Review of incentive schemes

Response to AER Discussion Paper

15 March 2022

Energy Networks Australia

Contents

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Key messages

- The **AER's incentive schemes have benefited consumers by delivering lower network prices and improved service quality,** producing outcomes that are in the long-term interests of consumers. These schemes have **encouraged networks to innovate and become consistently more productive over time**.
- HoustonKemp has **independently quantified that consumers with an electricity and gas service are $1,466 better off as a result of the incentive schemes**.

  HoustonKemp's analysis demonstrates that the **majority of benefits accrue to consumers rather than to networks, consistent with the intention and mechanics of the schemes**. Incentive payments to networks do not arise if consumers do not benefit.
- The AER's **expenditure incentive schemes are fit for purpose and operating as intended by incentivising efficient expenditure and delivering benefits to consumers**.
  - The **case for changing the Capital Expenditure Sharing Scheme has not been made** → there is no clear evidence of a problem warranting change.
  - There are **strong current safeguards, and the positive effect of recent reforms** made to AER assessment methods and supporting processes will be further realised in future rounds of regulatory determinations.
- However, a **review of the market impact component (MIC) in the transmission Service Target Performance Incentive Scheme is required** → market developments have resulted in the MIC no longer being an effective incentive mechanism for transmission networks. It is important that the AER provide clarity to stakeholders on when and how it is intending to address these concerns.

1 Overview

Energy Networks Australia (**ENA**) appreciates the opportunity to respond to the Australian Energy Regulator's (**AER**) Discussion Paper for its incentive scheme review.[1]

ENA is the national industry body representing Australia's electricity transmission and distribution and gas distribution networks. Our members provide more than 16 million electricity and gas connections to almost every home and business across Australia.

Australia's energy networks are regulated through an incentive-based system that encourages networks to find better ways to serve customers. The AER's incentive schemes enhance the overall regulatory

[1] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021.

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framework by ensuring networks have a strengthened and constant incentive to continually lower their costs and improve service performance.

This review provides an opportunity to assess the operation and performance of incentive schemes which are significant features of Australia's network regulatory framework.

ENA engaged HoustonKemp to provide an independent estimate of the consumer and network benefits of the AER's incentive schemes. HoustonKemp's analysis shows that the schemes have benefited consumers by delivering lower network prices and improved service quality.

The financial rewards provided under the incentive schemes encourage energy networks to improve network services whilst simultaneously lowering the costs of providing these services. The schemes have encouraged networks to innovate and become more productive, with consumers receiving the majority of these benefits, consistent with the intention and mechanics of the incentive schemes.

ENA strongly supports the AER's expenditure incentive schemes, which are fit for purpose and operating as intended by incentivising efficient expenditure and delivering benefits to consumers. Potential or claimed concerns with the incentive schemes must be carefully evaluated and clearly evidenced. There is no clear evidence that significant problems exist with the existing suite of expenditure schemes and the case for changing the Capital Expenditure Sharing Scheme has not been made.

Network businesses caution against prematurely undermining the capital expenditure incentives when these have only applied in one regulatory period. The capital expenditure incentives have not been in place for sufficient time to observe any trend of concerning behaviour by networks, nor has there been sufficient time to observe the full impact of the recent reforms made to AER assessment methods and supporting processes. In this regard, a key consideration for the review must be the role of regulatory predictability and confidence, which critically underpins current and future upfront investments by networks that are designed to achieve further efficiencies. Where incentive schemes have been introduced with the goal of impacting long-term investment decision-making, and they appear to be operating effectively to the benefit of consumer, there should be a 'high bar' for change and a preference for stability.

ENA, however, continues to recommend a review of the market impact component (**MIC**) in the transmission Service Target Performance Incentive Scheme. Market developments have resulted in the MIC no longer being an effective incentive mechanism. While currently outside of the scope of this review, we strongly recommend that the AER provide clarity to stakeholders on when and how it is intending to address these concerns.

2 Incentive regulation

Key messages

- Australia's energy networks are regulated through an **incentive-based system that encourages networks to find better ways to serve customers**. **Incentive regulation avoids the pitfalls of cost-plus regulation.**
- The AER's **incentive schemes enhance the overall regulatory framework by ensuring that networks have a strengthened and constant incentive to continually lower their costs and improve service performance**.

2.1 Role of incentive regulation

Energy networks provide an essential service to almost every household and business across Australia. However, as regulated businesses, networks are not exposed to the same degree of competitive market forces that would otherwise drive the need to contain costs and/or improve efficiency.

This is where incentive regulation, operated by the AER, steps in. The AER thoroughly reviews each network's proposed expenditure plans and sets prudent and efficient expenditure allowances and the maximum revenue that networks can collect from customers in a regulatory period (usually five-years).

This in turn encourages networks to deliver essential services in the most efficient possible manner. If efficiencies result in cost reductions in a regulatory period, the AER uses these revealed costs to set even more efficient expenditure and maximum revenue allowances in future regulatory periods. I**ncentive regulation therefore drives businesses to reveal their most efficient costs to serve customers and deliver essential services**. Efficiency improvements are passed on to consumers in the form of lower network charges.

Incentive regulation avoids the pitfalls of cost-plus regulation, which would allow networks to pass through their actual costs (plus a reasonable return on invested capital). Such an approach embeds poor incentives for business efficiency, typically leading to higher than necessary costs and/or lower quality of service for customers.

2.2 Incentive schemes

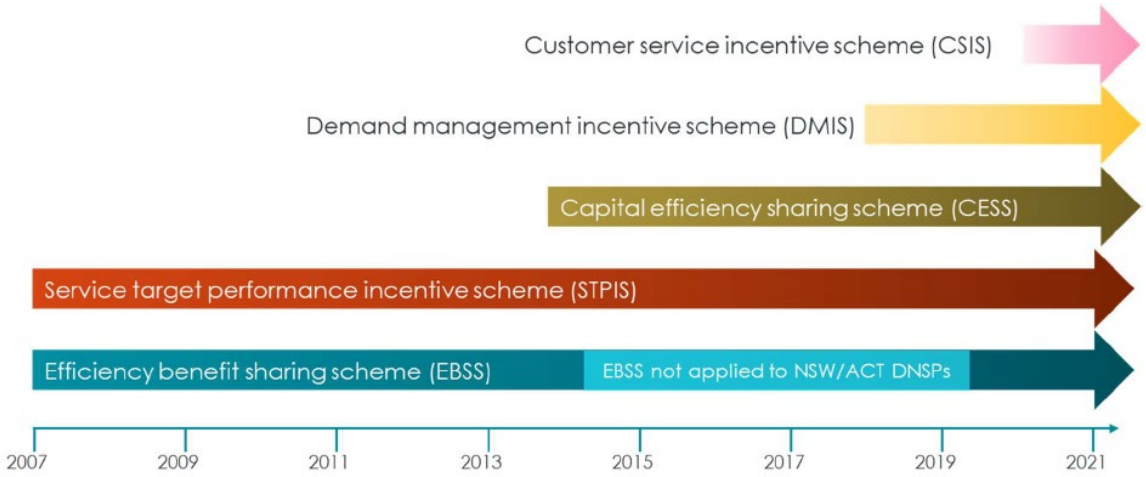
The AER's incentive schemes enhance the overall regulatory framework by ensuring networks have a strengthened and constant incentive to continually lower their costs and improve service performance.

The schemes are applied to networks through the regulatory determination process, and now include the:

- Capital Expenditure Sharing Scheme (**CESS**),
- Efficiency Benefit Sharing Scheme (**EBSS**),
- Service Target Performance Incentive Scheme (**STPIS**),
- Demand Management Incentive Scheme (**DMIS**), and
- Customer Service Incentive Scheme (**CSIS**).

A timeline of the schemes' development is shown in **Figure 1** below. Note that these schemes did not apply to all networks from the development of the scheme, instead schemes generally applied from the start of the network's next regulatory period following the development of the scheme.

Figure 1: AER Incentive schemes – timeline of development



Source: HoustonKemp, Consumer benefits resulting from the AER's incentive schemes, March 2022.

Figure 2 below provides an overview of the operation of the three core incentive schemes that are the focus of the AER's Discussion Paper.

Figure 2: AER Incentive schemes – operation of the EBSS, CESS & STPIS

EBSS	CESS	STPIS
• **Customer benefit: Share in opex savings.** • Provides networks with financial incentives to undertake efficient opex over time.	• **Customer benefit: Share in capex savings.** • Provides networks with financial incentives to undertake efficient capex over time, to ensure that only efficient capex is added to the RAB.	• **Customer benefit: Service performance is maintained or improved even as networks seek cost efficiencies under the EBSS & CESS.** • Provides networks with financial incentives for maintaining and improving network performance, to the extent that consumers are willing to pay for such improvements.

The incentive schemes apply efficiency gains and losses symmetrically – or in other words, networks can receive rewards, but they also receive penalties, and the rewards that networks can receive mirror the penalties that may be imposed.

3 Benefits of the incentive schemes

Key messages

- The AER's **incentive schemes have benefited consumers by delivering lower network prices and improved service quality**, producing outcomes that are in the long-term interests of consumers. These schemes **have encouraged networks to innovate and become more productive**.
- HoustonKemp's analysis demonstrates that the **majority of incentive scheme benefits accrue to consumers rather than to networks, consistent with the intention and mechanics of the incentive schemes**. Incentive payments to networks do not arise if consumers do not benefit.
- HoustonKemp has **independently quantified that consumers with an electricity and gas service are $1,466 better off**.
- ENA **supports the AER's observation that the regulatory framework balances incentives on networks to seek efficiencies while providing good levels of service**.[2]

3.1 Balanced independent assessment

In assessing the effectiveness of incentive schemes, it is important to consider not only the benefits to networks of the schemes (in the form of incentive payments) but also the benefits that consumers receive from networks responding to the AER's incentives.

As part of this review, ENA engaged HoustonKemp to provide an independent estimate of the consumer and network benefits of the AER's incentive schemes (the report can be found at **Appendix A**).

HoustonKemp has quantified the benefits of the EBSS, CESS, and the reliability component of the STPIS (for electricity distribution networks) over the period 2006 to 2020 whilst the incentive scheme applied.

3.2 Key findings

HoustonKemp, in its review of the AER's incentive schemes, found the following:

> *Our analysis shows that the **AER's incentive schemes have benefited consumers by delivering lower network prices and improved service quality**. The financial rewards provided to energy networks under the incentive schemes encourages them to improve network services whilst simultaneously lowering the costs of providing these services.*[3]

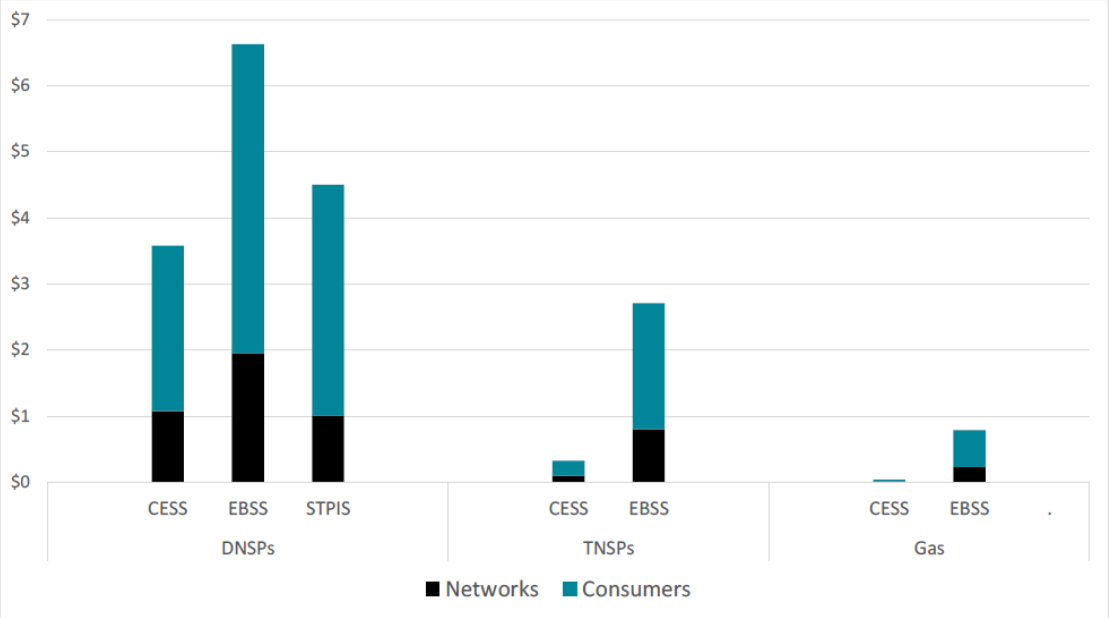
HoustonKemp's report estimates that the total benefits attributable to the incentive schemes is $18.6 billion (present value (PV), 2020), with consumers retaining $13.4 billion (PV, 2020) and networks receiving $5.2 billion (PV, 2020). The $13.4 billion represents the net gain to consumers after any incentive payments to networks and translates into gains for the average consumer with both an electricity and gas of $1,466, as shown in **Figure 3** and **Figure 4.**

[2] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 26.

[3] HoustonKemp, *Consumer benefits resulting from the AER's incentive schemes*, March 2022, key findings section [emphasis added].

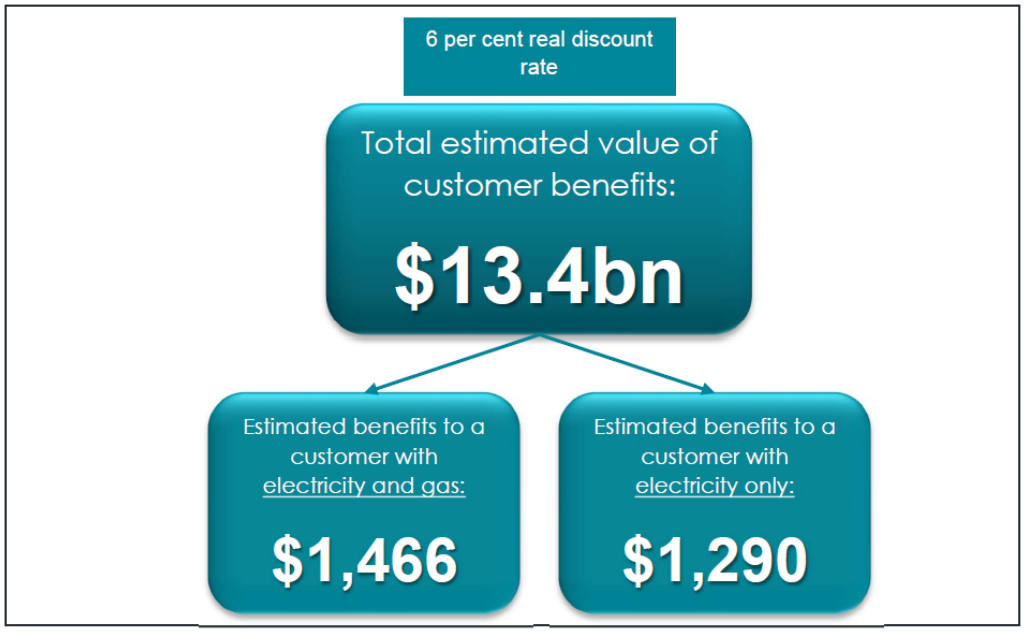
Importantly, the **majority of benefits accrue to consumers rather than to networks, consistent with the intention and mechanics of the incentive schemes**.

Figure 3: Total benefits of EBSS, CESS & distribution STPIS (reliability) ($bn in PV, 30 June 2020)



Source: HoustonKemp, Consumer benefits resulting from the AER's incentive schemes, March 2022.

Figure 4: Total consumer benefits of EBSS, CESS & distribution STPIS (reliability) (PV, 30 June 2020)



Source: HoustonKemp, Consumer benefits resulting from the AER's incentive schemes, March 2022.

HoustonKemp's analysis supports the AER's Discussion Paper observation that:

> *"…consumers have experienced both fewer and shorter outages over time, despite reductions in network revenues and expenditure"* and
>
> *"These reliability trends broadly suggests that network providers have been able to pursue efficient expenditure while maintaining service reliability.* ***This is an important outcome as it provides a high-level insight that the regulatory framework appears to balance incentives on network providers to seek efficiencies while providing good levels of service****."*[4]

4 ENA assessment of the incentive schemes

Networks have responded to the incentives as intended – the schemes have resulted in lower network operating costs, more efficient network investments and improved reliability – and there have been material benefits to consumers. Crucially, payments to networks do not arise if consumers do not benefit.

As shown in **Table 1**, ENA's overall position is that the AER's expenditure incentive schemes (EBSS & CESS) are fit for purpose and operating as intended. They play an important role in incentivising efficient expenditure and are delivering benefits for consumers, as demonstrated clearly in HoustonKemp's analysis.

The table also highlights our strong and continued position that the MIC of the transmission STPIS is no longer fit for purpose and needs to be reviewed – it is important that the AER provide clarity to stakeholders on when and how it is intending to address these concerns. In addition, ENA supports a continued focus on outcome-based incentives schemes that are flexible enough to accommodate evolving customer expectations and service offerings.

Table 1: AER incentive schemes – ENA assessment

AER incentive scheme	ENA assessment	Comment
EBSS		» EBSS is **fit for purpose and operating as intended** → incentivising **efficient opex and delivering benefits to consumers**. » EBSS **provides a continuous, or constant, incentive to reduce opex** → ensures that base year opex can be used in setting allowances in subsequent regulatory period. » Recent **inclusion of a positive productivity factor guarantees that consumers receive 100% of the expected improvement in productivity** over the regulatory period.

[4] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, pages 25-26 [emphasis added].

AER incentive scheme	ENA assessment	Comment
CESS		» CESS is **fit for purpose and operating as intended → incentivising efficient capex and delivering benefits to consumers**. » The case for changing the CESS has not been made → **there is no clear evidence of a problem warranting change**. » **Strong current safeguards** (e.g., AER information request process, role of capex deferments, ex-post review) combined with **recent refinement of AER methods and supporting processes** (e.g., introduction of AER Better Resets Handbook and enhanced AER expenditure assessment techniques) → **positive effect of recent reforms will be realised in future rounds of regulatory determinations**.
STPIS (distribution) - reliability		» Service reliability component of the distribution STPIS is **fit-for-purpose and is delivering positive outcomes for customers**.
STPIS (distribution) – Customer service & CSIS		» CSIS encourages networks to engage with their customers & provide customer service in accordance with their preference. » Support an **increasing focus on service performance incentive schemes that are flexible enough to accommodate evolving customer expectations and service offerings**.
STPIS (transmission)		» A **review of the MIC is required** → market developments, specifically the changing composition of the wholesale market, has resulted in the **MIC no longer being an effective incentive mechanism**.

5 AER's expenditure incentive schemes

Key messages

- The **AER's expenditure incentive schemes (EBSS & CESS) are fit for purpose and operating as intended by incentivising efficient expenditure and delivering benefits to consumers**.
- The **case for changing the CESS has not been made** → there is no clear evidence of a problem warranting change.
- There are **strong current safeguards and the positive effect of recent reforms made to AER assessment methods and supporting processes** will be realised in future rounds of regulatory determinations.
- We **do not support a bespoke application of the CESS. Consistent and stable regulatory incentive schemes** allow networks to confidently make investment and expenditure decisions that promote the interests of both today's and tomorrow's customers. There is a **continued need for incentive schemes to support efficient system transition investment**.
- We do **support a role for the AER in better communicating the role, operation and outcomes of the incentive schemes, along with how they fit within the wider regulatory framework**.

5.1 Overview

ENA supports the AER's position that the EBSS is broadly fit-for-purpose and plays an important role in ensuring that actual operating expenditure can be used in setting forecasts in subsequent regulatory periods.[5] HoustonKemp's report further supports the AER's conclusion that the EBSS, in conjunction with the AER's forecasting approach and the underlying incentives in the regulatory regime, is providing benefits to consumers by ensuring that network charges reflect the efficient costs of operating and maintaining the grid.[6]

As we understand it, the AER's primary focus of the review is whether the CESS is operating as intended and promoting efficient capital expenditure, citing potential information asymmetry concerns and proposing a bespoke application of the CESS as a potential solution.

Potential or claimed concerns with the incentive schemes must be carefully evaluated and clearly evidenced. There is no clear evidence that significant problems exist with the existing suite of schemes in place and the case for changing the CESS has not been made.

Network businesses caution against prematurely undermining the capital expenditure incentives when these have only applied in one regulatory period. The capital expenditure incentives have not been in place for sufficient time to observe any trend of concerning behaviour by networks, nor has there been sufficient time to observe the full impact of the recent reforms made to AER assessment methods and supporting processes.

[5] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 9.

[6] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 47.

In this regard, a key consideration for the review must be the role of regulatory predictability and confidence which critically underpins current and future upfront investments by networks that are designed to achieve further efficiencies. Where incentive schemes have been introduced with the goal of impacting long-term investment decision-making, and they appear to be operating effectively to the benefit of consumer, there should be a 'high bar' for change and a preference for stability.

5.2 Consumer benefits of the CESS

The CESS was developed as part of the AER's Better Regulation program and remedied the issue with the regulatory framework that capital incentives reduced in each year of the regulatory period. Pre-CESS, networks' incentives were strongest in the first year of the regulatory period, whilst in the final year there were no rewards or penalties for networks under/overspending their capital expenditure allowances.

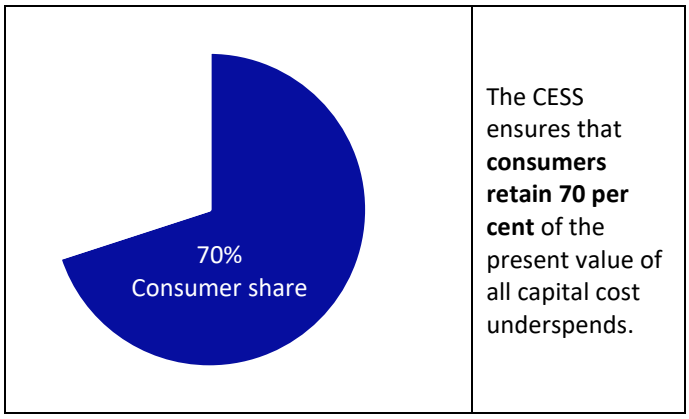
The CESS provides a network with the same reward for an efficiency saving and same penalty for an efficiency loss regardless of which year they make the saving or loss in.

As shown in **Figure 5**, consumers receive the majority of the CESS benefits. The CESS was first applied by the AER in 2015-16[7], and HoustonKemp has found that the CESS has delivered consumer benefits (PV 2020) of:

- $2.7 billion to electricity-only consumers (70 per cent of the total electricity CESS gains),
- $28 million to consumers that receive a gas service (70 per cent of the total gas CESS gains), and
- on an average per customer basis, $269 for customers with both an electricity and gas service, which is equivalent to just over 2 months of network charges.

The capital expenditure efficiency gains represent 18 per cent of the total consumer benefits for customers with both an electricity and gas from the three incentive schemes (i.e., $269 of the $1,466 per customer gains demonstrated in Figure 4 in Section 3.2).[8]

Figure 5: Share of CESS benefits to consumers



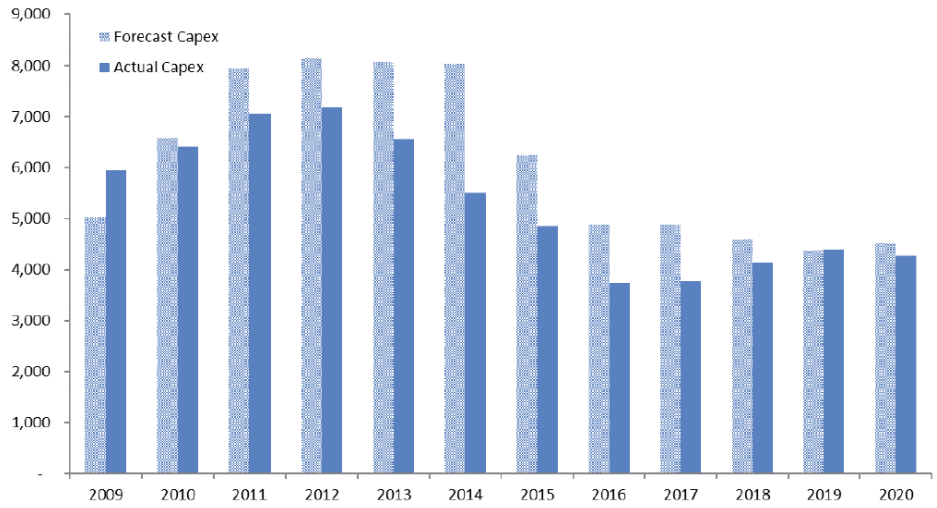
[7] The CESS was developed by the AER in 2013, with it applying to most electricity networks in 2015/16 or 2016. The CESS has been applied to Victorian gas networks since 2018.

[8] HoustonKemp, *Consumer benefits resulting from the AER's incentive schemes*, March 2022, page 9.

5.3 Capital expenditure profile

As demonstrated in the AER's Discussion Paper[9] and associated graph (**Figure 6** below), total capital expenditure has declined over time and been below the capital expenditure allowances independently set by the AER. The AER highlights that, where networks have been able to spend less than forecast despite reductions in forecast capital expenditure over time, it will lead to a relatively lower regulatory asset base (**RAB**) and consumers will benefit through lower network charges over time.

Figure 6: AER allowance ('forecast capex') and actual capital expenditure (electricity distribution)



Source: AER, Discussion Paper: Review of incentive schemes for networks, December 2021

However, the AER highlights two trends in capital expenditure that lead it to query the operation of the CESS. The AER notes that:

- networks appear to be spending more later in regulatory periods, and
- there is a growing disparity between initial proposals from networks and the AER's final decisions recently.

We address these directly in Section 5.3.1 and Section 5.3.2 below.

5.3.1 Timing of capital expenditure

The CESS has only been in operation for a short period (one regulatory period) and therefore it is too soon to observe any reliable or definitive trend from data. However, importantly, the fact that some networks in the first period of operation spent less in earlier years is inconsequential – the CESS is designed to be time invariant, and networks do not gain more depending on the capital expenditure pattern they adopt.

[9] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, Section 5 (Capital expenditure outcomes and incentives).

The AER's *Better Regulation: Expenditure incentives* fact sheet[10] explains that the CESS provides a network business with the same reward for an efficiency saving and same penalty for an efficiency loss regardless of which year they make the saving or loss in.

The CESS neutralises any financing benefit that networks obtain from adopting a different capital expenditure profile. Further, any underspend that results in a lower RAB benefits consumers over the long term where this is driven by efficiency. If it is driven by inefficient underspend, it will drive a deterioration in service quality that will then be penalised under the STPIS. If it is driven by an inefficient deferral of capital expenditure from one period until the next, the AER already has, under existing regulatory rules, the ability to remove this portion of underspend from the CESS calculations (as explained further in Section 5.4.1).

The varying expenditure profiles do, however, demonstrate that the timing of capital expenditure is influenced by a wide range of business specific and external factors, such as natural disasters, emergency events, market developments, and business transformation projects. For example, the capital expenditure profile of New South Wales networks during the 2014-19 regulatory period was driven by the lease transaction process which delayed expenditure early in the period and required correction later in the period.

5.3.2 Capital expenditure allowances vs actuals

The AER also observes that there has been a growing disparity between initial proposals from networks and its final decisions recently, noting that initial proposals from electricity distribution networks are typically higher than its final decisions.

The regulatory determination process is at least 21 months long and operates under a propose respond model. A network submits an initial regulatory proposal, the AER makes a draft decision, the network then submits a revised regulatory proposal, and the AER then makes its final decision, including a decision on the approved capital expenditure allowance.

The AER's final approved capital expenditure allowance is the input into the CESS mechanism, not the network's initial proposal. The usefulness of the comparison of networks' initial proposals and AER final decisions to the AER's assessment of the CESS is therefore unclear. In fact, the AER's observation may actually result from its greater discretion and capacity to scrutinise the reasonableness of networks' forecasts and substitute its own estimates compared to past periods.

Section 5.4.2 of our submission looks further into how the AER's expenditure assessment tool kit has been enhanced over time.

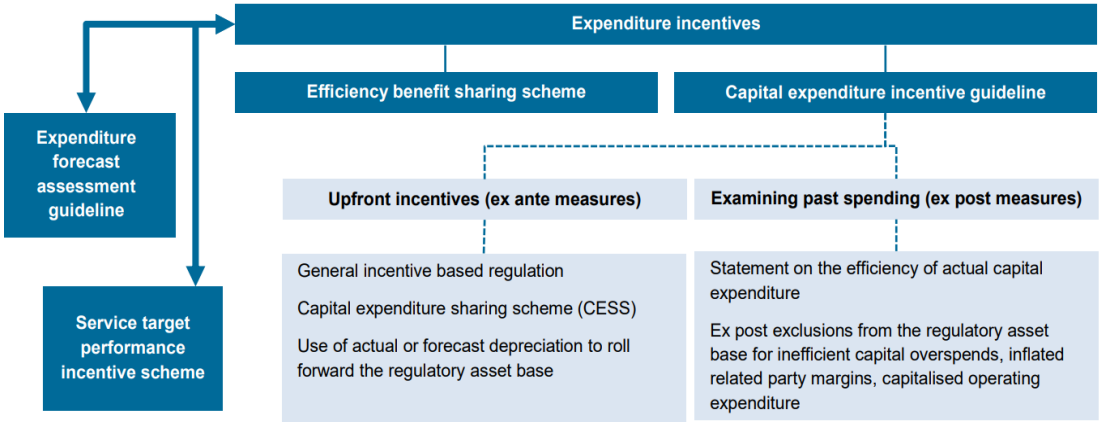
5.4 Incentive measures and safeguards

As outlined in the AER's *Better Regulation: Expenditure incentives* fact sheet and **Figure 7** below, the AER's capital expenditure incentive measures mean that consumers pay only a portion of efficient

[10] AER, *Better Regulation factsheet – expenditure incentives guideline*, November 2013.

overspends, pay nothing for inefficient overspends and consumers share in the benefits when a network business is able to spend less than its capital expenditure allowance.[11]

Figure 7: AER capital expenditure incentive measures



Source: AER, Better Regulation factsheet – expenditure incentives guideline, November 2013.

The AER's Discussion Paper highlights that some stakeholders are concerned with information asymmetry, querying whether the AER's capital expenditure forecasts are materially incorrect and therefore whether the CESS is rewarding genuine efficiency gains.

Strong current safeguards and recent reforms to AER methods and supporting processes, however, ensure that the CESS is fit for purpose. If there are concerns with the setting of approved capital expenditure allowances, then ENA supports a targeted approach to address this directly, rather than indirectly through a potential bespoke application of the CESS, leaving the primary concern unaddressed.

ENA does, however, support the AER in better communicating the role, operation and outcomes of the incentive schemes, along with how they fit within the wider regulatory framework. ENA considers it important to present to stakeholders not only the benefits to networks of the schemes (in the form of incentive payments) but also the benefits that consumers receive from networks responding to the AER's incentives.

5.4.1 Role of deferrals and AER information request powers

The CESS provides the AER with the flexibility to reduce the CESS rewards where it identifies that the network has deferred a material amount of capital expenditure between regulatory periods.

As explained by the AER, networks may defer capital expenditure between regulatory periods. This can be efficient where deferral extends the life of existing assets and reduces the need for additional investment in the near term, benefiting consumers through relatively lower network charges and more productive use of networks.

[11] AER, *Better Regulation factsheet – expenditure incentives guideline*, November 2013.

However, it is necessary to account for the deferral of capital expenditure projects in the calculation of CESS payments where a network defers expenditure between periods.

Short term deferrals will be detrimental to consumers where a network is able to defer a material amount of expenditure, and this leads to higher capital expenditure forecasts in the next regulatory period. This leads to consumers not sharing in the benefit of such a deferral and potentially paying for more than efficient costs.[12]

For this to occur, however, the AER's expenditure assessment tools (such as trend analysis, benchmarking and detailed project assessment) must fail to discover either:

- specific project(s) that have appeared in the network's proposed capital expenditure allowances in both the first and second regulatory periods – which is highly unlikely given that networks disclose details of major capital projects to the AER as part of the regulatory determination process; or
- that the network had deferred expenditure in an ongoing capital program (for example, pole replacements) from one period to the next – however, any substantial deferment would result in materially higher capital expenditure in the subsequent period which would likely be discovered by the AER's trend and benchmarking tools.

Consequently, the risk of material deferments being both unidentified by the AER and included in two or more capital expenditure allowances is highly unlikely.

The AER possesses significant powers to request information from networks and identify deferred capital expenditure, and actively uses these powers – as demonstrated in **Box 1**, which outlines a combination of deferred projects either identified by the AER or classified as such in a network's regulatory proposal.

The wide-ranging discretion that the AER has to request information may not be transparent to external stakeholders. The information request process between the formal submission gateways of the regulatory determination process is extensive and affords the AER opportunity to request additional information if it needs to better understand a network's expenditure and internal decisions. For example, CitiPower, Powercor and United Energy's regulatory determination process involved responding to 2,500 separate AER questions.

The AER has also established extensive annual information reporting requirements for networks, where externally audited Regulatory Information Notices (**RIN**) are submitted to the AER by networks each year. The Annual RIN, for example, requires networks to report on annual actual expenditure versus allowances, with an explanation required for material differences between the two.

Box 1: CESS adjustments for deferrals

AER/NSPs have made a **CESS adjustment for deferred capex** in the following decisions:

- Powerlink: $18 million in deferred capex [2022-27 DD]
- Powercor: $51 million in deferred capex [2021-26 FD]
- Jemena: $9 million in deferred capex [2021-26 FD]
- Ergon Energy: $63 million in deferred capex [2020-25 FD]
- AusNet (D): $14 million in deferred capex [2019-24 FD]
- Transgrid: $40 million in deferred capex [2018-23 FD]

[12] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, pages 52-53.

In the AER's upcoming network information requirements review, we support a focus on ensuring that network reported data is made available to stakeholders in an accessible and transparent manner to ensure that stakeholders can make informed contributions to AER decision making.

More broadly, we also support the AER's focus on providing stakeholders with better information and monitoring of incentive scheme outcomes over time.

5.4.2 AER assessment toolkit

The AER's approach to assessing a network's capital expenditure forecast has developed over time, with both more detailed requirements on the material that networks are expected to submit in support of their forecasts, as well as more sophisticated tools being adopted by the AER for assessing proposed capital expenditure. Specifically, the AER has published a number of guidelines, guidance notes and assessment tools that demonstrate an increased sophistication in how the AER evaluates capital expenditure forecasts.

The AER's initial capital expenditure assessment framework prior to 2013 was to consider:[13]

- a network's overall capital governance framework,
- the capital expenditure forecasting methodology adopted by the network, and
- a review of a sample of capital projects and/or programs.

The 2013 *Expenditure forecast assessment guideline* then outlined the introduction of new measures to improve capital expenditure forecasting, including:[14]

- imposing a greater requirement on networks to provide an economic justification of expenditure and increasing the data requirements to support proposals,
- emphasising the role of top-down economic benchmarking and category level benchmarking,
- the development of the CESS, and
- the continued use (and refinement) of the AER's capital expenditure assessment tools (which have continued to evolve post-2013), such as:
  - trend analysis,
  - targeted reviews of high value or high-risk projects and programs,
  - reviewing the network's expenditure forecasting methodology and resulting expenditure forecasts, and
  - category specific forecasting models (i.e., repex and augex models) (first developed in 2011).

Box 2: Role of AER

*"**Our assessment approaches are rigorous, transparent and cost effective**. Businesses need to invest in electricity networks to provide a safe and reliable supply, but **we'll focus on the efficiency of that expenditure so consumers pay no more than necessary**."*

- AER

Source: AER, Better Regulation factsheet – expenditure forecast assessment guideline, November 2013 [emphasis added]

[13] AER, *AER explanatory statement – expenditure forecast assessment guidelines,* November 2013, page 12.

[14] AER, *AER explanatory statement – expenditure forecast assessment guideline,* November 2013, pages 74-75 and 227-257.

The AER's current approach (as set out in its 2020 capital expenditure outline for electricity distributors) is to evaluate a network's capital expenditure forecasts, using the following tools:[15]

- top-down trend analysis of historical actual and expected capital expenditure, to determine the reasons for disparities, and if trends are indicative of required future expenditure,
- category analysis to compare expenditure across distributors and over time,
- bottom-up analysis of a network's capital expenditure programs and projects,
- top-down analysis, including predictive modelling, and detailed technical reviews,
- economic benchmarking, and
- other assessment factors, including stakeholder submissions, internal technical and engineering reviews, and external consultant reviews.

A similar rigorous evaluation framework is reflected in the AER's more recent Better Reset Handbook (**Handbook**) and applies to all networks.[16]

These overall approaches have been supplemented recently by additional detailed guidance on major capital expenditure categories (subsequent to the 2013 guideline), including:

- replacement capital expenditure (repex), which has been the subject of two recent guidance notes:
  - *Industry practice application note for asset replacement planning (2019)*, and
  - *Repex model outline for electricity distribution determinations (2020).*

  When developing their repex forecasts, networks undertake a detailed cost benefit analysis of different replacement options (rather than simply replacing like-for-like), including assessing opportunities and risks of different options compared to continuing with 'business as usual', such as replacing the asset, extending the life of the existing asset and credible non-network options. The repex model sets out the data, assumptions and scenarios that the AER will use when assessing a network's repex forecast and provides a predictive modelling tool for the AER.
- *Guidance note on non-network ICT capital expenditure assessment approach (2019)*

  A specific capital expenditure and forecasting guidance note to facilitate a more systematic and transparent assessment of non-network information and communications technology (**ICT**) expenditure across networks. Networks separate non-network ICT expenditure into recurrent and non-recurrent expenditure, and to categorise non-recurrent ICT capital expenditure into subcategories which reflect the nature of the investment undertaken.[17] The guidance note also states that the AER will use trend analysis, benchmarking and business cases to assess forecast non-network ICT capital expenditure.[18]

[15] AER, *Capital expenditure assessment outline for electricity distribution determinations*, February 2020, page 9-13.

[16] AER, *Better Resets Handbook,* December 2021, pages 19-23.

[17] AER, *Non-network ICT capex assessment approach,* November 2019, pages 8-9.

[18] AER, *Non-network ICT capex assessment approach,* November 2019, page 9.

» *Draft DER integration expenditure guidance note (2021)*

This guidance note facilitates a consistent approach across distribution networks to proposed distributed energy resources (**DER**) integration expenditure and its assessment by the AER.[19]

These recent developments demonstrate the increased sophistication of the AER's assessment of capital expenditure forecasts. The full positive impact of these reforms will, however, be borne out in future regulatory determinations, but their future expected impact should be taken into consideration when assessing the effectiveness of the incentive schemes.

In particular, ENA strongly supported the development of the AER's Handbook in 2021, and we support the AER's Discussion Paper conclusion that the Handbook provides a clearer and more transparent top-down consideration to allow the AER to better link capital expenditure forecasting with the CESS. The Handbook will facilitate the sharing of better-quality information that can be used by the AER to confirm its understanding of network performance and future expenditure requirements.

The Handbook outlines that the AER's capital expenditure expectations, including that:

- the AER expects businesses to demonstrate that forecast total capital expenditure is not materially above current period actual spend – in particular, the AER would question whether a step up in forecast capital expenditure is required if network performance metrics like SAIDI show that it is able to maintain its network well on its efficient revealed spending levels,
- where there is material underspend in the current period as well as a forecasted step up in total capital expenditure, the AER would question why forecasting a step up is required from its revealed efficient level, and
- if material incentive benefits are being claimed, there are well-justified reasons for this, and these have been explained to customer groups.

5.5 Balance of incentives

In assessing the effectiveness of the CESS, the AER also queries whether the financial incentives are correctly balanced between the expenditure incentive schemes, noting changes in economic conditions over the short term have resulted in the EBSS incentive rate to be currently lower than the CESS incentive rate.

The expenditure incentive schemes are designed to provide networks with an incentive to make efficient decisions on when and what type of expenditure to incur, while maintaining service performance.

There is no clear evidence that networks are deferring capital expenditure to the detriment of service reliability and operating expenditure outcomes – networks are continuing to make incremental efficiency gains and improving service reliability.

[19] AER, *Draft DER integration expenditure guidance note*, July 2021.

ENA supports the AER's Discussion Paper observations that:

- there is no evidence of networks inflating base year operating expenditure[20],
- the EBSS, in conjunction with the AER's operating expenditure forecasting approach, is working well to incentivise networks to improve operating expenditure efficiency[21],
- the EBSS, in conjunction with the AER's forecasting approach and the underlying incentives in the regulatory regime, is providing benefits to consumers by ensuring that network charges reflect the efficient costs of operating and maintaining electricity networks[22],
- the distribution STPIS is continuing to achieve its objective of delivering improved service reliability over time that is valued by customers[23], and
- the regulatory framework appears to balance incentives on networks to seek efficiencies while providing good levels of service.[24]

The AER's findings are further supported by HoustonKemp's independent analysis on the benefits of the incentive schemes.

Further, a theoretical concern that networks may shift spend into operating expenditure is in practice unrealistic, noting that:

- there is little expenditure that is not clearly capital or operating in nature, with any discretion in the allocation between these two expenditure types likely to be at the margin, noting the strict accounting standards and scrutiny by external auditors,
- material shifts between capital and operating expenditure would be clearly evident in regulatory reporting, and
- the AER's ability to determine that a network's base year operating expenditure is inefficient – and to then reset benchmark operating expenditure or not apply the EBSS at all – provides an additional incentive for networks to minimise operating expenditure.

As demonstrated above, in assessing whether incentives are balanced, it is necessary to have regard to all factors rather than a narrow examination of only the sharing ratios of the specific incentive schemes – the AER's objective should be for a balanced incentive framework as opposed to a sole focus on the sharing ratios between schemes.

[20] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, pages 46-47.

[21] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 13.

[22] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 47.

[23] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 64.

[24] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 26.

5.6 Bespoke CESS application

The current version of the CESS applies a fixed reward or penalty to each network – as highlighted by the AER, this fixed approach is relatively straightforward and transparent.

However, the AER notes that this approach does not provide flexibility to change the approach to incentives based on how networks behave and respond to the regime, or concerns around the accuracy of capital expenditure forecasts.

The AER raises the possibility of a bespoke application of the CESS – for *each network*, the AER may adjust the strength of financial incentives, and/or change the balance of rewards and penalties during the regulatory determination process.

The AER notes that this may reduce the regulatory burden of identifying asset deferrals where there are concerns with inter-period deferral or over-stated capital expenditure allowances. As explained in sections above, the regulatory framework effectively deals with deferrals and the AER's expenditure assessment techniques have increased in sophistication over time, with the positive impacts of recent reforms yet to be fully realised. More evidence is therefore required to support the AER's problem definition.

However, if there are residual concerns with the setting of approved capital expenditure allowances, then ENA supports a targeted approach to address this directly, rather than indirectly through a potential bespoke application of the CESS, leaving the primary concern unaddressed.

A bespoke application of the CESS can potentially decrease the incentive to improve efficiency, as explained below. In addition, an individual application of CESS sharing ratios risks punishing high-performing networks that have invested effort and resources to drive efficiency savings for consumer benefit and adds an additional layer of complexity in the administration of these schemes.

Bespoke incentive arrangements also risk undermining the important role of stable and consistent national incentive regimes in fostering competition and innovation in the management and ownership of regulated networks, the outcome of which is ongoing pressure for efficient service delivery for consumers.

5.6.1 Consistent and stable incentive schemes

Most network efficiency improvements require significant upfront investments and the full efficiency benefits may take some years to be realised.

The goal of incentive schemes is to promote strong and continuous exploration by networks of potential efficiency gains. Whilst most projects and initiatives will achieve this objective, it is recognised that some will not.

A stable incentive regime provides confidence that the efficiency gains anticipated to occur from business improvement investments will be realised.

An unstable – or constantly changing – regulatory regime can potentially decrease the incentive to improve efficiency as anticipated future regulatory changes may undermine the basis of potential investments as well as investments already made.

Limiting regulatory change will encourage complex and long-duration investments in business efficiency to occur, many of which may be effectively financed through the anticipated operation of incentive

schemes over years to come. Networks require a stable and predictable framework that provides confidence that the rewards anticipated from investments in business improvement will be realised.

6 AER's service performance incentive schemes

Key messages

- Service **reliability component of the distribution STPIS is fit-for-purpose** and is delivering positive outcomes for customers.
- Support an **increasing focus on service performance incentive schemes that are flexible enough to accommodate evolving customer expectations and service offerings**.
- A **review of the MIC in the transmission STPIS is required** → market developments have resulted in the MIC no longer being an effective incentive mechanism. **It is important that the AER provide clarity to stakeholders on when and how it is intending to address these concerns**.

As explained by the AER, the STPIS provides electricity networks with incentives for maintaining and improving network performance, to the extent that consumers are willing to pay for such improvements. It does this by rewarding networks that outperform service performance targets and penalising networks that underperform service performance targets.[25]

The combination of the expenditure and service performance schemes ensures that cost reductions are not at the expense of inefficient reductions in service quality to consumers.

6.1 Distribution STPIS

ENA supports the AER's finding that the service reliability component of the distribution STPIS is generally fit-for-purpose and is delivering positive outcomes for customers.[26]

This is further supported by HoustonKemp's independent analysis, which found that the STPIS distribution reliability component has delivered consumer benefits (PV 2020) from:

- improvements in the number of service interruptions of $3.1 billion (78 per cent of the total STPIS reliability (frequency) gains), and
- reductions in the average minutes off supply of $0.4 billion (78 per cent of the total STPIS reliability (duration) gains).[27]

ENA supports the AER's CSIS, which encourages networks to engage with their customers and provide customer service in accordance with their preference. We do, however, support an increasing focus on service performance incentive schemes that are flexible enough to accommodate evolving customer expectations and service offerings.

[25] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 61.

[26] AER, *Discussion Paper: Review of incentive schemes for networks*, December 2021, page 10.

[27] HoustonKemp, *Consumer benefits resulting from the AER's incentive schemes*, March 2022, page 10.

We also highlight the importance of separately progressing the review of potential service incentives to apply to export services, as required by the Australian Energy Market Commission's recent access, pricing and incentive arrangements for DER rule change.[28]

6.2 Transmission STPIS

The transmission STPIS has three components — the service component, market impact component (or MIC as previously defined), and network capability component.

The MIC provides an incentive for transmission networks to manage network outages to minimise their impacts on wholesale market prices. As highlighted in the letter to the AER from the Chief Executives of the transmission networks[29], the MIC has delivered significant customer benefits since its application to transmission businesses, however, the current MIC is not fit-for-purpose.

ENA continues to strongly recommend a review of the MIC. Market developments have resulted in the MIC no longer being an effective incentive mechanism – a backward-looking target setting approach no longer meets the current needs much less those of the future.

While currently outside of the scope of this review, we strongly recommend that the AER provide clarity to stakeholders on when and how it is intending to address these concerns.

Without a review, there is a risk that the incentive scheme will not drive behaviours to deliver outcomes that align with customers' expectations.

[28] AEMC, *Access, pricing and incentive arrangements for distributed energy resources*, Rule determination, 12 August 2021.

[29] Letter to the AER (AER Review of Incentive Schemes) from the Chief Executives of Powerlink, Transgrid, TasNetworks, AusNet Services and ElectraNet, 11 March 2022.

Appendix A I HoustonKemp's report

Consumer benefits resulting from the AER's incentive schemes

HOUSTONKEMP
Economists

Consumer benefits resulting from the AER's incentive schemes

A report for Energy Networks Australia

8 March 2022

Key findings

Energy Networks Australia (ENA) has asked HoustonKemp to provide an independent estimate of the consumer benefits that have arisen (and are expected to continue to accrue in future) from networks responding to the incentive schemes that form part of the Australian Energy Regulator (AER's) overall regulatory framework.

We have quantified the benefits to consumers generated by networks due to the operation of the following three incentive schemes:

- the Efficiency Benefit Sharing Scheme (EBSS) that encourages networks to lower the cost of operating their network and was developed by the AER in 2007;[1]
- the Capital Expenditure Sharing Scheme (CESS) that incentivises networks to minimise the cost of their network investments and was developed by the AER in 2013 and first applied in 2015/16;[2] and
- the reliability component of the Service Target Performance Incentive Scheme (STPIS) for electricity distribution networks that provides incentives to improve service quality and was developed by the AER in 2007.[3]

With the exception of the STPIS, our assessment has considered electricity distribution and transmission networks and gas distribution networks, for the period from 2006 to 2020. Noting that we have included consumer benefits arising during periods when networks were subject to the similar jurisdictional incentive mechanisms administered by the AER.[4]

Consumers have benefited by at least $13.4bn as a result of the three main AER incentive schemes

Our analysis shows that the **AER's incentive schemes have benefited consumers by delivering lower network prices and improved service quality**. The financial rewards provided to energy networks under the incentive schemes encourages them to improve network services whilst simultaneously lowering the costs of providing these services. The incentive schemes complement other factors impacting incentives, such as the ability of the AER to benchmark an network service provider's (NSP's) base year operating expenditure and undertake ex-post reviews of capital expenditure. The incentive schemes have encouraged networks to innovate and become more productive.

Figure 1 highlights that consumers have benefited by at least $13.4 billion in present value terms (PV, 2020) adopting the 6 per cent discount rate that was used when the schemes were first developed.

[1] AER, *Final decision | Electricity transmission network service providers | Efficiency benefit sharing scheme*, September 2007.

[2] AER, *Capital expenditure incentive guideline for electricity network service providers*, November 2013 and AER, *Final Decision | Ausgrid distribution determination 2015−16 to 2018−19 | Attachment 10 – Capital expenditure sharing scheme*, April 2015, p 8.

[3] AER, *Final decision | Electricity transmission network service providers | Service target performance incentive scheme*, August 2007.

[4] The jurisdictional operating expenditure and reliability incentive mechanisms.

Figure 1: Total consumer benefits of the EBSS, CESS and distribution STPIS (reliability) (PV, 30 June 2020)

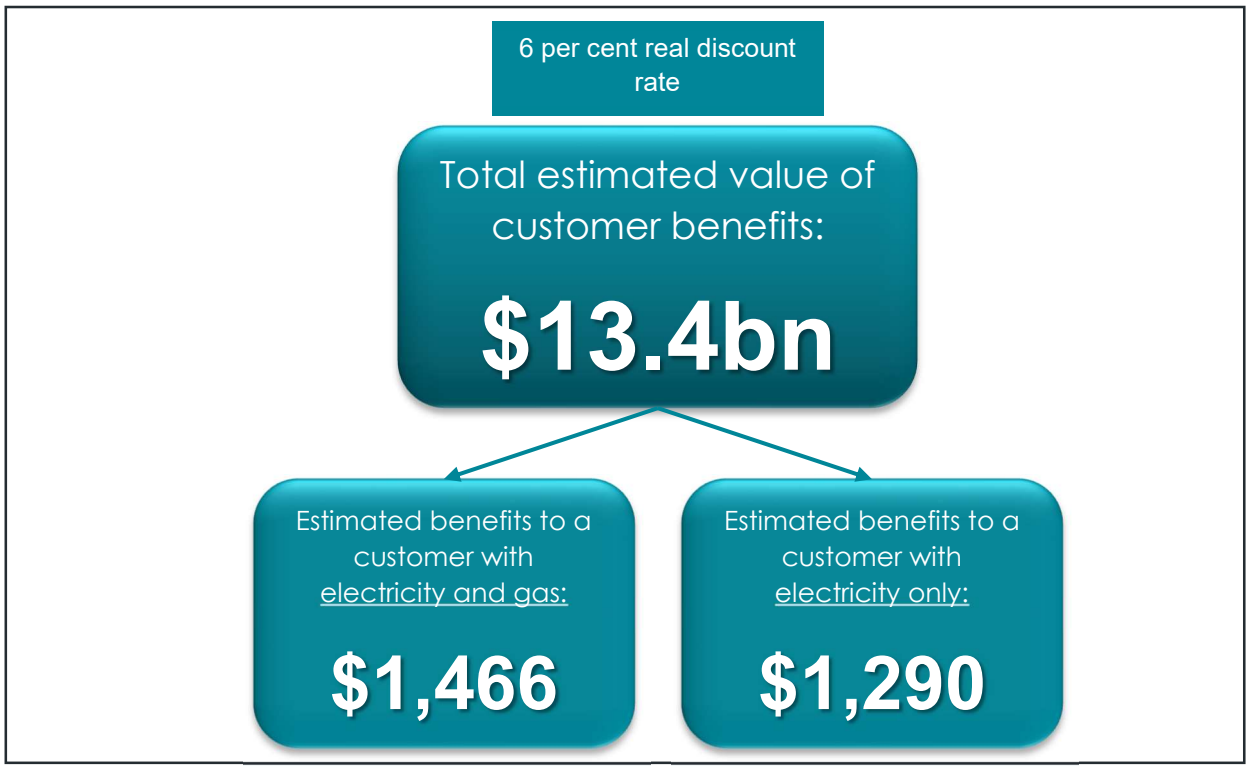


Figure 1 shows our estimate of the consumer share of network expenditure and reliability outperformance over the 2006 to 2020 period, in present value terms (2020) when the network was subject to the AER incentive schemes.

In calculating these consumer benefits, we have assessed the difference between a network's actual capital and operating expenditure and their respective regulatory allowances, as a measure of the extent of cost 'out-performance' that the business has achieved. Consumer benefits and losses have been measured against the network's expenditure allowances as the ex-ante regulatory allowances represent an independent and informed estimate of the network's expected efficient expenditure. We have calculated the implied efficiency gains to consumers that are 'locked-in' by the regulatory framework and the network's actions to date. The benefits from improved reliability have been estimated from a network's change in actual performance.

All estimated consumer benefits (costs), that occur over a number of different years (including into the future where regulated expenditure allowances are lower (higher) than they would otherwise have been), are brought to a common point in time (30 June 2020) using the discount rate.

The $13.4 billion in consumer benefits highlighted in figure 1 represents the net present value (2020) of the gains that consumers have both already received across all three of the incentive schemes, using a real discount rate of 6 per cent, as well as those that are locked-in by the current arrangements and will be enjoyed by consumers in future periods.

Benefits have accrued to consumers from each of the three main incentive schemes

We have also calculated the average benefit per consumer[5] attributable to each of the schemes. This is presented below in figure 2 and figure 3. These figures show that customers have benefited from each of the three incentive schemes, with the EBSS (which has been in place for the longest) delivering the highest share of benefits.

Figure 2: Electricity only consumer benefits per consumer by incentive scheme ($, PV'2020)

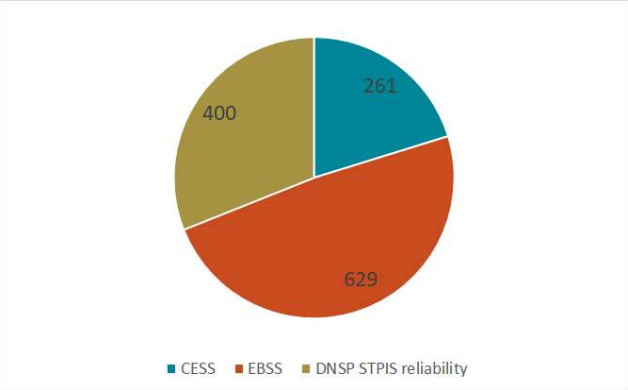
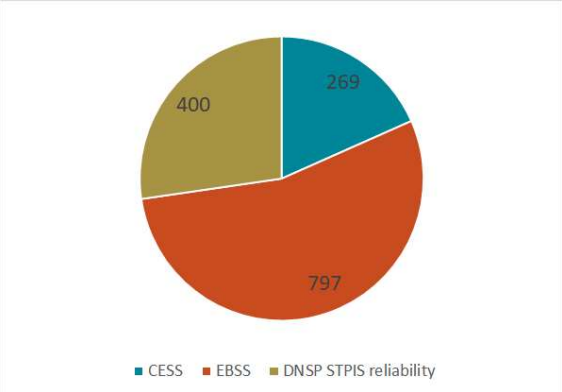


Figure 3: Electricity and gas consumer benefits per consumer by incentive scheme ($, PV'2020)



Note: Assuming a 6 per cent discount rate.

The estimate of consumer benefits increases to $22.3 bn if an industry average discount rate is adopted

The use of a different discount rate will change the estimated present value of benefits. Adopting a discount rate equal to the annual average real WACC for gas and electricity networks (rather than assuming a constant real 6 per cent discount rate), increases the value of consumer benefits to $22.3 billion (PV, 30 June 2020). The principal reason for the higher present value is that the discount rate used for future periods is assumed to equal the average real WACC in the final year of the assessment period (2020) for gas and electricity networks of 3.34 per cent. This lower discount rate increases both the present value of the consumer benefits and the consumers' share of total benefits (which increases to 81 per cent of the total gains). Appendix A2 provides a discussion of the impact on our findings of adopting an industry average real WACC as the discount rate.

In this report we have focused on the present value of consumer benefits using a 6 per cent discount rate, which aligns with the discount rate used by the AER to calculate the sharing of efficiency gains between consumers and networks when first developing the EBSS and CESS.[6]

The majority of benefits accrue to consumers rather than to networks

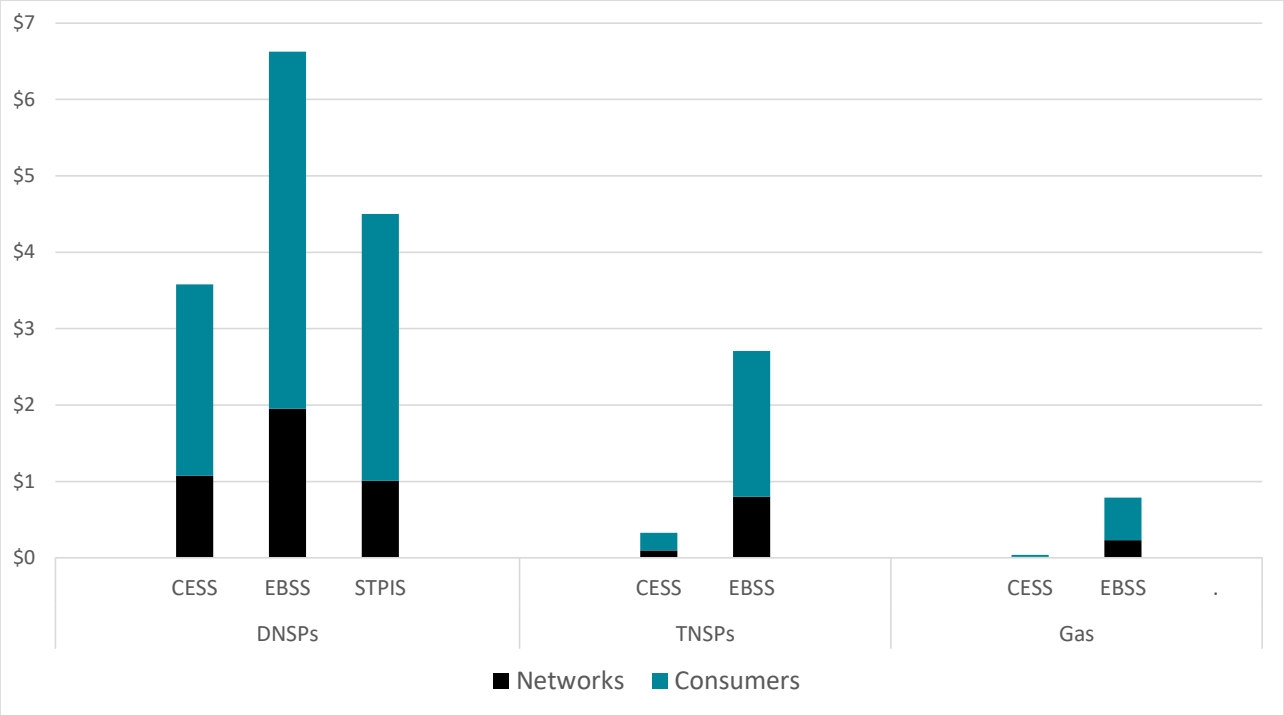
The lower than forecast operating and capital expenditure outcomes by gas and electricity networks and improved distributor reliability that occurred during the operating of the incentive schemes has resulted in substantial efficiency benefits. We have estimated that the present value (2020) of the total efficiency gains resulting from the EBSS, CESS and distribution STPIS (reliability) is $18.6 billion, with consumers retaining 72 per cent of the total benefits ($13.4 billion).

[5] The average benefit per consumer has been calculated by dividing the total benefits by the number of network customers.

[6] See AER, *Better regulation | Capital Expenditure Incentive Guideline for Electricity Network Service Providers | Explanatory statement*, November 2013, p 46; and AER, *Better regulation | Efficiency benefit sharing scheme for Electricity Network Service Providers | Explanatory statement*, November 2013, p 34.

Figure 4 shows the network and consumer shares of the benefits attributable to the AER's incentive schemes for electricity distribution and transmission networks and gas distributors.

Figure 4: Present value of network and consumer benefits ($billion, 2020)



Note: Assuming a 6 per cent discount rate and excluding Power and Water (NT).

Other elements of the regulatory framework also affect incentives

We were also asked by the ENA to provide a summary of other elements of the regulatory framework that affect a network's incentive to either reduce its costs and/or improve service levels. These features are important because a network's behaviour is not exclusively affected by the AER's incentive schemes but is also influenced by:

- the ability of the AER to find that a network's base year operating expenditure is inefficient, which would result in a downward adjustment to the network's future operating expenditure allowance as well as the suspension of the EBSS;
- the capacity for the AER to find recent capital expenditure to be inefficient and disallow the recovery of these costs;
- the inclusion of a productivity factor into the setting of the operating expenditure allowance, where 100 per cent of these efficiency gains (which would be in addition to the gains calculated in this report) are passed through to consumers; and
- the existence of State and Territory minimum reliability standards, that networks are required to meet as part of their licencing obligations.

A network's decision to reduce costs or improve service levels will have regard to the entirety of the regulatory framework, not just the incentive schemes. Consequently, any changes to the incentive schemes should have regard to all the incentives that apply to expenditure and service quality rather than an assessment of the incentive schemes in isolation.

Contents

Figures

1. The role of incentive regulation

Key findings

- The AER's incentive schemes operate in the context of the overall regulatory framework.
- The incentive schemes enhance the overall regulatory framework by ensuring networks have a strengthened and constant incentive to continually lower their costs and improve service performance.
- There are a number of incentive schemes, of which the CESS, EBSS and STPIS are the most material and have generally been in place for the longest period of time.

1.1 Why is it important?

Energy networks underpin the delivery of electricity and gas to the majority of households and businesses in Australia. This report has been prepared at the request of Energy Networks Australia (ENA) which represents electricity transmission and distribution networks as well as gas distribution networks.

The report sets out the incentives on Australian electricity and gas networks and how the Australian Energy Regulator's (AER's) incentive schemes have benefited consumers. Specifically, we have estimated the consumer benefits associated with the operation of the Efficiency Benefit Sharing Scheme (EBSS), the Capital Expenditure Sharing Scheme (CESS) and the reliability component of the distribution Service Target Performance Incentive Scheme (STPIS).

The ENA members operate regulated assets valued at over $110 billion and generate revenues of almost $12.7 billion per annum.[7] However, unlike many industries where competition can be relied on to deliver desirable outcomes, competition is not possible for regulated energy businesses.

For this reason, the AER, building on approaches widely applied internationally and in line with the principles and objectives set out in the National Electricity and Gas Rules, developed its framework of incentive regulation.

This framework seeks to:

- encourage businesses to innovate and deliver value to consumers;
- ensure that efficiency improvements are shared with consumers; and
- provide the AER with valuable information on historical costs, which can inform its decisions on future efficient cost levels.

The incentive regulation framework is similar to those applied by other regulators internationally in that it periodically sets forecast expenditure allowances and maximum revenue allowances for regulated networks. This underlying framework is enhanced by a number of specific incentive schemes.

1.2 Role of incentive schemes within the overall regulatory framework

The AER sets the following for regulated network businesses:

- the forecast level of spending necessary to deliver the services expected by consumers (forecast expenditure allowances);
- the total revenue that can be collected from consumers (maximum revenue allowances); and

[7] AER, *State of the Energy Market 2021*.

- for electricity and some gas networks, an expected level of service quality for each year of the regulatory period.

The setting of a maximum amount of revenues that networks can collect from consumers for a period of time (usually five years) encourages networks to reduce their costs during that period. These lower revealed costs are then used by the AER as the basis for determining expected efficient costs in the subsequent regulatory period. The framework ensures that efficiency improvements are passed through to consumers in the form of lower network charges.

The incentive schemes further encourage networks to reduce costs and improve service levels and also ensure that networks do not favour one form of expenditure, nor cut costs at the expense of inefficient reductions in service quality. Finally, the schemes maintain a constant level of incentives for expenditure and service quality incentives over the regulatory period.

We also observe that a network's incentives to reduce costs and improve service levels are increasingly influenced by customer expectations. For example, the AER's Better Reset Handbook establishes an expectation that a network's regulatory proposal will be developed through meaningful consumer engagement on forecast expenditure and expected service levels.[8]

1.3 Merits of a balanced incentive framework

A balanced incentive framework seeks to replicate the forces that operate in competitive markets, where services are delivered at least cost and with improved service quality, together with ongoing improvements through time.

A balanced incentive framework encourages networks to make decisions that benefit consumers, by:

- ensuring that networks do not favour one form of expenditure (operating or capital) over the other, raising the long term cost to consumers; and
- ensuring that there are sufficient counterbalancing incentives on customer service level outcomes and safeguards against cost reductions occurring to the detriment of efficient service levels.

Cost-plus regulation allows networks to pass through their actual costs (plus a reasonable return on invested capital). However, this has resulted in poor outcomes for consumers, typically leading to higher than necessary costs and/or poor service levels. Incentive regulation avoids the pitfalls of cost-plus regulation.

In assessing the balance of regulatory incentives, it is necessary to have regard to all factors that affect a network's expenditure and service level decisions rather than a narrow examination of the specific incentive schemes only. Chapters 3 to 5 of this report summarise other elements of the wider regulatory framework that affect a network's expenditure and service level decisions.

1.4 The current AER incentive schemes

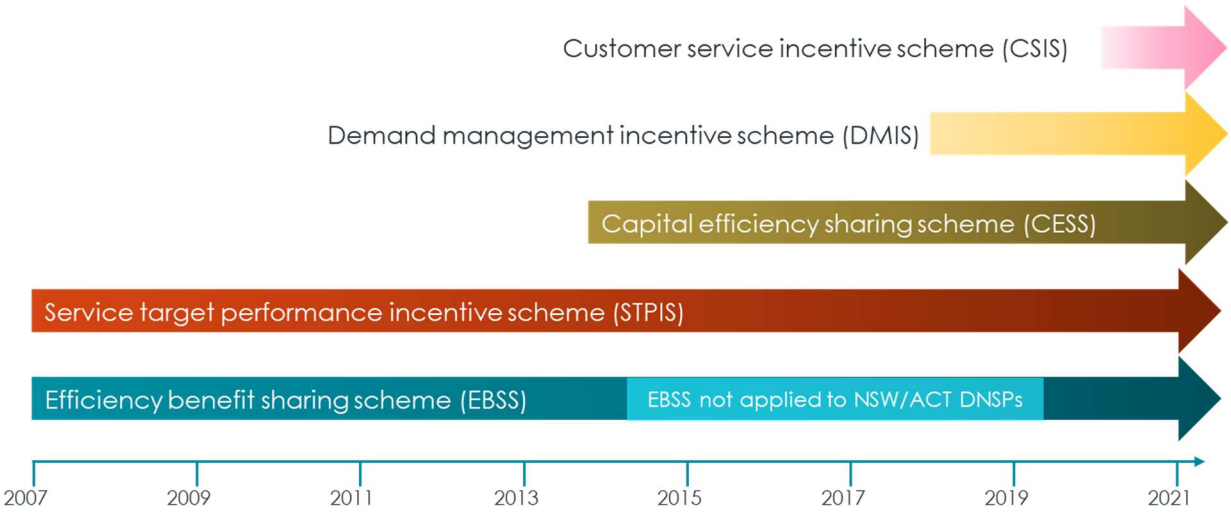
The AER's main incentive schemes are directed toward different aspects of a network's behaviour such as:

- reducing the cost of providing the service;
- improving service levels; and
- having a net positive impact on related markets, such as developing a demand response market and improving the working of the wholesale electricity market.

Figure 1.1 sets out the timeline for the introduction of the AER's main incentive schemes.

[8] AER, *Better reset handbook | Towards consumer centric network proposals*, December 2021.

Figure 1-1: The AER's incentive schemes and timeline of when they were first developed[9]



Note that these schemes did not apply to all networks from the introduction of the scheme. Instead schemes generally applied from the start of the regulatory period following the introduction of the scheme.

1.5 Features of the AER's incentive schemes

The AER's three core incentive schemes (EBSS, CESS and STPIS reliability) all share the following common features.

1.5.1 Symmetrical rewards and penalties

The incentive schemes are symmetric in that the rewards networks receive for reducing their costs or improving consumer service levels mirror the penalties imposed on networks for increasing their costs or reducing consumer service levels.

The importance of symmetric rewards and penalties is that they encourage networks to make efficient trade-offs between different types of expenditure and between service levels and costs.

For example, investing in new technology may result in greater capital costs but also result in operating cost savings. Having symmetrical incentives allows networks to be penalised for incurring higher capital costs but rewarded for their lower operating costs. A balanced incentive scheme would then encourage networks to make this trade-off in way that minimises the total costs to consumers.

Importantly, ensuring balanced incentives in this way requires consideration of all of the incentives under the regulatory framework, and is not a matter of applying the same incentive rate across the different incentive schemes.

1.5.2 Consistent over time

The second feature common to the incentive schemes are that they provide a constant incentive over time. That is, the proportion that a network retains from saving $1 today is the same as it will receive from saving $1 next year.

Because $1 today is more valuable to a network than $1 in the future, the incentive schemes encourage networks to achieve savings or improve service quality as soon as possible.

Consistency in the application of the incentive schemes over time also provides greater assurance to networks as they consider long-term actions.

[9] We note that prior to the AER's incentive schemes there were equivalent jurisdictional schemes applying to some networks.

1.6 Estimating consumer benefits

The purpose of this report is to estimate the benefits that consumers have received over the period that the incentive schemes have operated.

To estimate the consumer benefits of the incentive schemes, we have:

- used public data reported to the AER and supplemented with data from the networks' externally audited regulatory information notices (RINs);
- calculated the present value of gains/losses as at 30 June 2020;
- measured consumer benefits and losses against the networks' expenditure allowances to capture the entire value of the benefit, rather than focusing on the incentive rewards included in the network's revenue allowances (which only represent part of the benefit to networks alone);
- estimated consumer benefits and losses associated with improved distribution reliability using the change in the network's actual performance;
- assessed expenditure and service outcomes when the incentive schemes operated within the period 2006 to 2020;
- used a discount rate of either:
  - 6 per cent real discount rate (which was the rate assumed by the AER when it developed the EBSS and CESS); or
  - the annual industry average real rate of return which ranged between 3.34 and 7.02 per cent (with the 2020 rate (3.34 per cent) applied to future periods);
- calculated consumer benefits as the total benefits less the rewards (incentive payments) retained by networks;
- assumed that incremental changes[10] in real operating expenditure are ongoing, with networks retaining any incremental gain (loss) for a period of six years before the gain is passed through to consumers in perpetuity – consistent with the operation of the EBSS;
- consumers retain 70 per cent of any capital expenditure outperformance (underspending of capital expenditure allowance) – consistent with the operation of the CESS which ensures that consumers retain a fixed proportion (in present value terms) of any capital expenditure outperformance; and
- assumed that changes in distribution reliability performance (ie, duration and frequency) are enduring and that networks are rewarded (penalised) for the consumer benefit (cost) of this annual change in reliability for a period of five years (starting from year *t+2*) – consistent with the operation of the STPIS.[11]

Use of expenditure allowances to estimate benefits

Consumer benefits and losses in our analysis have been measured against the NSPs' ex ante expenditure allowances set by the AER, as these represent an independent and informed estimate of the networks' expected efficient expenditure.

We note that the ex-ante expenditure allowances may be above or below the ex-post actual efficient costs of providing energy network services over the regulatory control period, due to a range of factors.

However, any variance between allowances and efficient expenditure is unlikely to change our finding that the incentive schemes deliver material benefits to consumers:

- for example, even if half of the calculated outperformance was assumed to be the result of overstated allowances, the consumer benefits would still be in the order of $6.7 billion (PV, 2020).

Further, the AER's continued expansion and refinement of its expenditure assessment techniques and tools lessens the future likelihood of regulatory expenditure allowances not reflecting an NSP's forecast efficient costs.

[10] An incremental change is generally calculated as the difference between outperformance (ie, actual cost less allowance) in the current year and outperformance in the immediately preceding year. For example, if a network's actual operating expenditure in year 1 was $2 million below its allowance, and in year 2 it underspends its allowance by $7 million, then the incremental operating gain was $5 million (ie, $7 million in year 2 less $2 million in year 1). In other words, in year 2 the network has incrementally improved its operating expenditure performance by $5 million compared to year 1.

[11] Note the value of improved reliability is calculated using the respective AER estimates of the value of customer reliability (VCR) for different network types (CBD, urban and rural). Further, the split of the VCR we have assumed between

All estimated consumer benefits (costs), that occur over a number of different years (including into the future where regulated expenditure allowances are lower (higher) than they would otherwise have been), are brought to a common point in time (30 June 2020) using the discount rate.

The details of how we have calculated the benefits presented in this report are set out in appendix A.

improvements in frequency and duration reflects the values used in the STPIS incentive rewards.

2. How consumers benefit from incentive regulation

Key findings

- During the period that the AER incentive schemes have functioned, our analysis shows that consumers have benefited from lower network operating costs, lower than expected network investments and improved network reliability.
- Table 2-1 sets out the estimated total benefits associated with the three incentive schemes (EBSS, CESS and electricity distribution reliability STPIS). The incentive schemes have delivered consumer benefits of at least $13.4 billion using the 6 per cent discount rate that the AER applied when it developed the incentive schemes.
- Figure 2-1 and figure 2-2 quantify the average consumer benefits in present value terms (2020) locked-in from each of the AER's incentive schemes. The schemes have generated gains for the average consumer with both an electricity and gas service of $1,466 (using a 6 per cent discount rate). An average consumer with an electricity service only is $1,290 better off (using a 6 per cent discount rate).

Table 2-1 Total benefits attributable to the incentive schemes (PV, 30 June 2020) – 6% discount rate

	Total ($, billions)	Per connection with electricity and gas service ($)
Total	$18.6	$2,032
Networks	$5.2	$565
Consumer	$13.4	$1,466

During the period that the incentive schemes have applied, our analysis shows that consumers have benefited from lower network operating costs, lower than expected network investments and improved network reliability. These outcomes have locked-in substantial gains for consumers, today and in the future, in terms of lower prices and improved network reliability.

While there have been significant long term consumer benefits produced by the incentive schemes, we note that the schemes are generally designed so that networks are rewarded (or penalised) before the benefits (costs) are passed through to consumers. These consumer benefits are locked-in by the regulatory framework and so the full benefits of past outperformance, in terms of lower costs and improved reliability, will be realised by consumers into the future.

This is especially true for reductions in capital expenditure where the benefits to consumers are felt over a long period of time, in the form of lower network asset values feeding into lower network prices.

Figure 2-1 and figure 2-2 quantify the average consumer benefits in present value terms (2020) locked-in from each of the AER's incentive schemes (using a 6 per cent discount rate). The schemes have generated gains for the average consumer with both an electricity and gas service of $1,466 in present value terms (2020). Consumers with an electricity service only are $1,290 better off.

The consumer present value calculation converts all gains (losses) that consumers have and will receive from efficiency gains (losses) in the 2006 to 2020 period to a single point in time (2020).

The following sections provide a breakdown of the consumer benefits associated with the three incentive schemes.

Figure 2-1: Electricity only consumer benefits per consumer by incentive scheme ($, PV'2020)

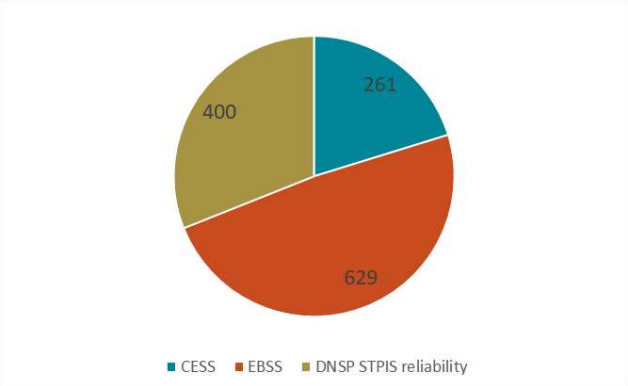
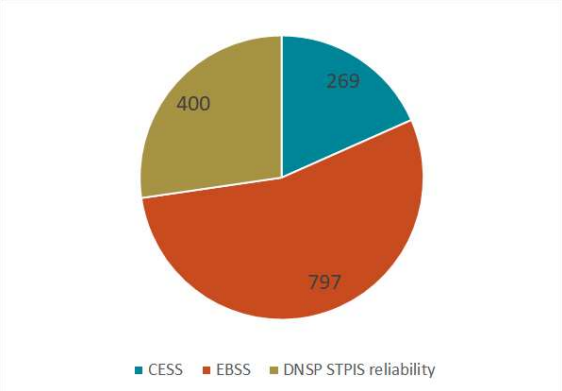


Figure 2-2: Electricity and gas consumer benefits per consumer by incentive scheme ($, PV'2020)



Note: Assuming a 6 per cent discount rate.

2.1 Consumer benefits under the EBSS

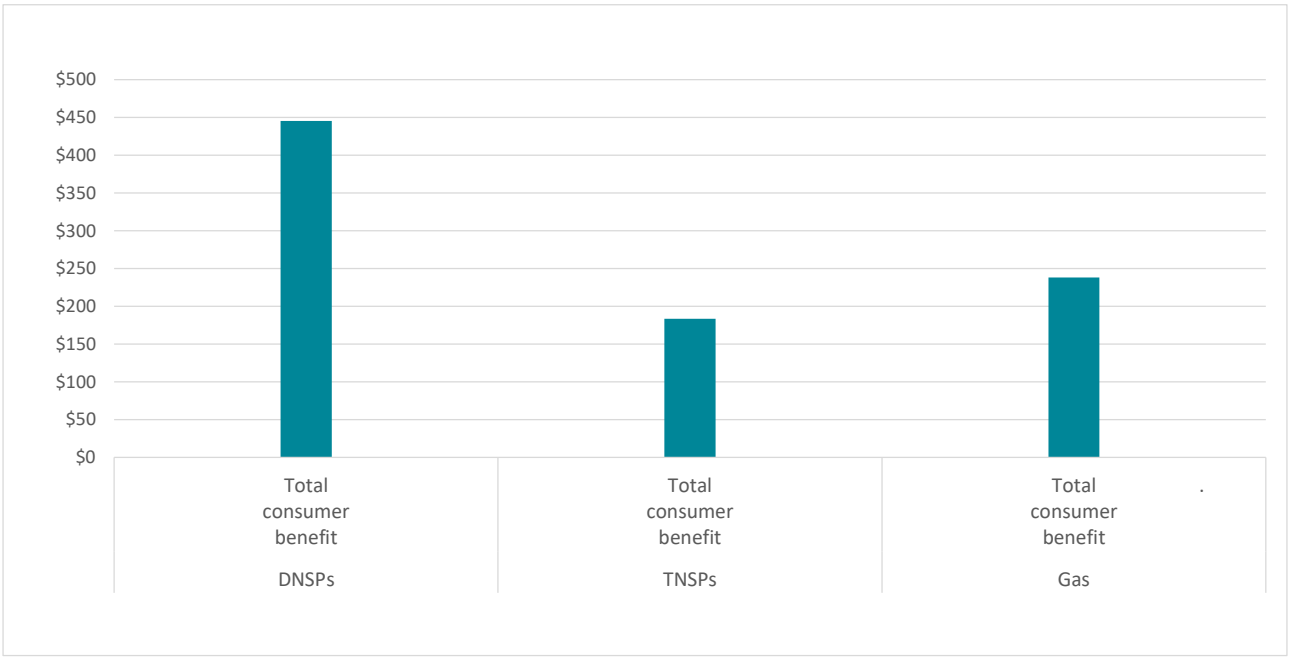
The EBSS, has been applied to both electricity and gas networks since 2006 and has been responsible for the largest share of consumer benefits. At a 6 per cent discount rate, the operating expenditure efficiency gains represent 54 per cent (ie, $797 of the $1,466 per customer gain) of the total consumer benefits received by customers with both an electricity and gas service from the three incentive schemes.

At a 6 per cent discount rate, the EBSS has delivered consumer benefits (present value 2020) of:

- $6.6 billion to electricity-only consumers (70 per cent of the total electricity EBSS gains); and
- a further $0.55 billion to those consumers that also use gas (70 per cent of the total gas EBSS gains);
- representing an average saving per consumer (with both electricity and gas service) of $797, which is equivalent to nearly 7 months of network charges.[12]

Figure 2-3 shows the breakdown of the present value of consumer benefits (per customer) by different network types.

Figure 2-3: Present value (2020) of consumer benefits attributable to the EBSS (per customer)



Note: Assuming a 6 per cent discount rate.

[12] HoustonKemp calculation of the 2020 average annual network costs for an electricity and gas consumer was $1,390, using data from the AER, *State of the Energy Market 2021*.

2.2 Consumer benefits under the CESS

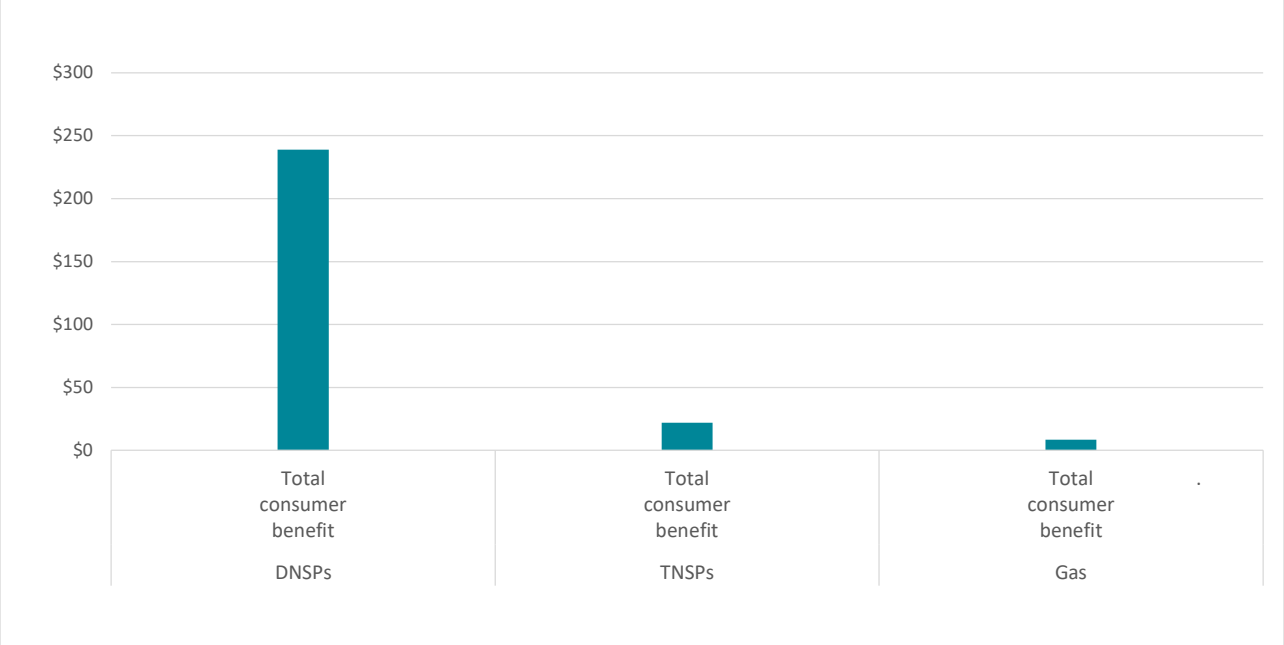
The CESS is a new mechanism that was developed by the AER in 2013 and first applied in 2015/16.[13] Our analysis shows that during that period networks have delivered substantial consumer benefits by limiting their network investments whilst generally maintaining or improving network reliability.

At a 6 per cent discount rate, the capital expenditure efficiency gains represent 18 per cent (ie, $269 of the $1,466 per customer gains) of the total consumer benefits for customers with both an electricity and gas from the three incentive schemes.

At a 6 per cent discount rate, the CESS has delivered consumer benefits (present value 2020) of:

- $2.7 billion to electricity-only consumers (70 per cent of the total electricity CESS gains);
- $28 million to consumers that receive a gas service (70 per cent of the total gas CESS gains); and
- on an average per customer basis, $269 for customers with both an electricity and gas service, which is equivalent to just over 2 months of network charges.[14]

Figure 2-4: Present value (2020) of consumer benefits attributable to CESS (per customer)



Note: Assuming a 6 per cent discount rate.

[13] Note that some distributors operated on a calendar year (2016) while other networks operate on a financial year (2015/16)

[14] HoustonKemp calculation of the 2020 average annual network charges was $1,390, using data from the AER, *State of the Energy Market 2021*.

2.3 Consumer benefits under the STPIS

Distributors that improve network reliability are rewarded, in the short term, by STPIS payments to ensure that networks continue to invest in reliability improvements that consumers value. However, the STPIS incentives are calibrated to be equal to the value to consumers of the improved reliability. It follows that in the short term the cost to consumers of a sustained improvement in reliability (ie, the STPIS reward) is equal to the value consumers place on improved network reliability.

We have presented the consumer benefits of improvements in the reliability of electricity distributors, since these gains can be quantified using the AER's estimates of the value that customers place on network reliability.[15]

At a 6 per cent discount rate, improvements in network reliability represent 27 per cent (ie, $400 of the $1,466 per customer gains) of the quantified consumer benefits from the AER's incentive schemes. Figure 2-5 highlights significant improvement in both duration and frequency of customer interruptions (SAIDI and SAIFI) on a NEM-wide basis, including:

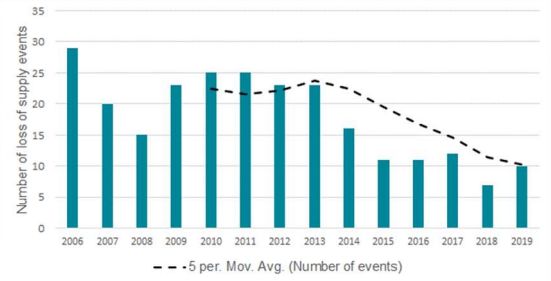
- a 17.8 per cent reduction in minutes off supply (SAIDI) in 2020 compared to 2006; and
- a 38.3 per cent reduction in the number of service interruptions (SAIFI) in 2020 compared to 2006.

Transmission reliability

The transmission STPIS does not have an explicit link to the consumer value of reliability like the distribution STPIS and so we have not included the impact to consumers of changes in transmission reliability.

However, transmission networks have made material improvements in some aspects of reliability, such as the number of loss of supply events. Figure A shows that on a five year moving average this metric has improved by 54 per cent in 2019 compared to 2010.

Figure A: Transmission loss of supply events



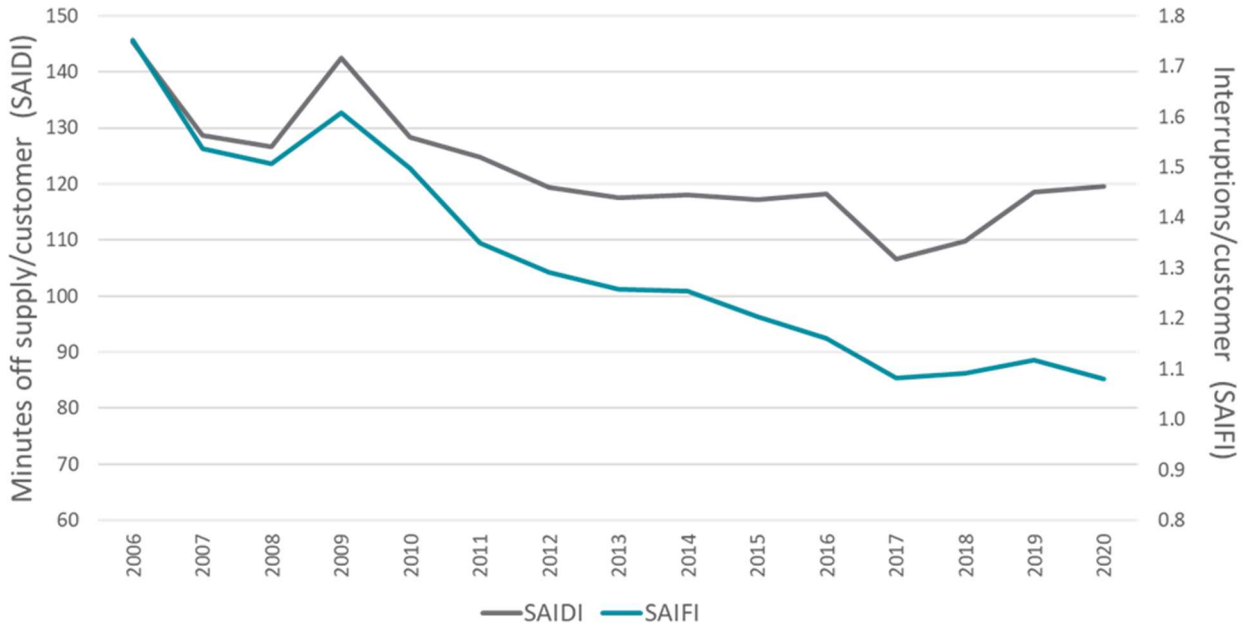
Source: AER TNSP performance report 2021

At a 6 per cent discount rate, the STPIS distribution reliability component has delivered consumer benefits (present value 2020) from:

- improvements in the number of service interruptions of $3.1 billion (78 per cent of the total STPIS reliability (frequency) gains); and
- reductions in the average minutes off supply of $0.4 billion (78 per cent of the total STPIS reliability (duration) gains).

[15] Clause 3.2.2 of the AER, *Electricity distribution network service providers | Service target performance incentive scheme | Version 2.0*, November 2018.

Figure 2-5: Electricity distribution SAIDI and SAIFI trends



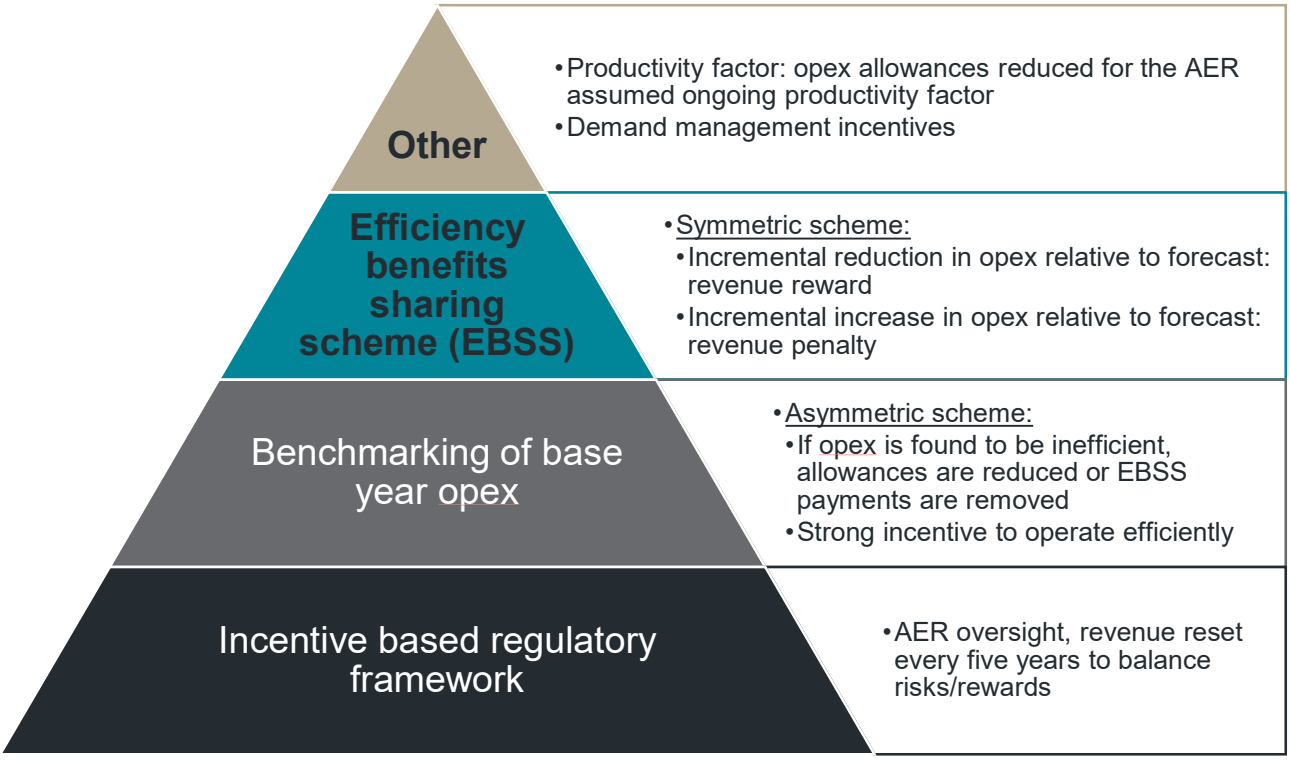
Source: HoustonKemp analysis of AER 2021 DNSP operational performance data.

3. Incentives to reduce consumer costs by lowering network operating expenditure

Key findings

- The inclusion of a positive productivity factor in setting the regulatory allowance for operating expenditure guarantees that consumers receive 100 per cent of the expected improvement in productivity over the regulatory period.
- The EBSS ensures that consumers also retain 70 per cent of the benefits associated with reductions in operating expenditure over and above that from expected productivity improvements (using a 6 per cent discount rate).
- The ability of the AER to find base year operating expenditure as inefficient creates an additional incentive for networks to minimise operating expenditure.

Figure 3-1: Factors affecting operating expenditure incentives



The cost to finance, build, operate and maintain regulated networks represents approximately a third of the price paid by consumers for energy network services.[16]

Incentives in the regulatory framework encourage networks to constantly strive to lower their operating costs, with these cost savings being passed through to consumers through lower future operating costs.

This section outlines the primary incentives within the regulatory framework for networks to minimise operating costs.

Efficient forecast operating expenditure

The price paid by consumers for energy network services includes an allowance for the network's forecast operating expenditure. The expenditure allowance reflects the AER's expected efficient costs to operate and maintain the regulated network over the regulatory period, and has recently included a productivity factor (discussed later in this section).

Other than in exceptional circumstances, this allowance is then fixed for the regulatory period, normally five years.

Networks have an incentive to lower their actual operating expenditure to outperform their fixed operating expenditure allowance.

The AER then uses the lower revealed operating expenditure to reset the allowance in future regulatory periods, which then results in lower network charges for consumers.

The efficiency of base year operating expenditure

The operating expenditure allowance in the forthcoming regulatory period is generally built from a network's observed expenditure in a 'base' year, normally the second last year of a regulatory period.

However, the AER does not unquestioningly accept that the network's actual expenditure is efficient.

The AER uses a range of tools to assess whether base year operating expenditure is efficient including:

- benchmarking of the costs of similar networks;
- trends in the network's own performance over time; and
- use of independent experts to examine aspects of a network's base year performance.

Therefore, the approved operating expenditure allowance reflects the AER's forecast of efficient operating costs.

A finding that base year operating expenditure is inefficient is at the discretion of the AER and can occur even when a network is outperforming its operating expenditure allowance. Where base year expenditure is found to be inefficient, the AER will adopt a value that is below the network's actual operating costs.

Networks must then reduce their expenditure to the new lower allowance, with the benefits of this efficiency improvement fully passed through to consumers. Further, networks are financially penalised if they are unable to reduce their costs to match this more challenging expenditure allowance, without the benefit of sharing these higher than allowance operating expenditure with consumers through the incentive schemes.

A further consequence of base year expenditure being found to be inefficient is that the specific incentive scheme applying to operating expenditure (the EBSS) may not be applied by the AER in the following regulatory period.[17] Consequently, the network bears 100 per cent of the cost of adapting to the new lower operating expenditure allowance.

The possibility of a base year adjustment creates an additional incentive for networks to reduce their operating expenditure over time, and so reduces future network prices for consumers.

Efficiency benefit sharing scheme

The EBSS increases and improves the incentives provided by the underlying regulatory framework.

[16] HoustonKemp calculation from data in AER, *State of the Energy Market 2021*, Figure 3.5 at p 134.

[17] This happed to a number of electricity distributors in NSW/ACT in the 2014-19 period.

The incentive rewards (or penalties) paid under the EBSS ensure that networks retain the benefits of any incremental improvements in operating expenditure (or cost of any deterioration) for a period of 6 years before that benefit (or cost) is permanently passed through to consumers.

The incremental change in operating expenditure is the difference between:[18]

- the relative position of the NSP's actual operating expenditure to its allowance in a given year; and
- the relative position of the NSP's actual operating expenditure to its allowance in the immediately preceding year.

Further, because the EBSS ensures that any reward (or penalty) is retained by the NSP for a period of 6 years, the incentive rate is the same in each year of the regulatory period. This improves the integrity of the incentives by *removing* the incentive to:

- defer productivity improvements to years when networks retain the gains for the longest period of time; and
- increase operating expenditure in the later years of the regulatory period to achieve a higher allowance in the following period.

Consequently, the EBSS ensures that:

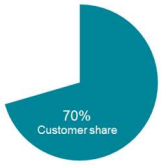
- consumers retain the majority of the incremental improvements in operating expenditure; and
- networks are encouraged to continually drive the efficient operating expenditure level lower, which reduces future network prices for consumers.

Figure 3-2 highlights that the sharing ratio of the EBSS changes depends on the discount rate used to calculate the present value of the future benefits of the improvement (or deterioration) in performance.

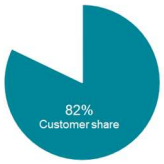
When the discount rate falls, the present value of future benefits (costs) increases. This both increases the value of ongoing cost reductions as well as increasing the share retained by consumers.

Figure 3-2 also shows that at the 2020 industry average real rate of return, the share of operating efficiency gains retained by consumers has increased from 70 per cent to 82 per cent.

Figure 3-2: Share of EBSS benefits to consumers



When the EBSS was developed (2008) the real discount rate was assumed to be 6 per cent, and so consumers retained 70 per cent of the present value of all operating cost underspends.



With the fall in the real WACC[19] the consumer's share of operating cost efficiency savings has increased to 82 per cent*

** Based on the 2020 average industry real WACC of 3.34 per cent.*

Productivity factor

A positive productivity factor has been incorporated into the operating expenditure allowances of some transmission networks since 2015.[20] The AER has also included a productivity factor of 0.5 per cent per annum in its forecast of operating expenditure for distribution networks since 2019.[21]

The implication of a positive productivity factor is to lower the operating expenditure allowance for a network. Consequently, consumers receive 100 per cent of these anticipated operating expenditure productivity improvements.

[18] For example, if an NSP's actual operating expenditure is $3 million below its allowance in 2019 and was only $1 million below its allowance in 2018, the incremental change in operating expenditure in 2019 is a $2 million improvement in performance. Further, if in 2020 the NSP's actual operating expenditure matches its allowance, the incremental change in operating expenditure would be a -$3 million deterioration in performance.

[19] Weighted average cost of capital (WACC) is the rate of return that the regulator has determined that energy networks should earn on their regulated asset base (RAB).

[20] AER, Final decision, *TransGrid transmission determination 2015−16 to 2017−18 | Attachment 7*, April 2015, p 85.

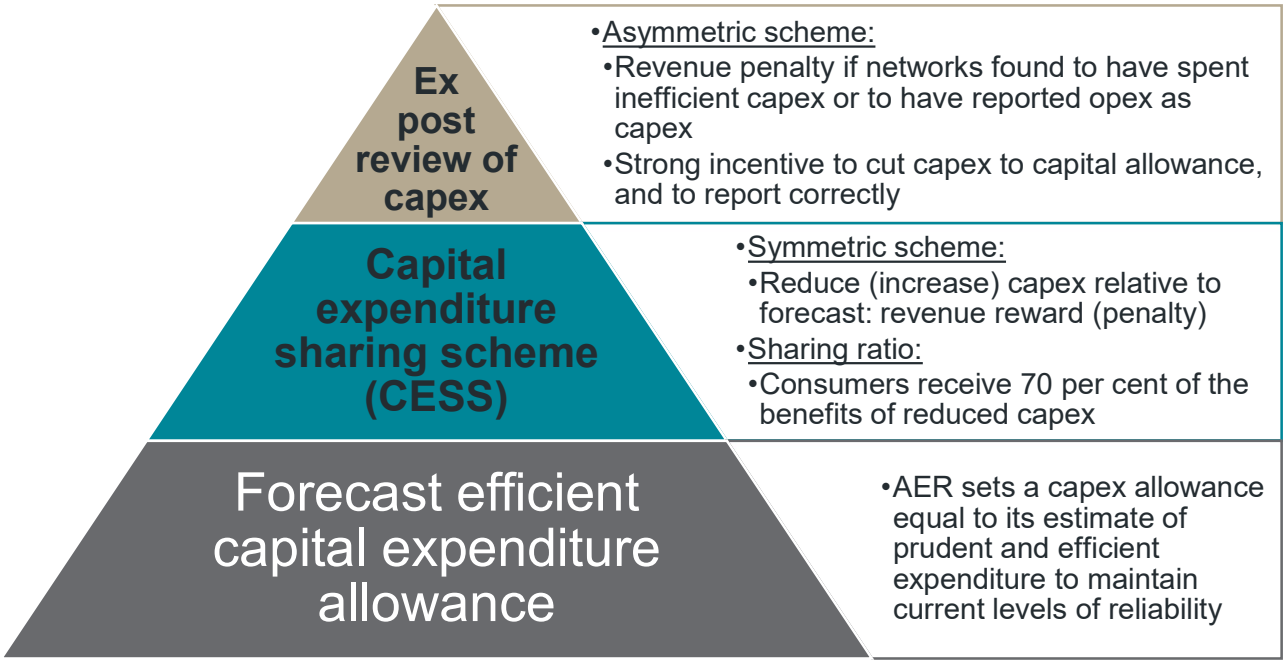
[21] AER, *Final decision paper, Forecasting productivity growth for electricity distributors*, March 2019, p 9.

4. Incentives to reduce consumer costs by efficiently investing in their networks

Key findings

- Consumers receive a fixed share (70 per cent) of any capital expenditure efficiencies under the CESS incentive scheme.
- The AER identifies and adjusts rewards (penalties) for capital expenditure that has been deferred by the network.
- The AER, in certain circumstances, can also identify recent capital expenditure that it considers is not efficient and then disallow the recovery of this expenditure.

Figure 4-1 Factors affecting capital expenditure incentives



The transportation of electricity and gas is capital intensive. Networks must recover the cost of these investments from consumers over the useful life of the assets, with most investments recovered over a 40+ year period.

Consequently, the benefits of lower than forecast capital expenditure have a small but ongoing impact on consumer prices. However, ongoing reductions in the amount of capital invested have the capacity to significantly improve consumer affordability given that capital costs represent nearly two thirds of networks' costs.[22]

This section outlines the primary incentives within the regulatory framework for networks to minimise capital costs.

[22] See AER, *State of the Energy Market 2021*.

Efficient forecast capital expenditure

The price paid by consumers for energy network services over a regulatory period includes a capital expenditure allowance. The expenditure allowance reflects the AER's view of the expected efficient costs to replace existing assets and augment the network for expected future growth over the period.

The AER uses a range of tools to assess whether the proposed capital expenditure is efficient, including past performance, statistical tools and independent experts. The AER's method for forecasting capital expenditure has been enhanced over time with the development and publication of a range of guidance notes and guidelines, including (but not limited to) the:

- Better Reset Handbook, December 2021;
- assessing distributed energy resources integration expenditure guidance note (Draft), July 2021;
- repex model outline for electricity distribution determinations, February 2020;
- capital expenditure assessment outline for electricity distribution determinations, February 2020;
- non-network ICT capital expenditure assessment approach, November 2019; and
- industry practice application note for asset replacement planning, January 2019.

However, these enhancements will only be applied to a network's subsequent regulatory reset. Consequently, the full impact of these enhancements are yet to be realised, and will be borne out in future periods.

Networks have an incentive to lower their actual capital expenditure by either delivering capex projects and programs at lower cost or by efficiently deferring expenditure to outperform their fixed allowance. However, in the absence of the CESS these incentives diminish over the regulatory period.

Outperformance means that networks have invested less capital than forecast. At the end of the regulatory period the regulatory asset base (RAB) is rolled forward for actual capital expenditure so that the benefits of lower than anticipated capital expenditure are passed through to consumers and reflected in lower network prices in subsequent regulatory periods.

Capital expenditure sharing scheme

The CESS was developed as part of the AER's 2013 Better Regulation program, with it applying to most electricity networks in 2015/16 or 2016. The CESS has been applied to Victorian gas networks since 2018.

The CESS remedied the issue with the regulatory framework that capital incentives reduced in each year of the regulatory period.[23]

The CESS removed this bias by ensuring that the network retains a fixed 30 per cent of any capital expenditure under- or over-spend. The CESS explicitly calculates the CESS carryover amount for the following regulatory period that:

- ensures that the network retains the targeted sharing ratio in present value terms;
- includes the expected increase in future capital expenditure due to the deferment of capital expenditure from the current period; and
- has regard to any financial benefits (costs) received by the network in the current period.

As seen in figure 4-2, the CESS sharing ratio is not affected by changes in the discount rate and is designed to guarantee that consumers receive (or bear) 70 per cent of any under or overspend.

[23] Pre-CESS, networks' rewards were strongest in the first year of the regulatory period, whilst in the final year there were no rewards or penalties for networks under/overspending their capital expenditure allowances.

Figure 4-2: Share of CESS benefits to consumers

With a 6 per cent real discount rate the CESS ensures that consumers retain 70 per cent of the present value of all capital cost underspends.

Unlike the EBSS, a fall in the real WACC does not change the consumer's share of capital cost underspends, which remains at 70 per cent.

The AER also has the ability to identify and adjust rewards (penalties) for any capital expenditure that has been deferred by the network. Where expenditure is identified as being deferred the CESS benefit is equal to the time value of the deferment (rather than the avoidance of the expenditure).[24]

Additional AER review powers - capital expenditure

The AER can, at the end of a regulatory period, review a network's actual capital expenditure. This is a mechanism for the regulator to, in specific circumstances, identify capital expenditure over the preceding period above the efficient level, and to disallow the recovery of this excess expenditure.

The ex-post review allows the AER to remove inefficient capital expenditure so that it is not rolled into the RAB – or the amount that the network can recover – at the end of a regulatory period.

An ex-post adjustment operates as an additional potential penalty where networks bear 100 per cent of the cost of any inefficient expenditure. An ex-post review can only impose a penalty on the network, unlike the CESS which both rewards and penalises networks.

While these powers can have a impact on a network's incentives to invest, the circumstances that would allow the AER to apply these provisions have not arisen to date.

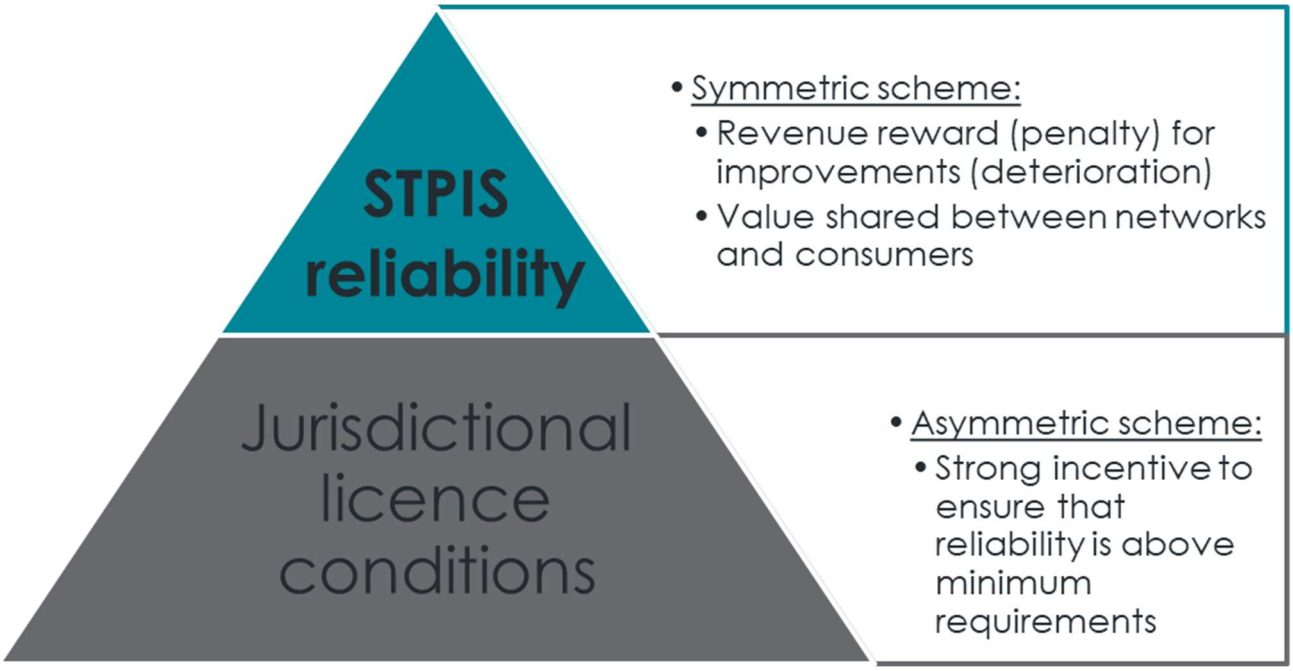
[24] For example, if the rate of return is 5 per cent, and the network is able to defer $1 million in capital expenditure for one year then the CESS benefit is $50,000 (ie, 5% of $1 million). This CESS benefit would then be shared between consumers ($35,000 or 70% of the total benefit) and the network ($15,000 or 30% of the total benefit).

5. Incentives to improve reliability of network services to consumers

Key findings

- The STPIS provides short term financial rewards to the distributor for improvements in network reliability.
- The rewards allowed under the reliability components of the STPIS match the value consumers place on improved network reliability.
- Consumers retain 78 per cent of the benefits of improved reliability, using a 6 per cent discount rate.

Figure 5-1: Factors affecting network service quality incentives



Consumers benefit from improvements, and are harmed by deteriorations, in the quality of network services. Service quality incentives aim to ensure that networks deliver optimal service levels by:

- incentivising networks not to reduce expenditure at the expense of inefficient reduction in service quality; and
- encouraging networks to improve service levels over time where it is cost effective to do so.

In a competitive market, firms must successfully balance service quality and cost efficiency to increase sales and profitability. The AER's incentive framework seeks to replicate these twin objectives.

While service quality has multiple facets, the primary service quality for electricity distribution networks is network reliability.

This section outlines the primary incentives within the regulatory framework for networks to improve network reliability.

Jurisdictional licence conditions

Networks are required to obtain an operating licence which details the requirements they must meet in order to operate a network in a state or territory.

Licences normally specify a minimum level of reliability and can potentially cover:

- overall minimum feeder reliability standards;
- a reliability standard for different distribution feeders, ie, urban, rural or remote lines;
- direct connection for larger consumers not covered by the STPIS; and
- consumer service standards.

These jurisdictional minimum service levels are generally designed to complement the AER STPIS framework.

Service target performance incentive scheme - reliability

The STPIS incentive scheme was introduced in 2007 for electricity transmission networks, with the distribution scheme introduced in 2008, which continued to incentivise reliability improvements established by jurisdictional incentive mechanisms. There is no equivalent scheme for gas networks, however, the gas CESS includes a component that reduces rewards if service quality falls.

The STPIS incentivises networks to maintain and improve service performance by:

- rewarding networks that improve network reliability; and
- penalising networks for deterioration in network reliability.

These rewards are calibrated so that the increase in network costs matches the value, estimated by the AER, that consumers place on improved reliability.

The STPIS applies to unplanned outages, so it excludes planned outages as well as extreme weather events. However, outages caused by storms are generally included since networks have some ability to partially mitigate the impacts of these events.[25]

The STPIS reliability component for distributors has three reliability measures which networks are incentivised to minimise:

- the annual duration of minutes off supply;
- the annual number of interruptions; and
- for some networks, the annual number of momentary interruptions.

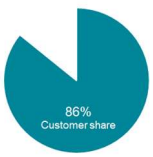
When a network is able to outperform its reliability targets, it is rewarded. However, in subsequent regulatory control periods these targets are reset to reflect the network's improved reliability and so consumers receive a higher level of reliability without incurring the cost of any additional STPIS rewards.

In this scenario consumers immediately benefit from the improved reliability. The STPIS rewards the network for the improvement in network reliability (with a two-year delay); however, the increase in network costs is calibrated to match the value that consumers place on improved reliability.

Figure 5-2 shows the share of reliability improvements that consumers retain.

Figure 5-2: Share of STPIS reliability benefits to consumers

With a 6 per cent real discount rate the STPIS reliability measures ensure that consumers retain 78 per cent of the present value of reliability improvements.



Like the EBSS, a fall in the real WACC increases the consumer's share of reliability improvements to 85 per cent*

** Based on the 2020 average industry real WACC of 3.34 per cent*

[25] Noting that major event days (MEDs) are excluded from the STPIS.

6. Conclusion

The AER's incentive schemes are designed to encourage energy networks to both improve network services whilst simultaneously lowering the costs of providing these services. The schemes also ensure that the majority of benefits from these gains are passed through to consumers.

In this report we have quantified the benefits to consumers attributable to the following three incentive schemes:

- the EBSS that encourages network to lower the cost of operating their network;
- the CESS that incentivises networks to minimise the cost of their network investments; and
- the reliability component of the STPIS for distribution networks that ensures that cost reductions are not at the expense of inefficient reductions in service quality to consumers.

Our analysis estimates that since the introduction of the incentive schemes the average consumer with both an electricity and gas service is at least $1,466 better off in present value terms (2020). Consumers with an electricity-only service are $1,290 better off. Both estimates assume a 6 per cent discount rate.

The estimated consumer benefits rise when a lower annual average industry real WACC is used. Consumers with both an electricity and gas service are $2,448 better off assuming this lower WACC, and consumers with an electricity-only service are $2,168 better off.

We find that the largest source of consumer benefits was associated with networks reducing the cost of operating and maintaining their networks. For electricity and gas customers the consumer benefits in present value terms (2020) were estimated to be $7.1 billion, or 70 per cent of the total operating expenditure gains (assuming a 6 per cent discount rate).[26]

We estimated that the consumer benefits of the CESS had a present value (2020) of at least $2.8 billion which was 70 per cent of the total benefits of lower than forecast capital expenditure (assuming a 6 per cent discount rate).[27]

We estimated that the consumer benefits from the distribution reliability STPIS was $3.5 billion in present value (2020) terms, with consumers receiving 78 per cent of the total benefits from reliability improvements (assuming a 6 per cent discount rate).[28]

Incentive schemes are one of many factors in the regulatory framework that influence the strength of incentives on networks. In assessing whether incentives are balanced, it is necessary to have regard to all factors rather than a narrow examination of only the sharing ratios of the specific incentive schemes.

Further, we note that efficiency improvements will generally require networks to commit significant upfront costs while the benefits may take a number of years to be fully realised. Consequently, networks require a stable and predictable framework that provides confidence that the rewards anticipated from investments in business improvement will be realised.

[26] At the lower average industry real WACC the consumer gains in present value (2020) terms were estimated to be $13 billion which was 82 per cent of the total gain from lower than expected operating costs.

[27] At the lower average industry real WACC the consumer gains in present value (2020) terms were estimated to be $2.6 billion which was 70 per cent of the total gain from lower than expected capital expenditure.

[28] At the lower average industry real WACC the consumer gains in present value (2020) terms were estimated to be $6.6 billion which was 85 per cent of the total value of improved distribution reliability.

A1. Appendix Methodology for quantifying incentive scheme benefits

A1.1 Measurement of efficiency gains with respect to AER expenditure allowances

Expenditure efficiency gains have been measured by comparing actual outturn expenditure against the operating and capital ex-ante allowances independently determined by the AER.

The AER's expenditure allowances represent an independent and informed estimate of the networks' expected efficient expenditure;

- any ex-ante expenditure allowances inevitably involve a degree of uncertainty as to how future events will unfold (such as unexpected growth in customer connections, unforeseen changes in demand and unanticipated changes in the physical condition of assets);
- actual efficient costs may therefore be either above or below that forecast by the AER at the start of the regulatory period; however
- the AER has a range of assessment tools to help it determine the appropriate allowance and is required to set its best estimate of the NSP's efficient costs over the regulatory control period, further the AER is continually refining and enhancing its expenditure assessment tools with the full impact of the recent reforms to be borne out in future resets.[29]

The adoption of the AER's expenditure allowances as the yardstick against which efficiency gains are measured in our analysis is unlikely to materially impact the conclusion that the incentive schemes have led to material gains for consumers.

For example, even if the AER's expenditure allowances were assumed to systematically overstate the efficient costs of networks, and half of the outperformance is assumed to be the result of overstated allowances, the consumer benefits (assuming a 6 per cent discount rate) would still be in the order of $6.7 billion (PV, 2020).

A1.2 Discount rates

For each incentive scheme, we have calculated the benefits to consumers using a:

- real WACC of:
  - a constant 6 per cent real discount rate; and
  - an industry average of the real vanilla WACC applying each year across electricity transmission, electricity distribution and gas distribution, as reported in each PTRM/RFM; or
- nominal WACC of:
  - a constant 6 per cent real discount rate, converted to a nominal rate by Dec-Dec CPI; and
  - the industry average real rate, converted to a nominal rate by Dec-Dec CPI.

We have calculated the net present value of benefits as at 30 June 2020.

[29] See clauses 6.5.6(a), 6.5.7(a), 6A.6.6(a) and 6A.6.7(a) of the National Electricity Rules, and clauses 79 and 91 of the National Gas Rules.

A1.3 CESS

Data:

We have relied on capital expenditure underspends and deferments reported in final decision CESS models for each business. For years in which CESS models were not available, actual and forecast allowance capital expenditure data was sourced from the AER's 2021 operational performance report.[30]

Customer numbers for the CESS, EBSS and STPIS calculations were sourced from ENA from RIN data and supplemented by RIN data where necessary.[31]

Methodology:

The steps used to calculate the benefits from the CESS were as follows:

- input total from the NSP CESS models including:
  - net nominal underspend/overspend per year (including ½ year WACC);
  - deferment (as a negative (overspend) value); and
  - NPV of the underspend/overspend at a given point in time;
- for years where data was not available from the NSP's CESS model we have inputted RIN data of the inflation adjusted capital expenditure allowance and actual capital expenditure;
- use 30 per cent sharing ratio to determine allocation to NSPs and consumers each year;
- calculate the net present value as at 30 June 2020 of total, consumer and NSP benefits using the nominal discount rate:
  - for the industry discount rate, NPV of underspend reported in the CESS model adjusted to 30 June 2020 plus the present value of any under(overspend) from the RINs in years that the CESS model did not apply; and
  - for the 6 per cent constant discount rate,
    - multiply each year's benefits by the appropriate discount factor, adjusting for a half year WACC; and
    - sum the benefits from each year; and
- calculate per customer values for total, NSP and consumer benefits (divide by appropriate customer numbers).

A1.4 EBSS

Data:

We have relied on forecast operating expenditure allowance for EBSS purposes and actual operating expenditure for EBSS purposes reported in final decision EBSS models as the primary source of data.

In the most recent years where EBSS models were not available for a given business, we have drawn actual operating expenditure from economic benchmarking RINs (or annual RINs for gas businesses) and forecast operating expenditure allowance from the most recent final decision operating expenditure model for the business. When collecting data from operating expenditure models and RINs, we have accounted for the relevant operating expenditure categories excluded from EBSS calculations for each business, based on the

[30] AER, *Electricity network performance report 2021*, 22 September 2021, financial performance data spreadsheets.

[31] ENA, ENA Model – Rewarding Performance – Incentive analysis and Table 3.4.2 of the DNSP annual economic benchmarking RIN.

most recent final decision or EBSS model for that business, to ensure consistency with the EBSS model data.[32]

These forecast and actual operating expenditure data were used to calculate the incremental operating expenditure efficiency gains made by a business each year, as described under 'methodology' below.

In earlier regulatory periods where EBSS models were not published by the AER, we calculated incremental efficiency gains directly from EBSS revenue increments or carryover amounts reported in final decision PTRMs. For example, the incremental gain for a business in 2010 can be calculated as the difference between the carryover amount in 2015 and 2016, adjusted for inflation.

Where the required PTRM data was unavailable or unsuitable (in particular, for TransGrid from 2006 – 2009 and the Victorian DNSPs from 2006 – 2008), we have drawn on regulatory decisions to collect data on actual and forecast operating expenditure for EBSS purposes.

Methodology:

The steps used to calculate the benefits from the EBSS were as follows:

- calculate the present value of a $1 incremental gain/loss in each year, in particular:
  - the present value to a network of a $1 incremental gain/loss for the first six years;
  - the total present value of a $1 incremental gain/loss calculated as the sum of:
    - the present value of $1 gain/loss in each year of the 2006-20 period; and
    - the present value of a $1 per annum gain/loss for the post-2020 period ; and
  - the present value of benefits to consumers = total benefits – NSP benefit;
- convert all input data for calculating incremental operating expenditure efficiency gains (ie, actuals, forecasts and PTRM increments) to real $2020;
- use forecast and actual operating expenditure for EBSS purposes to calculate the incremental efficiency gains for each business each year, ie;
  - where year t is the first year of a regulatory period, cumulative gain in year t ; or
  - for all other years, cumulative gain in year t ;
- sum the incremental gains for each year NEM-wide to assess total patterns;
- when the EBSS applies, multiply the incremental gains by the NSP and consumer benefits per dollar to obtain total NSP and consumer benefits in real 2020 terms;
- bring the values forward to NPV as at June 2020, using the real discount rate; and
- sum the values across years and divide by customer numbers to obtain total, NSP, and customer benefits.

[32] Exclusions included (but were not limited to) debt raising costs, network support costs, demand management expenditure and guaranteed service level (GSL) payments. EBSS operating expenditure exclusions varied from business to business.

A1.5 STPIS reliability (DNSP only)

Data:

We have relied on the AER's 2021 DNSP operational performance report for SAIDI and SAIFI performance data (ie, minutes off supply and number of interruptions for each business each year from 2006-2020).[33] This data is used to calculate the change in the annual duration and frequency of interruptions for an average customer.

The AER's 2021 DNSP operational performance report was also used as the source of energy delivered by each distribution network for each year from 2006-2020.[34] This data was used to calculate the average energy delivered per minute.

We have used the following data to estimate the value of changes in SAIDI and SAIFI:

- the AER's STPIS guidelines for appropriate SAIDI and SAIFI VCR values. VCR values that reflect the new SAIDI/SAIFI weightings were used for NSW, ACT and Tas DNSPs in 2020 for their new regulatory period; and
- to account for the different VCR values attributed to different network segments (CBD, urban and other) we have used customer number breakdowns for each network type sourced from ENA (which was sourced from the RINs) and supplemented by RIN data where necessary.[35]

This data was used to value changes in network reliability:

- the SAIDI portion of the VCR (weighted by network segment customer numbers) was used to attribute a value for the change in energy delivered due to changes in network SAIDI; and
- the SAIFI portion of the VCR (weighted by network segment customer numbers) was used to attribute a value for the change in energy delivered due to changes in network SAIFI (together with the assumption that of the average length of a network interruption).

Apportioning the VCR to a network's SAIDI and SAIFI performance mitigates the risk of any double counting of the benefits from the reduction in the duration of interruptions.

We have adopted this approach as it is consistent with the method used to calculate DNSP rewards and penalties under the distribution STPIS reliability component. Other approaches to valuing changes in network reliability could be adopted that more directly estimate the value consumers place on changes in SAIFI. However, this requires estimates of the value customers place on outage frequency, which to our knowledge do not exist for Australian consumers and is likely to be dependent on when outages are assumed to occur, ie, during peak or off-peak periods, and whether it occurs in the summer or winter.

Methodology:

At a high level we have calculated consumer gains from improvements in actual annual distribution network reliability (duration and frequency) from one year to the next. The steps used to calculate the benefits from the distribution STPIS reliability component were as follows:

- calculate the present value of $1 perpetual improvement in annual actual reliability gain/loss for each year, in total, to a DNSP and to consumers;
- calculate gross consumer benefits from SAIDI;
- separately, calculate gross consumer benefits from SAIFI; and

[33] AER, *Electricity network performance report 2021*, 22 September 2021, financial performance data spreadsheets.

[34] AER, *Electricity network performance report 2021*, 22 September 2021, financial performance data spreadsheets.

[35] ENA, ENA Model – Rewarding Performance – Incentive analysis and Table 3.4.2 of the DNSP annual economic benchmarking RIN.

- calculate the net present value of SAIDI and SAIFI benefits to consumers, DNSPs & total (all gains/losses converted to 30 June 2020 present value terms (using real discount rate)).

The more detailed steps for calculating the present value of a perpetual change in reliability were:

- calculate the present value of $1 incremental gain/loss in each year, in particular;
  - the present value to a network of a $1 gain/loss for years 3-7;
  - the total present value of a $1 incremental gain/loss calculated as the sum of:
    - the present value of $1 gain/loss in each year of the 2006-20 period; and
    - the present value of a $1 per annum gain/loss for the post-2020 period ; and
  - the present value of benefits to consumers = total benefits – NSP benefit.

The more detailed steps used to calculate the benefits from SAIDI were:

- For each network, each year, calculate:
  - (A) energy delivered per minute per customer;
  - (B) annual incremental change in outage minutes per customer;
  - (C) incremental energy delivered per customer = A * B; and
  - (D) value of incremental energy delivered = C * weighted average VCR, where
    - weighted average VCR[36] = CBD customers * CBD VCR + urban customers * urban VCR + other customers * other VCR.

The more detailed steps used to calculate the benefits from SAIFI were:

- For each network, each year, calculate:
  - (A) energy delivered per minute per customer;
  - (B) annual incremental change in interruptions per customer;
  - (C) assumed length of interruption = SAIDI/SAIFI;
  - (D) incremental energy delivered = A * B * C; and
  - (E) value of incremental energy delivered = D * weighted average VCR, where
    - weighted average VCR = CBD customers * CBD VCR + urban customers * urban VCR + other customers * other VCR.

[36] VCR values for each network type taken from clause 3.2.2 of the AER, Electricity distribution network service providers | Service target performance incentive scheme | Version 2.0, November 2018.

A2. Impact of using an industry average real WACC discount rate

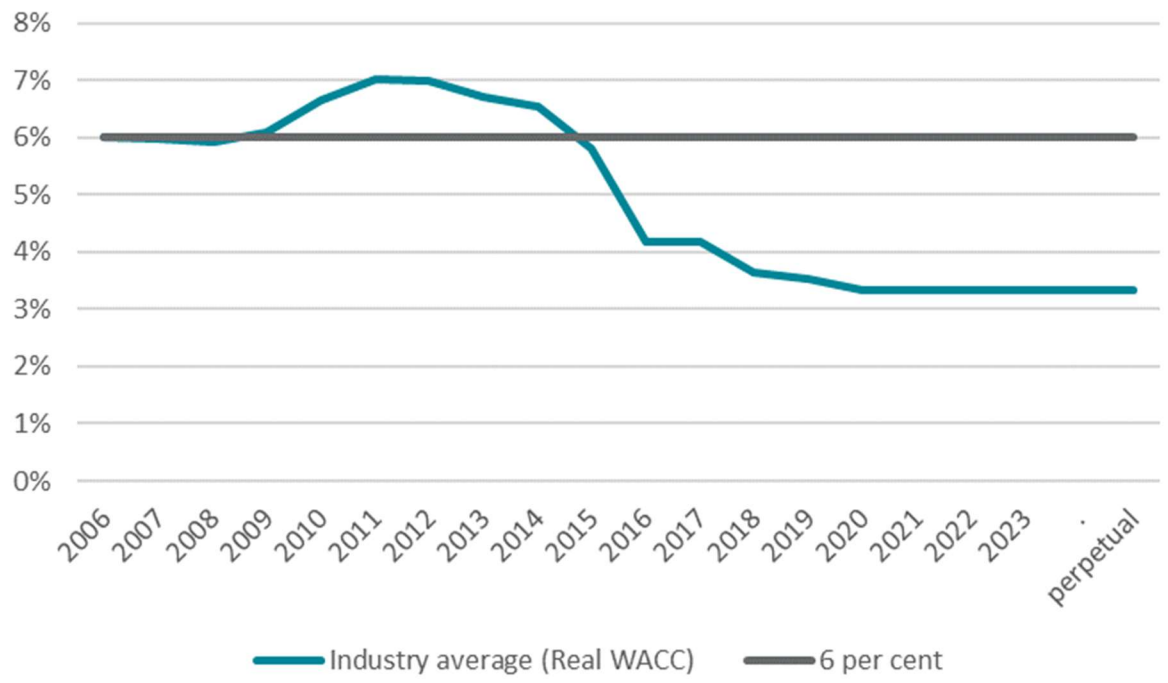
The impact of changes in network expenditure efficiency or network reliability will have an impact on consumers over a number of different years. To allow for a meaningful assessment of these annual impacts we have converted all values to a common point in time (30 June 2020) using a discount rate.

In this report we have focused on the present value of consumer benefits using a 6 per cent discount rate, which aligns with the discount rate used by the AER to calculate the sharing of efficiency gains between consumers and networks when developing the EBSS and CESS.[37]

However, an alternative to assuming a 6 per cent discount rate would be to use a value that corresponds to the opportunity cost of capital for the electricity and gas network sector. We have estimated this value using the average real weighted average cost of capital (real WACC) as determined by the AER. Further, we have assumed that in future years the average industry real WACC is unchanged from the last period observed (ie, 2020).[38]

Figure A 1, sets out over time the two alternative discount rates.

Figure A 1: Alternative discount rates



The discount rate has a material impact on the estimated consumer benefits from both the EBSS and STPIS, since both these schemes assume that consumers retain in the long term any efficiency gains (losses) made

[37] See AER, *Better regulation | Capital Expenditure Incentive Guideline for Electricity Network Service Providers | Explanatory statement*, November 2013, p 46. AER, *Better regulation | Efficiency benefit sharing scheme for Electricity Network Service Providers | Explanatory statement*, November 2013, p 34.

[38] The adoption of that the future WACC is equal to the last observed rate is consistent with recent observations contain the most up to date market information of future market conditions.

by networks. As a consequence, the assumption that the industry average real WACC is substantially below 6 per cent in future periods increases the value of any future consumer benefits.[39]

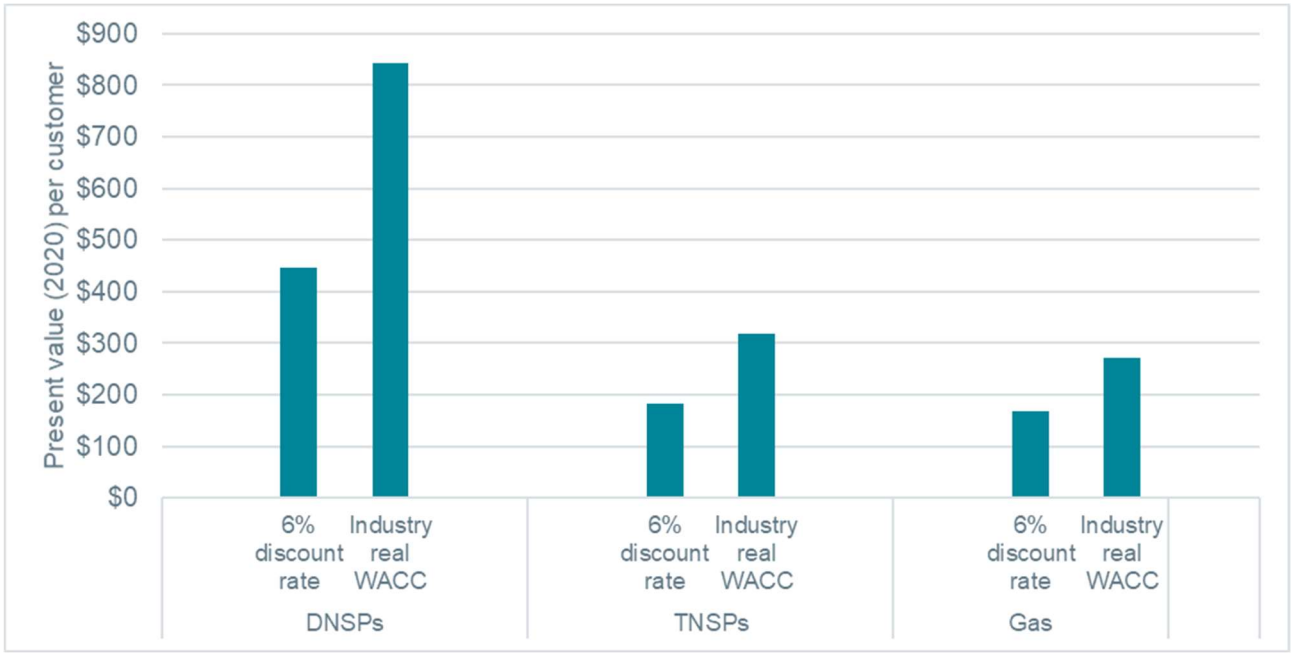
Using the average industry discount rate increases the present value (2020) of total consumer benefits from $13.4 billion (using a 6 per cent discount rate) to $22.3 billion.

On a 'per consumer' basis, adopting the lower average industry real WACC results in the estimated consumer benefits generated by the AER's incentive schemes increasing to $2,448 for an electricity and gas customer. Consumers with an electricity-only service would be $2,168 better off.

This is primarily due to higher consumer benefits from the EBSS, with the present value of estimated consumer benefits (2020) increasing to $12.1 billion (electricity and gas) from $6.6 billion using a 6 per cent real discount rate. Further, using the average industry discount rate results in consumers retaining over 80 per cent of the total operating expenditure gains.

Figure A 2 shows the breakdown of the present value of the EBSS consumer benefits (per customer) by different network types using the two different discount rates.

Figure A 2: Present value (2020) of consumer benefits attributable to the EBSS (per customer)



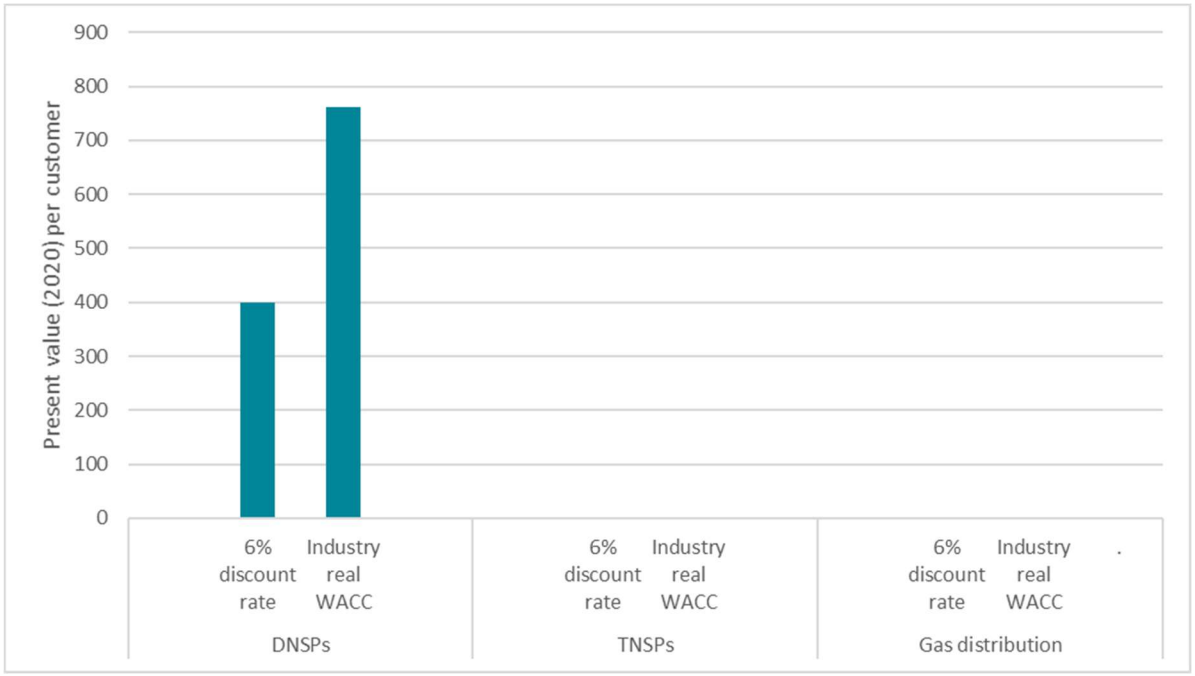
The impact of using a lower average industry real WACC on the present value (2020) of the improvements in electricity distribution reliability to consumers is that:

- the value of the reduced number of service interruptions to consumers increases from $3.1 billion (using 6 per cent) to $5.8 billion, and increases the proportion of the gains retained by consumers from 78 per cent to 85 per cent; and
- consumer value from a lower number of minutes off supply increases from $0.4 billion to $0.75 billion, and the proportion of the gains retained by consumers increases from 78 per cent to 84 per cent.

[39] For example, a $100 consumer gain in 2030 has a present value as at 2020 (ie, a gain 10 years in the future) of $55.84 using a 6 per cent discount rate. However, using a 3.34 per cent discount rate that $100 in consumer gains in 2030 has a present value of $72.00. In other words, adopting the lower discount rate results in a 29 per cent increase in the present value of the $100 consumer gain in 2030.

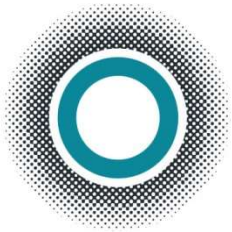
Figure A 3 shows the net present value of the consumer benefits of improvements in distribution reliability.

Figure A 3: Present value (2020) of consumer benefits attributable to distribution reliability STPIS (per customer)



The use of the average industry real WACC does not materially change the estimated consumer benefits delivered by the CESS.[40] This is because the CESS, unlike the EBSS and STPIS, does not involve networks retaining benefits for a fixed period of time. Instead, the CESS rewards are explicitly calculated to ensure the networks receive a fixed sharing ratio.

[40] The present value (2020) of the consumer gains attributable to the CESS (electricity and gas) using the industry average real rate of return, is $2.6 billion which is $155 million lower than using a 6 per cent real discount rate.



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