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Interaction between incentives and licence conditions on the reliability outcomes of distributors

A report for the Independent Pricing and Regulatory Tribunal

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Response to scope of work questions

1. What are the properties of a regulatory framework that mandates a level of reliability?

Section 3.5 of this report summaries the regulatory elements affecting the level of distribution network reliability.

The principal AER's incentives mechanisms are the following three schemes:

- the STPIS that rewards (penalises) a distributor for improving (worsening) network reliability;
- the EBSS that rewards (penalises) a distributor for delivering network services at lower (higher) levels of opex; and
- the CESS that rewards (penalises) a distributor for delivering network services at lower (higher) levels of capex.

The implication of the AER's incentive framework is that it internalises for the distributor the twin objectives of delivering distribution services at least cost and maximising the value customers receive from consuming electricity.

Where the incentives are balanced, a distributor should have an incentive to deliver an efficient level of reliability regardless of how the targets are set. A balanced incentive framework would provide similar incentives for reducing (increasing) expenditure and improving (worsening) reliability.

However, as discussed in sections 3.2 and 3.3, the AER's three incentive schemes currently provide different incentive rates, with the distributor retaining:

- 30 per cent of any increase/decrease in capex;
- 16 per cent of any increase/decrease in opex; and
- 13 per cent of the customer benefit (cost) of any increase/decrease in reliability.

This difference is primarily driven by the different mechanisms used to share the gains and losses between the distributor and customers, with the recent falls in the discount rate lowering the incentive rates provided by the EBSS and STPIS.

However, we noted that the AER is required under the NER to have regard to interactions between the incentive mechanisms, and to the extent the AER considers the imbalance in incentives to be a material issue it would be able to adjust the incentive rates when it next reviews these mechanisms.

Section 3.4 of this report review the impact of the reliability and performance conditions contained within the NSW distribution licences. The following two conditions were assessed to have the potential to effect the level of reliability:

- the overall reliability standards for SAIDI and SAIFI which:
  - if they require higher reliability than current levels, it gives rise to a regulatory obligation to increase reliability that results in additional expenditure being included in the distributor's regulatory allowances;
  - if they stipulate a lower level of reliability would not be binding, and so the distributor's regulatory allowances would continue to be set by reference to maintaining current levels of reliability; and
- the guaranteed service level payments scheme provided a limited incentive to improve reliability.

2. How would licence based reliability measures impact distribution businesses incentives to optimise reliability and expenditure, considering:

This question has primarily been answered in section 5 of the report.

a) Performance standards (SAIDI and SAIFI levels) set at a level below the STPIS target?

Scenario D (section 5.1) and Scenario 1 (section 5.3) illustrate a situation where the performance standards are set to require a higher level of reliability (and so lower SAIDI and SAIFI levels). In Scenario D, assumes that the performance standards have been set to an efficient level and so the AER would adjust the distributor's expenditure allowances and STPIS targets to reflect the transition to higher levels of reliability and then:

- the distributor would transition to an efficient higher level of reliability, although we note that we expect that the rate of transition would be no different from the scenario without mandated performance standards since the distributors incentives are independent of allowances/STPIS targets; and
- all the net benefits of the delivering a more efficient level of reliability would accrue to customers with the distributor just recovering its costs.

Scenario 1 highlights the potential risk that mandating a level of reliability that is higher than efficient. The implications of this outcome shows that:

- a distributor acting on its financial incentives would not comply with the performance standard and would instead deliver a lower efficient level of reliability;
- in doing so the distributor would be exposed to substantial financial penalties, with the STPIS penalties outweighing the rewards provide by the EBSS and CESS; and
- if the distributor instead complied with its licence requirements, then the:
  - cost of providing the increment of reliability in above the efficient level will be greater than the value customers place on that improvement in reliability; and
  - savings from reducing reliability expenditure beyond the efficient level will be less than the value customers place on that lost reliability.

  In both cases, customers would be worse off than if networks delivered an efficient level of reliability.

b) Performance standards (SAIDI and SAIFI levels) set at the same level as the STPIS target?

In this scenario the performance standards would not have a material impact.

c) Performance standards (SAIDI and SAIFI levels) set at a level above the STPIS target?

Scenario E (section 5.2) and Scenario 2 (section 5.4) illustrate a situation where the performance standards are set to require a lower level of reliability (and so increase SAIDI and SAIFI levels). The impact mirrors the impacts described above our response to question 2(a).

d) Automatic guaranteed service level payments to customers based on the value of customer reliability for the each outage?

The guaranteed service level payments provide limited financial incentive for distributors to improve the reliability. This is unlikely to materially change if an automatic payment is introduced. The main limitation of guaranteed service level payments, the incentive is only directed limited to the reliability of customers eligible for a payment, rather than targeted reliability outcomes of all customers.

3. How does the existing framework under STPIS, CESS, EBSS, RIT-D and baseline allowances for operating and capital expenditure incentivise businesses to transition towards efficient levels of reliability?

Scenarios A to C in section 4.1 of this report sets how the AER's existing framework would transition a distributor towards efficient levels of reliability.

The impact of the AER's incentive framework is to focus the distributor on the task of how to deliver an efficient level of reliability, by providing rewards when:[1]

- the cost of reliability improvements is less than the value its customers place on the improved reliability; and
- the savings from reducing reliability expenditure exceed the value its customers place on the deteriorating reliability.

Scenarios B and C show that a distributor would be rewarded to transition to the efficient level of reliability, regardless of whether it is above or below current levels. Further, the incentive framework shares the net gains from any efficiency improvements between the distributors and its customers (with customers receiving most of the net benefits).

a) Are there any behavioural or other factors that impact on the incentives to transition to efficient levels of reliability, in particular where lower levels of reliability are efficient? For example using the term 'target' to define STPIS baseline reliability and distributor investment in baseline reliability operating and capital expenditure proposals and the requirement on the business to demonstrate savings to qualify for the CESS and EBSS.

   This should also take into account changes to jurisdictional reliability standards (for example, taking into account when NSW and Queensland moved away from the deterministic reliability standards that drove significant investment in improving reliability).

Section 4.2 of this report identified some potential reasons why distributors may not in practice have acted on the financial incentives in the current regulatory framework to deliver efficient levels of reliability including:

- the NSW distributors were not required to consider the efficiency of their reliability investments under the previous deterministic reliability standard, which was only removed on 1 July 2014;
- the comprehensive incentive framework has only recently been operational in NSW;
- reliability outcomes are inherently uncertain and so distributors may discount the expected value of benefits of reliability improvements; and
- potential behaviour responses of distributors, such as risk aversion and adoption of performance targets.

b) Over what time period would your expect this transition to occur when the efficient levels of reliability differ by say +/- 10% from current levels (for example, the life of the assets)?

Section 4.3 of this report considers the factors that would determine the period of time that a distributor would need to transition to efficient levels of reliability. While we have not been able to identify the expected transition period, we noted that transition period will depend on a number of factors, including:

- the speed of transition will depend on the adjustments that the distributor must make to reach an efficient level of reliability, for example:

[1] The framework will also penalise a distributor for inefficient outcomes, such as when the cost of delivering higher levels of reliability is greater than the value customers place on that reliability improvement .

- if the distributor only needs to change opex to reach the efficient level of reliability then the transition would be relative quick (a year or two);
- if the transition requires the distributor to alter its reliability assets then the timing will depend on the asset replacement cycle. With changes to relatively short lived assets (such as an upgrading the SCADA system) the transition period could be a period of a couple of years, however, if the change requires the distributor to reconfiguring its network (to remove unnecessary duplication) then the transition path may take 30 to 40 years.

4. Where lower levels of reliability are efficient, the existing STPIS targets would penalise businesses for achieving lower levels of reliability. Is this appropriate?

Scenario C (section 4.1.3) illustrates how the existing STPIS targets would penalise a distributor for achieving a lower level of reliability. However, the AER's overall incentive framework would reward the distributor where lower level of reliability is efficient because the savings from delivering lower reliability would be greater than the costs imposed on customers from lower reliability. Consequently, the rewards provided by the EBSS and CESS would be greater than the penalties imposed by the STPIS.

5. Where higher levels of reliability are efficient,

a) And no licence condition is added, the existing targets would reward businesses for achieving higher levels of reliability? Is this appropriate?

Scenario B (section 4.1.2) illustrates how the existing STPIS targets would reward a distributor for achieving higher levels of reliability. The AER's overall incentive framework would reward the distributor where higher level of reliability is efficient because the value of the reliability improvement to customers would be greater than the costs of delivering the higher reliability. Consequently, the rewards provided by the STPIS would be greater than the penalties imposed by the EBSS and CESS.

b) And a licence condition is added, would the STPIS targets increase to reflect the licence conditions (and expenditure forecasts be set to meet the licence condition)? Is this appropriate?

Scenario D (section 5.1) and Scenario 1 (section 5.3) illustrate a situation where the performance standards are set to require a higher level of reliability (and so lower SAIDI and SAIFI levels). The impact of the licence condition is described above our response to question 2(a).

c) Which of the above approaches for higher levels of reliability would provide the most efficient incentives?

Section 6 of our report sets out conclusions to the appropriateness of introducing a binding licence condition.

We highlight that there are the following reasons for including a performance standards in the NSW distribution licences that reflect efficient levels of reliability:

- to ensure that customers receive all the net benefits from the move an efficient level of reliability;
- the recent falls in discount rate has unbalanced the AER's incentive framework with distributor retaining a larger proportion of capex gains (losses), compared opex and reliability gains (losses) and so efficient outcomes are no longer assured;
  - Although we noted in section 3.5 that the AER is required under the NER to have regard to interactions between the incentive mechanisms, and to the extent the AER considers the imbalance in incentives to be a material issue, it would be able to adjust the incentive rates when it next reviews these mechanisms.
- the concerns that distributors are not acting on the financial incentives due to either:

> the presence behavioural responses which are discouraging distributors from efficiently targeting lower levels of reliability; or

> uncertainty of future reliability outcomes is deterring distributors from undertaking projects that efficiently improve reliability.

This would need to be balanced against:

- the consequences of mandating a performance standard does not reflect the efficient level of reliability, noting that the efficient levels of reliability are dynamic and will move over time depending on a number of factors including network costs and customer preferences;
- the potential that a distributor would not comply with the performance standard and would instead deliver an efficient level of reliability, in which case the only effect of the mandatory performance standard is to expose the distributor to substantial financial penalties; and
- disempowering distributors from innovating and finding ways to deliver higher levels of reliability at less cost.

We conclude that the optimal outcome would be to allow the AER to develop its incentive mechanisms to better ensure that:

> Penalties and rewards under the STPIS are calibrated with how willing customers are to pay for improved service. This aligns the distributor's incentives towards efficient price and non-price outcomes with the long-term interests of consumers, consistent with the National Electricity Objective (NEO).

6. Would the target levels of reliability in STPIS need to be reset to the efficient levels identified by IPART? What would be an appropriate period of time for any reset? How would any rewards or penalties be set during this time?

The target levels of reliability in STPIS could be changed by the AER if the distributor's expenditure allowances are expected to materially change the level of reliability. While we have not been able to determine the efficient transition period for STPIS target levels our response to question 3(b) discusses factors that will determine the transition period.

Section 5 of this report considers how the rewards and penalties would be set if the STPIS targets were adjusted to reflect efficient levels.

1. Introduction

This report has been prepared by HoustonKemp at the request of the NSW Independent Pricing and Regulatory Tribunal (IPART) and presents an assessment of the incentives that apply to the NSW distributors under the regulatory framework in relation to the reliability provided by their networks, and how this is affect by standards mandated in their distribution licence.

Our engagement is in the context of IPART's review of electricity distribution reliability standards in NSW, where IPART has been tasked with recommending:[2]

- any changes to electricity distribution reliability standards for the NSW distribution network businesses that could deliver bill savings to NSW electricity customers; and
- any other measures that could be imposed on or implemented by the NSW distribution network businesses within the current regulatory framework that would be likely to reduce network prices and are consistent with the National Electricity Objective.

IPART is also developing a model to estimate the efficient levels of SAIDI and SAIFI across the NSW distributors' networks. This modelling will produce three possible outcomes for each of the NSW distributors:

- efficient levels of reliability are similar to the existing STPIS targets for that distributor;
- efficient levels of reliability are higher than existing STPIS targets for that distributor (ie, lower levels of SAIDI and SAIFI are efficient); or
- efficient levels of reliability are lower than existing STPIS targets for that distributor (ie, higher levels of SAIDI and SAIFI are efficient).

To assist IPART in understanding the interaction between the incentives provided by the NSW licences and the AER's schemes, we have been asked the following questions:

1. What are the properties of a regulatory framework that mandates a level of reliability?
2. How would licence-based reliability measures impact distribution businesses' incentives to optimise reliability and expenditure, considering:
    a) Performance standards (SAIDI and SAIFI levels) set at a level below the STPIS target?
    b) Performance standards (SAIDI and SAIFI levels) set at the same level as the STPIS target?
    c) Performance standards (SAIDI and SAIFI levels) set at a level above the STPIS target?
    d) Automatic guaranteed service level payments to customers based on the value of customer reliability for each outage?
3. How does the existing framework under STPIS, CESS, EBSS, RIT-D and baseline allowances for operating and capital expenditure incentivise businesses to transition towards efficient levels of reliability?
    e) Are there any behavioural or other factors that impact on the incentives to transition to efficient levels of reliability, in particular where lower levels of reliability are efficient? For example, using the term 'target' to define STPIS baseline reliability and distributor investment in baseline reliability operating and capital expenditure proposals and the requirement on the business to demonstrate savings to qualify for the CESS and EBSS.

[2] The Hon Gladys Berejiklian MP, *Terms of Reference for IPART to review electricity distribution reliability standards*, 26 February 2019, p 2.

This should also take into account changes to jurisdictional reliability standards (for example, taking into account when NSW and Queensland moved away from the deterministic reliability standards that drove significant investment in improving reliability).

f) Over what time period would you expect this transition to occur when the efficient levels of reliability differ by say +/- 10% from current levels (for example, the life of the assets)?

4. Where lower levels of reliability are efficient, the existing STPIS targets would penalise businesses for achieving lower levels of reliability. Is this appropriate?

5. Where higher levels of reliability are efficient:

   g) And no licence condition is added, the existing targets would reward businesses for achieving higher levels of reliability. Is this appropriate?

   h) And a licence condition is added, would the STPIS targets increase to reflect the licence conditions (and expenditure forecasts be set to meet the licence condition)? Is this appropriate?

   i) Which of the above approaches for higher levels of reliability would provide the most efficient incentives?

6. Would the target levels of reliability in STPIS need to be reset to the efficient levels identified by IPART? What would be an appropriate period of time for any reset? How would any rewards or penalties be set during this time?

1.1 Structure of this report

Our report is structured as follows:

- section 2: provides a high-level evaluation of the determinants of an efficient level of reliability;
- section 3: reviews the factors that impact the level of reliability experienced by NSW customers;
- section 4: assesses the incentives distributors have under the national regulatory framework to transition to an efficient level of reliability in the absence of a binding requirement under the NSW distribution licences;
- section 5: concludes.

2. The efficient level of reliability

A distribution network that is able to supply electricity to all of its customers at all times would have perfect reliability. However, the costs that would be incurred to ensure that there is no interruption to customers' electricity supply would be substantial and unlikely to be efficient. An efficient level of network reliability is where the cost to the distributor of providing an incremental improvement in reliability equals the value customers place on that reliability. It follows that networks that are able to deliver reliability at low cost and/or where its customers place a relatively high value on reliability should have higher reliability than networks where the costs of improving reliability are higher and/or its customers place a relatively low value on reliability.

Consequently, the efficient level of network reliability will depend on both:

- the distributor's cost of delivering reliability, which will depend on the physical characteristics of the network and will evolve as technology, productivity and costs change; and
- how much the network's customers value reliability, which is determined by both the value that network customers place on consuming a unit of electricity (termed the Value of Customer Reliability or VCR) and the volume of electricity delivered by the network.

2.1 Cost of reliability varies between networks and through time

The cost of delivering reliability will depend on a number of factors including the physical characteristics of distribution network. For example, a given level of reliability is more expensive to provide with a geographically dispersed customer base compared with networks with high customer density, with the length of the distribution networks effecting the cost of:

- identifying and responding to outages; and
- maintaining vegetation clearance from power lines.

To illustrate the difference in the length of the network between the NSW distributors we note that:

- Ausgrid's distribution network covers an area of 22,275 square kilometres and 41,642 kilometres of power lines;[3]
- Endeavour Energy's distribution network covers an area of 24,980 square kilometres and 59,300 kilometres of power lines;[4] and
- Essential Energy's distribution network covers an area of 737,000 square kilometres and 183,612 kilometres of power lines.[5]

Undergrounded lines deliver a higher level of reliability than overhead lines. Consequently, networks with a higher proportion of their network undergrounded, experience better reliability outcomes. While the cost of installing underground lines is higher than for overhead lines, in greenfield developments the cost of underground lines may not be borne by the distribution network.[6] Consequently, networks that have a higher

[3] Ausgrid, *Distribution and Transmission Annual Planning Report*, December 2018, p.10, and Ausgrid, *Revised Regulatory Proposal | 1 July 2019 to 30 June 2024*, January 2019, p.94.

[4] Endeavour Energy, *Year in Review 2017-18 Safe, affordable and reliable electricity supply*, p. 3.

[5] Essential Energy, *Annual Report 2018-19*, 31 October 2019, p. 6.

[6] We understand that large new residential developments connecting to the distribution network are required to gift connection assets to the distributor. These developers may choose to underground power lines for aesthetic reasons, with the additional costs recovered through the sale price of the developed land.

proportion of gifted underground lines are able to deliver better reliability outcomes at lower cost than other networks.

Finally, some networks have been built with a higher degree of redundancy. For example, the NSW government in December 2007 mandated that networks be built with the following levels of redundancy:[7]

- CBD sub transmission network and CBD zone substations were required to be built to an N-2 standard; [8]
- an N-1 standard was required for:
  - CBD distribution networks;
  - non-CBD sub transmission assets;
  - non-CBD zone substations; and
  - urban distribution feeders (town > 15,000); and
- an N standard was required for non-urban networks and urban feeders (town < 15,000).

These deterministic reliability standards were removed by the NSW government on the 1 July 2014, and replaced with the current NSW reliability framework (which is detailed in section 3.4 of this report).[9]

Networks that have previously been built with a higher degree of redundancy are both inherently more reliable (as a single (N-1) or two (N-2) network component(s) can fail while maintaining satisfactory levels of reliability) and able to undertake necessary repairs with less risk of supply being interrupted (ie, components with these networks can be repaired without service interruption).

We also note that the costs of network reliability are likely to change through time due to:

- the introduction of new technology, such as automation systems that automatically restore supply to customers; and
- improved network productivity.

2.2 Customer value of network reliability

Customers value greater network reliability because it lowers the time that customers are unable to receive electricity supply from the national electricity market. Customers that are able to access the national electricity market must either generate electricity themselves or, more likely, go without electricity.

The measure of value that customers place on network reliability is the product of:

- the quantum of electricity (MWh) that is not supplied to customers due to a minute of lost supply; and
- the value that customers place on consuming a MWh of electricity (the Value of Customer Reliability (VCR).

In other words, the impact of a network interruption that results in 100 MWh of electricity not being consumed would have a greater impact than an interruption that resulted in loss of 50 MWh.

Further, different customers will value electricity services differently. The AER in estimating the VCR noted:[10]

[7] Ian Macdonald, *Design, reliability and performance licence conditions for distribution network service providers*, 1 December 2007.

[8] N-2 means that the system is planned such that, with all sub-transmission facilities in service, the system is in a secure state, and for any unexpected failure of two system components, the system moves to an acceptable reliability level.

[9] Anthony Roberts Minister for Resources & Energy, *Reliability and performance licence conditions for electricity distributors,* commencement date 1 July 2014.

[10] AER, *Values of Customer Reliability*, Final report on VCR values, December 2019, p. 4.

> How different customers value electricity supply depends on what they use their energy for, from running air conditioners in residential homes to helping to manage a small business to powering large scale manufacturing processes. The value customers place on electricity reliability therefore depends on the value they place on these services and because these services differ, so too does the value of reliability across these different customer segments.

There are different VCR estimates for different customer types. The AER's recent estimates of VCR ranged from:[11]

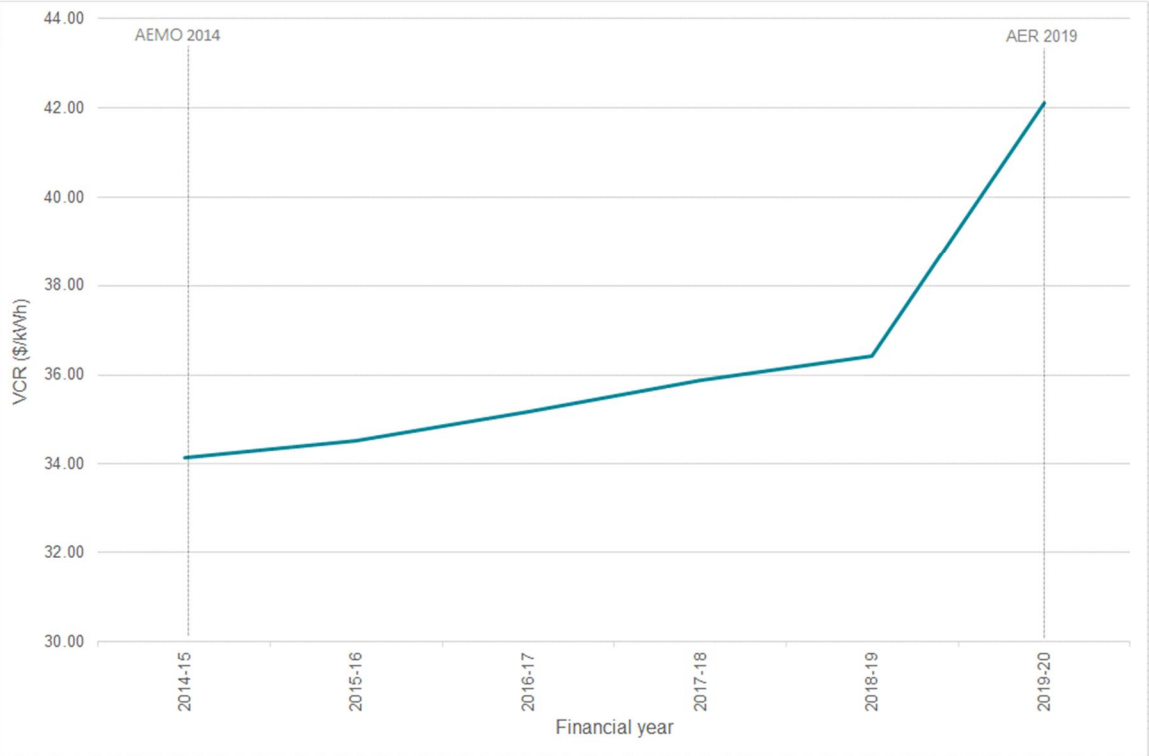
- residential customers from $16.96 ($/kWh) to $33.23 ($/kWh), depending on the location (ie, CBD, urban and regional) and climate;
- small business customers:
  - agriculture $37.87 ($/kWh);
  - commercial $44.52 ($/kWh); and
  - industrial $63.79 ($/kWh).
- large business customers;
  - services $10.54 ($/kWh);
  - industrial $117.99 ($/kWh);
  - metals $19.86 ($/kWh); and
  - mines $36.16 ($/kWh).

These granular VCR estimates can be used by networks in their planning applications. However, for the purposes for setting incentives under the AER's Service Target Performance Incentive Scheme (STPIS), state composite values are adopted.

Figure 1 sets out the NSW composite VCR since the removal of deterministic planning standards. Until the AER's most recently re-estimation of VCR, the values were based on an earlier study by AEMO and escalated by CPI each year. The AER's 2019 review resulted in a 14.5 per cent increase in the NSW VCR.

[11] AER, *Values of Customer Reliability*, Final report on VCR values, December 2019, pp. 14-18.

Figure 1: NSW composite VCR ($'nominal) used to value the STPIS incentive



Source: AER and HoustonKemp analysis.

Differences in costs incurred by distributors to ensure reliability and differences in the value their customers place on having a reliable network mean that the efficient level of reliability will differ both between networks and within the same network over time.

3. Factors affecting the level of reliability

The level of reliability experienced by NSW customers depends on a number of factors, including:

- external factors outside the control of the distribution networks;
- the AER's regulatory expenditure incentive framework;
- the AER's quality of service incentive framework ; and
- the NSW licence requirements.

The remainder of this section sets out the impact of each of these factors and answers the first of the questions set out in the scope of work, ie:

> What are the properties of a regulatory framework that mandates a level of reliability?

3.1 External factors

The level of network reliability experienced by customers will depend on factors that are outside the control of the distribution network.

In principle supply interruptions can be caused by insufficient generation supply or transmission outages, both of which are outside the control of the distributors. However, in practice these factors are rarely the cause of distribution customer outages.[12]

A major cause of distribution outages are environmental events such as storms, lightning strikes, fires, and floods. While a distributor does not have control of the weather they can:

- in some circumstances ensure that customers do not lose supply, for example the vegetation management practice of a distributor directly impacts the likelihood that that a storm event will result in customer outages; and
- when outages occur, the distributor's actions will determine the duration of the outage, for example, by their investments in network visibility to promptly identify and locate the outage events and their rostering of repair crews to reconnect supply.

Consequently, these weather events are included in measures of reliability except, where it results in a major event day.[13]

A further implication of unpredictability of weather events is that reliability outcomes are inherently uncertain and variable through time. It follows that the benefits of any investment to improve reliability are also uncertain. For example, an increase in customer outages can occur even when the distributor has recently hired additional repair crews that were expected to improve reliability because of an increase in bush fire events.

3.2 Expenditure incentives

The AER's expenditure incentive framework has the following three elements:

- the regulatory capital and operating allowances (capex and opex) for the regulatory control period;

[12] The AER estimated that 94 per cent of interruptions to customer supply over the 2007/08 to 2017/18 period were the result of distribution network outages.

[13] Major event days are excluded from the reliability components of the STPIS and the NSW licence reliability standards. The exclusion of major event days ensures that distributor's reliability measures are not skewed by infrequent but significant events.

- the capital expenditure sharing scheme (CESS) that ensures that distributors have a symmetrical and time invariant incentive to reduce capex; and
- the efficiency benefit sharing scheme (EBSS) that ensures that distributors have a symmetrical and time invariant incentive to reduce opex.

A brief description of each of these elements and their implications for reliability is provided below.

3.2.1 Expenditure allowances

The AER approves for each distributor a maximum annual revenue (MAR) for each year of a five year period (the regulatory period).[14] A key input into the MAR is the expenditure allowances, which in the absence of a regulatory obligation to change reliability levels, are developed to ensure that the distributor can maintain current levels of network reliability.

With respect to reliability of the network, the NER requires that both the capex and opex allowances of the distributor should achieve:[15]

> to the extent that there is no applicable *regulatory obligation or requirement* in relation to:
>
> (i) the quality, reliability or security of supply of *standard control services*; or
>
> (ii) the reliability or security of the *distribution system* through the supply of *standard control services*,
>
> to the relevant extent:
>
> (iii) maintain the quality, reliability and security of supply of *standard control services*; and
>
> (iv) maintain the reliability and security of the *distribution system* through the supply of *standard control services*;

It follows that the expenditure allowances have regard to the expected efficient costs (and savings) associated with any change in the mandated level of reliability (either to increase or decrease the current level of reliability), arising from a regulatory obligation or requirement.

3.2.2 Capital expenditure sharing scheme (CESS)

The CESS ensures that the distributor bears 30 per cent (in present value terms) of the cost of any increase in capex, including capex necessary to improve network reliability, with the remainder (70 per cent) being passed through the customers. Further, the distributor retains 30 per cent (in present value terms) of the benefit of any decrease in capex, including where the decrease results in a deterioration in network reliability, with the remainder being passed through to customers. In other words, a distributor bears 30 per cent of the cost of any incurred capex compared with the scenario of not spending the capex.

The CESS has been progressively introduced from 2014 to address deficiencies in the regulatory framework including:[16]

> The power of the incentive to incur capex efficiently declines during a regulatory control period. This is because if a NSP makes an efficiency gain in year one of a regulatory control period any benefit will last for four more years before the RAB is updated for actual capex. In year five, however, the benefit will be approximately zero. Under this approach, a NSP has an incentive to

[14] Note that the MAR is recalculated each year for outturn inflation, an updated trailing average cost of debt, service quality outcomes (ie, the STPIS), contingent projects as well as under and over adjustments from previous years.

[15] See clauses 6.5.6(3) and 6.5.7(3) of the NER.

[16] AER, *Better Regulation | Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, Explanatory Statement, November 2013, p. 10.

spend more capex towards the end of a regulatory control period. This may lead to inefficient capex and inefficient substitution of opex for capex towards the end of a regulatory control period.

In developing a CESS, the National Electricity Rules (NER) require that the AER:

- must ensure that the CESS is consistent with the capital expenditure incentive objective, which provides that only capex that reasonably reflects the capex criteria can be included in an adjustment that increases the value of a RAB;[17] and
- must take into account the following principles:[18]
  - the DNSP should be rewarded or penalised for improvements or declines in the efficiency of capex respectively;
  - the rewards and penalties should be commensurate with the efficiencies or inefficiencies in capex, but a reward for efficient capex need not correspond in amount to a penalty for the same amount of inefficient capex; and
- must also take into account:[19]
  - the interaction of the scheme with other incentives that the DNSP may have in relation to undertaking efficient opex or capex (eg, the EBSS); and
  - the capex objectives, and if relevant, the opex objectives.

The CESS is set out in the AER's *Capital Expenditure Incentive Guideline* and the accompanying model, which were published in November 2013 following a consultation process.[20]

The AER's CESS mechanism works as follows:[21]

- at each revenue determination following the introduction of the CESS, the AER will calculate the under or overspend in actual capex compared with the capex allowance over the previous period;
- the AER will calculate the amount of any benefits or costs that have already accrued to a distributor during the regulatory control period as a result of underspending or overspending its capex allowance;
- the AER will calculate a CESS revenue adjustment to be included in the subsequent regulatory period revenue model, necessary for the distributor to retain the target sharing ratio (ie, 30%) of the present value of the distributor underspending or overspending its capex allowance, having regard to the benefits or cost that have already accrued to the distributor.

Note that the CESS adopts a net present value mechanism to share the benefits (costs) of a distributor underspending (overspending) its capex allowance. Consequently, the distributor's share of any benefits (costs) automatically adjust for any changes in the discount rate, to ensure that the distributor retains the target sharing ratio.

The CESS was first applied to the NSW distributors' 2015/16 capex, which was the second year of the 2014/15 to 2018/19 regulatory control period. Table 3.1 sets out when the CESS was first applied to distributors in each jurisdiction of the NEM.

[17] Clause 6.5.8A(b) of the NER.

[18] Clause 6.5.8A(c) of the NER.

[19] Clause 6.5.8A(d) of the NER.

[20] AER, *Better Regulation Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013; and AER, *Capital Expenditure Sharing Scheme Model*, November 2013.

[21] AER, *Better Regulation Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013, pp.6-9; and AER, *Better Regulation Explanatory Statement Capital Expenditure Incentive Guideline for Electricity Network Service Providers*, November 2013, p.21.

Table 3.1: Jurisdictional implementation of the CESS

State	Implementation
NSW + ACT	2015/16 to 2018/19 regulatory period[22]
Queensland	2015/16 to 2019/20 regulatory period[23]
Victoria	2016 to 2020 regulatory period[24]
South Australia	2015/16 to 2019/20 regulatory period[25]
Tasmania	2017/18 to 2018/19 regulatory period[26]

3.2.3 Efficiency benefit sharing scheme (EBSS)

The EBSS ensures that distributors retain the cost, for a period of six years, of any increase in opex, including that necessary to improve network reliability, after which the cost of higher opex will be borne by customers. Conversely, the EBSS also ensures that distributors retain the benefit, for a period of six years, of any decrease in opex, including where that results in a deterioration in network reliability, after which the benefits of lower opex are passed through to customers.

The EBSS seeks to ensure that distributors have a continuous incentive to pursue efficiency improvements in opex and to share any efficiency gains or losses between NSPs and network users. Importantly, the EBSS is intrinsically linked to the AER's base-step-trend approach for setting the opex allowance in the subsequent regulatory period. Together, these two opex mechanisms:

- provide a distributor with a continuous incentive to pursue efficiency improvements in opex; and
- remove the previous incentive for distributors to increase opex in the expected 'base year' to increase its forecast opex allowance for the following regulatory control period.

The main elements of the AER's EBSS are that:

- the distributor is allowed to keep the benefit (or incurs the cost) of delivering actual opex lower (higher) than forecast opex in each year of a regulatory control period;
- EBSS carryover amounts are calculated for the next regulatory control period for opex efficiency gains or losses made in the current period, that ensures that the distributor retains incremental efficiency gains or losses[27] for a period of five years after it makes the gain or loss (ie, in incremental gains or losses are retained by the distributor for a period of six years);
- accrued carryover amounts for each year of the subsequent regulatory control period are added to the distributor's MAR – the accrued carryover amounts for a given year are calculated as the sum of the incremental efficiency gains or losses that have been carried forward to that year; and

[22] AER, *Ausgrid distribution determination 2015−16 to 2018−19 | Final decision | Overview*, April 2015, pp. 47-48.

[23] AER, *Ergon Energy determination 2015−16 to 2019−20 | Final decision | Overview*, October 2015, p. 39.

[24] AER, *United Energy final decision 2016-20 | Overview*, May 2016, p. 38.

[25] AER, *SA Power Networks determination 2015−16 to 2019−20 | Final decision | Overview*, October 2015, p. 37.

[26] AER, *TasNetworks distribution determination 2017−18 to 2018−19 | Final decision | Overview*, April 2017, pp. 39-40.

[27] Incremental efficiency gain or loss in the first year of the regulatory period is the difference between actual opex and forecast opex in that year, adjusted for any non-recurrent efficiency gains removed from base opex when forecasting opex. For each subsequent year, the incremental efficiency gain is calculated as the underspend in the relevant year less the underspend in the previous year.

- the actual opex incurred in the base year is used as the starting point for forecasting opex in the next regulatory control period.

Under this approach, the benefits of any incremental increase or decrease in opex is shared by allowing the distributor to retain the gains or losses for a period of six years. Consequently, the share of any opex efficiency gains or losses retained by the distributor will change depending on the discount rate adopted, with the distributor retaining a higher proportion of the efficiency gains or losses when the discount rate is high.

When the EBSS was first developed a 6 per cent real discount rate was used that resulted in the distributor receiving 30 per cent of the efficiency gains or losses.[28] However, the share of the EBSS gains or losses retained by the distributor has fallen as the discount rate has decreased, with a real post-tax vanilla WACC of 3 per cent, the gain or loss retained by the distributor is 16 per cent, with customers retaining the remaining 84 per cent of the gain or loss. This is substantially lower than the share of capex gains or losses retained under the current CESS.

We note that the AER in developing the EBSS is required to have regard to:[29]

> any incentives that *Distribution Network Service Providers* may have to capitalise expenditure

Potentially, the discrepancy between the incentive rates provide by the EBSS and CESS may consideration when the AER next reviews the expenditure incentives.

In NSW the EBSS has been applied to the distributors since 2009/10. However, the decision by the AER to not adopt a base-step-trend method in establishing opex for Essential and Ausgrid for the 2014-19 regulatory period means that the EBSS has only been applied from 2019/20 by the AER for these businesses. Table 3.2 sets out when the EBSS was first applied to distributors in each jurisdiction of the NEM.

Table 3.2: Jurisdictional implementation of the EBSS

State	Implementation
NSW + ACT	2009/10 to 2013/14 regulatory period[30]
Queensland	2010/11 to 2014/15 regulatory period[31]
Victoria	2011 to 2015 regulatory period[32]
South Australia	2010/11 to 2014/15 regulatory period[33]
Tasmania	2012–13 to 2016–17 regulatory period[34]

[28] AER, *Efficiency benefit sharing scheme for the ACT and NSW 2009 distribution determinations*, Final decision, February 2008, p. 24.

[29] Clause 6.5.8(c)(4) of the NER.

[30] AER, *New South Wales distribution determination 2009–10 to 2013–14 | Final decision*, 28 April 2009, pp. 248-249. Not applied to Ausgrid and Essential for the 2009-10 to 2013-14, and 2014-15 to 2018-19 periods due to the benchmarking of opex costs in the 2014 decision.

[31] AER, *Queensland distribution determination 2010–11 to 2014–15 | Final decision*, May 2010, p. xxxii.

[32] AER, *Victorian electricity distribution network service providers Distribution determination 2011–2015 | Final decision*, October 2010, p. XLVI.

[33] AER, *South Australia distribution determination 2010–11 to 2014–15 | Final decision*, May 2010, pp. xxvii-xxviii.

[34] AER, *Determination Aurora Energy Pty Ltd 2012–13 to 2016–17*, Final decision, April 2020.

Overall, the expenditure incentives provide a financial incentives for a distributor to minimise its reliability expenditure. This incentive is counterbalanced by the incentives provided by the STPIS, described below.

3.3 Service target performance incentive scheme (STPIS)

The AER's distribution service target performance incentive scheme (STPIS) provides a financial incentive linked to the overall quality of service experienced by customers. The objective of the scheme was to balance incentives to reduce expenditure under the expenditure incentives:[35]

> Our distribution STPIS provides a financial incentive to distributors to maintain and improve service performance. The scheme aims to ensure that cost efficiencies incentivised under our expenditure schemes do not arise through the deterioration of service quality for customers.

The STPIS achieves this objective by providing financial incentives to distributors to maintain and improve service performance when customers are willing to pay for these improvements. That is, while the regulatory regime as a whole encourages distributors to improve operating and capital efficiency, the STPIS is designed to ensure that this increase in efficiency is not at the expense of an inefficient deterioration in service performance for customers.

Under the scheme, the AER establishes service-based targets for each distributor and provides financial rewards for distributors that exceed the targets and financial penalties for distributors that fail to meet the targets. The scheme currently consists of four components

- the reliability of supply component;
- the quality of supply component (there are none in the current STPIS);
- the customer service component;[36] and
- the guaranteed service level (GSL) component.[37]

The incentive rates provided through the reliability of supply component are calibrated with how willing customers are to pay for improved service, consistent with the requirements in the NER.[38]

There are two primary elements to the reliability of supply component of the STPIS:[39]

- the system average interruption frequency index (SAIFI), that measures the average number of interruptions a customer experiences over a regulatory year; and
- the system average interruption duration index (SAIDI), that measures the average total duration of outages that a customer experiences over a regulatory year.

Both the SAIFI and SAIDI exclude momentary interruptions that involve the brief loss of electricity supply.

The reliability of supply component of the STPIS included in the NSW regulatory determinations:

1. separates the distributor's network into the following network types:
    a. CBD feeders (only Ausgrid)
    b. urban feeders;

[35] AER, *Efficiency benefit sharing scheme for the ACT and NSW 2009 distribution determinations*, Final decision, February 2008, p. 24.

[36] In NSW the only customer service component is telephone answering.

[37] The GSL scheme sets threshold levels of service for distributors to achieve and requires direct payment to customers who experience service levels below the threshold level. This component does not however apply to the NSW DNSPs, who are instead subject to the NSW guaranteed customer service scheme (GCSS) as a condition of their distribution licence.

[38] Clause 6.6.2(b)(3) of the NER.

[39] Note that the STPIS for NSW distributors does not include financial incentives for momentary average interruption frequency index (MAIFI) outcomes.

c. short rural feeders; and

d. long rural feeders;

2. calculates a SAIFI and SAIDI incentive rates for each network type, which has regard to:

   a. the average revenue requirement for each network type;

   b. the average annual energy consumption for each network type; and

   c. the applicable value of customer reliability for each network type, split so as to attribute 40 per cent to the SAIFI incentive rate and 60 per cent to the SAIDI incentive rate;[40]

3. calculates the SAIDI and SAIFI targets for the regulatory period based on the average performance over the past five years adjusted to remove excluded events.[41] Note that the targets can be adjusted if:[42]

   a. reliability improvements completed or planned are expected to result in material improvements in supply; and

   b. for any other factors that are expected to materially affect network reliability, which would allow the AER to adjust reliability targets if there is expected to be a material deterioration in supply.

During the regulatory period the STPIS adjustment is calculated by:

- calculating the SAIFI and SAIDI outcomes for the year for each network type adjusted for excluded events; and
- these individual s-factors are aggregated to calculate the raw s-factor, which is subjected to an overall cap of ± 5.0%.

This s-factor adjustment is calculated for each year by multiplying the s-factor by the smoothed revenue of the distributor for that year. The s-factor adjustment in year 1 (in real dollars) is then included in the adjusted annual revenue for years 3. The benefits of a permanent improvement in reliability is retained for a period of five years (ie, a permanent improvement in reliability in year 1 would result in a s-factor adjustment in years 3 to 7). However, temporary variations in reliability are retained for a single year (ie, improvement in reliability in year 1 that then reverts to target levels in year 2, would result in an s-factor adjustment only in years 3)

Under this approach, the customer gains or losses from any permanent changes in reliability is shared by allowing the distributor to retain the gains or losses for a period of five years. Consequently, the share of any permanent changes in reliability retained by the distributor will change depending on the discount rate adopted. With a real post-tax vanilla WACC of 3 per cent, the distributor retains 13 per cent of any permanent reliability gains or losses under the STPIS, with customers retaining the remaining 87 per cent.

This is lower than the 16 per cent share provide by the EBSS and substantially lower than the 30 per cent provided by the current CESS. An implication of the current differing incentive rates is that a distributor would have a financial incentive to reduce expenditure (both opex and capex) at a cost to network reliability.

We note that the AER stated view is that:[43]

> The STPIS counterbalances this incentive [under the expenditure incentives] by discouraging cost reductions that lead to a decline in performance.

[40] The weighting between SAIDI and SAIFI were changed in 2018, from an equal split to 60:40 to SAIDI and SAIFI, respectively. See AER, *Explanatory statement | Amendment to the Service Target Performance Incentive Scheme (STPIS) | Establishing a new Distribution Reliability Measures Guideline (DRMG)*, Final decision, November 2018, p. 3

[41] Excluded events, includes major event days, load shedding due to generation shortfall or direction from AEMO, transmission outages or direction from state or federal emergency services.

[42] AER, *Electricity distribution network service providers | Service target performance incentive scheme - Version 2.0*, November 2018, section 3.2.1.

[43] AER, *Ausgrid, Endeavour Energy and Essential Energy | Regulatory control period commencing 1 July 2019*, Framework and approach, July 2017, p. 64.

The AER in developing and implementing the STPIS is required to consider:[44]

> the need to ensure that the incentives are sufficient to offset any financial incentives the *Distribution Network Service Provider* may have to reduce costs at the expense of service levels

This imbalance between the expenditure and reliability incentives, caused by recent falls in the regulated WACC, could be addressed in the next update of the incentive schemes.

In NSW the STPIS has been applied to the distributors since 2015/16. Table 3.3 sets out when the STPIS was first applied to distributors in each jurisdiction of the NEM.

Table 3.3: Jurisdictional implementation of the STPIS

State	Implementation
NSW + ACT	2015/16 to 2018/19 regulatory period[45] Applied on a non-financial basis in the 2009/10 to 2013-14 regulatory period.
Queensland	2010/11 to 2014/15 regulatory period[46]
Victoria	2011 to 2015 regulatory period[47]
South Australia	2010/11 to 2014/15 regulatory period[48]
Tasmania	2012/13 to 2016/17 regulatory period[49]

3.4 NSW electricity distribution licences

The NSW distribution licences contain the following four reliability conditions:[50]

- an overall reliability standard, that over a financial year the average SAIDI and SAIFI *must not exceed* [our emphasis] a stipulated standards for each of the following four feeder types:
  - CBD Sydney;
  - Urban;
  - Short-rural; and
  - Long-rural;
- a requirement that where individual feeder performance exceeds the relevant *individual feeder standards* for any 12 month period ending March, June, September or December for each of the four feeder types, the distributor must:
  - investigate the cause for each feeder exceeding the *individual feeder standards*;

[44] Clause 6.6.2(b)(3)(v) of the NER.

[45] AER, *Ausgrid distribution determination 2015−16 to 2018−19 | Attachment 11 – Service target performance incentive scheme*, Final Decision, April 2015, p.7.

[46] AER, *Queensland distribution determination 2010–11 to 2014–15 | Final decision*, May 2010, p xxxi.

[47] AER, *Victorian electricity distribution network service providers Distribution determination 2011–2015 | Final decision*, October 2010, pp XLIX-LI.

[48] 'AER, *South Australia distribution determination 2010–11 to 2014–15 | Final decision*, May 2010, p xxvi.

[49] AER, *Final Distribution Determination Aurora Energy Pty Ltd 2012–13 to 2016–17*, April 2020.

[50] IPART, *Review of distribution reliability standards*, Issues paper, March 2020, p. 8.

  - report and rectify the feeder if it is efficient to do so(where analysis indicates that the costs of rectifying is greater than the benefits no further action is required).
- an individual customer standard, for some large industrial customers that are directly connected via the sub-transmission feeders, that performance does not exceed specified levels. Again distributors have a requirement to report and rectify the individual connection if it is efficient; and
- customer service standards - that require distributors to pay individual customers $80 where the distributor exceeds the interruption duration and/or frequency standard for that customer.

The overall reliability standard sets a minimum reliability requirement for each of the NSW distributors. As a regulatory requirement, the distributors are required to improve the reliability of any network type that is expected to breach the average SAIDI and SAIFI standards. In this scenario, the distributor's expenditure allowances would no longer be set to deliver current levels of reliability. Instead, the distributor's expenditure allowances would increase to reflect the efficient costs of improving reliability to meet the overall reliability standard.[51] Further, if the expected change in reliability is material the AER could adjust the STPIS targets for the regulatory period to reflect the forecast improvement in reliability.

We note that the obligation to improve reliability to meet the overall reliability standard in the licence will occur even if the expenditure is not efficient.

In contrast, where a distributor's current reliability levels are better than the overall reliability standard in the licence, there is no licence requirement to target a lower level of reliability. In this scenario, a distributor's expenditure allowances would continue to be set to deliver current levels of reliability and its STPIS targets would continue to reflect past levels of performance. In other words, the NSW licence would have no effect on a distributor's revenues or STPIS targets when they are expected to exceed the overall reliability standard.

It follows that the current overall reliability standard has an asymmetric impact since it obliges a distributor to improve reliability but does not require it to target a lower level of reliability, even when a lower level of reliability is deemed to be efficient.

We note that since 2007/08 distributors have generally provided higher levels of overall network reliability than is required by their licences.[52] Consequently, the impact of the current overall reliability standard in the licence appears limited.

The impact of individual feeder performance standards in the licence is similar to an information disclosure requirement. This is because distributors are required to report breaches but are only required to rectify the breach when the cost of doing so has a positive net benefit. Consequently, this licence requirement mirrors the practice that an efficient distributor should already be undertaking, which is to identify and undertake any efficient improvements in reliability. We note that the national regulatory framework already seeks to incentivise distributors to undertake efficient improvements in reliability.

The individual customer standard has a similar impact as the individual feeder performance standard. In that it also requires a distributor to report breaches and only requires them to rectify the breach when the cost of doing so has a positive net benefit.

Finally, the GCSS does provide a limited financial incentive for distributors to improve the reliability. This incentive arises because the expected cost of the GCSS is included in the distributor's opex allowance and any outperformance of the allowance would be rewarded through the EBSS. However, the incentive is limited to the reliability of customers eligible for a GCSS, rather than the reliability outcomes of all customers. Further, the incentive is muted because the GCSS payment is not automatically made for all breaches. Consequently, the expected costs of a breach is less than the GCSS payment of $80.

[51] See clauses 6.5.6(3) and 6.5.7(3) of the NER.

[52] IPART, *Review of distribution reliability standards, Issue paper*, March 2020, pp. 11-13.

3.5 Conclusion

The AER's incentive framework seeks to balance the objectives of delivering distribution services at least cost with maximising the value customers receive from consuming electricity. The mechanisms for balancing these objectives are the following three schemes:

- the STPIS that rewards (penalises) a distributor for improving (worsening) network reliability;
- the EBSS that rewards (penalises) a distributor for delivering network services at lower (higher) levels of opex; and
- the CESS that rewards (penalises) a distributor for delivering network services at lower (higher) levels of capex.

Each of the schemes has the following features:

- an invariant incentive, such that the reward (penalty) retained by the distributor is constant through time, which addresses previous concerns that in the absence of scheme the regulatory incentives fell over the regulatory control period; and
- a symmetrical incentive, that imposes similar rewards and penalties on the distributor, ie, the penalty for increasing opex by $1 is the same as the reward for reducing opex by $1.

A consequence of these two features is that the incentive to lower expenditure and increase reliability is independent of the expenditure allowances/STPIS targets. That is, a distributor receives a reward of $0.30 for not spending $1 in capex, irrespective of whether the distributor is above or below its capex allowance, since it will result in either a:

- $0.30 increase in the reward the distributor receives under the CESS, if its total capex is below the capex allowance; or
- $0.30 reduction in the penalty the distributor receives under the CESS, if its total capex is above the capex allowance.

It follows that the distributor's incentives are independent of the allowances/targets set by the regulator.

A further implication is that, because the STPIS incentive rates are set by reference to the value customers place on reliability, the incentive framework internalises for the distributor the twin objectives of delivering distribution services at least cost and maximising the value customers receive from consuming electricity.

Where the incentives are balanced, a distributor should have an incentive to deliver an efficient level of reliability regardless of how the targets are set. A balanced incentive framework would provide similar incentives for reducing (increasing) expenditure and improving (worsening) reliability.

However, as discussed earlier in this section, the AER's three incentive schemes currently provide different incentive rates, with the distributor retaining:

- 30 per cent of any increase/decrease in capex;
- 16 per cent of any increase/decrease in opex; and
- 13 per cent of the customer benefit (cost) of any increase/decrease in reliability.

This difference is primarily driven by the different mechanisms used to share the gains and losses between the distributor and customers, with the recent falls in the discount rate lowering the incentive rates provided by the EBSS and STPIS.

We note that the AER is required under the NER to have regard to interactions between the incentive mechanisms, and to the extent the AER considers the imbalance in incentives to be a material issue it would be able to adjust the incentive rates when it next reviews these mechanisms.

Finally, we note that the reliability standards contained in the NSW distribution licences have the following interactions with the national framework:

- if the overall reliability standards for SAIDI and SAIFI require higher reliability than current levels, it gives rise to a regulatory obligation to increase reliability that results in additional expenditure being included in the distributor's regulatory allowances;
- if the overall reliability standards for SAIDI and SAIFI suggest a lower level of reliability, the current wording of the licence condition does not give rise to a regulatory obligation to decrease reliability, and so the distributor's regulatory allowances would continue to be set by reference to maintaining current levels of reliability; and
- the GCSS provides a limited incentive to improve reliability.

4. National incentive reliability framework

This section sets out how the national regulatory framework operates to incentivise distributors to deliver an efficient level of network reliability, in the absence of a binding overall reliability standard in the NSW licence condition.

4.1 Transition to new efficient levels of reliability

In the absence of a binding licence condition, we have developed illustrative models of the incentives faced by a distributor under the following three scenarios:

- **Scenario A:** where the current level of reliability is efficient, and so the distributor's expenditure allowances are set to maintain the current levels of reliability and the STPIS targets reflect current levels of reliability;
- **Scenario B:** where the current level of reliability is less than the efficient level, and where:
  - the distributor's expenditure allowances are set to maintain the current level of reliability and the STPIS targets reflect current levels of reliability; and
  - because the efficient level of reliability is higher than current levels, the cost of improving reliability is less than the value customers place on the improvement in reliability;
- **Scenario C:** where the current level of reliability is greater than the efficient level, and where:
  - the distributor's expenditure allowances are set to maintain the current levels of reliability and the STPIS targets reflect current levels of reliability; and
  - because the efficient level of reliability is lower than current levels, the saving from lowering reliability is greater than the value customers place on the deterioration in reliability.

In our illustration we have assumed that the national regulatory framework provides a balanced incentive framework, consistent with the AER's stated objective. That is, the incentive to reduce capex and opex is the same as the incentive to improve network reliability. However, as discussed in sections 3.2 and 3.3 currently the incentives under the AER incentive schemes are imbalanced due to the low discount rate, with the distributor having a substantially greater incentive to reduce capex relative to the incentives on opex and reliability, while the incentives on opex are slightly greater than the incentives on reliability. The impact of this imbalance is that distributors currently have a financial incentive to deliver cuts in expenditure at the cost of reliability.

Implicit in these scenarios is the premise that determining the efficient level of reliability should be a forward looking exercise. That is, the efficient level of reliability for a network should have regard to current state of the network and focus on the forward looking cost of delivering reliability and the value of that reliability to customers.

4.1.1 Scenario A - Steady state

In this scenario, the distributor's current level of reliability matches the efficient level. As a consequence:

- in the absence of a regulatory obligation to change reliability, the opex and capex allowances are set to maintain current efficient levels of reliability;
- the STPIS targets for SAIDI and SAIFI target the preservation of the current efficient levels of reliability;
- because the current level of reliability is efficient, this implies that the cost of improving reliability is greater than the value customers place on any improvement in reliability;
- because the current level of reliability is efficient, this implies that the savings from lowering reliability is less than the cost customers place on any deterioration in reliability; and

- the assumption of balanced incentives means that the distributor would be penalised if increased or lowered reliability, and so would deliver the target level of reliability with its outturn expenditure matching its allowances.

Figure 2 and Figure 3 illustrate that under this steady state the distributor over a 10 year period maintains the current efficient levels of reliability.

Figure 2: Steady state revenue, opex and capex targets and actuals

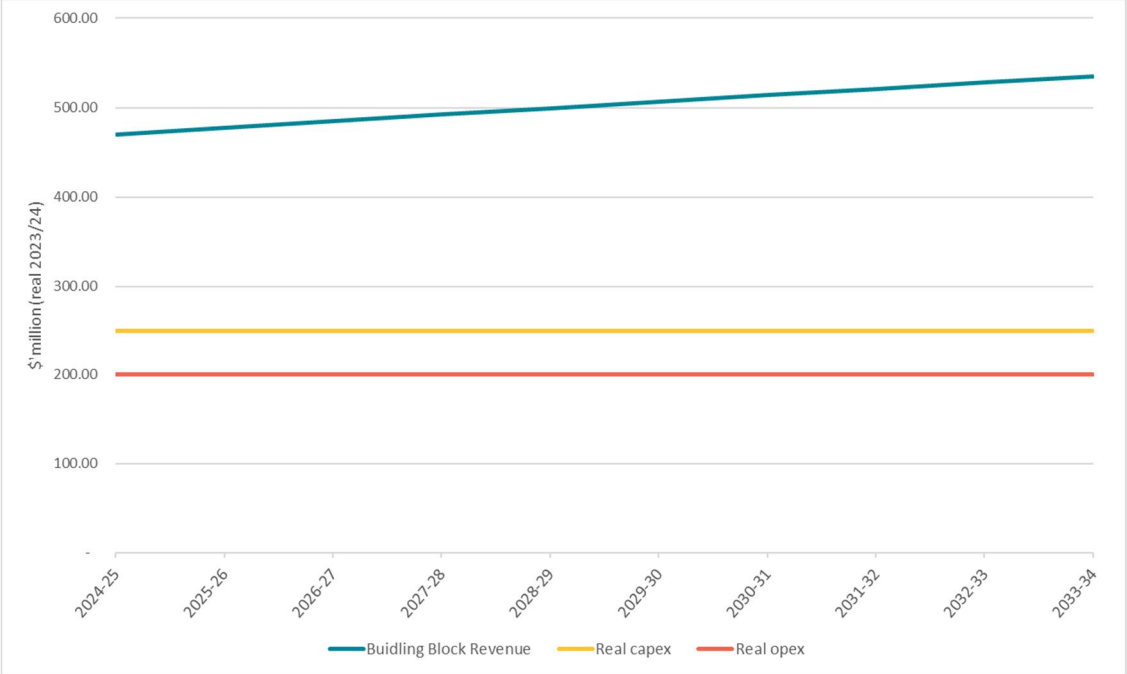


Figure 3: Steady state SAIDI and SAIFI targets and outturn reliability

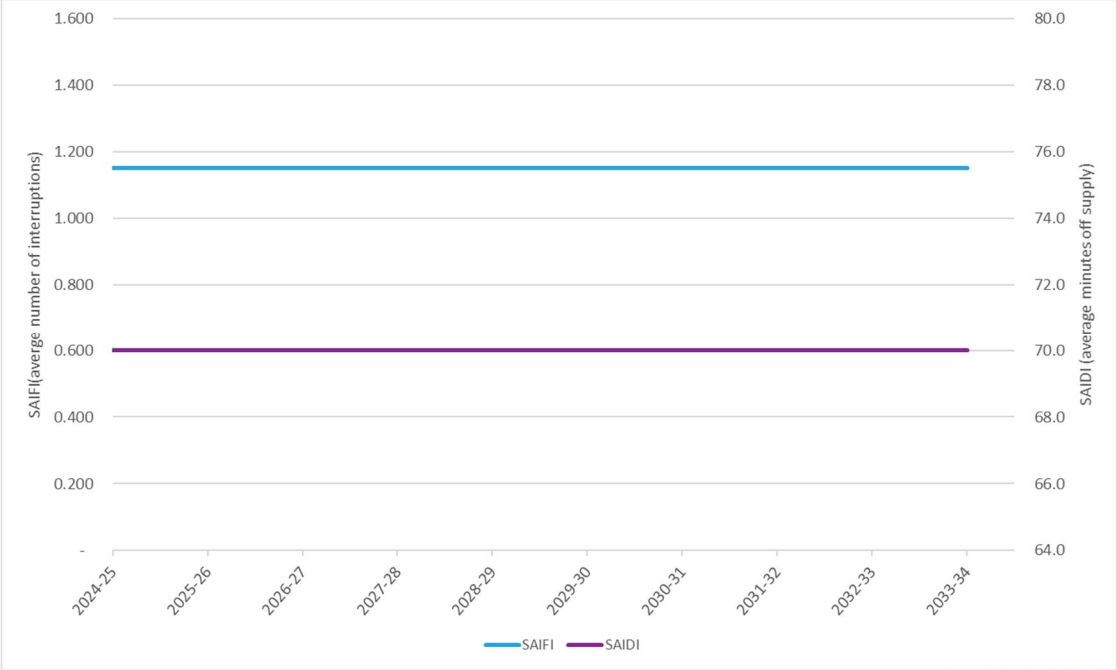


Table 4.1 shows the distributor's outturn expenditure matches its allowances and its reliability outcomes match its targets, and so the distributor just recovers the costs of providing distribution services and does not receive any incentive payments (or incur any incentive penalties).

Table 4.1: Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	$0.00
Capex incentive	$0.00
STPIS incentive	$0.00
Net financial impact for DNSP	$0.00

Under a balanced incentive framework, a distributor would have a financial incentive to continue to deliver an efficient level of reliability because:

- its expenditure allowances would be set at a level that would allow it to maintain its current (and efficient) level of reliability;
- its STPIS targets would be set at its current (and efficient) level of reliability; and
- the costs (savings) associated with increasing (decreasing) reliability do not outweigh the value customers place on moving away from the current (and efficient) level of reliability.

4.1.2 Scenario B – current level of reliability is below the efficient level

In this scenario, the distributor's current level of reliability is below the efficient level. We assume that the efficient level of reliability is 5 per cent better than current levels and that it would be efficient to improve reliability by 1 percentage point per annum for 5 years until the efficient level is reached.

As a consequence:

- in the absence of a regulatory obligation to change reliability, the opex and capex allowances are set to maintain current levels of reliability;
- the STPIS targets for SAIDI and SAIFI target the preservation of the current levels of reliability;
- the because the current level of reliability is below the efficient level, the cost of improving reliability is less than the value customers place on any improvement in reliability, until it reaches the efficient level; and
- the assumption of balanced incentives means that the distributor would be rewarded for increasing the level of network reliability until it reaches the efficient level.

Figure 4 shows that a distributor will improve reliability (resulting in lower SAIDI and SAIFI outcomes) where the cost of improving reliability is less than the value customers have for increased reliability. Where the target SAIDI and SAIFI is based on outcomes in the previous 5 years, in the second period the distributor will outperform its reliability targets, and only in the third period would the distributor's targets match the new efficient level of reliability.

Figure 4: Scenario B - SAIDI and SAIFI targets and outturn reliability

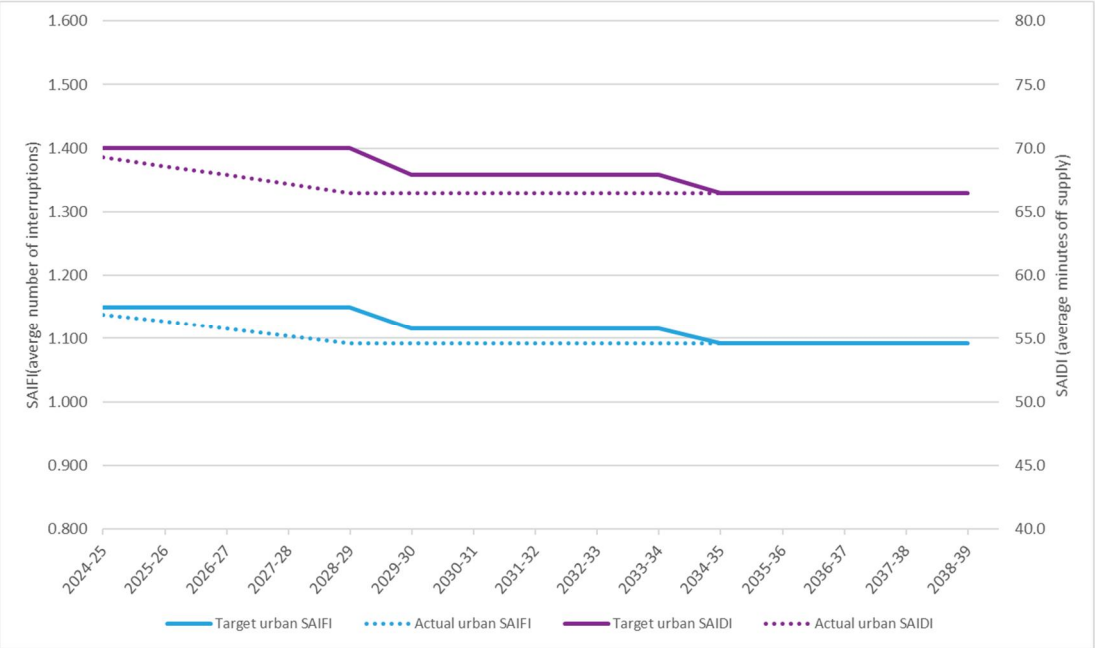
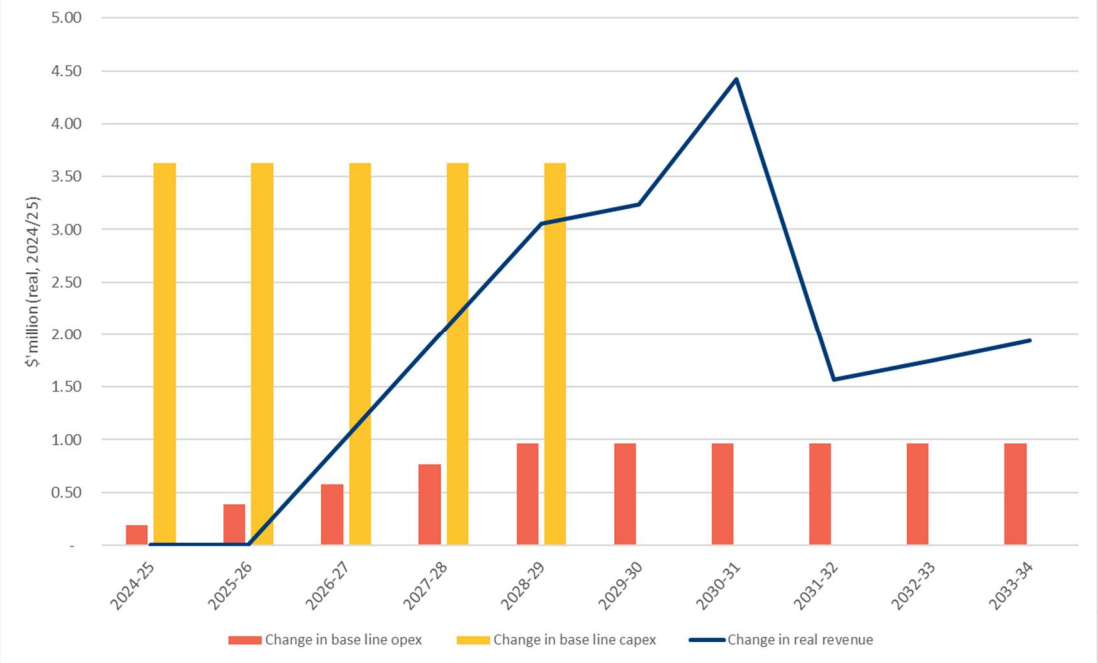


Figure 5 reflects the assumption that the distributor would need to use a mix of both opex and capex to improve reliability. Further, to sustain the higher levels of reliability the distributor would need to maintain the higher levels of opex, while it is assumed for simplicity that a one-off increase in capex can deliver a permanent improvement in reliability.

Figure 5: Scenario B – Change in revenue, opex and capex from base line levels[53]



[53] Note that revenue includes the incentive payments made under all three schemes, ie the CESS, STPIS and EBSS.

Figure 5 also shows that the distributor's revenue goes up from 2026/27. The increase in the first period is due to the STPIS payments for relating to the improvement in reliability. In the second regulatory period, higher revenue is a combination of the STPIS rewards offset by the penalties arising from the CESS and EBSS.

Figure 6 shows that the reward for increasing reliability under the STPIS more than offsets the penalties the distributor incurs from overspending its capex and opex allowances.

Figure 6: Scenario B – Incentives rewards and penalties for the distributor

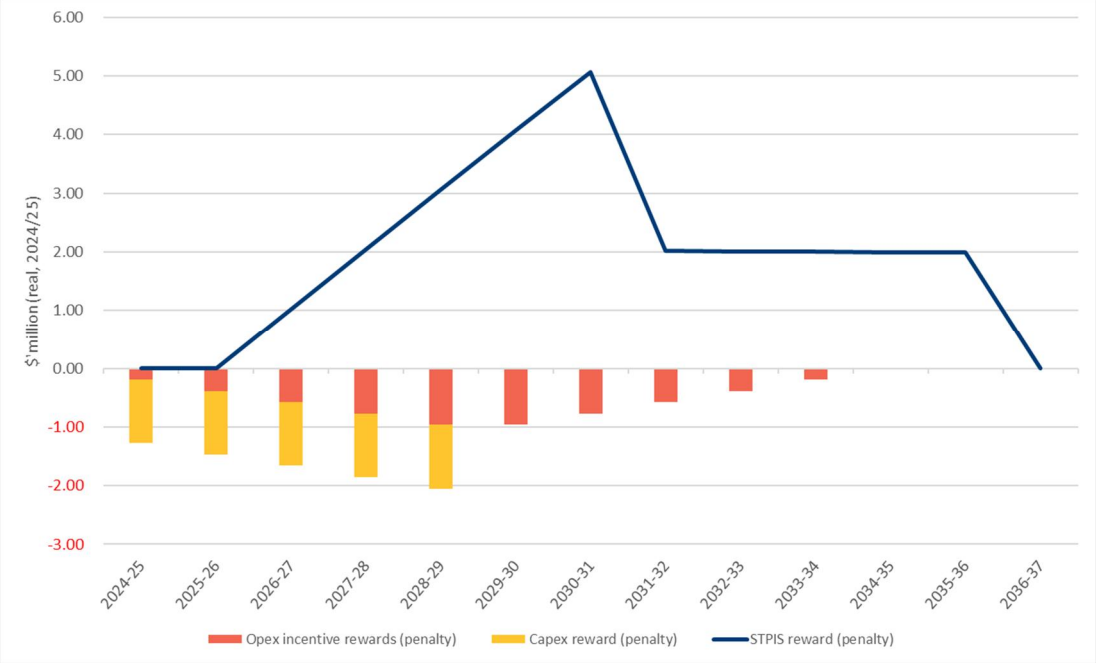


Table 4.2 shows that where the cost of increasing reliability is less than the value that customers place on that higher reliability the distributor will overspend its expenditure allowances to gain the rewards provided by the STPIS for better reliability outcomes.

Table 4.2: Scenario B - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	-$5.06
Capex incentive	-$5.06
STPIS incentive	$21.24
Net financial impact for DNSP	$11.11

4.1.3 Scenario C – current levels of reliability is above the efficient level

In this scenario, the distributor's current level of reliability is above the efficient level. We assume that the efficient level of reliability is 5 per cent lower than current levels, and that it would be efficient to worsen reliability by 1 per centage point per annum until the efficient level is reached.

As a consequence:

- in the absence of a regulatory obligation to change reliability, the opex and capex allowances are set to maintain current levels of reliability;
- the STPIS targets for SAIDI and SAIFI target the preservation of the current levels of reliability;
- because the current level of reliability is above the efficient level, the savings from worsening reliability are greater than the costs customers place on any deterioration in reliability, until it reaches the efficient level; and
- the assumption of balanced incentives means that the distributor would be rewarded for lowering the level of network reliability, until it reaches the efficient level.

Figure 7 shows that a distributor will worsen reliability (resulting in higher SAIDI and SAIFI outcomes) where the savings from less reliability are greater than the costs imposed on customers from lower reliability. Where the target SAIDI and SAIFI is based on outcomes in the previous 5 years, in the second period the distributor will underperform its reliability targets, and only in the third period would the distributor's targets match the new efficient level of reliability.

Figure 7: Scenario C - SAIDI and SAIFI targets and outturn reliability

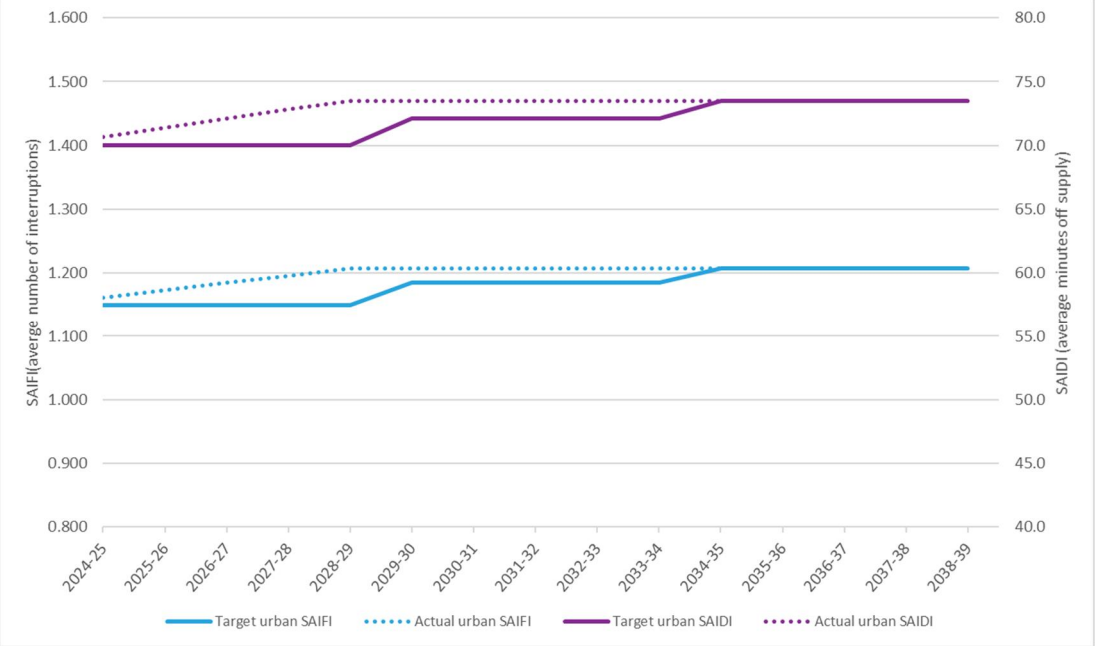


Figure 8 reflects the assumption that the distributor would need to cut both opex and capex to result in a deterioration in reliability. Further, the distributor can sustain the lower levels of reliability through permanently lower levels of opex, while it is assumed that a one-off savings in capex will deliver a permanent reduction in reliability.

Figure 8: Scenario C – Change in revenue, opex and capex from base line levels

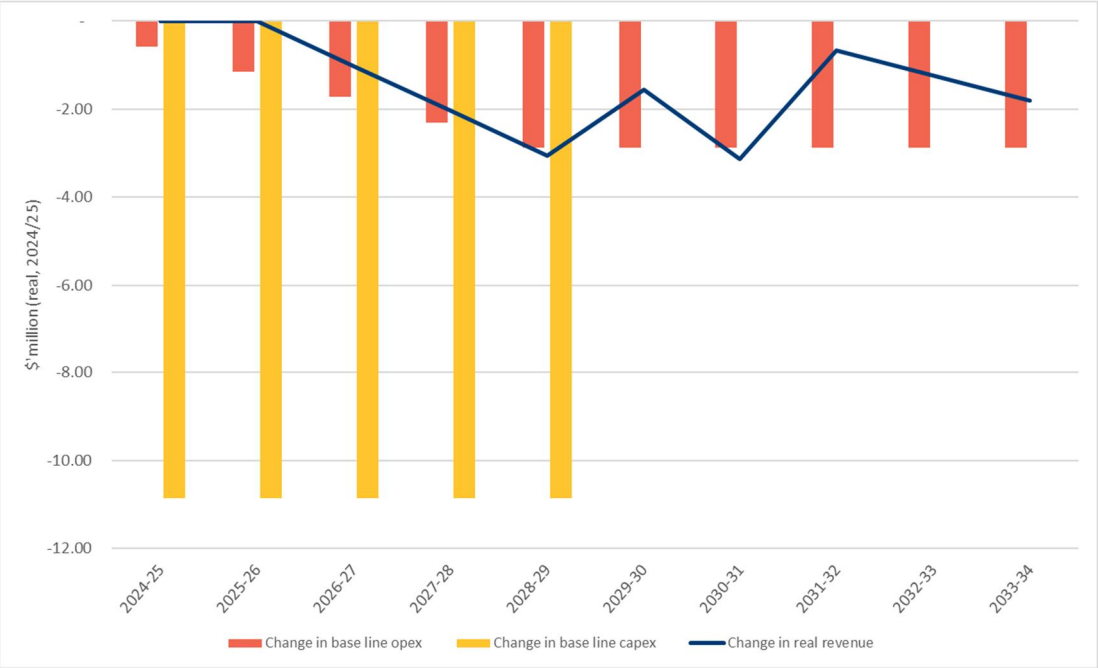


Figure 8 also shows that the distributor's revenue goes down from 2026/27. In the first period, the lower revenue is due to the STPIS penalty arising from the deteriorating reliability. In the second regulatory period, lower revenue is a combination of the STPIS penalties offset by the rewards arising from the CESS and EBSS.

Figure 9 shows that the savings from lower reliability expenditure more than offset the penalties for lower reliability under the STPIS.

Figure 9: Scenario C – Incentives rewards and penalties for the distributor

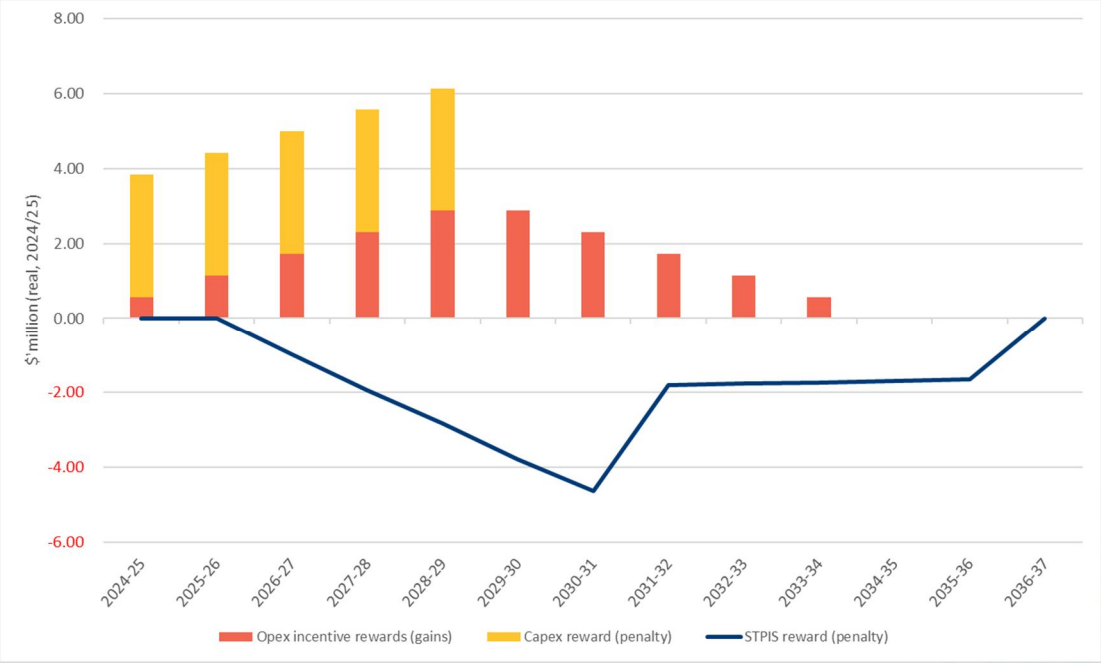


Table 4.3 shows that the penalty of delivering a lower level of reliability is less than the rewards the distributor receives from underspending its expenditure allowances.

Table 4.3: Scenario C - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	$15.19
Capex incentive	$15.19
STPIS incentive	-$21.24
Net financial impact for DNSP	$9.14

4.2 Impediments to achieving efficient level of reliability

This section identifies some potential reasons why distributors may not in practice have acted on the financial incentives in the current regulatory framework to deliver efficient levels of reliability.

There are a number of possible reasons why distributors may not have acted on the AER's incentive framework, including:

- the NSW distributors were not required to consider the efficiency of their reliability investments under the previous deterministic reliability standard, which was only removed on 1 July 2014;
- the comprehensive incentive framework has only recently been operational in NSW;
- reliability outcomes are inherently uncertain and so distributors may discount the expected value of benefits of reliability improvements; and
- potential behaviour responses of distributors, such as risk aversion and adoption of performance targets.

The deterministic reliability standards were removed by the NSW government on 1 July 2014, and replaced with the current NSW reliability framework.[54] While the design planning requirement was abolished on this date, the distributors capex programs would have included a number of reliability projects (ie, N-2 and N-1 projects) that were underway at that date. For a number of the projects already started, the benefits of the project (notwithstanding the removal of the deterministic reliability standards) may have still outweighed the costs to complete the project. In other words, it would have been efficient to complete an already started project, even when that project if started after 1 July 2014 would not be efficient. Consequently, the reliability of the NSW distributors may have continued to improve after 1 July 2014 due to completion of projects that originated under the previous deterministic reliability standards.

Another potential reason is that the AER's comprehensive incentive framework has only relatively recently been applied to the NSW distributors. As outlined in sections 3.2 and 3.3 the incentives schemes were first applied in NSW :

- in the 2015/16 regulatory year for the STPIS;
- in the 2015/16 regulatory year for the CESS; and
- in the 2009/10 regulatory year for the EBSS, although the AER subsequently decided to not apply the EBSS for Essential and Ausgrid until the 2019/20 regulatory year.

[54] Anthony Roberts Minister for Resources & Energy, *Reliability and performance licence conditions for electricity distributors*, commencement date 1 July 2014.

Further, it may take distributors some time to properly understand the effect of each individual scheme and also the interaction between the schemes and therefore respond to the incentive to deliver an efficient level of reliability.

The reliability outcomes depend on a number factors that are at least partially outside the control of distributors. This means that future reliability outcomes are uncertain, even where distributors alter their reliability expenditure. Consequently, distributors when assessing reliability expenditure will be trading off between relatively certain costs (and their impact on the CESS and EBSS) and relatively uncertain service outcomes (and their impact on the STPIS). This uncertainty may lead distributors to explicitly (or implicitly) discount the service outcomes which means that they are not fully responding to the financial incentives. That said, unless distributors are substantially discounting service outcomes the potential losses from this behaviour are likely to be minor as this will likely only impact projects that have a marginal net benefit.

Finally, there may behavioural responses by distributors to the setting of reliability targets that discourage businesses from acting on the financial incentives, especially those encouraging worsening reliability outcomes. For example, distributors may be concerned about the reputational risk of being seen to target lower levels of reliability (relative to their STPIS targets) when a major outage occurs. Further, meeting or outperforming the STPIS target may be adopted as a business and individual objective. Both behavioural responses may dampen the financial incentives to deliver a lower, but efficient, level of reliability.

4.3 Transition period

The determination of a distributor's efficient level of reliability should be a forward looking assessment. That is, given where each of the networks is today the efficient level of reliability is where the future costs of delivering a marginal change in reliability equals the value customers place on marginal change in reliability. Consequently, distributors must transition to efficient levels of reliability as it reconfigures it network and business process.

The time period over which a distributor will transition from current levels of reliability to a new efficient level in response to the incentive framework will depend on a number of factors.

If the move to the efficient level of reliability involves changes in opex then distributors should be able to transition relatively quickly (in a year or two).

If the change in reliability requires capex the transition period will depend on the asset replacement cycle. For example, if the change in reliability would be efficiently achieved through the investment in a new SCADA system, then this could be achieved in a relatively short period of time.[55] However, if the change in reliability is due to the current network having been built with an inefficient level of redundancy, then the transition to the "efficient" level of reliability may take 30 to 40 years, as it will depend on when the distributor decides to replace the unnecessary duplicate asset.

Where substantial changes in the levels of reliability is required to reach efficient levels, it is more likely that distributors will require changes to both its current levels of opex, and it investment in both short and long lived assets. It would be reasonable to expect a longer transition to efficient levels of reliability where the efficient level of reliability is substantially different for current levels.

[55] Note that the reliability benefits may not justify the immediate replacement of the distributor's existing SCADA system. However, the addition of reliability benefits may make it efficient for the distributor to bring forward the replacement of the system.

5. Setting of a licence reliability outcome

This section sets out how the NSW licence reliability framework interacts with the national regulatory framework, and how this would affect the incentives that distributors have to deliver an efficient level of network reliability.

If the efficient performance standard set by licence condition is similar to the existing STPIS targets and reliability outcomes of the distributor then the outcome would be similar to the one illustrated in Scenario A – steady state. That is, the distributor would continue to deliver an efficient level of reliability and it would just recover the cost of providing distribution services (with no incentive payments).

We have developed the following four scenarios to highlight the implication of a finding that the efficient level of reliability differs from current levels:

- **Scenario D:** where the current level of reliability is less than the efficient level mandated by the distributors licence, and where:
  - the distributor's expenditure allowances are increased to meet this new higher level of reliability and the STPIS targets are also adjusted to reflect the transition to the new higher efficient levels of reliability; and
  - because the efficient level of reliability is higher than current levels, the cost of improving reliability is less than the value customers place on the improvement in reliability;
- **Scenario E:** where the current level of reliability is greater than the efficient level, and the NSW licences mandate that the distributor target this efficient lower reliability levels, and where:
  - the distributor's expenditure allowances are lowered to reflect the expected savings from the new lower level of reliability and the STPIS targets are also adjusted to reflect the transition to the new lower efficient levels of reliability; and
  - because the efficient level of reliability is lower than current levels, the savings from lowering reliability is greater than the cost imposed on customers from the deterioration in reliability.
- **Scenario 1:** where the current level of reliability is less than current levels (as in Scenario D), however, the level of reliability mandated by the distributor's licence overshoots the efficient level and requires the distributor to reach a higher than efficient level of reliability, and where:
  - the distributor's expenditure allowances are increased to meet the mandated higher level of reliability and the STPIS targets are also adjusted to reflect the transition to the mandated higher levels of reliability; and
  - because the efficient level of reliability is higher than current levels, the cost of improving reliability is less than the value customers place on the improvement in reliability up to the efficient level and for further improvements in reliability the costs of improving reliability are greater than the value customers place on improved reliability;
- **Scenario 2:** where the current level of reliability is greater than current levels (as in scenario E), however, the level of reliability mandated by the distributor's licence overshoots the efficient level and requires the distributor to reach a lower than efficient level of reliability, and where:
  - the distributor's expenditure allowances are lowered to reflect the expected savings from new lower level of reliability and the STPIS targets are also adjusted to reflect the transition to the mandated lower levels of reliability; and
  - because the efficient level of reliability is lower than current levels, the savings from of lowering reliability is greater than the value customers place on the deterioration in reliability up to the efficient level, but for further deterioration in reliability the savings from lowering reliability are less than the losses to customers of lower reliability.

Each of these scenarios are set out below.

5.1 Scenario D – mandated higher efficient reliability

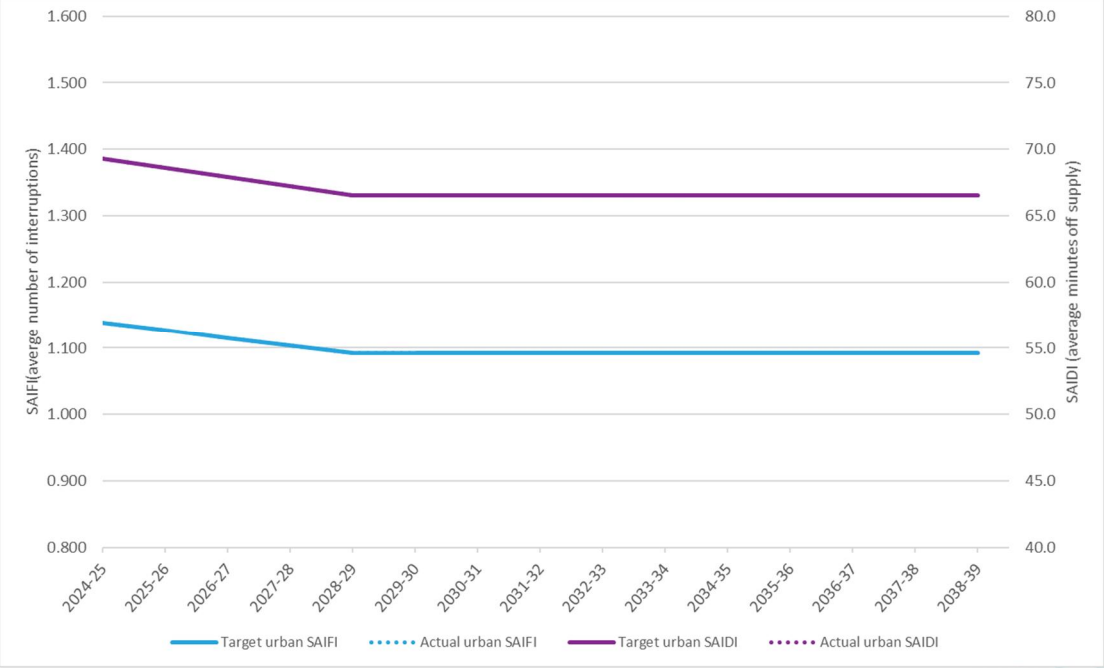
In this scenario, the distributor's licence mandates a transition to an efficient and higher level of reliability. We assume that the efficient level of reliability is 5 per cent better than current levels, and it is assumed that reliability will improve by 1 percentage point per annum until the efficient level is reached.

As a consequence:

- the existence of the regulatory obligation to increase reliability results in the distributor's opex and capex allowances being adjusted to reflect the additional cost of increasing reliability;
- the STPIS targets for SAIDI and SAIFI would no longer be set to historical levels and would instead reflect the expected improvement in reliability as the distributor transitions to the new efficient level of reliability;
- because the current level of reliability is below the efficient level, the cost of improving reliability is less than the value customers place on any improvement in reliability, until reliability reaches the efficient level; and
- the distributor would be penalised if it does not efficiently increase the level of network reliability until it reaches the efficient level, because the STPIS penalty from the distributor not improving reliability, in line with the higher STPIS targets, would be greater that the rewards the distributor received from the CESS and EBSS from not undertaking the reliability improving expenditure.

Figure 10 shows that the distributor improves reliability (resulting in lower SAIDI and SAIFI outcomes) because the cost of improving reliability is less than the value customers place on increased reliability.[56] In this scenario, the targets for SAIDI and SAIFI have been adjusted to reflect the expected transition to the higher efficient level of reliability. Which would be the same as that observed in Scenario B.

Figure 10: Scenario D - SAIDI and SAIFI targets and outturn reliability



[56] In this scenario it is again assumed that the efficient path to improving reliability is to improve reliability by 1 percentage point per year.

Figure 11 reflects the assumption that the distributor would need to use a mix of both opex and capex to improve reliability. Note that the amount of opex and capex spent by the distributor is unchanged to that in Scenario B, because irrespective of how the allowances are set the incentive framework will encourage the distributor to efficiently transition to the new efficient level of reliability.

Figure 11: Scenario D – Change in revenue, opex and capex from base line levels

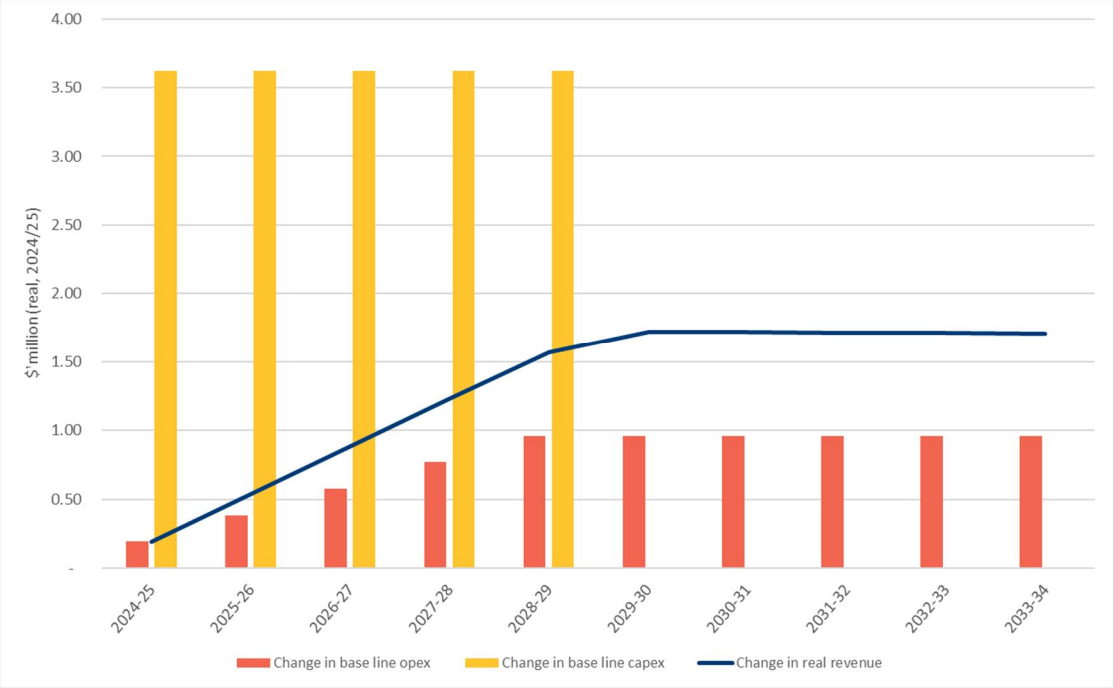


Figure 11 also shows that the distributor's revenue increases from the start of the first regulatory period which reflects the higher opex and capex allowances included to transition to the new efficient level of reliability. In the second regulatory period, the higher revenue is due to the higher opex allowance and higher Regulatory Asset Base (RAB) value resulting from the higher period 1 capex.

Figure 12 shows that the distributor receives no reward or penalty for increasing reliability under the, EBSS, CESS or STPIS.

Figure 12: Scenario D – Incentives rewards and penalties for the distributor

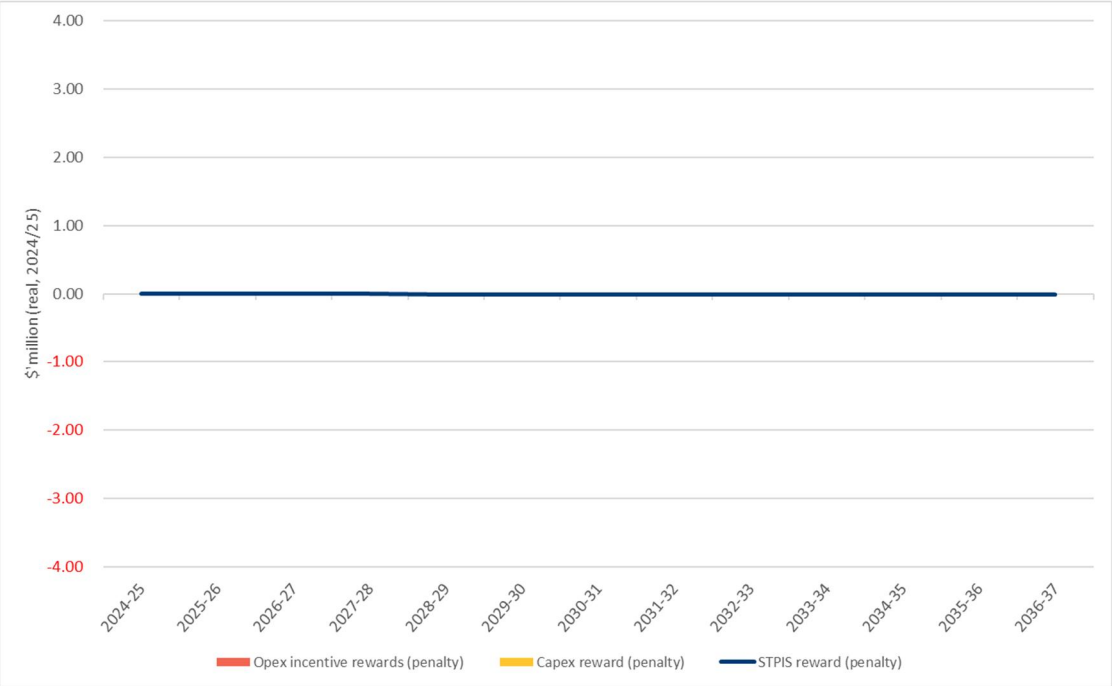


Table 5.1 shows that where:

- IPART is able to mandate the efficient level of reliability in the NSEW distribution licences; and
- the AER is able to correctly estimate the distributor's level and timing of the required increase in expenditure necessary to transition to the higher efficient levels of reliability, then

the distributor's expenditure allowances will match its outturn expenditure and its reliability outcomes will match its STPIS targets.

Table 5.1: Scenario D - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	$0.00
Capex incentive	$0.00
STPIS incentive	$0.00
Net financial impact for DNSP	$0.00

The primary difference between this scenario with a mandated reliability target and Scenario B is that all the benefits from transitioning to the new efficient level of reliability are accrued by customers while the distributor is only able to recover its efficient costs.

5.2 Scenario E – mandated lower efficient reliability

This scenario, mirrors Scenario C in that the current level of reliability is higher than the efficient level. However, this scenario incorporates a licence condition that requires the distributor to target the new lower

efficient level of reliability. For example, the overall reliability standard contained in the distributor licence could be changed to stipulate:

> A Licence Holder must efficiently target, when excluded interruptions are disregarded, the achievement of the SAIDI average standards that apply to its feeder types.
>
> A Licence Holder must efficiently target, when excluded interruptions are disregarded, the achievement of the SAIFI average standards that apply to its feeder types.

We assume that the efficient level of reliability is 5 per cent lower than current levels, and that reliability will worsen by 1 percentage point per annum until the efficient level is reached.

In this scenario the regulatory obligation to transition to an efficient lower level of reliability would have the following consequences:

- the existence of the regulatory obligation to target lower levels of reliability would result in the distributor's opex and capex allowances being reduced to reflect the savings that could be achieved from lowering reliability;
- the STPIS targets for SAIDI and SAIFI would no longer be set to historical levels and would instead reflect the expected deterioration in reliability as the distributor transitions to the new efficient level of reliability (although on an average basis, see below);
- because the current level of reliability is above the efficient level, the cost of improving reliability is less than the value customers place on any improvement in reliability, until it reaches the efficient level; and
- the distributor would be penalised if it does not efficiently decrease the level of network reliability until it reaches the efficient level, because the CESS and EBSS penalty from not reducing reliability expenditure would outweigh the expected reward from outperforming the STPIS reliability targets.

Note that the clause 3.2.1(a) of the STPIS guideline requires that:[57]

> The performance targets to apply during the regulatory control period must not deteriorate across regulatory years

To be consistent with this requirement, this scenario does not rachet down the STPIS targets over the regulator period, instead the targets are set at the expected average level reliability over the regulatory control period. In the first regulatory period, this results in the distributor outperforming the STPIS targets in the first two years of the period and underperforming in the final two years.

Figure 13 shows that a distributor will lower reliability (resulting in higher SAIDI and SAIFI outcomes) because the savings from reducing expenditure and allowing reliability to worsen are greater than the value customers place on the lower network reliability.[58] In this scenario, the target SAIDI and SAIFI have been adjusted to reflect the expected lower average level of reliability over the regulatory period.

[57] AER, *Electricity distribution network service providers | Service target performance incentive scheme | Version 2.0*, November 2018, pp. 10-11.

[58] Again in this scenario it is assumed that the efficient path is to lower reliability by 1 percentage point per year.

Figure 13: Scenario E - SAIDI and SAIFI targets and outturn reliability

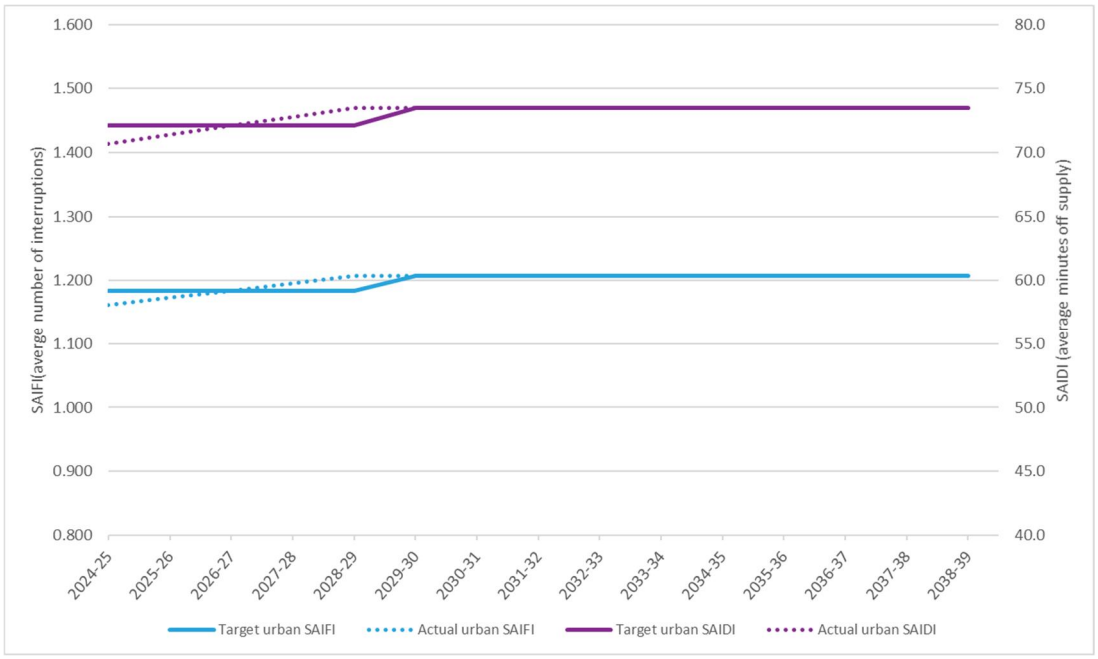


Figure 14 reflects the assumption that the distributor would reduce expenditure on both opex and capex to achieve a deterioration in reliability. Note that the amount of opex and capex actually saved by the distributor is unchanged from that in Scenario C, because irrespective of how the allowances are set the incentive framework will encourage the distributor to efficiently transition to the new efficient level of reliability.

Figure 14: Scenario E – Change in revenue, opex and capex from base line levels

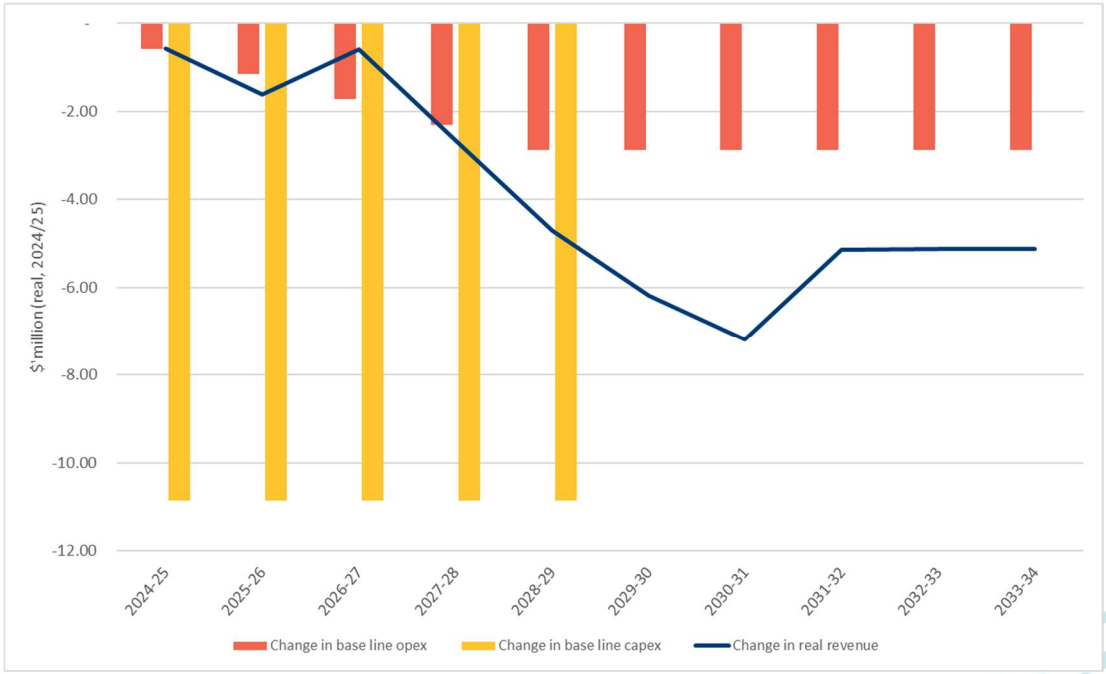


Figure 14 also shows that the distributor's revenue goes down from the start of the first regulatory period reflecting the lower opex and capex allowances included in the transition to the new efficient level of

reliability. Over the second regulatory period, the lower revenue is due to the lower opex allowance and smaller RAB resulting from the decrease in period 1 capex.

Figure 15 shows that the distributor receives a slight STPIS reward in period 1 due to the distributor outperforming its reliability targets in the first two years which more than offsets the penalties for underperforming the STPIS targets in the final two years of the period. There are no incentive rewards or penalties associated with the distributor's expenditure.

Figure 15: Scenario E – Incentives rewards and penalties for the distributor

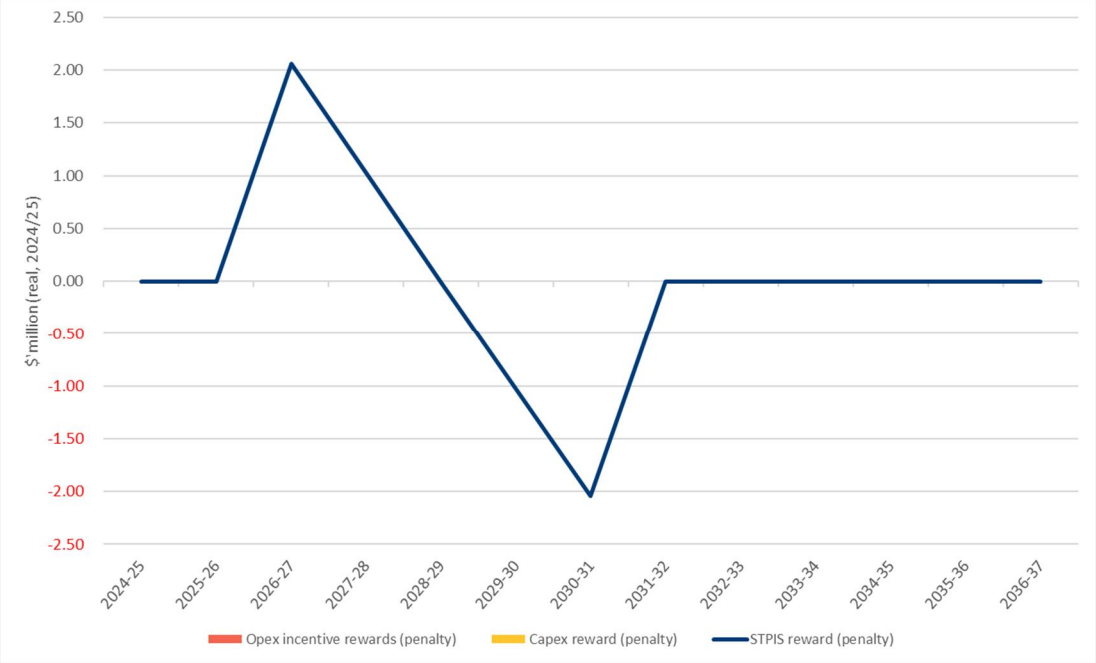


Table 5.2 shows that where:

- IPART is able to mandate the efficient level of reliability in the NSW distribution licences; and
- the AER is able to correctly estimate the distributor's level and timing of the required decrease in expenditure necessary to transition to lower efficient levels of reliability, then;

the distributor's expenditure allowances will match its outturn expenditure. However, because the STPIS performance targets cannot deteriorate over the regulatory period the distributor would gain a small STPIS reward as it transitions to the lower efficient level of reliability.

Table 5.2: Scenario E - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	$0.00
Capex incentive	$0.00
STPIS incentive	$0.24
Net financial impact for DNSP	$0.24

Again in this scenario customers will accrue almost all the benefits from transitioning to the new efficient level of reliability.

5.3 Scenario 1 – mandated higher reliability target that is above efficient levels

This scenario highlights the risk that a mandated level of reliability contained in the distributor's licence overestimates the efficient level of reliability. To illustrate this risk, this scenario mirrors Scenario D. However the distributor's licence mandates a 10 per cent improvement in reliability, when a 5 per cent improvement is efficient. The consequences of this are:

- the existence of the regulatory obligation to increase reliability by 10 per cent, results in the distributor's opex and capex allowances being adjusted to reflect the efficient cost of increasing reliability to this level;
- the STPIS targets would reflect the expected 10 per cent improvement in reliability, which we assume is estimated at a rate of 2 percentage points per annum;
- the efficient level of reliability is 5 per cent better than current levels, and it is assumed that reliability will improve by 1 percentage point per annum until the efficient level is reached;
- because the current level of reliability is below the efficient level, the cost of improving reliability is less than the value customers place on any improvement in reliability, until it reaches the efficient level;
- improving reliability beyond the efficient level would result in the cost of improving reliability being greater than the value customers place on the reliability improvement, and so the distributor would not undertake this expenditure; and
- the distributor would be penalised if it does not efficiently increase the level of network reliability until it reaches the efficient level, because the STPIS penalty imposed on the distributor from not improving reliability in line with the higher STPIS targets, would be greater than the reward from the CESS and EBSS from not undertaking the reliability improving expenditure.

Figure 16 shows that a distributor will improve reliability (resulting in lower SAIDI and SAIFI outcomes) because the cost of improving reliability is less than the value customers place on increased reliability, up to the efficient level. Once the distributor reaches the efficient level of reliability, the cost of further improving reliability must by definition be greater than its value to customers. Consequently, the distributor's outturn reliability would underperform the STPIS target for the first two regulatory control periods.[59]

This scenario explicitly assumes that a distributor would respond to its financial incentives even when it results in the distributor breaching its licence requirements. We understand this is a feasible outcome. Where the distributor instead complied with its licence requirements, the cost of providing the increment of reliability in excess of the efficient level will be greater than the value customers place on that improvement in reliability.

[59] Note to simplify this scenario we have assumed that reliability targets are adjusted to efficient levels in the third regulatory control period.

Figure 16: Scenario 1 - SAIDI and SAIFI targets and outturn reliability

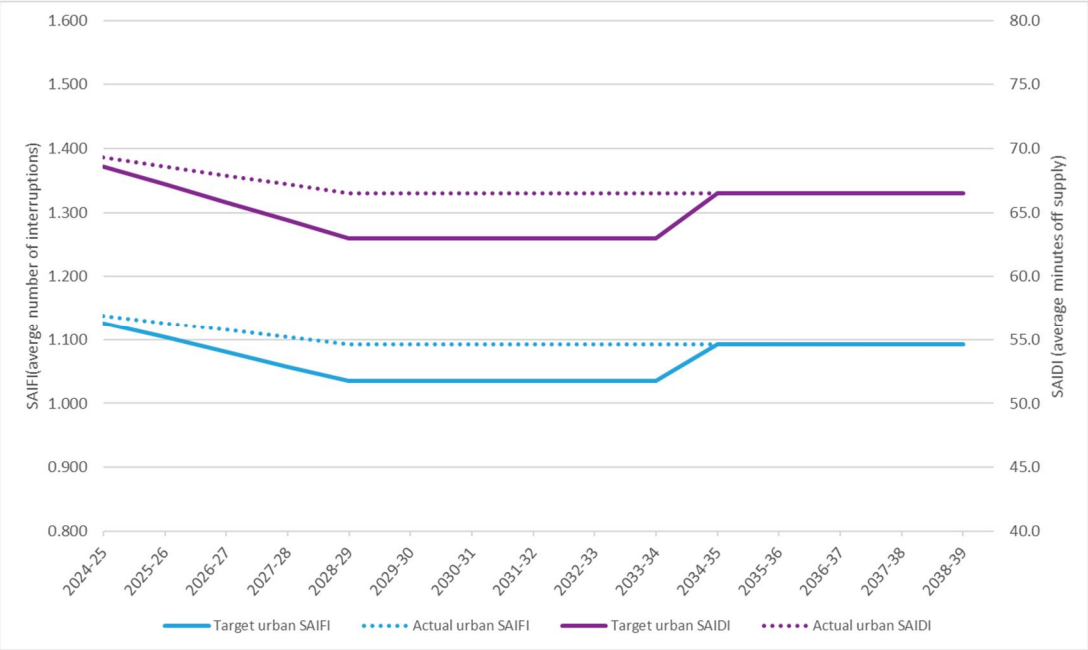
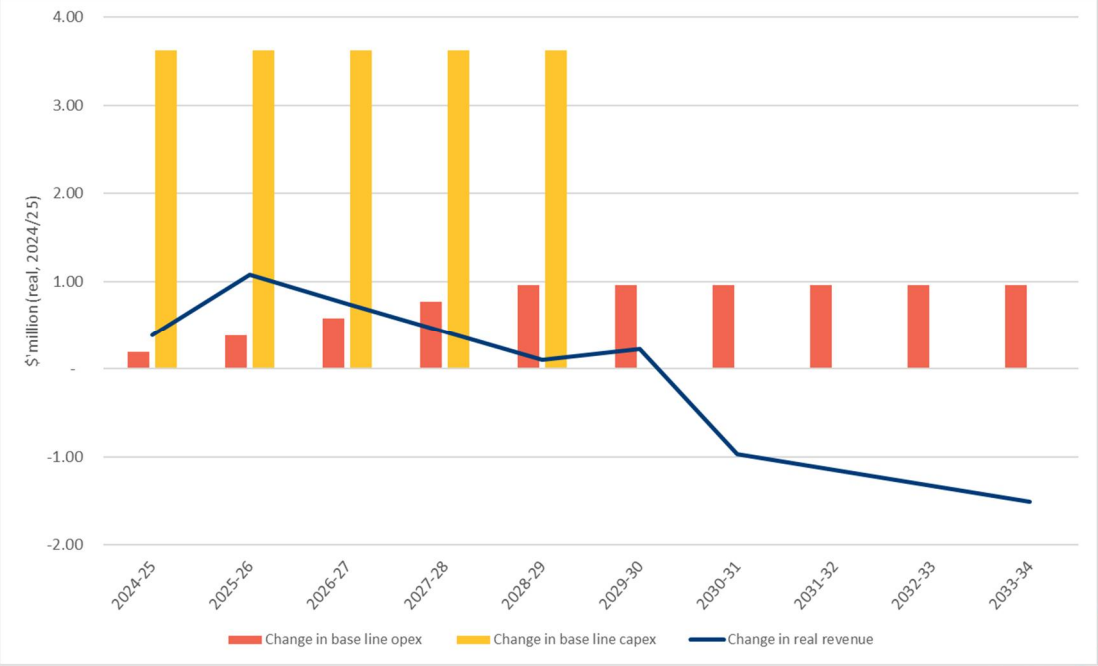


Figure 17 reflects the assumption that the distributor would use a combination of opex and capex to improve reliability. The result of this additional expenditure is an increase in the annual revenues of the distributor. However, this impact of the distributor's higher expenditure is eventually overwhelmed by the STPIS penalty associated with the distributor failing to meet the target level of reliability.

Figure 17: Scenario 1 – Change in revenue, opex and capex from base line levels



Note that the amount of opex and capex spent by the distributor is unchanged to that in scenarios B and D, because irrespective of how the allowances are set and the licence condition the incentive framework will encourage the distributor to efficiently transition to the efficient level of reliability.

Figure 18 shows that the rewards received by the distributor from underspending its opex and capex allowances are substantially less than the penalty associated with the STPIS for not meeting the target level of reliability.

Figure 18: Scenario 1 – Incentives rewards and penalties for the distributor

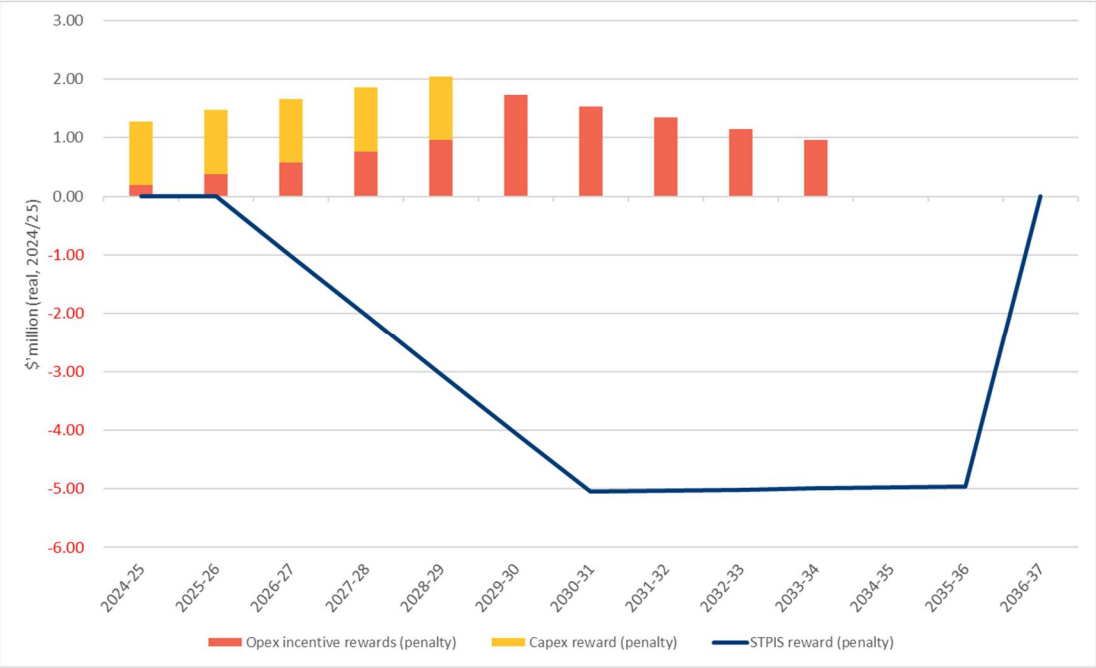


Table 5.3 shows that mandating a reliability target that overshoots an efficient level of reliability will result in a substantial financial penalty being imposed on the distributor. In this scenario, the distributor would still transition to the efficient level of reliability, however this is below the mandated level of reliability. Consequently, the distributor would be penalised by the STPIS which outweighs any rewards the distributor would receive from underspending its expenditure allowances.

Table 5.3: Scenario 1 - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	$8.24
Capex incentive	$5.06
STPIS incentive	-$32.97
Net financial impact for DNSP	-$19.67

To summarise, risk of mandating as a licence condition that distributors improve their reliability is that the target could be in excess of the efficient level of reliability. In this scenario, the distributor would minimise its losses by only improving reliability when the cost of improving reliability is less than the value customers place on increased reliability. The distributor would not increase reliability beyond the efficient level because by definition the costs of improving reliability must be less than it is value to customers and so the operation of the incentive framework would leave the DNSP even worse off'. The consequence of not reaching the target level of reliability is that the distributor would likely face substantial STPIS penalties, which would be greater than any rewards it would receive from underspending its expenditure allowances.

5.4 Scenario 2 – mandated lower reliability that is below efficient levels

This scenario highlights the risk that the mandated level of reliability contained in the distributor's licence underestimates the efficient level of reliability. To illustrate this risk, this scenario mirrors Scenario E. However the distributor's licence mandates a 10 per cent deterioration in reliability, when a 5 per cent fall in reliability is efficient. The consequences of this are:

- the existence of the regulatory obligation to target a 10 per cent lower level of reliability results in the distributor's opex and capex allowances being cut to reflect the cost of delivering the lower level of reliability;
- the STPIS targets would reflect the expected 10 per cent deterioration in reliability, at an assumed rate of 2 percentage points per annum;
- the efficient level of reliability is 5 per cent lower than current levels, and it is assumed that reliability will deteriorate by 1 percentage point per annum until the efficient level is reached;
- because the current level of reliability is above the efficient level, the savings associated with reducing expenditure and reduced reliability are greater than the value customers place on any worsening in reliability, until reliability reaches the efficient level;
- lowering reliability beyond the efficient level, the savings from worse reliability must by definition be less than the value customers place on the loss of reliability; and
- the distributor would be penalised if it does not efficiently decrease the level of network reliability until it reaches the efficient level, because the CESS and EBSS penalty associated with additional spending on reliability would be less than the reward the distributor would receive from outperforming its STPIS targets.

Figure 19 shows that a distributor will reduce its reliability expenditure resulting in lower reliability outcomes (resulting in higher SAIDI and SAIFI outcomes). A distributor would lower its reliability expenditure when the savings from not spending on reliability is greater than the value customers place on the lower reliability outcomes. However, once the distributor reaches the efficient level of reliability, the savings from further cuts in reliability expenditure would be less than the value customers place on the lost reliability. Consequently, the distributor will not reduce its expenditure further, and the distributor's outturn reliability underperforms the STPIS target for the first two regulatory control periods.[60]

This scenario explicitly assumes that a distributor would respond to its financial incentives even when it results in the distributor breaching its licence requirements. We understand this is a feasible outcome. Where the distributor instead complied with its licence requirements, the savings from reducing reliability expenditure beyond the efficient level will be less than the value customers place on that lost reliability.

[60] Note to simplify this scenario we have assumed that reliability targets are adjusted to efficient levels in the third regulatory control period.

Figure 19: Scenario 2 - SAIDI and SAIFI targets and outturn reliability

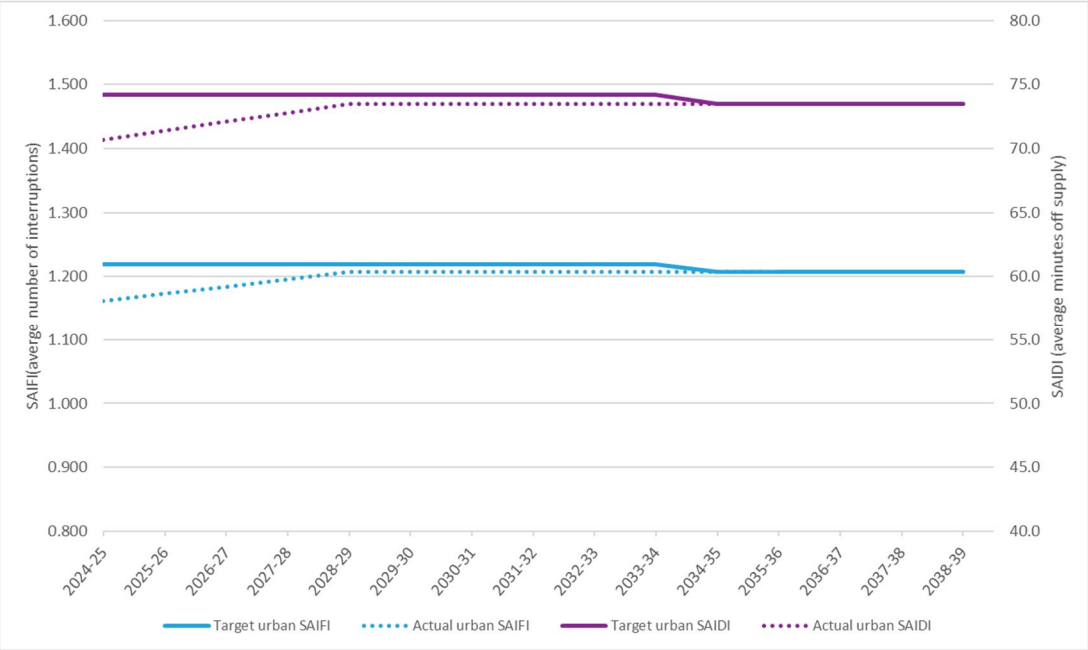
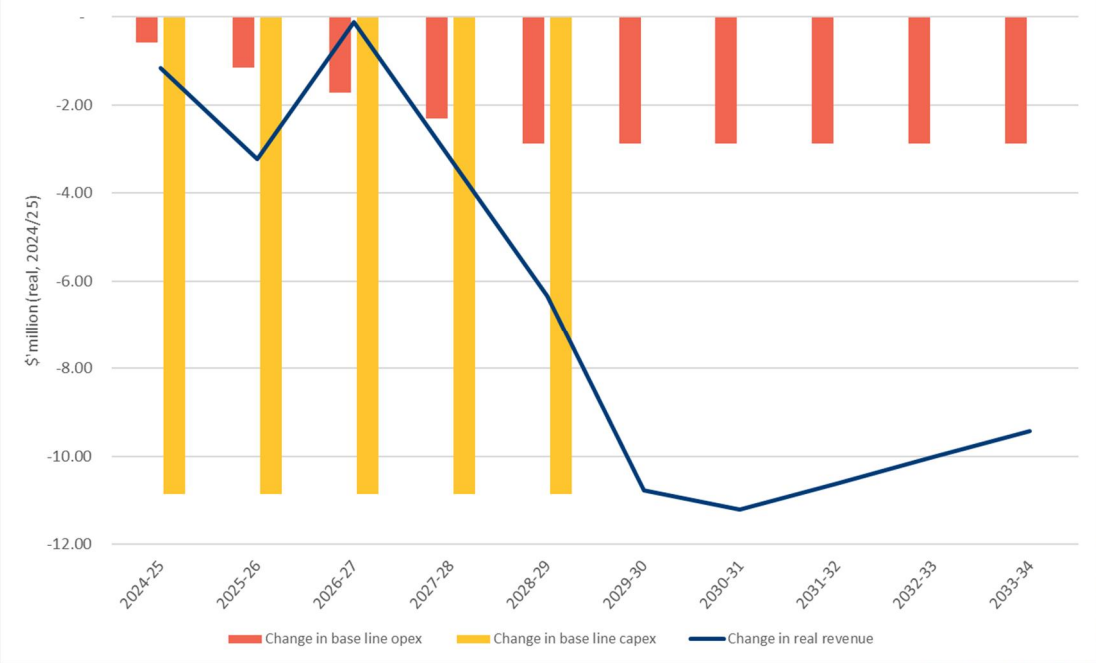


Figure 20 reflects the assumption that the distributor would cut both its opex and capex expenditure, resulting in worsening reliability outcomes The result of this reduction in expenditure is a lower annual revenues requirement for the distributor, while the STPIS reward falls through the first period (with the exception of 2026/27,when revenues increase due to the distributor outperforming its STPIS target in 2024/25). In the second period the impact of the distributor's lower expenditure overwhelms the STPIS reward associated with the continued outperformance of the STPIS reliability targets.

Figure 20: Scenario 2 – Change in revenue, opex and capex from base line levels



Note that the amount of opex and capex spent by the distributor is unchanged to that in scenarios C and E, because irrespective of how the allowances are set and the licence target, the incentive framework will encourage the distributor to efficiently transition to the efficient level of reliability.

Figure 21 shows that the penalties received by the distributor from overspending it opex and capex allowance are substantially greater than the rewards associated with the STPIS outperformance.

Figure 21: Scenario 2 – Incentives rewards and penalties for the distributor

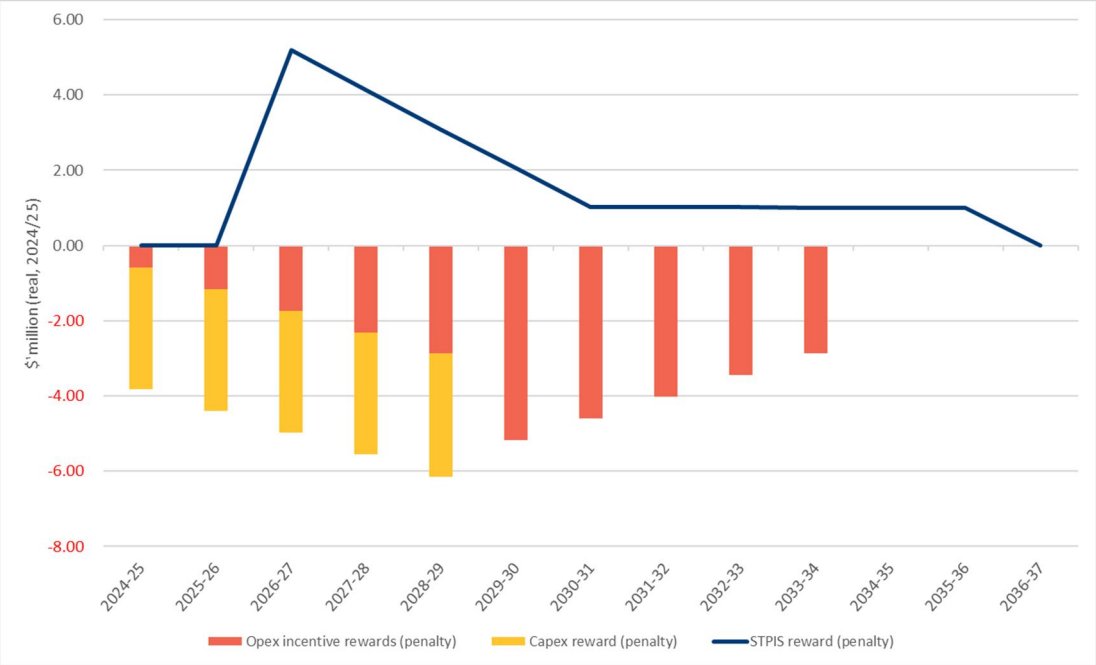


Table 5.3 shows the impact of mandating a reliability target that overshoots the efficient reduction in reliability is a substantial financial penalty to the distributor. In this scenario, the distributor would still transition to the efficient level of reliability, however, this would be above the mandated level of reliability.

Table 5.4: Scenario 2 - Net present value from the AER's incentive schemes

Incentive mechanism	NPV of the 2024/25 to 2038/39 period ($m, 2024-25)
Opex incentive	-$24.72
Capex incentive	-$15.19
STPIS incentive	$17.96
Net financial impact for DNSP	-$21.94

To summarise, the risk of mandating a reduction in network reliability through a licence condition is that it could exceed the efficient reduction in reliability. In this scenario, the distributor would minimise its losses by only cutting reliability expenditure when the expenditure savings exceed the value that customers place on the lost reliability. The distributor would not cut reliability beyond an efficient level because by definition the savings from reducing expenditure would be less than the value customers place on the lost reliability. Consequently, the distributor would likely face substantial CESS and EBSS penalties for failing to reach the mandated reductions in expenditure, which would be greater than any rewards it would receive from outperforming its STPIS performance.

6. Conclusion

The AER has developed a comprehensive incentive framework that seeks to create financial incentives for distributors to minimise the cost of providing regulated services, but not at the detriment of inefficient reductions in network reliability. The consequence of the incentive framework is to focus the distributor on the task of how to deliver an efficient level of reliability, by providing rewards when:[61]

- the cost of reliability improvements is less than the value its customers place on the improved reliability; and
- the savings from reducing reliability expenditure exceed the value its customers place on the deteriorating reliability.

This outcome is demonstrated in Scenarios B and C where a distributor would be rewarded to transition to the efficient level of reliability, regardless of whether it is above or below current levels. Further, the incentive framework shares the net gains from any efficiency improvements between the distributors and its customers (with customers receiving most of the net benefits).

We understand that IPART is currently evaluating whether the current levels of reliability for each of the distributors is efficient. Potentially, this analysis could find that the efficient levels are similar, above, or below current levels. Where the analysis concludes that current levels of reliability is not efficient, it could impose a performance standard (SAIDI and SAIFI levels) at the efficient levels through the NSW distribution licences.

This impact of this outcome was considered in the chapter 5 of this report. Scenarios D and E show, that when the performance standard (SAIDI and SAIFI levels) have been set to reflect the efficient levels, and the AER appropriately adjusts the distributor's expenditure allowances and STPIS targets then:

- the distributor would transition to an efficient level of reliability, we note that we expect that the rate of transition would be no different from the scenario without mandated performance standards since the distributors incentives are independent of allowances/STPIS targets; and
- all the net benefits of the delivering a more efficient level of reliability would accrue to customers with the distributor just recovering its costs.

However, the setting of mandatory performance standard is not without risk. One potential risk is that the mandated performance standards overshoot the efficient level of reliability. Scenarios 1 and 2, explore the implications of these outcomes and show that:

- a distributor acting on its financial incentives would not comply with the performance standard and would instead deliver an efficient level of reliability;
- in doing so the distributor would be exposed to substantial financial penalties; and
- if the distributor instead complied with its licence requirements, then the:
  - cost of providing the increment of reliability in above the efficient level will be greater than the value customers place on that improvement in reliability; and
  - savings from reducing reliability expenditure beyond the efficient level will be less than the value customers place on that lost reliability.

  In both cases, customers would be worse off, than if networks delivered an efficient level of reliability.

[61] The framework will also penalise a distributor for inefficient outcomes, such as when the cost of delivering higher levels of reliability is greater than the value customers place on that reliability improvement .

In our opinion, there are the following reasons for including a performance standards in the NSW distribution licences that reflect efficient levels of reliability:

- to ensure that customers receive all the net benefits from the move an efficient level of reliability;
- the recent falls in discount rate has unbalanced the AER's incentive framework with distributor retaining a larger proportion of capex gains (losses), compared opex and reliability gains (losses) and so efficient outcomes are no longer assured;
  - Although we noted in section 3.5 that the AER is required under the NER to have regard to interactions between the incentive mechanisms, and to the extent the AER considers the imbalance in incentives to be a material issue, it would be able to adjust the incentive rates when it next reviews these mechanisms.
- the concerns that distributors are not acting on the financial incentives due to either:
  - the presence behavioural responses which are discouraging distributors from efficiently targeting lower levels of reliability; or
  - uncertainty of future reliability outcomes is deterring distributors from undertaking projects that efficiently improve reliability.

This would need to be balanced against:

- the consequences of mandating a performance standard does not reflect the efficient level of reliability, noting that the efficient levels of reliability are dynamic and will move over time depending on a number of factors including network costs and customer preferences;
- the potential that a distributor would not comply with the performance standard and would instead deliver an efficient level of reliability, in which case the only effect of the mandatory performance standard is to expose the distributor to substantial financial penalties; and
- disempowering distributors from innovating and finding ways to deliver higher levels of reliability at less cost.

In our opinion, the optimal outcome would be to allow the AER to develop its incentive mechanisms to better ensure that:

> Penalties and rewards under the STPIS are calibrated with how willing customers are to pay for improved service. This aligns the distributor's incentives towards efficient price and non-price outcomes with the long-term interests of consumers, consistent with the National Electricity Objective (NEO).

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