



Advice on NBN Co Ltd's Special Access Undertaking

A Report Prepared for Webb Henderson

January 2012
Synergies Economic Consulting Pty Ltd
www.synergies.com.au

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In conducting the analysis in the report Synergies has used information available at the date of publication, noting that the intention of this work is to provide material relevant to the development of policy rather than definitive guidance as to the appropriate level of pricing to be specified for particular circumstance.

Acknowledgement

I have read, understood and complied with the contents of 'Practice Note CM 7: Expert Witnesses in proceedings in the Federal Court of Australia' supplied to me by Webb Henderson. I agree to comply with the terms of the Practice Note.

Sam Lovick for Synergies Economic Consulting Pty Ltd

A handwritten signature in black ink, appearing to read 'Sam Lovick', written over a horizontal line.

17 January 2012

Executive summary

Webb Henderson has instructed Synergies to:

1. *Please advise whether NBN Co's proposed 'building block model' and regulatory asset base methodology for the recovery of its costs following the expiry of the ICRA, and the use of an organisation-wide revenue cap to limit the expected net present value of NBN Co's prudently incurred investments to zero, is efficient.*

Synergies confirms that NBN Co's proposed 'building block model' and regulatory asset base methodology, and the use of an organisation-wide revenue cap to limit the expected net present value of NBN Co's prudently incurred investments to zero, can reasonably be expected to be efficient for the following reasons:

The building block approach

- the building block approach has been widely adopted by regulators in Australia;
- NBN Co's building block approach is similar to building block approaches adopted by regulators for determining maximum annual revenue requirements;

RAB valuation

- regulatory precedent on asset valuation outside of telecommunications, echoed by the Australian Competition Tribunal in its recent telecommunications decisions, indicates that a simple roll forward of asset values, as opposed to optimisation and revaluation, is not only reasonable but preferred;
- possible advantages of alternative approaches to asset valuation in the RAB (such as replacement cost and optimised asset valuation) are also attended by significant disadvantages;
- alternative approaches are more complex and less certain in respect of future outcomes, impacting investor confidence;
- in respect of forward looking and optimised valuation alternatives, which have been advocated in some past regulatory decisions as having efficiency benefits, it is difficult to draw any normative conclusion as to the efficiency or otherwise of asset values based on a hypothetical efficient new entrant (which is the typical basis for such optimisation) if, as a matter of practice, no such new entrant would arise. If, conversely, the entrant was a real and

likely prospect, NBN Co can reasonably be expected to take account of this in its own decision making, without necessitating RAB revaluation.

2. *Please advise whether it is efficient for NBN Co to include its actual capital expenditure and operating expenditure into its ICRA / 'building block' calculations in the event that NBN Co has complied with the prudency processes that apply to NBN Co under Schedule 8 of the SAU.*

Synergies confirms that the inclusion by NBN Co of its actual capital expenditure and operating expenditure into its ICRA / 'building block' calculations in the event that NBN Co has complied with the prudency processes under Schedule 8 of the SAU can reasonably be expected to be efficient for the following reasons:

Prudency provisions and customer engagement

- prudency and customer engagement are accepted regulatory tools for managing investment;
- in so far as the parameters and assumptions used in the process of investment assessment are robust, the prudency requirements for selecting and identifying investments can reasonably be expected to deliver efficient outcomes;
- the characteristics of NBN Co's customers are such that inclusion of a customer engagement and endorsement process in NBN Co's SAU in relation to the scope of network capacity expansions can reasonably be expected to prevent inefficient investment;
- the customer engagement processes allow customers to lodge valid objections and hence impede investments that are likely to be productively inefficient;

Other factors fostering productively efficient investment

- the requirement to review the operation of the customer engagement procedures on a 5 year basis;
- having regard to all the circumstances of NBN Co:
 - governance and investment pressures during the prolonged loss-making period, in combination with the SAU mechanisms, can reasonably be expected to generate strong incentives to operate efficiently;

- if or when these pressures subside, or possibly earlier, Ministerial Declarations under the *National Broadband Network Companies Act 2011* can reasonably be expected to trigger a comprehensive review of regulatory and operational arrangements to address shortcomings in any SAU or other regulations that govern NBN Co operations thereafter;
- in the absence of such declarations, the 2027 SAU review can reasonably be expected to address those same issues in a timely fashion;

Dynamic efficiency and innovative investments

- the SAU contains a reasonable mechanism for facilitating innovative investments which is necessary to foster dynamic efficiency;

Operating cost efficiency

- the SAU, given the context and circumstances of NBN Co, provides reasonable incentives to minimise operating costs, for the following reasons:
 - NBN Co will have strong incentives to be productively efficient in the Initial Cost Recovery Period, for at least as long as it is incurring losses relative to its annual revenue requirement;
 - for the same reasons as noted above, NBN Co's SAU will be subject to extensive review at or around the time that these pressures might be expected to subside;
 - meeting the objective of achieving value for money and lowest overall Total Cost of Ownership is consistent with operating cost efficiency, and identification of the inclusion of inefficiently high operating costs in the Annual Building Block Revenue Requirement ('ABRR') could be deemed a breach of the SAU;
 - the Australian Competition & Consumer Commission ('Commission') can obtain information necessary to assess SAU compliance to the extent that the information disclosure set out in the SAU is insufficient.
- collectively, these can reasonably be expected to deliver efficient outcomes.

3. *Please advise whether it is efficient for NBN Co to adopt a straight line depreciation methodology for the term of the SAU.*

Synergies confirms that straight line depreciation can reasonably be expected to be efficient for the following reasons:

- the approach is widely adopted in financial markets, corporate accounting and regulatory practice;
 - there are considerable complexities involved in the application of alternative approaches and variants of straight line depreciation, which reflect factors such as technological obsolescence and stranding. These offset the advantages they may have; and
 - none of the alternatives in the context of the NBN is demonstrably superior to straight line depreciation such that they can reasonably be expected to result in more efficient outcomes.
4. *Please advise whether it is efficient for the SAU to have a 30 year term. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period, as well as the evolving market position of NBN Co over the proposed 30 year term.*

Synergies confirms that the 30 year term with limited intermediate reviews can reasonably be expected to deliver efficient outcomes for the following reasons:

- there is regulatory precedent in Australia for long term undertakings with review intervals that are considerably longer than 5 years;
- the economic and regulatory trade-offs that predispose long-term undertakings apply in respect of NBN Co. Specifically:
 - the requirement to allow a sufficient scope for infrastructure providers to recover their costs, particularly in environments where initial uptake (or the value of initially provided services) is low;
 - longer terms are desirable for new infrastructure projects in which the terms of the undertaking are a key consideration for prospective investors;
 - the need for sufficient time and certainty to allow complementary investments to take place in associated upstream and downstream markets that are likely to be significant drivers of demand for the service that is the subject of the undertaking;

- it increases incentives for the service provider to stimulate markets that rely on the service that is subject to the undertaking; and
 - there is scope within the SAU to allow changes to the terms and conditions of access in the event that circumstances change significantly;
 - additional safeguards within the SAU explicitly guard against inefficient outcomes including tariffs for Price Controlled Offers that are fixed until 30 June 2017 and thereafter subject to a cap on increases, limits on price increases of other services, and an overall revenue cap.
5. *Please advise whether NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the Initial Cost Recovery Account, is efficient. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period.*

Synergies confirms that NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the ICRA, can reasonably be expected to be efficient for the following reasons:

- capitalisation of revenue under-recovery is an accepted feature of undertakings, recognising that in the developmental stages of network businesses, usage may be below capacity. Pricing to recover all costs from a small initial base will exacerbate this, being likely to result in very high prices that deter access and use, giving rise to inefficiently low levels of uptake;
- most commercial investments in workably competitive markets commence with a period of low profitability or losses which, if they were to continue, would render an inadequate return on investment. Investors expect to recover these losses over the asset life;
- safeguards within the SAU and the context and circumstances of NBN Co can reasonably be expected to limit capitalised losses, specifically:
 - the governance arrangements that apply to NBN Co can be expected to prevent capitalised losses rising to a level where investors would no longer expect a return of and on capital;
 - the prudency requirements that apply to NBN Co under the SAU in respect of capital investments; and
 - the review mechanisms within the SAU and relevant statutes; and

- safeguards within the SAU and the context and circumstances of NBN Co can reasonably be expected to prevent the setting of prices that result in adverse efficiency consequences when the ICRA becomes large in comparison with the value of the RAB, specifically:
 - the requirement for geographically uniform prices, which would limit NBN Co's ability to charge higher prices in higher cost areas; and
 - the commitments made in the SAU in relation to initial prices of the Price Controlled Offers, the CPI/2 annual price cap on all products and the characteristics of demand for broadband services in the face of these pricing constraints.
6. *Please advise whether NBN Co's proposal for a single ICRA / RAB-based approach to cover all capital expenditure in respect of NBN Co fibre, wireless and satellite networks and related systems and platforms is efficient. In undertaking your analysis, please take account the following:*
- *in support of the Australian Government' s objective of enabling uniform national wholesale prices, NBN Co will be required to charge access seekers uniformly for services across its fibre, wireless and satellite networks and for its basic service (called the Basic Access Offer in the SAU), as set out in the Statement of Expectations provided to NBN Co by its shareholder ministers*
 - *NBN Co has set its initial prices to 'meet the market' as a means of ensuring the smooth migration of end user connections from legacy networks to the NBN and to also meet the Australian's Government's objectives of setting wholesale prices to achieve the "broadband take up targets agreed by Government through the NBN Co Corporate Plan and Business Case", again as set out in the Statement of Expectations (footnotes omitted).*

Synergies confirms that a single ICRA / RAB-based approach to cover all capital expenditure in respect of NBN Co's fibre, wireless and satellite networks and related systems and platforms can reasonably be expected to be efficient. In particular:

- Synergies considers that, subject to the constraints and safeguards set out in the SAU, efficient outcomes are more likely to be fostered if NBN Co is able to structure its wholesale prices so as to minimise its risks and maximise its revenues, provided revenues do not exceed costs. This is likely to be facilitated by flexibility to set initial prices outside of Price Controlled Offers;

- the risks of having to price to 'meet the market' in accordance with government expectations, are best managed by providing NBN Co with a degree of pricing flexibility; and
 - the single ICRA/RAB supports pricing flexibility in so far as it reduces the complexity associated with pricing compared to pricing based on hypothecated ICRA/RAB approaches. It is therefore a reasonably necessary mechanism for achieving uniform national prices that meet the market. In addition, it facilitates pricing flexibility for NBN Co, which can, within the constraints imposed on NBN Co by the SAU and its broader operating context, reasonably be expected to foster efficient outcomes.
7. *Please advise whether it is efficient for NBN Co to have flexibility in setting the initial price points for new products on the basis that NBN Co's existing suite of wholesale products as they exist at that time and the existence of alternative wholesale products is likely to provide an 'anchoring' or constraining effect on NBN Co's price setting behaviour.*

Synergies confirms that NBN Co's proposal for flexibility in setting the initial price points for new products can reasonably be expected to be efficient for the following reasons:

- the other provisions of the SAU are likely to:
 - constrain the prices within the bounds of stand-alone and incremental costs which, if exceeded, would be *prima facie* inefficient;
 - prevent NBN Co earning a monopoly profit;
 - prevent price changes adverse to the interests of access seekers;
- NBN Co's pricing and related decisions are not influenced by conflicts from vertical integration;
- NBN Co seeking to minimise the time to fully recover its losses within the constraints imposed by the SAU and NBN Co's circumstances is consistent with efficiency;
- NBN Co does not have strong incentives to set inefficient prices in response to a real as opposed to hypothetical risk of bypass, and is nonetheless limited in its scope to do so; and
- to the extent that NBN Co does gain more freedom over pricing by reason of customers migrating from the Price Controlled Offers in favour of a higher value, expanded range of services, this is likely to arise at or near a time of significant regulatory review.

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1 Introduction

Webb Henderson, acting for NBN Co Ltd and NBN Tasmania Ltd (together 'NBN Co'), has requested that Synergies Economic Consulting ('Synergies') provide independent advice on whether mechanisms in the Special Access Undertaking ('SAU')¹ given by NBN Co to the Australian Competition and Consumer Commission ('the Commission') under s 152CBA(2) of the Competition and Consumer Act 2010 ('the Act') are efficient.

The SAU sets out core terms and conditions of access to the National Broadband Network ('NBN') for access seekers including pricing principles that NBN Co proposes to adopt, the approach for determining the components of the regulatory asset base ('RAB') for determining NBN Co's maximum allowable revenue, and processes for modification to the RAB over time.

1.1 Instructions

Webb Henderson has instructed Synergies as follows:²

We kindly request your independent advice on whether key elements of NBN Co's SAU construct are efficient. In our instructions where we refer to "efficient" we direct you to consider the following three aspects of that concept as conventionally understood by economists: productive efficiency; allocative efficiency and dynamic efficiency. In assessing efficiency, you should approach this as an exercise of constrained optimisation, with the relevant constraints being those as set out in the Statement of Expectations, in particular the requirements on NBN Co to:

- recover costs plus a rate of return;
- adopt uniform national wholesale pricing; and
- roll-out a nationwide network with a specified mix of technology coverage and speed.

In particular:

- Please advise whether NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the Initial Cost Recovery Account, is efficient. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's

¹ 5 December 2011 NBN Co Special Access Undertaking in respect of the NBN Access Service given to the ACCC in accordance with Part XIC of the Competition and Consumer Act 2010

² Attachment 1 of correspondence to Sam Lovick, Principal of Synergies from Webb Henderson dated 16 January 2012 (footnotes omitted).

investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period.

- Please advise whether NBN Co's proposed 'building block model' and regulatory asset base methodology for the recovery of its costs following the expiry of the ICRA, and the use of an organisation-wide revenue cap to limit the expected net present value of NBN Co's prudently incurred investments to zero, is efficient.
- Please advise whether NBN Co's proposal for a single ICRA / RAB-based approach to cover all capital expenditure in respect of NBN Co's fibre, wireless and satellite networks and related systems and platforms is efficient. In undertaking your analysis, please take account the following:
 - in support of the Australian Government's objective of enabling uniform national wholesale prices, NBN Co will be required to charge access seekers uniformly for services across its fibre, wireless and satellite networks and for its basic service (called the Basic Access Offer in the SAU), as set out in the Statement of Expectations provided to NBN Co by its shareholder ministers
 - NBN Co has set its initial prices to 'meet the market' as a means of ensuring the smooth migration of end user connections from legacy networks to the NBN and to also meet the Australian's Government's objectives of setting wholesale prices to achieve the "broadband take up targets agreed by Government through the NBN Co Corporate Plan and Business Case", again as set out in the Statement of Expectations.
- Please advise whether it is efficient for NBN Co to adopt a straight line depreciation methodology for the term of the SAU.
- Please advise whether it is efficient for NBN Co to include its actual capital expenditure and operating expenditure into its ICRA / 'building block' calculations in the event that NBN Co has complied with the prudency processes that apply to NBN Co under Schedule 8 of the SAU.
- Please advise whether it is efficient for the SAU to have a 30 year term. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period, as well as the evolving market position of NBN Co over the proposed 30 year term.

- Please advise whether it is efficient for NBN Co to have flexibility in setting the initial price points for new products on the basis that NBN Co's existing suite of wholesale products as they exist at that time and the existence of alternative wholesale products is likely to provide an 'anchoring' or constraining effect on NBN Co's price setting behaviour.

1.1 The core components of NBN Co's SAU

The core elements of the SAU are set out below.

1.1.1 Clause 7 of the SAU

Clause 7 of the SAU sets out the end date of the undertaking as 30 June 2040. The term of the SAU is addressed in section 4.

1.1.2 Schedule 4 Price Controlled Offers

This Schedule sets out the Price Controlled Offers, prices for which are fixed until 30 June 2017, and thereafter limited to annual increases of CPI/2. These services are broadly similar to cable and ADSL+ broadband services currently available in most urban areas of Australia.

1.1.3 Schedule 5 Price Controls

This Schedule sets out the maximum regulated prices for the Price Controlled Offers, defines the Individual Price Increase Limit for all services, to CPI/2, with provision for the Commission to approve higher increases.

1.1.4 Schedule 6 Product Development and Withdrawal

This Schedule provides mechanisms for adding new or withdrawing old products and the role of the Product Development Forum ('PDF') and Public Ideas Forum ('PIF') in this process.

1.1.5 Schedule 7 Long Term Revenue Constraint Methodology

This Schedule defines how the maximum annual revenue that NBN Co can earn from its services (the revenue cap) is determined, including asset valuation, the regulatory asset base, treatment of losses, cost of capital, depreciation and operating expenditure. A considerable portion of this advice (notably, sections 2, 3, 5 and 6) relates to this Schedule.

1.1.6 Schedule 8 Prudency

This Schedule sets out the SAU mechanisms that aim to ensure that investment and operating costs are prudently incurred. This Schedule (read in the context of Schedule 9 on review and variation, and Schedule 10 on reporting) is extensively discussed in section 2.

1.1.7 Schedule 9 Review and variation of aspects of the SAU

This Schedule sets out the processes for assessing the performance of elements of the SAU (including the customer engagement and PDF process) and the SAU itself. The operation of these alongside the prudency provisions is central to Synergies' advice.

1.1.8 Schedule 10 Reporting

This Schedule sets out the reporting that NBN Co will provide the Commission.

1.2 Meaning of efficiency

Synergies has been asked to advise on whether elements of the SAU are efficient. This section summarises the concept of efficiency adopted by Synergies in providing its advice. As noted above, Synergies was instructed to:³

...consider the following three aspects of that concept as conventionally understood by economists: productive efficiency; allocative efficiency and dynamic efficiency. In assessing efficiency, you should approach this as an exercise of constrained optimisation, with the relevant constraints being those as set out in the Statement of Expectations, in particular the requirements on NBN Co to:

- recover costs plus a rate of return;
- adopt uniform national wholesale pricing; and
- roll-out a nationwide network with a specified mix of technology coverage and speed.

1.2.1 The concept of efficiency

The Australian Competition Tribunal ('Tribunal') has addressed the issue of efficiency in the context of examining the economically efficient use of, and the economically

³ Attachment 1 of correspondence to Sam Lovick, Principal of Synergies from Webb Henderson dated 16 December 2011.

efficient investment in, the infrastructure by which listed services are supplied, and the economically efficient operation of a carriage service, a telecommunications network or a facility. It has stated that the concept of efficiency in these provisions moves beyond the simple question of whether the operator is efficient in so far as it can recover all its costs, but should encompass the economist's notions of allocative, productive and dynamic efficiencies.⁴

Broadly, these require that prices should reflect costs (allocative efficiency), that costs should be efficiently incurred in the short and long term (productive efficiency), and that appropriate levels of innovation occur sufficient to engender efficient changes and improvements over time, including cost reductions (dynamic efficiency).

Notwithstanding the instructions to the same effect, Synergies concurs with and has adopted the Tribunal's approach to efficiency. For clarity of exposition, Synergies refers to mechanisms that deliver these three aspects of efficiency as delivering efficient outcomes. Efficiency in the context of the SAU should be determined by reference to the extent that it ensures, over its term, minimum costs and prices, high quality services, and development of new services.

The Tribunal has also characterised the incentive effects associated with under or over recovery of economically efficient investment costs:

Economically efficient investment by an access provider in infrastructure necessary to supply telecommunications services will be achieved when the firm is just able to recover the costs of such investment (inclusive of a normal rate of return on its investment). If the firm is unable to recover the costs of efficient investment, it will not undertake such investment. If the firm is able to recover more than the costs of its investment, it will have an incentive to expand investment beyond efficient levels.⁵

Synergies also concurs with this, and assesses efficiency by reference to whether businesses can expect to recover their total costs, whether there are safeguards that prevent excess or inadequate recovery, and whether there are mechanism in place that can reasonably be expected to prevent excessive costs or inadequate resourcing.

1.2.2 Workable competition and efficiency

The relevant question is then whether it is reasonable to rely upon the mechanisms set out in the SAU to deliver these outcomes, having regard to the requirements of

⁴ *Telstra Corporation Ltd (No 3)* [2007] ACompT 3, at [171].

⁵ *Telstra Corporation Ltd (No 3)* [2007] ACompT 3, at [159].

government policy and the other constraints that NBN Co faces. In this regard, Synergies notes that the rationale behind regulation is to increase competitive pressures in industries where workable competition is absent,⁶ on the basis that competition would otherwise deliver such an outcome.

On that basis, efficiency can be addressed by examining whether outcomes under the SAU can reasonably be expected to deliver outcomes similar to those that would be expected in a workably competitive market. The key insight from this metric is that it not reasonable to expect the SAU to deliver an outcome that is equivalent to an idealised market in which there is never a deviation from a competitive equilibrium. Rather, Synergies considers that the characterisation provided in the Dampier to Bunbury Natural Gas Pipeline judicial review decision is most appropriate, specifically:

The underlying theory and expectation of economists, however, is that with workable competition market forces will increase efficiency beyond that which could be achieved in a non-competitive market, although not necessarily achieving theoretically ideal efficiency.⁷

Synergies agrees with these positions, and that the metric of workable competition, which does not seek to impose some unachievable ideal, is appropriate in respect of determining whether outcomes are efficient. Consistent with the principles of workable competition set out in the Dampier to Bunbury Natural Gas Pipeline decision,⁸ this does not require that, at any one time the provider of access services is recovering precisely that amount. Rather, it allows for periods of higher or lower levels of recovery.

1.2.3 Additional considerations

In accordance with the instructions, Synergies notes the Ministerial Statement of Expectations⁹ which sets out the Government's expectation of certain broadband take up targets,¹⁰ achievement of which is likely to be affected by price levels, and uniform

⁶ National Competition Policy Review, August 1993, *National Competition Policy* (Commonwealth of Australia) ('The Hilmer Report') at 269.

⁷ *Ex Parte Epic Energy (WA) Nominees Pty Ltd & Anor* [2002] WASCA 231, at [128].

⁸ *Ex Parte Epic Energy (WA) Nominees Pty Ltd & Anor* [2002] WASCA 231.

⁹ Letter dated 17 December 2010 from Senator the Hon Penny Wong ad Senator the Hon Stephen Conroy to Mr Harrison Young, Chairman NBN Co Limited ('Statement of Expectations').

¹⁰ *Ibid*, at 10.

national wholesale pricing.¹¹ Synergies is advised that these are statements of Australian Government policy, and notes the instruction to treat these as constraints.¹²

In Synergies' view, it is the legitimate role of Government to establish policy that takes account of broader societal interests, including both negative and positive externalities, which are difficult, if not impossible, to consider under more narrowly drawn assessments of efficiency. Notwithstanding the instructions to the same effect, government policies such as national uniform wholesale pricing are, from an efficiency perspective, appropriately viewed as constraints rather than discretionary factors to be weighed. This advice proceeds on this basis, assessing efficiency on the basis that government objectives and policy, particularly uniform national pricing, are pre-requisites.

1.3 Principal authors

This advice has been prepared by Synergies Economic Consulting. The principal authors of the advice are Euan Morton and Sam Lovick. Their qualifications and experience are set out in Attachment A.

¹¹ Ibid, at 7.

¹² Brief to advice – Regulatory Asset Base (RAB) in NBN Co's special access undertaking. *Letter of instruction from Webb Henderson* 16 January 2012, at 8.

2 Prudency and the building block approach

Synergies has been asked to:

Please advise whether NBN Co's proposed 'building block model' and regulatory asset base methodology for the recovery of its costs following the expiry of the ICRA, and the use of an organisation-wide revenue cap to limit the expected net present value of NBN Co's prudently incurred investments to zero, is efficient.

and

Please advise whether it is efficient for NBN Co to include its actual capital expenditure and operating expenditure into its ICRA / 'building block' calculations in the event that NBN Co has complied with the prudency processes that apply to NBN Co under Schedule 8 of the SAU.

2.1 Summary of conclusions

Synergies conclusions in relation to the above questions are summarised below.

Synergies confirms that NBN Co's proposed 'building block model' and regulatory asset base methodology, and the use of an organisation-wide revenue cap to limit the expected net present value of NBN Co's prudently incurred investments to zero, can reasonably be expected to be efficient. In particular:

The building block approach

- the building block approach has been widely adopted by regulators in Australia;
- NBN Co's building block approach is similar to building block approaches adopted by regulators for determining maximum annual revenue requirements;

RAB valuation

- regulatory precedent on asset valuation outside of telecommunications, echoed by the Tribunal in its recent telecommunications decisions, indicates that a simple roll forward of asset values, as opposed to optimisation and revaluation, is not only reasonable but preferred;
- possible advantages of alternative approaches to asset valuation in the RAB (such as replacement cost and optimised asset valuation) are also attended by significant disadvantages;

- alternative approaches are more complex and less certain in respect of future outcomes, impacting investor confidence;
- in respect of forward looking and optimised valuation alternatives, which have been advocated in some past regulatory decisions as having efficiency benefits, it is difficult to draw any normative conclusion as to the efficiency or otherwise of asset values based on a hypothetical efficient new entrant (which is the typical basis for such optimisation) if, as a matter of practice, no such new entrant would arise. If, conversely, the entrant was a real and likely prospect, NBN Co can reasonably be expected to take account of this in its own decision making, without necessitating RAB revaluation;

Synergies confirms that the inclusion by NBN Co of its actual capital expenditure and operating expenditure into its ICRA / 'building block' calculations in the event that NBN Co has complied with the prudency processes under Schedule 8 of the SAU can reasonably be expected to be efficient. In particular:

Prudency provisions and customer engagement

- prudency and customer engagement are accepted regulatory tools for managing investment;
- in so far as the parameters and assumptions used in the process of investment assessment are robust, the prudency requirements for selecting and identifying investments can reasonably be expected to deliver efficient outcomes;
- the characteristics of NBN Co's customers are such that inclusion of a customer engagement and endorsement process in NBN Co's SAU in relation to the scope of network capacity expansions can reasonably be expected to prevent inefficient investment;
- the customer engagement processes allow customers to lodge valid objections and hence impede investments that are likely to be productively inefficient;

Other factors fostering productively efficient investment

- the requirement to review the operation of the customer engagement procedures on a 5 year basis;
- having regard to all the circumstances of NBN Co:
 - governance and investment pressures during the prolonged loss-making period, in combination with the SAU mechanisms, can

reasonably be expected to generate strong incentives to operate efficiently;

- if or when these pressures subside, or possibly earlier, Ministerial Declarations under the National Broadband Network Companies Act 2011 can reasonably be expected to trigger a comprehensive review of regulatory and operational arrangements to address shortcomings in any SAU or other regulations that govern NBN Co operations thereafter;
- in the absence of such declarations, the 2027 SAU review can reasonably be expected to address those same issues in a timely fashion;

Dynamic efficiency and innovative investments

- the SAU contains a reasonable mechanism for facilitating innovative investments which is necessary in order to foster dynamic efficiency;

Operating cost efficiency

- the SAU, given the context and circumstances of NBN Co, provides incentives to minimise operating costs, for the following reasons;
 - NBN Co will have strong incentives to be productively efficient in the Initial Cost Recovery Period, for at least as long as it is incurring losses relative to its annual revenue requirement;
 - for the same reasons as noted above, NBN Co's SAU will be subject to extensive review at or around the time that these pressures might be expected to subside;
 - meeting the objective of achieving value for money and lowest overall Total Cost of Ownership is consistent with operating cost efficiency, and identification of the inclusion of inefficiently high operating costs in the ABBRR could be deemed a breach of the SAU;
 - the Commission can obtain information necessary to assess SAU compliance to the extent that the information disclosure set out in the SAU is insufficient; and
- collectively, these can reasonably be expected to deliver efficient outcomes.

2.2 The building block approach

2.2.1 NBN Co's building block model

Schedule 7 of NBN Co's proposed SAU sets out the Long Term Revenue Constraint Methodology that it proposes to apply. This is essentially a building blocks model (described in Section 4) which will be used to determine the revenue that NBN Co will be entitled to recover through its prices (subject to the pricing requirements detailed in clause 3 of the SAU).

The general characteristics of the Long Term Revenue Constraint Methodology are similar to the standard building blocks model (i.e. prices based on the asset base and prudent capital and operating expenditure). Specifically:

- the annual revenue requirement is to be determined by:
 - the nominal Regulatory Asset Base ('RAB') in relation to the determination of the return on and of capital;
 - prudent operating expenditure;
 - tax allowances; and
 - the Annual Construction in Progress Allowance.
- the return on capital component of the annual revenue requirement will be determined by applying the Weighted Average Cost of Capital ('WACC')¹³ to the RAB;
- the return of capital component will be determined in accordance with the straight-line depreciation method; and
- the model is to include a mechanism whereby revenue under and over-recoveries in a financial year are incorporated into the annual revenue requirement for the following financial year.

Each of the above features are broadly consistent with the components of the building block models that are applied to calculate the annual revenue requirements of other regulated infrastructure providers.

The duration of the SAU is longer than for most undertakings submitted to the Commission, and relates to broadband services which have seen rapid technological

¹³ Synergies has not been asked for advice on the setting of WACC and therefore does not discuss required rate of return.

change over recent decades. It is important to examine the treatment of the RAB and the inclusion of capital expenditure incurred by NBN Co in that light.

There are some differences between the NBN Co methodology and the features commonly found in other undertakings, which for the reasons set out below reflect the circumstances and context of NBN Co. Specifically:

- there is no provision for 5 year price or revenue reviews (excepting review of customer engagement), which are commonly found in other undertakings;
- there is no express mechanisms that would allow the Commission to set or disallow investments or operating cost expenditure, as is usually included in standard building block models; and
- the SAU includes a loss capitalisation mechanism in respect of losses incurred in the initial cost recovery period of the undertaking.

These aspects of the Long Term Revenue Constraint Methodology in NBN Co's SAU are discussed in the following sections.

2.2.2 Application of the building block approach

The building blocks model is universally applied by economic regulators in Australia to determine the revenue requirements for major infrastructure service providers. For example, the building blocks approach is prescribed under clause 6.3.2(a) of the National Electricity Rules as the method to be adopted to determine the annual revenue requirement for Distribution Network Service Providers. In September 2010, the Commission stated that it intended to move to a building block pricing model in the regulation of wholesale fixed line telecommunications services pricing and in doing so noted the wide application of the model:¹⁴

The ACCC has used a building block pricing model (also known as a regulated asset base, or "RAB" model), which calculates prices based on the assets and costs associated with providing the regulated services. It is consistent with the ACCC's approach in other regulated industries.

Under the building block methodology, a 'bottom up' approach is adopted to establish a regulated price for a service which is intended to approximate a competitive market outcome. The overall objective of the building blocks approach is to benchmark the rates of return that are expected to be generated for the owners of like facilities.

¹⁴ 'ACCC proposed new simpler approach for wholesale fixed line telecommunications services pricing', 17 September 2010, DOA: 25/11/2011; <http://www.accc.gov.au/content/index.phtml/itemId/947485>.

A key benefit to the building blocks approach is that it involves a comprehensive approach to estimating each element that makes up the total cost of providing the regulated service. The estimation of the cost of service enables the annual revenue requirement of the business to be determined. The form of regulation that is applied then determines whether this annual revenue requirement is set as the businesses' revenue cap or whether a price cap is determined with reference to forecast demand. The approach is designed to ensure that the infrastructure provider is fully compensated (but not over-compensated) for the deemed cost of providing regulated services, including earning a risk-adjusted return.

2.3 RAB valuation

In accordance with clause 3.2 of Schedule 7 of NBN Co's SAU, the RAB upon which NBN Co's return on and of capital is to be based is to be calculated by reference to 'real capex' incurred in each financial year. Real capex is defined in the undertaking as the real capital expenditure incurred in the relevant financial year on a prudent basis in connection with the design, engineering and construction of the relevant assets, adjusted to reflect the timing of actual capital expenditure during that financial year.

The implication of the above definition is that the RAB is to be calculated based on actual capital expenditure incurred (i.e. prudently incurred capital expenditure is to be automatically incorporated into the RAB). The RAB will comprise the actual cost of assets depreciated on a straight line basis, subject to no revaluation for a 30 year period. The annual revenue requirement for and depreciation of the RAB are based on the *nominal* RAB, which is the value of the RAB multiplied by the Cumulative Inflation Factor (i.e. indexed by inflation).

Telecommunications and broadband markets have exhibited rapid technological change over the last three decades, with significant decreases in real prices and improvements in the range, quality and performance of the services on offer. These changes have been driven in large part by the dramatic changes in the cost and capabilities of the assets used to deliver those services. It is therefore necessary to ask whether, over the long term of the SAU, the forgoing approach to the RAB and depreciation can reasonably be expected to give efficient outcomes even though the depreciated value of the assets as recorded in the RAB may not, at some future date, reflect the cost of service provision using the best available technology at the time.

Synergies concludes that the adopted approach can reasonably be expected to deliver efficient outcomes, given that:¹⁵

- possible advantages of alternative approaches (such as replacement cost and optimised asset valuation) are associated with disadvantages; and
- mechanisms within the SAU and intrinsic to NBN Co's circumstances can reasonably be expected to prevent excessive capital investment, to the extent that such an outcome is more likely to arise under actual cost valuations.

2.3.1 The use of actual costs in the RAB

The NBN Co SAU essentially determines the RAB based on Depreciated Actual Cost ('DAC'). Under that approach and in the face of technological and demand changes, the value of the assets in the RAB can, over time, diverge from the prices that a hypothetical new entrant might offer. There are asset valuation approaches which, when combined with appropriate depreciation modalities, seek to address this.

Forward looking optimised approaches

In the past, the Commission's approach to assessing the reasonableness of access prices for telecommunications services has been based on the application of a TSLRIC+ modelling approach resulting in prices being determined for individual services. Under the Commission's TSLRIC+ framework, asset values have not been locked in and rolled forward but rather have been subject to revaluation and optimisation at each regulatory review reflecting the current cost of best in use technology. The TSLRIC+ approach adopted by the Commission incorporates a notion of optimisation. For example, the Commission noted:¹⁶

The ACCC considers that assets should be re-valued periodically to reflect a current hypothetically efficient network under TSLRIC+ in each regulatory period.

The TSLRIC+ approach has been subject to considerable criticism and the Commission has acknowledged that the continued use of this approach may need to be reviewed:¹⁷

¹⁵ Synergies also notes that the selection of WACC, asset valuation, depreciation and mechanisms for determining the annual revenue requirement must be consistent with each other. Synergies has not been asked to address WACC, and proceeds on the basis that WACC is so consistent .

¹⁶ ACCC April 2009 Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking Final Decision Public Version p.269

¹⁷ ACCC 2007 Assessment of FANOC's Special Access Undertaking in relation to the Broadband Access Service – Draft Decision p. 86

...it is the ACCC's assessment that its use of a TSLRIC+ based approach to access pricing in the past does not bind it to such an approach in perpetuity and it is open to access providers to propose alternatives as appropriate...

The approach, being based on a hypothetical new entrant, gave considerable concern to the Tribunal, who noted:

What a hypothetical market for the ULLS would look like, and what sort of prices would prevail in it, are very difficult to ascertain in the current circumstances; more so than was the case at the time when the ULLS was declared, because since that time the nature of the fixed-line market has become very uncertain with the proposed investment in the NBN coming on top of what was already a clear trend towards Telstra pushing fibre further and further towards customers' premises, thus reducing, over time, the extent of the ULLS.

... the Tribunal has a basic difficulty with the proposition that the costs of a hypothetical new entrant, at least as modelled by Telstra, should form the basis for the access price.¹⁸

And then went on to welcome a review of the approach by the Commission, suggesting a 'more appropriate pricing methodology might be, for example, to apply a "regulated asset base" approach, like that used in relation to other regulated infrastructure providers.'¹⁹

Optimisation approaches elsewhere

Other regulators have typically estimated RABs using the Depreciated Optimised Replacement Cost ('DORC') approach to establish the value of the *initial* RAB. DORC measures the current cost of replacing existing assets with assets that are optimised and adjusted for depreciation. Optimisation is designed to ensure that any over-engineered, over-designed or redundant assets in excess of current requirements for service delivery are excluded from the asset base while depreciation adjustments take account of the situation where the existing assets' remaining service lives are less than that which would be expected from a new asset.²⁰

These cases have applied to pre-existing or legacy asset bases rather than greenfield investments. This should be considered in assessing previous Commission decisions. The Commission has taken the DAC method into consideration when establishing the

¹⁸ *Telstra Corporation Limited* [2010] ACompT 1, at [197, 198].

¹⁹ *Ibid* [199].

²⁰ The depreciation of the asset base is not an important issue in this case due to the greenfields nature of the NBN.

RAB for gas pipeline assets and telecommunications networks, but has preferred optimised valuations on the basis that DAC fails to take into consideration market conditions at the time the new regulations are imposed, and may not provide appropriate incentives with regards to the efficient use of, and investment in, infrastructure. The disadvantages of the DAC or DHC method were noted by the Queensland Competition Authority ('QCA') in its 2004 draft decision on the Dalrymple Bay Coal Terminal ('DBCT') initial access undertaking:²¹

...given that historical cost valuations do not have any relation to market values or current replacement costs, the Authority considers that they therefore do not provide the appropriate economic signals for future investment or consumption of services by users.

The QCA also noted the advantages of the DORC method in terms of its ability to approximate outcomes that are consistent with those that would be expected from competitive markets:²²

The advantage of a replacement cost approach, such as DORC, is that it better approximates the actual cost of a new entrant into the market, thereby more closely replicating the outcomes that might be expected from a competitive market. It allows for technological change so that assets can be valued in a way that reflects current technology.

It is for these reasons that the DORC method is most commonly applied to determine the value of the initial RAB by all economic regulators in Australia.

The notion of optimisation is also included in some implementations of DORC and optimised deprival value ('ODV'). These approaches determine forward-looking asset value for the RAB, but also adjust the mix and sizes of assets to reflect expected demand for the services those assets supply. Optimisation can operate in a manner similar to the 'used and useful' test used in many US regulatory frameworks,²³ and can value existing assets based on smaller sized assets consistent with expected demand.

2.3.2 Discussion

In Synergies' view, the problems noted by the Tribunal are likely to arise in the future under any approach to the RAB involving revaluation and optimisation.

²¹ Queensland Competition Authority (2004). Draft Decision - Dalrymple Bay Coal Terminal Draft Access Undertaking, p 124-5.

²² Queensland Competition Authority (2004), p 125.

²³ Whereby assets are removed from the RAB if they are not used or are not useful.

These difficulties include, for example, defining what new technologies might be used in the future, the extent to which they change costs, and the extent to which they rely upon the legacy network to which it is assumed they would interconnect.²⁴ Accordingly, it is difficult to envisage a forward looking costing regime that would result in lower risk and lower cost to end-users than the proposal put forward in the SAU.

As a practical matter, regulation outside of telecommunications appears to have accepted this. Optimised valuations are confined to establishing an initial regulated price for a regulated business that has substantial legacy assets that predate the commencement of the regulations or undertaking.

Thereafter, once an initial RAB value has been set for a regulated entity, it is standard practice for regulators to adopt a 'roll-forward' mechanism in setting the opening RAB value at the commencement of each subsequent regulatory period. This involves adjusting the RAB value to account for efficient capital expenditure incurred, inflationary gain and the depreciation of the asset base. It is not standard practice for regulators to conduct a revaluation of the asset base after an initial RAB has been established.

This approach is demonstrated in the QCA's response to QR's claim for the inclusion of initial equity raising costs in the opening RAB for its 2005 access undertaking (noting that the initial RAB had been established by the QCA in 2001). The QCA's 2005 decision made the following statement in response to QR's request:²⁵

The Authority considered that, if it were to allow initial equity raising costs, it would reopen the entire regulatory asset base, and this would be inconsistent with the line-in-the-sand approach taken in relation to the asset base.

The standard roll-forward mechanism has also been adopted by the Commission for ARTC's Hunter Valley network. This is despite the initial RAB value having been established when the responsibility for the regulation of the network did not lie with the Commission (ARTC's Hunter Valley network was previously regulated by IPART). The regulation of the network transferred to the Commission for ARTC's most recent undertaking. In its 2009 Explanatory Guide for its proposed access undertaking, ARTC proposed to set the initial RAB for existing assets by rolling forward the DORC values

²⁴ For a fuller review of the issues arising in forward looking costing models see Ergas H (1998) SLRIC, TELRIC and Other Forms of Forward-Looking Cost Models in Telecommunications: A Curmudgeon's Guide. *Centre for Research in Network Economics and Communications The University of Auckland*

²⁵ QCA (2005). Decision: QR's 2005 Draft Access Undertaking, p 51.

set under the NSW Rail Access Undertaking. This approach was approved by the Commission in its March 2010 draft decision:²⁶

The ACCC's preliminary view is that the roll forward of the NSWRAU regulatory asset values is likely to be appropriate when having regard to the factors under section 44ZZA(3) of the Act.

Calculation of the RAB based on actual capital expenditure incurred as set out in the SAU does not allow for the retrospective assessment of the prudence and efficiency of previously incurred capital expenditure. That is, the value of the RAB under the SAU will not be materially affected by either technological obsolescence, demand driven stranding or inadequate forecasting.

NBN Co's situation differs from most regulated sectors, such as QR or Telstra, in that there are no legacy assets and so there is no case for determining an initial optimal asset value using either a DORC or TSLRIC type approach.

2.3.3 The principle of expected full cost recovery

There is basic agreement that the prices of service provision should be based on the costs of provision, and that *ex ante* investors expect full cost recovery in the sense of the return of their capital and an appropriate return on the capital they have provided. Investors will be reluctant to supply funds, or will require a higher return on their contributed funds, if they are not confident of this outcome. In regulated businesses that have natural monopoly characteristics, the regulatory bargain sets this out. NBN Co proposes to achieve this necessary level of investor confidence by:

- not selecting an approach based on future optimisation, so substantially reducing the risk that investors will perceive a mismatch between their return of capital through depreciation, and loss of asset value through *ex post* asset optimisation by a regulator;
- constructing a RAB that properly reflects the value of invested capital as and when it is added;
- providing an appropriate return on that invested capital by allowing an appropriate WACC; and
- repaying the capital to the investors through straight line depreciation.

²⁶ ACCC (2010). Australian Rail Track Corporation Limited - Hunter Valley Coal Network Access Undertaking Draft Decision, p 491.

2.3.4 Complexity

In Synergies' view, an appropriate regulatory bargain can be struck based on actual cost with straight line depreciation, or upon a forward looking optimised valuation approach in which depreciation takes account of anticipated technological changes and demand driven stranding. However, the latter forward-looking cost approaches introduce complexity through the revaluation process itself and through the schedule of depreciation that must be applied if investors are to be confident of both a return of and on capital. It is precisely these complexities that the Tribunal referred to in its 2010 Telstra decision.²⁷

Actual cost approaches have the benefit of simplicity. The procedures for valuation and auditing valuations are well understood and widely accepted. Statutory accounts generally value assets using historic (written down) costs and the approach is very important for that reason alone.

The same simplicity arguments apply in respect of depreciation. Regulators have preferred a straight line depreciation approach on the basis of its simplicity and transparency together with historical precedent.²⁸ Straight line depreciation is the default approach used by the AER,²⁹ although one of the primary concerns in respect of the energy sector is to prevent windfall gains if assets are re-valued upwards.³⁰

2.3.5 Prices that appear higher than a notional entrant's price

It is possible that NBN Co's prices under the SAU for some products and services may be higher than those that could be provided by a notional new entrant provider (as embodied in, for example, TSLRIC approaches to telecommunications prices) or hypothetical new entrant. However, it would be erroneous to equate such prices (using forward-looking valuation in the RAB under DORC or TSLRIC) with efficient prices or outcomes.

It is difficult to draw any normative conclusion as to the efficiency or otherwise of hypothetical entrant prices if, as a matter of practice, no such new greenfield provider would in practice arise. If, conversely, the entrant was a real and likely prospect, it would not be reasonable to consider that NBN Co would fail to consider the entrant in setting its prices or making investment or operating decisions.

²⁷ *Telstra Corporation Limited* [2010] ACompT 1, at [197, 198].

²⁸ QCA April 2005 Final Determination of Electricity Distribution Prices p.130

²⁹ AER June 2008 Final decision Electricity distribution network service providers Roll forward model p.4

³⁰ Technological obsolescence is modest for most energy and power transmission infrastructure.

The prospect of NBN Co earning a monopoly return for its shareholders is precluded by setting the maximum revenue equal to costs. When reviewing prices for individual services or bundles of services, absent a realistic prospect of entry, considerable regard must be paid to minimising the risk of failing to meet investors' expectation of full cost recovery.

In Synergies' view, it is reasonable to believe that the prospect of some *ex post* revaluation of assets under a DORC or TSLRIC standard, in the face of uncertain demand and technological change, would be seen by investors as excessively risky.³¹ It is precisely the *ex ante* commitment not to undertake such a review which provides confidence to attract investment. Furthermore, given the economic characteristics of the NBN, it is not reasonable to believe that entry on anything other than a niche or small scale is feasible. Synergies does not consider that the hypothetical prices of such an entrant, whose characteristics are highly uncertain and which does not appear commercially credible on anything other than a niche scale, is a sensible basis for setting NBN Co's future prices and revenue requirements.

Furthermore, the risk that future prices may deviate from the prices that would be set using new technology may be small. The Commission noted the rapid technological change in telecommunications technology and identified the need for the regulatory regime to adopt an approach reflecting current best in use technology rather than the cost of a technology that no one would now implement thereby leading to the potential for inefficient bypass.³² However, the Commission then goes on to state that this risk is likely to be much lower than originally thought:³³

...the concerns expressed in the 1997 Pricing Principles Guide – that measuring the costs of this infrastructure on a historic, rather than replacement cost, basis would lead to inflated access prices which would encourage inefficient bypass – may, in hindsight, have been overstated, given that the cost of replacing the infrastructure has been rising.

Synergies notes that the revenue that NBN Co can earn never exceeds costs incurred (including capital related costs) during the term of the SAU. Furthermore, given the large joint, common fixed and sunk costs associated with the NBN and the price

³¹ The actual risk is that the allowed depreciation (which must include a component for the optimised out obsolescence) is in practice very different from and lower than the optimised out value.

³² ACCC December 2009 Review of 1997 Guide to Telecommunications Access Pricing Principles for Fixed Line Services Discussion Paper p.18

³³ Ibid p.30

constraints in the SAU, the range between stand-alone and incremental costs³⁴ is likely to be very large, such that it is reasonable to consider that prices will not move outside of these bounds while the SAU operates.

2.3.6 Conclusions in respect of the RAB valuation

In Synergies' view, the approach to RAB valuation and projection in the SAU can reasonably be considered to be efficient on the basis that:

- the building block approach has been widely adopted by regulators in Australia;
- NBN Co's building block approach is similar to building block approaches adopted by regulators for determining maximum annual revenue requirements;
- regulatory precedent on asset valuation outside of telecommunications, echoed by the Tribunal in its recent telecommunications decisions, indicates that a simple roll forward of asset values, as opposed to optimisation and revaluation, is not only reasonable but preferred;
- possible advantages of alternative approaches to asset valuation in the RAB (such as replacement cost and optimised asset valuation) are also attended by significant disadvantages;
- alternative approaches are more complex and less certain in respect of future outcome, impacting investor confidence; and
- in respect of forward looking and optimised valuation alternatives, which have been advocated in some past regulatory decisions as having efficiency benefits, it is difficult to draw any normative conclusion as to the efficiency or otherwise of asset values based on a hypothetical efficient new entrant (which is the typical basis for such optimisation) if, as a matter of practice, no such new entrant would arise. If, conversely, the entrant was a real and likely prospect, NBN Co can reasonably be expected to take account of this in its own decision making, without necessitating RAB revaluation.

³⁴ Generally, the widest price range that prevents inefficient bypass or inefficiently subsidised prices so that they are below marginal cost.

2.4 Efficient investment and the RAB

The foregoing addresses whether the building block and RAB valuation approaches in the SAU are a reasonable means of determining revenues that are likely to be efficient. It is also necessary to address whether the level and type of investment that NBN Co makes under the SAU can reasonably be expected to reflect efficient levels.

Under the SAU, NBN Co is in effect allowed to recover its operating costs, earn a rate of return on its assets valued on the basis of their acquisition costs, and recover those acquisition costs. This is similar to the rate of return model of regulation that was the corner stone of US utility regulation. In its simplest form and absent other measures, rate of return gives only weak incentives to manage overall costs resulting in productive inefficiency in the form of excessive costs. This is the well-known Averch Johnson 'gold plating' effect³⁵ of over-investment and cost padding. Incentive based regulation (or CPI-X regulation) which was introduced in the UK and is widely adopted in Australia aimed to combat the productive inefficiency deficiencies of rate of return regulation by including incentives to improve efficiency (in the form of allowing the regulated firm to retain, for a short period at least, the extra profits from lowering costs below the allowed revenue cap).

In Synergies' view, the fundamental premise of the NBN Co SAU is as follows:

- prudence provisions establish reasonable processes and criteria for determining efficient investments; and
- appropriate engagement with well-informed customers provides a reasonable mechanism to ensure the prudence provisions operate properly to exclude inefficient but include efficient investments.

Synergies addresses each of these in turn and concludes that the terms of the SAU, particularly in respect of the prudence provisions, and the context and circumstances of NBN Co substantially mitigate the risk of productive inefficiency. On that basis, Synergies confirms that the mechanisms within the SAU for determining the size of the RAB can reasonably be expected to be efficient.

Synergies believes that it is necessary to determine whether the prudence provisions and customer engagement processes can reasonably be expected to prevent productive inefficiency, particularly (but not only) in respect of network changes.

³⁵ Averch, H. and L. Johnson, "Behavior of the firm under regulatory constraint." *American Economic Review*, 1962, 52, 1052-68

2.4.1 The prudency provisions

Schedule 8 of NBN Co's SAU contains provisions which outline the basis on which NBN Co will be permitted to include prudently incurred capital and operating expenditure in the determination of its revenue requirement. Clause 5 of this Schedule sets out the requirements that NBN Co must adhere to when undertaking network changes in order to meet the Prudent Design Condition. Similar prudency provisions can be found in other undertakings and regulated sectors (see Attachment B).

In order to meet the Prudent Design Condition, NBN Co is required to comply with the following requirements:

- identify the need for the network change;
- identify and assess the network change options; and
- select the appropriate network option (based on criteria in clause 5.6).

Identifying the need for the network change

For product-related network changes, the identified need will relate to the change required in connection with the introduction of the new, varied or enhanced product component or feature. However, in the case of Other Network Changes,³⁶ the access undertaking includes several potential types of identified need. These include the replacement of network assets; augmentation of capacity, extension of the geographic footprint of the network; the realisation of efficiency gains; introduction of new technology, features or functionality; and any other reason not related to the introduction of a new or varied product component or feature.

Identification of network change options

NBN Co is to take account of a range of factors when considering which network change options may be viable to implement and therefore appropriate for consideration in the options analysis.

³⁶ An 'Other Network Change' is defined as a network change other than that which impacts on the product components or associated product features, including network changes that would result in the introduction of a new product component or feature, or in a variation, change or enhancement to an existing product component or feature.

These factors include:

- the total cost of ownership and economic life of the associated assets;
- long-term planning;
- the availability of infrastructure, capital and resources;
- the network upgrade pathway and product roadmap;
- investment practices of other network owners and operators;
- operational complexities and technical and operational quality issues;
- the likely effect on demand for existing product components and features; and
- open access, non-discrimination obligations and the wholesale only status.

Assessment of the network change options

NBN Co is essentially provided with two options under clause 5.6 of the SAU in terms of identifying its preferred network change option. The first option is to select the network change option that is most likely to maximise net economic benefit compared to the likely outcome without the network change option (i.e. select the option that maximises economic welfare relative to the *status quo*).

The second option is to select an alternative option (i.e. other than the option that maximises net economic benefit). In the event that NBN Co selects a preferred network change option in accordance with this provision, it must provide its assessment of the difference in net economic benefit between this alternative option and the option that would maximise net economic benefit and its reasons for choosing the alternative option.

NBN Co must meet the following requirements in determining which network option change to select:

- identify material benefits that could be delivered by each option, including:
 - likely effect on demand, performance, functionality or features in relation to existing product components or features;
 - price effects;
 - cost effects including reductions in costs for access seekers and end-users, reduction in capital and/or operating expenditure, and cost savings due to differences in the timing of investment;
 - competition benefits;
 - any additional option value;
- quantify the classes of benefits which are determined to be material; and
- consider benefits as material unless it can be identified that a particular benefit is likely not to materially affect the outcome of the assessment or the cost associated with quantifying the benefit would be prohibitive.

NBN Co is also required to consider and estimate the costs associated with the network change options. These include costs associated with the impacts on the prices of product components or features, likely capital and operating expenditure, and the cost of complying with laws, regulations and administrative requirements.

The SAU also outlines a set of requirements with which NBN Co is required to comply in assessing the identified network change options. These include undertaking sensitivity analysis, identifying the methods for valuing specific inputs and including an assessment of various scenarios in its analysis. The level of analysis required is to be proportionate to the scope and size of the required network change. Requirements are also to be imposed on NBN Co in relation to the engagement of independent experts and vendors during the options analysis and the treatment of the advice or feedback that is provided.

Following the completion of the options analysis process and the selection of the preferred network change option, NBN Co will be required to publish an NBN Co Prudency Implementation Paper which is to be published on its website. This paper is to include:

- the network change options identified;
- a summary of the initial options assessment;
- the estimated capital and operating expenditure to be incurred under each option;
- where the option with the greatest net economic benefit is not selected as the preferred option:
 - an assessment of the difference in net economic benefit between the preferred alternative option and the option with the greatest net economic benefit; and
 - the reasons for the selection of the alternative option.

Following the publication of the NBN Co Prudency Implementation Paper, NBN Co will be required to seek endorsement for its preferred option, either from customers in accordance with the customer engagement and endorsement process or from the Commission. For Other Network Changes, NBN Co must seek endorsement from the Commission.³⁷

NBN Co processes and efficiency

As set out in the SAU, the prudency requirements in respect of network changes move considerably beyond the typical project appraisal undertaken by an investor, which would tend to solely focus on whether the investment earned an appropriate return. The procedure set in Schedule 8 clause 5 also requires that the benefits accruing to access seekers and end-users are also considered in determining the economic benefits of the investment. Other than its exclusion of costs or benefits that might be considered externalities (under clause 5.6(e)(i)), it determines the social benefits of the investment.

³⁷ The customer engagement and endorsement process is only available for product-related network changes.

Notwithstanding the exclusion of externalities, which Synergies considers entirely appropriate given their speculative nature, Synergies notes that there are two parts to the optimal efficient investment rule (i.e. investment that maximise social welfare) namely that:

- the project delivers net economic benefits; and
- the project is the least costly of those that can deliver the benefits.

Synergies considers that the requirement to present different options and sensitivity analysis, not simply the preferred option, can be considered to meet the second criteria and the definition of benefits in the provisions meets the first. On that basis, and subject to the caveat that the parameters and assumptions used in the modelling are robust, this should confine investments to those that are likely to be efficient.

In respect of implementation of the selected investments, the NBN Co procurement rules set out in clause 9.3 of Schedule 8 combining good competitive tendering, contract management and monitoring and audited conformance with good industry practice can reasonably be expected to result in efficient least cost implementation.

The SAU also allows NBN Co to select investments that do not maximise the net economic benefits. However, in so doing, NBN Co must report on the reasons for so doing and provide an assessment of the difference in benefits between the selected and benefit maximising options (Schedule 8, clause 5.8(a)(iv)). It is common in assessments of the efficiency of investments to include non-quantifiable or qualitative considerations in decision making. Seen in this light, the SAU is reasonable given that the reporting of this additional information provides a basis for customers to object and a basis for assessing whether the objections satisfy the requirements of the undertaking, which processes (for the reasons presented below) can reasonably be expected to deliver efficient outcomes.

Conclusion on the prudential process in respect of investment

Synergies confirms that, subject to the operation of the customer engagement process discussed below, and in so far as the parameters and assumptions used in the process are robust, the prudency requirements in respect of selecting and identifying investments can reasonably be expected to result in efficient outcomes.

2.4.2 Customer engagement

The foregoing sets out the mechanics for assessing network changes. The results of that process are then subjected to the customer engagement process. Customer engagement processes are an accepted feature of regulatory regimes (see Attachment C).

Clause 6 of Schedule 8 of NBN Co's SAU sets out the process that NBN Co will be required to adhere to in order to have expenditure relating to a Network Change endorsed as prudent by customers. Clause 5.8 of Schedule 8 states that, upon completion of its initial assessment of the Network Change Options, NBN Co will be required to prepare an NBN Prudency Implementation Paper, which is to be made available for customer consultation through the PDF. NBN Co will then be required to seek endorsement either from customers in accordance with clause 6 of Schedule 8, or the ACCC in accordance with clause 7 of Schedule 8.³⁸

NBN Co's key requirements under the provisions in clause 6 are as follows:

- invite customers to make submissions in relation to the NBN Prudency Implementation Paper in accordance with a published timetable, which is to include a reasonable period for consultation (through workshops, written submissions or other means);
- publish all formal written submissions on its website;
- make the necessary amendments to the NBN Prudency Implementation Paper based on the submissions provided; and
- at the conclusion of the consultation period, publish an updated paper and notify customers of a period (no less than 20 business days) within which they may notify NBN Co of any objections.

Customers may object (under clause 6.4(b)) to the preferred option put forward by NBN Co 'if the Customer has a reasonable basis for such an objection based on an error by NBN Co in the application of the criteria in clause 5.6.' For a customer to be able to object to the preferred option, it must have been involved in the consultation process.

If a customer objects and NBN Co wishes to proceed with its preferred network change option, then a prudency dispute will ensue, in which case NBN Co must, within 60 business days, submit the objection and its response to the Commission for resolution. The relevant provisions set out in clauses 6.4 and 6.5 of Schedule 8 of the SAU will then

³⁸ In relation to an 'Other Network Change', NBN Co will only be permitted to seek endorsement from the ACCC through the provisions contained within Clause 7.

apply to resolve the dispute. The SAU provides that the Commission will be the entity responsible for resolving the prudency dispute.

In the event of a prudency dispute, the Commission must accept that NBN Co's preferred option is the option that maximises the net economic benefit relative to the other options, unless the Commission considers that:

- an alternative identified option to NBN Co's preferred option would maximise the net economic benefit; or
- an option that has not been considered by NBN Co throughout the process would maximise the net economic benefit.

In either of the above cases, it must be the view of the Commission that the net economic benefit of the alternative option would materially exceed the economic benefit of NBN Co's preferred option.

If the preferred option selected by NBN Co is not the option that maximises the net economic benefit and that option is subject to a prudency dispute, the Commission will approve NBN Co's preferred change if:

- it meets the identified need;
- there is a greater economic benefit compared with the situation where no option is implemented; and
- the design scope is not materially different to that which a prudent operator would consider to be reasonable.

In the event that there is no prudency dispute initiated (or a dispute is lodged and the Commission accepts NBN Co's preferred option as reasonable), the option will be considered to be endorsed and NBN Co will publish the NBN Prudency Implementation Paper on its website as a document endorsed by the PDF.

2.4.3 Appropriateness of the customer endorsement process

While a mechanism which provides for regulated infrastructure providers to secure customer pre-approval for the scope of capacity expansions does provide certain benefits (as outlined above), it is not appropriate for inclusion in all regulatory regimes.

For a customer pre-approval process to be appropriate, it is important that the customer base is well-informed with regards to the capacity of the infrastructure and the nature of capacity expansion works. This is evidenced by the observation that up until this point, such approval processes have been implemented in the context of rail

access infrastructure and port terminal capacity where the customer base consists of large mining companies. These companies possess a high level of knowledge on the capacity of the supply chain and the need for expansions and are therefore well-placed to determine whether the scope of a proposed expansion is prudent.

NBN Co's customer base will consist of telecommunications service providers.³⁹ These customers are large companies that are well established in the industry and possess a high level of knowledge on telecommunications network services and network capacity. As with large mining companies, these wholesale service providers are appropriately positioned to assess the prudence of any proposed investments in network capacity expansions.

The inclusion of a customer engagement and endorsement process in NBN Co's SAU in relation to the scope of network capacity expansions is therefore considered to be appropriate.

The test for objections

The test for whether a customer can object to a proposed network change, which in Synergies' view would be the main avenue that could be used for the making of productively inefficient investments, is that 'a Customer may only object to NBN Co's preferred Network Change Option if the Customer has a reasonable basis for such an objection based on an error by NBN Co in the application of the criteria in clause 5.6.'

Clause 5.6 sets out a broad set of criteria which, in Synergies' view, are consistent with ensuring that the resultant investment is consistent with the productively efficient investment. The term 'error' may be interpreted either broadly or narrowly. Clause 5.6 necessitates, in Synergies' view, considerable modelling, quantitative and qualitative assessment which will require a range of input assumptions and forecasts. Recognising that persons can reasonably differ in respect of such assumptions, provided that the term 'error' extends to include assumptions that would reasonably be considered to be erroneous, extreme, systematically biased or inconsistent then clause 6.2(b) in Schedule 8 should allow customers to lodge valid objections to investments that are likely to be productively inefficient.

³⁹ For example, NBN Co wholesale customers include Telstra, Optus, iiNet, Primus, Internode, Telcoinbox, AAPT and Macquarie Telecom.

2.5 Other factors fostering productively efficient investment

There are a series of factors that, in practice, further reduce the risk, under the SAU, that NBN Co will over-invest. In particular:

- the prolonged loss-making period which will reduce incentives to over-invest or inappropriately invest;
- if or when these pressures abate, the possibility of Ministerial directions which can reasonably be expected to trigger a comprehensive review of regulatory and operational arrangements;
- a review of the SAU in 2027; and
- the requirement to review the operation of the customer engagement procedures every 5th year.

The first three of these factors are discussed in detail in section 2.7 below which relates to operating cost.

Reviews of customer engagement

The requirement for the Commission to review the customer engagement process against set criteria (Schedule 9, clause 2.2(b)(i)-(vi)), is an additional safeguard against productive inefficiency. In the event that these mechanisms appear not to be resulting in productively efficient investment, clause 2.2(b)(vi) of Schedule 9 requires that the Commission review 'whether the customer engagement process and the PDF Processes are encouraging the economically efficient use of the NBN Co Network.'

In Synergies' view, this requires an examination of investment and operating costs. It could operate, for example, if the customer objection mechanism was routinely disallowing reasonable objections (because NBN Co did not make an error in application of the criteria) in respect of network changes, were those objections based on, for example, different but valid views of future demand, and this appeared to the Commission to give rise to the risk of productive inefficiency.

2.5.1 Conclusion in respect of the customer endorsement process

Synergies confirms that the adoption of a customer engagement process whereby well informed customers are able to object to and impede productively inefficient investment and, through other means, stimulate efficient investments, can be an effective proxy for the disciplines that would otherwise be placed on a provider in a

workably competitive market. The proposed approach in the SAU can therefore reasonably be expected to deliver efficient outcomes, on the basis that:

- prudence and customer engagement are accepted regulatory tools for managing investment;
- the characteristics of NBN Co's customers are such that inclusion of a customer engagement and endorsement process in NBN Co's SAU in relation to the scope of network capacity expansions can reasonably be expected to prevent inefficient investment;
- in so far as the parameters and assumptions used in the process of investment assessment are robust, the prudence requirements for selecting and identifying investments can reasonably be expected to deliver efficient outcomes;
- the customer engagement processes allow customers to lodge valid objections and hence impede investments that are likely to be productively inefficient;
- the requirement to review, the operation of the customer engagement procedures on a 5 year basis; and
- having regard to all the circumstances of NBN Co:
 - governance and investment pressures during the prolonged loss-making period, in combination with the SAU mechanisms, can reasonably be expected to generate strong incentives to operate efficiently;
 - if or when these pressures subside, or possibly earlier, Ministerial Declarations under the National Broadband Network Companies Act 2011 can reasonably be expected to trigger a comprehensive review of regulatory and operational arrangements to address shortcomings in any SAU or other regulations that govern NBN Co operations thereafter; and
 - in the absence of such declarations, the 2027 SAU review can reasonably be expected to address those same issues in a timely fashion.

2.6 Facilitating innovative investments

There is also an issue as to whether the SAU includes the necessary provisions and arrangements to provide the incentives necessary to facilitate innovative investment to ensure that dynamic efficiency is achieved. The Commission has previously noted the

importance of considering all three forms of efficiency, including dynamic efficiency, in assessing the efficiency of investment in communications infrastructure:⁴⁰

The ACCC considers that efficient investment occurs when competitors build a new network that results in better service potential, as measured in productive, allocative and/or dynamic efficiency outcomes.

This position has been confirmed by the Tribunal.

The PDF is to play an important role in ensuring that the appropriate mechanisms are in place to encourage innovative investment.

An issue of concern in relation to the effectiveness of this mechanism is that it must not inhibit the disclosure and development of ideas for innovative investments due to concerns held by major wholesale customers with respect to confidentiality issues (i.e. customers with an idea for an innovative network investment may be hesitant to disclose the details of this investment in the PDF). The PDF processes set out in Annexure 1 of Schedule 6 make provision for such confidentiality, and establish a mechanism for seeking the waiver of confidentiality should it be necessary to the identification and development of ideas for innovative investment. There is also provision within the SAU in Schedule 9 clause 2 for review of the PDF on a periodic basis which should determine in a timely manner if it is not sufficiently effective.

The Public Ideas Forum may contribute to ensuring that ideas for innovative investment are pursued under the SAU. Unlike the PDF, this forum is not restricted to NBN Co customers only, and is open to all parties. While it may foster innovation, it should be noted that the parties contributing to it (expected to be predominantly end users) are likely to lack the knowledge held by customers, for example, the patterns of demand, commercial costs, the realities of implementing major network investments, and the implications for the viability of innovative investments.

Synergies confirms that the SAU contains a reasonable mechanism for facilitating innovative investments which is necessary in order to foster dynamic efficiency.

2.7 Operating cost considerations

A key difference between the Long Term Revenue Constraint Methodology detailed in NBN Co's SAU and the standard building block approach is the absence of an express efficiency mechanism in relation to operating expenditure. It is standard practice for

⁴⁰ ACCC (2009). Assessment of Telstra's Unconditioned Local Loop Service Band 2 monthly charge undertaking. Final Decision - Public Version, p 103.

economic regulators to implement a CPI-X mechanism in the building blocks model to encourage service providers to achieve efficiencies with respect to operating expenditure (see Attachment D for three examples). While the SAU includes a CPI/2 limitation on price increases, for the reasons set out below, Synergies does not characterise this as an incentive mechanism aimed at cost efficiency. Even so, without such an express mechanism within the SAU, NBN Co will have strong incentives to be productively efficient with respect to its operating expenditure as follows:

- from the obligation to achieve the lowest overall cost of ownership;
- in the Initial Cost Recovery Period, for at least as long as it is incurring losses relative to its annual revenue requirement such that its capitalised losses in the Initial Cost Recovery Account are accumulating;
- Ministerial declarations under s 48 and s 50 of the *National Broadband Network Companies Act 2011* trigger comprehensive review of the operation of the SAU, which can be expected to address operating inefficiency; and
- in the event that no such declarations are made, a review of the SAU in 2027 that can be expected to address whether the SAU is fostering efficient operating costs.

Synergies does not consider that the CPI/2 provision should be considered as a mechanism that is necessarily capable of fostering efficient investment and operating costs as it does not apply to total revenues, but only to the prices of services that then combine into total revenues. Rather, Synergies views the CPI/2 mechanism primarily as a measure to ensure price continuity and stability over time, such that access seekers making downstream sunk investments have a degree of commercial certainty over future access terms and conditions.

Total cost of ownership

The SAU imposes obligations on NBN Co to meet the lowest Total Cost of Ownership (e.g. Schedule 8 clauses 3.2(b) and 10.1(c)), which is defined to minimise 'all costs incurred or likely to be incurred over the economic life of the Relevant Assets calculated on a net present value basis, including Capital Expenditure, Operating Expenditure and costs that arise in connection with upgrades or expansions of the Relevant Assets (including expansions of the capacity, functionality and geographic reach of the Relevant Assets).'

In Synergies' view, if capital investment is efficient and prudent (an issue discussed in section 2.4 above), then this objective is consistent with delivering efficient levels of operating costs. Accordingly, to the extent that the Commission or another person

identifies that NBN Co is including inefficiently high operating costs in the ABBRR, it can under the Act seek a court order that NBN Co is in breach of its SAU.

Incentives to be productively efficient in the initial period

Synergies confirms that NBN Co will have strong incentives to be productively efficient in the Initial Cost Recovery Period, for at least as long as it is incurring losses relative to its annual revenue requirement such that its capitalised losses in the Initial Cost Recovery Account are accumulating.

These losses are capitalised in the expectation but not certainty of future recovery. Accordingly, Synergies considers that it is reasonable to expect that the managers of NBN Co will face pressure through the investment community and normal governance arrangements to minimise investment and operating costs, where it is possible to do so within its contractual and other obligations in respect of service type, quality and standards. This pressure can reasonably be expected to curtail productively inefficient operating costs in that this would constitute an effective mechanism for reducing the risk of non-recovery of capitalised losses.

Incentives in contemplation of privatisation or fully built and operational

Clause 3.2(a) of Schedule 9 of the SAU provides for a comprehensive review of the operation of the SAU in the period:

- extending from the date that a declaration is made by the Communications Minister that the NBN should be treated as built and fully operational under section 48 of the *National Broadband Network Companies Act 2011*; to
- the date that declaration made by the Finance Minister that conditions are suitable for the entering into and carrying out an NBN Co sale scheme takes effect under section 50(6) of the *National Broadband Network Companies Act 2011*.

If the review contemplated under clause 3.2(a) of Schedule 9 does not commence by 30 June 2027, the SAU review is to take place between the period from 1 July 2027 and 30 June 2028.

Furthermore, under section 49 of the *National Broadband Network Companies Act 2011*, the Productivity Minister can refer to the Productivity Commission a range of matters in respect of the NBN, including regulatory arrangements. While the referral is discretionary, Synergies considers that its express inclusion in *National Broadband Network Companies Act 2011* is significant: in the event of concern over the efficiency of outcomes, a referral would be an effective mechanism for triggering review and possible change to the regulatory arrangements.

Synergies considers that the actions triggered by this SAU provision and the potential for review contemplated in the *National Broadband Network Companies Act 2011* can reasonably be expected to ensure that NBN Co behaves and operates in a manner consistent with efficient outcomes.

Subsequent constraints on excessive operating costs

The performance of the SAU in respect of operating costs must also be examined in the event that such Ministerial declarations are not forthcoming and NBN Co does achieve the level of financial security in respect of its capitalised losses.

In Synergies' opinion, the presence of the following factors is necessary to be reasonably confident that operating costs are efficiently incurred in such circumstances:

- incentives to minimise operating costs;
- mechanisms for ensuring that these incentives do not result in adverse quality of service; and
- knowledge of the extent of any inefficiency.

In workably competitive markets, incentives to lower costs subject to maintaining quality derive from the adverse competitive consequences of not doing so, which also provides the impetus for management accounting in order to determine the scope for efficiency gains. As noted above, governance arrangements can reasonably be expected to perform a similar role when operating costs are a material determinant of losses and investors (particularly equity investors) are exposed to the risk of failing to recover those losses. When these incentives and governance arrangements do not apply, regulators are commonly tasked with ensuring these outcomes.

Provision of information to the Commission

Schedule 10 of the SAU requires NBN Co to submit to the Commission on an annual basis what appears to be comprehensive data on the RAB, forecasts of expenditure by asset type and operating cost class, and compliance reports certifying the prudence of expenditure in the previous financial year. While Synergies has not seen drafts of these various reports, they contain, in principle, the information that the Commission might itself request if it were making a determination of whether costs were prudently or efficiently incurred. Subject to NBN Co forming an agreement with the Commission as to their exact contents, Synergies confirms that these reporting requirements are a reasonable mechanism for informing an assessment of productive inefficiency. Synergies also understands that, in the event that the Schedule 10 reports do not, in the

Commission's view, provide the necessary data to make assessments on NBN Co's compliance with the SAU, it has the power to secure additional data. Based on this, Synergies is satisfied that the Commission can obtain information necessary to assess SAU compliance to the extent that the information set out in the SAU is insufficient.

Quality of service standards

While not express in the SAU, Synergies understands that standards of quality of service will be managed through the Network Design Rules and customer contracts. Synergies infers this from the obligations in the prudency provisions including, for example, Schedule 8, clause 8.2(c)(iv), which states in respect of approving network changes 'which are reasonably necessary to establish and maintain the quality, reliability and security of the NBN Co Network or the supply of the Product Components.'

Incentives to minimise operating costs

Synergies accepts that, in aggregate, these conditions, particularly conformance with the lowest overall cost of ownership, would, if enforced, be likely to result in productively efficient operating costs. While the SAU does not set out explicitly how these proposed tests are to be implemented, in respect of efficiency it is nonetheless reasonable when considered in the context of:

- the other incentive mechanisms operating on NBN Co to reduce costs;
- the SAU requirement for lowest overall cost of ownership, which is consistent with minimum efficient costs, failure of which would constitute a breach of the undertaking; and
- the powers of the Commission in respect of reporting (which facilitate demonstration of lowest overall cost of ownership) and suspected breaches of the undertaking.

The importance of timelines and subsequent review

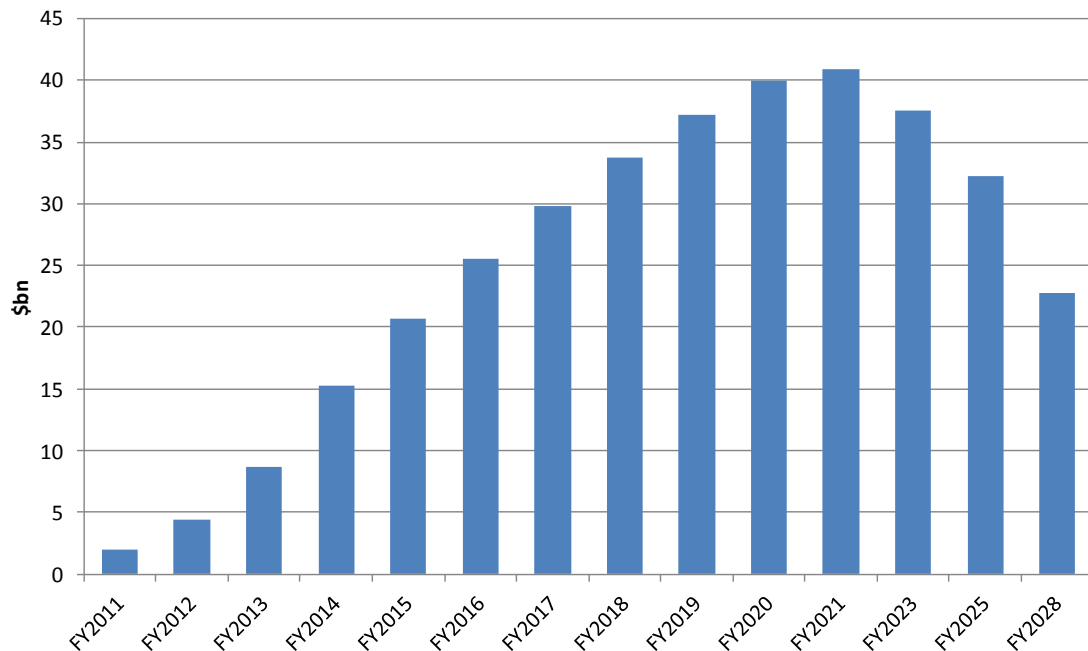
In Synergies' view, incentives for NBN Co to minimise operating costs are likely to be weaker if NBN Co is confident of full cost recovery. Figure 1 shows NBN Co's expected total funding requirement over the period to 2028, showing a progressive accumulation to \$40bn over the 10 year network roll-out period to 2021.⁴¹ The large total funding requirement, the long time period over which it accumulates, the

⁴¹ The minimum unlevered funding requirement is also reported at \$37.1bn. *NBN Co Limited Corporate Plan 2011 – 2013*, 17 December 2010, at 139.

inherent uncertainty over future demand and the constraints on pricing within the SAU and from government policy, indicate that NBN Co will not be confident of full-cost recovery (i.e. NBN Co will not be certain whether it will be able to achieve full cost recovery) at least until 2021 and in all likelihood for several years beyond that date. During this period for the reasons noted above, Synergies expects investment and governance incentives to be effective in minimising costs.

Synergies’ concerns in respect of productive inefficiency arise principally in the period subsequent to 2025 in the absence of Ministerial declarations. Synergies notes, however, that in the absence of such declarations, under Schedule 9, clause 3.2(b) NBN Co is required to review the SAU, including those components relevant to operating costs and capital expenditure in the period between 1 July 2027 – 30 June 2028. This review must be considered by the Commission. The review process set out in Schedule 9 of the SAU is, in Synergies’ view, a reasonable mechanism for determining whether the SAU in operation prior to that date was or will continue to be effective in dealing with inefficient investments and operating costs. Since it will commence no later than 2027, the review process can be reasonably considered timely having regard to NBN Co’s expected operational and financial performance.

Figure 1. Expected total funding requirement



Source: Exhibit 10.3, *NBN Co Limited Corporate Plan 2011 – 2013*, 17 December 2010.

2.7.1 Conclusions in respect of operating costs in the building block

The SAU can reasonably be expected to provide adequate information on operating costs to allow the Commission to assess NBN Co's performance, and Synergies understands that any shortcomings in this regard can be addressed using existing Commission powers under the Act.

On this basis, the SAU, given the context and circumstances of NBN Co, provides incentives to minimise operating costs, for the following reasons;

- NBN Co will have strong incentives to be productively efficient in the Initial Cost Recovery Period, for at least as long as it is incurring losses relative to its annual revenue requirement, through its governance framework and investment pressures;
- for the same reasons as noted above in respect of prudent investment, NBN Co's SAU will be subject to extensive review at or around the time that these pressures might be expected to subside;
- meeting the objective of achieving value for money and lowest overall Total Cost of Ownership is consistent with operating cost efficiency, and identification of the inclusion of inefficiently high operating costs in the ABBRR could be deemed a breach of the SAU; and
- the Commission can obtain information necessary to assess SAU compliance to the extent that the information disclosure set out in the SAU is insufficient.

When these are considered, Synergies considers that the SAU can reasonably be expected to deliver efficient outcomes.

3 Depreciation of the RAB

Synergies has been asked to:

Please advise whether it is efficient for NBN Co to adopt a straight line depreciation methodology for the term of the SAU.

3.1 Summary of conclusions

Synergies confirms that straight line depreciation can reasonably be expected to be efficient for the following reasons:

- the approach is widely adopted in financial markets, corporate accounting and regulatory practice;
- there are considerable complexities involved in the application of alternative approaches and variants of straight line depreciation, which reflect factors such as technological obsolescence and stranding. These offset the advantages they may have; and
- none of the alternatives in the context of the NBN is demonstrably superior to straight line depreciation such that they can reasonably be expected to result in more efficient outcomes.

3.2 Adoption of straight line depreciation

Schedule 7 of NBN Co's proposed SAU sets out the Long Term Revenue Constraint Methodology to be used to determine the annual revenue requirement under the building block methodology. In accordance with clause 8.1 of Schedule 7, real straight-line depreciation is to be used for the purpose of calculating the depreciation allowance in the calculation of the RAB in each financial year. The real straight-line depreciation is defined as the sum of the straight-line depreciation of the real capex value of each asset type incurred prior to and including the relevant financial year, using the asset lifetimes in table 8.1 of Schedule 7.

3.3 The purpose of depreciation

The purpose of depreciation is to determine the consumption of capital from one period to the next, meaning the loss of economic value of the asset from one period to the next, which investors hope to recover from the charges they levy for the use of that asset over the same period. If investors fail to recover this periodic diminution in value (including any depreciation that contributes to the ICRA and is expected to be recovered in subsequent time periods), they will not get a return of their capital.

Depreciation in the context of the SAU has to be considered in this light. Unless investors expect their investment to be returned (i.e. they expect total depreciation to equal their investment), they will not invest.

In the context of the discussion of optimising asset valuation frameworks in Section 2.3 above, if assets are re-valued downwards to reflect, for example, stranding or obsolescence then investors, in order to be willing to invest, reasonably expect to recover that diminution through depreciation.

Estimating true economic depreciation is difficult because of the large range of factors that can influence the value of an asset from one period to the next. These include wear and tear, change in the cost of replacements, reduction in the value of its output due to, for example, improved quality from elsewhere, etc. This is particularly difficult over long time periods. As a result, rules that seek to approximate economic depreciation are used, of which straight-line depreciation is one example.

3.4 Straight-line depreciation in economic regulation

Straight-line depreciation involves calculating the current residual asset value as: the remaining asset life expressed as a proportion of the total asset life, multiplied by the current replacement cost, less any estimated residual or salvage value that the asset may have. The straight-line method allocates an equal amount of depreciation each period until the value of the RAB has been written down to its estimated scrap value at the end of its useful life. The main advantages of this approach are that it is simple and transparent in its application, is well understood, and is consistent with the depreciation approach used in financial reporting of most publicly listed companies. It is most appropriate for assets where the rate of decline in the economic value of the asset base is relatively consistent. The main disadvantage with the straight-line method is that it does not necessarily correspond with actual asset consumption over time.

The straight-line method is the standard depreciation approach applied by the Australian Energy Regulator (AER), the Commission and the jurisdictional regulators. This was noted by the ACCC in its 2011 discussion paper on the final access determinations for declared fixed line services:⁴²

Use of straight line depreciation is consistent with the approach adopted by the ACCC and AER for other regulated industries.

⁴² ACCC (2011). Discussion paper – Public inquiry to make final access determinations for the declared fixed line services, p 103.

However, there are a small number of cases where regulators have approved alternative depreciation profiles for specific assets due to exceptional circumstances. Some examples include:

- the AER recently accepted Ergon Energy's claim for accelerated depreciation in relation to assets destroyed by Cyclone Larry;
- the Commission effectively approved the deferral of depreciation allowances for the initial access agreement for the Central West Pipeline by adding a value for economic depreciation to the initial RAB; and
- the Commission approved an accelerated depreciation profile for the initial access arrangement for the Amadeus Basin to Darwin Pipeline based on the projected usage of the pipeline and the risks of partial stranding after the conclusion of the foundation contract in 2011. The AER adopted a straight-line approach in its assessment of depreciation for the pipeline's 2011 access arrangement.

The Commission's decision with respect to the Amadeus Basin to Darwin Pipeline is of particular significance given the relevance of stranding risk to the NBN. In its final decision, the Commission acknowledged the appropriateness of the pipeline owner's proposed accelerated depreciation profile, noting the degree of stranding risk to which the pipeline was exposed:⁴³

Based on the information provided, the Commission is satisfied that there is sufficient evidence to support NT Gas' assertion that the ABDP is likely to face a risk of stranding after 2011.

...

The Commission believes that its approach to accelerated depreciation appropriately reflects the projected usage of the pipeline and the risks of partial stranding after 2011. ... Future developments in the gas market may, however, affect the risk of stranding faced by NT Gas. The Commission will monitor these developments and reassess the risk of stranding and the value of the pipeline in subsequent revisions.

Despite the above instances, straight-line depreciation is still clearly the preferred method of depreciation used by economic regulators. For example, the QCA has

⁴³ ACCC (2002). Final Decision - Access Arrangement proposed by NT Gas Pty Ltd for the Amadeus Basin to Darwin Pipeline, p 67-8.

consistently applied straight-line depreciation across all regulated infrastructure providers under its jurisdiction, largely for the reasons already set out.

Of particular relevance is the Commission's recent decision to apply straight-line depreciation in determining prices for declared fixed line services. The straight-line approach was applied despite both Telstra and Optus proposing alternative depreciation profiles. Telstra proposed that a method be adopted which would result in the front-loading of depreciation. The rationale underpinning Telstra's approach was that the economic lives of its CAN and core assets should be truncated in response to the roll-out of the NBN. In contrast, Optus' proposal involved the back-ending of the depreciation profile to ensure that Telstra is not over-compensated in the period prior to it establishing an agreement with NBN Co. The Commission made the following statement on its decision to adopt a straight-line depreciation profile:⁴⁴

The ACCC considers that the straight line depreciation methodology remains appropriate. It does not consider that front-loading or back-loading of depreciation is warranted since payments under the proposed deal between Telstra and NBN Co are expected to compensate Telstra for unrecovered depreciation on assets no longer used to provide the fixed line services following the roll-out of the NBN.

Straight-line depreciation has also been consistently applied for the purpose of determining regulated prices for long-lived assets. This is demonstrated by the use of the straight-line method to determine regulated prices for DBCT, QR Network's coal network and ARTC's Hunter Valley network.

3.5 Depreciation, obsolescence and asset stranding risk

The building blocks model under NBN Co's SAU includes a loss capitalisation mechanism whereby revenue shortfalls in the short-term are to be capitalised into the ICRA. This effectively constitutes a back-loading of the depreciation profile (i.e. a higher proportion of the return of capital component being recovered in the later years as opposed to the early years of the regulatory period), in so far as the depreciation cost that is not recovered in the year in which it is incurred is added to the ICRA for recovery in subsequent periods.

While this mechanism deals with the risk of under-recovery in the initial years of operation, it does not address the asset stranding risk to which NBN Co might be subject given the lengthy duration of the proposed undertaking and the prospect of technical change in the telecommunications sector. If the depreciation profile were to

⁴⁴ ACCC (2011). Discussion paper – Public inquiry to make final access determination for the declared fixed line services, p 105.

be altered to address this asset stranding risk, it would be appropriate to front-end the depreciation profile in a similar manner as was approved by the Commission in relation to the Amadeus Basin to Darwin Pipeline.

Noting these concerns, there are considerable difficulties in determining a reasonable depreciation profile on these principles, specifically:

- the rate of technological obsolescence is difficult to predict, and as the Commission has previously noted in the context of fixed telecommunications networks, may be much lower than originally thought;⁴⁵
- even if there is technological obsolescence, it is far from clear that this would, in a workably competitive market in which large sunk costs were required, result in entry based on new technology. For reasons noted in Section 2, it is important not to equate a hypothetical new entrant with the actual prospect of entry; and
- even if it were possible to make an appropriate estimate, the benefit of relying upon it would be much diminished by the expected duration of the Initial Cost Recovery Period.

3.6 Summary

For the reasons set out above, Synergies confirms that straight line depreciation can reasonably be considered to be efficient given the surrounding context of a RAB based on actual costs, its widespread use in regulatory and commercial accounting, and the complexity of alternatives.

⁴⁵ See footnote 33

4 Term

Synergies has been asked to:

Please advise whether it is efficient for the SAU to have a 30 year term. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period, as well as the evolving market position of NBN Co over the proposed 30 year term.

4.1 Summary of conclusions

Synergies confirms that the 30 year term with limited intermediate reviews can reasonably be expected to deliver efficient outcomes for the following reasons:

- there is regulatory precedent in Australia for long term undertakings with review intervals that are considerably longer than 5 years;
- the economic and regulatory trade-offs that predispose long-term undertakings apply in respect of NBN Co. Specifically:
 - the requirement to allow a sufficient scope for infrastructure providers to recover their costs, particularly in environments where initial uptake (or the value of initially provided services) is low;
 - longer terms are desirable for new infrastructure projects in which the terms of the undertaking are a key consideration for prospective investors;
 - the need for sufficient time and certainty to allow complementary investments to take place in associated upstream and downstream markets that are likely to be significant drivers of demand for the service that is the subject of the undertaking;
 - it increases incentives for the service provider to stimulate markets that rely on the service that is subject to the undertaking; and
 - there is scope within the SAU to allow changes to the terms and conditions of access in the event that circumstances change significantly;
- additional safeguards within the SAU explicitly guard against inefficient outcomes, including tariffs for Price Controlled Offers that are fixed until 30

June 2017 and thereafter subject to a cap on increases, limits on price increases of other services, and an overall revenue cap.

4.2 Duration of access regimes in Australia

The typical duration of access undertakings or, more properly, intervals between the regulatory review of access terms and conditions under such approved access regimes, is 5 years. However, there are examples of access arrangements that have materially longer time intervals between reviews.

4.3 Precedent from other industries

The National Gas Code⁴⁶ (now superseded by the National Gas Rules)⁴⁷ provided scope for access arrangements of any duration. However, if the proposed period was greater than five years, the regulator was required to consider whether mechanisms should be included in the access arrangement to address the potential risk that forecasts, on which terms of the proposed access arrangement are based, subsequently prove to be incorrect. The National Gas Code provided the following examples of mechanisms for guidance:

- triggers for early submission of revisions based on the service provider's profitability or the value of services reserved in contracts;
- changes to the type or mix of services provided; and
- the return of some or all revenue or profits in excess of a certain amount to users.

Under the National Gas Rules (which applied from 2008), there is a 'general rule' that access arrangements last for a period of five years before review. The regulator may also approve dates that do not conform with the general rule, if it is satisfied that the dates are consistent with the national gas objective and the revenue and pricing principles. In light of the above guidance in the applicable regulatory framework, gas pipelines (transmission and distribution) have typically had access arrangements applying for a period of approximately 5 years. However, there are exceptions which have extended the term to as long as 14 years.

⁴⁶ See <http://www.coderegistrar.sa.gov.au/>

⁴⁷ See <http://www.aemc.gov.au/Gas/National-Gas-Rules/Current-Rules.html>. See also, the lead legislation, National Gas (South Australia) Act 2008.

4.3.1 Central West Pipeline

On 31 December 1998, AGL Pipelines (NSW) Pty Limited (AGLP) submitted a proposed access arrangement for the Central West Pipeline (CWP) to the Commission. The Commission's final decision allowed a 10 year review period. The Commission recognised in its decision the risks associated with a new regional pipeline that had, from the outset, considerable uncontracted surplus capacity, stating:

The Commission's approach has been to recognise the risks AGLP faces with the CWP and, where possible, balance those risks through the regulatory framework while determining a high ex-ante cost of equity for AGLP of 15.4 per cent. In addition to providing explicit incentives and rewards through the regulatory framework the Commission has decided not to adjust AGLP's projected demand volumes or costs. Most importantly, the Commission has decided to accept AGLP's proposal to capitalise early 'losses' so that they can be recovered once demand grows and to allow AGLP an extended initial access arrangement period which would allow AGLP the opportunity to earn higher returns than suggested by the ex-ante regulated rate of return.

In its earlier Draft Decision, the Commission had accepted a 4½ year term, but proposed that a review of the arrangements would be triggered when, in effect, profits reached threshold levels.⁴⁸ The purpose of the proposed contingent review was to balance the interests of customers in lower prices should AGLP exceed its forecasts and the benefits of incentives on AGLP to promote the development of the gas market. That was subsequently revised to a fixed 10 year term that:⁴⁹

- provided a greater opportunity to recover a stream of revenue that covers efficient costs, particularly when determination of the duration of the period is asymmetric in nature;
- did not distort investment decisions; and
- provided a significant incentive to AGLP to develop the natural gas market.

The Commission noted that the extended period would give AGLP the opportunity to retain all 'excess' revenues during the period. Whether AGLP is able to do that will depend on whether it is able to outperform its forecasts and the extent of that out-performance. Similarly, the Commission noted the likelihood of under-

⁴⁸ ACCC September 1999 Draft Decision Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline p.90

⁴⁹ ACCC June 2000 Final Decision Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline p.121

performance/outperformance is equal. To outperform and retain this for 10 years should provide AGLP with a substantial increase in the actual rate of return for the business. To underperform and carry the result for the period could be a significant burden. However, the Commission noted that AGLP has the right to seek revisions at any time.

4.3.2 Central Ranges Pipeline ('CRP')

The CRP has an access arrangement approved for 14 years (2005 - 2019).⁵⁰ This approval occurred in the context of a tender process approved by the Commission under the National Gas Code. The tender process resulted in the approval of a number of tender outcomes, including the reference tariffs that may be charged until 2019.

For reference tariffs determined through a competitive tender process, the National Gas Code requires that the regulator must be satisfied that the commencement date for revisions to be included in the access arrangement is:⁵¹

'not later than 15 years after the Access Arrangement for the proposed Pipeline is approved'.

Alternatively, the revisions commencement date can be a later date if it is considered appropriate by the regulator on the basis of the proposed tariffs.

Therefore, the 'revision commencement date' of 2019 for the CRP was determined as part of the tender process, and subsequently approved by the Commission in its approval of the access undertaking in December 2005.

4.3.3 Dawson Valley Pipeline ('DVP')

The Commission approved an access arrangement term for the Dawson Valley Pipeline (Qld) for an 8 year period from 2007-2015, with a review trigger where throughput is in excess of 25% of forecast. This was the term proposed by DVP.

In its decision,⁵² the Commission considered that an access arrangement period longer than the typical five years is suitable for the DVP at this time. When combined with the major event trigger, the Commission considered that Anglo Coal has the opportunity to earn a greater return than suggested by the benchmark rate of return specified in the decision while the interests of prospective users are reasonably protected.

⁵⁰ Central Ranges Pipeline Pty Limited Access Arrangement for Central Ranges Pipeline November 2005 p.3

⁵¹ National Third Party Access Code For Natural Gas Pipeline Systems s.3.33(d)

⁵² ACCC, Draft Decision, Access Arrangement for Dawson Valley Pipeline, 23, May 2007, p. 92 - 96

The Commission noted that an extended access arrangement period for the DVP provides Anglo Coal with:

- a greater opportunity to recover a stream of revenue that covers efficient costs (s. 8.1(a)) of Code); and
- a greater incentive to reduce costs and develop the market (s. 8.1(f) of Code).

The Commission considered that, while both of these aspects of s. 8.1 are important for the DVP, given the pipeline's expected excess capacity, Anglo Coal would have a strong incentive to seek to promote and take up any opportunities to improve throughput as they arise. An extended access arrangement period increases these incentives as any improvements that Anglo Coal can achieve can be retained for a longer period.

4.3.4 ARTC Interstate Rail Access Undertaking

Access arrangements in excess of 5 years have also been allowed in interstate rail. In July 2008, the Commission accepted ARTC's Interstate Access Undertaking, which applies for a 10 year term.

ARTC originally proposed a 5 year regulatory term. However, in 2008, it instead proposed a 10 year term, arguing that this longer term would increase certainty in the industry and promote greater commitment and investment by network users.⁵³ It also considered it would assist in achieving the modal shift from road to rail that underpins its investment in the North-South corridor, as this shift depends on complementary investment in above rail assets.

ARTC noted that the risk associated with a longer term lies with ARTC, as it would be making a commitment in an industry environment that is yet to stabilise. However, it believed that the benefits for industry investment, growth and sustainability outweigh the risks. ARTC proposed not to provide the Commission with detailed revenue and expenditure forecasts for the whole period, but instead, projected ceiling and floor limits and revenue out for two years, and provided the Commission with a new set of 5 year capital expenditure estimates during the fifth year of the undertaking.

The Commission accepted the 10 year proposal, including a mechanism for review after 5 years. The review would be undertaken by ARTC to help identify if there is a need to seek an amendment.

⁵³ ACCC July 2008 Final Decision Australian Rail Track Corporation Access Undertaking - Interstate Rail Network s.D.2.3.

The Commission identified that:

- a longer term provides scope to maximise cost recovery (by providing an environment for more above rail investment and growth in use of rail services);
- a 10 year term may help promote efficient investment in above rail services, as the investment time for an above rail operator investing in terminal, locomotives and rolling stock is typically 10 to 20 years;
- to the extent that a longer undertaking facilitates investment, it will also promote competition in the rail industry;
- rail access regimes have been operating for some years and are well understood, with few formal disputes about access to the ARTC network. Therefore, the industry is not so unstable as to warrant a review after 5 years;
- the proposed review of operation of undertaking in 5 years will help identify if there is a need for ARTC to seek an amendment to the undertaking; and
- ARTC was unlikely to reach the regulatory ceiling over the proposed 10 year term, so ARTC's circumstances are unlikely to change to the point that reconsidering the access regime is warranted.

4.3.5 Foxtel

The Commission accepted a SAU from Foxtel in relation to its digital set top unit service⁵⁴ which would operate for a period of 8 years.

4.4 Issues predisposing longer undertakings

These cases clearly establish the range of economic and regulatory trade-offs that long-term undertakings present. Specifically:

- the requirement to allow a sufficient scope for infrastructure providers to recover their costs, particularly in environments where initial uptake (or the value of initially provided services) is low;
- longer terms are desirable for new infrastructure projects in which the terms of the undertaking are a key consideration for prospective investors;

⁵⁴ ACCC, March 2007, *Assessment of Foxtel's Special Access Undertaking in relation to the Digital Set Top Unit Service. Final Decision.*

- sufficient time and certainty to allow complementary investments to take place in associated upstream and downstream markets that are likely to be significant drivers of demand for the service that is the subject of the undertaking;
- incentives for the service provider to stimulate markets that rely on the service that is subject to the undertaking; and
- scope to allow changes to the terms and conditions of access in the event that:
 - out-turn demand for services is greater than forecast, to the extent that this allows the infrastructure provider to earn greater than expected returns; or
 - out-turn demand for services is lower than forecast, resulting in lower than expected returns and undermining the viability of future service provision in the absence of changes to the terms of access.

4.4.1 Scope to recover costs

NBN Co differs from the cited infrastructure providers in a number of crucial respects that are relevant to the time it is likely to take for investors to recover their costs:

- the scale of the overall investment at \$35.9bn;⁵⁵
- the undertaking is to provide universal coverage, which means that:
 - NBN Co will inevitably provide services to locations that, on a stand-alone basis, might not be profitable,⁵⁶ particularly regions with low customer density and low proportions of high value customers; and
 - NBN Co is likely to face greater competition in those parts of the network that contain the highest proportion of high value customers, such as areas with higher customer density;
- NBN Co anticipates that it will take much longer to achieve economic profitability⁵⁷ than is the case for the gas pipeline projects for which longer undertakings have been accepted; and

⁵⁵ *NBN Co Limited Corporate Plan 2011 – 2013*, 17 December 2010, at 133.

⁵⁶ Having regard to the requirements in the Statement of Expectations for geographically undifferentiated prices.

⁵⁷ I.e. the point at which NBN Co's revenues are sufficient to cover total operating costs and a return of and on capital, which requires that post-tax post-interest earnings are sufficient to fully remunerate equity investors.

- NBN Co faces greater technological risk than rail or gas, in so far as changes in the technology or cost of technology are likely over the period of the SAU, and the nature and level of demand is highly dependent on new end-user applications and services that rely upon high bandwidth.

The current corporate plan anticipates that the network rollout phase will take approximately 9.5 years resulting in total capex at the end of the construction period of \$35.9bn and a peak funding requirement of \$40.9bn. The payback year is indicated at 2033 and over the full period of the 30 year business model, NBN Co anticipates an IRR of 7%.⁵⁸

4.4.2 The requirements of investors

The willingness of investors to provide capital to NBN Co, in terms of the required rate of return that they will demand *ex ante*, depends on the nature and extent of the risks that they perceive. Investors view regulation as a relevant risk in determining their required rate of return. Investor confidence will be affected by the prospect of an uncertain future review of access arrangements significantly prior to the time horizon over which they expect to earn an adequate return.

Without commenting on how best such regulatory risk should be included in prices, it is sufficient to note that the effect is significant and material. Any regulatory review triggered at the discretion of the Commission (as opposed to a voluntary review requested by NBN Co) prior to a stable period of operation would affect investor confidence in that:

- it would likely place the investor in an environment of continued uncertainty; and
- NBN Co would be unlikely to have achieved the necessary objective of overall cost recovery.

In this respect, we note that the long-term steady state of NBN Co's operation is anticipated to commence in 2028,⁵⁹ and under its terms a review of the SAU is to be undertaken by 30 June 2027.

⁵⁸ NBN Co Limited Corporate Plan 2011 – 2013, 17 December 2010, at 22, 139, 133.

⁵⁹ Ibid at 133.

4.4.3 Complementary investments and market development

The Commission recognised the importance of complementary investments in its ARTC⁶⁰ rail decision. In that case, demand for the below rail was contingent on substantial investment in above rail facilities. That investment would, in turn and in part, depend upon certainty over the terms and conditions of rail access.

NBN Co is in a similar position. Many of its prospective wholesale customers, particularly future customers for higher bandwidth services than those that comprise the Price Controlled Offers, will have to make substantial investments of their own in order to drive retail demand, many of which are likely to be sunk. NBN Co is proposing to minimise these risks by fixing its wholesale prices for the Price Controlled Offers until 30 June 2017 and to limit price increases to CPI/2 thereafter, and to limit annual price increases on other services to CPI/2.

It should also be noted that a company, including NBN Co, faced with the risk that its revenues will be curtailed by regulation at some future date, has reduced incentives to drive demand to the extent that doing so, absent the curtailment, increases profit.

4.4.4 The consequences of higher than forecast demand

The Commission, through its decision making processes in the foregoing gas and rail decisions, has articulated the concern that customers may not see the benefit of lower prices in the event that demand for the services in question exceeds the forecast levels used in setting the terms and conditions of the undertaking. The sensitivity of returns to demand is a consequence of the high level of operational gearing of infrastructure companies. That concern is diminished in the instant case by the overall revenue cap, although reduced prices may be deferred while accumulated losses in the ICRA are reduced.

In respect of the ARTC undertaking, it noted that ARTC's situation was unlikely to change during the 10 year term in a manner that would render the undertaking problematic. Based on the foregoing financial forecasts, similar considerations would arise in respect of NBN Co.

Fixed tariffs for Price Controlled Offers

The foregoing concerns are largely driven by the adoption of fixed reference tariffs in the gas and rail undertakings. These are, in effect, fixed price terms of access such that

⁶⁰ Australian Rail Track Corporation Limited Undertaking, 15 July 2008 last retrieved on 15 June 2010 from <http://www.artc.com.au/library/2007%20ARTC%20Interstate%20Access%20Undertaking%20-%20clean.pdf>

revenue and profitability are levered to demand. Long-term undertakings present a risk that actual demand can deviate substantially above forecast demand, resulting in revenues considerably in excess of that needed to compensate investors. Notwithstanding the complex issue of asymmetry, NBN Co's proposed SAU incorporates safeguards that can reasonably be expected prevent this. Specifically:

- NBN Co will operate under a revenue cap, which will ensure that its total revenues over the 30 year SAU will be no more than sufficient to cover its prudently incurred costs. Hence, to the extent that demand is greater than expected, NBN Co will reduce its prices to accord with the total cost recovery objective;
- there are fixed reference tariffs that NBN Co proposes for the Price Controlled Offers;
- price increases for each service are limited to CPI/2, including Price Controlled Offers after the initial fixed price period; and
- for reasons set out in 5.4.1 below, SAU and market constraints can reasonably be expected to constrain prices.

4.4.5 The consequences of lower than forecast demand

NBN Co anticipates earning a commercial rate of return for its investors but low demand outcomes in combination with higher than expected network roll-out costs may reduce its expected return. This may reduce revenue below the level needed to ensure full cost recovery, may cause NBN Co some financial distress, and may cause a review of future investment and pricing decisions. It is unclear, at this stage, what the efficient response to such circumstances might be, but it could require some adjustment to NBN Co's access terms and conditions. The SAU does not preclude NBN Co at some future date from requesting that the Commission approve a change to its undertaking or increases to particular prices; hence, there does not appear to be any adverse consequences that would impact efficiency.

4.4.6 Scope for inefficient investment

The 30 year term may, in the absence of constraints and with the emergence of market power, provide incentives to over-invest and to incur excessive operating costs. The issue of operating costs is discussed in section 2.7. The main safeguard in respect of over-investment is the customer engagement process supported by the other prudency safeguards outlined in the SAU. In effect, NBN Co proposes to rely upon expertise in

its downstream markets to confirm that its proposals are prudent and efficient, and on those same markets to ensure they are provided at least total cost of ownership.⁶¹

⁶¹ Set out in the Prudent Cost Condition specified in Schedule 8 in the SAU.

5 Capitalisation of losses

Synergies has been asked to:

Please advise whether NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the Initial Cost Recovery Account, is efficient. In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period (as described in section 1 above) and the supply and demand uncertainty that is likely to be faced by NBN Co over this period.

5.1 Summary of conclusions

Synergies confirms that NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the ICRA, can reasonably be expected to be efficient for the following reasons:

- capitalisation of revenue under-recovery is an accepted feature of undertakings, recognising that in the developmental stages of network businesses, usage may be below capacity. Pricing to recover all costs from a small initial base will exacerbate this, as it is likely to result in very high prices that deter access and use, giving rise to inefficiently low levels of uptake;
- most commercial investments in workably competitive markets commence with a period of low profitability or losses which, if they were to continue, would render an inadequate return on investment. Investors expect to recover these losses over the asset life;
- safeguards within the SAU and the context and circumstances of NBN Co can reasonably be expected to limit capitalised losses, specifically:
 - the governance arrangements that apply to NBN Co can be expected to prevent capitalised losses rising to a level where investors would no longer expect a return of and on capital;
 - the prudency requirements in respect of capital investment; and
 - the review mechanisms within the SAU and relevant statutes; and
- safeguards within the SAU and the context and circumstances of NBN Co can reasonably be expected to prevent the setting of prices that result in adverse efficiency consequences when the ICRA becomes large in comparison with the value of the RAB, specifically:

- the requirement for geographically uniform prices, which would limit NBN Co's ability to charge higher prices in higher cost areas; and
- the commitments made in the SAU in relation to initial prices of the Price Controlled Offers, the CPI/2 annual price cap on all products and the characteristics of demand for broadband services in the face of these pricing constraints.

5.2 The proposed mechanism

The SAU provides for a loss capitalisation mechanism in the Initial Cost Recovery Period,⁶² as set out in clause 5 of Schedule 7. The purpose of this mechanism is to capitalise any shortfall between actual revenue and the calculated annual revenue requirement⁶³ in the Initial Cost Recovery Period, which ends at the end of the financial year in which NBN Co's ICRA first becomes equal to or less than zero (effectively, when the capitalised losses have been fully paid down). At this point, full cost recovery will have been achieved and the Building Block Revenue Period will commence. In effect, any revenue in excess of that needed to cover operating costs, depreciation, work in progress related to construction, and a return on the assets in the RAB is used to pay down those capitalised losses.

In the Building Block Revenue Period, the proposed methodology is to include an annual revenue under and over-recovery mechanism to ensure that recovered revenues are consistent with NBN Co's revenue requirement over time. This is consistent with standard building block models.

5.3 The Commission's decisions on capitalised losses

The Commission has previously allowed the capitalisation of revenue under-recovery for inclusion in the RAB, recognising that in the developmental stages of network businesses, usage may be below capacity, and pricing to recover all costs from a small initial base will inefficiently frustrate access and use.

5.3.1 Central West Pipeline ('CWP')

An early example of this approach can be seen in the proposed access arrangement for the CWP. The Commission recognised that market demand for the services to be

⁶² This period is to commence on the Cost Commencement Date and continue until the end of the financial year in which the Methodology Change Event Occurs (i.e. transfer to the Building Block Revenue Period).

⁶³ The annual revenue requirement in the Initial Cost Recovery Period is to be calculated using the same general methodology as detailed for the Building Block Revenue Period.

provided by the pipeline would initially be low and subsequently the pipeline owner would be subject to risk of under-recovery, noting that:⁶⁴

As a result of low forecast throughput during the early years of the CWP, coupled with low initial tariffs (which are intended to stimulate demand), revenue is not expected to recover all costs during the first phase (which extends over a significant number of years) of the lifetime of the CWP. Any net under-recovery is termed 'economic depreciation' which is negative. AGLP's economic depreciation approach is intended to allow AGLP to subsequently recoup these under-recovered revenues and have the opportunity to earn a revenue stream that covers efficient costs over the life of the asset. The methodology results in negative depreciation during the first phase, which has the effect of increasing the asset value for regulatory purposes. The residual value at the end of the initial access arrangement period is greater than the initial capital base at the start of the period. Similarly, the initial capital base is greater than the actual cost of the assets as a result of negative economic depreciation in the first period of operation.

APT Pipelines Pty Ltd made a commercial decision to charge a tariff in the early years of operation that was below the price that would have been determined using the building block approach. A mechanism was proposed, and approved by the Commission, for any revenue shortfalls (relative to full economic costs) in these early years of operation to be rolled into the asset base (i.e. capitalised) so that the foregone revenue could be recovered in a later period.

5.3.2 ARTC Hunter Valley

More recently, the Commission in discussing the ARTC Hunter Valley undertaking noted:⁶⁵

ARTC's underlying financial model contained in the HVAU is a "loss capitalisation" regulatory model. This form of model allows economic losses incurred in a given year to be capitalised into the regulatory asset base and recovered in future years. This operates to place ARTC under a form of long term revenue cap, subject to some limited regulatory risk on the expiration of the Undertaking. The ACCC's preliminary view is that the use of a loss capitalisation model is likely to be appropriate for the HVAU subject to ARTC limiting the pricing uncertainty facing access seekers, as this should: result in a relatively efficient allocation of risk; help

⁶⁴ ACCC. Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline. June 2000 p.53

⁶⁵ ACCC. Australian Rail Track Corporation Limited Hunter Valley Coal Network Access Undertaking Draft Decision. March 2010 p.477

ensure ARTC earns a return commensurate with the regulatory and commercial risk associated with its rail investments in the Hunter Valley; and facilitate efficient investment and use of infrastructure, thereby promoting effective competition in upstream and downstream markets.

ARTC subsequently withdrew the Draft Undertaking and lodged a revised undertaking which was approved by the Commission, based on a standard building block approach to determining revenues, but it is clear from the final approval that the mechanism was retained:⁶⁶

In particular, the ACCC notes that:

The intent of loss capitalisation is to allow under-recovery of economic cost for a period and then recovery of the relevant shortfall at a later date. In appropriate circumstances, loss capitalisation may therefore operate to facilitate investment in new assets where there is limited initial demand by allow initial under-recovery of relevant costs in the expectation of 'making up' the shortfall when demand reaches an appropriate level....

In light of this, the ACCC considers that it is appropriate to accept the loss capitalisation approach as set out in the June 2011 HVAU.

The Commission's foregoing comments on the ARTC's Hunter Valley draft undertaking remain relevant for greenfield infrastructure businesses that require time to build demand.

5.3.3 Under- and over-recovery and competition

In respect of CWP, the Commission noted:⁶⁷

...the Commission is of the view that AGLP's proposal to apply economic depreciation as a type of levelising mechanism to eventually recoup under-recoveries accrued in the early period of the life of the CWP is consistent with Code principles. However, it must be noted that the proposed framework is only feasible because it is unlikely that alternative pipelines would be available to users and potential users of the CWP. This allows tariffs to be sustained above long run costs during the period when the economic value of the asset for regulatory purposes exceeds the ORC.

⁶⁶ ACCC 29 June 2011, *Decision on Australian Rail Track Corporation's Hunter Valley Rail Network Undertaking* at 44.

⁶⁷ ACCC June 2000 Final Decision Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline p.70

Essentially, the Commission is arguing that the ability of CWP to recover what it terms 'negative economic depreciation' in the later period of an asset life arises only because alternative pipelines are not available to users, that is, that there is no competition and CWP has a position of market power. This approach highlights something of a misconception about competitive processes in markets such as broadband networks and gas pipelines where there are substantial and large costs of entry, and where initial utilisation is likely to be substantially below total capacity. In such markets:

- no investor (including one contemplating investment in competing infrastructure where an incumbent is already operating) would contemplate *ex ante* entry unless they were confident in their ability to recover any negative economic depreciation;
- accordingly, the premise that recovery is only possible because of a lack of alternatives does not imply that the outcome is inefficient (and in many such cases it is not) or inconsistent with a workably competitive market when assessed over an appropriate time dimension; and
- forcing an infrastructure provider to price as if such a non-viable competitor were to arise (which, appropriately, the Commission did not do in the foregoing cases) would result in outcomes clearly at odds with the efficient outcomes, namely:
 - high initial prices that would deter early adoption;
 - longer time periods than necessary to recover investments, if indeed they could be recovered at all; and
 - incentives to delay investment and run network capacity at inefficiently high utilisation (with concomitant loss of quality).

5.3.4 Discussion

Most commercial investments in workably competitive markets commence with a period of low profitability or losses which, if they were to continue, would render an inadequate return on investment.⁶⁸ That the investment decision nonetheless takes place is testament to the expectation that early losses will be fully recovered in later years. Nor is it generally sensible to set prices for initial customers that fully compensate for the annual revenue requirement in the sense that it is determined for

⁶⁸ The most extreme examples arise in the area of research and development in pharmaceuticals, where it can take many years to recover past losses on both successful and failed products.

NBN Co (i.e. recovering a full return of and on assets), as this would result in very high prices and, almost certainly, inadequate and delayed customer adoption.

NBN Co's investment in the NBN is no different. The NBN requires a large initial investment in order to achieve the expectations of Government in respect of coverage and then uptake. Furthermore, the expectations of uptake would clearly be frustrated if prices had to be set at levels necessary to avoid losses. Indeed, given the availability of existing substitutes for the Price Controlled Offers and the consequentially high cross-price elasticity of demand for connection that is likely to arise, it is doubtful whether there are feasible initial prices that would earn a return of and on capital in the period of network rollout.

Accordingly, in order for investors to be willing to make the investments necessary to implement the NBN in the manner and form expected by the Government, there must be a mechanism for recovering early losses. The absence of or inadequate nature of such mechanisms would discourage efficient investment.

The logic of early losses on new infrastructure is well understood and recognised in the Commission's willingness to allow capitalisation of the losses for inclusion in the RAB which, thereby, allows recovery in later time periods. The mechanisms proposed for capitalising the losses in the SAU are consistent with mechanisms already accepted by the Commission and similar to the processes for capitalisation of interest during construction, a widely accepted practice in determining the capital costs of new investments upon commissioning.

5.3.5 Conclusion

Inclusion of capitalised losses in the RAB that result from low initial utilisation of assets (or "meet the market" initial prices designed to stimulate rapid uptake), such that the losses are recovered when assets are more fully utilised is a reasonable mechanism within the SAU in that it can reasonably be expected to be efficient.

5.4 The extent of accumulated losses

The value of the ICRA/RAB will be the predominant determinant of NBN Co's prices given the high operational gearing of broadband network provision. There is considerable uncertainty over the timing and nature of higher value services that might command higher wholesale prices and more rapid rates of customer connection. Accordingly, capitalised losses in the ICRA could, over a 10 year period in which

\$35.9bn⁶⁹ of investment in fixed assets is contemplated, represent a significant component of the final price.

Given the uncertainty over broadband market outcomes it is quite possible that losses will continue to accumulate for a prolonged period of time such that the Initial Cost Recovery Period comprises a significant proportion of the proposed 30 year term of the undertaking.

The arrangements proposed in the SAU give NBN Co a degree of freedom to set the initial prices for new services. The SAU does not explicitly set an upper bound on the ICRA and hence on the contribution that capitalised losses make to final prices. If NBN Co expects to and does achieve a position of substantial market power in the provision of any of these new services then, *absent constraints*:

- investors and the board may be willing to sustain higher capitalised losses;
- substantial capitalised losses in the ICRA may confer on NBN Co the ability to set high prices for these services; and
- these prices may not, absent constraints, be efficient.

However, Synergies considers that there are sufficient constraints in the SAU itself, in statutes and in the market context of the NBN to mitigate this risk, such that the SAU can reasonably be expected to deliver efficient outcomes. In reviewing the operation of these mitigating factors (discussed below), it is necessary to set out how unrestrained capitalised losses might result in inefficient outcomes.

It may be possible that, absent constraints, capitalised losses could rise to such a level that the resultant prices would be in excess of the prices that would be offered by a hypothetical new entrant that did not incur such losses or which offered a less geographically extensive (and therefore less costly) network. This outcome is more likely if technological change conferred an absolute cost advantage on a hypothetical new entrant using modern technology (a metric that has been adopted for determining the prices of declared telecommunications services).

The large sunk costs of entry and the natural monopoly characteristics of the NBN suggest new entry is unlikely, particularly on a similar national scale. On that basis, NBN Co is likely to achieve a position of market power in some of its services for some market segments. This might then allow NBN Co, absent the constraints that are articulated in section 2 above and summarised below, to recover any higher than expected capitalised losses that arise even if, in a workably competitive market, that

⁶⁹ NBN Co Limited Corporate Plan 2011 – 2013, 17 December 2010, at 134.

would not be possible. Absent these constraints, in combination, the ICRA/RAB valuation and depreciation approaches adopted in the SAU mean that the value of the ICRA/RAB might increasingly deviate, over time, from that of an albeit hypothetical optimal network.

Alternatively, to the extent that commercial risks materialise that would be borne by investors in a workably competitive market (including the risk that NBN Co's forecasts of demand are erroneously low), NBN Co might be able to avoid them. Such avoidance could reasonably be considered to be in NBN Co's legitimate business interests (following the Dampier to Bunbury Natural Gas Pipeline decision), but does not reasonably satisfy an allocative efficiency criterion.

Synergies recognises both the difficulty of establishing an undertaking that is sufficiently long to provide confidence of a reasonable return on investment given the size of the investment, the anticipated roll-out and uptake, and the potential inconsistency of judging this SAU in the light of possible regulatory tests at some intermediate date. Nonetheless, cognisant of the allocative, productive and dynamic efficiency criteria, Synergies considers that the SAU can reasonably be expected to deliver efficient outcomes.

5.4.1 Constraints on the impact of capitalised losses

There are a number of features of the SAU and of the operation of broadband markets which can reasonably be expected to mitigate the concern that an unrestrained right to capitalise losses may confer on NBN Co the ability to set prices that are significantly higher than what might be considered efficient. These can be separated into two broad classes:

- those constraints that act to limit the size of the ICRA, namely:
 - the governance arrangements that apply to NBN Co can be expected to prevent capitalised losses rising to a level where investors would no longer expect a return of and on capital;
 - the prudency requirements in respect of capital investment;
 - the review mechanisms within the SAU and relevant statutes; and
- those that tend to prevent inefficient prices from arising when the ICRA becomes large in comparison with the value of the RAB, namely:
 - the requirement for geographically uniform prices, which would limit NBN Co's ability to charge higher prices in higher cost areas; and

- the commitments made in the SAU in relation to initial prices of the Price Controlled Offers, the CPI/2 annual price cap on all products and the characteristics of demand for broadband services in the face of these pricing constraints.

Governance arrangements

The normal governance constraints that investors impose on businesses can reasonably be expected to limit the maximum extent of capitalised losses to a level where the board and investors of NBN Co remain confident that they will be fully recovered.

Synergies understands that NBN Co will adapt its core business plan in the event that market outcomes are different from its expectations, as articulated in its approach to risk management.⁷⁰

Prudency requirements

The prudency requirements set out in Schedule 8, while not expressly addressing or limiting the extent of capitalised losses, place a constraint on the extent of investment that may be included within the ICRA, particularly in respect of network changes. In so far as these provisions reduce the likelihood of:

- excessive investment;
- investment that does not yield a net economic benefit;
- investments that yield a lower economic benefit than alternatives; and
- excessive operating cost

(matters that are addressed in sections 2.4 and 2.7), they reduce the risk of productive inefficiency (i.e. costs in excess of efficient costs) and can be expected to limit the extent of capitalised losses.

Review mechanisms within the SAU and relevant statutes

There are a series of factors that, in practice, reduce the risk, under the SAU, that NBN Co will set inefficient prices as a result of a high level of losses within the ICRA:

- the possibility of Ministerial directions which can reasonably be expected to trigger a review of regulatory and operational arrangements;

⁷⁰ NBN Co Limited Corporate Plan 2011 – 2013, 17 December 2010 at 145.

- a commencement of a review of the SAU, which must occur by 1 July 2027 at the latest; and
- the 5 year reviews of the operation of customer engagement processes, which must address economic efficiency considerations.

The impact of these constraints is discussed in section 2.5 above.

Uniform pricing

The government expectation of uniform national wholesale pricing for NBN Co services will impose some constraint on the ability of NBN Co to set prices, particularly if it faces the prospect of ‘cream-skimming’ of some of its services.⁷¹ This concept was described by Telstra in respect of its Retail Price Parity Obligation (‘RPPO’).⁷² Under such an obligation, service providers must offer prices above cost in some areas and below in others. To the extent that bypass technologies are possible in areas where prices are above cost, there is a risk of cream-skimming. In so far as NBN Co is more likely to obtain a degree of market power in those areas where bypass is unlikely, the uniform wholesale price expectation places an upper bound on the prices that can be charged in those areas.

Price caps, initial prices and the characteristics of demand

Prices for the Price Controlled Offers are set in the SAU and fixed during the First Period (to 30 June 2017). Thereafter, they may increase by no more than half the rate of retail inflation (‘CPI/2’). The initial prices for new services are at NBN Co’s discretion, but increases thereafter are limited to CPI/2.⁷³ While initial prices for these new services are notionally unconstrained (other than by the overall revenue cap constraint), Synergies considers that there are significant market constraints.

New services are likely to relate to higher bandwidth offerings. While some new services might be provided for genuinely new and distinct market segments, Synergies would expect most to be subject to significant cross-price elasticity between lower and

⁷¹ As a means of reducing the risk of cream-skimming of NBN services, the *Telecommunications Legislation Amendment (National Broadband Network Measures – Access Arrangements) Act 2011* provides that super-fast broadband networks built or upgraded after 1 January 2011 (other than the NBN) which wholly or principally serve residential or small business customers that do not make wholesale access via Layer 2 bitstream services available must not supply fixed-line carriage services. To the extent that it is successful in so doing, Synergies believes that this legislative restriction will mitigate but not obviate the constraint imposed by uniform national wholesale pricing. Furthermore, if this requirement does reduce the risk of cream-skimming, it will also reduce the risk that NBN Co will be unable to recover any cross-subsidy from low-cost to high-cost areas, helping to limit the size of capitalised losses.

⁷² *Telstra Corporation Ltd (No 3)* [2007] ACompT 3, at [61].

⁷³ With certain minor exceptions related to such factors as promotional offers. See, clauses 3.2 and 3.3 of Schedule 5 of the SAU.

higher bandwidth services. Where this is the case, an excessive differential between higher and lower bandwidth services will stifle uptake of the higher bandwidth service. This places a constraint on pricing. This cross-price elasticity is likely to be particularly high when the benefits to end-users from high bandwidth services (which is reflected in their willingness to pay) are modest due to the lack of high value applications and services that are reliant upon it. Synergies notes that NBN Co has already released pricing for access virtual circuits with bandwidth combinations up to 100/40 Mbps (downstream / upstream).⁷⁴ These services will be captured by the CPI/2 cap limit and will potentially operate to constrain the pricing of higher bandwidth services that NBN may release in the future. In addition, Synergies understands that prices for currently planned higher bandwidth services will be set early in the period of operation of the SAU, rendering these market pressures more effective.

In so far as the value to end-users of these additional services increases such that their willingness to pay increases, and NBN Co achieves a position of significant market power in those services, the CPI/2 cap limits NBN Co's ability to exploit that position by raising prices to inefficiently high levels.

5.4.2 Conclusion

The level of capitalised losses is not expressly capped in the undertaking. There are a series of constraining influences both within the SAU and imposed by market conditions that can reasonably be expected to mitigate the risk that this will allow NBN Co to set prices that could be considered economically inefficient.

⁷⁴ NBN Co Wholesale Broadband Agreement, Price List. See, <http://www.nbnco.com.au/assets/documents/wba-product-catalogue-sfaa-v1-30-nov-11.pdf>

6 A single RAB across all services

Synergies has been asked to:

Please advise whether NBN Co's proposal for a single ICRA / RAB-based approach to cover all capital expenditure in respect of NBN Co's fibre, wireless and satellite networks and related systems and platforms is efficient. In undertaking your analysis, please take account the following:

- in support of the Australian Government's objective of enabling uniform national wholesale prices, NBN Co will be required to charge access seekers uniformly for services across its fibre, wireless and satellite networks and for its basic service (called the Basic Access Offer in the SAU), as set out in the Statement of Expectations provided to NBN Co by its shareholder ministers
- NBN Co has set its initial prices to 'meet the market' as a means of ensuring the smooth migration of end user connections from legacy networks to the NBN and to also meet the Australian Government's objectives of setting wholesale prices to achieve the "broadband take up targets agreed by Government through the NBN Co Corporate Plan and Business Case", again as set out in the Statement of Expectations.

6.1 Summary of conclusions

Synergies confirms that a single ICRA / RAB-based approach to cover all capital expenditure in respect of NBN Co's fibre, wireless and satellite networks and related systems and platforms can reasonably be expected to be efficient. In particular:

- Synergies considers that, subject to the constraints and safeguards set out in the SAU, efficient outcomes are more likely to be fostered if NBN Co is able to structure its wholesale prices so as to minimise its risks and maximise its revenues, provided revenues do not exceed costs. This is likely to be facilitated by flexibility to set initial prices outside of Price Controlled Offers;
- the risks of having to price to 'meet the market' in accordance with government expectations, are best managed by providing NBN Co with a degree of pricing flexibility; and
- the single ICRA/RAB supports pricing flexibility in so far as it reduces the complexity associated with pricing compared to pricing based on hypothecated ICRA/RAB approaches. It is therefore a reasonably necessary mechanism for achieving uniform national prices that meet the market. In addition, it facilitates

pricing flexibility for NBN Co which can, within the constraints imposed on NBN Co by the SAU and its broader operating context, reasonably be expected to foster efficient outcomes.

6.2 Uniform pricing

In the Statement of Expectations, the Government stated:

In support of the Government's objective of enabling uniform national wholesale prices, NBN Co will be required to charge access seekers uniformly for services across its network for all technologies and for the basic service offering.

NBN Co has implemented this expectation in its SAU through:

- its Long Term Revenue Constraint Methodology (set out in Schedule 7 of the SAU), which adopts a single ICRA / RAB, and a single figure for operating costs, for determining the overall maximum level of revenue;
- uniform prices for the components of the Price Controlled Offers set out in Schedules 4 and 5; and
- freedom to select the initial prices for other services, subject to a CPI/2 constraint on annual price increases.

The basic structure of the SAU is therefore that NBN Co is: constrained from securing revenue in excess of its total costs (appropriately determined); obliged to offer fixed geographically uniform Price Controlled Offers for 5 years; and obliged to limit price increases.

6.3 Discussion

6.3.1 Are the single ICRA and RAB reasonably necessary

The costs of providing telecommunications network services, including wholesale broadband services which extend from the POI to the end-user customer premises, vary substantially with network topology, connection density and terrain, being lower in respect of fixed costs and operating costs in high density areas. There is also very often a correlation between usage and customer density, *per capita* usage being higher in densely populated areas (notably central business districts). This is reflected in a much lower contribution from costly low usage areas than lower cost high usage areas.

Uniform national wholesale pricing imposes a requirement on NBN Co to earn higher returns from some parts of its network and lower (possibly negative) returns from

others by reason of these differences in costs and revenue characteristics. NBN Co might adopt a number of different approaches for achieving this outcome. It could propose to adopt:

- hypothecated costs to different areas of its network (which would involve the allocation of operating costs and particular assets or asset shares to specific geographical areas) as a means of determining the actual costs of provision in that area of the network, with a transfer mechanism between high and low cost areas;⁷⁵ or
- a 'single till' as adopted in the SAU, in which no formal transfer is necessary.

The former has considerable disadvantages in respect of flexibility of operation. The uptake, rate of roll-out of network and rate of roll-out and introduction of new services is highly uncertain. Furthermore, the response characteristic of customers and end-users is uncertain and may differ across time and locations. NBN Co's ability to structure its wholesale prices so as to minimise its risks and maximise its revenues within the limits of the SAU revenue cap (or to meet other objectives) is likely to be facilitated by flexibility to set initial prices of non-basic services and by adoption of a single ICRA/RAB rather than a hypothecated ICRA/RAB.

6.3.2 Meeting the market prices

Synergies also notes that NBN Co's initial prices are affected by the requirement to 'meet the market' and secure uptake targets in line with government expectations. There are, in many parts of Australia, existing broadband services which are similar to NBN Co's Price Controlled Offers, the pricing of which are a clear constraint on NBN Co's pricing to wholesale customers who may seek to offer retail services in those same areas. Uniform national wholesale pricing constrains NBN Co from recovering more in parts of its network where such competition is limited.

Accordingly, NBN Co faces a high degree of uncertainty over uptake in the most costly phase of its development (network roll-out) and at a time where uptake of its Price Controlled Offers will face most competition, and higher value wholesale services are least developed due to the likely initial paucity of high value retail services that make use of them.

In Synergies' view, it is therefore important that, within the constraints of preventing NBN Co from earning an excessive profit by limiting revenues to prudently incurred

⁷⁵ Costs can also be hypothecated (i.e. specifically allocated) to services, or even to services within a geographical region, as a means of determining actual costs.

costs, the foregoing risks are best managed by providing NBN Co with pricing flexibility. The single ICRA/RAB supports that pricing flexibility and is therefore in the legitimate business interests of NBN Co and can, given the full context and circumstances of NBN Co, reasonably be expected to result in efficient outcomes.

6.3.3 Summary

Adoption of the single ICRA/RAB supports pricing flexibility in so far as it reduces the complexity associated with pricing compared to pricing based on hypothecated ICRA/RAB approaches. It is therefore a reasonably necessary mechanism for achieving uniform national prices that meet the market. It also facilitates pricing flexibility for NBN Co which can, within the constraints imposed on NBN Co by the SAU and its broader operating context, reasonably be expected to foster efficient outcomes.

7 Pricing flexibility

Synergies has been asked to:

Please advise whether it is efficient for NBN Co to have flexibility in setting the initial price points for new products on the basis that NBN Co's existing suite of wholesale products as they exist at that time and the existence of alternative wholesale products is likely to provide an 'anchoring' or constraining effect on NBN Co's price setting behaviour.

7.1 Summary of conclusions

Synergies confirms that NBN Co's proposal for flexibility in setting the initial price points for new products can reasonably be expected to be efficient for the following reasons:

- the other provisions of the SAU are likely to
 - constrain the prices within the bounds of stand-alone and incremental costs which, if exceeded, would be *prima facie* inefficient;
 - prevent NBN Co earning a monopoly profit;
 - prevent price changes adverse to the interests of access seekers;
- NBN Co's pricing and related decisions are not influenced by conflicts from vertical integration;
- NBN Co seeking to minimise the time to fully recover its losses within the constraints imposed by the SAU and NBN Co circumstances is consistent with efficiency;
- NBN Co does not have strong incentives to set inefficient prices in response to a real as opposed to hypothetical risk of bypass, and is nonetheless limited in its scope to do so; and
- to the extent that NBN Co does gain more freedom over pricing by reason of customers migrating from the Price Controlled Offers in favour of a higher value, expanded range of services, this is likely to arise at or near a time of significant regulatory review.

7.2 Pricing of new services

Prices for the Price Controlled Offers are set in the SAU and fixed during the First Period (to 30 June 2017). Thereafter, they may increase by no more than half the rate of retail inflation ('CPI/2'). Prices for other services are not specified in the SAU. Rather:

- NBN Co will consult customers on pricing through the PDF;
- NBN Co will otherwise be free to set the prices for other services at levels it determines; subject to
 - a maximum annual increase in price of no more than half the rate of retail inflation ('CPI/2'); and
 - total revenue is not to exceed the revenue cap.

Clause (1)(b) of Schedule 5 allows NBN Co to negotiate lower prices with individual customers, subject to any statutory non-discrimination obligations, although Synergies expects this to be substantially constrained by the uniform national wholesale pricing requirement. Under clause 4 of Schedule 5, NBN Co can also request approval from the Commission to increase prices above CPI/2.

The SAU gives NBN Co a degree of freedom to set initial prices for new services outside of the Price Controlled Offers. However, as mentioned in section 5.4.1, Synergies notes that while the initial pricing for new services may be notionally unconstrained by the SAU (other than by the overall revenue cap), there are still significant market constraints.

NBN Co has already released pricing for services other than the Price Controlled Offers, including access virtual circuits with bandwidth combinations up to 100/40 Mbps (downstream/upstream). Synergies understands that prices for these higher tier services will apply at least until the SAU is expected to come into effect and will be subject to the CPI/2 limit on annual increases thereafter.⁷⁶ Synergies would expect there to be significant cross-price elasticity between these existing services and new higher bandwidth services that may be released in the future, which can be expected to constrain the initial prices of such future services.

⁷⁶ NBN Co Wholesale Broadband Agreement, Price List. The Price List provides for NBN Co's recurring charges for access virtual circuits with bandwidths of 25/5, 25/10, 50/20 and 100/40 Mbps to be fixed for the period between 1 October 2011 and 31 December 2013. See, <http://www.nbnco.com.au/assets/documents/wba-product-catalogue-sfaa-v1-30-nov-11.pdf>.

7.3 Price setting criteria

In order to determine whether this price setting freedom might reasonably be considered to be efficient, it is helpful to examine prices that might be considered to be outside of efficient bounds, and to further assess whether it is reasonable to consider that NBN Co will set prices within those bounds. There is no universally agreed definition of efficiency that can be used to anchor this proposal. However, in Synergies' view pricing that meets the following criteria can reasonably be expected to be efficient.

Subject to positive network externalities (which Synergies does not consider NBN Co should be required to consider in its pricing, unless directed to do so),⁷⁷ prices for any service or group of services that are either above stand-alone cost or below incremental cost should be considered inefficient: the former will encourage inefficient bypass while the latter would price below incremental costs of provision and would therefore be allocatively inefficient. Prices within those bound cannot be viewed as inefficient *per se*. To the extent that there are large joint and common costs in network provision, these bounds are likely to be wide, and therefore from an efficiency perspective, relatively unproblematic.

Outside of these bounds, constraints on prices that result in NBN Co having incentives to delay network roll-out or the provision of new services to parts of the network or groups of customers are likely to be inefficient.

Setting prices on the basis of willingness to pay and own price elasticity of demand⁷⁸ (within the constraints imposed by government policy, expectations or regulations) is consistent with efficient recovery of fixed cost with the least distortion of consumption decisions, noting that, *ex ante* it must be assumed that NBN Co will expect to recover all its prudently incurred fixed costs. To the extent that different features of the NBN Co service – such as quality of service, bandwidth, and recovery times – are valued differently by different end-users, they are an appropriate basis for differential pricing.

As a general matter, NBN Co is likely to have the best information to be able to optimise prices to maximise the likelihood of full cost recovery, and should be given some latitude to do so, particularly as NBN Co is not vertically integrated and therefore is not likely to consider any foregone retail revenue in making its pricing decisions.

⁷⁷ In Synergies' view, such externalities are difficult to identify and quantify, and are likely to be contentious.

⁷⁸ That is, on the basis of the change in demand for NBN Co's services as a function of the prices it sets. The Ramsay pricing rule is that allocation of fixed costs in prices results in least distortion.

7.3.1 Customer interests

In addition to the foregoing criteria, customers are likely to have to incur considerable fixed and sunk costs in providing downstream services based upon NBN Co's wholesale access service. As a result, their interests are likely to be affected by *changes* in NBN Co's wholesale pricing, an issue that was canvassed in the Tribunal's decision on Telstra's proposed ULLS undertaking. Specifically, it is questionable whether investments made by customers will be efficient if they perceive that there is a high risk that their investments will be stranded by price increases in the wholesale services upon which they rely. Hence, while the initial price chosen by NBN Co may have implications for adoption of the service by NBN Co customers, the constraint on price increases (to CPI/2) can be viewed as an important price stability measure that minimises the risk that customers' own sunk costs will be stranded by price changes.

7.4 Discussion

The following is premised on NBN Co's costs being prudently incurred (having regard to government expectations and related requirements), discussed in detail in section 2 above. Under this assumption:

- the RAB, including capitalised losses, can be assumed to reflect economically efficient operation, in so far as NBN Co's total prudent costs represent stand-alone costs (of a network of the NBN Co type);
- the SAU limits total revenue to the revenue cap sufficient to recover these RAB-related costs and prudent operating costs, so the pricing of all services, in aggregate, cannot exceed stand-alone cost. To the extent that there are substantial joint and common costs in the NBN, the stand-alone [cost] price ceiling for individual services or small bundles is likely to be very high and not a binding constraint;
- as a practical matter (and within the constraints imposed by uniform national wholesale pricing), the incremental costs of services beyond the Price Controlled Offers – using common infrastructure and considering the revenue expected from Price Controlled Offers and the predominance of fixed costs – are likely to be low and not reasonably binding on prices;
- it is reasonable to allow NBN Co to choose prices (including reductions of prices to existing services in the event the revenue cap is binding under the introduction of higher priced higher value services) that minimise the time taken for NBN Co to recover capitalised losses, subject to the safeguard that

these losses are not inflated by imprudent investment and operating costs (as discussed in section 2 above);

- there are potential efficiency consequences from NBN Co setting prices above a level that would result in bypass, particularly if that bypass results from cream skimming. However, for the reasons set out in section 2.3.5 above, it is important not to draw normative conclusions on pricing when such bypass is based on hypothetical but not practical entry, having regard to all the circumstances;
- even if bypass is a practical prospect, there is no reasonable basis for considering that NBN Co will fail to consider this risk in their pricing, operational and investment decisions in a manner inconsistent with efficient outcomes, particularly given its lack of vertical integration; and
- given that NBN Co may reduce the price of services by more than CPI/2 (and indeed may be compelled to do so if exceeding the annual revenue requirement is a binding constraint), the cap on increases provides a degree of certainty to customers.

Attachment A. Principal authors

Euan Morton

Euan Morton is a principal at Synergies Economic Consulting Pty Ltd, a company that specialises in providing economic advice to infrastructure providers. Euan has extensive experience in consultancy and government advisory roles in relation to transport infrastructure. A summary of Euan's qualifications and experience is set out as follows:

- Euan holds the degrees of a Bachelor of Economics (first class honours) (1993), Bachelor of Laws (second class honours) (1988) and Bachelor of Commerce (1986). He has been admitted as a Solicitor to the Supreme Court of Queensland (1991);
- in 1995, Euan was appointed to the National Competition Policy Unit of Queensland Treasury, where he implemented third party access and prices oversight reform in Queensland. This responsibility extended to:
 - developing policy on prices oversight and third party access;
 - managing the development of the Queensland Competition Authority Act 1997; and
 - the creation of the Queensland Competition Authority;
- in 1997, upon the QCA being established, Euan was appointed as the Authority's first employee;
- in 1998, Euan was appointed as a Director of the QCA, with responsibility for rail and port regulation;
- between 1999 and 2001, Euan managed the QCA's first major review, being that of QR's draft undertaking. Euan managed this process until he resigned in 2001, at which time the Authority's Final Decision on the draft undertaking was completed;
- in this time, Euan also prepared the QCA's Statement of Regulatory Principles: Dalrymple Bay Coal Terminal (February 2001) as part of the Dalrymple Bay Coal Terminal leasing process to inform prospective bidders of the methodologies the Authority may apply when assessing an access undertaking;
- since 2001, Euan has operated as a consultant specialising in advising clients involved in transport infrastructure issues. Specifically, between 2002 and 2006,

Euan advised the DBCT User Group in relation to the access undertaking for the Dalrymple Bay Coal Terminal prepared by Prime Infrastructure (subsequently Babcock and Brown Infrastructure). Since 2004, Euan has been advising QR on regulatory issues associated with their network;

- in 2004, Euan was appointed by the Essential Services Commission of South Australia (ESCOSA) to advise on the methodologies that ought to be adopted by arbitrators in resolving disputes about access and pricing arrangements for port and rail infrastructure in South Australia;
- in 2005, Euan was appointed to an expert panel to review network pricing issues for the Ministerial Council of Energy;
- Euan's experience in the telecommunications sector includes the following:
 - provided advice to Telstra on the economic regulation of providing declared wholesale telecommunication transmission services, including issues associated with determining the cost of providing services, and the issues in the allocation of costs to various services and locations;
 - advised on the economic and social benefits of facilitating increased access to broadband services in regional and remote areas;
 - advised on the pricing for the provision of infrastructure for telecommunications services;
 - provided a detailed advice on the asymmetric consequences of regulatory error in the context of telecommunications infrastructure;
 - advised on the price and income elasticity of demand for fixed and mobile services, including the limitations of relying upon published elasticity estimates;
 - performed Ramsey pricing calculations for a telecommunications service provider;
 - advised on cost allocation issues in provision of local carriage services;
 - assessed the market structure, growth and competition in the major telecommunications markets for an energy provider considering diversifying into telecoms and advised on the most favourable market segments for the entity to enter the market; and
 - provided advice on regulatory and commercial strategy to be adopted in the negotiation and litigation of mobile termination access charges.

Sam Lovick

Sam Lovick is also a principal at Synergies. Sam has 17 years of experience working as an economic consultant in the United States, United Kingdom and Australia, where he has worked extensively in the electricity, water, airport, health and pharmaceutical, and telecommunications industries. A summary of Sam's qualifications and experience is set out as follows:

- Sam holds the degrees Physiological Sciences (Medicine) from Oxford University;
- acted as an advisor to the New South Wales Government Pricing Tribunal on the regulation of the New South Wales electricity distributors and the development of economic performance measures;
- provided advice to the State Electricity Commission of Victoria on a variety of subjects including performance indicators, international electricity reforms, the valuation of the Snowy Mountain Scheme and power pooling;
- acted as an advisor to NEMMCO on efficient fee structures for market services;
- conducted an assessment of market definition, market power and market power mitigation measures for TXU Energy in Texas;
- provided advice to the Alberta Department of Energy on market design and market power mitigation measures;
- provided advice to the Ontario Energy Board on the design of an appropriate performance based rate making regime to cover the Ontario electricity distribution companies;
- acted as a consulting expert on anti-trust issues arising in the bankruptcy of an electricity retailer in Texas;
- conducted an economic appraisal of interconnection between regional power systems in India;
- undertook operational and environmental modelling of the Indian electricity supply industry for the World Bank study on long term issues in the Indian power sector;
- conducted an assessment of the appropriate cost of capital in a variety of regulated industries including airports, electricity distribution and transmission, water and telecommunications;

- acted as an advisor to the California Independent System Operator on transmission investment evaluation, including the development of software tools and algorithms that take into account the cost impacts of uncertainty, the independence between transmission and generation investment, and the market power mitigation effects of transmission (after accounting for market structure, contracting behaviour and demand side responses);
- provided advice to the Major Electricity Users Group (MEUG) in New Zealand on transmission valuation and pricing issues;
- provided advice to the California Trust in relation to the development and testing of the Power Exchange, in addition to providing related advice on financing issues, Federal Energy Regulatory Commission (FERC) filings, and a range of other tasks;
- constructed least cost expansion models for Nigeria and Pakistan using WASP III;
- provided advice on the design of an optimal performance based rate-making regime for a Canadian transmission company;
- conducted an assessment of restructuring options for British Energy and PECO in the Ontario power market;
- provided advice to the Independent Market Operator of Ontario on integrating markets across North American ISOs;
- recently completed five years as the Chief Economist of CSL Limited, where he worked on a wide range of strategic and public policy issues;
- Sam's experience in the telecommunications sector includes the following:
 - analysis of the effect of regional telecommunications investment on regional development;
 - design of mechanisms for efficient implementation of telecommunications universal service in rural Australia;
 - assessment of the impact of minimum quality of service standard on cost efficiency in the Australian telecommunications industry;
 - analysis of the scope of competition in international telecommunications in Australia;

- investigating market power in the mobiles market for Telstra in the context of seeking to escape formal price regulation;
- analysis of internetworking and termination charges in mobile telecommunications networks for Telstra;
- comprehensive comparison of network terminating and originating charges in Australia and New Zealand (against international counterparts) for Telstra;
- comprehensive comparison of a broad set of telecommunications charges in Australia and New Zealand (against international counterparts) for Telstra and TCNZ;
- preparation and provision of expert testimony concerning terminating charges as part of the appeal of T/O charges set by the Australian Competition and Consumer Commission (ACCC);
- conducting a study of the appropriate framework for telecommunications regulation to establish sustainable competition post 1997 for the Federal Government of Australia;
- advising the Department of Communications and the Arts on the efficacy of the accounting separation regime;
- estimation of damages in the context of litigation between Telstra and BT;
- analysis of the cost impediments faced by Telstra as a consequence of the nature of the environment they serve and their obligation to provide a specified universal service; and
- cost-benefit analysis of the impact of changing the telephone numbering scheme for Oftel (1991).

Attachment B: Prudency requirements

This Attachment outlines the prudency requirements that are imposed on regulated infrastructure providers under other regulatory regimes and undertakes a comparison with the prudency conditions outlined in NBN Co's access undertaking.

National Electricity Rules

The NER specifies several factors to which the AER must have regard when assessing the prudency and efficiency of proposed capital expenditure. While these are generally high-level factors that are to be taken into account by the AER in its assessment process, regulated service providers must still have regard to these factors when preparing their expenditure proposals. The factors specified are as follows:

- the need for the service provider to recover the efficient costs of complying with regulatory obligations or requirements;
- the need to provide effective incentives to the service provider to promote economic efficiency;
- whether the project was evaluated against and satisfied the regulatory test;
- whether the capital expenditure was undertaken in a manner consistent with good business practice so as to practicably achieve the lowest sustainable cost of services to be delivered as a consequence of the capital expenditure;
- the desirability of minimising investment uncertainty;
- the need to provide incentives to avoid service providers undertaking inefficient capital expenditure; and
- the value of the relevant assets.

The key criterion in terms of assessing the requirements imposed on service providers to demonstrate the prudency of capital expenditure under the NER and their comparability to the prudency provisions in Schedule 8 of NBN Co's SAU is the criterion that requires the capital project to have satisfied the AER's regulatory test.

The regulatory test cited in the NER refers to the test developed and published by the AER in accordance with clause 5.6.5A of the Rules. The key requirements of service providers under the AER's regulatory test guidelines are as follows:

- identify the need for the expenditure – capital projects are typically driven either by reliability requirements or to achieve market benefits (i.e. efficiencies);
 - reliability investments are linked to specific service standards, regulatory requirements, projects included in annual planning reports, or projects that have been subject to an application notice;
 - investments driven by market benefits or efficiencies require service providers to identify the need driving the proposed expenditure;
- identification of options – the test must include a comparison between all alternative options across a number of likely scenarios;
- estimation of costs and benefits;
 - the costs of all potential options must be estimated, including the initial capital and ongoing operating and maintenance costs (i.e. full costs of each option);
 - market benefits under each option are to be estimated and their sensitivity under various reasonable scenarios is to be assessed;
 - the test is to include the details of the calculation of costs and benefits of each option and must be compliant with the specific provisions in the regulatory test guidelines relating to the modelling process that is to be undertaken in estimating costs and benefits (i.e. least cost modelling and pool dispatch modelling is to be undertaken);
- estimation of competition benefits – the test allows for but does not require competition benefits to be included in the assessment;
- assessment of alternative options is to be undertaken under three steps:
 - identification and assessment of the alternative options;
 - narrowing of the identified options to alternative options; and
 - narrowing of the alternative options to likely alternative options.

Having identified the likely alternative options, the results of the assessment of costs and benefits and the sensitivity of results under various reasonable scenarios will be assessed and the preferred option identified.

Comparison with NBN Co' prudency conditions

The AER's regulatory test implements a similar process to NBN Co's prudency conditions, with service providers required to demonstrate the identification of the need driving the expenditure in addition to canvassing all potential options and undertaking a comparison of the potential alternatives. This comparison is to include, as is that undertaken by NBN Co, an assessment of the costs and benefits under each option in addition to assessing the sensitivity of results under reasonable scenarios.

The AER regulatory test guidelines are more prescriptive than NBN Co's prudency conditions in relation to the modelling processes that are to be implemented in assessing benefits and costs (i.e. the guidelines specify that service providers should apply least cost and pool dispatch modelling). Service providers are not provided with the same scope for identifying a preferred option other than that shown to maximise the net economic benefit, as is the case under NBN Co's undertaking. Finally, there is no potential under the AER's regulatory test for a service provider to secure customer pre-approval for a capital project. This is expected given the nature of electricity service providers' customer bases.

DBCT access undertaking

DBCT Management's access undertaking requires it to submit to the QCA the details of the scope of any proposed terminal capacity expansion. This information is to include either:

- confirmation that the expansion complies with the Terminal Master Plan or System Master Plan; or
- a justification acceptable to the QCA as to why the proposed capacity expansion is economically and operationally prudent.

It is a requirement under the undertaking that DBCT Management provide all information required by the QCA to enable it to assess the prudency of any proposed or incurred capital expenditure.

Capital expenditure relating to terminal capacity expansions is accepted as prudent if DBCT Management is able to demonstrate to the QCA that the scope of works complies with the following requirements:

- consistent with the master plans and applicable laws and regulations;
- has satisfied the 60/60 requirement;
- the terminal expansion is consistent with the expansion of overall system capacity;
- the standard and specification of works is appropriate; and
- works have been undertaken in accordance with the approved Tender and Contract Management Process (TCMP) or are otherwise considered reasonable by the QCA.

Where DBCT Management's proposal fails to meet all of these requirements, the QCA undertakes an assessment of the prudence of the capital expenditure as if the works were 'Other Costs'. In assessing these costs, the QCA is to have regard to the scope and standard of works to be undertaken and the reasonableness of the cost of the works. In assessing the prudence of the scope of works, the QCA is to have consideration for:

- the contents of Terminal and System Master Plans;
- current contracted and likely future demand and spare capacity; and
- the appropriateness of DBCT Management's processes for the evaluation and selection of the proposed capital works, including the extent to which alternatives were evaluated as part of the selection process.

Comparison with NBN Co's prudence conditions

Like the NBN Co SAU, DBCT Management's access undertaking makes use of a customer engagement process to ensure the prudence of capital expenditure. The details differ from that of the NBN Co SAU, driven in large part by the different contractual arrangements and services that operate in the two markets. DBCT Management must demonstrate that its proposed capital expenditure projects satisfy the 60/60 requirement (in addition to complying with the contents of master plans and other criteria) in order to avoid having the QCA review the expenditure proposals. In contrast, NBN Co customers can object to NBN Co's product related investment proposals.

The access undertaking does not include a high level of detail in terms of the QCA's assessment of capital expenditure where the 60/60 requirement is not met (yet to occur for a major capacity-related capital project). However, as is the case in NBN Co's prudence conditions, the QCA will consider the extent to which alternative options were evaluated as part of the process of identifying and selecting the project.

QR Network access undertaking

Schedule A of QR Network's access undertaking contains provisions relating to the maintenance of the RAB, including the incorporation of prudent capital expenditure. Under clause 2 of the schedule, the QCA is to assess the prudence of capital expenditure in terms of its scope, standard of works and cost. The provisions relating to the actual assessment of the capital expenditure are set out in clause 3.

QR Network is entitled under the undertaking to seek regulatory pre-approval for capital expenditure either from the QCA or through agreement from the customer group. In the case of a customer-specific branch line, pre-approval can be secured from the relevant customer.

The specific provisions to be taken into account in assessing the prudence of capital expenditure are contained in clause 3.3 of schedule A. The key factor relevant to QR Network that the QCA is to have regard to in assessing the prudence of capital expenditure is the appropriateness of QR Network's processes in relation to the evaluation and selection of proposed capital expenditure projects, including the extent to which alternatives were evaluated.

Comparison with NBN Co's prudence conditions

As with DBCT Management's access undertaking, QR Network's capacity expansion approval process requires customer endorsement as a means of ensuring the prudence of capital expenditure (in contrast to NBN Co's reliance on objections). However, where the QCA is required to assess the prudence and efficiency of expenditure, QR Network's access undertaking notes the importance of the processes followed by QR Network in relation to the evaluation of the alternative options and selection of the proposed capital project. This is consistent with NBN Co's prudence conditions which include extensive requirements relating to the identification and evaluation of alternative options.

ARTC Hunter Valley access undertaking

ARTC's recently approved access undertaking for its Hunter Valley coal network includes a capacity investment framework. This framework details a step-by-step

process that must be followed by ARTC in order for capacity-related capital expenditure to be deemed prudent and efficient and incorporated into the RAB.

The first step is the initiation of the project. ARTC's key obligation in relation to this step is the preparation and publication of the Hunter Valley Corridor Capacity Strategy. This strategy must include:

- capacity expansion options which seek to ensure sufficient capacity to meet producers' combined demand forecasts;
- consideration of the preferred outcomes from the Coal Chain Master Plan, existing capability and future investment commitments in other parts of the supply chain;
- a preliminary assessment of the objectives of the capital projects in addition to indicative cost estimates and benefits;
- estimates of the costs to be incurred in the concept assessment stage under various options; and
- recommendations on the preferred options.

Prior to finalisation of the strategy, ARTC is required to:

- hold an annual meeting with the Hunter Valley Coal Chain Coordinator and the relevant coal terminal operators;
- publish a draft strategy and invite comments on the options specified in the strategy; and
- consider the views put forward in the consultation process in finalising the strategy.

The finalisation of the strategy enables ARTC to initiate individual capital projects. Having identified a project, ARTC is required to prepare a Concept Assessment Report for endorsement by the RCG.

The next step after receiving initial endorsement from the RCG involves the industry consultation process. This includes a staged process for the development and implementation of the project in consultation with industry as represented by the RCG. Under this process, ARTC requires approval from the RCG before it can progress to the next stage of the project. The costs relating to each phase of the project are progressively deemed to be prudent by the Commission as they receive endorsement from the RCG. The framework also provides ARTC with the opportunity to apply

directly to the Commission for approval in the event that endorsement is not provided by the RCG.

The key project development stages that capital projects are required to progress through in order to be considered prudent are as follows:

- concept assessment – ARTC is required to prepare a Concept Assessment Report, which is to include a preliminary assessment of potential costs, benefits and risks and an indicative assessment of project benefits and timeframes for delivery;
- project feasibility – ARTC is to provide a project feasibility report to the RCG, which is to include more detailed and precise information on costs, benefits and risks, an outline of the scope of the project, a preliminary project management plan and an indicative budget;
- project assessment – this step involves the development of a more detailed scoping report and project schedule, a detailed financial evaluation including estimation of the impact of the project on access pricing, the development of a project management plan including a delivery strategy and detailed management plans relating to resourcing, quality, safety, etc.; and
- project implementation – the focus of this step is the procurement process, with ARTC required to undertake a competitive tender process to confirm the scope and cost of the project. Where the cost estimate provided by the successful tenderer is outside of the previously identified range, ARTC is to seek endorsement of the variation from the RCG. In the event that the RCG refuses to endorse the variation ARTC can either revisit the tendering process or engage an agreed independent expert to determine whether the variation is prudent.

Comparison with NBN Co's prudency conditions

The provisions included in the capacity investment framework within ARTC's Hunter Valley access undertaking are more prescriptive than those implemented in either the DBCT or QR Network undertakings or under the AER's regulatory test. The framework is similar to NBN Co's prudency conditions in that it sets out the step-by-step process to be followed by the ARTC in the development and assessment of options for capital projects. However, the requirements imposed on ARTC are greater than those imposed on NBN Co in relation to the preparation and publication of the Hunter Valley Corridor Capacity Strategy and the need to secure customer endorsement in order to progress from each stage of the project.

Attachment C: Customer engagement

Processes whereby users are able to directly endorse the prudence of capital expenditure relating to a capacity expansion are common in regulatory regimes where the customer base consists of large, well-informed users (as is the case in relation to NBN Co). The following sections provide an overview of the customer consultation processes that are in place under the access undertakings for DBCT Management, QR National and ARTC in relation to its Hunter Valley coal network in addition to assessing the similarities that these processes share with the provisions in clause 6 of Schedule 8 of NBN Co's proposed SAU.

DBCT capacity expansion approval process

The Dalrymple Bay Coal Terminal (DBCT) is a common user terminal which handles coal for mines on the Goonyella rail system in central Queensland. The terminal is a long-lived asset, with the QCA considering in its 2006 final decision that an economic life of 50 years was appropriate for the recovery of capital costs. The QCA also considered that demand for the services provided by the terminal was relatively certain over this time period.

DBCT was first subject to price regulation by the QCA under Part 5 of the *Queensland Competition Authority Act 1997* following the Queensland Government entering into a long-term lease agreement with Prime Infrastructure (DBCT) Management. The facility was declared in response to concerns that the lease would be acquired by an entity with little interest in expanding the facility whilst also having an incentive to exploit its market power.

As is the case with NBN Co's SAU, DBCT Management's 2006 draft access undertaking, which had a duration of five years, did not include an upfront capital expenditure program for the regulatory period, but alternatively detailed an approval process to be applied for proposed capital expenditure relating to within-period capacity expansions.

The QCA's draft decision noted concerns with the robustness of DBCT Management's proposed triggers for capacity expansion:⁷⁹

The Authority acknowledges the DBCT User Group's concerns regarding the capacity expansion triggers...

⁷⁹ Queensland Competition Authority (2004). Draft Decision: Dalrymple Bay Coal Terminal - Draft Access Undertaking, p 45.

The Authority sees merit in other aspects of the DBCT User Group's proposal, in particular, a consultation process to facilitate and promote expansions in a timely manner. The Authority notes that a consultation process could be designed to fit in with other aspects of the QCA Act.

These concerns over the robustness of the proposed triggers resulted in the implementation of the "60/60 test". Under this test, the QCA is obliged to automatically approve the scope of a proposed capacity expansion if:

- 60% of the proposed expansion is subject to firm contractual commitments; and
- 60% of existing users (as determined by contracted tonnages), excluding those who have provided the commitments that necessitated the proposed expansion, do not oppose the expansion.

The QCA considered that these triggers would effectively incorporate the users and access seekers into the regulatory decision making framework:⁸⁰

The Authority believes that these triggers will assist the regulatory process as they bring users and access seekers into the regulatory decision making framework in such a way that, if they demonstrably are in favour of the proposed expansion, then the regulatory process should simply and quickly confirm the commercial requirements of the parties.

Where a proposed capacity expansion fails to meet the requirements under the 60/60 test, the undertaking provided for the QCA to assess the proposed expansion under the framework that would be adopted in assessing an upfront capital expenditure program at the commencement of a regulatory period (i.e. consider the prudence and efficiency of the proposed expenditure). The key components of this framework are as follows:

- assessment of the proposed capacity expansion against the Terminal and System Master Plans;
- provision of information by DBCT Management to the QCA demonstrating that the proposed expansion is economically and operationally prudent; and
- the QCA assessing the scope, standard and reasonableness of costs associated with the capacity expansion, having regard to various factors including:
 - current contracted and likely future demand and spare capacity; and

⁸⁰ Queensland Competition Authority (2005). Final Decision: Dalrymple Bay Coal Terminal Draft Access Undertaking, p 44.

- the appropriateness of the processes followed in evaluating the proposed works, including the assessment of alternative options.

DBCT Management largely maintained the above capacity expansion approval process (including the 60/60 test) for its 2010 access undertaking, with the incorporation of several minor amendments, one of which was that additional information be provided to access holders and seekers to enable them to form a view on whether to support a proposed expansion. This additional information includes an estimate of the temporary reductions in terminal and system capacity from construction works and the impact of expanded capacity on user charges. This amendment was supported by the QCA on the basis that it would increase the transparency of the process and enable access holders to make better informed decisions.

The 60/60 test operates in a similar manner to the customer engagement and endorsement process in NBN Co's access undertaking, in that it provides an avenue for customer involvement in the capacity expansion process and also a mechanism for the regulated business to have the prudence of capital expenditure automatically endorsed through customer approval, with the backstop that the QCA can intervene to approve investment that is rejected by the customer community, an option also available under the SAU. The DBCT access undertaking also includes a mechanism which allows DBCT Management to apply directly to the regulator to have the prudence and efficiency of a proposed capacity expansion reviewed. This is also a feature of NBN Co's proposed undertaking.

DBCT Management secured approval for the prudence of two items of capital expenditure relating to capacity expansions (capital expenditure relating to phase 1 and phase 2/3 of the initial terminal expansion project) through the 60/60 test during the 2006 access undertaking period.

Customer group approval process in QR Network's access undertaking

QR Network's access undertaking includes similar provisions to those in DBCT Management's undertaking with respect to securing customer approval with regards to the scope of capital expenditure projects. Under clause 3.1.1(a)(ii) in schedule A of the undertaking, the QCA will accept the scope of a capital expenditure project if it is general expansion capital expenditure⁸¹ and the scope of the expenditure has been accepted by a Customer Group⁸² in accordance with clause 3.2.2(f).

⁸¹ General expansion capital expenditure is defined in the undertaking as expenditure on capital projects required to expand, create or enhance capacity (including to develop new rail infrastructure) where the relevant rail infrastructure is utilised or to be utilised for the benefit of more than one customer or more than one access holder.

⁸² A Customer Group is defined as all customers and access holders who do not have customers and have responsibility for reference tonnes.

In seeking pre-approval under this clause, QR Network is required to provide a written request to each member of the customer group. This request must include advice on the capital project/s for which it is seeking customer group acceptance and QR Network's assessment of the member's reference tonnes and the total number of reference tonnes relating to the identified project/s. The written request is also to outline the rights and obligations of the group members. The identified project/s must be commenced no less than six months after the provision of this written request.

Members of the customer group have a six week period within which to note their objections to QR Network's proposed scope. If such an objection is not submitted, the member is considered to have accepted QR Network's proposed scope. Customer group acceptance of the proposed scope will be deemed to have been received if at least 60% of the customer group accepts the proposed scope. The proportion is assessed by weighting members in accordance with their reference tonnes.

The principles underpinning QR Network's customer group approval process are similar to those upon which the previously described processes in DBCT Management's and NBN Co's access undertakings are based. In essence, the purpose of these processes is two-fold:

- to provide an avenue for users to be actively involved in assessing the prudence of proposed capacity expansion projects; and
- to provide the service provider with an avenue for the pre-approval of the scope of a capacity expansion project by the customer base.

The customer group approval process is regularly used by QR Network to obtain pre-approval for the scope of major capital expenditure relating to capacity expansions. For example, in 2008/09, QR Network secured customer pre-approval for system enhancement capital expenditure totalling \$300.5 million relating to eleven items of capital expenditure. Customer group approval was also secured for a further \$178 million relating to four projects in the post commissioning stage, the largest of which was an \$83 million project for the construction of a third loop at DBCT on the Goonyella network.

Industry consultation under ARTC's Hunter Valley access undertaking

ARTC's 2011 Hunter Valley access undertaking, which received approval from the ACCC in June 2011, also includes a process whereby users have the ability to endorse the prudence of investments in additional network capacity. The investment framework contained within the undertaking includes several pathways for network investments to be pursued, one of which is through industry consultation.

Under this pathway, ARTC is required to undertake a staged process for the development and implementation of a project in consultation with industry via the Rail Capacity Group (RCG), commencing with concept assessment. This process involves several stages where the RCG is requested to endorse the project to proceed to the next stage.

While the user consultation process for capital expenditure relating to the new capacity in ARTC's access undertaking does not include the level of detail of the processes detailed in the undertakings for QR Network or DBCT Management, there is still a clear process for users to endorse the prudence of capital projects that are identified as appropriate to increase network capacity within the regulatory period. This is directly comparable to the mechanism which has been included in NBN Co's proposed undertaking.

Attachment D. Efficiency mechanisms

Text boxes 1 through 3 below summarise the approaches used for addressing operating costs in the ARTC and QR undertakings, and in the National Electricity Rules. All of these procedures effectively allow the relevant regulator to disallow operating costs that do not meet the efficiency objective. This is clarified, at least to some degree, in the rules or the undertaking. It is mediated through:

- provision of data and forecast from the business subject to the undertaking to the relevant regulator;
- assessment of the data against the criteria in the undertaking or rules, including by an independent expert in the case of QR; and
- a binding (but sometimes appealable) determination that the operating costs are or are not allowable.

Box 1 Approval of operating expenditure in ARTC Hunter Valley undertaking

The ARTC's Hunter Valley access undertaking includes a provision under which the Commission is able to undertake annual assessments to ensure ARTC's compliance with the terms of the undertaking. The Commission stated that it was necessary for the undertaking to provide the Commission with explicit powers as part of the compliance assessment process to disallow inefficiently incurred operating expenditure. The Commission considered that this addition was necessary in order to appropriately promote the efficient use and operation of the Hunter Valley network.

In response to the Commission's requirements, clause 4.10 of ARTC's revised access undertaking was adjusted so that, as part of the annual compliance assessment, the Commission is able to determine whether ARTC has incurred efficient costs and efficient operating expenditure, in accordance with clause 4.5(b) of the undertaking. This clause states that all operating costs that are to be included in the formation of prices are to be assessed on an 'Efficient' basis. The term 'Efficient' is defined in the undertaking as:

...in respect to costs and operating expenditure, costs incurred by a prudent service provider managing the Network, acting efficiently, having regard to any matters particular to the environment in which management of the Network occurs...

The undertaking specifies three considerations to which the Commission is to have regard in assessing the efficiency of operating expenditure: maximising coal chain throughput and reliability; obligations of ARTC to maintain the network under user access agreements; and obligations of ARTC under relevant laws, legislation and the NSW Lease.

The provisions of ARTC's undertaking with respect to the efficiency of operating expenditure are prescriptive and leave ARTC susceptible to a significant degree of discretion from the Commission in terms of what constitutes 'efficient' operating expenditure. This increases the regulatory risk under the undertaking as there is greater potential for operating expenditure to be excluded from the calculation of regulated prices.

Box 2 Provisions relating to approval of operating expenditure in QR Network's undertaking

QR Network is required to submit an access undertaking for its central Queensland coal networks to the QCA for approval every five years. As part of this process, QR Network submits its operating and maintenance expenditure forecasts for the upcoming regulatory period. The QCA then engages an independent consultant to undertake an assessment of the expenditure proposal to determine whether the forecasts are representative of prudent and efficient costs and should therefore be included in the calculation of reference tariffs. There are no specific clauses in the access undertaking that dictate the process to be followed by the QCA (or its consultant) in assessing QR Network's expenditure proposals.

In its assessment of QR Network's 2006 undertaking, the QCA generally accepted QR Network's proposed operating and maintenance expenditure forecasts, approving costs of approximately \$25 million per annum and a proposed X-factor of zero (on the basis that expenditure forecasts reflected expected efficiency gains over the term of the undertaking). However, for the 2010 undertaking, the QCA did not accept QR Network's operating and maintenance cost forecast of \$62.6 million per annum. In its draft decision, the QCA stated that QR Network had not established a clear link between its proposed cost increases and the reasons justifying those increases. The QCA subsequently engaged a consultant (GHD) to undertake an assessment of QR Network's cost forecasts. Based on the outcomes of this process, the QCA proposed several changes to QR Network's operating and maintenance expenditure forecasts which resulted in a total annual allowance of \$55.7 million, an 11% reduction from QR Network's initial proposal. QR Network's revised undertaking was consistent with the QCA's decision.

The outcome of the QCA's assessment of QR Network's 2010 draft undertaking provides a demonstration of the high degree of regulator discretion that exists under QR Network's regulatory regime, and the associated regulatory risk, with regards to the approval of operating and maintenance expenditure. Where the QCA does not consider QR Network's cost forecasts as being sufficiently substantiated, it has the power to engage its own consultant to conduct an assessment of the proposal and to effectively substitute its own allowance for operating and maintenance expenditure. Under these arrangements, QR Network is exposed to significant regulatory risk in relation to the recovery of its operating expenditure.

Box 3 Provisions relating to the approval of operating expenditure in the NER

Clause 6.5.6 includes provisions that relate to the inclusion of an allowance for operating expenditure in the calculation of the annual revenue requirement for a Distribution Network Service Provider. Clause 6.5.6(a) specifies four objectives in relation to the operating expenditure allowances afforded to DNSPs:

- meet or manage expected demand
- compliance with regulatory obligations and requirements
- maintain quality, reliability and security of supply
- maintain reliability, safety and security of the distribution system.

Clause 6.5.6(c) sets out the factors that the AER must take into consideration in assessing operating expenditure proposals submitted by DNSPs. The clause states the AER must accept the proposed forecast of required operating expenditure if it is satisfied that the proposal reasonably reflects:

- the efficient costs of achieving the objectives listed above (in clause 6.5.6(a));
- the costs that a prudent operator in the circumstances of the relevant DNSP would require to achieve the objectives; and
- a realistic expectation of the demand forecast and the cost inputs required to achieve the objectives in clause 6.5.6(a).

These factors are termed the operating expenditure criteria and serve to exert some discipline on the AER in undertaking its assessment of service providers' proposed operating expenditure allowances. Under clause 6.5.6(d), the AER must not accept the proposed operating expenditure forecast if these criteria are not satisfied.

Clause 6.5.6(e) of the Rules includes ten further criteria to which the AER must have regard in determining whether the operating expenditure criteria listed in clause 6.5.6(c) are satisfied. These criteria include the consideration of information included in the service provider's proposal, submissions received from interested parties and any analysis undertaken for or by the AER; benchmark operating expenditure for an efficient service provider; actual and expected expenditure during preceding regulatory periods; relative input prices; substitution possibilities between operating and capital expenditure; whether non-network alternatives have been considered; etc. These criteria serve to further define the AER's role in assessing DNSPs' proposed operating and maintenance expenditure allowances.

While the framework provided for under the Rules includes broad discretion in terms of the ability of the AER to disallow operating expenditure forecasts proposed by DNSPs, there are provisions that do impose some constraints on the AER's discretion which serve to reduce the degree of regulatory risk to which DNSPs are exposed in relation to operating expenditure.

Most importantly, if the AER decides that the operating expenditure criteria are not satisfied it can substitute its own values in place of the DNSP's proposed operating expenditure forecasts. However, under clause 6.12.3(f), the AER can only amend a DNSP's forecast on the basis of the DNSP's regulatory proposal and only to the extent necessary to enable it to be approved in accordance with the Rules (i.e. to meet the operating expenditure criteria). In simple terms, these provisions mean that the AER must have a reasonable basis for substituting its own operating forecasts for those proposed by a DNSP.

Attachment E. Declaration

Synergies has made all the inquiries that Synergies believes are desirable and appropriate and that no matters of significance that Synergies regards as relevant have, to Synergies knowledge, been withheld from the ACCC or the Court .

Synergies declares that each of the opinions expressed in this report is wholly or substantially based upon Synergies' specialised knowledge.

Sam Lovick for Synergies Economic Consulting Pty Ltd

A handwritten signature in black ink, appearing to read "Sam Lovick". The signature is written in a cursive style with a horizontal line underneath the name.

17 January 2012