found that cross-subsidy arrangements do not support transparency or contestability for service delivery in regional areas, and subsidy sources are likely to be eroded over time by entrants attracted to compete with NBN Co in areas where NBN Co prices are above the costs of an efficient competitor.

On 11 December 2014, the Government released the *Telecommunications Regulatory and Structural Reform* policy paper (**Policy Paper**) which included a response to the recommendations of the NBN Cost-Benefit Analysis and NBN Market and Regulatory Report.

In relation to cross-subsidies, the Government's Policy Paper states:

> *The cross-subsidies which are currently embedded in NBN Co's wholesale prices will be replaced by transparent funding provided via contributions sourced from owners of high-speed broadband access networks that target residential and small business customers – i.e. the NBN and networks in commercially viable areas that are comparable to the NBN. There will be no additional costs to consumers relative to current NBN pricing – an opaque part of the cost of the NBN will be made explicit. The Government will provide the ACCC with sufficient powers to monitor the introduction of these arrangements.*[2]

New regulatory framework

The Government is seeking to establish a more competitive regulatory framework and to make NBN Co more 'competition ready'. Following a transition period, a new regulatory framework will be introduced from 1 January 2017. Under the new framework:

- Structural separation will remain the default requirement for new high-speed fixed line broadband networks. The Australian Competition and Consumer Commission (**ACCC**) will be given the power to authorise functional separation of such networks, and impose conditions as part of that authorisation, where it judges this to be in the long-term interests of consumers
- 'Grandfathering' arrangements will apply to networks that were in place prior to 2011, and any networks rolled out under the interim carrier licence condition, but not to future extensions of those networks
- Competitively neutral arrangements will be put in place for the funding of the NBN's non-commercial fixed wireless and satellite services, and
- Legislation will be introduced requiring NBN Co to operate as the broadband infrastructure provider of last resort. The legislation will provide scope for non-NBN carriers to be so designated in circumstances where they take on or are better able to fulfil this role.

[2] Department of Communications, *Telecommunications Regulatory and Structural Regulatory and Structural Reform*, (December 2014) p. 6.

As part of the Policy Paper, the Government has:

> *…[tasked] the Bureau of Communications Research in the Department of Communications with providing advice on the amount of non-commercial service funding required to provide for NBN satellite and fixed wireless services. The intention is that new funding arrangements will be put in place that are competitively neutral across telecommunications carriers. The Government will implement an industry contribution and explicit funding mechanism for NBN satellite and fixed wireless services (expected implementation date 1 January 2017).*[3]

The BCR will develop a report which addresses the Terms of Reference included at Attachment A. The report will be based on BCR research, stakeholder consultations, financial modelling and economic analysis with input from external expert advisors and peer review arrangements. The final report will be provided to Government by 30 September 2015.

Consistent with the Terms of Reference, the BCR will develop a version of the report which is suitable for public release.

1.2 Purpose of consultation paper

The BCR is seeking submissions from stakeholders, including responses to key questions in this paper, which will assist it to assess the losses attributable to NBN Co's non-commercial services and develop advice to Government regarding funding arrangements.

Specifically, this consultation paper sets out key concepts and issues relevant to NBN non-commercial services and seeks comments on:

- cost measurement concepts and funding design principles
- an appropriate approach to developing a financial model to quantify NBN non-commercial service losses
- the proposed approach to designing funding options including implementation issues, and
- regulatory issues.

Questions are included throughout the consultation paper and summarised at Attachment B.

2. Current arrangements

Successive Governments have imposed requirements on NBN Co to deliver high-speed broadband to all Australian premises at affordable prices.

To meet these requirements, NBN Co has to date developed its pricing on a Uniform National Wholesale Pricing (**UNWP**) basis where equivalent broadband services have the same wholesale price, regardless of geographic location or the NBN technology platform used to deliver them.

While this approach supports the underlying objective of consistent retail pricing for equivalent services, it constrains the revenue that NBN Co can recover through its wholesale pricing.

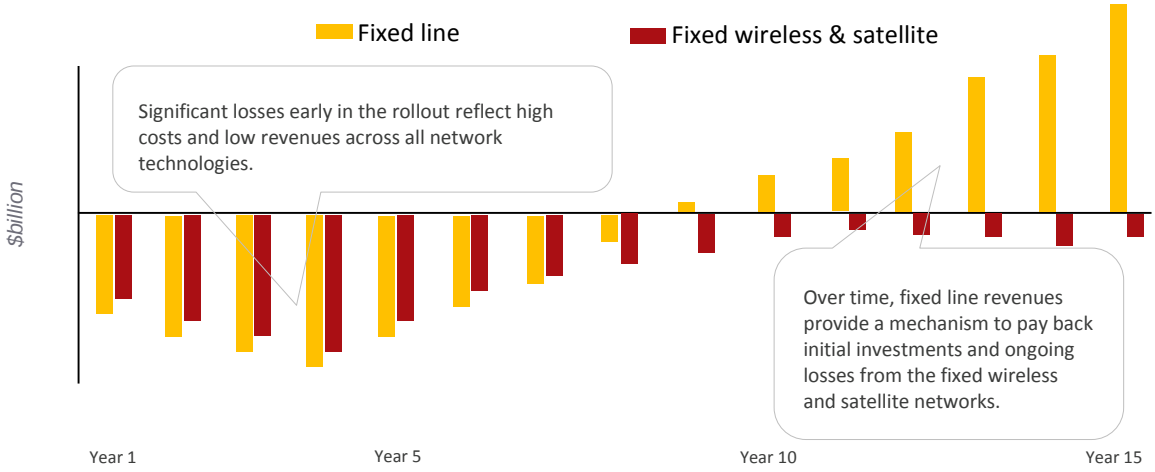
Over time, as revenues from commercial services increase, this would result in a cross-subsidy between technology platforms. In effect, revenues from fixed line services are expected to exceed the

[3] Department of Communications, *Telecommunications Regulatory and Structural Regulatory and Structural Reform*, (December 2014) p 12.

costs of delivering them (allowing for an appropriate cost of capital), while revenues from fixed wireless and satellite services are expected to fall short of the cost of these services (independent of the UNWP, there would be willingness to pay constraints on commercial provision of these services).

On a whole-of-network basis, the returns generated from the 'commercial' fixed line networks cross-subsidise (i.e. contribute to paying for) the losses associated with the 'non-commercial' fixed wireless and satellite services over time.

Figure 2. Conceptual illustration of annual cash flows by NBN access network type



(Note: Chart is illustrative and does not reflect actual figures)

Simple illustration of an NBN non-commercial service

Assuming that the cost to pass and connect an NBN satellite service is $8,500 and the average revenue generated by that service per month is $40, then it would take approximately 213 months, or more than 17 years for revenues to cover the nominal cost (ignoring ongoing operating costs and not discounting future costs and revenues) – longer that the 15 year asset life of the satellite itself.

2.1 NBN rollout

Following the transition to a Multi-Technology Mix (**MTM**) solution, the NBN is expected to have three distinct phases:

- **cash flow negative build phase** (approximately the first 10 years), with negative cash flows arising from low revenues and high capital and operating costs
- **cash flow positive pay-back phase**, where cash flow forecasts become positive and start to pay back debt and equity, and
- **established phase**, where debt and equity is largely repaid and operations generate substantial free cash flows.

This has implications for NBN non-commercial service funding arrangements as there are different loss profiles across the different phases.

2.2 Indicative losses for NBN fixed wireless and satellite services

The NBN Co Fixed Wireless and Satellite Review released in May 2014 provides an indication of NBN fixed wireless and satellite operating losses during the cash flow negative build phase to Financial Year (**FY**) 2021. The table below shows a cumulative negative operating cash flow of up to -$5.3 billion between FY2011 and FY2021. (These estimates were made on the basis of a shift the MTM deployment, but do not account for financial and network planning undertaken by NBN Co since the release of this report).

Table 1: Estimated annual non-fixed line costs for FY2011 to FY2021

Non-fixed line footprint cumulative FY11-21	Estimated Financial outcomes
Revenue	$0.9 to 1.0 billion
Operating expenditure	$1.5 billion
Capital expenditure	$4.5 to $4.7 billion
Operating cash flows	Up to -$5.3 billion

(Source: NBN Co Limited, Fixed Wireless and Satellite Review (Scenario 2), May 2014, p. 13)

Estimates were also provided for annual non-fixed line costs at a steady state of operations (assumed to be in FY2028).

Table 2: Estimated annual non-fixed line costs for FY2028

Non-fixed line footprint steady state FY28	Estimated Financial outcomes
Revenue	$240 to $310 million
Operating expenditure	$260 million
Capital expenditure	$280 to $290 million
Operating cash flows	-$230 to -$310 million

(Source: NBN Co Limited, Fixed Wireless and Satellite Review, (Scenario 2), May 2014, p. 13. Operating cash flows are inferred)

2.3 Transition to price caps and cost recovery

As part of its Policy Paper, the Government has formally requested that NBN Co transition from UNWP to price caps and advise industry of implementation arrangements over the course of 2016, including any necessary changes to its Special Access Undertaking (**SAU**). The Government noted:

> *Price caps will not increase NBN wholesale prices in either urban or regional areas above the current levels approved by the ACCC in the SAU. There will be scope for reduced wholesale prices in some markets, where this is necessary for NBN Co to respond to more competitive arrangements.*[4]

This does not change the fundamental proposal that, without a separate funding mechanism, cross-subsidisation from commercial to non-commercial services will be required. While NBN Co may be able to increase its revenue in fixed line areas by selectively pricing below the cap to meet competition, any increases are not expected to be significant. Further, price cap flexibility is unlikely to boost revenues in non-commercial areas as pricing is in general already well below costs - NBN Co will still be

[4] Department of Communications, Telecommunications Regulatory and Structural Regulatory and Structural Reform, (December 2014) p. 4-5.

constrained regarding the extent to which it can recover the cost of non-commercial services (by both the price cap ceiling and customer willingness to pay).

BCR's preliminary view is price cap arrangements are not expected to affect the regulatory arrangements provided for in the SAU which allow recovery of efficient costs. The SAU has been designed to allow NBN Co to accumulate and capitalise initial losses and provides the opportunity to recover those losses over the term of the SAU, including a regulated rate of return on its investment. This key principle is not affected by the price cap transition.

2.4 The need for change

The Vertigan Review found that cross-subsidy arrangements do not support transparent, contestable and sustainable service delivery to high cost regional areas. Furthermore, subsidy sources are likely to be eroded over time by entrants attracted to compete with NBN Co in areas where NBN Co prices are above the costs of an efficient competitor. The Vertigan Review noted:

> *…entrenching an opaque cross-subsidy, they provide no transparency as to the extent of the transfers and impose no benchmarks as to whether future claimed transfers are reasonable compared with the actual costs of supply and revenues received. There is no potential for contestability of any subsidy, which reduces the incentive to seek efficiencies in service delivery in high-cost areas. And even under the current provisions in Parts 7 and 8 of the Telecommunications Act, the subsidy sources are likely to be eroded over time by entrants attracted to lower cost urban areas under the 1 kilometer exemption.*[5]

In short, cross-subsidy arrangements are a potential inhibitor in transitioning the Australian wholesale broadband market to a more competitive footing. As noted in the Government's Policy Paper:

> *Elements of the NBN policy adopted by the then-Government required NBN Co to provide very substantial non-commercial services and sought to provide competitive protections to NBN Co in commercially attractive areas so that it could fund non-commercial services with an internal cross-subsidy.*
>
> *This model is unsustainable in the long term and not in the interests of the consumers who ultimately fund the cost of the services under any model, and typically face higher costs where competition is reduced.*[6]

Since the release of the Government's policy paper, there have been a number of ongoing and relevant developments:

- **competition** – new entrants have emerged and are continuing to compete in the provision of high-speed wholesale broadband fixed line services in commercially attractive areas. While this may erode sources of funding for subsidising non-commercial services, increased competition has the potential to drive economic efficiencies, such as downward pressure on price, increased choice and greater innovation.[7]
- **new technologies** – Telstra has announced its '4GX' mobile broadband service with "typical download speeds [of] 2-100 [megabits per second] in 4GX areas". Optus has made similar

[5] Dr Michael Vertigan et al., *Independent Cost-Benefit Analysis of Broadband and Review of Regulation Report*, Department of Communications (August 2014) vol 1, p. 103.
[6] Department of Communications, *Telecommunications Regulatory and Structural Regulatory and Structural Reform*, December 2014) p. 4.

[7] The BCR notes that measures have been put in place by the Government to support competition outcomes. See *New rules to protect customers of new superfast broadband networks* (14 December 2014).

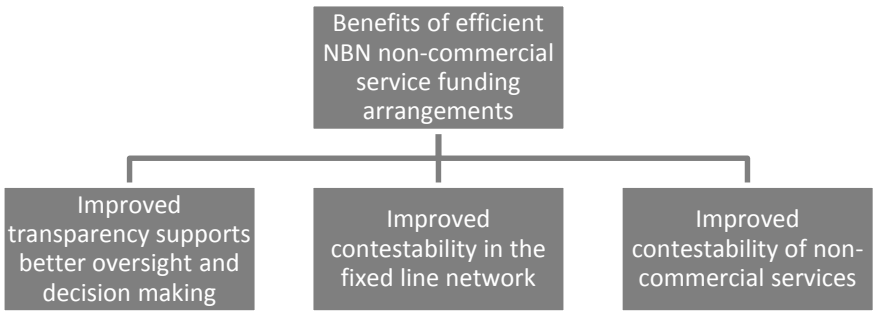
announcements regarding enhanced 4G network performance[8]. While ongoing improvements in 4G network capacity may emerge as a substitute to NBN fixed line services, mobile broadband developments may also provide alternative technology platforms for the delivery of NBN non-commercial services. Recent investments by Google, the Virgin Group and Qualcomm into high-speed internet delivery via Low Earth Orbit (**LEO**) satellite constellations may also see alternative platforms for providing NBN services in rural and remote areas in the foreseeable future[9] (although a number of technical and commercial challenges need to be overcome and significant further investment will be required in order to launch such platforms).

These developments highlight the need to establish transparent funding arrangements which support the delivery of high-speed broadband services in rural and remote Australia. Beyond the NBN rollout, funding arrangements need to be future looking and flexible, allowing for changing social, technological and economic circumstances.

Ultimately, the development and implementation of improved NBN non-commercial service funding arrangements will provide the following benefits:

- **improved transparency** – transparent funding arrangements will provide a better understanding of the costs associated with providing NBN non-commercial services. This will support monitoring and oversight and future Government decision making
- **improved contestability of fixed line service areas** – current cross-subsidy arrangements do not support competition on a level playing field basis. This problem would be reduced by introducing funding arrangements which spread the burden of funding NBN non-commercial services with eligible owners of high-speed broadband access networks, and
- **improved contestability of non-commercial areas** – current arrangements do not allow for the benefits of contestability in delivering non-commercial services. Over time, new funding arrangements could support the introduction of contestability in non-commercial areas.

Figure 3. Benefits of improved NBN non-commercial service funding arrangements



[8] See, https://www.telstra.com.au/mobile-phones/coverage-networks/telstra-4gx, accessed 22 April 2015 and http://www.optus.com.au/shop/mobile/network/4g, accessed 24 April 2015.
[9] See, Issie Lapowsky, 'SpaceX Lands $1 Billion From Google and Fidelity' on wired.com (20 January 2015); Peter B Selding, 'Virgin, Qualcomm Invest in OneWeb Satellite Internet Venture' on spacenew.com (15 January 2015).

3. Cost measurement issues

There following measurement issues require careful examination in developing NBN non-commercial service funding arrangements:

- appropriate approach to costing
- commerciality of service provision at a granular network level, and
- timeframes for assessing NBN non-commercial service losses.

3.1 Appropriate approach to costing

There are a number of costing approaches. Definitions used in regulatory contexts include:

- **stand-alone costs** – these are the costs of providing service to a particular group of customers only.
- **marginal costs** – these are the costs of providing service to a group of customers while also servicing other customers. Again, capital costs are included but only to the extent that these costs specifically support the services in question. The key difference to stand-alone costs is that it would not include common costs. In the case of NBN Co, this includes costs related to fixed corporate overheads, operational and business support systems (**OSS/BSS**) and the transit network. These costs would still be incurred if non-commercial services were not provided.

Alternatively, costs could be measured on a more commercially focused basis, where costs of a particular class of service (such as NBN fixed wireless and satellite services) comprise direct operational and capital costs which relate to this class of service, plus a share of common costs. The allocation of common costs would be determined on an engineering, activity based cost basis or another cost allocation rule.

The BCR considers that measuring costs on a more commercially focused basis is appropriate for assessing NBN non-commercial services. Specifically, the BCR supports an approach where operational and capital expenditures, and an allocated share of common costs, are aggregated over time to a net present value (**NPV**).

Question 1 *Is measuring NBN satellite and fixed wireless service costs on a commercially focused basis appropriate?*

3.2 Commerciality of service provision at a granular network level

Over the course of the NBN rollout, it is possible that some fixed wireless services may be commercially viable where they are deployed in in areas where deployment costs are low and/or revenue opportunities are relatively high. For example, the introduction of higher speed fixed wireless services, such as services providing peak wholesale download speeds of between 25 to 50 megabits per second (**Mbps**), may improve fixed wireless take up and commerciality in some localities.[10]

[10] NBN Co media release, *NBN Co pilot to boost broadband speeds for the bush*, 20 April 2015

Historically, access network costs have been assessed at a granular network level when developing universal service funding arrangements in Australia. For example, the Bureau of Transport and Communications Economics (**BTCE**) assessed costs on an exchange area basis when considering Universal Service Obligation (**USO**) cost modelling in the late 1980s.[11]

Where possible, the BCR will seek to understand the commerciality of fixed wireless services on a location-specific network cluster basis. Network clusters might be based for example on Wireless Serving Areas (**WSA**).[12] If commerciality were assessed purely at the national level there would still be an implicit cross-subsidy between low-cost and high-cost fixed wireless areas. The use of granular network analysis will support better consideration of non-commerciality. However, the BCR notes this approach is dependent on the availability of NBN Co data at a high level of geographic granularity.

For the NBN Co long term satellite service, substantial costs are involved in the construction and launch of the satellites themselves. This does not practically support a granular assessment of commerciality, as these costs are not relative to a particular network cluster. The BCR intends to assess the commerciality of the NBN long term satellite service at an aggregate level.

Question 2 *Is it appropriate to consider commerciality on a network 'cluster' basis?*

3.3 Timeframes for assessing NBN non-commercial service losses

Consideration is required regarding the relevant timeframe for examining the cost and revenue projections that underpin NBN non-commercial service losses. In particular, assessing losses over longer time periods would necessitate the consideration of replacement capital expenditure as well as initial capital costs. This is relevant for the NBN long term satellite service where the useful asset life of the satellites is between 15 to 18 years and replacement costs are high.

In assessing the overall commerciality of NBN services, the selection of the time period is a determinant of whether a service will be commercial or not (and the extent of the losses). The NBN Strategic Review estimated that building the NBN using a MTM approach would be complete by calendar year 2020, with eventual recovery of initial NBN costs over a longer period.[13] The SAU allows for a cost recovery period to FY2040.[14]

For social policy analysis, a period of 30 years is commonly used. Commercial operations often consider a shorter payback period (closer to 10-15 years), although long term infrastructure projects may look for a hurdle rate of return over the life of an asset.

The BCR's preliminary view is to model non-commercial losses (i.e. negative cash flows) over the NBN Co business case period to FY2040, as contemplated under the SAU. This allows assessment of the profile of losses over the cash flow negative build phase through to the established phase, including initial sunk costs and replacement capital expenditure.

Alternatives to adopting a FY2040 timeframe include:

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[11] D, Luck, *Future funding of the USO in Australia*, p.238.

[12] NBN Co, *Network Design Rules*, p.28.

[13] NBN Co, *Strategic Review*, p.17.

[14] NBN Co website, *Special Access Undertaking*, accessed on 6 May 2015

- A shorter period (say to FY2022, to match the period of more detailed NBN Co financial forecasts). This would require either:
    - steeper cost recovery over this period to quickly recover the large build costs of the fixed wireless and satellite networks, or
    - a decision to recover only part of the losses over this shorter period (for example 25 or 50 per cent of the losses); and
- A longer period, requiring either:
    - extending NBN Co's long term forecasts beyond FY2040, or
    - including a terminal value that reflects ongoing costs and revenues anticipated beyond FY2040.

As discussed later in the consultation paper, sensitivity analysis will be used to examine issues associated with using different timeframes for assessing NBN non-commercial service losses.

Question 3 *Is FY2040 at an appropriate time period for assessing NBN non-commercial services?*

4. A principles based approach to developing funding options for non-commercial services

The Terms of Reference require the BCR to provide advice on options to replace the current arrangement, where NBN Co funds non-commercial services through an internal cross-subsidy, with direct funding arrangements based on industry contributions.

As a starting point, the BCR considers there is value in identifying overarching principles that can help guide the development of appropriate funding arrangements (noting that in practice it may not be possible to fully address all principles at all times). The following table provides a set of core principles derived from an examination of relevant reports.[15]

[15] See, Luck, D (2007), *Future funding of the telecommunications universal service obligations in Australia*, Record of the Communications Policy & Research Forum 2007, pp. 236-261; Organisation for Economic Cooperation and Development (OECD) (2010), *Universal Service Obligations, A Republication Under A New Title Of The Otherwise Unaltered 2004 OECD Policy Roundtable Paper* on "Non-commercial service obligations and liberalisation", DAF/Comp (2010) 13, OECD, Paris; Steering Committee on National Performance Monitoring of Government Trading Enterprises (SCNPMGTE) (1994), *Community Service Obligations: Some Definitional, Costing and Funding Issues*, the Industry Commission, Canberra; Arnold, R, D *et al*. (1995), *Issues in infrastructure pricing, Bureau of Industry Economics Research Report* Number 69, The Australian Government Publishing Service, Canberra; Harvey, M (1992), *The costs of community service obligations in roads*, Paper presented to the Australian Transport Research Forum, BTCE Conference Paper, Bureau of Transport and Communications Economics, Canberra; Hilmer, FG, M Rayner and G Taperell (1993), *National Competition Policy*, Australian Government Publishing Service, Canberra; Industry Commission (1997), *Community Service Obligations: Policies and Practices of Australian Governments*, Industry Commission Information Paper, Australian Government Publishing Service, Canberra.

Table 3: Principles relevant to NBN non-commercial services

Principle	Description
Transparency	• The design, implementation and costs of a non-commercial obligation should facilitate scrutiny and evaluation. • Transparency allows the Government to monitor a service provider's performance, and cost information supports decisions to improve arrangements as appropriate.
Economic efficiency	• Non-commercial funding models should be assessed by whether they support or constrain productive, allocative or dynamic efficiency. Technology neutrality may be an issue in this regard.
Contestability	• The design of a non-commercial funding arrangements should minimise barriers to entry or other impediments to the process of competition within markets. • The design of non-commercial service funding arrangements should ensure no unfair advantage to any market participants.
Sustainability	• The mechanism used to fund the provision of the non-commercial service should be viable for the anticipated period the non-commercial obligation will be in effect. • The funding mechanism should be secure and reasonable in the face of changing social, technological and economic circumstances.
Equity	• Non-commercial service obligations should consider how any funding arrangement will fall across society. Consideration should be given to equitable outcomes for beneficiaries, and providers and funders, of non-commercial services.

Question 4 *Are the proposed principles relevant and applicable for considering NBN non-commercial service funding arrangements?*

Question 5 *Should the BCR consider additional principles? If so, what are they?*

The application of these principles to NBN non-commercial service funding arrangements gives rise to a number of issues.

4.1 Transparency

A key outcome in addressing the Terms of Reference will be to make transparent:

- the losses associated with the deployment and maintenance of NBN non-commercial services
- who contributes towards the funding of non-commercial services and how much do they contribute, and

- how contributions towards NBN non-commercial services change over time as revenues or industry funding replace Government equity and third party debt.

Clearly defining NBN non-commercial services and quantifying the losses associated with these services will be an important step in developing transparent funding arrangements. Once NBN non-commercial service losses are established, consideration can be given to industry funding arrangements.

Importantly, under current arrangements, the basis of eventual cost recovery of NBN non-commercial services is through NBN Co wholesale pricing – in effect, current arrangements involve industry (and ultimately end user) contributions towards NBN non-commercial services, but do so in a way that does not make clear the extent to which industry contributions are funding these loss-making services.

New arrangements will make clear the method for calculation and the required contribution amount. This should support monitoring and oversight of funding arrangements and outcomes.

The BCR notes that through the cash flow negative build phase and ahead of revenues covering all expenses during the cash flow positive pay-back period, NBN Co's non-commercial services will be funded through a combination of Government investment (i.e. equity) and third party debt.

Funding arrangements should reflect how Government equity and third party debt contribute towards NBN non-commercial services and how this changes over time as NBN Co revenues increase.

The BCR notes that the Government's policy paper requires NBN Co to maintain separate accounts for its satellite, fixed wireless, fibre, Hybrid Fibre Coaxial (**HFC**) and transit networks. This may provide a mechanism to make transparent how sources of funding and NBN Co wholesale revenues are attributed to non-commercial services.

The extent to which NBN non-commercial service funding arrangements allow for transparency of operations and provide visibility of contributions by Government and industry participants will be considered in developing funding options.

Question 6 *To what extent could financial reporting support transparency of the allocation of equity, debt and revenues towards non-commercial services?*

4.2 Economic efficiency

Economic efficiency is a concept that captures an important dimension of social welfare: the effectiveness with which a society utilises its resources. The economic welfare of society is typically maximised when the following three components of economic efficiency are achieved:

- **productive efficiency** - incentives to minimise the costs of production are present
- **allocative efficiency** - economic resources can move freely towards their most highly valued uses, and
- **dynamic efficiency** - incentives to invest and innovate in the future provision of the service are present.

The structure of the NBN non-commercial funding arrangements raises a number of economic efficiency considerations.

Funding arrangements need to ensure that NBN Co has appropriate incentives to minimise costs to achieve productive efficiency. As such, funding arrangement will need to be considered alongside the current incentives for prudent expenditure as considered in the SAU.

Making transparent the subsidies for non-commercial areas can lead to improved allocative efficiency over time. This information can ensure that the inefficiency of delivering services in non-commercial areas can be appropriately considered against the Government's policy objectives. This may support future consideration of future policy settings, including for example high-speed broadband service performance standards or pricing.

Further, the design of funding arrangements should consider allocative efficient distortions arising when prices are not in alignment with relevant costs. Minimising the extent of the misalignment between prices and costs can reduce the extent of allocative inefficiency caused by the funding arrangement.

Funding arrangements which affect industry participants can give rise to issues of economic efficiency. For example, the World Bank Group notes the following regarding the use of levies on telecommunications carriers to fund universal services:

> *…a levy is imposed on all carriers it is likely to be passed through directly to consumers in the form of higher prices for telecommunications services. The higher prices will mean that some consumers who would otherwise have purchased telecommunications services would not enter the market. If the levy is set too high, private investment in telecommunications infrastructure may be discouraged, making the challenge of extending universal service even harder for Governments. These effects, described as 'deadweight losses', ultimately run counter to the purposes of the [non-commercial service fund].*[16]

Careful examination of economic efficiency will be central to assessing the effectiveness of different NBN non-commercial service funding arrangements.

Question 7 *What issues are associated with maximising economic efficiency in developing NBN non-commercial service funding arrangements?*

4.3 Contestability

As part of its NBN reform agenda, the Government is seeking to establish a telecommunications regulatory framework that does not unnecessarily restrict competition at both the retail and infrastructure levels and associated benefits that flow from competition.

Under normal market conditions NBN Co would not typically invest in non-commercial services. For NBN Co, the requirement to provide non-commercial services arises from the Government obligation to deliver high-speed broadband to all Australian premises. This represents a cost burden on NBN Co which other industry participants are not required to meet and puts NBN Co at a commercial disadvantage in fixed line areas relative to competing infrastructure providers.

Putting in place an appropriate funding arrangement allowing for contributions from eligible operators of high-speed broadband networks supports the transition to a pro-competitive high-speed wholesale broadband market. Market participants will be able to compete with NBN Co on a level playing field with NBN Co having capacity (within price cap arrangements) to reduce wholesale pricing in response to competition while still deploying and maintaining NBN non-commercial services.

[16] World Bank Group, *Broadband Strategies Toolkit*, Module 4, Universal Access Strategy and Broadband Development

A funding structure that leads to a level playing field in areas that can be commercially serviced would be more likely to promote all forms of economic efficiency. Competitive tension would force NBN Co to rigorously control costs and constantly consider alternative and better ways of delivering services and push prices towards costs.

A structure that leads to contestability of subsidies for non-commercial areas would also support efficiency outcomes. Again, competitive tension could lead to services being delivered at lower costs and for innovation to occur through better service delivery. Due to the natural monopoly characteristics of many network infrastructure industries (including telecoms networks), it would likely be inefficient to rollout two high-speed broadband networks in non-commercial areas. In these circumstances, contestability in these areas would only promote efficiency if an alternative provider to NBN Co could deliver services in some non-commercial areas at lower cost, with NBN Co then not obliged to provide infrastructure to deliver these services. An example might be using high speed broadband mobile networks instead of NBN Co deploying additional fixed wireless infrastructure.

If alternative providers were permitted to compete with NBN Co for subsidies in non-commercial areas, safeguards may be required to ensure that the recipients of subsidies are financially viable in the longer term. Otherwise, there is a risk that alternative providers will fail, leaving behind islands of incompatible technology which NBN Co may ultimately have to take on or replace, possibly requiring greater subsidies than would have been the case if NBN Co had provided these services in the first place.

Question 8 *In designing NBN non-commercial services, how can pro-competitive market conditions for the provision of both non-commercial and commercial services best be achieved?*

4.4 Sustainability

Issues with the sustainability of internal cross subsidies to fund non-commercial obligations are not unique to telecommunications. Australia Post provides an example where funding its loss-making letter Community Service Obligations (**CSO**) from its profitable but highly contested parcels business has become unsustainable over time. Changes in technology and consumer behaviour are driving a sharp decline in demand for letter services, which is putting pressure on Australia Post's profitability and its ability to deliver Government policy objectives.[17]

Similarly, current funding arrangements for NBN non-commercial services create concerns regarding sustainability of funding sources. In the event NBN Co fixed line revenues are not realised, NBN Co will be constrained in its ability to deploy and maintain NBN non-commercial services.

A further consideration regarding sustainability relates to future changes to high-speed broadband services standards. Over time, the Government may seek to change the minimum speeds objectives that NBN Co is required to deliver, for example through an updated Statement of Expectations. Changes to the service standards could affect NBN non-commercial service losses and funding arrangement would need to have regard to such changes over time.

Ultimately, NBN non-commercial service funding arrangements will need to be assessed to ensure they support the ongoing provision of high-speed broadband in non-commercial areas including by supporting contestability in commercial areas. Funding arrangements will need to be flexible to accommodate future Government requirements.

[17] Australia Post, *Letter Losses Drive Australia Post Profit Decline, Pointing to Necessary Reform*, 23 February 2015.

Question 9 *What issues are associated with developing sustainable NBN non-commercial service funding arrangements?*

4.5 Equity

NBN non-commercial service funding arrangements will explore issues and concepts associated with the redistribution of costs across the telecommunications industry.

This gives rise to the issue of equity. Equity, or fairness, is a dimension of social welfare that is an important consideration in the design and assessment of Government policies (noting that the NBN policy accepts that end users in the fixed line footprint will have access to higher speed NBN broadband services compared to those outside of the fixed line footprint).

In considering funding arrangements, an assessment will be required to understand the impact, if any, to end users. The BCR notes the Government's Policy Paper seeks to ensure that the introduction of non-commercial funding arrangements does not increase total NBN end user costs compared to current forecasts. In this context, consideration is required to understand the implications of different funding options to end user pricing and ultimately to end users themselves.

Further to this, the BCR recognises that careful assessment is required to ensure that any industry participants are not disproportionately affected as a result of the introduction of NBN non-commercial service arrangements.

Question 10 *What equity issues need to be considered as a result of NBN non-commercial service funding arrangements?*

Question 11 *What are appropriate mechanisms and measures to ensure equitable outcomes?*

5. Financial model

The BCR is developing a financial model which quantifies NBN non-commercial service losses, with losses accounting for all operating and capital expenditure and revenues. The model will provide NBN non-commercial service losses to FY2040 in aggregate and on a year by year basis.

The BCR will use NBN Co's 2015-18 Corporate Plan financial projections as the latest and most reliable estimate of NBN non-commercial service costs – discounted cash flows will form the basis for measuring non-commercial service costs across the fixed wireless and satellite networks.

Subject to commercial-in-confidence requirements, the model design and key outcomes will be made public.

In developing a financial model, the following are key issues for consideration:

- use of a discounted cash flow analysis
- treatment of projected revenues and costs
- treatment of common costs
- discount rate

- terminal value, and
- sensitivity analysis

5.1 Use of a discounted cash flow analysis

Discounted cash flow analysis uses future free cash flow projections and discounts them to arrive at a present value. While a discounted cash flow approach is sensitive to underlying assumptions (such as the profile of cash flow projections, the discount rate and the approach to a terminal value calculation if a timeframe beyond FY2040 is used), it can reduce the effect of regulatory and commercial accounting practices and assumptions compared to other methods.

An alternative approach possible for the financial model is an asset building block model, as often used by regulators such as the Independent Pricing and Regulatory Tribunal (IPART)[18] and the ACCC, and used by NBN Co for the SAU. These models involve annualising capital costs and are typically used by regulators to assess prices and revenues for regulated services.

The BCR's considers a model which assesses cash flows over time is more appropriate and practical given the availability of aligned NBN Co financial projections. This approach will support the relevant financial assessment of NBN non-commercial service losses. The financial inputs used for a discounted cash flow analysis can subsequently be utilised for the development of a building block model if required.

Question 12 *Is a discounted cash flow methodology based on NBN Corporate Plan projections an appropriate approach to modelling NBN non-commercial service losses? If not, why not?*

5.2 Treatment of projected revenues and costs

Revenues and costs associated with the deployment and maintenance of NBN non-commercial services will be based on financial records and forecasts provided by NBN Co as part of its Corporate Planning process.

The BCR considers there is value in developing a financial model which can accommodate the replacement of forecasts with actual data and updates to financial projections as they are occur through NBN Co's annual Corporate Plan cycle.

The BCR study will not attempt to validate NBN Co's cost and revenue forecasts. Rather, sensitivity analysis will be conducted to test underlying assumptions and model outcomes which may affect NBN non-commercial service funding arrangements.

Question 13 *What, if any, issues arise in using NBN Co Corporate Plan financial estimates for the purpose of assessing NBN non-commercial service losses?*

[18] Independent Pricing and Regulatory Tribunal of NSW, 'IPART cost building block and pricing model' (22 December 2009). See http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/Financial_Models/IPART_cost_building_block_and_pricing_model

5.3 Treatment of common costs

Common costs are typically defined as costs that cannot be specifically attributed to a particular service. From an NBN perspective, this includes corporate, transit network, OSS/BSS and other IT system costs.

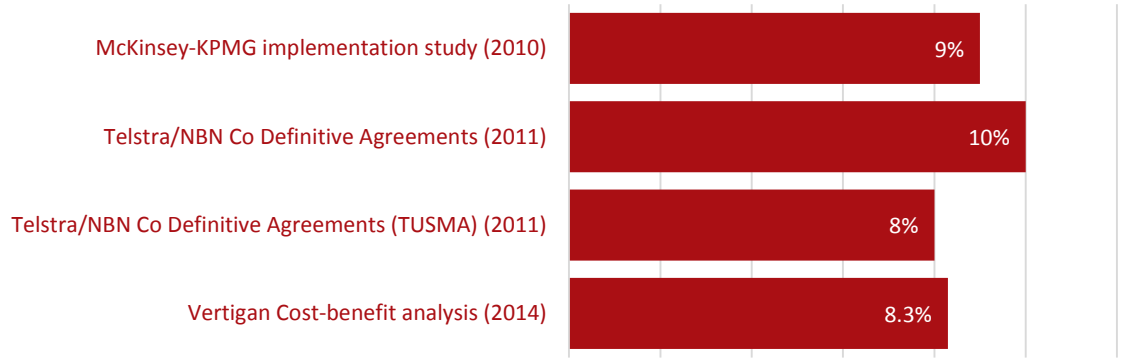
The BCR considers that common costs should be allocated to the fixed line, fixed wireless and satellite networks using a fully allocated cost approach. The BCR notes that activity based costing is an accepted accounting method for identifying the relationship between activities and resource consumption, and a common way of fully allocating cost.[19] It is used, for example, by Australia Post "for its own management decision making and financial reporting, as well as for the ACCC's regulatory purposes i.e. for price notification assessments and to produce annual regulatory accounts for cross-subsidy monitoring purposes".[20]

Question 14 *Is a fully allocated cost approach appropriate for the treatment of NBN non-commercial services? What are the strengths and limitations of this approach?*

5.4 Discount rate

The discount rate employed under a discounted cash flow analysis is an important input to determining financial outcomes (noting that the profile of cash flows and variables such as the terminal value also affect outcomes). As shown in below, a number of discount rates have historically been utilised to assess NBN commercial projections.[21]

Figure 4. Historical NBN discount rates



Importantly, these discount rates consider NBN Co as a single 'cash generating unit' rather that looking at an appropriate discount rate for non-commercial services on a stand-alone basis. The BCR notes that the discount rate employed in assessing a project can change over time. While it may be useful to

[19] Cooper, R. and Kaplan, R., 'Profit priorities from Activity-Based Costing', *Harvard Business Review*, (May-June 1991).
[20] ACCC, *ACCC Decision: Australia Post price notification for its 'ordinary' letter service February 2014*, (February 2014).
[21] See, McKinsey-KPMG, *Implementation Study for the National Broadband Network*, (March 2010); *Addition Information*, (regarding Telstra and NBN Co Definitive Agreements), 2011 Internal rate of return (IRR) from NBN Co, *Strategic Review*, [public, redacted version] December 2013; Vertigan *et al*. 'Volume II: Cost Benefit Analysis', *Independent cost-benefit analysis of broadband review of regulation* (August 2014), p. 40.

consider historical benchmark, the BCR will also develop an appropriate discount rate to use for evaluating NBN non-commercial service losses.

Question 15 *What are the relevant issues in determining a discount rate for NBN non-commercial services?*

Question 16 *What discount rate should be considered for NBN non-commercial services?*

5.5 Terminal value

As part of discounted cash flow analysis applied for the purpose of valuing a business, a terminal value is often used as an estimate of the ongoing value of a business or business activity beyond a forecast period. Perpetual growth models and exit multiples are commonly used methods to calculate terminal values (for example, NBN Co applies a '6x EBITDA' exit multiple).

The application of a terminal value for calculating NBN non-commercial service losses needs to be assessed. As discussed in section 3.3 above, including a terminal value provides an assessment of ongoing losses beyond FY2040. This is on the assumption that the requirement to provide non-commercial services will still be in effect beyond this period of time and accordingly, a longer timeframe than FY2040 is appropriate. However, depending on how funding arrangements are structured, this approach could see an increase in short term funding requirements by adding ongoing losses beyond FY2040.

The BCR will examine the appropriateness of taking a timeframe beyond FY2040 and using a terminal value, including quantifying the effect of a terminal value across different funding options.

Question 17 *What issues arise when considering the application of a terminal value for calculating NBN non-commercial services?*

5.6 Sensitivity analysis

Modelling will allow for sensitivity testing of underlying assumptions and scenario analysis.

Sensitivity analysis will help identify key value drivers and will 'stress-test' key assumptions to assess the impact to NBN non-commercial service losses. Further, the BCR will conduct scenario-based analysis which accounts for future uncertainty.

The use of sensitivity analysis will support the development and assessment of funding options, including for example, by indicating issues associated with considering NBN non-commercial service losses over different time periods.

Question 18 *What are the key sensitivities or scenarios which should be considered?*

6. Designing NBN non-commercial services funding arrangements

The types of funding arrangements that Governments might consider when designing telecommunications non-commercial obligations have been widely discussed by such international bodies as the Organisation for Economic and Co-operation and Development (**OECD**), the International Telecommunications Union and Ofcom as well as Australian Government agencies such as the Productivity Commission.

The following tables sets out often-considered funding options.

Table 4: General funding options for non-commercial services

Funding Option	Description
Internal cross subsidies between different profitable and unprofitable parts of the overall business, such as currently used by NBN Co and Australia Post	• Non-commercial services are funded by means of a cross-subsidy where consumers pay through prices that are higher than the cost of supplying the service.
A charge directly to end customers, such as a charge based on a telephone number or a Service in Operation (**SIO**)	• A fixed fee is calculated and applied for assigned end users (e.g. telephone numbers).
An indirect levy on consumers via a levy on communications service providers (i.e. industry levy)	• A levy is applied on all participants in the telecommunications sector, with contributions typically based on a revenue threshold.
Direct Government funding from central Government consolidated revenue.	• Funding non-commercial services through consolidated revenues.

Consistent with the Government's policy paper, the Terms of Reference ask that the BCR provide advice on direct funding arrangements based on industry contributions from high-speed broadband access networks that target residential and small business customers. Any reference to alternative models that do not meet these requirements are included only for the sake of completeness and are not contemplated in this consultation paper.

6.1 Implementation issues

As an input to identifying issues relevant to the development of industry based funding options, the BCR has considered a range of domestic and international examples of telecommunications non-commercial service funding arrangements (see Attachment C).

Having regard to these examples, the BCR has identified the following issues relevant to NBN non-commercial services which require careful examination:

- industry funding eligibility

- eligibility thresholds and proportionality
- contestability, and
- transparency mechanisms.

6.1.1 Industry funding eligibility

The Government's Policy Paper identifies that funding arrangements will be:

> *…sourced from owners of high-speed broadband access networks that target residential and small business customers – i.e. the NBN and networks in commercially viable areas that are comparable to the NBN.*[22]

In considering funding from other owners of high-speed networks that operate in commercially viable areas, it is important to first consider a definition of high-speed broadband as it would apply to network operators comparable to the NBN.

The Government's Statement of Expectations released on 8 April 2015 provides a minimum download data rate objective of at least 25 Mbps with proportionate upload rates. This service standard is consistent with Part 8 of the *Telecommunications Act 1997* which defines a superfast carriage service where the download transmission speed of a carriage service is normally more than 25 Mbps and the carriage service is supplied using a line to premises occupied or used by an end user.[23]

On this basis, a service standard could comprise high-speed broadband access networks that target residential and small business customers and which offer download speed of at least 25 Mbps via a fixed line.

In considering industry participants that meet this service standard, this would include current and new entrants offering high-speed wholesale broadband fixed line services operating under the one kilometer exemption under Part 7 and 8 of the Telecommunications Act (and subject of the *Carrier License Conditions (Networks supplying Superfast Carriage Services to Residential Customers) Declaration 2014*. Network operators offering high-speed fixed line broadband services under other Ministerial or statutory exemptions would also be included.

Further, telecommunication providers in new developments that offer high-speed broadband to residential and small business customers would also meet this criterion.

In terms of how funding is collected, a possible approach is that contributions towards NBN non-commercial services from owners of high-speed broadband access networks (including NBN Co) would be made via a Commonwealth account. Funds would be released to NBN Co from the Commonwealth account to build and maintain non-commercial services.

An alternative would be for non-NBN network operators to contribute via a Commonwealth account while NBN Co continues to fund non-commercial services directly (i.e. without making contributions or receiving funds via the Commonwealth account) – NBN Co's contributions would in effect 'net out' against the cost of deploying non-commercial services. Appropriate accounting and reporting arrangements would be needed to ensure transparency.

The following figure outlines the process by which contributions are provided by eligible high-speed broadband access network owners in commercial (fixed line) areas and by NBN Co (where

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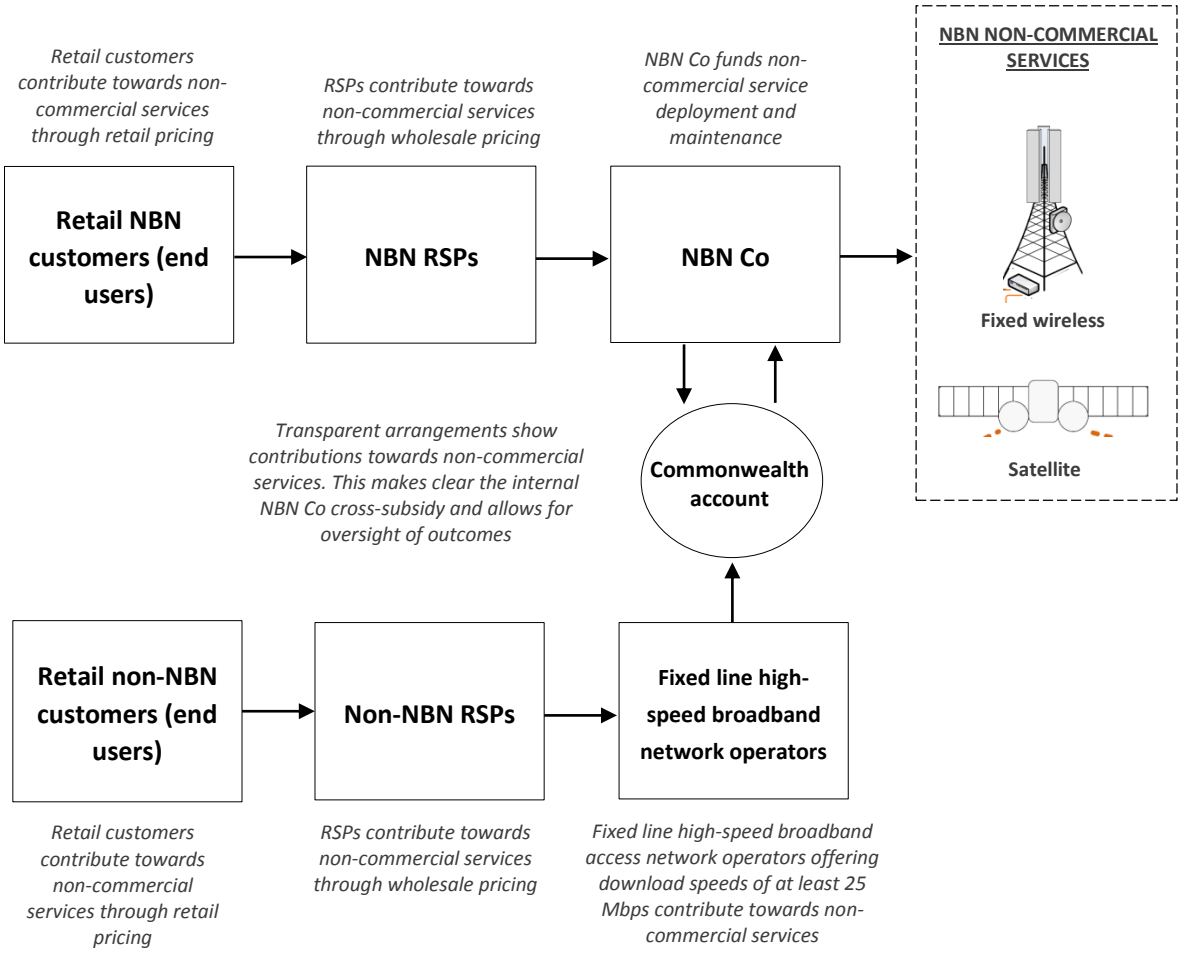
[22] Australian Government, *Telecommunications Regulatory and Structural Reform* policy paper, December 2014 p. 6.

[23] *Telecommunications Act 1997*, Part 8, section 142A

contributions would be recovered through wholesale prices to RSPs and ultimately retail prices to end customers). This figure reflects an approach where NBN Co contributes to a Commonwealth account consistent with other eligible network operators.

Figure 5. NBN non-commercial services funding model



(Note: fixed wireless and satellite images sources from NBN Co 2012-15 Corporate Plan)

For both current and proposed funding arrangements, RSPs (and ultimately retail customers) contribute indirectly through higher prices, rather than being levied directly. The differences between the proposed and current arrangements are two-fold. Firstly, rather than just NBN Co contributing directly to funding the non-commercial fixed wireless and satellite services as occurs under the current arrangements, both NBN Co and competing fixed line operators comparable to the NBN would contribute directly.

Secondly, under the proposed arrangements all fixed line RSPs (and retail customers) contribute to funding NBN fixed wireless and satellite services, while under current arrangements only NBN RSPs (and retail customers) contribute.

In effect, responsibility for funding the non-commercial technologies is spread more widely and allows for pro-competitive outcomes by ensuring a level playing field.

This contrasts with international and domestic funding schemes which often involve all telecommunications industry participants contributing towards the funding of telecommunications non-commercial services, subject to meeting a minimum revenue threshold. This is the case with the

Australian Universal Service Obligation (**USO**) provided under the Telecommunications Industry Levy (**TIL**) as well as funding schemes in the US, Japan and New Zealand.

While this approach would address technology neutrality principles and supports sustainability of funding arrangement by ensuring a broad levy base, it would unfairly target industry participants that are not seeking to contest the high-speed broadband access market for consumers and small businesses with services equivalent to NBN fixed line services.

To this end, the BCR considers that industry funding eligibility should be based on a service standard relative to owners of high-speed broadband access networks, consistent with the Government's policy objectives. This approach would not include mobile broadband networks.[24]

Question 19	*Should NBN Co contributions towards NBN non-commercial services, and funding to deploy and maintain these services, be made via a Commonwealth account?*
Question 20	*What issues should be considered when examining industry funding eligibility?*
Question 21	*Is it reasonable to apply a service standard to determine eligibility? If so, is a high-speed broadband speed criteria based on a minimum download speed of 25 Mbps reasonable?*

6.1.2 Eligibility thresholds and proportionality

Once industry participant eligibility is determined, consideration can be given to such concepts as a revenue eligibility threshold. For example, in Australia companies earning above AU$25 million in qualified revenue must contribute to the USO under the TIL. The TIL calculates eligible revenues based on the gross sales revenue of an eligible 'participating person', less a series of revenue and expense deductions (which adjusts for such factors as non-telecommunications sales revenues and revenues from overseas activities).[25]

Internationally, there are further examples of eligibility thresholds:

- **New Zealand** - only companies earning at least NZ$10 million of qualified revenue [26] need to contribute to the Telecommunications Development Levy (**TDL**), and
- **Japan** - only companies with annual revenues exceeding ¥1 billion (approximately AU$10.6 million) contribute to the Universal Service Fund (**USF**).

As an alternative to revenues, one approach might involve contributions based on market share as determined by criteria such as number of active services - this may or may not involve a market share eligibility threshold.

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[24] Future inclusion of mobile network operators could be considered on the basis of mobile networks operating in competition with fixed line networks primarily resulting in fixed to mobile substitution rather than fixed-mobile complementarity. The BCR notes that the extent of fixed to mobile substitution is not clear. It is likely that the full extent of competition and substitution between fixed line and mobile networks may not be known for many years. In this context, and noting the Government's Policy Paper guidance on industry funding eligibility, the BCR will focus on arrangements relevant to high-speed fixed line networks.

[25] ACMA, *Summary of 2013-14 eligible revenue calculation*

[26] Commerce Commission New Zealand, *Final liability allocation determination under sections 87 and 88 of the Telecommunications Act 2001 for 1 July 2013 to 30 June 2014 [2014] NZCC 44*, p. 37.

As a starting point, there may be practical benefit in aligning with the AU$25 million qualified revenue threshold used for the USO for the purpose of NBN non-commercial services.

The effect of including or not including an eligibility threshold will be assessed in developing NBN non-commercial services.

The amount of funding to be contributed by eligible participants will also require careful assessment.

In considering international and domestic examples, industry levy calculations are typically based on determining an overall annual funding requirement as well as a calculation for the percentage contribution required from each eligible industry participant based on the chosen eligibility requirements.

For example, in New Zealand, the **TDL** has been set at NZ$50 million per annum set until FY2015-16. The levy amount payable by an eligible participant is proportionate to their qualified revenues. For example, in the levy allocation for FY2013 to FY2014, Spark had qualified revenues which equated to 38.17% of overall industry qualified revenues. Therefore, Spark's contribution was determined at 38.17% of the overall levy amount.[27]

BCR considers that proportionality should be considered in assessing NBN non-commercial service funding arrangements. A funding approach that allows for proportionality supports equitable outcomes. By calculating funding contributions based on for example market share, this supports the notion that the greater contributions should be provided by more established participants that should better be able to afford to make the contributions.

In practice, it is expected the industry funding eligibility arrangements discussed above would result in the majority of contributions towards NBN non-commercial services being made by NBN Co, though this could change over time from increased infrastructure based competition.

Question 22 *In the context of NBN non-commercial services, what issues should be considered regarding eligible revenue or other eligibility thresholds?*

Question 23 *To what extent is it appropriate to consider proportionality when developing funding arrangements?*

6.1.3 Contestability

In implementing funding arrangements, a key outcome will be ensuring the delivery of pro-competitive market conditions as described in the Government's Policy Paper. To this end, NBN non-commercial service funding arrangement will need to support outcomes where all high-speed wholesale broadband market participants are free to compete (including NBN Co) on a level playing field basis.

Beyond contestability in the fixed line market, assessment is required regarding contestability in the delivery of non-commercial services.

[27] Commerce Commission New Zealand, *Final liability allocation determination under sections 87 and 88 of the Telecommunications Act 2001 for 1 July 2013 to 30 June 2014 [2014] NZCC 44*, p. 31.

In an Australian context, NBN Co can be characterised as the 'universal service provider' for the wholesale delivery of non-commercial high-speed broadband services.[28] There is currently no arrangement that would allow alternative providers to receive funding to deliver the equivalent of NBN non-commercial services.

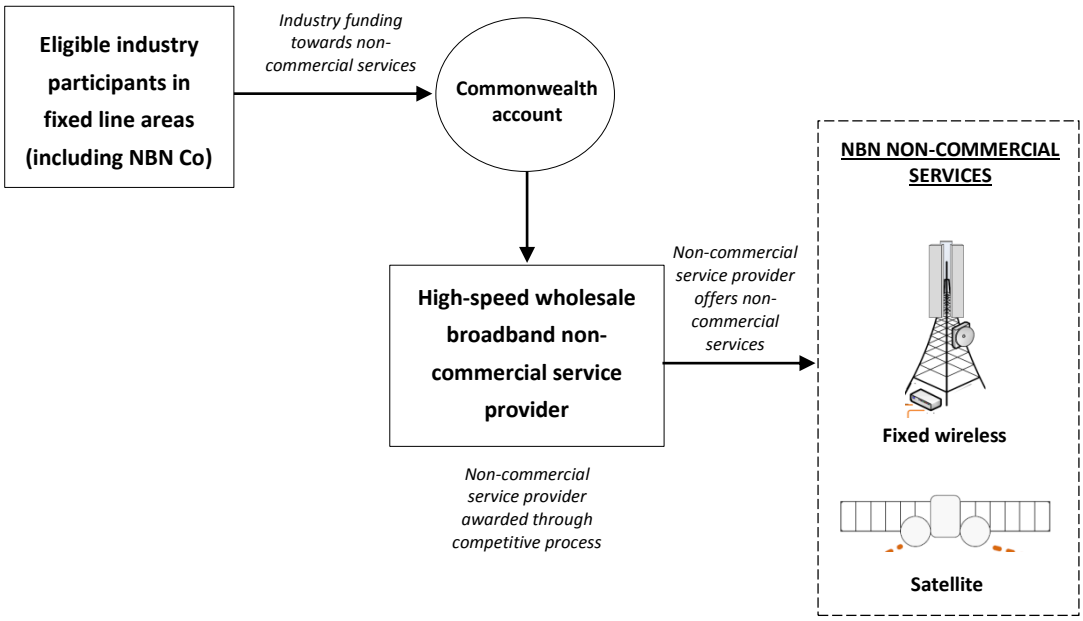
This differs from international examples, where often a funding program identifies non-commercial projects or services and industry participants compete to secure funds to deliver program requirements. This drives efficiency by placing competitive tension on the cost of delivering services.

In considering contestability of NBN non-commercial services, it is important to note that NBN Co has entered into significant long term contracts and invested in long-life assets (including satellites) to ensure the delivery of high-speed broadband. An issue is whether it is efficient to consider mechanisms which would allow alternative providers to receive funding that would allow them to offer the equivalent of NBN non-commercial services on a level playing field basis, and whether this would result in better outcomes for consumers and reduce the overall cost of delivering NBN non-commercial services.

While it may not be appropriate to consider contestability of delivering NBN non-commercial services during the cash flow negative build phase, funding arrangements that allow for contestability in later years could be explored.

The following figure illustrates a long term model for contestability in delivery of non-commercial services.

Figure 6. Future model for contestability in delivery of NBN non-commercial services



(Note: Fixed wireless and satellite images sources from NBN Co 2012-15 Corporate Plan)

[28] This differs from Telstra provider of last resort obligation for the provision of standard telephone services under the Universal Service Obligation. See http://www.acma.gov.au/Citizen/Consumer-info/My-connected-home/The-NBN-and-you/the-universal-service-obligation-and-the-nbn

Question 24 *It is practical to consider contestability in the provision of NBN non-commercial services?*

6.1.4 Transparency mechanisms

As a transparency mechanism, many countries have allowed for retail bill transparency, whereby non-commercial service costs incurred by eligible industry participants are reflected in end user invoicing. In effect, this shows the contribution being made by an end users towards a non-commercial service.

In the context of NBN non-commercial services, implementing an arrangement that allows for bill transparency would make clear the contribution being made by end users through retail charges.

For example, consideration could be given to the model in Japan where, in simple terms, the total non-commercial service costs are divided by the number of telephone lines in operation which allows for a per-line calculation.

For NBN non-commercial services a calculation could be performed which would show contributions made on a SIO basis (for example, the contribution made towards the non-commercial costs of the NBN fixed wireless and satellite networks for each active NBN fixed line service in operation).

Implementation of any arrangement where information is provided on end user invoicing would be subject to billing and other IT system capabilities.

Question 25 *Would bill transparency arrangements be beneficial?*

Question 26 *Is it feasible for NBN non-commercial services to be reflected on end user invoicing?*

7. Regulatory issues

7.1 Australian Universal Service Obligation

The current Australian USO is a consumer protection mechanism that ensures a standard telephone service (generally delivered over a fixed line) and public pay phones are reasonably accessible to all people in Australia. The Department of Communications has policy responsibilities for managing the USO, while the Australian Communications and Media Authority (**ACMA**) is responsible for its regulatory oversight.

Telstra is the designated USO provider in Australia. Current levy arrangements mean carriers proportionally contribute to the cost of contracts for the USO Standard Telephone Service (**STS**) and payphones based on their share of total eligible revenue.

On 1 July 2012 the Telecommunications Universal Service Management Agency (**TUSMA**) was established to develop and manage contracts for the delivery of standard telephone service and payphone services under the USO, on behalf of the Australian Government and in accordance with the requirements of the *Telecommunications Universal Service Management Agency Act 2012*

(**TUSMA Act**).[29] On 1 July 2015, the function of TUSMA transferred to the Department of Communications.

Following the establishment of TUSMA, funding of USO services, as well as the National Relay Service (**NRS**) levies, were replaced with the TIL established under the *Telecommunications (Industry Levy) Act 2012*. The TIL funds the residual costs (after Government funding) for:

- reasonably accessible standard telephone services and payphone services to all Australians on an equitable basis, regardless of where they live or carry on business (i.e. the USO)
- a national telephone service to enable people with a hearing or speech impediment to make and receive telephone calls (i.e. the NRS)
- delivery of emergency call services, and
- delivery of other public policy telecommunications outcomes.[30]

For the 2013-14 eligible levy period, the TIL raised $221 million from participating persons (carriers with eligible revenue of $25 million or more).

Importantly, the STS USO is focused only on the provision of public switched telephone network (**PSTN**) voice services. The provisions to fund universal access to broadband is not covered under the voice USO, and under the current long term contractual arrangements for the voice USO there is not scope in the immediate future to integrate this with a 'broadband USO' arrangement.

In the context of NBN non-commercial service funding arrangements, this gives rise to a policy question of whether it would be appropriate over time to combine industry funding arrangements for the delivery of voice and broadband services.

Currently, the USO is delivered by Telstra as the primary universal service provider. This arrangement is supported by long term contractual obligations between the Commonwealth and Telstra.[31] Changes to current USO arrangements would need to be assessed in light of these arrangements. Certain policy issues regarding USO arrangements may be considered as part of the forthcoming Regional Telecommunications Independent Review (**RTIRC**), noting that the review will consider issues around equitable access to telecommunications services and consumer safeguard issues in an NBN context.[32]

In addressing the Terms of Reference, the BCR will take into account if and how NBN non-commercial service funding arrangements will interact with the USO in an operational sense. For example, there may be potential benefits for industry in using the same or similar collection arrangements that currently exist under the USO, rather than introducing an entirely new collection arrangement which would add an additional administrative burden on industry and potentially introduce new setup and ongoing compliance costs. Hence the question below is intended to examine any potential to leverage existing funding arrangements, not to specifically explore the broader policy issues of integration of universal service provision of voice and broadband services.

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[29] TUSMA, *Corporate Plan 2012-15*, p. 4.
[30] ACMA, *Telecomms funding arrangements*, accessed 3 May 2015

[31] TUSMA, *Register of Public Interest Telecommunications Contracts*, accessed 3 May 2015

[32] RTIRC website, accessed 6 May 2015

Question 27 *Is there opportunity to amend the existing USO collection arrangements to include NBN non-commercial services collection arrangements – noting that industry funding eligibility may be different?*

7.2 NBN Co Special Access Undertaking

NBN Co's SAU is a key part of the regulatory framework that governs the prices NBN Co, as a wholesale open access telecommunications network, can charge for the services it supplies to RSPs.

The SAU is designed with a modular structure, with more detailed terms applying for the first 10 years (the Initial Regulatory Period, during which the NBN is expected to be rollout out in accordance with the Network Design Rules, as updated in accordance with the SAU) and a set of higher level principles to apply for remainder of the SAU term (the Subsequent Regulatory Period). During the Subsequent Regulatory Period, the SAU requires NBN Co to lodge Replacement Module Applications every three to five years. A key part of each such application will be financial forecasts for the upcoming regulatory period.[33]

As part of its NBN reform agenda, the Government has requested that NBN Co move to a wholesale price cap model and to advise industry of any implementation arrangements including any necessary changes to the SAU.

The introduction of an NBN non-commercial service funding will support greater competition in the wholesale broadband market by creating a level playing field. Contributions from eligible industry participants towards non-commercial services in effect give NBN Co flexibility to reduce pricing while still being able to deploy and maintain NBN non-commercial services. Noting that competition is unlikely to emerge on a national basis, this concept suggests a requirement for pricing flexibility on a more granular level, for example by different geographies or market segments.

Further, NBN non-commercial services funding arrangements will need to be considered in the context of the SAU prudency and cost recovery requirements.

A key feature of the SAU is an overall revenue cap and prudency measures, to provide NBN Co with the opportunity to recover its prudent and efficient costs over the term of the SAU. Under this approach unrecovered costs are rolled into an Initial Cost Recovery Account (**ICRA**). Once the ICRA is extinguished, regulatory constraints will apply on NBN Co's actual revenue which is capped at regulated levels.

Where a funding option allows for industry contributions towards NBN non-commercial services, this source of funding should adjust the unrecovered costs that NBN Co can recover through the ICRA.

Ultimately, an assessment will be required regarding the extent to which the SAU can accommodate the issues associated with the introduction of NBN non-commercial service funding arrangements

Question 28 *To what extent will elements of the SAU need to change to accommodate the introduction of NBN non-commercial service funding arrangements?*

[33] NBN Co website, *Special Access Undertaking*, accessed on 6 May 2015

7.3 NBN Co as broadband provider of last resort

In transitioning the NBN regulatory framework, the Government's policy paper notes that legislation will be introduced requiring NBN Co to operate as the broadband infrastructure provider of last resort. The legislation will provide scope for non-NBN carriers to be so designated in circumstances where they take on or are better able to fulfil this role.

BCR expects this will not impact its consideration of the magnitude of non-commercial service losses and funding options, as NBN Co has already assumed this role to meet the coverage objective set through the Statement of Expectations (noting there are exceptions as contemplated through the adequately served arrangements and the updated fibre in new developments policy).[34]

However, over time, the BCR notes that an allowance for non-NBN carriers to be designated broadband infrastructure provider of last resort supports the notion of contestability in the delivery of NBN non-commercial services.

8. How to comment

The BCR invites comments from the public, industry and other interested stakeholders by way of written submission. The closing date for submissions is 1 June 2015. Submissions can be lodged in the following ways:

Email: (preferred)	BCR@communications.gov.au
Post:	The Director Market Analysis Bureau of Communications Research Department of Communications GPO Box 2154 CANBERRA ACT 2601

Enquiries about issues raised in the paper may be directed by email to BCR@communications.gov.au or by telephone to Richard Bullock, Director Market Analysis, Bureau of Communications Research on (02) 6271 7035.

This paper is for consultation purposes only and does not represent current Australian Government policy.

Discussion questions are included in the boxes throughout this paper to guide submissions. Respondents are invited to provide written submissions or comments to address these questions, or provide a more general response if preferred. For convenience, the full list of questions is provided at Attachment B.

Submissions must include the respondent's name organisation (if relevant) and contact details.

The BCR is bound by the Department of Communications' (the Department's) Publications, Confidentiality and Privacy provisions.

[34] The Statement of Expectations and NBN policy papers are available at the Department of Communications website

8.1 Publication

Respondents should be aware that submissions may be made publicly available, including on the Department's website (www.communications.gov.au) unless indicated otherwise by the submitting party. The Department reserves the right not to publish any submission, or part of submission, which is in the view of the Department contains potentially defamatory material, or where it considers it appropriate to do so for confidentiality reasons.

8.2 Confidentiality

All submissions will be treated as non-confidential information unless the respondent specifically requests that the submission, or part of a submission, is kept confidential. Alternatively, respondents may choose to provide an additional version of that submission for public release.

Even when the Department agrees to keep a submission or part of it confidential, the obligation of confidence will not be breached where the Department discloses the information to a House or Committee of Parliament, relevant Ministers, Commonwealth entities (where this meets the Commonwealth's legitimate interests), within the Department and to its advisors, or where authorised or required by law. The Department cannot guarantee the confidentiality of information released through these or other legal means. The Department will treat any personal information provided in accordance with the Department's Australian Privacy Principles Privacy Policy (see www.communications.gov.au/privacy). Note that submissions will generally be subject to the *Freedom of Information Act 1982*.

8.3 Privacy

The Department has obligations under the *Privacy Act 1988*, which establishes certain principles with respect to the collection, use, and disclosure of information about individuals. In particular, the Privacy Act contains the Australian Privacy Principles which govern how the Department collects, uses, discloses and stores personal and sensitive information, and how individuals can access and correct records containing their personal or sensitive information.

If you include any personal information and/or sensitive information in your submission, this information will be collected by the Department. By providing the Department with your personal information and/or sensitive information in your submission (or, if relevant, in your communication enclosing the submission), you consent to the Department collecting, using and disclosing that information in accordance with this notice.

As part of considering your submission, the Department may use your personal and/or sensitive information for the purpose of consideration of the issues raised in this paper and developing policies and programs in relation to the subject of this paper. Further, the Department may also disclose your personal information to its Minister, its Parliamentary Secretary or other Government agencies and by placing the public version of your submission (including personal information included in the submission and such information as is required to identify who made the submission, such as your name) on the Department's website, which means it may be viewed by individuals in Australia or overseas.

Respondents should clearly indicate in their submission if they do not wish to have their name or other information included in any submissions or summary of submissions that the Department may publish.

If you do not consent to the Department's collection, use and disclosure of your personal information, please do not provide your personal information to the Department. If you have already provided your

information to the Department, please notify the Department immediately at BCR@communications.gov.au.

For further information, including in relation to how to access or correct personal information, or to make a complaint, please see the Department's Australian Privacy Principles Privacy Policy (see www.communications.gov.au/privacy).

Attachment A – Terms of Reference

The Bureau of Communications Research (BCR) within the Department of Communications will investigate and provide a report to the Minister for Communications and the Minister for Finance by 30 September 2015 on options for the efficient and transparent funding of non-commercial services in the National Broadband Network (NBN).

The BCR will provide advice on options to replace the current arrangement, where NBN Co funds non-commercial services through an internal cross-subsidy, with direct funding arrangements based on industry contributions.

The BCR will provide recommendations on the total amount and possible structure of industry contribution arrangements. In developing this advice the BCR will:

1. Identify and quantify the level of loss incurred by fixed wireless and satellite NBN services, including:
    a. accounting for losses incurred across the NBN fixed wireless and satellite networks
    b. include the reasonable share of costs associated with commons such as NBN's Operations Support Systems/Business Support Systems (OSS/BSS), transit network and corporate functions
    c. accounting for NBN Co having increased flexibility over time to adjust pricing in non-commercial areas subject to price cap arrangements
2. Consider options for structuring the funding arrangements, including:
    a. options for the efficient and transparent collection of industry contributions
    b. eligibility requirements of contributors (based on revenue, services in operation or other criteria)
    c. whether funding should be based on actual losses or losses forecast over a future period with options for the funding arrangements to allow for changes to forecasts over time
    d. adjustments to NBN Co pricing to reflect the removal of the internal cross-subsidy for non-commercial NBN services
3. Consult with industry on the amount and possible structure of contribution arrangements.
4. Consider the interaction of proposed funding arrangements with relevant NBN-related regulatory instruments and other telecommunications levy schemes, including:
    a. Consideration should be given to, but not limited to, how the funding arrangements will interact with the NBN Co Special Access Undertaking and the TIL.
5. Identify any financial risks to the Commonwealth posed by alternate funding and financing mechanisms.
6. Provide advice on competition issues arising from implementation of the proposed funding arrangements, including:
    a. Consideration should be given to long term implications including potential contestability of funding arrangements.

The BCR should take into account evidence from previous reports and inquiries from overseas and in Australia, including information from the Independent Cost-Benefit Analysis of Broadband and Review of Regulation, the Fixed Wireless and Satellite Review, NBN Co Strategic Review and NBN Co's

Corporate Plan process. The BCR should also consider other issues that may be relevant to this task and provide recommendations.

The BCR will also develop a publically releasable version of its final report.

Attachment B – List of questions

Question 1 Is measuring NBN satellite and fixed wireless service costs on a commercially focused basis appropriate?

Question 2 Is it appropriate to consider commerciality on a network 'cluster' basis?

Question 3 Is FY2040 at an appropriate time period for assessing NBN non-commercial services?

Question 4 Are the proposed principles relevant and applicable when considering NBN non-commercial service funding arrangements?

Question 5 Should the BCR consider additional principles? If so what are they?

Question 6 To what extent could financial reporting support transparency of the allocation of equity, debt and revenues towards non-commercial services?

Question 7 What issues are associated with maximising economic efficiency in developing NBN non-commercial service funding arrangements?

Question 8 In designing NBN non-commercial services, how can pro-competitive market conditions for the provision of both non-commercial and commercial services best be achieved?

Question 9 What issues are associated with developing sustainable NBN non-commercial service funding arrangements?

Question 10 What equity issues need to be considered as a result of NBN non-commercial service funding arrangements?

Question 11 What are appropriate mechanisms to ensure equitable outcomes?

Question 12 Is a discounted cash flow methodology based on NBN Corporate Plan projections an appropriate approach to modelling NBN non-commercial service losses? If not, why not?

Question 13 What, if any, issues arise in using NBN Co Corporate Plan financial estimates for the purpose of assessing NBN non-commercial service losses?

Question 14 Is a fully allocated cost approach appropriate for the treatment of NBN non-commercial services? What are the strengths and limitations of this approach?

Question 15 What are the relevant issues in determining a discount rate for NBN non-commercial services?

Question 16 What relevant discount rate should be considered for NBN non-commercial services?

Question 17 What issues arise when considering the application of a terminal value for calculating NBN non-commercial services?

Question 18 What are the key sensitivities or scenarios which should be considered?

Question 19 Should NBN Co contributions towards NBN non-commercial services, and funding to deploy and maintain these services, be made via a Commonwealth account?

Question 20 What issues should be considered when examining industry funding eligibility?

Question 21 Is it reasonable to apply a service standard to determine eligibility? If so, is a high-speed broadband speed criteria based on a minimum download speed of 25 Mbps reasonable?

Question 22 In the context of NBN non-commercial services, what issues should be considered regarding eligible revenue or other eligibility thresholds?

Question 23 To what extent is it appropriate to consider proportionality when developing funding arrangements?

Question 24 It is practical to consider contestability in the provision of NBN non-commercial services?

Question 25 Would bill transparency arrangements be beneficial?

Question 26 Is it feasible for NBN non-commercial services to be reflected on end user invoicing?

Question 27 Is there opportunity to amend the existing USO/TIL collection arrangements to include NBN non-commercial services collection arrangements – noting that industry funding eligibility may be different?

Question 28 To what extent will elements of the SAU need to change to accommodate the introduction of NBN non-commercial service funding arrangements?

Attachment C – Summary of international and domestic research

As an input into the development of NBN non-commercial services funding options, the BCR has conducted an initial review of the Australian standard telephone service Universal Service Obligation (USO) and several international funding programs. In considering these examples, the BCR has sought to:

- identify the overarching 'problem' that a non-commercial service strategy is aiming to solve and assess relevance in the context of NBN non-commercial services
- understand how funding mechanisms have been structured; and
- identify implementation issues of relevance in the context of developing NBN non-commercial services.

Importantly, Australian broadband market conditions, including the role of NBN Co, are unique. While an examination of international developments is expected to provide insights into how NBN non-commercial services can be structured, any funding arrangements will need to be tailored for local conditions.

The following table summarises information from international and domestic research:

Country	Non-commercial service strategy	Funding approach
Australia	The *Telecommunications Industry Levy* which includes the USO supports delivery of standard telephone services, payphones, national relay service and emergency call services.	Both government funding and industry levy which applies to eligible carriers based on a revenue threshold.
New Zealand	*Rural Broadband Initiative* to bring at least five Mbps to 97 per cent of population by 2016; the remaining three per cent to have access to one Mbps.	Industry levy which applies to eligible carriers based on a revenue threshold.
UK	*The Superfast Broadband Programme* aims to ensure that 95 per cent of UK premises have access to at least 24Mbps, and the remaining five per cent to have access to at least 2Mbps by 2017.	Co-investment model with funding contributed by Government and the telecommunications industry.
USA	Basic broadband access is part of universal service objectives in the US, which is funded through the Universal Service Fund.	Industry levy which applies to all telecommunications carriers.
Canada	*Broadband Canada Program: Connecting Rural Canadians*, aimed to bring faster internet to 218,000 Canadians in underserved areas mainly through installing fixed wireless access networks	Co-investment between Government and telecommunications industry funding.
Finland	*The Broadband for all 2015* initiative targets the most sparsely populated areas of Finland (five per cent of the population) by constructing of fibre 'middle-mile' networks.	Combination of Government and industry funding.

Japan	A USF helps fund telephone access, through either copper or Internet Protocol (IP) optical networks, in areas not otherwise served by the private sector.	Industry levy which applies to eligible carriers based on a revenue threshold.
European Union (EU)	The *European Regional Development Fund* (ERDF) is a funding mechanism available to Member States as an incentive to co-investment in next-generation telecommunications networks in rural and regional markets.	Funding from EU budget matches funding by other sources (local authorities, government schemes, other public bodies and the telecommunications industry).