Advice on NBN Co Ltd's Special Access Undertaking

A Report Prepared for Webb Henderson

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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.

Executive summary

Instructions

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 ('ACCC') under s 152CBA(2) of the Competition and Consumer Act 2010 are efficient. The SAU sets out core terms and conditions of access to the National Broadband Network ('NBN'). Webb Henderson's instructions are set out in Attachment H.

Synergies considered the SAU in the context of the Ministerial Statement of Expectations,[2] which sets out certain Government expectations of the NBN.[3] Synergies is advised that these are statements of Australian Government policy, and notes the instruction to treat these as constraints.[4]

Synergies was asked to consider the productive efficiency, allocative efficiency and dynamic efficiency outcomes under the SAU. Synergies considers that these are the pertinent concepts of efficiency when considering overall economic efficiency, in concordance with the approach adopted by the Australian Competition Tribunal ('ACT').[5]

Term and structure of the SAU

The SAU extends from the date of acceptance to 30 June 2040. It comprises three core modules: Module 0 which sets out the foundational SAU clauses that operate across the full term; Module 1 which sets out detailed terms for the Initial Regulatory Period expected to last for the first 10 years of the SAU; and Module 2 which set out the long-term cost recovery and pricing arrangements for the Subsequent Regulatory Period thereafter. In addition, the SAU contemplates a series of shorter-term Replacement

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1 *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 (Cth)* ('SAU').

2 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*').

3 Ibid, at 10.

4 Further revised brief to advise – Expert report on NBN Co's Special Access Undertaking. *Letter of instruction from Webb Henderson* 19 September 2012, at 4.

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

Modules in the Subsequent Regulatory Period which will set out, *inter alia*, capital expenditure forecasts, operating costs forecasts and service offerings during the term of their application.

In Synergies' view, this long-term modular structure can reasonably be expected to deliver efficient outcomes, for the following reasons:

- it strikes an appropriate balance between allowing sufficient scope for investors to recover their costs, and the risk associated with the size of the investment given the low level of likely initial uptake relative to the eventual capacity of the NBN;
- longer-term undertakings are necessary to foster efficient outcomes for major new infrastructure projects characterised by demand risk and long investor payback durations;
- the terms and conditions in the SAU that are prescribed at the outset for the full term — including approaches for valuing the Regulatory Asset Base ('RAB'), depreciation, and weighted average cost of capital ('WACC') — reduce regulatory risk;
- in so far as the long duration of the undertaking increases the risk that costs and prices will deviate from efficient levels, the SAU contains safeguards that can reasonably be expected to prevent this, including prescribed approaches to new investment and operating cost, and ongoing ACCC scrutiny; and
- the modular structure which differentiates between the network roll-out and mature phases of NBN operation allows the terms of the SAU to adjust in line with market developments and expected changes in NBN Co's context and circumstances, in a manner that can be expected to foster efficient outcomes. Replacement Modules, which must be approved by the ACCC, can be expected to ensure that the SAU adapts efficiently to changing market circumstances in the future.

Pricing during the Initial Regulatory Period

In the Initial Regulatory Period, the revenue cap methodology that underpins the SAU is unlikely to provide an economically useful constraint on prices. The additional pricing mechanisms in the Initial Regulatory Period, in the face of this limitation, can reasonably be expected to deliver efficient outcomes, for the following reasons:

- the initial Reference Offer prices are set at levels consistent with similar services from alternative technologies, and are therefore consistent with the prices one might expect from a workably competitive market;
- the Reference Offers are consistent with NBN Co recovering but not over-recovering its prudent operating and investment costs;
- the initial fixed price period followed by clearly specified maximum price increases after July 2017 provides certainty that should allow NBN Co customers to make complementary investments necessary to maximise uptake and utilisation of the NBN;
- year on year price increases of the Reference Offers are constrained to CPI-1.5%, and this is known to NBN Co customers. This limits the likelihood of inefficient 'hold-up' from unexpected price increases; and
- the SAU allows NBN Co additional but safeguarded pricing flexibility (such as temporary discounts), which can deliver allocative and productive efficiency benefits.

The CPI-1.5% Individual Price Increase Limit on Reference Offers after July 2017 can reasonably be expected to deliver efficient outcomes for the following reasons:

- the 5 year initial fixed price period represents a reasonable trade-off between price certainty that encourages complementary investments and pricing flexibility that allows NBN Co to re-balance prices in order to set allocatively efficient prices; and
- the possible future price paths for Reference Offers under the Individual Price Increase Limit are likely to result in prices that remain within the range that would normally be considered efficient.

In addition, inclusion of price-regulated Non-Reference Offers in the SAU can reasonably be expected to deliver efficient outcomes because uncertainty over the future demand for and use of NBN Non-Reference Offers, which might favour delaying setting the prices of Non-Reference Offers, is ameliorated by certainty for

customers over the service offerings and their prices. Balancing these considerations favours inclusion of the Non-Reference Offers in the SAU.

The SAU sets out pricing principles that NBN Co must consider when setting the prices of new Non-Reference Offers and Other Charges (i.e. those not set out in cl 1D.3). Synergies considers that these principles, within the context of the SAU, circumscribe the factors that would need to be considered in establishing an efficient price. They, collectively, limit the scope for NBN Co to set prices for New Offers that differ substantially from those that would be considered efficient.

Pricing during the Subsequent Regulatory Period

In Synergies' opinion, inclusion of a mechanism in a Replacement Module for the Reference Offers to be reviewed every 3-5 years as part of a replacement Module Application can reasonably be expected to deliver efficient outcomes for the following reasons:

- it helps to ensure that the NBN is not encumbered by out-dated services that are provided solely because they are preserved by the regulatory arrangements;
- it fosters dynamic efficiency by subjecting hitherto guaranteed offers to consideration for withdrawal if they are no longer appropriate, and replacing them with superior more widely accepted services;
- it provides that where the composition of a Reference Offer is to be updated, the characteristics of the old Reference Offer will become a Non-Reference Offer; and
- it promotes productive efficiency by allowing NBN Co (and potentially NBN Co's customers) to reduce costs associated with NBN Co services, that are no longer relevant to current market needs while addressing the concerns of any remaining customers using such services in making any decision to withdraw the product.

The CPI-1.5% Individual Price Increase Limit prior to the Methodology Change Event ('MCE', the point at which capitalised losses are fully recovered) can reasonably be expected to result in efficient outcomes in much the same manner as the Initial Regulatory Period. Furthermore, the commitment to provide information to customers on the likely timing of the MCE and its expected impact on prices minimises the risk of adverse efficiency consequences.

The inclusion of forecasts of revenue, demand and costs in a Replacement Module in the Subsequent Regulatory Period can reasonably be expected to result in efficient outcomes, for the following reasons:

- the use of forecasts is widely accepted in commercial and regulatory practice and does not present significant challenges *per se* in respect of the SAU;
- the use of forecasts of revenue and revenue requirement (which necessitate capex and opex forecasts) in the Initial Cost Recovery Period ('ICRP') presents strong incentives for NBN Co to minimise its costs, maximise demand and to price in an allocatively efficient manner, which is likely to be particularly efficiency enhancing while accumulated losses are large or increasing;
- in Synergies' view, the ACCC will be in a position to minimise the risk of NBN Co strategically using the forecast process, such that the incentives will operate to foster more efficient outcomes;
- after the MCE, when the NBN can be expected to have achieved a degree of maturity, the SAU makes provision to carry-over under- or over-recovery from one Replacement Module to its successor, ensuring that NBN Co does not incur excessive losses or earn excessive profit as a result of demand forecast error (which has proved problematic in other regulated businesses);
- NBN Co's revenue requirement in the Subsequent Regulatory Period after the MCE is still based on forecasts of capex and opex that are locked into the Annual Building Block Revenue Requirement ('ABBRR'). As a result NBN Co can earn additional profit if it outperforms those forecasts and additional losses if it fails to meet them. This provides continued incentives for cost efficiency by allowing NBN Co to retain the benefits from further efficiency gains, at least for the remaining duration of the Replacement Module; and
- if the likelihood of forecast error is considered to be high, there is scope to adopt shorter Replacement Module durations, in order to reduce problems that might otherwise arise from large differences between actual and forecast outcomes, whether or not the differences can be carried across from one Regulatory Cycle to the next.

Synergies considers that NBN Co will have strong incentives to submit Replacement Module Applications that are acceptable to the ACCC in order to avoid the imposition

of regulation by the ACCC for a Regulatory Cycle (of 3 to 5 years) through Access Determinations or Binding Rules of Conduct, noting that the ACCC is an experienced telecommunications and broadband regulator that can be expected to determine whether NBN Co's forecasts of capex and opex reflect efficient cost. Furthermore, Synergies considers that, during the Initial Cost Recovery Period, while NBN Co is still paying down capitalised losses (i.e. prior to the MCE), commercial and governance constraints can reasonably be expected to encourage cost efficiency as a means of minimising the duration of the ICRA.

The Long Term Revenue Constraint Methodology ('LTRCM')

The LTRCM sets out the approach for determining NBN Co's ABBRR, which comprises:

- a return on the value of the RAB derived from an allowed WACC;
- prudently incurred operating expenditure;
- depreciation;
- an allowance for construction in progress; and
- an allowance for tax.

In Synergies view, NBN Co's building block approach in combination with the ICRA mechanism can reasonably be considered to be efficient on the basis that the elements of the building block approach are, collectively, consistent with NBN Co recovering its prudently incurred costs over the term of the SAU, and no more, as set out below.

The RAB

The RAB is based on 'real capex' incurred in each financial year. Real capex is defined 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. Hence, the RAB comprises actual capital expenditure. The RAB is depreciated on a straight line basis and is not subject to further revaluation during the term of the SAU. 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). In Synergies view, this approach can reasonably be expected to deliver efficient outcomes for the following reasons:

- the possible advantages of alternative approaches to asset valuation in the RAB (such as replacement cost and optimised asset valuation) are

associated with significant and more than offsetting disadvantages, including complexity and perceived risk to investors;

- even if the alternatives could in some circumstances foster more efficient investment decisions, mechanisms within the SAU and intrinsic to NBN Co's circumstances can reasonably be expected to obviate this advantage; and
- regulatory precedent on asset valuation outside of telecommunications, echoed by the ACT 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 more likely to deliver efficient outcomes.

In the Initial Regulatory Period, prudency provisions safeguard against the risk inherent in long-term undertakings, that investment costs (and operating costs) will deviate from efficient levels, for the following reasons:

- the Prudent Cost Condition (cl 1E.4) can be expected to subject NBN Co's asset purchases to appropriate market discipline, or to otherwise ensure that the purchases are cost efficient in comparison to alternatives;
- those purchases and arrangements that are deemed to be prudent (that are within Synergies' area of competence to assess, cl 1E.3.2) are reasonable having regard to the direct and indirect costs of compliance with the Prudent Cost Condition;
- the initial design scope of the Network Design Rules (cl 1E.6.1) is directed at meeting the Government's requirements in respect of NBN Co and will be considered in the review of the SAU; and
- the multilateral engagement processes that have been established, in Synergies view, can reasonably be expected to offset the adverse efficiency consequences that might otherwise arise under a long-term undertaking, particularly reduced incentives to innovate and to remain productively efficient. In particular, they
    - engage experienced telecommunications companies (i.e. NBN Co wholesale customers) that can be expected to understand and evaluate:
        - proposed network changes;
        - new product development;

    - set out workable criteria that allow for the review of and objection to proposed investment changes that are likely to result in inefficiency; and
    - are subject to review by the ACCC to address any shortcomings prior to 1 July 2018; and
- operating costs can reasonably be expected to be efficient given the effects of prudency provisions and commercial pressures that NBN Co will face to minimise costs and capitalised losses.

In the Subsequent Regulatory Period, the phase of the SAU in which the MCE is most likely to occur, periodic review of forecast capital and operating costs by the ACCC, a highly experienced regulator in the area of telecommunications and broadband networks, as part of a Replacement Module Application can reasonably be expected to ensure that those forecasts reflect efficient costs. The use of forecasts also provides incentive for NBN to innovate in order to reduce its capital expenditure below the forecast level. Hence, the asset value that is, in fact, rolled into the RAB may be lower than that forecast.

Depreciation

The straight line depreciation approach adopted in the SAU can reasonably be expected to result in efficient outcomes for the following reasons:

- in so far as alternatives may have advantages (such as dealing with technological obsolescence or changing costs of technology over time), these are offset by disadvantages including complexity and the additional risk they impose on investors;
- none of the alternatives in the context of the NBN is demonstrably superior to straight line deprecation such that they can reasonably be expected to result in more efficient outcomes; and
- its advantages are recognised in its widespread adoption in financial markets, corporate accounting and regulatory practice.

Loss capitalisation

The SAU provides a loss capitalisation mechanism that capitalises any shortfall between actual revenue and the calculated annual regulated revenue in the Initial Cost Recovery Period. This period ends at the end of the financial year in which NBN Co's ICRA first becomes equal to or less than zero.

NBN Co's proposal to adopt a loss capitalisation approach can reasonably be expected to result in efficient outcomes for the following reasons:

- 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, which is the expected practical outcome of the approach in the SAU;
- loss capitalisation does not allow NBN Co to earn revenues in excess of its long-run costs, nor does it guarantee that it will recover its long-run costs, in so far as they may persist to the end of the SAU;
- safeguards within the SAU and the context and circumstances of NBN Co can reasonably be expected to minimise capitalised losses and thereby prevent NBN Co from setting prices that result in adverse efficiency consequences, including:
    - the governance arrangements of NBN Co which 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 operating expenditure in the Initial Regulatory Period and the use of forecast capex and opex, subject to assessment by the ACCC, to set the forecast real ABBRR for Regulatory Cycles in the Subsequent Regulatory Period;
    - specification of prices for Reference Offer and for a substantial proportion of the Non-Reference Offers likely to be offered in the Initial Regulatory Period in the SAU; and
    - the characteristics of demand for broadband services in the face of capped prices for Reference and Non-Reference Offers.

Adoption of a single ICRA/RAB

The SAU adopts a single ICRA/RAB for all its investments as opposed to 'hypothecation' whereby assets are allocated to particular classes of customers or offerings. Synergies confirms that this approach can reasonably be expected to foster efficient outcomes for the following reasons:

- it minimises impediments that might otherwise result in allocatively inefficient prices;

- 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 inherent in a single ICRA/RAB;
- the risks of having to price to 'meet the market' in accordance with government expectations, are best managed by providing NBN Co with 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 with a transfer mechanism between high and low cost areas. It is therefore a reasonably necessary mechanism for achieving uniform national prices that meet the market.

Contents

1 Introduction

1. 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')[6] given by NBN Co to the Australian Competition and Consumer Commission ('ACCC') under s 152CBA(2) of the Competition and Consumer Act 2010 ('CCA') are efficient. The SAU sets out core terms and conditions of access to the National Broadband Network ('NBN') for access seekers including pricing approaches 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. Webb Henderson's instructions are set out in Attachment H.

2. 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.

1.1 Efficiency

3. In the instructions, Synergies was asked to consider the productive efficiency, allocative efficiency and dynamic efficiency outcomes under the SAU, which are the concepts of efficiency that Synergies considers to be pertinent when considering overall economic efficiency. This section summarises these concepts of efficiency.

4. The Australian Competition Tribunal ('ACT') has addressed the issue of efficiency in the context of examining the economically efficient use of, and the economically efficient investment in, telecommunications infrastructure. It has stated that the concept should encompass allocative, productive and dynamic efficiencies.[7] 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 to engender efficient changes and improvements over time, including cost reductions (dynamic efficiency).

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[6] *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 (Cth)* ('SAU').

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

5. Synergies has adopted the ACT's approach and, for clarity of exposition, 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.

6. The ACT 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.[8]

7. Synergies 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 mechanisms in place that can reasonably be expected to prevent excessive costs or inadequate resourcing.

1.1.1 Additional considerations

8. In accordance with its instructions, Synergies notes the Ministerial Statement of Expectations[9] 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 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]

9. 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

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

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.

11 Ibid, at 7.

12 Further revised brief to advise – Expert report on NBN Co's Special Access Undertaking. *Letter of instruction from Webb Henderson* 19 September 2012, at 4.

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 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.

1.2 The core components of NBN Co's SAU

1.2.1 Term and modular structure

10. The SAU extends from the date of acceptance to 30 June 2040,[13] which for convenience is described in this advice as a 30 year term. It is then composed of a series of distinct components, termed Modules, that are intended to operate over different time periods within that 30 year term. The following modules are defined (see Figure 1 below):

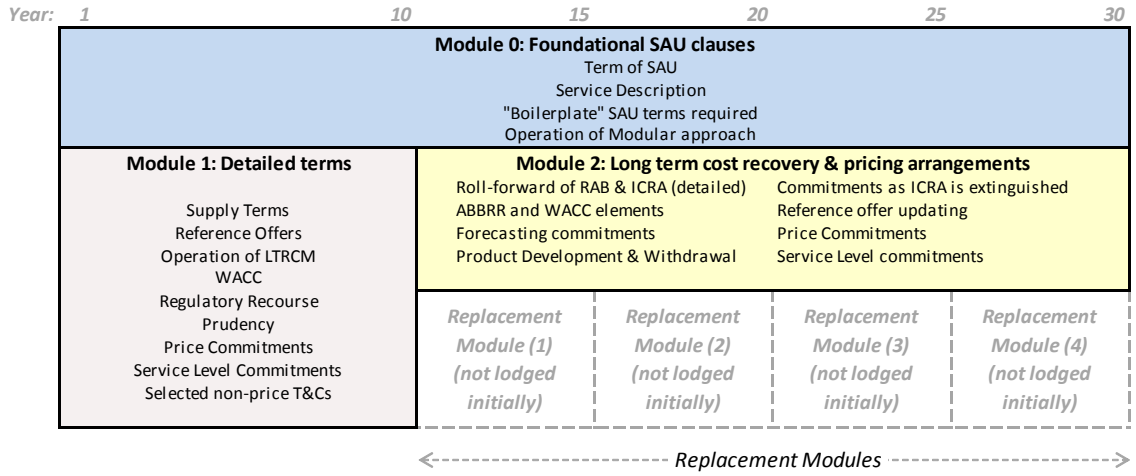
- ***Module 0*** operates across the full term of the SAU, and sets out the term of the SAU, the modular structure of the SAU, definitions of the services covered by the SAU, and the definitions and meanings of terms used in the SAU;
- ***Module 1*** operates over the Initial Regulatory Period which comprises the period in which the NBN is constructed. For convenience, this is described in this report as the initial 10 years of the SAU although there is provision for extending its duration (in limited, well-defined circumstances for a maximum of 12 months). Module 1 sets out, for the duration of its application, the detailed approach for determining the prices and conditions of Reference and Non-Reference Offers and Other Charges, and the approach that NBN Co will adopt to ensure the prudency of its investments and to determine its revenue requirements;
- ***Module 2*** commences operation when the Initial Regulatory Period ends and operates for the remainder of the SAU, i.e. the Subsequent Regulatory Period. Module 2 sets out a number of core regulatory and pricing principles that shall apply for the term of its application including the rolling forward over time of the Regulatory Asset Base ('RAB') and the

[13] SAU cl 3.

Initial Cost Recovery Account ('ICRA'), which together form the principal determinant of the maximum annual revenue that NBN Co can earn. It is also expected that the Methodology Change Event ('MCE') will occur during the operation of Module 2, which occurs when the ICRA balance reaches zero, after which time a building block approach is adopted; and

- ***Replacement Modules***, which are not set out in the SAU other than in conceptual terms, but which operate concurrently with Module 2 and can be considered as modifications of the underlying SAU over the final 20 years of its operation, subject to the continued overarching provisions set out in Modules 0 and 2. Clause 4.6 of the SAU commits NBN Co to submit Replacement Module Applications. Synergies understands that these modules would set out detailed forecasts of capex, opex, cost of capital and related terms and conditions. If accepted by the ACCC, these modules would be incorporated in the SAU and operate over 3 to 5 year periods in concert with Module 0 and Module 2.

Figure 1. Overview of key elements of the incentive based modular SAU approach



Source: NBN Co.

1.2.2 Conceptual design of the SAU

11. In Synergies view, the SAU can be described conceptually having regard to this modular structure, as follows:

- a 30 year term commensurate with the expected time that it may take NBN Co to fully recover the substantial capital costs of the network such that NBN Co may expect at the outset to recover prudent capital investment and an appropriate return on that capital;

- an undertaking not to recover revenue in excess of that needed to ensure an appropriate return of and return on capital, expressed broadly in the form of an annual revenue cap;
- capitalisation of losses incurred in the earlier years of operation of the SAU, with the expectation that these will be recovered during the latter years;
- the initial 10 year network roll out period in which capital and operating expenditure will substantially exceed revenue, during which time prices based on a conventionally assessed revenue cap would not be practical or efficient and NBN Co would expect to face a substantial revenue shortfall. Service offerings, prices and maximum price changes for this period are, for the most part, prescribed in the SAU;
- at the end of the initial period, expected revenues and revenue requirements will be based on forecasts over a 3 to 5 year period, including forecasts of capital costs over that time period, that would be subject to regulatory scrutiny by the ACCC when considering a Replacement Module. Several core principles — for determining the value of the RAB, the cost of capital, the annual revenue requirement and the maximum allowable increase in Offer prices — apply across all the Replacement Modules and are set out in Module 2.

12. NBN Co can determine price levels under the SAU, within the following constraints:

- fixed prices specified in the SAU for Reference Offers that are to apply for a period from the commencement of the SAU until 30 June 2017;
- maximum prices specified in the SAU for current Non-Reference Offers as at the commencement date of the SAU;
- year on year price increases for any Reference and Non-Reference Offers cannot exceed CPI-1.5%;
- annual revenue or forecast revenue across all Reference and Non-Reference Offers cannot exceed the revenue cap;
- initial or starting prices for new Reference Offers, Non-Reference Offers and Other Charges must be set according to initial pricing principles; and
- Reference Offers cannot be withdrawn through the term of the relevant module under which the prices are set.

There is no provision for the ACCC to directly determine or otherwise control prices for Reference Offers, Non-Reference Offers and Other Charges, except in the limited circumstances where NBN Co determined to place a price on a Reference Offer (or an Other Charge associated with the supply of a Reference Offer) that had, up to that point in time, been charged at a zero dollar price.

2 Term and modular structure

13. Synergies has been asked to:

> please advise whether NBN Co's approach of having a 30 year SAU term with the following elements is efficient
>
> - the specified terms expiring after an initial 10 year period contained in Module 1;
> - the specified terms not commencing until the expiry of the initial 10 year period and continuing for the duration of the SAU contained in Module 2;
> - the introduction of further modules with terms of between 3 and 5 years, after the expiry of Module 1, as nominated in a future variation to the SAU (i.e. Replacement Modules).
>
> In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period 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;

2.1 Summary of conclusions

14. In Synergies' opinion, the 30 year term comprising two distinct periods, Module 1 followed by Module 2 with a sequence of concurrent Replacement Modules can reasonably be expected to deliver efficient outcomes for the following reasons:

- 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; and
  - there is scope within the SAU to allow changes to the terms and conditions of access in the event that circumstances change significantly;
- there is regulatory precedent in Australia for undertakings with durations in excess of the typical period review for economic regulation (5 years) when the infrastructure in question involves substantial capital investment and low levels of initial capacity utilisation;

- there are reasonable efficiency grounds for making different commitments across the whole term of the SAU in line with expected changes in NBN Co's context and circumstances, and the separation of the SAU into Initial and Subsequent Regulatory Periods is a reasonable approach;
- the terms of the SAU that are discontinued at the end of the Initial Regulatory Period are replaced by mechanisms that adequately reduce the risk of inefficient outcomes;
- there are additional safeguards within the SAU to guard against inefficient outcomes that might otherwise be expected to arise under a long-term undertaking (for example, the risk that prices may deviate from those that would arise in a workably competitive market because NBN Co becomes less productively inefficient). These additional safeguards comprise:
    - measures within the undertaking that reduce the risk that NBN Co will invest or operate in a productively inefficient manner during the Initial Regulatory Period;
    - measures during the Subsequent Regulatory Period that also reduce the risk that NBN Co will invest or operate in a productively inefficient manner, specifically:
        - the ACCC will assess the operating and capital expenditure forecasts as part of any Replacement Module Application, meaning that the allowed ABBRR will only reflect a forecast of prudent costs; and
        - NBN Co is fully exposed to the risk of failing to meet those cost forecasts because they are locked into the ABBRR; NBN Co therefore incurs losses if they fail to meet the forecasts and profits if their actual costs are below the forecasts. This provides NBN Co with additional incentives to implement further cost efficiencies by allowing them to profit from so doing; and
    - the weighted average cost of capital ('WACC') in the Subsequent Initial Regulatory Period will be determined for each Regulatory Cycle using a nominal vanilla WACC with reference to: the risks involved in providing the relevant services; a benchmark financing structure; and a cost of debt and a cost of equity (determined using a well-accepted

financial model such as the Capital Asset Pricing Model) that meet benchmark standards for efficient financing, having regard where appropriate to past, present and expected future financial conditions.[14] This will be estimated for each Replacement Module and approved by the ACCC (replacing the fixed 3.5% mark-up over the risk free rate used in Module 1) so as to ensure that NBN Co will earn an appropriate return on its RAB during the Module 2 period.

2.2 Issues predisposing longer undertakings

2.2.1 Scope to recover costs

15. NBN Co differs from most infrastructure providers that seek to establish the regulatory terms and conditions under which they propose to operate in a number of crucial respects:

- the scale of the overall investment at $37.4bn (to end FY2021)[15] is much larger than any other infrastructure provider, and the bulk of the investment has yet to be made, so the terms of the regulatory bargain established in the SAU will predate most of the investment;
- the NBN is to provide Australia-wide coverage, which means that:
  - NBN Co will inevitably provide services to locations that, on a stand-alone basis, might not be profitable,[16] particularly regions of low customer density or low proportion of high value customers; and
  - NBN Co may face competition in those parts of the network that contain the highest proportion of high value customers, such as areas of higher customer density;
- NBN Co anticipates that it will take longer to achieve profitability than is the case for the infrastructure projects for which longer undertakings have been accepted (see Attachment B); and

[14] SAU cl 2D.2.1(a)(iii).

[15] NBN Co Limited Corporate Plan 2012 – 2015, 6 August 2012 at 73.

[16] Having regard to NBN Co's proposal for geographically undifferentiated prices.

- NBN Co faces greater technological and demand risk than is the case for infrastructure for which undertakings longer than 5 years have been previously accepted (for instance for rail or gas).

16. The current corporate plan anticipates that the network rollout phase will take 9 years resulting in total capex of $37.4bn by the end of FY2021 and a peak funding requirement of $44.1bn. The payback year is indicated as being 2033 and over the full period of the 30 year business model NBN Co anticipates an IRR of 7.1%.[17]

2.2.2 The requirements of investors

17. 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 apprehended by those investors. Investors view regulation as a relevant risk in determining their required rate of return. The rate of return that investors would require will be affected by the prospect of future reviews of access arrangements that might significantly affect the core determinants of the expected return. Accordingly, investors would apprehend higher investment risk if the SAU provided for such reviews prior to the date when investors expect to recover all of their capital and an appropriate return thereon.

18. The SAU, in broad terms, imposes a revenue cap on NBN Co equal to its expected required revenue, determined by reference to costs incurred by NBN Co, including capital costs and capitalised accumulated losses incurred in those periods when NBN Co's revenues are below costs. The largest impacts on NBN Co's required revenue are the value of the RAB, the value of the capitalised accumulated losses, and rate of return allowed on both. It follows that investors perceive that regulatory risk will be greatest if the parameters that affect these are uncertain. In Synergies view, minimising regulatory risk is best achieved by ensuring that:

- the SAU establishes an internally consistent approach to asset valuation, depreciation and allowed rate of return that is consistent with earning an expected return of and return on capital over the expected life of the investment; and

- future regulatory reviews, to the extent that they are contemplated, are not able to impose ex post, different approaches to these key determinants of

[17] NBN Co Limited Corporate Plan 2012 – 2015, 6 August 2012 at 73.

required revenue that are not foreshadowed at the time of the investment. The prospect of 'changing horses' in this fashion would be perceived as raising regulatory risk in a manner that does not appear to be remunerated through depreciation and WACC.

19. Investors that perceive regulatory risk will require some compensation in order to bear that risk. In Australia, regulators have acknowledged the existence of regulatory risk and, on occasion, included that risk as a factor in determining allowed WACC (although the approach for doing so is not without controversy). In practice, investors are most likely to perceive regulatory risk if the ACCC has discretion to change the most important determinants of future revenue. These are the valuation of the installed asset base (the RAB), allowance for and holding cost of previously incurred losses (the ICRA), depreciation and WACC.

20. The SAU does not provide the ACCC with significant discretion in these matters. The WACC adopted for each Replacement Module does not include a specific component to address regulatory risk. However, the wording of 2D.2.1(a)(iii) leaves it open to do so. Estimating regulatory risk premiums is both challenging and controversial, and regulators are reluctant to do so. In Synergies' view it is preferable to structure the SAU so as to reduce regulatory risk by removing the main drivers of that risk as NBN Co has done, for example by valuing the RAB based on actual costs with no revaluation[18] and with the approach adopted for carrying forward accumulated losses.

21. The principal difference in the determination of annual revenue requirements between Module 1 and Module 2 (i.e. the Initial Regulatory Period and Subsequent Regulatory Period) is that WACC in Module 1 is based on a fixed 3.5% increment over the risk free rate. Synergies has not been asked to advise on the WACC, but notes the considerable difficulty of making robust determinations of equity cost of capital using CAPM in the formative stages of capital intensive unique enterprises. On that basis, Synergies accepts the rationale for a different approach to WACC in Module 1 and Module 2, but takes no view on the 3.5% figure adopted in Module 1.

[18] See section 6 for a discussion of asset revaluation.

2.3 Changing NBN Co context and circumstances

22. NBN Co's context and circumstances will change once the initial network roll-out is complete (noting that Australian Government policy does not give NBN Co discretion to delay roll-out on the basis of the likely revenue from different network extensions). In the Initial Regulatory Period, NBN Co will incur the substantial capital cost associated with rapid and universal network roll-out; will have a governance, managerial and operational focus on efficiently so doing; and can be expected to incur substantial losses relative to its annual revenue requirements. In the Subsequent Regulatory Period, NBN Co's network investments will be largely sunk; and its governance, managerial and operational focus can be expected to shift towards maximising the value of its network investment within the constraints accepted under the SAU. In Synergies' view, the nature of the regulatory constraints necessary to ensure efficient outcomes change with this change in circumstances, to include:

- re-appraisal of the cost of capital in so far as NBN Co's equity cost of capital differs or can be more accurately assessed during the stable period of operation post the Initial Regulatory Period;
- given the length of the Initial Regulatory Period, it is likely that the mix of products and services demanded will have changed. Furthermore, in the mature period of operation, efficiency considerations are likely to demand a greater emphasis on new service offerings and innovation, which is likely to be facilitated by greater flexibility. In Synergies' view, this can reasonably be expected to be achieved through:
    - 3 to 5 yearly updating of Reference Offers;
    - periodic assessment of expected capex rather than greater reliance on prudency assessments as and when new network investments are contemplated; and
    - periodic assessment of expected opex.

2.3.1 Changes from the Initial to the Subsequent Regulatory Period

23. The principal changes in the SAU at the end of the Initial Regulatory Period are as follows:

- removal of the prudency provisions in respect of network investments (although the Network Design Rules will be retained) to be replaced with forecasts of capital and operating expenditure to accompany a Replacement Module;
- the inputs to the LTRCM will be set for on an anticipated cycle of 3 to 5 years and will include, inter alia, forecasts of future demand, opex and capex that will be subject to ACCC scrutiny;
- the period over which NBN Co undertakes not to withdraw Reference Offers will be reduced to the period specified in an application for each Replacement Module, with additional safeguards from the review and reset mechanisms that apply to Basic Access Offers ('BAO'), Enhanced Access Offer ('EAO') and the Standard Business Offer ('SBO'). The other constraints on pricing of Reference and Non-Reference Offers and Other Charges carry over from the Initial to the Subsequent Regulatory Period;
- transition from a WACC based on a fixed margin over the risk free rate to a nominal vanilla WACC determined with reference to: the risks involved in providing the relevant services; a benchmark financing structure; and a cost of debt and a cost of equity (determined using a well accepted financial model such as the Capital Asset Pricing Model) that meet benchmark standards for efficient financing, having regard where appropriate to past, present and expected future financial conditions.

24. In addition, both regulatory periods contain an asymmetric trigger that prevents the ongoing capitalisation of losses as soon as the ICRA is extinguished, such that under-recovery in subsequent periods cannot be capitalised and recovered (unless the ACCC accepts a modification to the SAU to the contrary). As a practical matter, this trigger is very unlikely in the Initial Regulatory Period and is, functionally, a feature of the Subsequent Regulatory Period.

25. In Synergies view, the transition between these regulatory periods (and indeed, the transition between Replacement Modules) are not likely to give rise to step changes in prices, in the nature of Reference Offers, Non-Reference Offers or Other Charges. Hence, the modular structure is not likely to give rise to discontinuities in service characteristics that could give rise to inefficiencies. Rather, the phases give rise to changes in procedures and some regulatory

parameters that allow for the efficient evolution of NBN Co's investments, operations, service offerings and prices as NBN Co's context changes. Except as otherwise discussed in this report, the transition between phases will not result in material changes for NBN Co customers.

26. Hence, in Synergies view, the changes between the phases of regulation under the SAU appear to be reasonable to adapt the SAU to NBN Co's changed context and circumstances, particularly once the network rollout is completed.

Cessation of the prudency provisions

27. For the reasons set out in section 7 below, Synergies considers that the prudency provisions in the Initial Regulatory Period are effective mechanisms for minimising the risk that NBN Co's investment will be productively inefficient. These mechanisms do not operate in the Subsequent Regulatory Period. However, they are replaced by different safeguards and incentives, specifically:

    - Replacement Modules (which must be approved by the ACCC, an experienced telecommunications regulator) that set out NBN Co's forecast opex and capex over the 3 to 5 year term of their application and which reduce the risk that NBN Co will become productively inefficient during the Module 2 period;
    - incentives on NBN Co to outperform both its operating and capital expenditure forecasts since both are locked into the ABBRR over the Regulatory Cycle such that NBN Co can profit from outperforming the forecast costs, and make losses if it exceeds those costs; and
    - in the event that the ACCC does not approve a Replacement Module, the ability of the ACCC to effectively regulate NBN Co's future capex and opex forecasts via access determinations ('AD') [19] or binding rules of conduct ('BROC'),[20] provided they are consistent with Modules 0 and 2 of the SAU.

28. On that basis, Synergies considers that Module 2 with its attendant Replacement Modules can reasonably be expected to result in efficient outcomes.

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[19] CCA s 152BC.

[20] CCA s 152BD(1).

Availability of products and services

29. Module 1 guarantees the availability of Reference Offers until the end of the Initial Regulatory Period. Similarly, NBN Co will guarantee the availability of the Reference Offers specified in a Replacement Module Application for the duration of each Replacement Module Term. However, these terms are relatively short in duration.

30. Efficient use of the NBN will depend to a large degree on NBN Co customers being willing to sink complementary investments. The importance of such investments has been recognised by the ACCC in other decisions, for example in its ARTC[21] rail decision (see Attachment B). In that case, demand for the below rail was contingent on substantial investment in above rail facilities.[22] That investment would, in turn and in part, depend upon certainty over the terms and conditions of rail access.

31. NBN Co is in a similar position; complementary investments are necessary to enhance the commercial value and efficiency of use of the NBN. Many of its prospective wholesale customers will have to make substantial investments of their own in order to drive retail demand. Their willingness to entertain such investments will depend upon their confidence in both the price and availability of services from NBN Co.

32. The review mechanisms that would operate in each Replacement Module[23] provides additional safeguards against the withdrawal of specified Reference Offers including the BAO, EAO and SBO. These have the effect of preventing NBN Co withdrawing these Offers unless more appropriate replacement Reference Offers are available according to the principles set out in cl 2B.2. Schedule 2E also provides appropriate safeguards against product withdrawal that might otherwise give rise to inefficient outcomes.

33. In Synergies' view, these can reasonably be expected to reduce the risk that NBN Co will withdraw products and services strategically which, absent these constraints, might facilitate more rapid recovery of its capitalised losses in the Subsequent Regulatory Period than might otherwise be the case, adversely impacting on the extent of pro-efficient complementary investments.

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21 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

22 Below rail refers to rail and track infrastructure, signalling etc. Above rail refers to rolling stock and locomotives etc.

23 SAU cl 2B.2.

3 Pricing during the Initial Regulatory Period

34. Synergies has been asked to:

> please advise whether the following commitments made by NBN Co in Module 1 lead to efficient outcomes:
>
> - the inclusion of a set of price-regulated Reference Offers in the SAU, having regard to the scope of the offers proposed and the nature of the pricing commitments which attach to those offers over the initial 10 year period (see Schedule 1C) with specified maximum regulated prices in force until 1 July 2017;
> - the inclusion of price regulated Non-Reference Offers and Other Charges (i.e. all price regulated offers specified in clause 1D.2.1) in the SAU, having regard to the nature of NBN Co's pricing commitments for non-reference offers over the initial 10 year period (see clauses 1D.3 to 1D.6 inclusive);
> - an individual price increase limit of CPI-1.5% to apply to Reference Offers after 1 July 2017 (see clause 1C.4) and to Non-Reference Offers and Other Charges (excepting those covered by cl 1D.4.2) for the term of the initial regulatory period (see clause 1D.4); and
> - an approach to initial pricing for Non-Reference Offers and Other Charges during the initial 10 year period of the SAU (see clause 1D.6) which allows NBN Co to establish prices having regard to the pricing principles proposed by NBN Co (noting that there is no regulatory recourse available to access seekers in relation to pricing decisions made by NBN Co (see clause 1B.1.2));

3.1 Summary of conclusions

35. Synergies considers that supply of a set of price-regulated Reference Offers in the Initial Regulatory Period can reasonably be expected to deliver efficient outcomes for the following reasons:

- the revenue cap methodology that underpins the SAU cannot be expected to provide an economically useful constraint on prices in the Initial Regulatory Period;
- the Reference Offer prices are set at levels consistent with similar services from alternative technologies (that the NBN will displace), and are therefore consistent with the prices one might expect from a workably competitive market;
- the initial fixed price period followed by clearly specified maximum price increases after July 2017 provides certainty that should allow NBN Co

customers and end-users[24] to make complementary investments necessary to maximise uptake and utilisation of the NBN;

- the Reference Offers are consistent with NBN Co recovering but not over-recovering its prudent operating and investment costs over the full term of the SAU;
- year-on-year price increases of the Reference Offers are constrained to CPI-1.5%, and this is known to NBN Co customers and end-users. This limits the likelihood of 'hold-up', being the risk that customers will sink costs on the basis of a particular pricing structure and then be faced with unexpectedly large price increases;
- the SAU allows NBN Co some pricing flexibility by excluding temporary discounts and 'free' services, which can deliver allocative and productive efficiency benefits, from the Individual Price Increase Limit. It also includes adequate safeguards to prevent subversion of the CPI-1.5% Individual Price Increase Limit through these mechanisms; and
- the non-linear pricing of bandwidth between the BAO and EAO are likely to foster allocative efficiency.

36. Implementing the CPI-1.5% Individual Price Increase Limit on Reference Offers after July 2017 can reasonably be expected to deliver efficient outcomes for the following reasons:

- there is a trade-off between pricing flexibility that allows NBN Co to set allocatively efficient prices and price certainty that encourages complementary investments;
- over the fixed price period to July 2017, it is reasonable to suppose that market conditions could change such that those prices increasingly diverge from allocatively efficient prices, so scope to adjust prices thereafter can be expected to limit this;
- regulatory practice in Australia generally allows a degree of price rebalancing (although more typically in the form of price changes at fixed 5 year time intervals), and this is facilitated in NBN Co's SAU by the scope to adjust prices within the constraints of the Individual Price Increase Limit;

[24] For example, purchasing end-use equipment, services and training that make use of higher bandwidth services that might be offered to them by NBN Co's wholesale customers.

- the 5 year initial fixed price period and the limitation of individual price increases thereafter to CPI-1.5% provide a high degree of certainty which can reasonably be expected to enhance incentives for complementary investment in the early roll-out years, which will be important in fostering efficient outcomes from the NBN; and

- the possible future price paths for Reference Offers under the Individual Price Increase Limit could reasonably be considered to allow NBN Co to set prices that would be within the range that would normally be considered efficient.

37. Inclusion of price-regulated Non-Reference Offers and Other Charges in the SAU can reasonably be expected to deliver efficient outcomes as:

    - the revenue cap methodology that underpins the SAU cannot be expected to provide an economically useful constraint on prices in the Initial Regulatory Period; and

    - there is a trade-off between pricing certainty by including Non-Reference Offers in the SAU, and pricing efficiency from determining the initial Prices at the time when demand for the Non-Reference Offers arises. In Synergies view, uncertainty over the future demand for and use of NBN Non-Reference Offers, which is ameliorated by certainty over the service offerings and their prices, favours inclusion of the Non-Reference Offers in the SAU, to the extent that is possible.

38. The SAU sets out pricing principles that NBN Co must consider when setting the prices of new Non-Reference Offers and Other Charges (i.e. those not set out in cl 1D.3). Synergies considers that these principles, within the context of the SAU, circumscribe the factors that would need to be considered in establishing an efficient price. They, collectively, limit the scope for NBN Co to set prices for New Offers that differ substantially from those that would be considered efficient.

3.2 Pricing of Reference Offers

39. Synergies understands that the Reference Offers comprise a BAO, an EAO, and an SBO, along with connectivity and interconnection services necessary for their provision to a wholesale purchaser. The BAO is qualitatively similar in characteristics to high speed broadband currently available in most urban centres in Australia, and includes provision for a voice telephony service based on a symmetrical 150kbps channel. The EAO offers a bandwidth that is approximately

double that of the BAO downstream, and five-fold greater upstream. The SBO is similar to the EAO but has a higher bandwidth uplink and includes a 500 kbps (TC-1) Symmetric Access Capacity Offer.

40. The Reference Offers will be supplied for the duration of the Initial Regulatory Period (i.e. will not be withdrawn during that period).[25] The maximum price until 2017 is specified in the SAU. Thereafter, NBN Co may increase prices from one year to the next by no more than CPI-1.5%.[26]

41. The prices for the Reference Offers are set out in schedule 1C of the SAU.

3.2.1 Objectives of NBN Co pricing

42. NBN Co has to satisfy a number of different objectives in establishing its pricing approach, including prices for the Reference Offers. These objectives relate to uptake and coverage; complementary investment; and commercial imperatives.

Uptake and coverage

43. NBN Co needs to 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,"[27] noting that a significant proportion of end users connecting to the NBN will adopt the BAO Reference Offer, at least at the outset. The expected level of coverage and uptake over the Initial Regulatory Period are shown in Figure 2: by 2020, NBN Co anticipates passing 11.7 million premises and achieving a connection rate of 67%. Notwithstanding the transfer of existing broadband and voice-only customers from Telstra and Optus, in Synergies' view the prices of the BAO will need to be close to the market price of similar services based on alternative technologies to achieve the target uptake rates.

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[25] In the Subsequent Regulatory Period the review and reset mechanism (cl 2B.2) further constrain NBN Co's ability to withdraw Reference Offers.

[26] The price increase is limited to [(1+CPI)*(1-1.5%)-1]. If consumer price inflation is less than 1.5% in the relevant period, the individual price limit is zero. The allowable increase cannot be rolled over or accumulated across multiple periods.

[27] *Statement of Expectations* at 10.

Figure 2. Network roll-out and uptake targets

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2028
Premises passed or Covered ('000')												
FTTP	18	39	341	1,307	2,912	4,625	6,279	7,838	9,283	10,783	12,202	13,467
Wireless & satellite	165	174	320	374	752	907	921	934	948	961	974	1,055
Total	183	213	661	1,681	3,664	5,532	7,200	8,772	10,230	11,744	13,176	14,522
Premises connected ('000')												
FTTP	1	4	54	487	1,515	3,036	4,341	5,594	6,695	7,607	8,513	10,010
Wireless & satellite	0	10	38	64	100	145	161	191	206	219	232	303
Total	1	14	92	551	1,615	3,181	4,502	5,785	6,901	7,827	8,745	10,313
Premises connected (%)												
Fibre	6%	10%	16%	37%	52%	66%	69%	71%	72%	71%	70%	74%
Wireless	0%	6%	12%	17%	13%	16%	17%	20%	22%	23%	24%	29%
Total	1%	7%	14%	33%	44%	58%	63%	66%	67%	67%	66%	71%

Source: NBN Co Limited Corporate Plan 2012 – 2015, 6 August 2012 at 61.
All data in based on financial years.

44. In so far as the price of equivalent services using existing technologies has been established through workable competition (through ACCC determinations that seek to emulate outcomes that would arise under workable competition, or some combination of the two), which Synergies believes to the case, then these prices are likely to be productively, allocatively and dynamically efficient. Accordingly, setting prices for equivalent NBN Co services at levels close to existing market prices is likely to give rise to substantial productive, allocative and dynamic efficiency.

45. Furthermore, in so far as NBN Co is assisted in achieving its uptake rates by potential competitors withdrawing or restricting access to alternatives, the establishment of Reference Offer prices that are close to the market price of equivalents (and restricting NBN Co's scope to increase those prices) will help to mitigate the adverse efficiency consequences if the withdrawal of alternatives were to confer on NBN Co a degree of market power for wholesale broadband network services.

Complementary investment

46. NBN Co will be assisted in achieving its uptake targets by high levels of complementary investment by retailers and end-users[28] in equipment and services. For the reasons set out in paragraphs 30 through 33, their willingness to make such investments, particularly if they are sunk, will depend upon a high degree of certainty over the price levels of the relevant wholesale service and its continued availability.

[28] See footnote 24.

47. In this regard, Synergies considers that the fixed prices for Reference Offers until 2017, the CPI-1.5% ceiling on increases thereafter, and the undertakings in respect of continued availability provide a high degree of certainty. NBN Co customers' willingness to invest will be enhanced by this certainty, in that it removes the risk that the customer will suffer from hold-up, namely unexpectedly higher prices after they have sunk investments. On that basis, the SAU can reasonably be expected to foster the necessary complementary investments, with commensurate productive efficiency gains in the use of the NBN Co's assets and innovation (i.e. dynamic efficiency) in retail services.

Commercial imperatives and revenue cap constraints

48. The overall objective of the SAU is to limit NBN Co's revenues to the level of prudently incurred capital and operating costs, including a return on capital, such that the expected NPV of the NBN is capped at zero, within the constraints of other objectives such as national uniform pricing and target coverage and uptake. Assuming that revenues over the term of the SAU are sufficient to pay down capitalised losses in the ICRA,[29] the approach set out in the SAU, being to cap total revenues over the SAU term to an estimate of annual revenue requirement, is consistent with that objective.

49. It is doubtful whether NBN Co could set prices in the Initial Regulatory Period that would be sufficient to cover its annual revenue requirement. Prices that sought to close the gap between revenues and costs in this period would be likely to throttle demand and complementary investment, and prevent NBN Co meeting Australian Government objectives on uptake. It is doubtful whether such prices would be profit maximising for NBN Co (depending on the price elasticity of demand for connection). The SAU contemplates that losses may continue beyond the Initial Regulatory Period and provides for their capitalisation and recovery in subsequent years.

[29] Synergies notes the general right (that exists under the CCA) to seek ACCC approval to vary the SAU. If it appeared likely that NBN Co could not recover its economic costs (which would necessitate paying down the ICRA) then it might well seek to revise the SAU.

50. As the revenue cap methodology cannot be considered to provide an effective constraint that can reasonably be expected to ensure that Reference Offer prices in the Initial Regulatory Period will produce efficient outcomes, Synergies believes that the assessment of the efficiency consequences of the Reference Offer should be assessed by reference to:

- their effect on coverage, uptake and complementary investment as noted above;
- the extent to which they are consistent with the long-term objective of the SAU, namely that the expected NPV of the NBN is capped at zero; and
- the extent to which they mitigate adverse efficiency consequences if market outcomes that eventuate are substantially different from those anticipated by NBN Co.

51. In respect of the second of these, Synergies notes that the Reference Offer prices are consistent with the long-term objectives of the SAU given the assumptions set out in NBN Co's Corporate Plan.

52. In respect of the last of these criteria, the most troubling change in circumstances from an efficiency outcome would arise if NBN Co's costs were to rise substantially, demand for connection were to grow more slowly than expected, alternative providers of wholesale broadband services were to exit the market and NBN Co were to acquire a degree of market power in their provision. Under such circumstances, NBN Co could have commercial incentives to increase prices. In Synergies' view, the price cap until 2017, the limited scope to increase prices thereafter and the guarantee of service availability into the Subsequent Regulatory Period substantially reduce this risk. Accordingly, Synergies considers that the Reference Offer can reasonably be expected to prevent inefficient pricing by NBN Co in the event of unexpected market outcomes.

3.2.2 Exceptions to individual price constraints and safeguards

53. The SAU allows NBN Co to offer discounts, allowances and rebates and excludes those discounts from the Individual Price Increase Limit (i.e. discounted prices in one year are not used for determining the maximum allowable price for a Reference Offer in a following year).[30] In Synergies' view, the safeguards set out

[30] SAU cl 1C.4.3.

in cl 1C.4.4 can reasonably be expected to prevent the use of these exceptions by NBN Co to subvert the Individual Price Increase Limit.

54. Clause 1C.4.3 also allows NBN Co to increase the price of discounted or Zero-Priced Reference Offers beyond the constraints of the Individual Price Increase Limit. Clause 1C.4.5 states that Zero-Priced Reference Offers will remain at $0 unless customer behaviour in respect of that offers results in costs for NBN Co, service degradation, or is uneconomic for NBN Co to maintain.[31] If NBN Co sets a non-zero price, there is provision in the SAU for the ACCC to set a different price through an AD or BROC.

55. In Synergies' view, these exceptions to the Individual Price Increase Limit can be expected to improve efficiency. Productive efficiency of the NBN can reasonably be expected to be enhanced if NBN Co is able to provide incentive mechanisms such as discounts and rebates that accelerate uptake. Similarly, if demand for 'free' services causes commercial harm, involves unexpected costs that are not reasonably foreseeable or produce service degradation, then efficiency can reasonably be expected to be enhanced if prices can then be increased to mitigate the problems.

56. Synergies notes that Clause 1C.1.3 allows NBN Co to apply Other Charges, as set out in cl 1D.3.2, to the supply of Reference Offers. These are addressed in 3.3.2 below.

3.2.3 The CPI-1.5% ceiling on price increases after 2017

57. In Synergies' view, efficiency is likely to be maximised (within the context of the long-term revenue cap based on recovery of prudently incurred costs and geographically uniform pricing) if NBN Co has a degree of flexibility to change market prices as market conditions change. The SAU in the Initial Regulatory Period is predicated on certain assumptions on coverage and uptake of different services delineated in terms of bandwidth, degree of upstream and downstream asymmetry, CIR or PIR etc. Future demand for these services is uncertain. In economic terms, the price elasticity of demand for each service and the cross-price elasticities between them are uncertain; furthermore, to the extent that they are currently known, they may change over time.

[31] By way of example, the availability of untimed local calls with the advent of dial-up internet connection imposed substantial costs on network providers and degraded network performance.

58. Setting prices on the basis of willingness to pay and own price elasticity of demand[32] (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 (i.e. allocative efficiency), 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, they are an appropriate basis for price discrimination.

59. 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.

The pricing compromise

60. Setting prices substantially in advance under constraints that limit subsequent price changes, represents a compromise between the efficiency benefits that derive from price certainty and the inefficiencies that may arise over time as those prices deviate from allocatively efficient levels.

61. Typically, Australia economic regulators have adopted 5 year periodic reviews, at which time service providers have an opportunity to refine their pricing. Seen in this light, it would be consistent with normal regulatory practice to allow some increased scope for price rebalancing on Reference Offers after a similar 5 year period of operation. Furthermore, to the extent that there may be inefficient consequences from rebalancing, for example the risk of stranding end user equipment as prices rise, they are mitigated by limiting allowed price increases to the greater of 0%[33] or 1.5% below CPI on a 'use it or lose it' basis.[34]

62. Recognising that the timing of relaxation of the initial Reference Offer prices is, to a degree, arbitrary, Synergies nonetheless considers that allowing an individual

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[32] 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.

[33] If CPI is below 1.5%, NBN Co is not obliged under the SAU to reduce its prices in nominal terms.

[34] The Individual Price Increase Limit of CPI-1.5% cannot accumulate from one year to the next. If NBN Co elects not to raise a price by this limit in year 1, it cannot in year 2 then elect to raise prices by both the year 1 and year 2 Individual Price Increase Limits. This ensures NBN Co cannot 'bank' allowable increases and then make large prices changes that are more likely (than gradual changes) to result in inefficient outcomes.

price increase limit of CPI-1.5% to apply to reference offers after 1 July 2017 can reasonably be expected to deliver efficient outcomes.

3.3 Pricing of Non-Reference Offers and Other Charges

63. Module 1 of the SAU also sets out the prices for a range of Non-Reference Offers and Other Charges which Synergies understands represent most of the Non-Reference Offers and Other Charges that are likely to be provided in the Initial Regulatory Period. NBN Co also undertakes to follow a prescribed process for the withdrawal of a Non-Reference Offer, and to limit year on year price increases to CPI-1.5%. Non-Reference Offers and Other Charges in the Initial Regulatory Period also differ from Reference Offers in the omission of a fixed price period prior to 2017.

64. The Non-Reference Offers specified in the SAU comprise multicast, higher bandwidth asymmetric AVC services, additional AVC services to an existing network termination device, symmetric access capacity and CVCs with committed information rates (CIR).

65. For the reasons set out in section 3.2, Synergies does not consider that the annual revenue requirement presents an effective constraint on the prices of NBN Co services (whether Reference Offers, Non-Reference Offers or Other Charges) because costs during the network roll-out period, primarily driven by capital expenditure, are likely to be substantially greater than revenues. Accordingly, the considerations set out in section 3.2 also apply in respect of Non-Reference Offers and Other Charges, particularly in respect of the importance of fostering complementary investment and attracting rapid uptake.

66. In so far as demand for some Non-Reference Offers specified in cl 1D.2 might be expected to be low during the first few years of the Initial Regulatory Period and uncertain thereafter, there is a risk that maximum prices set significantly in advance will be allocatively inefficient, in the sense of failing to take account of market conditions when they materialise (although, NBN Co does have the option of pricing below these maximum prices, which may be both commercially rational and efficiency enhancing depending on market conditions). This allocative efficiency could be reduced by delaying the roll-out of the relevant services so that maximum prices could be set on more certain demand, or allowing greater pricing flexibility. However, either of these options would introduce a degree of pricing uncertainty which could deter NBN Co's customer uptake; itself resulting in less efficient use of the NBN.

67. There is no robust means of assessing the trade-off between these two considerations. But on balance, Synergies considers that the inclusion of maximum pricing for Non-Reference Offers can reasonably be expected to enhance efficiency. First, while delay may allow NBN Co to tailor the starting maximum price to market conditions, those very market conditions may be significantly and adversely impacted by the prior uncertainty over maximum prices. Second, since Reference Offers are likely to be substitutes, albeit imperfect substitutes, for Non-Reference Offers, delay may result in inefficient commitment by NBN Co customers to Reference Offers when Non-Reference Offers with certain maximum prices may have been more efficient.

68. In summary, given the large uncertainties about uptake of Non-Reference Offers, it can be reasonably considered that inclusion of maximum prices in the SAU for Non-Reference Offers in the Initial Regulatory Period will result in more efficient outcomes than the alternatives.

3.3.1 Initial pricing of Non-Reference Offers

69. As noted above, cl 1D.6 sets out an approach to initial pricing for Non-Reference Offers during the initial 10 year period of the SAU that are not set out in clauses 1D.2 to 1D.3. Since the length of the Initial Regulatory Period is likely to be at least 10 years, during which time Synergies would expect significant changes in demand for wholesale service, there needs to be provision for developing and pricing new Non-Reference Offers. The same consideration arises in respect of the Subsequent Regulatory Period.

70. As discussed in section 9 below, the substantial capitalised losses expected to arise under the SAU would allow NBN Co, absent constraints, scope to set quite extreme prices for new Non-Reference Offers. However, the SAU requires that NBN Co sets these prices by reference to Initial Pricing Principles, as follows:[35]

> having regard to, amongst other relevant matters:
>
> (iv) uniform national wholesale pricing;
>
> (v) the Statement of Expectations;
>
> (vi) the nature and extent of market demand;

[35] SAU cl 1D.6(a) and 2C.5(a).

(vii) the relationship between the New Offer, New Other Charge or Zero-Priced Non-Reference Offer and other Reference Offers, Non-Reference Offers and Other Charge;

(viii) the importance of affordability to drive take-up rates;

(ix) NBN Co's long term cost recovery; and

(x) the projected timeframe for recovery of initial losses.

71. In Synergies' view, these pricing principles within the context of the SAU, circumscribe the factors that would need to be considered in establishing an efficient price. The considerations, collectively, limit the scope for NBN Co to set prices for New Offers that differ substantially from those that would be considered efficient.

72. For example, in respect of a highly innovative new Non-Reference Offer, the pricing principles would require NBN Co to have regard to the trade-off between greater revenue under high 'early adopter' prices and the impact that those prices would have on rate of uptake. That is, the pricing principles allow NBN Co to balance the desirability of rapid uptake with the need to appropriately incentivise innovation and new product development. This latter consideration is particularly important because otherwise incentives to innovate in the broadband market might be inefficiently low. Incentives to innovate are likely to be weaker under a broadband market served by a single supplier than one in which there were multiple suppliers,[36] so there will necessarily be greater reliance on administrative mechanisms (such as those set out in Schedule 1I of NBN Co's SAU) to foster innovation, and less reliance on entrepreneurial behaviour by competitors to NBN Co. The administrative mechanisms within the SAU, in Synergies view, recognise and address this.

3.3.2 Other Charges

73. Other Charges, as set out in cl 1D.3.2, include charges for installation, activation and reactivation, system setup, equipment repair etc. The Others Charges are subject to the Individual Price Increase Limit of CPI-1.5% throughout the Initial Regulatory Period in the same manner as Non-Reference Offers, except for those charged on a time and materials rate; under cl 1D.4.2(d), the labour rate of these

[36] Noting that the natural monopoly characteristics of the NBN are likely to make multiple suppliers inefficient on productive efficiency grounds (see ACCC 19 July 2012 *Determination: Application for Authorisation of NBN Co Limited in respect of provisions of the HFC Subscriber Agreement entered into with SingTel Optus Pty Ltd and other Optus entities* at 40 ('*Optus Decision*').

charges may be indexed to the Australian Bureau of Statistics ('ABS') Labour Price Index, and materials will be charged at cost. This is the case even when they are included with Reference Offers, the prices of which are capped until 2017. The pricing of new Other Charges is subject to the same Initial Pricing Principles as apply to Non-Reference Offers.

74. In respect of Other Charges, Synergies notes that these mostly relate to labour-intensive activities, the costs of which are likely to relate to underlying unit labour costs and to be reflected in the rates charged to NBN Co by contractors undertaking those tasks. The underlying rate of increase in unit labour costs may well differ markedly from CPI. On that basis the indexation to labour costs is prudent and can reasonably be expected to result in efficient outcomes.

4 Pricing during the Subsequent Regulatory Period

75. Synergies has been asked to:

> please advise whether the following commitments made by NBN Co in Module 2 lead to efficient outcomes:
>
> - the inclusion of a review mechanism for the Reference Offers, having regard to the nature of those mechanisms outlined in Module 2 (see clause 2B.2);
> - an individual price increase limit of CPI-1.5% to apply to Reference Offers, Non-Reference Offers and Other Charges (excepting those covered by cl 2C.2.2) for the Initial Cost Recovery Period, with the same limit applying during the Building Block Revenue Period, but in conjunction with a revenue cap (see clause 2C.2). In undertaking your analysis, please take account of the other commitments in Schedule 2B and 2C of the proposed SAU, such as the use-or-lose-it provisions, the exceptions to the individual price increase limit and the anti-avoidance provisions (see clause 2C.2);
> - an approach to initial pricing after the expiry of the initial 10 year period of the SAU (see clause 2C.5) that allows NBN Co to establish prices for New Offers, New Other Charges and Zero-Priced Non-reference Offers by having regard to the pricing principles proposed by NBN Co (see clause 2C.5);
> - the inclusion of forecasts of revenue and demand in a Replacement Module to be used as the basis to roll-forward the Initial Cost Recovery Account (ICRA) during the Initial Cost Recovery Period instead of actual revenues (see clause 2D.2.1). In undertaking your analysis, please consider that, during the Building Block Period, forecasts will need to be consistent with the Annual Building Block Revenue Requirement (ABBRR); and
> - the inclusion of operating expenditure and capital expenditure forecasts that reflect prudent and efficient costs which are taken into account in the ACCC's consideration of a Replacement Module Application and are prepared by NBN Co having regard to number of specified factors (see clause (2D.6).

4.1 Summary of Conclusions

76. In Synergies' opinion, inclusion of a mechanism in a Replacement Module for the Reference Offers to be reviewed every 3-5 years as part of a replacement Module Application can reasonably be expected to deliver efficient outcomes for the following reasons:

- it helps to ensure that the NBN is not encumbered by out-dated services that are provided solely because they are preserved by the regulatory arrangements;

- it fosters dynamic efficiency by subjecting hitherto guaranteed offers to consideration for withdrawal if they are no longer appropriate, and replacing them with superior more widely accepted services;
- it provides that where the composition of a Reference Offer is to be updated, the characteristics of the old Reference Offer will become a Non-Reference Offer; and
- it promotes productive efficiency by allowing NBN Co (and potentially NBN customers) to reduce costs associated with legacy services, while addressing the concerns of legacy customers in making any decision to withdraw the product.

77. The CPI-1.5% Individual Price Increase Limit prior to the MCE in the Subsequent Regulatory Period can reasonably be expected to result in efficient outcomes in much the same manner as the Initial Regulatory Period. Synergies notes that there is scope for significant price falls at the MCE if the ICRA pay-down rate is rapid. In Synergies' view, the undertaking to provide information to customers on the likely path of price changes minimises the risk of adverse efficiency consequences from any such price changes.

78. Synergies considers that, in the Subsequent Regulatory Period, the pricing principles for New Offers that become Non-Reference Offers can reasonably be expected to deliver efficient outcomes, for the reasons set out in respect of the Initial Regulatory Period presented in section 3.3.

79. The inclusion of forecasts of revenue, demand and costs in a Replacement Module in the Subsequent Regulatory Period can reasonably be expected to result in efficient outcomes, for the following reasons:

- the use of forecasts is widely accepted in commercial and regulatory practice and does not present significant challenges *per se* in respect of the SAU;
- the use of forecasts of revenue and revenue requirement (which necessitate capex and opex forecasts) in the ICRP presents strong incentives for NBN Co to minimise its costs, maximise demand and to price in an allocatively efficient manner, which is likely to be particularly efficiency enhancing while accumulated losses are large or increasing;
- in Synergies' view, the ACCC will be in a position to minimise the risk of NBN Co strategically using the forecast process, such that the incentives will operate to foster more efficient outcomes;

- after the MCE, when the NBN can be expected to have achieved a degree of maturity, the SAU makes provision to carry-over under- or over-recovery from one Replacement Module to its successor, ensuring that NBN Co does not incur excessive losses or earn excessive profit as a result of demand forecast error (which has proved problematic in other regulated businesses);

- NBN Co's revenue requirement in the Subsequent Regulatory Period after the MCE is still based on forecasts of capex and opex that are locked into the ABBRR. As a result NBN Co can earn additional profit if it outperforms those forecasts and additional losses if it fails to meet them. This provides continued incentives for cost efficiency by allowing NBN Co to retain the benefits from further efficiency gains, at least for the remaining duration of the Replacement Module; and

- if the likelihood of forecast error is considered to be high, there is scope to adopt shorter Replacement Module durations, in order to reduce problems that might otherwise arise from large differences between actual and forecast outcomes, whether or not the differences can be carried across from one Regulatory Cycle to the next.

80. Synergies considers that NBN Co will have strong incentives to submit Replacement Module Applications that are acceptable to the ACCC in order to avoid the imposition of regulation by the ACCC for a Regulatory Cycle (of 3 to 5 years) through ADs or BROCs, noting that the ACCC is an experienced telecommunications and broadband regulator that can be expected to determine whether NBN Co's forecasts of capex and opex reflect efficient costs. Furthermore, Synergies considers that, during the ICRP and while NBN Co is still paying down capitalised losses (i.e. prior to the MCE), commercial and governance constraints on NBN Co can reasonably be expected to encourage cost efficiency as a means of minimising the duration of the ICRA.

4.2 Reference Offer review

81. Clause 2B.2 sets out the relevant considerations for determining the composition of Reference Offers in each Regulatory Cycle.

82. In Synergies view, the Reference Offers have as their foundation the voice only and broadband services that are currently in demand. The BAO is designed to transition existing broadband customers to retailers that provide services through the NBN. The EAO provides modestly priced speed enhancement to transition customers to higher speed connections as a means, it is hoped, of

securing growth in traffic. The SBO provides a business-grade offering with additional speed enhancements and the inclusion of a 500kbps CIR (TC-1) Symmetric Access Capacity Offer. Given the change in broadband usage over the last two decades, and the current prodigious 30% year on year growth in broadband traffic,[37] Synergies would expect demand to evolve away from BAO type offers.

83. Provision of infrastructure services in such a dynamic environment inevitably gives rise to the risk that:

- the infrastructure provider's services become out-dated, are provided solely because they are preserved by the regulatory arrangements despite being used by a small number of customers; and
- in the absence of effective means of evolving service offerings, the process of replacing legacy services is impeded, to the detriment of dynamic efficiency.

84. Accordingly, Synergies considers that the SAU needs to allow NBN Co to change Reference Offers over time. The composition of the Reference Offers in each Regulatory Cycle in the Subsequent Regulatory Period will be assessed prior to the commencement of that Regulatory Cycle by reference to the likely number of end users over that period acquiring the Data Transfer Rate relevant to that type of offer (for instance, connectivity for the purposes of basic connectivity or for broadband connectivity). In Synergies' view, this is a reasonable approach for establishing Reference Offers.

85. Furthermore, in so far as the composition of a Reference Offers is updated, Synergies notes that the characteristic of the old Reference Offer will not then be discontinued, but will continue to be supplied as Non-Reference Offers subject to the product withdrawal processes set out in Schedule 2E of the SAU, mitigating the stranding risk that might otherwise arise upon service withdrawal.

86. For these reasons, Synergies considers that the SAU's mechanisms for reviewing Reference Offers in the Subsequent Regulatory Period can reasonably be expected to lead to efficient outcomes.

[37] See, for example, Cisco's VNI forecasts which predict Australian, 'IP traffic will grow 4-fold from 2011 to 2016, a compound annual growth rate of 34%' available from (last viewed 18 August 2012) http://www.cisco.com/web/solutions/sp/vni/vni_forecast_highlights/index.html#~Country.

4.3 The Individual Price Increase Limit of CPI-1.5%

87. The analysis of the Individual Price Increase Limit of CPI-1.5% in respect of the Initial Regulatory Period is broadly applicable in the Subsequent Regulatory Period, particularly prior to the MCE, before which the revenue cap is not a binding constraint on prices (see section 3 above). The other commitments in the SAU, such as the use-or-lose-it provisions,[38] the exceptions to the individual price increase limit and the anti-avoidance provisions (set out in clause 2C) are examined in the analysis of similar provisions in the Initial Regulatory Period in sections 3.2 and 3.3 above. This analysis is not repeated.

4.4 Price transition at the end of the Initial Cost Recovery Period

88. In Synergies' view, there is scope for significant price falls at the MCE if the ICRA pay-down rate is rapid. At that time, the balance of the ICRA falls to zero, and NBN Co undertakes to set prices at levels that ensure revenues do not exceed the annual revenue requirement. Assuming that the ICRA falls to zero during the term of the SAU, the overall terms of the SAU (assuming the internal consistency between WACC, asset valuation and depreciation discussed in section 2.2.2) should ensure that NBN Co only recovers its prudently incurred costs, meeting the productive efficiency objective. Accordingly, revenue can be expected to fall by an amount approximately equal to the quantum of ICRA paid-down in the year preceding the MCE.

89. Economists are generally less concerned about price falls than increases. However, if they are sudden they can give rise to inefficiency. For example, they might cause a significant spike in demand for a service that then results in congestion in related markets (such as the market for the supply of end-user customer equipment that relies upon this now lower-priced service).

90. Synergies notes that, under cl 2D.4.5 and 2D.4.6, NBN Co will be informing the market over a 3 to 5 year period of the likely timing of the MCE and its pricing intentions in the period preceding the MCE. In Synergies' view, this process of informing the market can reasonably be expected to minimise the risk of adverse efficiency consequences that might otherwise arise from large price changes.

[38] If NBN Co elects not to increase a price by CPI-1.5% in the first year, it cannot then in the second year elect to increase the price twice by CPI-1.5%.

4.5 Initial pricing for Non-Reference Offers and Other Charges

91. The SAU allows NBN Co to set prices for Non-Reference Offers and Other Charges without regulatory recourse[39] throughout the Subsequent Regulatory Period. Synergies has set out the key considerations in respect of incentives for NBN Co to offer efficient prices for Non-Reference Prices and Other Charges in section 3.3.

92. In the Subsequent Regulatory Period, Synergies anticipates that Non-Reference Services and Other Charges will be added periodically to supplement an existing range of Non-Reference Services and Other Charges established in the Initial Regulatory Period, rather than in blocks as is the case at the outset of the Initial Regulatory Period. Hence, pricing certainty will be a less important factor in determining the efficiency of subsequent Non-Reference Offer and Other Charge pricing than was the case in the Initial Regulatory Period. In Synergies' view, a number of factors can reasonably be expected to ensure that Non-Reference Offer and Other Charge prices set in the Subsequent Regulatory Period will be efficient in the absence of any regulatory recourse to set those prices, namely:

- the revenue cap in the Building Block Revenue Period and, prior to then, the commercial necessity to pay down the ICRA;
- it is reasonable to allow NBN Co to choose prices that minimise the time taken for NBN Co to recover capitalised losses prior to the MCE, subject to the safeguard that these losses are not inflated by imprudent investment and operating costs (issues canvassed in subsequent sections of this report)
- the product withdrawal procedures and non-circumvention provisions can reasonably be expected to constrain NBN Co's ability to withdraw existing substitutes for new Non-Reference Offers that simply aim to increase prices or circumvent the Individual Price Increase Limit;
- substitution between the new Non-Reference Offer services and existing Reference and Non-Reference Offer services that can be expected to reduce incentives to set excessive initial prices;
- NBN Co's decisions are not influenced by conflicts from vertical integration that might otherwise provide incentives to set inefficient Non-Reference Offer and Other Charge pricing; and

[39] SAU Sch 2C.

- adherence to the Initial pricing principles (as discussed in section 3.3.1 above).

93. Accordingly, Synergies considers that the proposed Non-Reference Offer and Other Charge pricing commitments in the Subsequent Regulatory Period can reasonably be expected to result in efficient outcomes in the absence of regulatory recourse.

4.6 Forecasts used to roll forward the ICRA

94. Forecasting is universally used in incentive-based economic regulation and is necessary to estimate regulated prices and maximum allowable revenues over the Regulatory Cycle. The opportunity for the regulated firm to profit from outperforming the forecast and to incur losses from underperforming the forecasts presents strong performance incentives. The adoption of forecasts of demand, revenue, operating and capital costs in a Replacement Module for the purpose of determining revenues, ABBRR, and to roll-forward the ICRA during the Initial Cost Recovery Account Period (cl 2D.3.1) presents no conceptual difficulty.

95. In the ICRP of the Subsequent Regulatory Period, ABBRR and revenue for the purpose of determining Unrecovered Costs (cl 2D.4) are determined using forecasts that are submitted in each Replacement Module Application. As a result, Unrecovered Costs which determine the extent to which the ICRA increases or is paid down are based on forecasts (and actual CPI), and not on the surplus of actual revenue over the actual revenue requirement. Hence, if NBN Co earns greater revenue than forecast, it profits by the extent of the difference between actual and predicted revenue. Similarly, NBN Co profits from achieving lower than forecasts costs. Because of the predominantly fixed nature of NBN Co's costs, this presents a strong incentive for NBN Co to beat its revenue and cost forecast.

96. In Synergies' view, the use of forecasts provides strong incentives to maximise demand for NBN services for a given level of prices, and to price in a manner that maximises revenue (by allocating the largest share of joint and common costs to the least price elastic services). These responses would undoubtedly foster more efficient outcomes that would be the case if actual revenue/cost were used as the basis for rolling forward the ICRA. Incentives to maximise demand are likely to be particularly efficient in the immature phase of the NBN, when ICRA is likely to be accumulating.

97. It is also apparent that the use of forecasts in the ICRP presents incentives that may not result in efficient outcomes, for example to submit downwardly biased revenue forecasts. Once NBN Co perceives that the risk of not recovering the ICRA is small, downwardly biased forecasts can have the effect of allowing NBN Co investors to earn a superior return without enhanced efficiency or effort. Incentives for this type of strategic behaviour will be strongest when the ICRA is substantially paid down. The ACCC, through its decision making processes in the gas and rail decisions set out in Attachment B, has also 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.

98. However, Synergies would expect the ACCC to be well aware of these potential adverse outcomes. It can reasonably be expected to combat them. Specifically, the ACCC can consider NBN Co's forecasts in the context of considering a Replacement Module Application, and can secure what information it deems necessary to make an assessment of whether forecasts are appropriate. The ACCC may be unable to determine whether forecasts, particularly revenue forecasts, are affected by strategic considerations. If it is concerned that this is the case, it would likely encourage NBN Co to provide additional information as to their provenance or encourage NBN Co to submit a Replacement Module Application with a shorter period, which would reduce the prospective payoff from such strategic behaviour. Both markedly reduce the scope for strategic behaviour by NBN Co in respect of its forecasts. Furthermore, by the time such strategic behaviour is likely to arise, probably only when the ICRA is demonstrably declining, the ACCC will have had a considerable body of experience in the economic oversight of the NBN, and is likely to be helped in these matters by the advice and contributions of NBN Co customers.

99. In Synergies view, given the expected vigilance and expertise of the ACCC, the pro-efficient incentives from the use of fixed forecasts to determine Unrecovered Costs and to roll forward the ICRA can reasonably be expected to outweigh the potential inefficiencies.

4.7 Use of forecasts in the Building Block Period

100. The SAU adopts a different framework in the Building Block Period of the Subsequent Regulatory Period. In this mature phase of the NBN, after the MCE, and once the ICRA is extinguished, revenue is effectively capped to costs. In Synergies view, returns to NBN Co investors in this period are likely to be more sensitive to revenue forecast error than in the ICRP. Furthermore, the efficiency

benefits from very strong incentives to maximise demand are likely to be smaller. Accordingly, the adverse consequences from the use of revenue forecasts are likely to be more important in determining whether the SAU can be expected to deliver efficient outcomes.

101. Accordingly, Synergies considers that it is reasonable to allow NBN Co to carry over- or under-recovery of forecast revenue from one Regulatory Cycle to the next after the MCE.

102. Unders and overs accounts operate well where the differences between actual and forecast demand are relatively small. Problems tend to arise when there are large forecast errors. By way of example, IPART's past experience in regulating the NSW distribution network service providers ('DNSPs') presents an example of the problems that can arise in relation to the operation of unders and overs accounts. Two of the DNSPs accrued significant positive balances (i.e. over-recovery of revenue) due to forecasting error which became very difficult to manage. The problems associated with the management of these accounts was a key driver of IPART's decision to change the form of regulation from a revenue cap to a weighted average price cap.

103. Synergies does not anticipate that the SAU will give rise to the same problem. In so far as the likelihood of forecast error is high and may give rise to large over- or under-recovery, there is scope for NBN Co to adopt shorter Replacement Module durations, in order to mitigate this risk. Synergies understands that this will be one of NBN Co's considerations in selecting the duration of each Replacement Module.

104. NBN Co's revenue requirement in the Subsequent Regulatory Period after the MCE is still based on forecasts of capex and opex that are locked into the ABBRR. As a result NBN Co can earn additional profit if it outperforms those forecasts and additional losses if it fails to meet them. This provides continued incentives for cost efficiency by allowing NBN Co to retain the benefits from further efficiency gains, at least for the remaining duration of the Replacement Module. This can reasonably be expected to prevent productive inefficiency.

105. In summary, Synergies considers that the use of forecasts of demand, and operating and capital expenditure to determine the ABBRR, with the mechanisms in place to minimise the risk of adverse outcomes from biased or erroneous forecasts, can reasonably be expected to deliver efficient outcomes.

4.8 ACCC expertise

106. In Synergies' view, the review of operating and capital cost forecasts from the perspective of prudency and efficiency, and the review of demand forecasts, are routine task undertaken by economic regulators. The criteria presented in cl 2D.6 are not detailed or exhaustive. However, we would expect the ACCC to set out what it considered to be the appropriate information on NBN Co's cost forecasts in the process of reviewing any Replacement Module Application.

107. The ACCC is responsible for economic regulation of the communications sector, carrying out its functions under industry-specific competition and access regulation in Parts XIB and XIC of the CCA, and its predecessor statutes. It has, in Synergies' view, developed a considerable expertise in the regulation of telecommunications and related infrastructure businesses, extending back to its creation in 1995. It can be expected to have gained substantial further expertise on the NBN by the time that it is required to assess forecasts in Replacement Module Applications. In Synergies view, it will have the requisite experience to be able to assess whether the forecasts of NBN Co's opex and capex over each Replacement Module period reflect efficient costs, and whether forecasts of demand are affected by strategic considerations. In the Initial Regulatory Period, the SAU provides for comprehensive information disclosure to the ACCC under schedule 1G. In addition, section 155 of the CCA provides the ACCC with power to obtain information, evidence and documents for designated communications matters in the event that additional information is needed in either the Initial or Subsequent Regulatory periods.

108. In Synergies view, therefore, the ACCC has the necessary skills and can secure the necessary information to determine whether NBN Co's forecasts of opex, capex and demand are reasonable and, in addition, whether NBN Co's Replacement Module Applications can reasonably be expected to result in efficient outcomes. Synergies considers that NBN Co will have strong incentives to submit Replacement Module Applications that are acceptable to the ACCC in order to avoid the imposition of regulation by the ACCC through ADs or BROC.

5 The Long Term Revenue Constraint Methodology

109. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - a Long-Term Revenue Constraint Methodology (LTRCM) (see Schedule 1F and Schedule 2D);

110. The LTRCM sets out the approach for determining NBN Co's annual revenue requirement, which comprises a return on the value of the RAB derived from an allowed WACC, prudently incurred operating expenditure, depreciation, an allowance for construction in progress (ACIPA) and an allowance for tax. The LTRCM operates differently in the Initial Regulatory Period (Schedule 1F) and Subsequent Regulatory Period (Schedule 2D).

111. In the Initial Regulatory Period, the LTRCM sets out a building block approach for determining an annual revenue requirement, the ABBRR. The difference between actual revenue and the ABBRR is added to the ICRA which, in essence, contains capitalised losses to that date. Hence, if actual revenue is in excess of the ABBRR, some of the capitalised losses are paid down. This continues until all capitalised losses in the ICRA are recovered (i.e., the MCE), although it is highly unlikely that the MCE will occur within this period. If it does, the Building Block Revenue Period ('BBRP') will commence, in which NBN Co's Regulated Revenue will be set by reference to the ABBRR, and losses will no longer be added to the ICRA.

112. In the Subsequent Regulatory Period, revenue and ABBRRs are determined in both the Initial Cost Recovery Period and Building Block Periods using forecasts of demand, revenue (in the ICRP), operating costs and additional investment costs which are set out in each Replacement Module. Thereafter:

    - prior to the MCE (in the ICRP), any shortfall of forecast revenue to forecast ABBRR is added to the ICRA and any surplus is deducted from it;
    - subsequent to the MCE (in the Building Block Period which arises once the ICRA is fully paid down) there is no provision for accumulating losses in the ICRA. Rather, prices will be set such that the net present value of forecast revenue over the Replacement Module period will be equal to the net present value of the forecast ABBRRs over that same period. If actual

revenue then differs from forecast revenue, the difference is carried over into the subsequent Replacement Module.

113. Synergies' analysis of the review of the LTRCM is presented as follows:

- the building block approach is reviewed in the remainder of this section;
- section 6 addresses the construction and valuation of the RAB;
- section 7 addresses the prudency provisions, multilateral engagement and operating cost efficiency;
- section 8 addresses depreciation; and
- sections 9 addresses the capitalisation of losses.

5.1 The building block model

5.1.1 Summary of conclusions

114. In Synergies' view, subject to the individual components of the approach operating effectively, NBN Co's building block approach can reasonably be considered to be efficient on the basis that the elements of the approach are, together, consistent with NBN Co recovering its prudently incurred costs over the term of the SAU, and no more.

115. Furthermore, Synergies notes that the approach is similar to building block approaches adopted by regulators for determining maximum annual revenue requirements for infrastructure services, including by regulators in Australia.

5.1.2 Components

116. NBN Co's ABBRR[40] comprises the following building blocks:

- the nominal Regulatory Asset Base ('RAB') in relation to;
  - the return on capital component of the annual revenue requirement, which is determined by applying the Weighted Average Cost of Capital ('WACC')[41] to the RAB;

[40] The ABBRR in the Subsequent Regulatory Period is based on forecasts rather than actual opex, capex and depreciation. It also uses a different WACC formulation.

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

- the return of capital component, which is determined using straight-line depreciation;

- prudent operating expenditure;
- tax allowances; and
- for the Initial Regulatory Period, the Annual Construction in Progress Allowance (ACIPA).

117. In the unlikely event that the MCE occurs in the Initial Cost Recovery Period, differences in actual revenues (termed nominal revenues) and regulated revenues are carried over from one year to the next.[42]

118. The foregoing elements of NBN Co's building block model 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. However, 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:

- the Initial Regulatory Period operates for a 10 year period on an actual cost basis, subject to a range of prudency commitments including a multilateral engagement process which will be reviewed in 2018 (Schedule 1K);
- the Subsequent Regulatory Period is made up of consecutive 3-5 year Regulatory Cycles, which are assessed and approved by the Commission; and
- the SAU includes a loss capitalisation mechanism in respect of losses that are included in the ICRA (discussed in section 9).

5.1.3 Application of the building block approach

119. 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 electricity distributors. In

[42] That is, if actual revenues are greater than regulated revenues in year 1, then the ABBRR in year two is reduced by the year 1 surplus (appropriately capitalised) to determine the year 2 regulated revenue per cl 1F.5.

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:[43]

> 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.

120. 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.

121. 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 business's 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. This is an intended objective of the SAU.

5.1.4 The principle of expected full cost recovery

122. There is basic agreement that the prices of service provision should be based on the prudent and efficient 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, having regard to the risks they accept, but no more than full cost recovery. 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. This principle is a cornerstone of all regulatory bargains. NBN Co's building block approach proposes to achieve this outcome through:

[43] '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.

- eliminating RAB revaluation thereby 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 prudently invested capital as and when it is added;
- providing an appropriate return on that invested capital by allowing an appropriate WACC;
- repaying the capital to the investors through straight line depreciation;
- recovering prudent and efficient operating costs;
- recovering appropriate tax and work in progress costs.

123. Provided that the WACC, depreciation and RAB valuation are internally consistent, and that prudency measures in the Initial Regulatory Period and ACCC scrutiny of forecasts in the Subsequent Regulatory Period ensure that investment and operating costs are productively efficient, the RAB framework in the SAU can reasonably be expected to result in efficient outcomes.

6 The RAB

124. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - …
> - an approach to valuing NBN Co's RAB which is based on actual capital expenditure (see Schedule 1E);

6.1 RAB valuation

125. The RAB[44] is based on '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. Hence, the RAB comprises actual capital expenditure. The RAB is depreciated on a straight line basis (see section 8) and is not subject to further revaluation during the term of the SAU. 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).

126. 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 significant changes in the cost and capabilities of the assets used to deliver those services, particularly over a time period measured in decades.[45] 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 deliver efficient outcomes even though the depreciated value of the assets as recorded in the RAB may not, at

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[44] SAU cl 1E.2.

[45] Synergies notes that the RAB comprises a diverse set of assets with different longevities and economic characteristics. The replacement costs using best available technologies of some classes of assets, such as network elements, may decrease over time, but the replacement costs of other classes, for example civil works, may increase. Nor can it be supposed that in aggregate that these pool to substantially reduce revaluation risk. Rather, they make the process of future revaluation complex and a source of uncertainty for investors.

some future date, reflect the cost of service provision using the best available technology at the time (noting that, as discussed below, it is very unlikely that in the future the then legacy networks used to deliver the relevant services will, in practice, be substantially replaced by new technology).

127. In Synergies' view, the RAB approach can reasonably be expected to deliver efficient outcomes on the basis that:

- the possible advantages of alternative approaches to asset valuation of the RAB (such as replacement cost and optimised asset valuation) are associated with significant disadvantages, including complexity and perceived risk to investors;
- even if the alternatives were likely to foster more efficient investment decisions (which in Synergies' view is not necessarily the case), mechanisms within the SAU and intrinsic to NBN Co's circumstances can reasonably be expected to obviate this advantage; and
- regulatory precedent on asset valuation outside of telecommunications, echoed by the ACT 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 more likely to deliver efficient outcomes.

6.1.1 The use of actual costs in the RAB

128. 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 alternative asset valuation approaches which encompass revaluation of the assets and optimisation of the asset pool which, when combined with appropriate depreciation modalities, seek to address this. A brief critical summary of some of the alternatives is presented in Attachment D.

129. In Synergies' view, there are significant problems associated with future revaluation and optimisation of RABs. These have been noted by the ACT (see Attachment D). They include, *inter alia*:

- defining what new technologies might be used in the future;
- assessing the extent to which future technologies might change costs;

- determining the extent to which they rely upon the legacy network to which it is assumed they would interconnect; and
- questions as to whether new technologies would be deployed in practice given the pre-existing network.[46]

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.

130. 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 (see Attachment D). This involves adjusting the RAB value to account for inflationary, depreciation, and subsequent efficient capital expenditure actually incurred. It is not standard practice for regulators to conduct a revaluation of the legacy asset base once the initial RAB has been established. For practical purposes NBN Co has no legacy assets that might feasibly be re-valued. Hence, under this broadly accepted approach, its RAB should simply be based on efficient capital expenditure actually incurred.

6.1.2 Simplicity

131. 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. The ACT referred to these complexities unfavourably in its 2010 Telstra decision.[47]

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[46] 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.*

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

132. 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.[48] Straight line depreciation is the default approach used by the AER.[49]

6.1.1 Prices that appear higher than a hypothetical entrant's price

133. 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 hypothetical new entrant provider (as embodied in, for example, TSLRIC approaches to telecommunications prices). However, in Synergies' view it would be erroneous to equate such prices (using forward-looking valuation in the RAB under DORC or TSLRIC) with efficient prices or outcomes or the prices that would be produced under a workably competitive market.

134. It is difficult to draw any normative conclusion as to the efficiency or otherwise of hypothetical entrant prices if no such new greenfield provider would in practice arise. Conversely, if the entrant was a real and likely prospect, NBN Co would undoubtedly consider the real threat of competition in its pricing, investment and operating cost decisions.

135. 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, regard must be paid to minimising the risk of failing to meet investors' expectation of full cost recovery.

136. In Synergies' view, it is reasonable to consider that the SAU arrangements for RAB valuation, which do not allow for future revaluation, will deliver more efficient outcomes than alternatives, such as DORC or TSLRIC, which do involve future revaluation. Investors will perceive the latter as involving excessive

[48] QCA April 2005 Final Determination of Electricity Distribution Prices p.130

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

regulatory risk[50] The *ex ante* commitment not to undertake such a review provides confidence to attract investment.

137. Furthermore, Synergies does not consider that entry on anything other than a niche basis is likely to be commercially feasible, and even this may even be economically inefficient.[51] Accordingly, Synergies considers that revaluation approaches — which have as their basis the concept of efficient entry or workable competition, neither of which can be realised — will be less efficient that the actual cost approach adopted in the SAU.

138. Even if this were not the case, the risk that NBN Co's future prices might deviate from the prices that would be set using new technology may be small. The ACCC, when it reflected on the reasons for preferring a pricing approach based on current best in use technology (i.e. one based on asset revaluation and optimisation), states that this risk [of inefficient bypass] is likely to be lower than originally thought:[52]

> ...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.

[50] 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.

[51] See *Optus Decision* op cit n 36.

[52] Ibid p.30

7 Prudency and related mechanisms

139. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - …
> - an approach to prudency of capital expenditure and operating expenditure which during the initial 10 years of the SAU relies on the Network Design Rules, customer engagement, deemed categories, permitted variations and prudency principles (see clauses 1E.3 to 1E.11 inclusive);

7.1 Summary of conclusions

140. In Synergies' view, the prudency provision that operate in the Initial Regulatory Period comprising Network Design Rules[53] and prudency commitments[54] are appropriate safeguards against the risk inherent in long-term undertakings, that operating costs and the quantum and mix of investment will deviate from efficient levels over the course of time, for the following reasons:

- the Prudent Cost Condition (cl 1E.4) can be expected to subject NBN Co's asset purchases to appropriate market discipline, or to otherwise ensure that the purchases are cost efficient in comparison to alternatives;
- those purchases and arrangements that are deemed to be prudent (that are within Synergies' area of competence to assess, cl 1E.3.2 are reasonable having regard to the direct and indirect costs of compliance with the Prudent Cost Condition;
- the initial design scope of Network Design Rules (cl 1E.6.1) is directed at meeting the Government's requirements in respect of NBN Co. Synergies is not qualified to determine whether initial design scope is productively efficient, but recognises that such a determination can be made when the SAU is evaluated by the ACCC.

[53] SAU cl 1E.6.

[54] SAU cl 1E.3.

- In respect of network changes:
    - the approach set out for determining their prudency (cl 1E.3) sets out a comprehensive assessment of the efficiency consequences of the network change, and a requirement that NBN Co assess alternatives; and
    - the dispute resolution mechanism (cl 1E.9) strikes a reasonable balance between the latitude for the ACCC to impose its own assessment of prudency in the event of a disputed network change, and the scope for NBN Co to obtain approval for network changes that are likely to be inefficient;
- multilateral engagement processes have been established that, in Synergies view, can reasonably be expected to offset the adverse efficiency consequences that might otherwise arise under a long-term undertaking, particularly reduced incentives to innovate and to remain productively efficient. In particular, they:
    - engage experienced telecommunications companies (i.e. NBN Co wholesale customers) that can be expected to understand and evaluate:
        - proposed network changes;
        - new product development;
    - set out workable criteria that allow for the review of and objection to proposed investment changes that are likely to result in inefficiency;
- these multilateral engagement processes will be reviewed by the ACCC to address any shortcomings prior to 1 July 2018; and
- operating costs can reasonably be expected to be efficient given the effects of prudency provisions, the commercial pressures that NBN Co will face particularly in the Initial Regulatory Period, and the transition to periodic reviews of costs by the ACCC in the Subsequent Regulatory Period.

7.2 Risk of productively inefficient over-investment

141. In the Initial Regulatory Period, 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' effect of over-investment and cost padding.[55] 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).

142. In Synergies' view, the SAU seeks to minimise the risks of inefficiently high investment through prudency provisions that establish reasonable processes and criteria for determining efficient investments in the Initial Regulatory Period. These prudency provisions include procedures for engagement with well-informed customers as a means of ensuring that they operate properly to exclude inefficient but include efficient investments.

143. Synergies addresses each of these in turn and concludes that the terms of the SAU, particularly in respect of the prudency provisions, and the context and circumstances of NBN Co, substantially mitigate the risk of productive inefficiency. On that basis, Synergies confirms that the SAU can reasonably be expected to be efficient in respect of the size of the RAB that accumulates over the Initial Regulatory Period.

7.3 The prudency provisions

144. Schedules 1E and 1F of the SAU contain 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 during the Initial Regulatory Period. Similar prudency provisions can be found in other undertakings and regulated sectors (see Attachment B). The building blocks of the prudency provisions are as follows:

- procedures for ensuring that selected assets are prudently and efficiently procured through requirements that must be met to ensure that expenditure satisfies the Prudent Cost Condition (cl 1E.4) and the Prudent Design Condition (cl 1E.5); and

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

- procedures for ensuring that the choice of assets selected is likely to be prudent and efficient, comprising:
    - Network Design Rules comprising an initial design scope directed at meeting certain requirements set out in Australian Government's legislation, policy and Statement of Expectations (cl 1E.6); and
    - procedures for varying the Network Design Rules (cl 1E.6.2) or otherwise changing the network architecture (cl 1E.7 through 1E.11).

7.3.1 Prudent Design Condition

145. The Prudent Design Condition seeks to ensure that capital expenditure related to the initial network design, and any variations or augmentations to that design, has been incurred prudently.

146. No capital expenditure will be recognised in NBN Co's regulatory asset base unless it has first satisfied the Prudent Design Condition by either being deemed as satisfying the condition under the SAU (cl 1E.3.2) or where the expenditure is materially consistent with or within the scope of the Network Design Rules, permitted variations to those rules (cl 1E.6.2) or a network change that has been endorsed through the customer engagement and endorsement process in the SAU (cl 1E.8).

7.3.2 Prudent Cost Condition

147. The Prudent Cost Condition seeks to ensure that expenditure is subject to disciplining factors that are likely to ensure that it is least cost. These include a range of factors such as competitive tendering, risk management and documentation, arm's length dealing, open market transacting and benchmarking which, in Synergies' view can reasonably be expected to ensure that procurement is least cost.

148. Under cl 1E.4.1(e), NBN Co is deemed to have satisfied the Prudent Cost Condition if its capital expenditure is specifically required by a '…policy… or administrative' requirement… or the Shareholder Minister'. In so far as cl 1E.4.1(e) does not relate to legal or regulatory obligations in respect of investment, this provision provides scope for Government to intervene in the investment decisions of NBN Co.

149. However, in mitigation of this concern, Synergies notes that:

- in so far as the capital expenditure relates to policy, it suggests that the efficiency consequences should not be addressed in isolation from the public benefits of that policy;
- any such requirement would be:
  - subject to parliamentary scrutiny;
  - transparent to the ACCC; and
  - confined to the Initial Regulatory Period, and hence not a means of intervention across the whole term of the SAU.

7.3.3 Deemed satisfaction of the prudency provisions

150. Clause 1E.3.2 sets out a series of investments and arrangements for which NBN Co shall be deemed to have satisfied Prudent and Design and Cost Conditions. Synergies is not in a position to opine on the efficiency implications of those set out in cl 1E.3.2(a) through (f), but notes that the ACCC has authorised the Optus Arrangement (cl 1E.3.2(d)).[56]

151. In respect of cl 1E.3.2(g), it is reasonable to deem third party funded network changes as prudently incurred provided that the network changes do not impose costs on other NBN users and would not have been implemented without the third party funding.

152. Synergies notes that:

- it is reasonable to deem that minor expenditures are exempt from the Prudent Design Condition requirement (cl 1E.6.3), in so far as the costs are modest in comparison with the compliance costs of the prudency provisions; and
- it is also reasonable to exclude urgent and unforeseen investments necessary to maintain the performance of the NBN (or the safety and reliability of such (cl 1E.6.3)) from the Prudent Design Condition requirement, in so far as compliance with the prudency provisions would otherwise impede such changes.

[56] *Optus Decision op cit* at n 36.

7.3.4 Network Design Rules

153. The Network Design Rules (cl 1E.6) comprise an initial design scope (cl 1E.6.1) which is directed at meeting the network roll-out and performance requirements contained in the Australian Government's legislation, policy and Statement of Expectations.

154. In so far as these Government requirements are currently known, Synergies considers that it should be possible to make a determination as to whether the initial design scope can be reasonably said to be efficient, in the sense of being the least cost design to meet those requirements. Synergies is not qualified to make such a determination. Synergies notes that the Network Design Rules, which embody the initial design scope, will be lodged with the SAU and can be expected to be considered by the ACCC.

155. The prudency provisions set out procedures that NBN Co must follow in order to make changes to the Network Design Rules (cl 1E.7 through cl 1E.11). These procedures require that NBN Co assess feasible options that meet the identified network need by reference to a range of factors including:

- 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.

156. For each Network Change Option identified, NBN Co must identify and consider the following:

- market benefits that could be delivered by each Network Change Option including:
  - price effects;
  - likely effect on demand, performance, functionality or features in relation to existing product components or features;
  - 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 other value with respect to likely future investment of Access Seekers;
- consider and estimate the classes of benefits which are determined to be material and where the costs of making the assessment are not disproportionately large; and
- consider and estimate the classes of costs of each Network Change Option.

157. NBN Co is also required to consider and quantify the costs associated with the network change options. These Network Change Costs 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.

158. 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 is only required to be proportionate to the scope and size of the required network change.

159. After identifying the appropriate Network Change Options, NBN Co may select its preferred option (cl 1E.7.3) which will maximise the Net Economic Benefit compared to the case of no network change or which is otherwise reasonable in the circumstances having regard to affected stakeholders.

160. 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 Prudency Implementation Paper which is to be published on its website. This paper is to include:

- the Network Change Options identified;
- a summary of market benefits and network change costs;
- the Preferred Network Change Option and the extent to which it maximises Net Economic Benefit;
- required changes to the Network Design Rules; and
- 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.

161. Following the publication of the NBN Prudency Implementation Paper, NBN Co will be required to seek endorsement for its preferred option in accordance with the customer engagement and endorsement process (cl 1E.8).

7.3.5 NBN Co network change processes and efficiency

162. The procedure set out in cl 1E.11 requires that market benefits are considered in determining the economic benefits of the investment. Other than its exclusion of benefits that might be considered externalities, the procedure determines the social benefits of the investment.

163. 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 Network Change:

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

164. 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 network change 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 cl 1E.4.2 can reasonably be expected to result in efficient, least cost implementation.

165. The SAU also allows NBN Co to select investments that do not maximise the net economic benefits. 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, processes which (for the reasons presented below) can reasonably be expected to deliver efficient outcomes.

7.4 Conclusion on investment prudency provisions

166. 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 excepted to result in efficient outcomes in the Initial Regulatory Period. In reaching this conclusion, Synergies notes that NBN Co will face other pressures to invest in an efficient manner (see section 7.6.2 below).

7.5 Multilateral engagement processes

167. 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 F).

168. Clauses 1E.8 and 9 set 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.

169. Clause 1E.7.4 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 Product Development Forum ('PDF'). NBN Co is required to utilise the NBN Prudency Implementation Paper to consult with (cl 1E.8.2) and seek

endorsement from (cl 1E.8.1) NBN Co customers for its preferred Network Change.

170. In Synergies' view the process can reasonably be expected to ensure that customers' views are properly taken into account. Clause 1E.9 allows appropriately qualified customers to object to NBN Co's preferred Network Change and provides for a Prudency Dispute resolution process under the auspices of the ACCC. The scope of the ACCC's decision making in respect of the dispute is circumscribed (cl 1E.9.5).

7.5.1 Appropriateness of the customer endorsement process

171. 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 only been implemented 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.

172. NBN Co's customer base will consist of telecommunications service providers. 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 prudency of any proposed investments in network capacity expansions.

173. The inclusion of a customer engagement and endorsement process in NBN Co's access undertaking in relation to Network Changes is therefore considered to be appropriate.

The test for objections

174. The test for whether a customer can object to a proposed Network Change, which in Synergies' view is important for preventing productively inefficient investments, is that 'the Customer [with a sufficient interest] must have a reasonable basis for such an objection based on a material error by NBN Co in the

application of the criteria in clause 1E.11 with regard to NBN Co's Preferred Network Change Option'.[57]

175. Clause 1E.11 sets out a broad set of criteria which, in Synergies' view, are consistent with ensuring that the resultant investment is productively efficient. The term 'error' may be interpreted either broadly or narrowly. Clause 1E.11 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 cl 1E.9.1(b) should allow customers to lodge valid objections to investments that are likely to be productively inefficient.

176. In respect of the limitations on the decision making criteria that the ACCC can adopt (cl 1E.9.5), in Synergies' view they cannot reasonably be expected to allow NBN Co to make productively inefficient investment. Rather, they provide the ACCC with scope to reject NBN Co's preferred option if they reasonably consider that other options would result in materially greater net economic benefits. The materiality threshold is appropriate since it can reasonably be considered that the ACCC is not as well placed as NBN Co to assess the relative merits of different network investments. They also constrain the ACCC to accept Network Changes that yield a net benefit and which would be considered reasonable by a prudent operator in NBN Co's position.

7.5.2 Review of the multilateral engagement processes

177. The review of the multi-lateral processes prior to July 2018 will cover customer engagement, the PDF and dispute resolution and the multilateral SFAA forum, and will be reported by NBN Co to the ACCC with recommendations for change. The ACCC will have regard to a number of set criteria (cl 1K.2.2 (b)) including 'whether the multilateral processes are encouraging the economically efficient use of the NBN Co Network.'

[57] SAU cl 1E.9.1(b)(iv).

7.5.3 Conclusions on the multilateral engagement processes

178. Customer engagement processes 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. In Synergies' view, the multilateral processes can reasonably be expected to deliver efficient outcomes on the basis that:

- prudency 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 prudency 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 mechanism should facilitate innovative investment including that necessary to implement innovative services; and
- the review in 2018 can reasonably be expected to address any shortcomings in the processes.

7.6 Operating cost considerations

179. It is standard practice for 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-1.5% limitation on price increases, for the reasons set out below, Synergies does not characterise this as an incentive mechanism aimed at cost efficiency. Rather, Synergies views this as a measure of ensuring 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. Even so, NBN Co will have strong incentives to be

productively efficient with respect to its operating expenditure over the Initial Regulatory Period as follows:

- from the obligation to achieve the lowest overall cost of ownership; and
- during 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 ICRA are accumulating.

7.6.1 Total cost of ownership

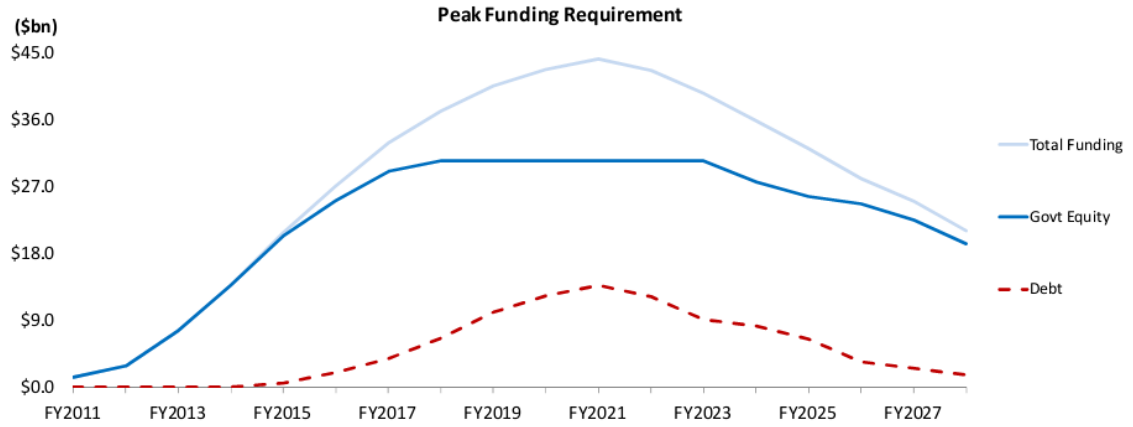
180. The SAU imposes obligations on NBN Co in the Initial Regulatory Period to meet the lowest Total Cost of Ownership (e.g. clauses 1E.4.2(e), 1E.6.2(a)(ii), 1E.6.2(a)(iii), 1F.6.2(b) etc.) which is defined to minimise 'all costs incurred or likely to be incurred over the economic life of the Relevant 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).' If the ACCC or another person identified that NBN Co is including unauthorised inefficiently high operating costs in the ABBRR, it could under the CCA seek a court order that NBN Co is in breach of its undertaking.

181. Noting this avenue, Synergies considers that NBN Co will have compelling incentives to avoid excessive operating and capital expenditure costs in the Initial Regulatory Period.

7.6.2 Incentives to be productively efficient in the Initial Cost Recovery Period

182. Synergies can confirm that NBN Co will have strong incentives to be productively efficient, for at least as long as it is incurring losses relative to its annual revenue requirement such that its capitalised losses in the ICRA are accumulating. These losses are capitalised (and funded) in the expectation but not certainty of future recovery; the risk that they will not be fully recovered, which will be perceived as being greatest when the shortfall of revenue to the ABBRR is greatest in the Initial Regulatory Period, presents a strong incentive for NBN Co to avoid excessive capital and operating costs. Figure 3 shows NBN Co's expected total funding requirement over the period to 2028, showing a progressive accumulation to $45bn over the 10 year network roll-out period to 2021. For the reasons noted above, Synergies therefore expects investment and governance incentives to be effective in minimising costs.

Figure 3. Expected total funding requirement



Source: Exhibit 9-10, *NBN Co Limited Corporate Plan 2012 – 2015*, 6 August 2012 at 80.

183. 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.

7.6.3 Quality of service standards

184. The SAU commits to service levels to customers as set out in Schedules 1J and 2F of the SAU. Synergies considers that this can reasonably be expected to prevent productive inefficiency in the sense of excessive costs for the delivered quality of service.

7.6.4 Conclusions in respect of operating costs in the Initial Regulatory Period

185. In Synergies' view, the SAU provides sufficient information to allow the ACCC to assess NBN Co's compliance with its operating cost prudency commitments and quality of service performance. Accordingly, the SAU, given the context and circumstances of NBN Co, provides incentives to minimise operating costs in the Initial Regulatory Period, 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 or commercial pressures. These commercial and governance pressures can reasonably be expected to be most intense in

the Initial Regulatory Period during which the ICRA will be increasing most rapidly;

- 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 ACCC can obtain information necessary to assess SAU compliance to the extent that the information disclosure set out in the SAU is insufficient.

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

8 Depreciation of the RAB

187. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - a straight line depreciation methodology (see clauses 1F.8);

8.1 Summary of conclusions

188. Synergies considers that straight line depreciation can reasonably be expected to be efficient based on the following:

- 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 deprecation such that they can reasonably be expected to result in more efficient outcomes.

8.2 Adoption of straight line depreciation

189. Clauses 1F.8 and 2D.2 of the SAU sets out that 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 appropriate asset life for that asset type. This depreciation framework is widely used by Australian regulators (see Attachment E).

8.3 The purpose of depreciation

190. 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.

191. In the context of the discussion of optimising asset valuation frameworks in Section 6.1 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.

192. 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.

8.4 Depreciation, obsolescence and asset stranding risk

193. 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.

194. While this mechanism deals with the risk of under-recovery in the initial years of operation, it fails to 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 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 ACCC in relation to the Amadeus Basin to Darwin Pipeline.

195. 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 ACCC noted, may be much lower than originally thought;[58]
- 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 by 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 ICRP.

8.5 Summary

196. For the reasons set out above, Synergies considers 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.

[58] See n 52.

9 Capitalisation of losses

197. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - …
> - a loss capitalisation approach, as implemented through the ICRA (see clauses 1F.4 and 2D.4);

9.1 Summary of conclusions

198. Synergies can confirm that NBN Co's proposal to adopt a loss capitalisation approach, as implemented through the ICRA is 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 and thereby prevent NBN Co from setting prices that result in adverse efficiency consequences:
    - the governance arrangements of NBN Co which can be expected to prevent capitalised losses rising to a level where investors would no longer expect a return of and on capital;
    - the requirement for geographically uniform prices in the face of possible niche entry and cream skimming;
    - the prudency requirements in respect of capital investment and operating expenditure in the Initial Regulatory Period and the use of

forecast capex and opex, subject to assessment by the ACCC, to set the forecast real ABBRR for Regulatory Cycles in the Subsequent Regulatory Period;

- specification of prices for Reference Offers and for a broad range of Non-Reference Offers and Other Charges likely to be offered in the Initial Regulatory Period in the SAU; and
- the characteristics of demand for broadband services in the face of capped prices for Reference and Non-Reference Offers.

9.2 The proposed mechanism

199. The SAU provides for a loss capitalisation mechanism in the Initial Cost Recovery Period, as set out in clauses 1F.4 and 2D.4 The purpose of this mechanism is to capitalise any shortfall between actual/forecast revenue and the actual/forecast ABBRR in the Initial Cost Recovery Period. Actuals are used in the Initial Regulatory Period and forecasts are used (for Replacement Module periods of 3 to 5 years) in the Subsequent Regulatory Period. This mechanism ceases to apply 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 are 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 the ABBRR is used to pay down those capitalised losses.[59]

9.3 Rationale for loss capitalisation

200. 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.[60] That the investment decisions 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 NBN Co (i.e. recovering both a full return on and return

[59] If the MCE occurs prior to the end of the Initial Regulatory Period, the methodology includes 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.

[60] 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.

on assets), as this would result in very high prices and, almost certainly, inadequate and delayed customer adoption.

201. 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 Reference 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 initial period.

202. 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.

203. The logic of early losses on new infrastructure is well understood and recognised in the ACCC's willingness to allow capitalisation of the losses for inclusion in the RAB which, thereby, allows recovery in later time periods. A brief summary of some of the ACCC's previous decisions in this area is presented in Attachment G.

204. The mechanisms proposed for capitalising the losses in the SAU are consistent with mechanisms already accepted by the ACCC 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.

9.4 The extent of accumulated losses

205. The value of the ICRA/RAB will be a key 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 $44.1bn[61] of investment in fixed assets is contemplated, represent a significant component of the final price.

[61] NBN Co Limited Corporate Plan 2012–2015, 6 August 2012, at 73.

206. 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 30 year term of the undertaking.

207. The arrangements proposed in the SAU give NBN Co the ability to set initial prices for new services subject to initial pricing principles. They do not set an upper bound on the ICRA and hence on the contribution that capitalised losses make to final prices. If NBN Co achieves a position of market power in the provision of any of these new services, then the substantial capitalised losses in the ICRA will confer on NBN Co the ability to set high prices for these services subject to the constraints imposed by the SAU.

208. Synergies recognises the difficulty of establishing an undertaking that is of a sufficiently long duration to provide confidence of a reasonable return on investment given the size of the investment, the anticipated roll-out and uptake. NBN Co may, at some point in time, exhibit natural monopoly characteristics and possess a degree of market power. However, the economic characteristics of the NBN are such that allocatively efficient prices can, for some services, be very high.

209. Given the safeguards discussed elsewhere in this report aimed at preventing productive and dynamic inefficiency, Synergies consider that prices under the SAU can reasonably be expected to be allocatively efficient. Furthermore, within the context of these safeguards, a commercial decision by NBN Co to accelerate the recovery of capitalised losses is unlikely to result in prices that are outside the bounds of those normally considered efficient (see section 3.2.3).

9.4.1 Constraints on the impact of capitalised losses

210. 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 include:

- the governance arrangements of NBN Co which should prevent capitalised losses rising to a level where investors would no longer expect a return of and on capital;
- the requirement for geographically uniform prices in the face of possible niche entry and cream skimming;

- the prudency requirements in respect of capital investment;
- specification of Reference Offer prices, Non-Reference Offer prices and Other Charges in for the Initial Regulatory Period in the SAU; and
- the characteristics of demand for broadband services, noting that large price increases can be expected to result in demand side substitution to Reference and Non-Reference offers whose prices were set with regard to the pricing principles and which are capped.

Governance arrangements

211. Based on NBN Co's approach to risk management, which takes account of strategic, financial and operations risk,[62] Synergies would expect NBN Co to adapt its core business plan in the event that market outcomes are different from its expectations. The normal governance constraints[63] 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.

Uniform pricing

212. The government expectation of uniform pricing for NBN Co services will impose some constraint on the ability of NBN Co to set prices under the SAU, particularly if it faces the prospect of 'cream-skimming' of some of its services. This concept was described by Telstra in respect of its Retail Price Parity Obligation ('RPPO').[64] 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. This places an upper bound on the prices that can be charged in those areas which, by dint of the uniformity requirement, caps prices elsewhere where cream skimming is not economically feasible.

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62 NBN Co Limited Corporate Plan 2012–2015, 6 August 2012 s 10 at 84.

63 Synergies recognises that governance arrangements for government owned businesses may differ from those of non-government businesses and may be more restrictive. However, regulators tend to deal with private and public enterprises on an equal footing. Synergies believes that this is appropriate in respect of NBN Co, in so far as the government has opportunity to state any requirements beyond those that might arise under private governance have been in its Statement of Expectations.

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

Prudency requirements

213. The prudency requirements set out in clauses 1E.3 – 1E.5, while not directly affecting the extent of capitalised losses, place a constraint on the extent of investment. 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 section 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.

Initial pricing

214. Schedules 1C and 1D set out Reference Offers, Non-Reference Offers and Other Charges for the Initial Regulatory Period. Although the SAU allows NBN Co to set the initial price for offers not included in the SAU, these must have regard to the Initial Pricing Principles (cl 1D.6) discussed in s 3.3.1 above. They allow NBN Co to have regard to, *inter alia*, affordability and rate of uptake, but are consistent with allocatively efficient prices under which NBN Co seeks to maximise the recovery of its capitalised losses (or minimise their rate of growth).

The characteristics of demand

215. Prices for the Reference and most Non-Reference Offers and Other Charges are set out in the SAU. Reference Offer prices are fixed during the period to 30 June 2017. Thereafter, they may increase by no more than CPI-1.5%. Non-Reference Offers and Other Charges are set out in the SAU as at its commencement, and price increases are similarly limited to CPI-1.5% but from the financial year after each offer is introduced.[65] For the reasons noted above, these constrain prices in the face of large capitalised losses.

216. In respect of new Non-Reference Offers, those whose initial prices are not specified in the SAU, Synergies would expect most to be subject to significant

[65] With certain minor exceptions related to such factors as promotional offers.

cross-price elasticity with other NBN Co services. Furthermore, NBN Co is required to have regard to, *inter alia*, the nature and extent of market demand and the relationship between the New Offer and existing Reference Offers and Non-Reference Offer.[66] These considerations, when set alongside the other constraints facing NBN Co, including the provisions of the SAU, this can reasonably be expected to ensure that the Initial Prices of Non-Reference Offers are set efficiently having regard to expected demand characteristics.

9.4.2 Conclusion

217. 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.

[66] SAU cls 1D.6.4 and 2C.5.

10 A single RAB across all services

218. Given NBN Co's revised SAU construct, Synergies has been asked to:

> please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:
>
> - …
> - a single ICRA/RAB-based approach to cover all capital expenditure in respect of NBN Co's networks.

10.1 Summary of conclusions

219. Synergies confirms that a single ICRA/RAB-based approach to cover all capital expenditure can reasonably be expected to foster efficient outcomes in that it minimises price impediments that might otherwise result in allocative efficiency, for the following reasons:

- 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 a degree of flexibility to set initial prices outside of Reference Offers, Non-Reference Offers and Other Charges that are specified for the Initial Regulatory Period, subject to the initial pricing principles;
- the risks of having to price to 'meet the market' in accordance with government expectations, are best managed by providing NBN Co with 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 with a transfer mechanism between high and low cost areas. 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.

10.2 Uniform pricing

220. 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.

221. NBN Co has implemented this expectation in its SAU through:

- its LTRCM (set out in Schedules 1F and 2D 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 Reference Offers and Non-Reference Offers set out in Schedules 1C, 1D, 2B and 2C; and
- freedom to select the initial prices for other services, subject to a CPI-1.5% cap on annual price increases and the initial pricing principles.

222. 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 prices; and obliged to limit price increases.

10.3 Implications of uniform pricing

223. 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 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.

224. Whether or not these arrangements result in cross-subsidies in the economic sense of prices outside the bounds of stand-alone and incremental costs and, if so, whether these give rise to efficiency consequences, s 152CBD(5A) of the CCA states that if:

> (a) the undertaking contains price-related terms and conditions relating to the supply of a service; and
>
> (b) the price-related terms and conditions are reasonably necessary to achieve uniform national pricing of eligible services supplied by the NBN corporation to service providers and utilities;
>
> then:
>
> (c) the Commission must not reject the undertaking for a reason that concerns the price-related terms and conditions; and
>
> (d) paragraph (2)(b) does not apply to the price-related terms and conditions.

225. Under this provision, even if the uniform pricing provisions do not meet the reasonableness criteria, the ACCC cannot reject the undertaking on that basis if the price-related terms and conditions are reasonably necessary to achieve uniform national pricing.

10.4 Discussion

10.4.1 Are the single ICRA and RAB reasonably necessary

226. For the reasons set out above, uniform national prices impose a requirement on NBN Co to earn higher returns from some parts of its network and lower (possibly negative) returns from others by dint of the substantial 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 (as described above) with a transfer mechanism between high and low cost areas; or
- a 'single till' as adopted in the SAU, in which no formal transfer is necessary.

227. 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-Reference Offers and Other Charges (subject to the initial pricing principles) and by adoption of a single ICRA/RAB rather than a hypothecated ICRA/RAB.

10.4.2 Summary

228. 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 (including the initial pricing principles and the Individual Price Increase Limits) and its broader operating context, reasonably be expected to foster efficient outcomes.

Attachment A. Principal authors

Euan Morton

229. 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

230. 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: Duration of access regimes in Australia

231. The typical duration of access undertakings or, more properly, intervals between 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.

Precedent from other industries

232. The Gas Code[67] (now superseded by the National Gas Act)[68] 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 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.

233. 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.

[67] See http://www.coderegistrar.sa.gov.au/

[68] See the lead legislation, National Gas (South Australia) Act 2008

Central West Pipeline

234. On 31 December 1998, AGL Pipelines (NSW) Pty Limited (AGLP) submitted a proposed access arrangement for the Central West Pipeline (CWP) to the ACCC. The ACCC's final decision allowed a 10 year review period. The ACCC 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.

235. In its earlier Draft Decision, the ACCC had accepted a 4½ year term, but proposed that a review of the arrangements would be triggered when, in effect, profits reached threshold levels.[69] 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:[70]

- 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.

236. The ACCC 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

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

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

will depend on whether it is able to outperform its forecasts and the extent of that out-performance. Similarly, the ACCC noted the likelihood of under-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 ACCC noted that AGLP has the right to seek revisions at any time.

Central Ranges Pipeline ('CRP')

237. The CRP has an access arrangement approved for 14 years (2005 – 2019).[71] This approval occurred in the context of a tender process approved by the ACCC under the 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 Code requires that the regulator must be satisfied that the commencement date for revisions to be included in the access arrangement is:[72]

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

238. 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 ACCC in its approval of the access undertaking in December 2005.

Dawson Valley Pipeline ('DVP')

239. The ACCC 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.

240. In its decision,[73] the ACCC 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 ACCC considered that Anglo Coal has the opportunity to earn a greater return than suggested by the benchmark rate of

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[71] Central Ranges Pipeline Pty Limited Access Arrangement for Central Ranges Pipeline November 2005 p.3

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

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

return specified in the decision while the interests of prospective users are reasonably protected. The ACCC 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).

241. The ACCC 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.

ARTC Interstate Rail Access Undertaking

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

243. 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.[74] 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.

244. 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 ACCC 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 ACCC with a new set of 5 year capital expenditure estimates during the fifth year of the undertaking.

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[74] ACCC July 2008 Final Decision Australian Rail Track Corporation Access Undertaking – Interstate Rail Network s.D.2.3.

245. The ACCC 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. The ACCC 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.

Foxtel

246. The ACCC accepted a SAU from Foxtel in relation to its digital set top unit service[75] which would operate for a period of 8 years.

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

Attachment C: Prudency requirements

247. 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. They are provided as a point of reference for the review of the Module 1 prudency provisions. It should be noted that the NBN Co SAU prudency provisions in that module relate to functionality expansion rather than capacity expansion whereas the following primarily address capacity expansion. Functionality expansion is likely to be a more common occurrence in broadband and telecommunications networks than it is in most other infrastructure sectors.

National Electricity Rules

248. 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.

249. 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

access undertaking is the criterion that requires the capital project to have satisfied the AER's regulatory test.

250. 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.

251. 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

252. The AER's regulatory test implements a similar process to NBN Co's prudency conditions (which apply only in the Initial Regulatory Period), 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.

253. 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.

254. In Synergies view, the different characteristics of the power networks and the NBN support these differences. In particular, energy market infrastructure investments can have profoundly different impacts on different classes of network users, raising costs for some and reducing costs to others, by dint of the economic characteristics of the transmission networks. Hence, it is important to narrowly confine the options that are considered. That does not happen in broadband networks. Hence, in broadband networks there are likely to be benefits from a more flexible approach to the final selection of the preferred option.

DBCT access undertaking

255. 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.

256. 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.

257. 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.

258. Where DBCT Management's proposal fails to meet all of these requirements, the QCA undertakes an assessment of the prudency 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 prudency 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' prudency conditions

259. Like the NBN Co SAU, DBCT Management's access undertaking makes use of a customer engagement process to ensure the prudency of capital expenditure. Its details differs from that of NBN Co, 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 investment proposals in the event that NBN Co seek a Network Change.

260. 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 prudency 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

261. 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 prudency 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.

262. 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.

263. The specific provisions to be taken into account in assessing the prudency 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 prudency 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' prudency conditions

264. As with DBCT Management's access undertaking, QR Network's capacity expansion approval process requires customer endorsement as a means of ensuring the prudency of capital expenditure (in contrast to NBN Co's reliance on objections). However, where the QCA is required to assess the prudency 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 prudency conditions which include extensive requirements relating to the identification and evaluation of alternative options.

ARTC Hunter Valley access undertaking

265. 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.

266. 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.

267. 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.

268. 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.

269. 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.

270. 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' prudency conditions

271. 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, particularly 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.

272. While there are merits to the ATRC approach, in Synergies view those merits arise due to the relatively narrow geographical scope of the ARTC and the limited options for development. Implementing the same arrangements in respect of the NBN would, in Synergies view, introduce significant administrative complexity, delay and inflexibility.

Attachment D: Alternative asset valuation approaches

Valuation under TSLRIC+

273. In the past, the ACCC's has assessed the reasonableness of individual telecommunications access prices using the TSLRIC+ modelling approach. Under its TSLRIC+ framework, asset values have been subject to revaluation and optimisation at each regulatory review reflecting what is deemed to be the current cost of best in use technology. This contrasts with the approach set out in the SAU. This TSLRIC+ approach incorporates a notion of optimisation. For example, the ACCC noted:[76]

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

274. The TSLRIC+ approach has been subject to considerable criticism. The ACCC has acknowledged that the continued use of this approach may need to be reviewed:[77]

> …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...

275. The approach, being based on a hypothetical new entrant, gave considerable concern to the ACT, 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.[78]

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

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

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

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.'[79]

Optimisation approaches elsewhere

276. Other regulators have estimated RABs typically used 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.[80]

277. These cases have applied to pre-existing or legacy asset bases rather than greenfield investments. The ACCC has considered Depreciated Actual Cost ('DAC') when establishing the RAB for gas pipelines 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 Depreciated Actual Cost ('DHC') were noted by the Queensland Competition Authority ('QCA') in its 2004 draft decision on the Dalrymple Bay Coal Terminal ('DBCT') initial access undertaking:[81]

> …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.

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[79] Ibid [199].

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

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

278. 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:[82]

> 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.

279. 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.

280. 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,[83] and can value existing assets based on smaller sized assets consistent with expected demand.

Precedent for rolling forward without revaluation

281. The standard roll-forward mechanism was adopted by the ACCC 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 ACCC (ARTC's Hunter Valley network was previously regulated by IPART). The regulation of the network transferred to the ACCC 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 set under the NSW Rail Access Undertaking. This approach was approved by the ACCC in its March 2010 draft decision:[84]

> 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.

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[82] Queensland Competition Authority (2004), p 125.

[83] Whereby assets are removed from the RAB if they are not used or are not useful.

[84] ACCC (2010). Australian Rail Track Corporation Limited – Hunter Valley Coal Network Access Undertaking Draft Decision, p 491.

282. The Queensland Competition Authority's ('QCA') 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) demonstrated considerable reluctance to reassess asset values. It made the following statement in response to QR's request:[85]

> 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.

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

Attachment E: Straight-line depreciation

283. 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.

284. The straight-line method is the standard depreciation approach applied by the Australian Energy Regulator ('AER'), the ACCC 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:[86]

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

285. 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;87
- the ACCC 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;88 and

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

[87] AER Final decision – Queensland distribution determination 2010-11 to 2014-15, May 2010 at 232.

[88] ACCC Final Decision – Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline, June 2000 at 71.

- the ACCC 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.[89]

286. The ACCC'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 ACCC acknowledged the appropriateness of the pipeline owner's proposed accelerated depreciation profile, noting the degree of stranding risk to which the pipeline was exposed:[90]

> 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.

287. Despite the above instances, straight-line depreciation is still clearly the preferred method of depreciation used by economic regulators. For example, the Queensland Competition Authority ('QCA') has consistently applied straight-line depreciation across all regulated infrastructure providers under its jurisdiction, largely for the reasons already set out.

288. Of particular relevance is the ACCC'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

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[89] The AER noted in its Draft decision – NT Gas Access arrangement proposal for the Amadeus Gas Pipeline 1 July 2011 – 30 June 2016, April 2011, at 55 that: 'the ACCC approved accelerated depreciation over the earlier access arrangement period to address uncertainty about the pipeline's expected economic life and the risk of asset stranding. However, with the connection of new gas sources to the pipeline this risk has reduced. NT Gas proposed the straight line method, which leads to relatively smooth price changes over time. The AER considers the straight line method promotes efficient growth in the market for reference services.' The straight line method was adopted in the Final Decision.

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

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 ACCC made the following statement on its decision to adopt a straight-line depreciation profile:[91]

> 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.

289. 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.

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

Attachment F: Customer engagement

290. Processes whereby users are able to directly endorse the prudency 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 undertaking.

DBCT capacity expansion approval process

291. 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.

292. 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.

293. As is the case with NBN Co's undertaking, 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.

294. The QCA's draft decision noted concerns with the robustness of DBCT Management's proposed triggers for capacity expansion:[92]

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

[92] 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.

295. 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.

296. The QCA considered that these triggers would effectively incorporate the users and access seekers into the regulatory decision making framework:[93]

> 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.

297. 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 prudency 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:

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

- current contracted and likely future demand and spare capacity; and
- the appropriateness of the processes followed in evaluating the proposed works, including the assessment of alternative options.

298. 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.

299. 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 prudency 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 prudency and efficiency of a proposed capacity expansion reviewed. This is also a feature of NBN Co's proposed undertaking.

300. DBCT Management secured approval for the prudency 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

301. 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 expenditure[94] and the scope of the expenditure has been accepted by a Customer Group[95] in accordance with clause 3.2.2(f).

302. 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.

303. 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.

304. 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 prudency 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.

305. 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-

[94] 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.

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

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

306. 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 prudency 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.

307. 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.

308. 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 prudency 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 G: Loss capitalisation

The ACCC's decisions on capitalised losses

309. The ACCC has previously allowed the capitalisation of revenue under-recovery for inclusion in the RAB,[96] 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.

Central West Pipeline ('CWP')

310. An early example of this approach can be seen in the proposed access arrangement for the CWP. The ACCC recognised that market demand for the services to be provided by the pipeline would initially be low and subsequently the pipeline owner would be subject to risk of under-recovery, noting that:[97]

> 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.

311. 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 ACCC, 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.

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[96] Under the SAU losses are not capitalised in the RAB but in the ICRA.

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

ARTC Hunter Valley

312. More recently, the ACCC in discussing the ARTC Hunter Valley undertaking noted:[98]

> 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 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.

313. ARTC subsequently withdrew the Draft Undertaking and lodged a revised undertaking which was approved by the ACCC, based on a standard building block approach to determining revenues, but it is clear from the final approval that the mechanism was retained:[99]

> 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.

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

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

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

Under- and over-recovery and competition

315. In respect of CWP, the ACCC noted:[100]

> ...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.

316. Essentially, the ACCC 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 in any way 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 ACCC 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

[100] Ibid p.70

- incentives to delay investment and run network capacity at inefficiently high utilisation (with concomitant loss of quality).

Attachment H: Instructions

317. Webb Henderson has instructed Synergies as follows (footnotes omitted):[101]

> We kindly request your independent advice on whether key elements of NBN Co's proposed SAU construct are efficient. In particular:
>
> - please advise whether NBN Co's approach of having a 30 year SAU term with the following elements is efficient:
>
> - the specified terms expiring after an initial 10 year period contained in Module 1;
>
> - the specified terms not commencing until the expiry of the initial 10 year period and continuing for the duration of the SAU contained in Module 2;
>
> - the introduction of further modules with terms of between 3 and 5 years, after the expiry of Module 1, as nominated in a future variation to the SAU (i.e. Replacement Modules).
>
> In undertaking your analysis, please take account of the magnitude and timeframe of NBN Co's investment, the expected payback period 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 the following commitments made by NBN Co in Module 1 lead to efficient outcomes:
>
> - the inclusion of a set of price-regulated 'Reference Offers' in the SAU, having regard to the scope of the offers proposed and the nature of the pricing commitments which attach to those offers over the initial 10 year period (see Schedule 1C) with specified maximum regulated prices in force until 1 July 2017;
>
> - the inclusion of price regulated Non-Reference Offers and Other Charges (i.e. all price regulated offers specified in clause 1D.2.1) in the SAU, having regard to the nature of NBN Co's pricing commitments for non-reference offers over the initial 10 year period (see clauses 1D.3 to 1D.6 inclusive);
>
> - an individual price increase limit of CPI-1.5% to apply to Reference Offers after 1 July 2017 (see clause 1C.4) and to Non-Reference Offers and Other Charges

[101] Further revised brief to advise – Expert report on NBN Co's Special Access Undertaking. *Letter of instruction from Webb Henderson* 19 September 2012 ('Instructions').

(excepting those covered by cl 1D.4.2) for the term of the initial regulatory period (see clause 1D.4); and

- an approach to initial pricing for Non-Reference Offers and Other Charges during the initial 10 year period of the SAU (see clause 1D.6) which allows NBN Co to establish prices having regard to the pricing principles proposed by NBN Co (noting that there is no regulatory recourse available to access seekers in relation to pricing decisions made by NBN Co (see clause 1B.1.2));

- please advise whether the following commitments made by NBN Co in Module 2 lead to efficient outcomes:
  - the inclusion of a review mechanism for the Reference Offers, having regard to the nature of those mechanisms outlined in Module 2 (see clause 2B.2);
  - an individual price increase limit of CPI-1.5% to apply to Reference Offers, Non-Reference Offers and Other Charges (excepting those covered by cl 2C.2.2) for the Initial Cost Recovery Period, with the same limit applying during the Building Block Revenue Period, but in conjunction with a revenue cap (see clause 2C.2). In undertaking your analysis, please take account of the other commitments in Schedule 2B and 2C of the proposed SAU, such as the use-or-lose-it provisions, the exceptions to the individual price increase limit and the anti-avoidance provisions (see clause 2C.2);
  - an approach to initial pricing after the expiry of the initial 10 year period of the SAU (see clause 2C.5) that allows NBN Co to establish prices for New Offers, New Other Charges and Zero-Priced Non-reference Offers by having regard to the pricing principles proposed by NBN Co (see clause 2C.5);
  - the inclusion of forecasts of revenue and demand in a Replacement Module to be used as the basis to roll-forward the Initial Cost Recovery Account (ICRA) during the Initial Cost Recovery Period instead of actual revenues (see clause 2D.2.1). In undertaking your analysis, please consider that, during the Building Block Period, forecasts will need to be consistent with the Annual Building Block Revenue Requirement (ABBRR); and
  - the inclusion of operating expenditure and capital expenditure forecasts that reflect prudent and efficient costs which are taken into account in the ACCC's consideration of a Replacement Module Application and are prepared by NBN Co having regard to number of specified factors (see clause (2D.6).

- given NBN Co's revised SAU construct, please confirm that the conclusions made by Synergies in its January 2012 report in relation to the efficiency of key elements of NBN

Co's original SAU (and which are not affected by the elements discussed above) remain valid. These key elements include NBN Co's adoption of:

- a Long-Term Revenue Constraint Methodology (LTRCM) (see Schedule 1F and Schedule 2D);
- an approach to valuing NBN Co's RAB which is based on actual capital expenditure (see Schedule 1E);
- an approach to prudency of capital expenditure and operating expenditure which during the initial 10 years of the SAU relies on the Network Design Rules, customer engagement, deemed categories, permitted variations and prudency principles (see clauses 1E.3 to 1E.11 inclusive);
- a straight line depreciation methodology (see clauses 1F.8);
- a loss capitalisation approach, as implemented through the ICRA (see clauses 1F.4 and 2D.4); and
- a single ICRA/RAB-based approach to cover all capital expenditure in respect of NBN Co's networks.

As previously instructed, 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.