MONASH University

MONASH ENERGY INSTITUTE

Forecasting and managing demand without the regulator

Chapter 2. Forecasting and managing demand

(in)

Removing the regulator from network regulation

OCTOBER 2026

Dr Ron Ben-David
Professorial Fellow
Monash Business School
Monash University

PREFACE

This paper was motivated by the question: Is there a better way to regulate energy networks than so-called, “incentive-based regulation”? It turns out there is – but it requires an entirely different way of thinking.

That’s why this paper initially sets out to uncover the “framework within the framework” of incentive-based regulation. These are the innermost propositions that explain the regulators’ conduct over the past 30 years and the seemingly endless cycle of new rules, processes and schemes. The paper then adopts two overarching principles: first, that a regulatory framework cannot create and solve the same problem; and second, regulators should not be second-guessing the parties they regulate.

These principles lead to a completely different way of thinking about the role of regulators and network operators. The paper describes new mechanisms to hold network operators responsible and accountable for honestly forecasting and efficiently managing demand for their services. These mechanisms make redundant much of the regulatory machinery that has accumulated over the past three decades.

This alternative approach to network regulation would drive profound cultural change. Network operators would no longer have the luxury of acting as mere asset managers narrowly focussed on regulatory compliance. At the same time, regulators would no longer see ‘outwitting’ network operators as their *cause celbre*.

The time has come to rethink network regulation.

Dr Ron Ben-David
October 2026

OVERVIEW

This paper challenges the foundations of Australia's economic regulation of energy networks. It outlines how the regulatory framework can be redesigned to hold network operators responsible for honestly forecasting demand and managing the consequences of their forecasts.

The paper begins by examining the conceptual foundations of incentive-based regulation. It finds the entire architecture of incentive-based regulation derives from a 'clash' between two of its innermost propositions. This clash sees regulators assume a role for which they are ill-equipped – namely, forecasting network operators' revenue requirements despite having limited information about the operators' operating environments. In their eternal quest to overcome this informational disadvantage, the regulators develop an ever-deepening system of rules, processes and schemes.

Demand forecasting is central to this problem because expected demand affects a network operator's expected expenditure, revenue requirements and prices. Regulators have traditionally applied either revenue cap regulation or price cap regulation to allocate the risk of mis-forecasts of demand in the absence of perfect information. The paper describes how both forms of control incentivise network operators to seek to game the regulator's forecasts.

By reconceptualising the regulatory challenge, this paper identifies a way forward that would sweep away much of the heavy-handed, convoluted and costly regulatory apparatus currently in place. The paper demonstrates that a **kinked revenue allowance curve** based on a network operator's own demand forecast, means an operator's best strategy is to reveal upfront its honest expectation of demand.

Because forecasting is inherently uncertain, the mechanism includes a **buffer** against honest forecasting errors. Network operators are free to determine the size of their buffers, thereby retaining responsibility for managing their forecasting risk. However, because the buffer transfers risk to consumers, network operators must compensate them for taking on this risk.
A **concave offset curve** makes larger buffers progressively more expensive for network operators. This encourages them to improve their forecasts rather than simply purchasing greater protection against errors. Moreover, it encourages network operators to facilitate outturn results that align as closely as possible with their forecasts. This includes by rebalancing their tariff structures and developing innovative demand-side measures. There would be limited regulatory oversight of these instruments.

The paper explains the mechanism can be extended to **network export services**, which are becoming increasingly important as consumers invest in distributed energy resources.

These alternative arrangements would drive profound shifts in culture. Network operators would finally need to act as **network system optimisers**, rather than mere asset managers. Regulators would cease producing competing demand, expenditure and revenue forecasts. Instead, they would focus their efforts on upholding the mechanism's integrity by adjusting the strength of its 'honesty' incentives where necessary.

By encouraging honest forecasting, these alternative arrangements could even do away with the traditional five-year regulatory cycle. Network operators could simply update their various forecasts (and corresponding prices) from time-to-time with only limited regulatory oversight.

TABLE OF CONTENTS

PREFACE

OVERVIEW

1. Introduction 5

2. The current state of network regulation 9

2.1 Incentive-based regulation: The framework within the framework

2.2 A false choice

2.3 Regulators are not risk neutral. Consumers pay.

2.4 Who is actually responsible for forecasting and managing demand?

2.5 Discussion: An entirely different way of thinking about network regulation

3. Demand forecasts: The key to everything (or almost everything) 20

3.1 The centrality of demand

3.2 Two forms of control: Price caps or Revenue Caps

3.3 Different networks. Different controls

3.4 Dealing with uncertainty

3.5 Discussion: Incentive-based regulation is the problem it is trying to solve

4. Extricating the regulator from forecasting demand 30

4.1 Rethinking demand forecasting

4.2 A kinked revenue allowance curve driving honest forecasts of demand

4.3 A buffer against honest mis-forecasting of demand

4.4 Buffers aren't free

4.5 Reducing reliance on uncertainty mechanisms

5. Applying the mechanism to network export services 38

5.1 Holding network operators responsible for forecasting demand for export services

5.2 Using the mechanism to set targets for network export services

6. Completing the picture 41

6.1 Defining demand and network export services

6.2 Safeguarding honest forecasting without increasing regulatory complexity

6.3 Network operators are not mere bystanders

6.4 The end of regulation as we know it?

7. Conclusion: Network operators finally become network system optimisers 44

REFERENCES 46

About the author 47

1. Introduction

This is the second paper in a series focussed on identifying – and solving – the core problems facing the economic regulation of energy networks in Australia. The first paper addressed the determination and delivery of efficient capital expenditure by network operators.[1] This paper turns to another contested area, namely, forecasting demand.

Demand forecasts have been a point of contention since the introduction of economic regulation of energy networks in the 1990s. The challenges of forecasting demand are only increasing with the gradual electrification of the economy (including the uptake of electric vehicles), improved building standards, increasingly efficient energy appliances, ongoing investment by consumers 'behind the meter' in distributed generation and batteries, and the rapid growth of (and reliance on) energy-intensive data centres.

In many ways, demand forecasts are the key factor driving network operators' claimed expenditure and revenue requirements, and their proposed pricing for network services. Herein lies the contentiousness of forecasting demand. Uncertainties about the future interact with regulatory arrangements to create powerful incentives for how network operators go about forecasting demand for their services.

Network operators are not in the business of public benevolence. They will seek profit where it can be sought and they will look to offload risk where it can be offloaded. And, as highlighted in this paper, they will *inter alia* use their demand forecasts in pursuit of these ends. Such conduct is to be expected because it is enabled, motivated and potentially rewarded by current regulatory arrangements.

As natural monopolies, however, network operators are not given free rein to determine their demand forecasts, or their expenditure and revenue requirements, or the quality of the network services they deliver, or the prices they charge for providing those services.

Standing between network operators and consumers lies a phalanx of regulatory authorities charged with the statutory objective of, promoting efficient investment in, and the efficient operation and use of, electricity and gas services.[2] In the national electricity market, the phalanx primarily consists of the Australian Energy Market Commission (AEMC) which makes the rules governing the conduct of economic regulation, while the Australian Energy Regulator (AER) administers those rules.[3]

For the most part, this paper does not distinguish between the AER and AEMC as they operate on a regulatory continuum. References to the "regulator/s" will generally have some relevance to one or both entities.

---

[1] Ben-David (May 2026)

[2] This is the general form of the national energy objectives consisting of the National Electricity Objective (NEO), National Gas Objective (NGO) and National Energy Retail Objective (NERO) – see: https://www.aemc.gov.au/regulation/neo

[3] The Australian Energy Market Operators (AEMO) also plays a role as does the Australian Competition and Consumer Commission (ACCC). In addition, state-based economic regulators and government departments retain some functions. Other state-based regulators are generally responsible for setting and enforcing safety standards.

The putative role of these regulators is to countervail against network operators otherwise unfettered efforts to extract rents and offload risk. The regulators do so by creating rules, processes, methodologies, mechanisms and schemes aimed at countering the expected conduct of network operators.

The first paper in this series, Ben-David (May 2026), describes how this approach establishes economic regulation as a "battle of wits" between the regulators and network operators. This dynamic has seen economic regulation descend into a strategic game – an arms race in which:[4]

> *Network operators strive to confound the regulator … [and] … In response, the regulator builds ever more elaborate methods to peer through the fog of information it receives. In turn, the operators seek ever new ways to confound the regulator. And on and on it goes. A very costly and time-consuming arms race.*

Put simply, the current approach to regulating energy networks sees network operators and regulators tidally locked into a pattern of conduct from which neither can escape. Such arms races rarely represent a productive use of resources.

Ben-David (May 2026) outlines how this arms race is the manifestation of an unchallenged assumption deep within the intellectual core of the regulatory construct – namely, that economic regulation relies on well-resourced regulators to act as a foil against network operators' commercial imperatives. This assumption sees the regulators continually arming themselves with more expansive rules, more detailed processes and more elaborate schemes. Despite countless reviews into the operation of the regulatory framework, or parts thereof, the singularly central assumption at the heart of the entire edifice is never challenged (or even acknowledged).

New rules, processes and schemes are often implemented in response to the inadequacies and undesirable consequences of the ones that came before. The economic regulation of energy networks is caught-up in an endless cycle of whack-a-mole where the regulators are both the whacker and the mole.

Observations by the AEMC reflect how economic regulation has become a perpetual motion machine of new rules, processes and schemes.[5,]

> *Without the STPIS, [network operators] may be incentivised under the EBSS and CESS to reduce expenditure at the expense of service quality, below the level that consumers value.*[6]

The EBSS and CESS are regulated schemes introduced in 2013 to overcome undesirable incentives arising from the regulatory framework as it operated at that time. In turn, the undesirable incentives created by these schemes needed to be 'fixed' by yet another scheme:

---

[4] Ben-David (May 2026), p.9

[5] AEMC (August 2026), p.iv

[6] The Service Target Performance Incentive Scheme (**STPIS**) is a scheme intended to provide network operators with an incentive to deliver network reliability at a level reflecting how consumers' value reliability. The Capital Efficiency Sharing Scheme (**CESS**) is an incentive scheme aimed at promoting efficient capital expenditure. The Efficiency Benefits Sharing Scheme (**EBSS**) is an incentive scheme aimed at promoting efficient operating expenditure. The former is discussed at length in Ben-David (May 2026). The latter will be the subject of an upcoming paper in this series.

the STPIS. More recently, another suite of regulated schemes has been implemented to incentivise network operators to support demand-side activity.[7] And now, the AEMC has initiated yet another review into network regulation to consider the efficacy of all-of-the-above.[8]

When viewed in its historical context, the AEMC's current review into network regulation appears to be just the latest effort in this perpetual motion machine of new rules, processes and schemes. The review appears destined to leave untouched the first cause of the problems it perceives itself to be solving – namely, its faith in a regulator sitting at the centre of so-called, "incentive-based regulation".[9]

The AEMC's review is seemingly seeking, once again, to find ways to bend network operators' commercial imperatives to its regulatory will.

This series of papers steps into the breach.

These papers do not accept the inevitability of whack-a-mole regulation. They demonstrate it is possible to move beyond a regulator locked into an endless 'battle of wits' with network operators. This can be achieved without building yet more regulatory machinery. Quite the opposite. By fundamentally rethinking the role of network operators and regulators, it is possible to sweep away large swathes of the regulatory machinery that has grown with seemingly little restraint over the past 30 years.

The alternative regulatory arrangements described in these papers fundamentally recasts the roles and responsibilities of network operators and the regulator. This paper recasts these responsibilities as they relate to forecasting and managing consumer demand for network services.

The paper proceeds as follows.

Section 2 begins with a brief description of incentive-based regulation before examining the underlying reason for why the regulatory framework exists and operates the way it does. Having done so, the discussion identifies three problematic consequences of the current approach to network regulation. The section ends by establishing the foundations for an entirely different approach to regulating network operators.

Section 3 applies a stylised mathematical model to illustrate the centrality of demand forecasting to the entire regulatory exercise. The two forms of regulatory 'control' are described, namely, price cap regulation and revenue cap regulation. The discussion then outlines the range of uncertainty mechanisms implemented by the regulators to deal with forecasting uncertainties. The section ends with a discussion explaining why incentive-based regulation is the problem it is trying to solve – concluding that, "It does not need to be this way."

Section 4 responds to this challenge by outlining a mechanism – described as a "kinked revenue allowance curve" – that ensures network operators produce honest forecasts of expected demand for their services. In doing so, it removes any need for the regulators to second-guess

---

[7] Discussed in section 2.4, see Box 2C.

[8] AEMC (August 2026)

[9] Or to be more precise, its faith in regulators' ability to invent rules, processes and schemes that efficiently deliver the promise of incentive-based regulation.

network operators' forecasts of demand, their revenue requirements or their proposed tariffs. The discussion recognises, however, that even the best-intentioned network operators will mis-forecast demand for their services and so describes a "buffer" against forecasting uncertainty. Because a buffer is funded by consumers, the discussion outlines a stylised arrangement for network operators to compensate consumers in return for this indemnity. To be clear, the model is illustrative only. Its purpose is to demonstrate that there is a viable alternative to the current approach to network regulation.

Section 5 responds to the growing expectation that network operators will support consumers' opportunity to export their surplus electricity to the grid. The discussion explains how the mechanisms described in section 4 can be deployed to promote the provision of network export services. This includes an opportunity to apply the mechanism in support of network export targets during the nascent stages of the energy transition.

Section 6 completes the picture by explaining how, under the alternative approach to regulating network demand, regulators' role would be narrowly limited to safeguarding the integrity of the alternative framework. The regulators would have no role in second-guessing network operators' forecasts. The discussion ends by postulating these alternative arrangements may render the traditional 5-yearly regulatory process redundant.

Section 7 concludes the paper by explaining the alternative approach to network regulation would sweep away the heavy-handed, convoluted and costly regulatory framework currently in practice. The alternative approach would demand a profound cultural shift by network operators and regulators. Network operators would no longer be able to view themselves as mere asset managers whose chief duty is to comply with their regulatory obligations. Instead, network operators would finally need to act as genuine **network system optimisers**. For regulators, the cultural shift would be no less categoric as their *raison d'etre* of the past 30 years would no longer exist. The regulators would no longer be responsible for inventing and administering an ever-growing morass of rules, processes and schemes. They would no longer play the role of *second-guesser-in chief* of the networks they regulate.

*

Before proceeding, it should be noted that this paper is written primarily with electricity distribution networks in mind. Whether the alternative regulatory approach outlined below (or some variant thereof) is applicable to other network operators awaits further exploration.

2. The current state of network regulation

An internally consistent and comprehensive system of ideas will often take on an air of inevitability. The system will seem part of the natural order of things; the self-evident paradigm within which all relevant thoughts take place. Such a system of ideas becomes its own point of reference; the basis for assessing the need for any changes to itself. But as its own point of reference, the system cannot contemplate change beyond the point where it no longer recognises itself. Change can only be comprehended at the margin. In the increment.

No less is true when it comes to the regulatory framework governing network operators in Australia and its unassailable embodiment of incentive-based regulation.

That is, until now.

The following discussion begins with a brief description of incentive-based regulation before turning to the ideas of Thomas Kuhn to uncover the *framework within the framework* – that is, the innermost propositions upon which the entire regulatory framework rests. Section 2.1 demonstrates the whole regulatory framework derives from just three propositions. It finds the pursuit of incentive-based regulation, and everything it entails, is explained by a clash between two of these propositions.

Sections 2.2 to 2.4 explore some of the consequences of this clash of propositions. Section 2.2 describes the false choice commonly cited by the regulators, namely, cost of service regulation as the only option to incentive-based regulation. Section 2.3 highlights how the regulators have adopted a predisposition favouring network operators. This destines consumers to pay a 'regulatory premium' to network operators that reflects the regulators' doubts about their own forecasting abilities. Section 2.4 shows how the regulators' incentive-based mindset has dragged them into seeking to manage how network operators respond to demand for network services.

Section 2.5 returns to the idea of a *framework within a framework*. It identifies an alternative innermost framework, also consisting of just three propositions. Only one of these alternative propositions differs from the propositions lying at the heart of the current regulatory framework. This is enough to free network regulation from the clash of propositions that has produced incentive-based regulation, and it enables the markedly different approach to network regulation outlined in subsequent sections of this paper.

2.1 Incentive-based regulation: The framework within the framework

The economic regulation of network infrastructure in Australia consists of thousands of pages of laws, rules, standards, guidelines, regulatory instruments, and so on. These documents enliven a suite of regulatory measures, methodologies and schemes dictating the conduct of the regulatory process.[10]

This regulatory framework sees the regulator determining *ex ante* a network operator's revenue allowance. The regulator determines this allowance by forecasting expected demand for an operator's network services and the efficient cost of meeting that demand. Once provided with its

[10] The regulatory process is described in Ben-David (May 2026), section 1.2, pp. 6-7

regulated revenue allowance, it is expected that a profit maximising network operator faces strong incentives to outperform the regulator's forecasts of expenditures (while maintaining required service standards). If the network operator succeeds, it retains some-or-all of the 'savings' it has identified. In doing so, the network operator reveals its efficient cost of delivering network services. This revealed information can then be used by the regulator to improve its forecasts of future revenue allowances. With each regulatory cycle, more information is revealed to the regulator – presumably and incrementally improving its ability to forecast future revenue allowances.

This regulatory approach is described as "incentive-based regulation".[11]

As the AEMC notes:[12]

> *The regulatory framework uses incentive-based regulation to align the interests of [network operators] with those of consumers. Financial incentives are designed to encourage [network operators] to deliver regulated services efficiently while maintaining service levels that reflect consumers' preferences and expectations.*

But there is a framework within the framework.

The observable regulatory framework consists of detailed rules, elaborate processes, elegant methodologies and designer incentive schemes. It not only dictates the conduct of incentive-based regulation, the regulatory framework also conditions how questions are asked and answered about its efficacy. To borrow from Thomas Kuhn, the philosopher of science, the observable regulatory framework embodies a "paradigm" (or "disciplinary matrix") of accepted concepts, theories and assumptions. As Kuhn explains, a paradigm not only determines what is observable, but also conditions *how* it is observed, interrogated and understood.

A well-known quote from Churchill offers a useful metaphor for the conditioning effect of paradigms once they have been established.[13]

> *We shape our buildings, and afterwards our buildings shape us.*

Having created the regulatory framework, the regulatory framework thereafter conditions how the regulators observe, interrogate and understand its operation and effectiveness. The regulators engage in identifying and solving problems from within the paradigm, rather than testing the paradigm itself. This isn't necessarily a defect in the regulatory endeavour. It's what makes day-to-day network regulation possible and manageable. But not forever.

From time to time, introspective thinking is required to unearth and test the 'framework within the framework' – that is, the innermost propositions that motivate the observable regulatory framework and its reliance on incentive-based regulation.

---

[11] Or sometimes, "revealed cost regulation".

[12] AEMC (August 2026) p.iii

[13] Winston Churchill (28 October 1943) speech to the House of Commons about the architectural decisions that would need to be made about the rebuilding of London after the Blitz.

This innermost framework is exposed by peeling away, layer-by-layer, the voluminous rules, processes and schemes that constitute the observable approach to regulating energy networks. The innermost conceptual framework is exposed once no further peeling away is possible.

This paper contends that within the observable approach to regulating energy networks lies an innermost framework consisting of just three simply stated propositions.

1. There shall be a regulator of natural monopoly network operators.
2. The regulator shall determine network operators' revenue requirements.
3. The regulator has less information about relevant matters than network operators.

Every element of the observable regulatory framework – every rule, every process, every methodology, every scheme – is reasoned from one-or-more of these propositions. And, it is the clash between Propositions 2 and 3 that motivates all of incentive-based regulation. Incentive-based regulation is the product of an assignment (Proposition 2) for which the regulator is knowingly ill-equipped (Proposition 3). Incentive-based regulation is how the regulators seek to resolve the clash by outwitting network operators. But as highlighted in section 1, this regulatory endeavour leads to a wasteful arms race between the regulator and network operators.

The AEMC's current review of network regulation pre-emptively dismisses the opportunity to re-examine the *framework within the framework* when it limits itself to only contemplating "reform" within the existing "overarching framework" of incentive-based regulation.[14]

> *Our starting point is to consider changes within the existing ex ante incentive-based regulatory framework. We consider this approach is likely to support more timely implementation of reform and have not identified a compelling case for moving away from the overarching framework at this time. This does not preclude significant change. Rather, we are exploring whether substantial reforms can be achieved within the existing ex ante regulatory model*.

This paper steps into the breach.

It begins with an innermost conceptual framework that is free of clashes between its constituent propositions. Section 2.5 of this paper replaces the second proposition above and, in doing so, liberates an entirely different way of thinking about the role of regulators and network operators in forecasting and managing demand for network services.

Before turning to this alternative approach, sections 2.2 to 2.4 reflect on some of the ungainly consequences of incentive-based regulation.

[14] AEMC (August 2026) p.ii

2.2 A false choice

The regulatory narrative – the way the regulators describe their task and craft – the way they describe their system of ideas and its implications – typically presents network regulation as a binary choice between incentive-based regulation and cost of service regulation.

As the examples in Box 2A highlight, the regulators' narrative invariably describes incentive-based regulation in positive and self-assured terms, with cost of service regulation representing its very antithesis – a choice between efficiency and regulatory impotence.

For the reasons outlined at the beginning of section 2, this singular understanding of the regulatory task is the product of a system of ideas that has come to be understood as the natural order of things. It is the product of a regulatory framework that has become its own point of reference and so cannot contemplate ideas beyond its own conceptual boundaries.

"It's our way or no way," say the regulators cited in Box 2A.

But as this paper shows, the regulatory narrative represents a false choice. There is another way network operators can be regulated. However, to reach this alternative approach the "framework within the framework" discussed in section 2.1 must change.

Section 2.5 modifies this innermost framework thereby liberating an entirely different approach to regulating network operators (subsequently described in sections 3 to 6 of this paper).

Box 2A. The regulatory narrative about the choice between incentive-based regulation or cost of service regulation

The regulators have repeatedly and consistently presented cost of service regulation as the alternative to incentive-based regulation. But it is invariably presented as a 'bogey man' – an alternative approach to be avoided if policy makers care about efficiency and keeping a lid on the cost of providing network services.

A former chair of the AEMC described the choice in the following terms.[15]

> *An alternative to the incentive regulation is 'cost of service' regulation, which is sometimes referred to as rate of return or cost-plus regulation. Cost of service regulation generally involves the regulator effectively reimbursing the business for its realised costs. Under this approach the regulated business is not rewarded for any efficiency gains it achieves, or any innovation.*

Some years later, the AEMC elaborated further including on the central role of the regulator in "approving and determining the efficient cost".[16]

> *Incentive based regulation is contrasted to cost of service regulation, which simply allows network businesses to recover the actual costs they incur in providing network services. […] Under cost of service regulation, network businesses do not have an incentive to make efficiency improvements because they recover their total costs regardless of whether they were efficiently incurred. Under this model the regulator plays a greater role in approving and determining the efficient cost of each project.*

[15] Pierce (May 2013) p.9

[16] AEMC (July 2017) p.20

> *Consumers lose out under cost of service regulation because businesses have limited incentives to make efficiency improvements over time and therefore consumers do not share in efficiency gains from lower total costs in the future.*

This regulatory choice quietly appears in the AER's network revenue determinations – albeit stated as a matter of fact rather than judgement.[17]

> *Dynamic efficiency is advanced through incentive regulation rather than cost of service regulation that compensates a service provider for its actual costs no matter how inefficient.*

This binary narrative persists to this day on the AEMC's website.[18]

2.3 Regulators are not risk neutral. Consumers pay.

Having placed themselves at the centre of the incentive-based regulatory framework they have built, the regulators are then burdened by self-doubt. They know their own fallibility given the information asymmetry they face when forecasting demand, expenditure and revenue requirements.[19]

In response, the regulators have considered it prudent to weight their decisions in favour of upside risk for network operators, that is, over-compensating (or over-funding) network operators despite it coming at consumers' expense. The regulators have made no secret of the predisposition embedded in their decision-making. See Box 2B for examples.

Box 2B. Regulatory predisposition favouring network operators

Australia's energy network regulators have considered it prudent to lean in favour of upside risk (or over-compensation or funding) for network operators, despite it coming at consumers' expense.

In a decision in 2003, the ACCC was entirely explicit in its preference for erring on the upside – in that case, with regards to capital expenditure.[20]

> *The capex allowance is the upper limit of the ACCC's estimate, as the ACCC considers that the risk of under investment far outweighs that of over investment.*

In 2011, the then Chair of the Australian Energy Regulatory (AER) expressed a similar view albeit tempered by references to "small" over- and under-investments".[21]

> *The language 'at least efficient cost' reflects the accepted principle in regulatory economics that, given the consequences of a supply failure, a small under-investment in infrastructure has a greater economic cost than a small over-investment.*

---

[17] For example, AER (February 2023) p.55

[18] AEMC website (on 23 September 2026). https://www.aemc.gov.au/energy-system/electricity/network-regulation?utm_source=chatgpt.com

[19] This regulatory self-doubt is the direct manifestation of the clash of propositions discussed in section 2.1.

[20] ACCC (December 2003) p.42

[21] Reeves, Andrew (December 2011) p.2

In a suite of regulatory determinations in the years that followed (2015-16), the AER, by then under a new Chair, restated its position though it cautioned against the "risk of introducing an inherent bias towards higher amounts".[22]

> *We take into account the* [Revenue and Pricing Principles] *when exercising discretion about an appropriate estimate. This requires a recognition that for the long-term interests of consumers, the risk of under compensation for, or underinvestment by, a service provider may be less desirable than the risk of overcompensation or overinvestment. However, the AER is also conscious of the risk of introducing an inherent bias towards higher amounts where estimates throughout the different components of the determination are each set too conservatively.*

In a recent consultation paper, the AEMC expressed its preference for upside risk for network operators, albeit in slightly more nuanced terms.[23]

> *If investors do not have confidence that the framework provides a reasonable opportunity to recover at least their efficient costs, they may delay efficient investment or require a higher return to compensate for that risk.*

The AEMC's reference to "at least recover" indicates it continues to consider it prudent to err in favour of network operators.

Alternatively stated, the regulators are requiring captive consumers pay a 'regulatory premium' because the regulators are unsure about their own ability to identify the efficient value of the inputs to the revenue models they have created.

This regulatory predisposition toward network operators may explain (or at least contribute notably to) the AER's finding that network operators consistently outperform expected regulated returns on both assets and equity – quite materially in some years.[24]

The Consumer Reference Group (CRG) established by the AER for its 2026 rate of return review expressed concerns within the context of that review about this regulatory predisposition and the cost it imposes on consumers. The CRG found:[25]

> *…a systemic upward bias in how the AER proposes to exercise its regulatory judgement. Across almost every aspect of this rate of return review, the AER is proposing to make decisions that give the benefit of the doubt to networks in the form of a higher rate of return than is otherwise justified.*

This predisposition extends to the design and operation of the AER's incentive schemes, most prominently, its schemes targeting capital and operating expenditures.[26] The AER claims that its modelling of efficient levels of expenditure has improved as a result of the efficient costs

---

[22] For example, see AER (October 2015) p.42, and AER (May 2016) p.44

[23] AEMC (August 2026) p.70

[24] For example, see: AER (July 2026) pp.68-69

[25] CRG (September 2022) p.4

[26] The CESS and EBSS, respectively. See Footnote 6.

revealed under incentive-based regulation.[27] But if this were true, it should be expected that rewards and penalties under these incentive schemes would become increasingly symmetrical over time. This has not been the case. The AER's incentive schemes continue to see rewards paid to network operators (by consumers) greatly exceeding penalties.[28]

The Consumer Reference Group appointed by the AER for its 2026 rate of return review similarly expressed concerns about this regulatory predisposition to err in favour of network operators. The CRG proposed a balanced formulation for regulatory decision-making.[29]

> *[The] rate of return must be set at the lowest possible level that, on the balance of probabilities, still supports prudent and efficient investment.*

For now, there is no indication of a shift in the regulators' predisposition toward favouring network operators in response to their self-doubt regarding their forecasts.

2.4 Who is actually responsible for forecasting and managing demand?

As with capital and operating expenditure forecasts, network operators must submit their demand forecasts to the regulator. Thereafter, it is up to the regulator to either accept these forecasts or adopt its own forecasts. As the AER recently explained:[30]

> *[The] AER must assess the [network operators'] proposal against specified criteria and accept the proposal if it is satisfied that it reasonably reflects prudent and efficient costs,* ***realistic demand forecasts****, and other requirements in the Rules. Where the AER is not satisfied, it may substitute its own estimate, but only in line with NER[31] framework and relevant factors.* [highlight added]

Despite the informational distance between the regulator and the consumers of network services, incentive-based regulation relies on the regulator to be a better judge of consumer demand than network operators. The regulator, and only the regulator, is the final arbiter of the demand forecasts that go into determining a network operator's revenue allowance and prices (explained further in section 3).

As explained in Ben-David (May 2026), it is wrong to view network operators as mere observers of regulatory decisions. Instead, they act strategically within the regulatory process. Network operators seek to use their informational advantage to influence the regulator's forecasts – in this case, what the regulator considers to be a "realistic demand forecast".[32] Section 3.2 describes how network operators' strategies to influence the regulator's forecasts of demand depends on the "form of control" applied by the regulator.

---

[27] For example, see AER (December 2021) p.54, and AER (August 2022), p.7

[28] AER (July 2026) Figure 3-2, p.14

[29] CRG (July 2026) p.3

[30] AER (June 2026) p.21

[31] National Electricity Rules (NER)

[32] The regulator is aware of network operators' strategic efforts to influence its forecast, which ultimately leads to the regulatory arms race described in section 1.

There is, however, a significant difference in the implications for network operators between regulatory forecasts of expenditure and regulatory forecasts of demand.

When it comes to regulated expenditure forecasts, once the regulator's final decision is made, the assumed role of the network operator is clear under incentive-based regulation – namely, the network operator is challenged to 'outperform' the regulator's forecast (thereby revealing its efficient costs to the regulator).

In contrast, the challenge facing a network operator is far more ambiguous once the regulator has determined its forecast of demand. Does incentive-based regulation challenge the network operator to 'hit' the regulator's forecast, or exceed it, or undershoot it? Or are network operators expected to be purely responsive to consumer demand?

As the energy transition deepens with the uptake of distributed energy resources, the challenge for network operators (particularly at the electricity distribution level) implied by incentive-based regulation is becoming increasingly unclear. Distribution networks are now expected to play a role in both delivering electricity to consumers and enabling consumers to export electricity and network stability services to the grid. In response, regulators have seen fit to implement a patchwork of new incentive schemes to address perceived shortcomings in the regulatory framework. These schemes are described in Box 2C. They operate alongside the other incentive schemes described in section 1.[33]

It is not the purpose of this paper to assess the efficacy of these schemes. This paper is, however, fundamentally interested in uncovering why the regulators have deemed it necessary to implement them. The schemes described in Box 2C are just the latest in an ever-growing morass of 'fixes' that have been layered on to the regulatory framework over the past 30 years.

Section 2.5 explains that this seemingly endless layering of fix and counter-fix is the product of a regulatory framework caught-up solving and creating the same problems.

Box 2C. Demand-side incentive schemes

Numerous incentive schemes have been implemented by regulators seek to overcome concerns about network operators' inherent tendency to favour capital expenditure even when alternative, non-capital-based solutions may come at an overall lower system cost. The DMIS and DMIAM took on their current form in 2017 while the ESIS was established in 2023.[34] Importantly, the cost of all these schemes falls on consumers.

Demand management incentive scheme (DMIS)

It has long been suspected that distribution network operators favour capital expenditure even though non-network solutions could otherwise be deployed at a lower overall cost of delivering network services. The DMIS seeks to overcome the alleged problem that network operators might not be able to capture whole-of-system benefits arising from non-network solutions.

[33] Primarily, the CESS, EBSS and STPIS. See Footnote 6.

[34] AER (June 2023)

According to the AEMC, “Up to and including FY2024, the DMIS had resulted in an estimated $52 million in benefits to consumers, at a cost of approximately $3.5 million,” [and] “This is relative to over $433 million in incentive payments potentially available to DNSPs under the DMIS over this time.” [35]

Demand management innovation allowance mechanism (DMIAM)

The DMIAM also seeks to overcome concerns about the so-called “capital bias” by providing network operators access to an annual funding allowance supporting development of non-capital solutions to demand management.

According to the AEMC, “In FY2025 the AER approved DMIAM expenditure of $9.87 million.”[36] This amount represents 0.07% of the total revenue of $14.5 billion earned by electricity networks during the same period.[37]

The Export Service Incentive Scheme (ESIS)

The ESIS rewards distribution network operators for enabling customers to export electricity to the network at a price that reflects the value of that service to consumers. It was introduced as a complement to the STPIS (which focusses on delivering electricity to consumers). The ESIS addresses concerns about distribution network operators having no, or few, incentives to support exports to the grid from consumer-owned energy resources.

According to the AEMC, “At this time, the AER has not yet applied the export service scheme to any DNSPs.”[38]

Customer Service Incentive Scheme (CSIS)

The CSIS was introduced by the AER in 2020 to encourage distribution network operators to consult their customers about their service requirements and expectations (and willingness to pay for services) – including access to network export services. Network operators are financially rewarded or penalised based on how they perform against targets set by the AER.[39]

The Voluntary Scheduled Resource (VSR) Incentive Mechanism (VIM)

Unlike the incentive schemes listed above, the VIM does not target network operators. It nonetheless is a demand-side incentive scheme with potential implications for network operators. The VIM is a fund established to support consumer-owned energy technologies to compete in the traditional, dispatched wholesale market. Eligible resources include Virtual Power Plants (VPPs), community batteries and flexible commercial and industrial loads. The VIM was scheduled to commence in May 2027 but is now subject to a rule change request that would delay commencement by 2½ years.[40]

---

[35] AEMC (August 2026), pp.46 and 54 , respectively.

[36] AEMC (August 2026) p.46

[37] AER (July 2026a) p.6

[38] AEMC (August 2026), p.49

[39] The CSIS was applied by the AER from 2021 but has not been applied in its most recent revenue determinations due to concerns around data quality, overlap with the STPIS, and other compliance requirements.

[40] AEMO (September 2026)

2.5 Discussion: An entirely different way of thinking about network regulation

The outcomes observed in sections 2.2 to 2.4 – regulators representing their task as a false choice, the regulators' predisposition towards network operators, and regulators seeking to incentivise demand-side activity by network operators – all arise because of the role assumed for the regulator under incentive-based regulation. As outlined in section 2.1, that role, and the entirety of incentive-based regulation, is the product of an innermost conceptual framework that operates deep within the observable framework of incentive-based regulation.

This paper (and the series of papers of which it is a part) begins from a different starting position by adopting the following two important and related principles.

First, the regulatory framework cannot create and solve the same problem. A problem can only be addressed efficiently by redesigning the overarching regulatory framework to avoid the problem the regulator otherwise feels compelled to solve. This means a problem arising from incentive-based regulation (for example, regulators' self-doubt leading to their predisposition favouring network operators over consumers[41]) cannot be efficiently solved by incentive-based regulation.

Second, the regulator should not be second-guessing the parties it regulates – especially when the regulator is subject to a significant informational disadvantage. It should be holding network operators responsible and accountable for honestly forecasting and delivering network investment and services based on their propriety knowledge.[42] Incentive-based regulation represents the antithesis of this principle because it relies entirely on the regulator formulating its own forecasts of a network operator's demand and expenditure requirements.

But pursuit of these principles requires changing the "framework within the framework" behind network regulation as we know it – that is, the innermost propositions that currently motivate adoption of incentive-based regulation.

The alternative construction also involves three propositions, two of which are the same as those in the current "framework within the framework". The third proposition differs, however.

1. There shall be a regulator of natural monopoly network operators.
2. The regulator has less information about relevant matters than network operators.
3. The regulator shall hold network operators' responsible for honestly forecasting their revenue requirements.

(noting, revenue requirements are *inter alia* informed by demand and expenditure forecasts)

Propositions 1 and 2 mirror Propositions 1 and 3 in the current framework (section 2.1), but they play a very different role by construction. The difference between the current and alternative innermost frameworks becomes particularly clear when the appropriate conjunctions are placed between their respective propositions.

---

[41] See section 2.3

[42] Noting the general form of the national energy objectives requires the regulator to promote efficient investment in, and efficient operation and use of, electricity and gas services for the long-term interests of consumers – see: https://www.aemc.gov.au/regulation/neo

Proposition	Current innermost framework	Alternative innermost framework
1	There shall be a regulator of natural monopoly network operators.	There shall be a regulator of natural monopoly network operators.
	and	but
2	The regulator shall determine network operators' revenue requirements.	The regulator has less information about relevant matters than network operators.
	but	so
3	The regulator has less information about relevant matters than network operators.	The regulator shall hold network operators' responsible for honestly forecasting their revenue requirements.

As noted in section 2.1, it is the clash between Propositions 2 and 3 in the current innermost framework that motivates incentive-based regulation, sets up network regulation as a "battle of wits" between the regulator and network operators, and results in the wasteful arms race described in section 1.

There is no such clash among the propositions of the alternative innermost framework.

The remainder of this paper describes a markedly different approach to regulating demand for network services. This different approach derives from the alternative innermost framework outlined above.

3. Demand forecasts: The key to everything (or almost everything)

Many points of contention between network operators and the regulator arise during a regulated revenue reset. Demand forecasting is perhaps the most central of these contentions. The expected level and profile of demand during (and beyond) a regulatory period will determine the capital investment and other operating expenditures a network operator can expect to incur.

As explained in sections 1 and 2 of this paper, under incentive-based regulation, it is the responsibility of the regulator to determine a network operator's revenue allowance. To do so, the regulator must develop its own estimates of the operator's efficient expenditures which, in turn, requires regulatory forecasts of demand for each network operator.

The discussion below proceeds as follows. Section 3.1 uses a simple mathematical model to illustrate the centrality of demand forecasts to regulated revenue allowances and the regulated prices a network operator can charge. Section 3.2 describes two different "forms of control" used by network regulators, namely, price cap and revenue cap regulation. As shown, each form of control creates its own incentives for gaming by network operators. Section 3.3 very briefly describes the different forms of control applied in Australia.

Economic regulators have long recognised the limits of using price cap or revenue cap forms of regulation to manage the risk of errors in their forecasts of demand and expenditures (and therefore, regulated revenue allowances). In response, they have implemented the range of "uncertainty mechanisms" described in Section 3.4.

Section 3.5 explains how incentive-based regulation is the problem incentive-based regulation is trying to solve, and the necessary steps that must be taken to escape this perpetual motion machine of regulatory 'fixes'.

3.1 The centrality of demand

The centrality of demand forecasts to regulated outcomes can demonstrated using the following stylised mathematical model.

The total cost of delivering network service consists of fixed costs ($\boldsymbol{F_0}$) which are invariant to the level of demand, and variable costs which are determined by the expected level of demand ($\boldsymbol{D^e}$) multiplied by a network operator's efficient unit variable cost ($\boldsymbol{v}$). The network operator's expected total cost ($\boldsymbol{TC^e}$) can be represented by:

$$Expected\ Total\ Cost\ (TC^e) = F_0 + vD^e \qquad (1)$$

To ensure network operators remain whole, they require a revenue allowance ($\boldsymbol{R}$) that covers their expected costs of satisfying the expected level of demand.

$$Regulated\ Revenue\ Allowance\ (R) = Expected\ Total\ Cost\ (TC^e) \qquad (2)$$

The revenue function also consists of a fixed component ($\boldsymbol{R_0}$) and variable component ($\boldsymbol{p}$) which, under incentive-based regulations, is multiplied by the regulator's forecast of the expected level of

demand ($\boldsymbol{D_R^e}$).[43] In this stylised model, the variable component (p) represents the price a network can charge per unit of delivered demand.[44]

$$Regulated\ Revenue\ Allowance\ (R) = R_0 + pD_R^e \qquad (3)$$

Substituting equations (1) and (3) into (2) solves for the regulated unit price a network operator can charge for network services.

$$p = v + \left(\frac{F_0 - R_0}{D_R^e}\right) \qquad (4)$$

This simplified model, demonstrates the centrality of the regulator's forecast of demand. Expected total costs (TC^e), the regulated revenue allowance (R) and the price a network operator can charge per unit of consumption (p), are all functions of the regulator's forecast of expected demand (D_R^e) – as per equations (1), (3) and (4), respectively.[45]

Although the regulatory process requires network operators to make submissions to the regulator indicating their forecasts of expected demand ($\boldsymbol{D_N^e}$), it is ultimately the regulator's forecast of expected demand (D_R^e) that determines the operator's regulated revenue allowance (R) and the prices it can charge (p).

As has been highlighted at some length in recent times,[46] over the past 30 years of network regulation, regulators have required the fixed revenue component (R_0) to be set below the estimated fixed cost (F_0) component of providing the service.[47]

$$R_0 < F_0 \qquad (5)$$

This approach means that some of a network operator's fixed cost must be recovered through its regulated variable charges. This is sometimes referred to as the "smearing" of fixed costs. As can be seen from equation (4), this means that regulated variable prices are set higher than the unit variable cost of delivering services.

$$p > v \qquad (6)$$

---

[43] Noting, volume-invariant revenue ($\boldsymbol{R_0}$) is recovered from users by the network operator though a fixed supply charge.

[44] Or more precisely, the price variable (p) in this stylised model represents the volume-weighted average price across the 'basket' of tariffs a network might charge for the different services it provides.

[45] A demand curve could be added to this model to reflect the relationship between price and quantity demanded. Doing so, complicates the model without offering additional insight and so has not been pursued further in this paper.

[46] For example, see AEMC (June 2026)

[47] This situation arises because clause 6.18.5(f) of the Network Pricing Principles in the National Electricity Rules (NER) dictates that variable tariffs must be based on the **long-run marginal cost (LRMC)** of providing the service. In a capital-intensive industry such as energy networks, the marginal cost will typically exceed the unit average cost at the expected level of demand. When prices are set at the LRMC, it results in a greater share of the revenue allowance being recovered from variable charges – thereby reducing the residual revenue requirement that must be recovered through fixed charges, hence $R_0 < F_0$.

The consequences of this approach are illustrated in Figure 3A where the relationship between demand and total costs is shown by the blue line, while the red line shows how the revenue allowance varies with the elected level of demand. The slope of the blue line is given by v in equation (1), while the slope of the red line is given by p in equations (3) and (4).

Figure 3A. Total costs and a revenue allowance that varies with expected demand

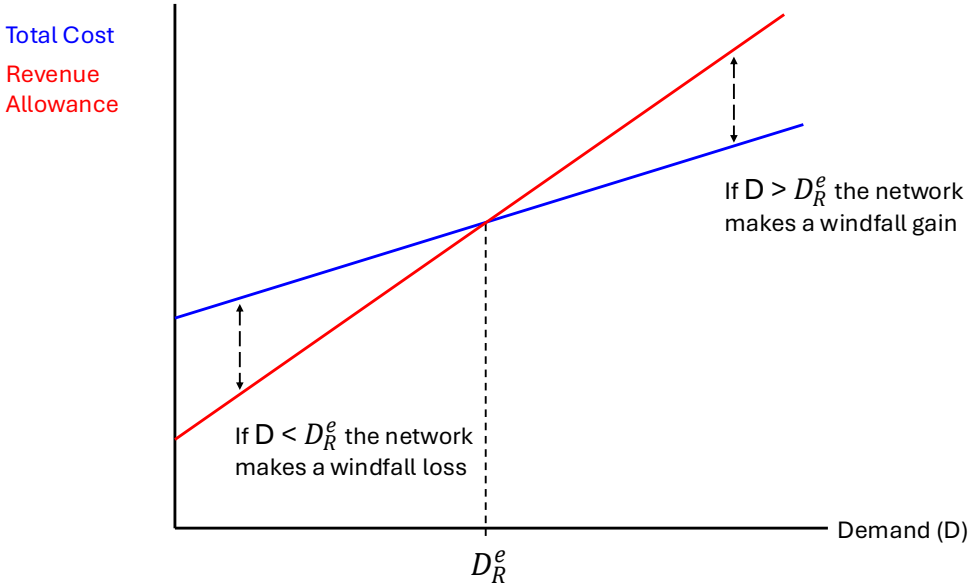


Figure 3A illustrates the central importance of the regulator's forecast of expected demand. It is only when outturn (or actual) demand matches the regulator's forecast (D_R^e), that the regulated revenue allowance correctly compensates the network operator for the cost of delivering services. If outturn demand falls below the regulator's expected level of demand, the network operator will incur a loss. Conversely, if the regulator's expectation proves to be conservative (too low) the network will earn a windfall gain.

As indicated by equation (4), the slope of the revenue allowance (red line) will vary with the regulator's demand forecast. A higher forecast will result in the revenue allowance in Figure 3A having a flatter slope. Conversely, a lower regulatory forecast of demand will result in a steeper revenue allowance curve. The slope of the revenue allowance curve corresponds to the regulated variable charge a network operator can recover per unit of demand delivered to consumers.

3.2 Two forms of control: Price caps or Revenue Caps

Regulators typically refer to two "forms of control" when it comes to determining a network operator's regulated revenue allowance and tariffs (or prices) – namely, price cap regulation and revenue cap regulation.

Under **price cap regulation,** the regulator, having established its forecast of expected demand, sets the per unit price a network operator can charge for each unit of energy it delivers. Within the simple model presented in section 3.1, this amounts to setting the price according to equation (4).

That is, the slope of the red line in Figure 3A is set *ex ante* in the expectation that it will not change during the regulatory period.[48]

Under this form of regulatory control, the network operator bears the up- and downside risk of outturn demand differing from the regulator's forecast of expected demand (D_R^e). As can be seen from Figure 3A, a network operator will make a loss when outturn demand lies below the regulator's forecast of expected demand because the total cost curve lies above the revenue allowance curve. Conversely, the network operator will earn a windfall gain under a price cap if outturn demand exceeds the regulator's forecast of expected demand.

Section 2.4 highlights that network operators are incentivised by incentive-based regulation to act strategically during the regulatory process, that is, to try using their informational advantage to influence regulatory decisions in a way that maximises their private benefit.[49]

Under price cap regulation, network operators will seek to downwardly influence the regulator's expectations about demand.

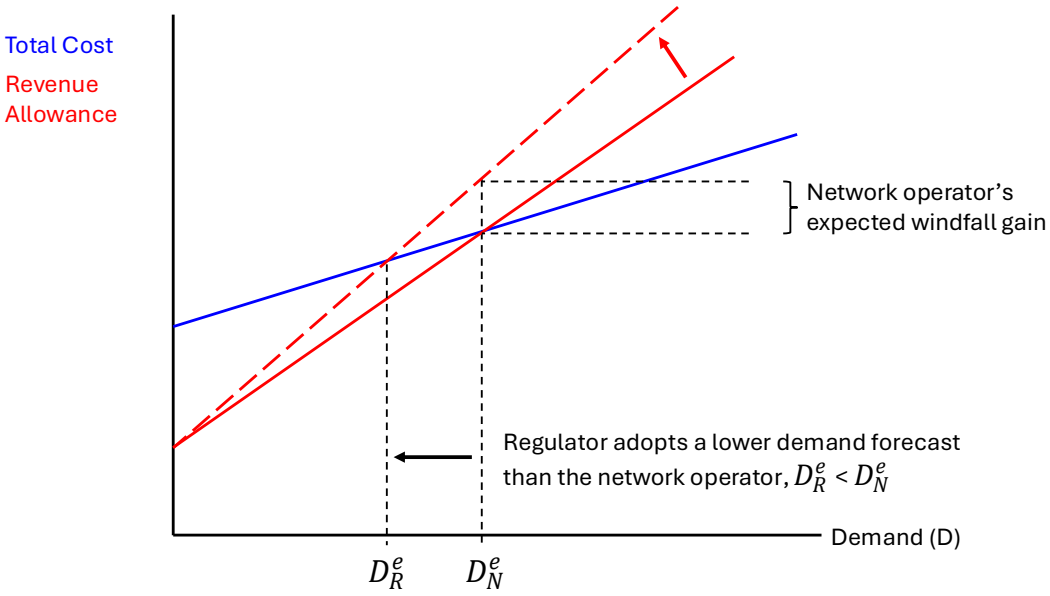
When a network succeeds in convincing the regulator to adopt a lower forecast of expected demand than its own private forecast ($D_R^e < D_N^e$), then the regulator will set variable prices higher than they otherwise would be set – as per equation (4). If the network operator's private forecast ultimately proves to be more accurate than the regulator's forecast, then the network operator's efforts at convincing the regulator to adopt a lower forecast will be rewarded through a windfall gain. The network operator's incentive to convince the regulator to adopt a lower demand forecast is illustrated in Figure 3B.

Figure 3B illustrates that if the regulator can be convinced to adopt a demand forecast based on $D_R^e < D_N^e$, the regulator will impose higher regulated variable tariffs than would otherwise be the case. The network operator will expect the resultant steeper revenue allowance curve to produce a windfall gain at its private forecast of demand (D_N^e).

[48] Section 3.4 outlines the limited situations in which a network operator's revenue allowance, and therefore prices, may be altered after commencement of the regulatory period.

[49] The regulatory reset process is described in Ben-David (May 2026), section XX.

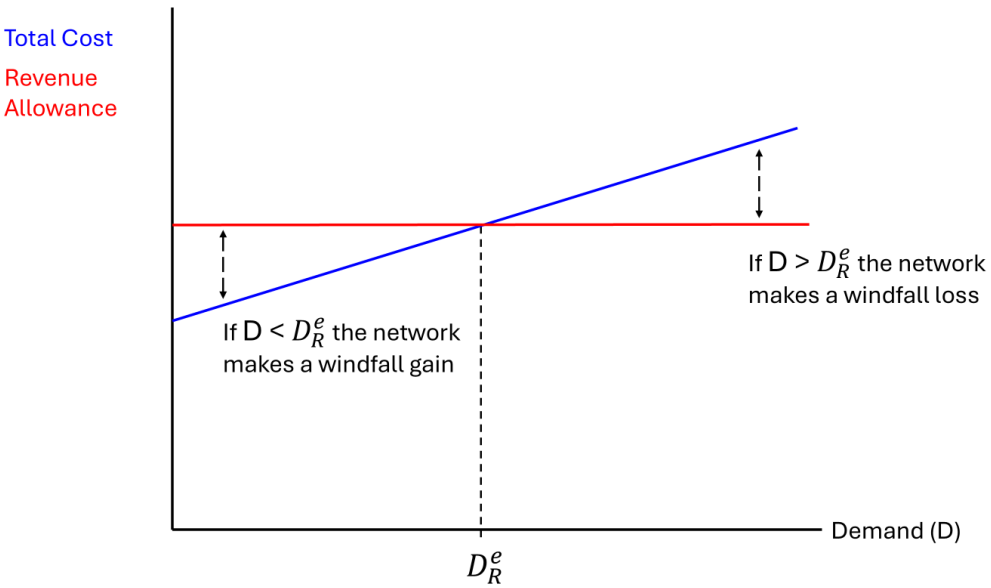
Figure 3B. Network operator's incentive to convince the regulator to adopt a lower demand forecast under price cap regulation



The second form of regulatory control is known as **revenue cap regulation**.

Under revenue cap regulation, the regulator, having formed its expectation of demand (D_R^e), sets the network operator's revenue allowance based on the revenue it requires at that expected level of demand. The revenue the network operator earns is then invariant to the outturn level of demand. Revenue cap regulation is illustrated in Figure 3C.

Figure 3C. Revenue cap regulation

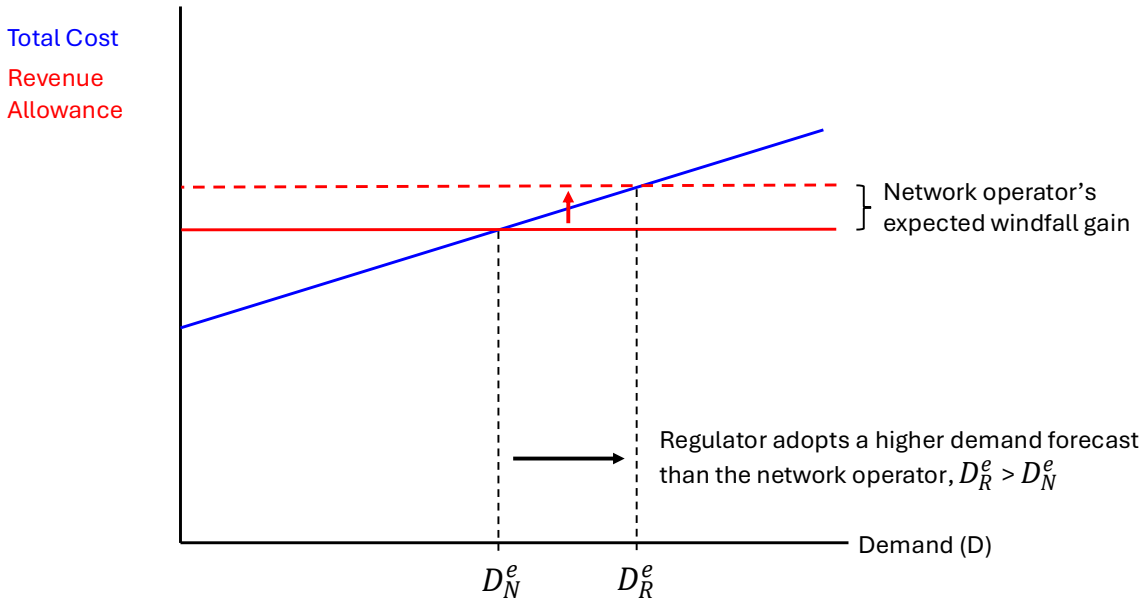


If outturn demand exceeds the regulator's expectations under revenue cap regulation, the network will make a loss in the first instance. However, under this form of regulatory control the network is allowed to recover this loss in subsequent years of the regulatory period – that is, prices are increased in future years to enable the network to recover its earlier losses under the cap. The converse is true if outturn demand undershoots the regulator's expectation of demand. In which case, prices are adjusted downward in future years to return windfall gains to network users. These price adjustments ensure the network operator earns its revenue cap no matter the outturn level of demand.

Whereas network operators bear the risk of errors in the regulatory forecasts of demand under price cap regulation, revenue cap regulation shifts this risk on to the users of network services.

Under revenue cap regulation, network operators are incentivised to upwardly influence the regulator's expectations of demand ($D_R^e > D_N^e$). If a network operator succeeds, it will increase the revenue it is guaranteed to earn during the regulatory period. Figure 3D illustrates a network operator's incentive under a revenue cap.

Figure 3D. Network operator's incentive to convince the regulator to adopt a higher demand forecast under revenue cap regulation



As can be seen from Figures 3B and 3D, a network operator's strategy when engaging with the regulator is dependent on whether it is subject to a price cap or revenue cap form of control. Section 4 demonstrates how this 'flipping' of network operators' strategic incentives can be used to remove the need for the regulator to produce its own forecasts of demand.

3.3 Different networks. Different controls

In the Australian energy market, gas networks are subject to price cap regulation while electricity networks are subject to a revenue cap.

The reason for the different forms of control appears to be largely historical. When regulatory arrangements were put in place for distribution gas networks around 30 years ago, gas was viewed as a 'growth business'. Price cap regulation was adopted to incentivise gas network operators to grow gas volumes. If a gas network operator could increase gas throughput, it could earn more revenue under price cap regulation.

In contrast, demand for electricity was seen to be relatively stable (or at least linked closely and predictably to population growth and economic activity). Revenue cap regulation was adopted to encourage electricity distribution network operators to focus on lowering their costs, thereby earning higher profits while revealing to the regulator the efficient cost of delivering electricity network services.[50]

3.4 Dealing with uncertainty

Dealing with uncertainty is a challenge in any forecasting endeavour. Economic regulators have long recognised the limits of using price cap or revenue cap forms of regulation to manage forecasting uncertainty – or to put it more precisely, to manage the risk that they have wrongly forecast a network operator's revenue requirement.

As this paper makes clear, under incentive-based regulation, the regulator is responsible for forecasting demand, efficient expenditures, and therefore a network operator's regulated revenue allowance. In other words, by having built incentive-based regulation with themselves at the centre, the regulators have assumed responsibility for forecasting errors.

In recognition of their own forecasting fallibility, the regulators have implemented a suite of 'uncertainty mechanisms' to address potential or actual material shortfalls (or surfeits) in their regulated revenue allowances. These mechanisms seek to respond to uncertain or unforeseen events during the regulatory period. All the mechanisms described in Box 3A are used by the AER in conjunction with price cap or revenue cap forms of regulation.

Box 3A. Uncertainty mechanisms

The main mechanisms in the regulatory framework for dealing with forecast uncertainty are briefly described below. Strict conditions typically limit access to these mechanisms.

Cost pass-throughs are regulatory allowances for events that may occur during a regulatory period but where timing and impacts on expenditure or demand are not known upfront. Examples may include changes in service standards or tax arrangements. Under a pass-through mechanism, the regulator approves an automatic addition to a network operator's revenue allowance if a pre-identified event occurs.

[50] The concept of revealed cost regulation is described in section 2.1.

Contingent funding is a regulatory allowance made for a known project with known costs but uncertain timing. In its regulatory revenue allowance, the regulator will approve funding for the project conditional on a pre-specified threshold or trigger being reached during the regulatory period. If the threshold or trigger is not reached during the regulatory period, the network operator cannot proceed to recover the costs of the project from network users.

Re-openers involve the regulator re-examining its revenue allowance during the relevant regulatory period. Network operators may apply for a re-opener though a high threshold usually applies. For example, the event must have been unforeseeable, lie beyond the network operator's control, and materially impact the network operator's financial viability. The regulator may trigger a re-opener if, during the regulatory period, it finds that the revenue allowance it provided to a network operator was unduly generous.

Ex post reviews may be sought by network operators at, or nearing, the end of the regulatory period. These reviews consider material expenditures that have been incurred during the regulatory period but were not included in a network operator's regulated revenue allowance. In reviewing whether to recognise these expenditures, the regulator will typically consider whether they were necessary, efficient and prudent.[51]

Regulatory Depreciation is not formally categorised as an uncertainty mechanism, but a network operator can apply to the regulator to alter its depreciation profile to help it manage its cashflow following an unexpected event.[52]

*

Cost pass-throughs and contingent project funding address the *ex ante* risk of forecast errors by the regulator. That is, once these mechanisms are included in a revenue allowance, the relevant mechanism is triggered without requiring further decision-making by the regulator. In contrast, re-openers and *ex post* reviews, if initiated, require the regulator to re-engage with its earlier revenue determination.

Given the centrality of the regulator's demand forecast (D_R^e) when determining a network operator's revenue allowance (section 3.1), these uncertainty mechanisms can also be applied to address potential or realised errors in the regulator's forecasts of demand. That is, when:

$$D^* \neq D_R^e$$

where D^* represents outturn demand for a network operator's services.

When a regulator materially under-forecasts demand, it is likely to result in it failing to anticipate the expenditures a network operator will incur during the regulatory period – resulting in it

[51] If the regulator finds the additional expenditure to have been necessary, efficient and prudent, it will typically capitalise these expenditures in the network operator's regulatory asset base (RAB). In doing so, it enables the network operator to recover these costs from consumers over ensuing years. If the regulator finds the additional expenditure had not been necessary, efficient and prudent, the network operator will be prevented from recovering the costs it has incurred from network users – in part or *in toto*. This leaves shareholders bearing the burden of such expenditures.

[52] Unlike statutory accounting rules, regulators have a broad discretion over the phasing of depreciation in a network operator's so-called, "regulatory accounts".

approving an insufficient revenue allowance. And conversely if the regulator over-forecasts demand.

In the United Kingdom, the regulator (Ofgem), which applies revenue cap regulation, has developed an additional mechanism known as a "volume driver revenue adjustment". It allows the regulated revenue allowance to respond automatically if the regulator has mis-forecast demand. As highlighted in Box 3B, Ofgem's volume drivers do not overcome the information asymmetries that exist between the regulator and network operators. Network operators still face strong incentives to use their informational advantage to game the regulator – in this case, its forecasts of the unit cost of demand, as well as its central forecast of demand (D_R^e).

Box 3B. Ofgem's 'volume driver' revenue adjustment mechanism

Ofgem's volume driver is an automatic mechanism that seeks to address errors in the regulator's forecast of demand. Although the regulator must still form an expectation of demand (D_R^e) in order to determine a revenue allowance (under its revenue cap form of regulation), the volume driver enables the revenue allowance to adjust automatically if demand exceeds or falls short of the regulator's forecast.

Ofgem achieves this automatic adjustment by estimating the unit cost of demand around its central forecast (D_R^e). The revenue cap then automatically adjusts by the unit cost multiplied by the forecast error. The volume driver is symmetrical. If Ofgem over-forecasts (under-forecasts) demand, the volume driver will result in an automatic reduction (increase) in the network operator's regulated revenue allowance.

Ofgem also uses uncertainty mechanisms such as those described in Box 3A, when its volume drivers are insufficient to address material forecast errors.

3.5 Discussion: Incentive-based regulation is the problem it is trying to solve

The regulators have built a regulatory framework – known as "incentive-based regulation" – with themselves at the centre of almost every aspect of that framework. Indeed, it is difficult to identify any outcomes from the regulatory process that do not directly rely on a decision by the regulator.

Every new rule, process, methodology, mechanism or scheme seeks to solve a deficiency, gap or missed opportunity arising from previous attempts by the regulators to optimise the framework. Incentive-based regulation is a regulatory perpetual motion machine.

Why? Because incentive-based regulation is the problem it is trying to solve.

In building incentive-based regulation with themselves at the centre, the regulators place themselves in a position of disadvantage – a position they then eternally seek to overcome by modifying the framework, paradoxically, by further expanding their position at its centre.

The regulator will never know as much about a network operator as the network operator knows about itself and its operating environment. And, even if a regulator had access to an abundance of information, the regulator could never be entirely certain about the quality or relevance of that information when it comes to forecasting the future. Under these circumstances, network

operators are incentivised to game the regulator's decision-making in their favour. In turn, the regulator is compelled to respond by engaging network operators in a "battle of wits" (section 1). This is the natural order of things under incentive-based regulation. It is why regulators continue to create new rules and processes, impose a regulatory premium (section 2.3), invent new incentive schemes (Box 2C) and apply numerous uncertainty mechanisms (Boxes 3A and 3B).

Each of these 'fixes' further blurs the demarcation between the regulation and management of network operators as regulators continue to expand the outcomes for which they are responsible. This blurring of responsibilities is anathema to efficient regulatory design.

It does not need to be this way.

But change requires breaking the perpetual motion machine – the spinning hamster wheel – of incentive-based regulation. And that requires recognising the "framework within the framework" must change (section 2.1). There is no other way forward. Without changing the innermost propositions driving the regulatory framework, regulators will just continue running on the hamster wheel they have created for themselves.

Sections 4 to 6 describe a new approach to network regulation. This alternative approach is enlivened by the two principles and the alternative "framework within a framework" outlined in section 2.5. Those two principles are: (i) the regulatory framework cannot create and solve the same problem, and (ii) the regulator should not be second-guessing the parties it regulates.

The rest of this paper demonstrates that network operators can be held responsible and accountable for honestly forecasting and reliably managing demand for network services, without being second-guessed by the regulator.

4. Extricating the regulator from forecasting demand

Preceding sections of this paper establish the case for changing the way network operators are regulated. The following discussion demonstrates it is possible to design a regulatory framework that holds network operators responsible and accountable for honestly forecasting demand without competing forecasts by the regulator.

Section 4.1 sets up the discussion by briefly recapitulating the case for fundamentally rethinking the conduct of network regulation. Section 4.2 responds to this challenge by outlining a mechanism – described as a "kinked revenue allowance curve" – that ensures network operators produce honest forecasts of expected demand for their services. Section 4.3 recognises that even the best-intentioned network operators face uncertainties when forecasting demand for their services. A mechanism is described whereby network operators can implement "buffers" against forecasting uncertainty. Section 4.4 explains that because buffers are funded by consumers, network operators must compensate consumers for this indemnity. The discussion outlines a stylised arrangement for compensating consumers based on the 'size' of the buffer a network operator chooses. Section 4.5 argues this approach to network regulations reduces reliance on regulated uncertainty mechanisms and may eventually eliminate entirely the need for such mechanisms.[53]

To be clear, the model used in the following discussion is illustrative only. The model's details are far less important than its message about what is possible.

4.1 Rethinking demand forecasting

Because incentive-based regulation places the regulator's forecasts of demand at the centre of the regulated revenue allowance, mis-forecasting of demand by the regulator creates risks for either networks or network users (consumers). Network operators therefore face an irresistible incentive to use their informational advantage to influence the regulator's expectations of demand in a way that shifts this risk on to consumers. Atomistic consumers face little opportunity to exert countervailing influence on the regulator.

Moreover, and by their own admission, regulators are predisposed toward tilting the allocation of mis-forecasting risk in favour of network operators, leaving consumers to pay network operators a 'regulatory premium' (see section 2.3).

Put bluntly, under incentive-based regulation, regulators are making captive consumers bear the risk of, and pay for, the regulator's fallibility in forecasting demand. Rules and processes, incentive schemes (Box 2C) and uncertainty mechanisms (Boxes 3A and 3B) may seek to ameliorate some of this forecasting risk. These regulatory measures, however, are no less prone to information asymmetry than the regulatory mis-forecasts they are seeking to mitigate against. This means they too a prone to the regulators' predisposition favouring network operators.

Incentive-based regulation creates the risks it then seeks to mitigate. This is a fundamentally inefficient approach to regulating network operators.

---

[53] These regulated uncertainty mechanisms are described in section 3.4

Economic theories of the firm contend that firms exist because they can manage risks (and costs) more efficiently than individuals. No less should be expected of regulated natural monopolies such as energy networks. And while the need to regulate monopolies is well-accepted, regulation of network operators should expect and allow those operators to efficiently manage risks (and costs) on behalf of their customers without being second-guessed by the regulator. Incentive-based regulation as it has operated and evolved over the past 30 years has delivered precisely the opposite outcome.

The following discussion demonstrates how network operators can be held responsible for forecasting, and accountable for managing, demand without a regulator second-guessing their every move.

4.2 A kinked revenue allowance curve driving honest forecasts of demand

Section 3.2 describes the two dominant forms of regulatory control, namely, price cap regulation and revenue cap regulation. As that discussion highlights, under price cap regulation, network operators will seek to downwardly influence the regulator's demand forecasts below their own expectation of outturn demand. If successful, a network operator will expect to earn a windfall profit. Conversely, under a revenue cap regulation, network operators will, all things being equal, seek to upwardly influence the regulator's forecasts of demand. If the regulatory forecast exceeds the operator's expectation of outturn demand, the network operator will expect to earn a windfall profit. Of course, windfall profits due to regulatory mis-forecasts of demand come at consumers' expense.

The flipping of network operators' incentives depending on the form of regulation creates an opportunity for innovatively rethinking regulatory design. A hybrid form of price cap and revenue cap regulation can be used to drive network operators to autonomously reveal their true expectations of demand ($\boldsymbol{D_N^e}$) over the regulatory period[54] – thereby eliminating the need for competing forecasts of demand by the regulator ($\boldsymbol{D_R^e}$). This autonomous revenue model is surprisingly simple and involves only four steps.

1. The network operator submits to the regulator its demand forecasts ($\boldsymbol{D_N^e}$), the corresponding forecast of its revenue requirement ($\boldsymbol{R_N^e}$), the corresponding prices ($\boldsymbol{p}$) it intends to charge network users for its services, and the quantum of volume-invariant revenue ($\boldsymbol{R_0}$) it proposes to recover from network users through fixed supply charges.[55]
2. The regulator adopts the network operator's submission subject only to verifying internal consistency of the variables it has submitted – namely, that D_N^e, R_N^e, p and R_0 comply with equation (3) in section 3.1. There is no need for the regulator to produce its own estimates of demand or revenue.

[54] Network operators would be required to engage with network users to inform their expectations of demand ($\boldsymbol{D_N^e}$) and understand the endogeneity between expected demand and proposed prices ($\boldsymbol{p}$).

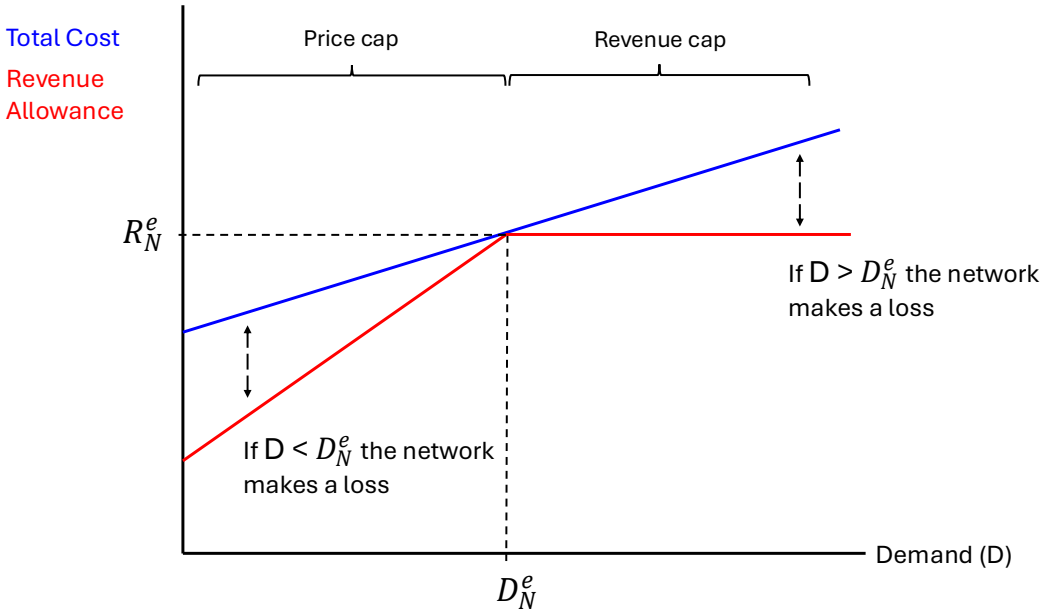
[55] Recalling from section 3.1 that (1) the price variable (p) represents the volume-weighted average price paid by consumers across a 'basket' of tariffs the network intends to charge consumers for different network services; and (2) volume-invariant revenue (R_0) is recovered from network users though a fixed supply charge.

3. Once satisfied about the internal consistency of the network operator's submission, the regulator would use the network's nominated price (p) to impose a price cap form of regulation up to the network operator's forecast level of demand (D_N^e).

4. Beyond the network operator's forecast level of demand (D_N^e), the regulator would impose a revenue cap at the network operator's forecast revenue requirement (R_N^e).

This approach is illustrated in Figure 4A where D_N^e is the network operator's forecast of demand, and R_N^e represents the network's forecast revenue requirement corresponding to that forecast of demand. The kinked red line represents how the network operator's revenue allowance varies with outturn demand.

Figure 4A. Kinked revenue allowance curve



The kinked revenue allowance curve illustrated in Figure 4A creates a compelling incentive for the network operator to reveal its true forecast of demand. That is:

$$D_N^e = E_N\{D^*\} \qquad (7)$$

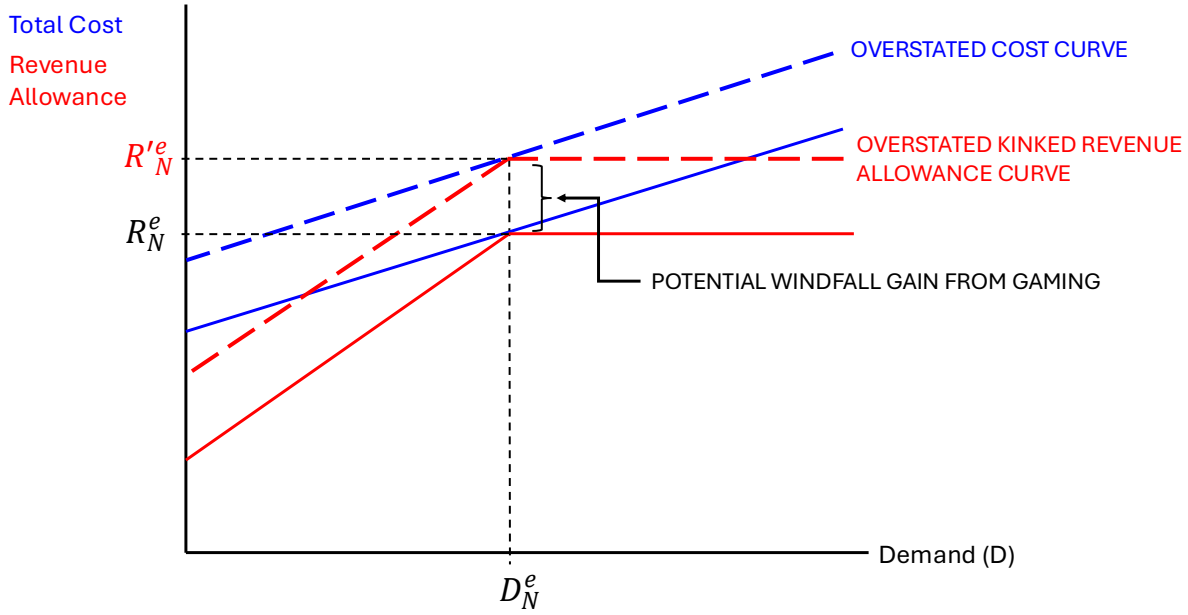
where $E_N\{D^*\}$ represents the network operator's true (that is, private) expectation of outturn demand (D^*).

Under any other scenario, the network operator would anticipate making a loss. For example, if the network operator understates its expected level of demand to the regulator such that $E_N\{D^*\} > D_N^e$ – that is, if it privately expects an outcome to the right of the kink in the revenue allowance curve – then it will anticipate making a loss. Likewise, it will anticipate a loss if it overstates its expected level of demand because its true expectation of demand will lie to the left of the kink in the revenue allowance curve. The best expected outcome for a network operator aligns with it revealing its 'honest' expectation of demand to the regulator as per equation (7).

Importantly, the kinked revenue allowance curve does not rely on regulatory forecasts of demand or revenue. There is no need for the regulator to challenge a network operator's forecasts (D_N^e). The network operator's forecast solely informs the position of the kink in its revenue allowance curve. Likewise, the regulator would simply adopt the network operator's claimed revenue requirement (R_N^e) without further interrogation – subject only to step (2) of the four steps listed above.

All things being equal, however, the four steps listed above do not prevent a network operator from overstating its total costs in order to upwardly manipulate its revenue allowance. As illustrated in Figure 4B, by overstating its costs, the network operator could claim its required revenue is higher than its true revenue requirement ($R'^e_N > R_N^e$) even though it is still in the operator's best interests to reveal its true expectation of demand (D_N^e).

Figure 4B. Gaming the kinked revenue allowance curve



But all things are not equal.

The risk of a network operator 'gaming' its claimed efficient costs of delivering services (and therefore its required revenue allowance) is mitigated by the mechanisms described in other papers in this series. For example, Ben-David (May 2026) describes a mechanism that seeks to ensure network operators reveal their true expectations of efficient capital expenditure. Upcoming papers will describe mechanisms for ensuring network operators provide 'honest' forecasts of other inputs contributing to their total costs of efficiently delivering services.

All the mechanisms described in this series of papers work together to facilitate network operators revealing honest forecasts of their total costs (TC_N^e) at their honest expectations of demand (D_N^e), and therefore their honest forecasts of their revenue requirements (R_N^e). In other words, these mechanisms work together to avoid the situation illustrated in Figure 4B. And in doing so, these papers demonstrate that network regulation can be conducted without the regulator placing itself at the centre of a framework that relies on its forecasts of these variables.

4.3 A buffer against honest mis-forecasting of demand

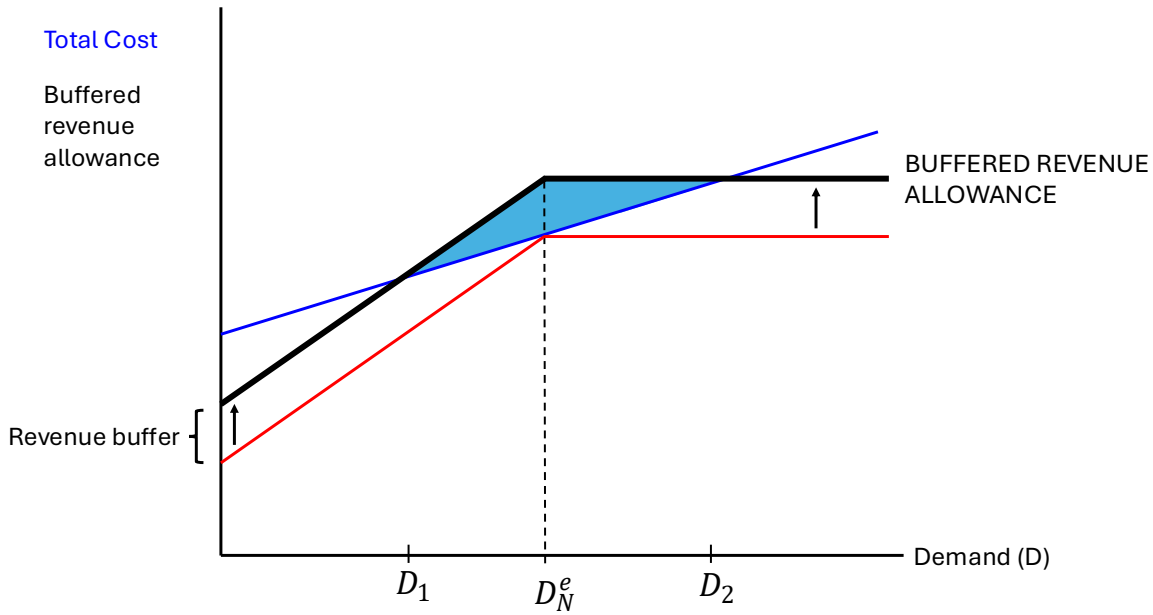
Forecasting is an inherently uncertain endeavour, but as discussed throughout this paper, current regulatory arrangements transfer responsibility for this uncertainty to the regulator. In response to the burden of this responsibility, regulators have created a plethora of schemes and mechanisms to assist them manage this uncertainty.[56] Each measure adds another layer of regulation to be navigated by network operators and administered (and determined) by the regulator.

The kinked revenue allowance mechanism outlined in the previous section removes any need for the regulator to second-guess network operators' forecasts of demand and revenue. However, as presented in Figure 4A, the kinked revenue allowance displays zero tolerance toward forecasting errors by a network operator. Any deviation in outturn demand (D^*) from the network operator's honest forecast of demand (D_N^e) results in a revenue allowance below the costs of providing network services. Even 'honest' forecasting errors are punished in Figure 4A. A buffer against honest forecasting errors solves this shortcoming.

The buffer can be designed in a multitude of ways. Figure 4C illustrates a simple buffer achieved through a flat uplift in a network operator's revenue allowance across all levels of demand. The buffered revenue allowance appears in black in Figure 4C. The buffer is represented by the shaded triangle between the **buffered revenue allowance curve** (black line) and the network operators total cost curve (blue line).

The effect of the buffer is to protect the network operator from an honest mis-forecast of demand within the outturn range D_1 to D_2. If outturn demand (D^*) falls within this range, the network operator avoids incurring a penalty in the form of a loss.

Figure 4C. A buffered revenue allowance



[56] For example, see Boxes 2C and 3A.

Importantly, the buffer is maximised at the network operator's honest forecast of expected demand (D_N^e). This feature of the buffer's design preserves the network operator's incentive to reveal its honest forecast of demand (D_N^e). Symmetry of the buffer around the network operator's honest forecast of demand is not strictly required, though it would seem sensible to avoid an unduly lopsided buffer.

In keeping with the second principle outlined in section 2.5 guiding this series of papers on regulatory design, network operators – not the regulator – would be responsible for nominating the 'size' of the buffer applying to their forecast of demand.[57] That is, each network operator would determine the width and height of the shaded triangle illustrated in Figure 4C.

Consumers would be funding the buffer. From their perspective, the buffer provides a network operator with an opportunity to earn a windfall gain at consumer's expense if outturn demand falls within its nominated range (D_1 to D_2). Alternatively stated, consumers are indemnifying network operators against forecast errors. All things being equal, it would seem rational for a network operator to take out the largest insurance policy possible – that is, nominate a very wide and deep triangle in Figure 4C – and transfer to consumers as much risk as possible. Were such transfers possible, it would certainly reduce the pressure on network operators to ensure their forecast of expected demand (D_N^e) were as reliable as possible.

Section 4.4 addresses this concern.

4.4 Buffers aren't free

The opportunity for network operators to earn a windfall gain under a buffered revenue allowance reflects the transfer of demand forecasting risk from the network operator to consumers. The larger the buffer (the shaded triangle in Figure 4C), the greater the transfer of risk to consumers. Consumers cannot be expected to assume this risk costlessly – especially as atomistic consumers have no negotiating power over the scale of the transfer.

There are a number of ways network operators can compensate consumers for assuming demand forecasting risk. Figure 4D demonstrates how the size of the buffer could be matched with a compensatory offset against the regulated rate of return a network operator earns on its sunk investment.[58]

(To be clear, offsetting the size of the buffer against a network operator's regulated rate of return is just one example of how an offset might be effected. Later papers in this series will consider other options – as well as alternative ways in which network operators' rate of return should be determined.)

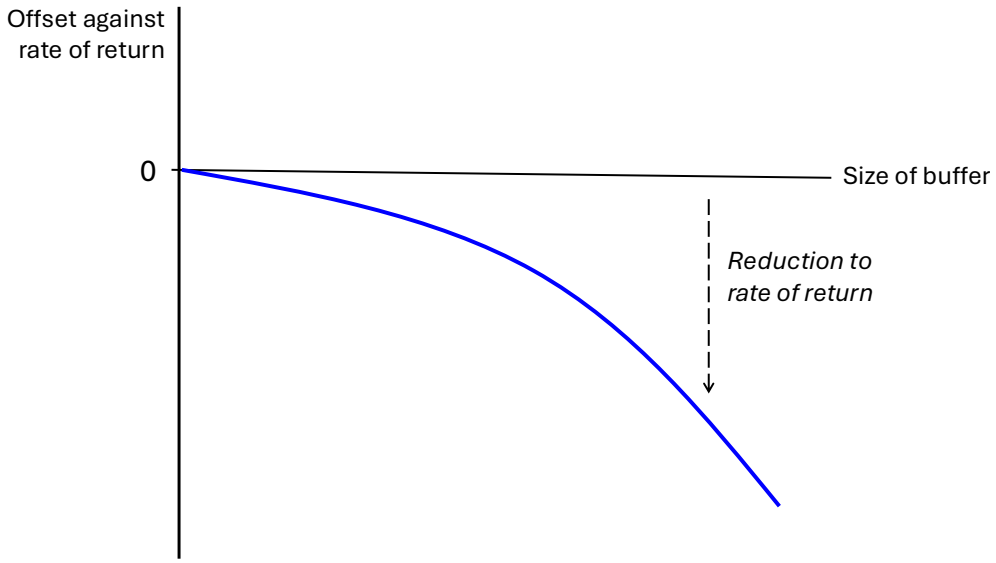
---

[57] The second principles states: The regulator should not be second-guessing the parties it regulates.

[58] Measuring the size of a buffer needs to account for the spread of risk between a network operator and its consumers (the triangle's width) and the maximum risk transfer from the network operator to its consumers (the triangle's height). Measuring the size of a buffer also needs to be standardised to account for the different commercial scale of network operators. One option might be to measure the size of the buffer as a relative measure – for example, the area of the triangle relative to the relevant network operator's unbuffered forecast revenue requirement (R_N^e in Figure 4A).

The offset curve shown in Figure 4D is concave. This concavity means small buffers come at a relatively small cost to network operators, but network operators contemplating larger buffers would incur proportionately larger offsets. In other words, a small transfer of demand forecasting risk to consumers is relatively inexpensive, but a large transfer is proportionately much more expensive.

Figure 4D. Offsetting the cost to consumers of a forecasting buffer



The purpose of a concave offset curve (as shown in Figure 4D) is to ensure network operators remain focussed on producing their best forecasts of expected demand (D_N^e) in order to minimise their need for an unduly large buffer against forecasting errors.

Section 6.2 explains how the regulator would adjust the concavity of the offset curve to uphold the integrity of the framework – that is, adjust concavity in light of a network operator's observed conduct. Making such adjustments is the regulator's chief responsibility under the framework outlined in this paper. (This responsibility contrast sharply with the regulator's chief role under incentive-based regulation which is to produce its own demand forecasts).

Importantly, having made their forecasts of expected demand (D_N^e), network operators are not mere bystanders of what happens next. Section 6.3 emphasises that network operators also have means to influence outturn demand (D^*) and therefore the risk of a forecast error, and therefore the penalty that comes with such errors. In other words, buffers are just one tool network operators have for managing their exposure to demand forecasting risk.

4.5 Reducing reliance on uncertainty mechanisms

A kinked demand curve (Figure 4A) supported by access to a forecasting buffer (Figure 4C) and a concave offset curve (Figure 4D) would encourage network operators to 'back their judgement' when forecasting demand and choosing the size of their buffers. The regulator would have no role in second-guessing network operators' judgements over these matters. The regulator's role would be strictly limited to determining the shape (or concavity) of the offset curve. In other words, the regulator relinquishes its role in forecasting demand and instead focuses on determining the strength of the incentive framework required to encourage network operators to forecast demand as honestly and reliably as possible.[59]

The kinked and buffered revenue curve may not eliminate the need for some-or-all of the uncertainty mechanisms described in section 3.4, at least not initially. That said, this approach – which imposes responsibility on network operators for forecasting and managing demand, while offering them a buffer against forecast errors, implies stricter conditions can be placed on access to any remaining uncertainty mechanisms.

Rules determining access to any regulated uncertainty mechanisms should be totally independent of the size of the buffer a network operator chooses to apply. Alternatively stated, network operators' discretion over the buffer they choose should have no bearing on their access to uncertainty mechanisms. The latter must remain strictly within the regulator's remit to decide. Nonetheless, when determining the size of their buffers, network operators must have full information about the limited conditions under which they would be granted access to the regulator's uncertainty mechanisms.

But an even more ambitious opportunity becomes realisable under the kinked revenue allowance curve described above – namely, dissolution of the entire regulatory process (see section 6.4).

[59] This approach echoes the approach taken in Ben-David (May 2026) where the regulator relinquishes its role in second-guessing network operators' capital expenditure requirements. Instead, the regulator focusses exclusively on assessing the required the strength of the incentives promoting honest forecasting of capital expenditure by network operators.

5. Applying the mechanism to network export services

So far, this paper has focussed on network operators' forecasts of demand for the energy they expect to deliver to consumers. With the advent of consumer-owned distributed energy resources (DER) 'behind the meter', electricity distribution networks are increasingly expected to support consumers' opportunity to export their surplus electricity to the grid.

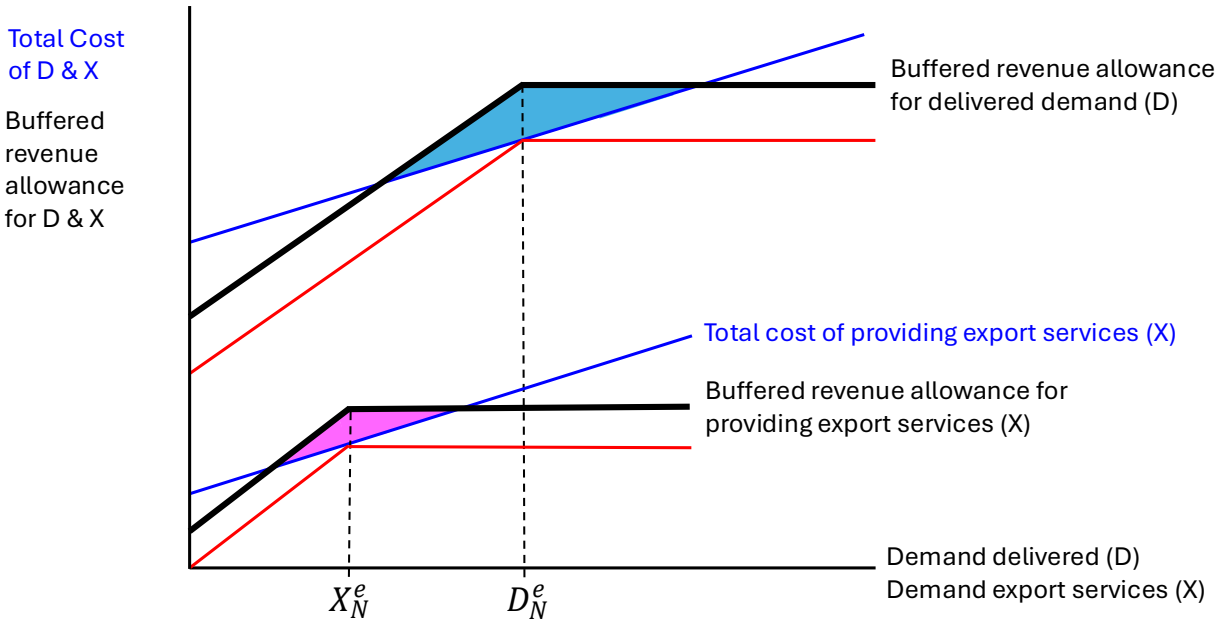
Section 5.1 demonstrates how the mechanisms described in section 4 can be used to support network operators' provision of network export services. During the still nascent stages of the energy transition, policy makers may, however, wish to impose targets for the provision of network export services – rather than relying on network operators' forecasts. Section 5.2 describes how the same mechanisms can be used in support of policy targets for network export services.

5.1 Holding network operators responsible for forecasting demand for export services

Network operators incur costs when supplying network export services (X). It is beyond the scope of this paper to consider the extent to which these costs are incurred over-and-above the costs of meeting demand for delivered energy (D). For simplicity, it is just assumed these costs also consists of a fixed and variable component. In contrast to demand tariffs, network export tariffs are assumed to consist entirely of a variable component with no fixed charge. This latter assumption appears to mirror network export pricing practices in the National Electricity Market.

Under these circumstances, a buffered revenue allowance mechanisms can be applied to the provision of network export tariffs by network operators. Figure 5A illustrates how such an arrangement would sit alongside the buffered revenue allowance for delivered demand.

Figure 5A. Applying the same mechanism to network export services



The upper set of curves in Figure 5A correspond to those shown in Figure 4C. The upper black curve represents a buffered revenue allowance for a network operator delivering its expected level of demand (D_N^e).

The bottom set of curves in Figure 5A represent a buffered revenue allowance for a network operator providing network export services. The mechanism is identical to the one described by the upper curves. It requires the network operator to forecast the level of network export services it expects its consumers will require (X_N^e). The kinked revenue allowance strongly encourages the network operator to reveal its honest forecast for these services.

(Figure 5A is illustrative only. Nothing should be read into the slopes of the various curves, the positioning of D_N^e and X_N^e, or the size of the two buffers.)

5.2 Using the mechanism to set targets for network export services

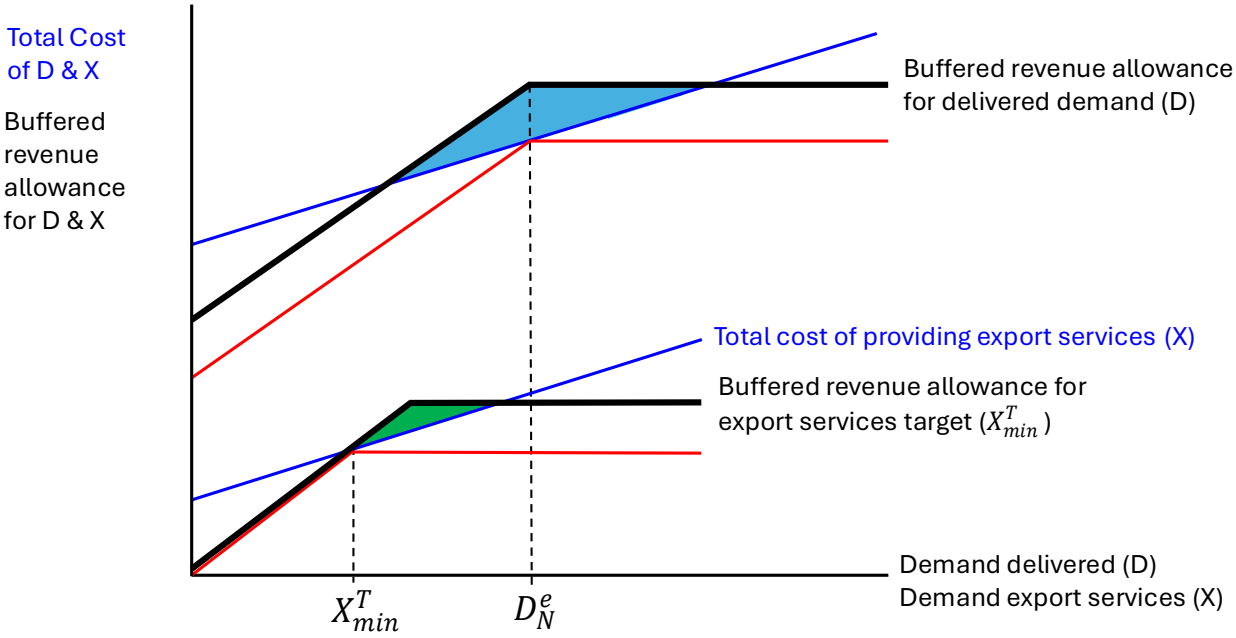
The regulators appear to be clearly concerned, if not sceptical, about network operators' interests in providing – let alone promoting – network export services under the core regulatory framework they have created. This scepticism is behind the suite of demand-side incentive schemes they have introduced in recent years (see Box 2C). In which case, there may be scepticism about whether network operators would be sufficiently ambitious when forming their expectations about consumers' potential desire for network export services. That is, X_N^e may understate latent consumer demand for network export services.

In light of such scepticism, regulators (or preferably policy makers) could impose a network export services target (X^T) on each network operator. The buffered revenue allowance mechanism described is easily modified to support the imposition of such targets. It would simply involve replacing X_N^e in Figure 5A with X^T.

Given it is still early days for distributed energy resources, regulators or policy makers might prefer a more ambitious approach to promoting network export services. For example, rather than setting a fixed export target (X^T) for each network operator, they may prefer to set minimum targets (X_{min}^T) with an incentive for network operators to exceed those minimums. Minimum targets can be supported using the buffered revenue allowance mechanism described above. Such an arrangement is illustrated in Figure 5B.

Under the mechanism illustrated in Figure 5B, a network operator would be strongly motivated to at least deliver X_{min}^T but would be rewarded for exceeding that amount.

Figure 5B. Promoting network export services in excess of a minimum target



Determining the value of X^T_{min} is beyond the scope of this paper. It could, for example, be set as a proportion of the network operator's expected demand for delivered electricity (D^e_N) with the ratio increasing asymptotically over time while the market for network export services matures. Arguably, the need for minimum export targets would only be required until consumer demand for these services reaches a sufficient level of maturity. Thereafter, the mechanism could potentially revert to the one illustrated in Figure 5A.

Perhaps most importantly, applying a buffered revenue allowance to support the provision of network export services would eliminate the need for the numerous incentive schemes listed in Box 2C – thereby fulfilling the two principles motivating this paper[60] and greatly simplifying network regulation.

[60] That is, the regulatory framework would no longer be seeking to solve the same problem that it has created; and the regulator would no longer be second-guessing the parties it regulates.

6. Completing the picture

This paper is motivated by the pursuit of two regulatory principles. First, the regulatory framework cannot create and solve the same problem. If the regulatory framework causes a problem for consumers, regulators or policy makers, then the problem can only be addressed efficiently by redesigning the framework to avoid creating the problem in the first place. Second, regulators should not be second-guessing (or seeking to outwit) the parties they regulate. Network operators should be held responsible and accountable for honestly forecasting and efficiently delivering network services.

The current regulatory approach to forecasting and managing demand (D) and the provision of network export services (X) directly contradicts these two principles. This has resulted in the labyrinthine and costly regulatory arrangements described in sections 2 and 3 of this paper.

The mechanisms described in sections 4 and 5 demonstrate it is possible to satisfy these two principles. These mechanisms hold network operators responsible for meeting consumers' demand for delivered energy (D) as well as supporting consumers' opportunity to export their surplus electricity (X) to the grid.

The following discussion outlines four elements that complete the alternative approach to regulating network demand. Section 6.1 discusses the need to consider carefully how delivered demand (D) and network export services (X) are measured. Section 6.2 describes the very targeted role regulators would play in safeguarding the integrity of the alternative framework. Section 6.3 explains how the alternative approach to regulating energy networks would drive a profound culture shift within the sector. Section 6.4 concludes the discussion by highlighting how the alternative arrangements may render the traditional 5-yearly regulatory process redundant.

6.1 Defining demand and network export services

It is beyond the scope of this paper to offer definitions for how delivered demand (D) and network export services (X) are measured for the purpose of the alternative mechanisms described in sections 4 and 5. It may not be as simple as measuring them just in volumetric terms, that is, kilowatt-hours (kWh) delivered and exported. It may require weighted or composite measures encompassing metrics that capture service quality and network performance. For example, this might include accounting for factors such as network reliability, system stability, frequency and volume of export curtailment (planned and unplanned), congestion, or asset utilisation.

6.2 Safeguarding honest forecasting without increasing regulatory complexity

The mechanisms outlined in sections 4 and 5 promote honest forecasting and management of demand (D) and the efficient provision of network export services (X) by network operators. In turn, these mechanisms (along with those described in other papers in this series) promote honest forecasts of expected costs (TC_N^e) from network operators and in turn, reliable forecasts of their revenue requirements (R_N^e). Nonetheless, there remains a possibility that network operators might still try to game these mechanisms – at least in the short-term.

This risk is readily mitigated by options already built into the alternative regulatory approach without any need for new rules, processes or schemes.

If a network operator's outturn demand and revenue requirement (D^*, R^*) vary significantly from the operator's forecasts (D_N^e, R_N^e) without acceptable explanation, the regulator would boost the strength of the honesty incentives already built into the regulatory mechanism. This is achieved by the regulator decreasing the concavity (that is, increasing the steepness) of the offset curve in Figure 4D. Decreasing concavity increases the cost of a buffer of any size for the network operator. Consequently, the network operator would face the choice of either a lower rate of return (because it is compensating consumers more for providing the same buffer) or the choice of a smaller buffer (meaning the network operator faces greater risk if it again mis-forecasts demand).

The regulator could also boost the strength of the honesty mechanisms applying to the network operator's capital expenditure forecasts, as described in Ben-David (May 2026).[61] (Future papers will look at honesty mechanisms for other elements of a network operator's revenue requirements.)

While increasing the strength of these honesty mechanisms would have no bearing on past mis-forecasts by a network operator, it would increase the costs to a network operator of future mis-forecasts. If regulators ensure this remains a credible and material threat, then backward induction should ensure the threat is never exercised. But if exercising the threat is required, then regulators should do so without hesitation.

6.3 Network operators are not mere bystanders

Having made their forecasts of demand (D_N^e) and export services (X_N^e), network operators are not thereafter hostages to fortune. They are not mere observers of outturn results (D^*, X^*).

The regulatory arrangements described in this paper encourage network operators to take charge of their destiny by using the tools at their disposal to facilitate outturn results that align as closely as possible with their forecasts – thereby managing the risks they face under the kinked revenue allowance curves described in sections 4 and 5. Each network operator would be self-motivated to shape how network users engage with its services by rebalancing it tariff structures[62] and developing innovative demand-side measures.

This means network operators must have broad discretion over the design of their tariff structures and their demand-side measures. Broadly speaking, the regulators' role would be limited to disallowing exploitative products, punitive tariffs or inequitable demand-side measures. In contrast to current regulatory arrangements, the regulators would not be dictating or approving network operators' tariff structures. Nor is there any need for the regulated demand-side incentive schemes listed in Box 2C. These schemes would all be abolished and replaced by the measures each network operator considered most useful in shaping the use of its network.

As section 7 concludes, making network operators responsible for honestly forecasting and strategically managing demand would drive a profound cultural shift within the sector. Network operators would no longer have the luxury of operating as mere asset managers. Instead, the regulatory arrangements outlined in this paper would drive network operators to optimise the use of their network assets – all without the heavy presence of second-guessing regulators.

---

[61] This would most readily involve decreasing the value of alpha (α) and/or increasing the value of beta (β) in equation (6) in Ben-David (May 2026) – see p.25.

[62] Rebalancing must occur with the network operator's 'basket' of tariffs (see section 3.1) and not breach its revenue allowance.

6.4 The end of regulation as we know it?

There are, however, even more profound possibilities to be realised from implementing the mechanisms outlined in this paper.

Because these arrangements eliminate any reason for network operators to game their forecasts, they have no reason for not sharing their updated forecasts with the regulator when circumstances change. In which case, there would be no substantive need for the uncertainty mechanisms described in Box 3A and, in turn, the central role the regulator plays in administering and determining outcomes under those mechanisms. Instead, the regulator could simply allow a network operator to update its forecasts when circumstances change (with tariffs adjusting in line with those new forecasts). No interrogation by the regulator would be required.

There appears to be only one reason for constraining network operators' autonomy to update their forecasts and prices as circumstances change – namely, it may introduce unwelcomed volatility in the prices charged for network services. This suggests the regulator may need to establish (1) materiality thresholds that must be met before network forecasts and prices can be automatically updated by network operators; and (2) limits on how frequently they can update their forecasts and prices.

To the extent this leaves network operators bearing a short-term risk of an outturn result that differs from their forecasts, they would be expected to anticipate and manage that risk using the mechanisms provided in this paper – namely, thinking strategically about (i) the interplay between the demand they deliver and the network exports they facilitate (sections 4 and 5), (ii) the size of the buffers they nominate *ex ante* (section 4.3), and (iii) the mechanisms they use in seeking to influence outturn results (section 6.2) until they can next update their forecasts.

However, the alternative regulatory arrangements outlined in this paper give rise to an even more profound and intriguing question – namely, whether there is even a need for the current 5-yearly regulatory process with its myriad of steps, obligations, resource demands, and so on.[63]

The traditional 5-year regulatory cycle rests on two premises. First, it provides the regulator sufficient opportunity to observe network operators' true costs of delivering services during the concluding regulatory period. Second, it provides the regulator time to gather and evaluate information (via network operators' revenue proposals) to inform its forecasts of network operators' revenue requirements in the upcoming regulatory period.

Both premises are rendered moot by the mechanisms outlined in this paper which promote honest forecasting by networks thereby relieving the regulator of having to produce its own forecasts and therefore the need to gather this information. In which case, there would seem to be no reason to continue with the traditional 5-year regulatory cycle. Network operators could simply update their forecasts from time-to-time (and subject to the two constraints noted above).

The possibility of abolishing the traditional regulatory cycle will be examined more closely in a later paper in this series.

[63] The traditional 5-year regulatory cycle and the concept of revealed cost regulation are described in Ben-David (May 2026).

7. Conclusion: Network operators finally become network system optimisers

For 30 years, the economic regulation of network infrastructure in Australia has presumed the need for regulators to countervail the inclinations of natural monopoly network operators.[64] The so-called "proposed-respond" model of regulation embeds the regulator at the centre of the regulatory exercise through thousands of pages of laws, rules, guidelines, standards, and so on. The entirety of incentive-based regulation is predicated on the belief that regulators are required to second-guess network operators' forecasts of demand, expenditure and revenue. But as highlighted in this paper, the regulators are conscious of their own forecasting fallibilities. And so, they lean toward over-compensating network operators (section 2.3), injecting themselves into managing network outcomes (section 2.4) and building elaborate mechanisms to manage uncertainty (section 3.4).

This paper highlights the weakness of the conceptual foundations on which this entire regulatory edifice rests (section 2.1) and how alternative foundations lead to an entirely different approach to network regulation (section 2.5)

The regulatory approach outlined in this paper is therefore not a variant of the existing approach – with its multitude of rules, processes and incentive schemes seeking to outwit network operators by getting them to reveal their efficient costs over multiple regulatory cycles. Instead, this paper is based on two entirely different principles. First, the regulatory framework cannot create and solve the same problem and, second, network operators should be held fully responsible and accountable for honestly forecasting and delivering network services.

The regulatory arrangements outlined in this paper ensures network operators respond to forecasting uncertainty by:

- producing their best forecasts without fear of being second-guessed by the regulator – that is, network operators have no incentive to 'game' the regulator because the regulator does not produce competing forecasts
- considering the extent to which they efficiently 'insure' themselves against forecasting uncertainty through the use of a forecasting buffer (Figure 4C) and with full knowledge about the cost of doing so (Figure 4D)
- taking into account limited or no access to uncertainty mechanisms (sections 3.4 and 6.4)
- avoiding the credible threat of intensified incentives in response to unexplainable forecasting errors (section 6.2)
- deploying available tools to facilitate outturn results that align as closely as possible with their forecasts (section 6.3), and
- potentially using the opportunity to reforecast their demand and revenue requirements as circumstances change (section 6.4).

[64] As noted earlier, this paper is primarily written with electricity distribution network operators in mind. Whether this alternative approach to network regulation (or some variant thereof) is applicable to other network operators awaits further exploration.

This alternative approach to network regulation contrasts starkly with the heavy-handed, convoluted and costly regulatory framework currently in practice. In doing so:

- It makes entirely clear to consumers, policy makers and regulators that network operators are fully responsible for honestly forecasting and efficiently delivering network services.
- It relieves the regulators of having to maintain the costly machinery required to second-guess every aspect of network operators' revenue proposals.
- It motivates network operators to approach product and tariff design as a strategic endeavour rather than an exercise in regulatory compliance.
- It avoids regulators complicating regulatory arrangements just to alleviate for their own forecasting insecurities.
- It promotes a more efficient, fair and transparent allocation of risk between network operators and consumers.
- It reduces compliance costs for network operators to a mere fraction of current costs.

When these outcomes are viewed in their totality, there is one additional consequence that perhaps outweighs all these benefits combined.

The approach outlined in this paper revolutionises in its totality the role of network operators. Rather than viewing themselves as mere asset managers whose chief duty is to comply with a myriad of regulatory requirements, network operators would finally need to act as genuine **network system optimisers**.

The cultural shift would be profound.

For regulators, the cultural shift would be no less categoric as their *raison d'etre* of the past 30 years would no longer exist. The regulators would no longer be responsible for inventing and administering an ever-growing morass of rules, processes and schemes. They would no longer play the role of *second-guesser-in chief*. Instead, they would narrowly focus on managing the incentives that hold network operators fully accountable for honestly forecasting the demand for network services.

This paper demonstrates the time has come for a fundamental rethink of network regulation.

— END —

REFERENCES

Ben-David, Ron (May 2026) *Regulating energy networks without the regulator. Chapter 1: Capital Expenditure*. Available at: https://www.monash.edu/__data/assets/pdf_file/0006/4335828/Ron-Ben-David-Regulating-energy-networks-without-the-regulator-May-2026.pdf

*

Australian Competition and Consumer Commission (December 2003) *Tasmanian Transmission Network Revenue Cap 2004–2008/09*. Available at: https://www.aer.gov.au/industry/registers/determinations/transend-determination-2004-09/final-decision

Australian Energy Market Commission (August 2026) *Electricity network regulation review: Package 2. Consultation paper*. Available at: https://www.aemc.gov.au/market-reviews-advice/electricity-network-regulation-review-package-2

Australian Energy Market Commission (June 2026*) Final Report: The pricing review - Electricity pricing for a consumer-driven future*. Available at: https://www.aemc.gov.au/sites/default/files/2026-06/final_report.pdf

Australian Energy Market Commission (July 2017) *The economic regulatory framework for electricity network service providers*. Available at: https://www.aemc.gov.au/markets-reviews-advice/electricity-network-economic-regulatory-framework

Australian Energy Market Operator (September 2026) *Rule change requests – IPRR staged implementation approach rule change request package*. Available at: https://www.aemc.gov.au/rule-changes/iprr-staged-implementation-approach

Australian Energy Regulator (July 2026) *2026 Network Performance Report*. Available at: https://www.aer.gov.au/publications/reports/performance/2026-electricity-and-gas-networks-performance-report

Australian Energy Regulator (July 2026a) *State of the energy market. Network performance report 2026*. Available at: https://www.aer.gov.au/publications/reports/performance/2026-electricity-and-gas-networks-performance-report

Australian Energy Regulator (June 2026) *Future of electricity network regulation – Information paper*. Available at: Information paper - Future of network regulation | Australian Energy Regulator (AER)

Australian Energy Regulator (June 2023) *Export service incentive scheme. Final.* Available at: https://www.aer.gov.au/industry/registers/resources/schemes/export-service-incentive-scheme

Australian Energy Regulator (February 2023) *Rate of Return Instrument. Explanatory Statement*. Available at: https://www.aer.gov.au/documents/aer-explanatory-statement-rate-return-instrument-24-february-2023

Australian Energy Regulator (August 2022) *Position paper: Capital Expenditure Sharing Scheme.* Available at: https://www.aer.gov.au/documents/aer-position-paper-review-incentive-schemes-options-capital-expenditure-sharing-scheme

Australian Energy Regulator (December 2021) *Review of incentive schemes for networks. Discussion paper.* Available at: https://www.aer.gov.au/documents/aer-review-expenditure-incentive-schemes-discussion-paper-december-2021

Australian Energy Regulator (May 2016) *Powercor distribution determination 2016 to 2020. Final Decision. Overview.* Available at: https://www.aer.gov.au/industry/registers/determinations/powercor-determination-2016-20/final-decision

Australian Energy Regulator (October 2015) *SA Power Networks determination 2015−16 to 2019−20. Final Decision. Overview*. Available at: https://www.aer.gov.au/industry/registers/determinations/sa-power-networks-determination-2015-2020

Consumer Reference Group (July 2026) *CRG submission to Draft Rate of Return Instrument*. Available at: https://www.aer.gov.au/documents/crg-submission-draft-2026-rori-31-july-2026

Consumer Reference Group (September 2022) *Response to the AER's Draft Rate of Return Instrument*. Available at: https://www.aer.gov.au/documents/crg-advice-aer-re-draft-rori-june-2022-september-2022

Pierce, John (May 2013) *Carrots, sticks and tightropes: The regulator's balancing act in incentivising efficient behaviour.* p.9. Available at: https://www.aemc.gov.au/sites/default/files/content/J-Pierce-conference-paper-Carrots%2C-sticks-and-tightropes-The-regulator-s-balancing-act-in-incentivising-efficient-behaviour.pdf?utm_source=chatgpt.com

Reeves, Andrew – AER Chairman 2010–14 (December 2011) *Finding the Balance – The Rules, Prices and Network Investment.* Network. Issue 42. p.2. Available at: https://www.accc.gov.au/system/files/Network%20-%20Issue%2042.pdf#:~:text=under-investment%20in%20infrastructure%20has%20a,development%20of%20the%20AER's%20rule

About the author

Dr Ron Ben-David is a Professorial Fellow, Monash Business School, and the principal of Solrose Consulting. He is a board member with the Consumer Policy and Research Centre (CPRC), Regulatory Policy Institute (A-NZ) and Australian Communications Consumer Action Network (ACCAN), and previously the ClimateWorks Centre. Ron served as Chair of the Essential Services Commission (Vic) between 2008-2019 and has since served in advisory roles with the Centre for Market Design (University of Melbourne), the Australian Energy Regulator (AER) and Infrastructure Victoria. Ron was recently a member of an Independent Pricing Committee for the National Disability Insurance Agency. In 2022, he was appointed deputy chair of the Victorian Gambling and Casino Control Commission. Ron writes and presents extensively on energy markets and regulation and has been described as "one of Australia's leading energy thinkers".

The views expressed below are those of the author. They do not represent the views of the Monash Business School or the Monash Energy Institute.