energy networks association

AUGUST 2015

FUTURE NETWORK COST RECOVERY AND DEPRECIATION

Regulatory and policy options

We must use time as a tool,
not as a couch

John F Kennedy

CONTENTS

Overview

Current regulatory approaches effectively presume future consumers will meet a substantial proportion of the capital costs of long-lived electricity and gas network investments made today.

Yet changes in demand, technology and cost conditions make this historic presumption less certain and the current approach potentially unsustainable. Continuation of the current path of not addressing the issue risks an avoidable regulatory failure with adverse outcomes for the long-term interest of consumers.

There are positive and proactive alternatives to a potentially risky 'wait and see' approach. There is a need for networks to move to more flexible depreciation approaches that will protect consumers from future regulatory failure arising from fundamental changes in energy markets.

The Australian Energy Regulator has rightly likened the regulatory asset base to the principal amount of a home mortgage, which is funded at an interest rate (the rate of return) and paid off over time. [1] Just as households can both save and have greater flexibility by paying off a home loan early, network customers as a whole may benefit by bringing forward the recovery of investment costs during the current phase of lower financing costs.

1. INTRODUCTION – THE CHALLENGES TO TRADITIONAL COST RECOVERY PATHS

Current economic regulatory approaches spread the recovery of long-lived capital investments in energy network assets over periods of between 30 to 50 years. This effectively defers the recovery of a substantial component of the costs of network infrastructure to future consumers that will be operating in future energy markets. These approaches presume future consumers will meet a substantial proportion of capital costs of major investments that are being made today.

Over the current determination cycle, for example, the Australian electricity and gas network sector is likely to need to make capital investments of approximately $600 million per month to connect and reliably serve households and businesses.[2]

The rapidly evolving energy market environment poses a significant challenge to this traditional paradigm of deferred recovery. Changes in demand, technology and cost conditions make the historic presumption of future consumers meeting a substantial proportion of today's capital investments less certain and the current approach potentially unsustainable. Continuation of the current 'wait and see' approach risks a regulatory failure with adverse outcomes for consumers. Modern risk management principles – and the logic of Pascal's wager[3] – suggest that where probabilities are uncertain, potential consequences should assume critical importance.

1 AER Issues Paper Victorian electricity distribution pricing review, 2016 to 2020, June 2015, p.10

2 Based on estimates in AER *State of the Energy Market Report* (2014), p.74 and Table 4.2

3 The seventeenth century mathematician Blaise Pascal formulated in his Pensées what came to be referred to as 'Pascal's wager'. The 'wager' is at its heart a pragmatic argument for the belief in a supreme being, derived by examining a matrix of potential consequences for beliefs for or against in the face of uncertainty before the fact. The key two potential outcomes in the hypothetical wager are salvation, or eternal damnation. It is commonly considered as an early forerunner to such modern concepts as game theory and risk management.

In this case, precaution should direct all stakeholders to understanding and discussing the risk mitigation options that are available to avoid costly regulatory failure. For exactly these reasons, this challenge is increasingly being recognised internationally by regulators and energy commentators as an area for assessment and early action.[4]

This paper discusses a number of regulatory and policy options to address this challenge, and examines their potential implications for the long-term interests of current and future consumers. It concludes that there are viable tools, in particular, the more flexible use of depreciation approaches, which can be used to address these challenges.

It is prudent and opportune to apply these more flexible approaches as part of the 'toolbox' of network regulation, and they should be progressed through active engagement with network customers and regulatory bodies about the benefits of these measures.

4 See for example, New Zealand Commerce Commission *Input methodologies: Invitation to contribute to problem definition*, 16 June 2015, p.29.and p.57-58, Frontier Economics Briefing *That Sinking Feeling*, July 2015 and COAG Energy Council Energy Working Group *Electricity network economic regulation; scenario analysis – Policy Advice*, June 2015

2. COST RECOVERY APPROACHES AND CHANGING MARKET CIRCUMSTANCES

2.1 EVOLVING MARKET ENVIRONMENT AND TRADITIONAL REGULATORY APPROACHES

The patterns and level of energy use and demand across Australian electricity and gas networks are currently undergoing a once in a generation shift. This is due to a combination of changing technologies and their impact on relative costs, past and current public subsidy arrangements for solar photovoltaic (PV) technologies, consumer responses to recent rises in energy charges and the cumulative impact of a suite of past energy efficiency measures.

For example, after around six decades of steady growth in total delivered electricity, peaking at total system demand just below 200 000 gigawatt hours in 2009, demand in the National Electricity Market connected electricity network has fallen 1.5 per cent on average over the past five years. Average annual residential and commercial consumption has fallen from around 8 000 kilowatt hours (Kwh) to around 6 000 Kwh per customer over the same period, a decline of approximately 30 per cent.[5]

This decline in the average volume of network demand does not significantly affect the costs of providing the network. Network costs are instead driven by the cost to reliably serve expected peak demand, obligations to offer new connections, and the costs to efficiently maintain assets and invest to deliver efficient services over the medium-term. Technology innovation or consumer behavior which lowers peak demand will generally put downward pressure on the cost of network services, but technologies and consumer behavior which only lower *average* energy demand will not lower the cost of network services and will tend to increase price per unit of energy.

The emergence of economic household level battery storage products, demonstrated by the launch in April 2015 of Tesla's 'Powerwall', represents a further transformative change to the energy delivery chain. The technology suites employed to deliver future network services are evolving rapidly to a greater mix of shorter-lived information technology and other network management assets, and average network demand is not growing predictably or steadily. In fact, it is possibly entering a long-term decline, with recent Australian Energy Market Operator forecasts encompassing scenarios ranging from continued decline, or a gradual recovery in demand.

The setting of the regulatory depreciation allowance decides who pays for network infrastructure services through time. Under current network regulatory rules a network business may propose a depreciation path, but the regulator has final discretion to set an allowance within the relevant *National Electricity Rules* and may also reject proposed depreciation proposals in some circumstances under the *National Gas Rules*.

Depreciation allowances to date have been a relatively uncontentious part of network revenue determinations. The previous steady growth in overall electricity demand, the largely stable technology for delivery of network services, and recognition of the typically long-lived nature of these investments contributed to this relative lack of regulatory policy attention.

The assumptions underpinning each element of this past regulatory approach to depreciation allowances are being challenged by changing technology, costs, demand patterns and emerging competitive forces impacting networks. The risk of a disjoint, between traditional regulatory approaches built on the historical conditions of yesterday and the emerging market circumstances of tomorrow, has arguably never been higher.

5 AEMO *National Electricity Forecasting Report Overview*, June 2015, p.8

2.2 LACK OF ACCESS TO NORMAL RISK MANAGEMENT AVENUES

Network owners and investors face the risks of these changing demands and conditions, but currently do not have access to the same risk management tools and strategies which would be used by normal commercial firms in comparable market circumstances.

These risk management tools include fully flexible pricing approaches to optimize efficient asset utilisation, a capacity to bring forward depreciation on assets at risk of being stranded, scope to set shorter depreciation schedules for new assets, a capacity to pause investment plans, or exercise the strategic 'option' to delay investment.

Under current network regulatory rules, however, the structure of prices is subject to approval and disallowance by the economic regulator. Similarly, depreciation allowances, while being proposed by each network business, are effectively determined by the regulatory body. In addition, electricity and gas networks commonly face statutory obligations to serve (with these obligations translating to requirements to make customer-specific investments), in contrast to normal market participants.

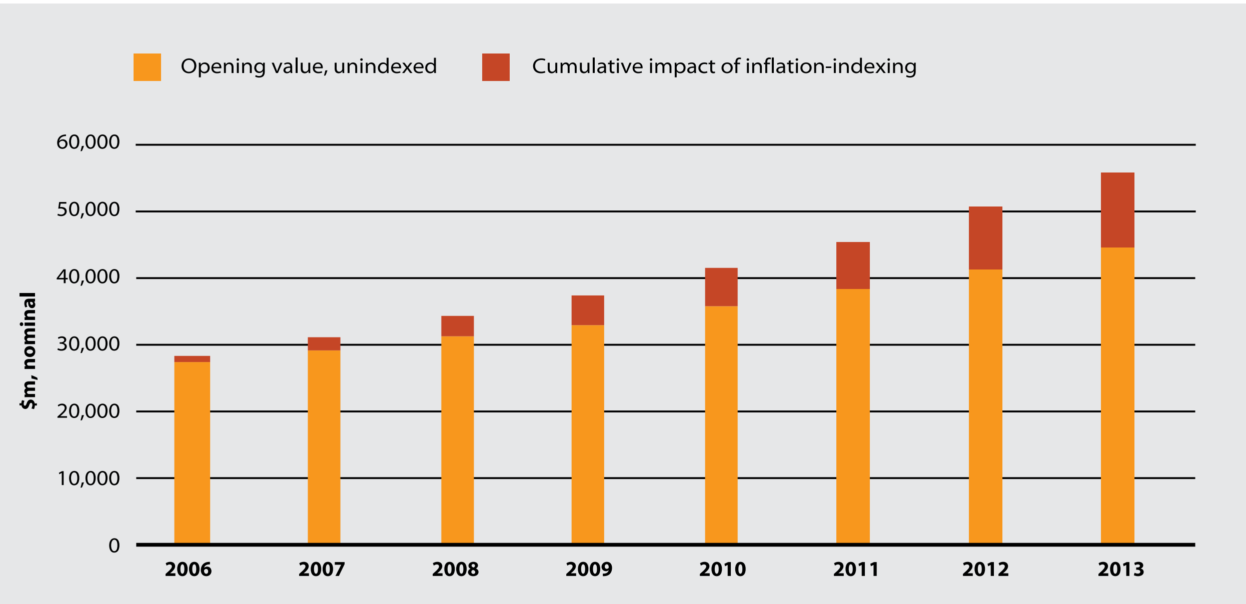
In fact, current regulatory approaches and regimes reflect an approach to cost recovery risks that runs directly counter to expected normal commercial practice.

For example, the annual indexation of the regulatory asset base (RAB) results in a deferral of recovery of part of the required return on capital, and its effective addition to (or capitalisation into) the capital base. This occurs because under the existing 'Post-Tax Revenue Model' of the Australian Energy Regulator (AER), the regulator reduces the amount of straight-line depreciation by the amount of inflation (or indexation) that is applied to the RAB.

That is, compensation for changes in inflation are capitalised into the RAB by decreasing the amount of depreciation provided to the business. This approach provides only the real element of the return in cash, and as such, has the impact of slowing the overall return of capital to the network business. This reduces cash flows in the short term relative to an approach where this indexation adjustment was not made.

Figure 1 sets out an illustrative example of the cumulative and compounding impact of this effect as a proportion of the 2006 regulatory asset base of all Australian electricity network businesses.

FIGURE 1 ILLUSTRATIVE EXAMPLE OF CUMULATIVE IMPACT OF RAB INDEXATION (2006-2013)



Applying current approaches has the effect of further back-loading the recovery of approved efficient network costs towards the end of the assets assessed lives. In practical terms, this means the deferral of recovery of regulator-approved revenues even further into the future than intended, and into periods in which greater uncertainty about market conditions and eventual recoverability exists. Perversely, this outcome artificially pushes investment recovery into a period in which the relevant assets are at proportionally *greater* risk of economic stranding or bypass.

Recent determinations affecting recovery of the costs of existing electricity meters provide a further example of how regulatory approaches can exacerbate approaches that are at odds with those observed in competitive markets.

In Queensland and New South Wales, AER electricity network determinations provide for the unrecovered value of existing meter assets which are replaced by new meters under a new competitive metering model to be added to the existing RAB for future recovery. This outcome avoids the necessity of any party bearing a lump sum payment, with the objective of facilitating metering competition and consumer choice. While there may be some positive features of this approach in the specific case, the practical impact of this approach, however, is to further add to the unrecovered asset base the value of assets which are in reality no longer in service.

Arguably, flexibility is also lacking in the other direction. Under the current *National Electricity Rules*, deferral of depreciation on electricity network infrastructure between regulatory periods beyond that implied by current 'straight-line' depreciation approaches is not currently permitted. This is despite there being some instances in which it is efficient for both networks and consumers to defer depreciation on a proportion or set of network assets into the future, so that the time profile of cost recovery will not unduly impact on network demand. Regulatory approaches and rules in electricity do not currently cater for this ordinary commercial practice.

2.3 CURRENT DEPRECIATION APPROACHES NOT DELIVERING ON PROMISED POLICY GOALS

The key rationales for the current dominant 'straight-line' depreciation approach have been that it promotes stable network prices overtime, and provides for all users of an asset to contribute to the capital costs which support their services.

In fact, network prices have varied significantly over the past decade, influenced by a variety of cost drivers, including changes to the cost of capital, labour and other input costs. In addition, significant capital expenditure programs in the first round of AER-determinations contributed to an associated increase in required depreciation allowances.

This means that in many cases the policy goal of stable network prices over time cannot be said to have been fully achieved. Lack of network pricing stability has been a major argument used by proponents of recently implemented network regulatory reforms to argue for these changes. In response to a similar set of concerns, the AER has recently sought to investigate the implications of the increasing profile of RABs as a driver for pricing outcomes in its current Queensland network revenue review.[6]

6 AER Issues paper *Queensland electricity distribution regulatory Proposals 2015–16 to 2019–20*, December 2014, p.19

2.4 NEED FOR REGULATORY POLICY INNOVATION IN A CHANGING MARKET ENVIRONMENT

Areas of regulation that are relevant to the emerging technologies, new services and competitive forces transforming the environment of networks are increasingly being re-examined in Australia and internationally. Policy makers are considering the need for regulatory change through processes such as the Australian Energy Market Commission's review of competition in metering, and the Energy Council's current policy review process around the implications of new energy services for customer protection frameworks and regulation.

The past five years has also seen major regulatory reforms to how regulators set a number of the core revenue 'building blocks' that make up regulated network revenues. Changes to rules, and detailed AER guidelines, have significantly reformed how rates of return are determined and operating and capital expenditures are estimated. New investment tests and incentive schemes to drive greater capital investment efficiency, as well greater assurance and oversight around the efficiency of past investments, have been introduced.

Building on these changes, electricity network pricing rule changes finalised by the Australian Energy Market Commission in November 2014 are designed to progressively allow for the introduction of improved pricing signals to network customers from 2017 onwards. This should in turn progressively help drive more efficient investment and usage decisions, improving the utilisation of network infrastructure.

All of this reform activity has occurred, however, without any substantial re-examination or alteration to one of the key drivers of network charges – the setting of regulatory depreciation allowances. Regulatory depreciation provides for the return of capital invested, and typically constitutes between 10 to 20 per cent of final network charges, equivalent to over $3.0 billion per year for Australian electricity and gas networks.[7]

Declining average network demand, and largely fixed network costs, creates a risk of locking in steadily increasing network charges over time. This potential is exacerbated by network pricing structures that rely heavily on the recovery of fixed costs through volume-based charges, and the potential emergence of battery storage and distributed generation technologies that could allow a significant proportion of existing customers to entirely disconnect from networks over the coming decade. This possibility, commonly referred to as the 'utility death spiral' hypothesis, has been widely canvassed in utility sector commentary both internationally and in Australia.[8]

A number of commentators and the AER have identified the growth in network asset bases as an issue for potential concern.[9] However, to date there has been insufficient recognition that under the building blocks model a growing RAB is synonymous with the proposition that the total of regulator-approved charges being paid by today's consumers are less than the sum total of deferred future returns on and of capital. This is characteristic of the phase of significant network investments made over 2008-2012, and it highlights the importance of sustainably addressing this challenge.

Networks, consumers and regulators may have differing perspectives on how quickly network investments can or should be depreciated (that is, the economic lives of the assets). It is uncontroversial, however, that the regulatory framework is specifically designed to ensure both a reasonable opportunity to recover efficient future costs, and a high degree of assurance over the recovery of past investments.[10] This reasonable opportunity and assurance underpins investors' willingness to provide relatively low cost capital for long-lived investments made in the common network, which directly benefits consumers by lowering network charges. This is practically achieved through the regulatory framework by providing for a commercial risk-adjusted rate of return on the RAB and a depreciation allowance based on the economic lives of the assets forming the RAB.

An important factor in progressing discussion on this issue is that changes to depreciation allowances, unlike operating or capital cost estimates, or the rate of return, do not result in absolute changes in required revenues. That is, they are revenue neutral. They simply change the *time profile* of cost-recovery – put simply, they decide how much current versus future consumers should pay.

---

7 Estimate based on AER *State of the Energy Market Report* (2014), p.71, Figure 2.2 and Table 4.1.

8 See for example, EEI *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business*, January 2013

9 AER *Issues Paper - Queensland electricity distribution regulatory proposals 2015–16 to 2019–20*, December 2014, p.19

10 See *National Electricity Law*, Section 7A(2), *National Gas Law*, Section 24(2), COAG Energy Council Energy Working Group *Electricity network economic regulation; scenario analysis – Policy Advice*, June 2015, p.iii and Standing Committee of Officials of the Ministerial Council on Energy *Explanatory Material - Changes to the National Electricity Rules to establish a national regulatory framework for the economic regulation of electricity distribution*, April 2007, p.44

3. RESPONDING TO THE CHALLENGE – ASSESSING POTENTIAL OPTIONS

3.1 POTENTIAL OPTIONS TO ADDRESS EVOLVING ENERGY MARKET IMPACTS

There are a set of alternative options which relevant regulatory economic literature and practice suggests could help in addressing the issue of promoting sustainable cost recovery in a way that maintains the integrity of the regulatory compact and the building blocks approach.

Options to meet the challenge of the impacts of evolving market circumstances on historical depreciation approaches which are not longer 'fit for purpose' could include, for example:

Option 1

Increased new grid connection fees – increased grid connection fees would reduce the magnitude and risk of future stranded costs, by bringing forward cost recovery and sharing risks with new consumers. Both infrastructure providers and users can benefit from these revised arrangements, as evidenced by the significant role that similar 'take or pay' contracts play in competitive infrastructure service provision.

Option 2

Network exit fees – an exit fee on customers choosing to leave the grid could be developed, which provided for the recovery of a cost which recognises the historic share of network capacity dedicated to that customer (which could, for example, be based on relative share of coincident demand as a proportion of the RAB).[11]

Option 3

Compulsory 'rates' style network access levies – movement to charging based not on usage, but on access to the grid would recognise the broad community benefit of a ubiquitous grid to all (whether individual users take advantage of the opportunity to connect or not), and potentially avoid inequitable outcomes where some users sought to 'exit' the grid, placing an increased burden on those customers remaining connected.

Option 4

Providing explicit compensation for stranding risks – alternatively network revenues could be adjusted to compensate for future stranding risks. This could occur through adjustments to regulatory cash-flows or an addition to the existing cost of capital (which does not currently include compensation for stranding risk).[12]

Option 5

Greater flexibility in depreciation approaches – providing greater scope for networks to better manage cost recovery risks by addressing the back-loading of depreciation under current models and approaches, addressing the impacts of RAB-indexation, bringing forward recovery where appropriate, or allowing scope for the deferral of the return of capital across multiple regulatory periods.

A number of these options obviously would face profound implementation challenges. Options of new grid connection fees or network exit fees (*option 1* and *option 2*), while economically well-founded, would be likely to encounter significant consumer resistance and there are issues about how they could be applied in practice.

Higher connection fees for new customers present difficult equity and hardship issues, while exit fees can be represented as an unfair barrier to emerging competitive technologies. In part, these options are likely to encounter resistance because they affect only a subset of readily identifiable and specific customers, rather than network customers as a whole. This sits uneasily with the fact that the grid has characteristics of a shared 'public good'. Different perspectives on these mechanisms highlight the potential tensions between the interests of individual customers and collective customers, when determining fair, efficient cost recovery frameworks for network infrastructure.

11 Commercial Economics *Consulting Memorandum - NSP Asset Stranding Risk – Optimum Whole of Economy Outcome* (2014)

12 Kolbe, A. and Tye, W. 'Compensation for the risk of stranded assets' in *Energy Policy*, Vol.24, No.12 pp.1025-1050, 1996

An option which explicitly recognises and is based on this shared 'public good' character of utility networks is a compulsory 'rates' or 'land tax' style charge (*option 3*). This could be incurred based on the grid being available to the user, rather than actual connection or usage. This model is used in the water utility sector in a number of Australian states and territories. Despite this, a flat charge based merely on potential access to a service (even where that potential access may be of material value to the consumer) would be likely to face substantive challenges on the grounds of customer acceptance, inter-customer equity, and impacts on emergent competing technologies.

Adjustments to the cost of capital or cash flows to compensate for network stranding risks (*option 4*) are established theoretical options for addressing similar cost recovery issues. However, there remain a range of outstanding and complex issues regarding how they could be assessed and applied in practice.[13] Compensation for future stranding risk may be impractical, contentious and difficult to calibrate to the conditions of individual networks, and compensation following stranding would also be complex and problematic.[14] These outstanding issues have limited their application in practice.

By contrast, providing greater flexibility to bring forward or deferring depreciation (*option 5*) better recognises the common contribution of all past and present network customers to the existing network. In a recent report to the AER, University of Sydney Chair of Finance Associate Professor Graham Partington observed:

> *The appropriate way to adjust to for disruptive technology is therefore to adjust the cash flow. To the extent that the result of disruptive technology is stranded assets, then the effective economic life of the asset is reduced and/or its residual value is less than originally assumed. Consequently, one way to allow for the impact on cash flow is to increase the regulatory depreciation allowance.*[15]

The AER has recently confirmed that its preferred approach to addressing issues relating to changing market conditions and the risk of technological disruption from such technologies as solar PV and battery storage is by adjusting network firms' cash flows. Recently, the AER advised that:

> *Further, we recognise the development of disruptive technologies in the Australian energy sector may create some non-systematic risk to the cash flows of energy network businesses. We consider these can be more appropriately compensated through regulated cash flows (such as accelerated depreciation of assets).*[16]

Such measures would affect all customers in a more manageable way, impacting customer network charges only marginally. They could be achieved by either pre-defined adjustments to forward depreciation paths, or effected via a revision (and shortening) of assumed asset lives under the Post-Tax Revenue Model. New Zealand's Commerce Commission, in recent exploratory work in this area, has identified modification of assumed asset lives as a primary potential means of addressing this issue in a way that is consistent with the principle of providing adequately for cost recovery.[17]

How to implement either of the flexible approaches mentioned under *option 5* above should be the subject of broad and informed discussion between industry, consumers and regulators. In the mean time, removal of the impact of the deferral of returns on capital that arise solely as a function of the operation of inflation-indexed RAB should be pursued to ensure the issue does not continue to compound.

---

13 Discussed, for example, in the Productivity Commission *Review of the National Access Regime* (2002)

14 See Professor Paul Kerin 'What would an Efficient Regulatory Contract Look Like?' in *Network*, Issue 55, June 2015

15 Partington, G. *Report to the AER – Return on Equity – Updated*, April 2015, p.77-78

16 AER *SA Power Networks preliminary decision – Attachment 3: Rate of return*, April 2015, p.376

17 New Zealand Commerce Commission *Input methodologies: Invitation to contribute to problem definition*, 16 June 2015, p.53-58

4. CONSUMER BENEFITS FROM REFORMING DEPRECIATION AND COST RECOVERY APPROACHES

Any changes to cost recovery or depreciation approaches should ultimately be considered based on whether the outcomes will promote the long term interests of consumers. Reforming depreciation approaches, by adopting more flexible approaches to accelerated depreciation will benefit consumers in a number of critical ways.

4.1 BETTER REFLECTING 'USER PAYS' PRINCIPLES

If current customers are expected to use the network more heavily than future customers are likely to, current customers should pay relatively more than future customers. This contributes towards intergenerational equity because it avoids future consumers from bearing an undue proportion of costs for services which they do not utilise as intensively as past consumers, and instead provides for the recovery of the costs of assets from their beneficiaries

If this approach is not adopted, there is a risk that tomorrow's electricity consumers could be penalised by being required to contribute to the return of capital of a proportion of assets which they do not derive benefits from. An example of this scenario arising is circumstances in which distributed generation and storage provides a significant proportion of network customers with an option to fully or partially bypass the grid. In this case, the existing regulatory approach would suggest the recovery of total depreciation charges from remaining grid customers. This would effectively represent a 'double penalty' likely to fall mostly upon customers with fewer options to bypass the grid.

4.2 LONGER-TERM PRICE STABILITY CONSISTENT WITH ECONOMIC EFFICIENCY AND CONSUMER PREFERENCES

Flexible depreciation approaches also have the potential to better promote long-term stability in the path of network pricing over future investment cycles.

For example, greater capacity to bring forward, or defer depreciation allowances would enable a network business to propose a 'smoother' revenue path into the future. In the current environment of historically low risk-free rates, for example, there would be a capacity to bring forward depreciation allowances. This capacity would have particular value in providing more stable pricing outcomes in current capital market conditions (this is discussed further in *Section 5*).

Customers consistently report that they value pricing stability and certainty over time.[18] Flexible depreciation approaches are a tool for delivering this, through the capacity of the return on and the return of capital to respond to evolving capital and energy market drivers.

Improving price stability over time would also facilitate economically efficient investments by household and business network users. Greater stability over time is more likely to foster efficient investments from users (either in complimentary technologies and service elements, or grid substitutes) than unstable network pricing paths over time. In addition, it is likely to result in more equitable treatments of grid-dependent investments made by consumers and distributed energy owners in the past.[19]

18 See for example Panchal, S. and Jha, A. 'Fairness and Reciprocity of Consumers' in Voice of Research, Vol.3, December 2014 and ENERGEX *Your network, your choice: Customer assumptions report*, December 2014, drawing on residential and small business consumer survey by TNS Australia.

19 Biggar, D. 'Is Protecting Sunk Investments by Consumers a Key Rationale for Natural Monopoly Regulation?', *Review of Network Economics* 8(2): 128–53, 2009

4.3 FLEXIBLE DEPRECIATION WOULD REPLICATE THE OUTCOMES OBSERVED IN COMPETITIVE MARKETS

Flexible depreciation would also promote outcomes in the energy network sector which would occur in a competitive market subject to a similar pace of market and technological change. Facing the potential risks of market or technological changes leading to an economic stranding of a portion of investment, investors in a competitive market recognise the potential shortened asset lives in their investment evaluation. Investors in these circumstances will only make investments where they assess that a reasonable opportunity to recover the costs of these investment within a shortened economic life exists.

Similarly, a commercial firm which faces the potential risk of market 'disruption', or a deterioration in its capacity to recover costs in future market conditions will seek to bring forward its cost recovery on undepreciated assets.

4.4 POSITION NETWORKS TO BEST SERVE CUSTOMERS IN THE EMERGING MARKET FOR ENERGY SERVICES

Implementing faster depreciation in response to changing market and technological conditions would also have the benefit of lowering the growth of network firms' individual regulatory asset bases, and therefore reduce the total amount of future network revenues that would be linked to the size of the RAB.

The direct connection between the RAB and projected revenues is commonly identified as a potential distortion in network investment and operational decision-making.[20] Reducing the overall level and connection between regulatory allowances and the RAB would materially lessen this potential impact. In particular, faster depreciation resulting in smaller future RABs would lower the potential for either the network firm, or consumers, competitors and other energy market participants to view the primary commercial driver as being the maximisation of the future value of the RAB.

4.5 AVOIDING HIGHER COSTS AND DISINCENTIVES TO INVEST BY DE-RISKING FUTURE CASH FLOWS

Providing for accelerated depreciation for network assets would also contribute to 'de-risking' future cash-flows, by making the undepreciated component of the RAB smaller, and therefore at less risk of being economically non-recoverable. Undertaking this through a more flexible depreciation allowance that was not based on the current 'straight-line' indexed approach would provide existing and potential network investors greater confidence around the regulatory treatment of new and existing assets. This would mitigate potential incentives for underinvestment compared to circumstances where alternative higher risk or 'do nothing' approaches were adopted.

For example, network capital providers, anticipating a risk of future uncompensated stranding, could require higher future returns and/or reduce the scale of network investments to minimise their exposure to future stranding risks. This could lead to current and future consumers paying higher financing and operating costs through network charges than necessary, and reduced quality of service through underinvestment in long-lived network assets. Distorted network charges of this type would also promote a potential costly and inefficient over-investment by customers in distributed generation and storage technologies.

20 COAG Energy Council Energy Working Group *Electricity network economic regulation; scenario analysis – Policy Advice*, June 2015, p.6

5. A 'WINDOW OF OPPORTUNITY' IS OPEN NOW TO LOWER THE RISK OF REGULATORY FAILURE LATER

Collectively, consumers, regulators and networks have an unusual opportunity to take advantage of a historically low interest rate environment to embrace more flexible regulatory depreciation approaches. By providing an option, where market conditions allow, for the timely recovery of existing investments such an approach would serve to increase the capacity and resilience of networks to efficiently meet the needs of future consumers and avoid the creation of a potential regulatory failure.

5.1 LOWER FINANCING COSTS PROVIDE AN OPPORTUNE 'WINDOW' TO ADDRESS COST RECOVERY

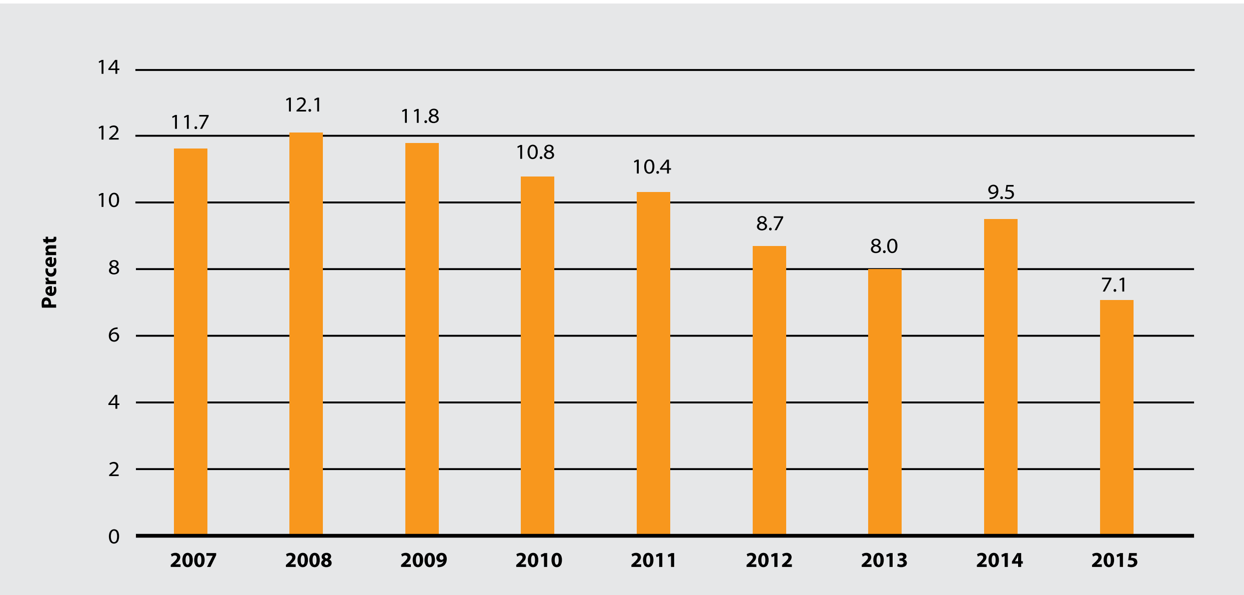
There is currently a valuable opportunity to address long-term cost recovery risks created by the significant falls in financing costs for network companies.

Since 2009, the median AER-approved cost of capital has fallen approximately 300 basis point, or 3 per cent (See Figure 2). Further reductions over the next twelve months are possible, due to the Commonwealth bond rate declining from around 4 per cent to 2.5 per cent in the past year.

Under current cost of capital approaches, declines in interest rates feed directly into future estimates of the required return on equity and debt creating a substantial downward pressure on regulated network charges. These declines have been partially reflected in some recent network determinations. For illustrative purposes, a decline of 1.5 per cent in the Commonwealth bond rate, like that which has occurred, lowers future required revenue by just over $1.5 billion per annum on a whole of industry basis.

The reduction in return on capital flowing from less costly access to debt finance, and the fall in the Commonwealth bond rate provides Australian energy regulators (such a the AER and WA Economic Regulation Authority) with a rare opportunity to deliver both real reductions in network charges, and allow for more neutral or even front-loaded, depreciation approaches than have been applied to date.

FIGURE 2 MEDIAN AER APPROVED RETURN ON EQUITY (2007-2015)



This opportunity can be considered as analogous to the opportunity presented to a home owner to take advantage of low interest rates to make further payments against the principal. As home loan rates fall during the economic cycle, many Australian households maintain fixed nominal contributions, effectively repaying the principal faster. In total, Australian mortgage holders prepayments are estimated to have built up a prepayment 'buffer' which is the equivalent of 1.5 years of scheduled repayments, with over 40 per cent of mortgage holders estimated to maintain a buffer of greater than a year.[21]

Lower cost of capital estimates in the network sector today provide a similar community opportunity to reduce the outstanding depreciation (which can be viewed as the 'debt' owed by future consumers for today's assets).[22]

Lower cost of capital estimates in the network sector today provide a similar community opportunity to reduce the outstanding depreciation

5.2 POTENTIAL RISKS OF INACTION – A 'REGULATORY FAILURE' FOR CONSUMERS

If the current opportunity is not taken advantage of, and unless alternative approaches are adopted, the interaction of market, technology and inflexible regulatory approaches create the material risk of a regulatory failure in the cost recovery framework established under the regulatory regime. This regulatory failure would arise from a lack of flexible adaption to the changed circumstances.

Two broad scenarios are possible.

» **Tomorrow's electricity consumers could be penalised by being required to contribute to the return of capital of a proportion of assets which they do not derive benefits from.**

  An example of this scenario arising is circumstances in which distributed generation and storage provides a significant proportion of network customers with an option to fully or partially bypass the grid. In this case, the existing regulatory approach would suggest the recovery of total depreciation charges from remaining grid customers. This would effectively represent a 'double penalty' likely to fall mostly upon customers with fewer options to bypass the grid.

» **Network capital providers, anticipating the risk of future uncompensated stranding, could require higher future returns and/or reduce the scale of network investments to minimise their exposure to future stranding risks.**

  This could lead to current and future consumers paying higher financing and operating costs through network charges than necessary, and reduced quality of service through underinvestment in long-lived network assets. Distorted network charges of this type would also promote a potential costly and inefficient over-investment by customers in distributed generation and storage technologies.

Both of these scenarios result in significant harm to the long-term interests of consumers, and so should be avoided. Either outcome would represent a 'first order' regulatory policy failure that would be likely to be avoidable through a proactive use of the mix of existing regulatory tools. The risks and costs of a potential regulatory failure of this scale make it prudent to consider more flexible depreciation techniques in the 'toolbox' of network regulation, which can be progressed in active engagement with network customers, and regulatory bodies, about the benefits of these measures.

21 RBA *Financial Stability Review*, September 2012, Box B

22 This is an analogy the AER has itself used. For example, the AER recently noted in its Issues Paper for the Victorian electricity distribution pricing review: "*The Regulatory Asset Base is just like the balance on a mortgage, or on a credit card.….Each year, any new capital expenditure is added to the RAB. This new capital expenditure is like any new borrowings on your mortgage, or any new charges on your credit card.… any repayments of principal are subtracted from the RAB. In the building block model the repayments of principal are called 'depreciation.' This term is a little misleading, since it doesn't refer to any actual wear-and-tear on the assets—it is purely the repayment of the amount borrowed. This is just like the repayments of principal on your mortgage or the repayments of the borrowings on your credit card.*" (p.10)

REFERENCES

Australian Energy Market Operator *National Electricity Forecasting Report Overview*, June 2015

Australian Energy Regulator *State of the Energy Market Report 2014,* December 2014

Australian Energy Regulator *Issues paper Queensland electricity distribution regulatory proposals 2015–16 to 2019–20*, December 2014

Australian Energy Regulator *SA Power Networks preliminary decision – Attachment 3: Rate of return*, April 2015

Australian Energy Regulator *Issues Paper Victorian electricity distribution pricing review, 2016 to 2020*, June 2015

Biggar, D. 'Is Protecting Sunk Investments by Consumers a Key Rationale for Natural Monopoly Regulation?' in *Review of Network Economics* 8(2): 128–53, 2009

Council of Australian Governments Energy Council Energy Working Group *Electricity network economic regulation; scenario analysis – Policy Advice*, June 2015

Edison Electric Institute *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business*, January 2013

Frontier Economics Briefing Note *That Sinking Feeling*, July 2015

Kolbe, A. and Tye, W. 'Compensation for the risk of stranded assets' in *Energy Policy*, Vol.24, No.12, 1996

New Zealand Commerce Commission *Input methodologies: Invitation to contribute to problem definition*, June 2015

Productivity Commission *Review of the National Access Regime,* September 2002

Partington, G. *Report to the AER – Return on Equity – Updated*, April 2015

Reserve Bank of Australia, *Financial Stability Review*, September 2012

ABOUT THE AUTHOR

Garth Crawford is Executive Director – Economic Regulation, at the Energy Networks Association. He previously served as a Senior Research Fellow at the SMART Infrastructure Facility at the University of Wollongong from 2011 to 2013, undertaking research focused on major international and Australian economic regulatory trends affecting infrastructure investment, pricing and use.

He holds a graduate qualification in law and postgraduate qualifications in regulatory economics and trade and has worked as a regulatory economic consultant advising firms in the energy, rail and telecommunications sectors.

ACKNOWLEDGMENTS

This paper was written by Garth Crawford, Executive Director – Economic Regulation, Energy Networks Association. Senior Economic Analyst Ms Irina Kiparskaya also contributed research and analytical assistance.

The author would like to thank members of ENA's regulatory affairs groups for their helpful comments and input. The paper also received valuable guidance and review by several other anonymous reviewers. All remaining errors or omissions are the responsibility of the author.

The opinions in this report are those of the author and do not necessarily represent the views of the ENA or its members, individual board members or committee members.

FURTHER INFORMATION

E: INFO@ENA.ASN.AU
P: (+61) (0) 2 6272 1555