Energy Networks Australia

Rewarding Performance

How customers benefit from incentive-based regulation

July 2019





Key findings

Over the 2006-2018 period, incentive regulation has encouraged energy networks to deliver efficiencies and improvements to customers.

To date, the major incentive schemes will deliver the following estimated benefits to customers:

$6.3bn

Total estimated value of customer benefits assuming a 6% real rate of return

$11.2bn

Total estimated value of customer benefits using the average real rate of return

$661

Or $1,175 using the average real rate of return

Estimated benefits to a customer with both gas and electricity

$546

Or $991 using the average real rate of return

Estimated benefits to an electricity customer

NB. All dollars in this report are Real December 2018 unless otherwise noted.

Contents

Executive Summary

- **Australia's energy networks are regulated through an incentive-based system that encourages networks to find better ways to serve customers.**
- **Regulated energy networks operating under these schemes over the past 13 years will deliver an estimated $6.3 billion of additional benefit to Australian energy customers.**
- **This means a customer with both gas and electricity will benefit by $661, whilst an electricity only customer will be $546 better off.**
- **These estimates understate the true benefit to consumers as they do not include any operating efficiencies made by networks since 2012 and are based on a rate of return that is higher than that applied to networks in recent years.**
- **Recent lower rates of return deliver an even greater share of benefits to customers than that envisaged in the design of the schemes. Customers will, on average, receive 86 per cent of the combined benefits from operating efficiencies and service improvements.**
- **Incentive payments to energy networks represent no more than 3.5 per cent of total network allowances.**

Incentive-based regulation serves an important role in encouraging energy networks to reduce costs and improve service in the interests of customers.

Consistent and stable regulatory incentive schemes allow networks to confidently make investment and expenditure decisions that promote the interests of both today's and tomorrow's customers.

Whilst the benefits of incentive-based regulation are well-understood by policy and rule makers as well as energy regulators, there has not been any previous analysis to quantify the benefits received by Australian network customers from the current incentive framework.

This paper provides a broad overview of the incentive schemes currently in operation, how they benefit customers and why incentive-based regulation plays an important role for Australian gas and electricity networks and their customers.

In particular, the paper focuses on the Efficiency Benefit Sharing Scheme (EBSS) and Service Target Performance Incentive Scheme (STPIS) to provide an initial estimate of the scale of benefits offered by such schemes to date.

These two schemes are the longest running incentive schemes in the Australian energy market and together comprise virtually all the total reported incentive scheme payments over the 2006 to 2018 period.

- The EBSS provides a short-term financial benefit to network businesses if they can deliver operating expenditure efficiencies *beyond* those forecast and approved by the regulator.
- The STPIS provides networks with a short-term financial reward if they beat reliability targets for customers set by the regulator.

Both incentive schemes encourage networks to continuously seek out better ways of delivering network services at a lower cost.

After allowing network businesses to earn more from these additional efficiencies/ improvements for a short period, the benefits are passed on to customers - forever.

Regulated energy networks operating under these schemes over the past 13 years will deliver an estimated $6.3 billion of benefits to customers.

Overview of incentive-based regulation

Why it is important

Energy networks provide an essential service to almost every household and business across Australia.

However, as regulated businesses, networks are not exposed to the same degree of competitive market forces as most other businesses that would otherwise drive the need to constrain costs and/or improve efficiency.

This is where incentive regulation, operated by the Australian Energy Regulator (AER), steps in.

The AER regularly reviews each network's proposed expenditure plans and is responsible for setting approved expenditure and maximum revenue allowances. This ensures that only the efficient costs of operation are recovered from customers.

What is incentive regulation?

Incentive regulation is designed to replicate the forces of a competitive market and encourage monopoly businesses to further reduce costs and improve efficiency, without compromising the standard of service to customers.

Commencing in the United Kingdom in the 1980s, and now applied globally, it is a widely applied model of regulation across numerous industries.

It is recognised as a powerful form of regulation as it drives businesses to reveal their efficient costs to serve customers. This information then helps a regulator set ever more challenging benchmarks for performance in the future.

How it works

Network business are regulated by the AER. Every regulatory period (generally a five-year period), the AER sets:

- the **operating and capital expenditure allowances** for each year within the regulatory period; and
- **the revenue** that can be collected from customers in each year of the regulatory period; and
- for electricity networks, the **service standards** to apply for the regulatory period[1].

Then, as the regulatory period progresses:

- the costs of the business are tracked.
  - If a network business spends more than the AER approved allowance in any year, it bears the costs of any overspend.
  - If it spends less than the AER approved allowance, the business keeps the difference.

  After a further five years, the on-going benefit of any underspend (or costs of any overspend) are passed on to customers.
- For electricity networks, the service performance is monitored.
  - A decline in performance leads to a financial penalty for the network, that in turn reduces costs for customers.
  - An improvement in performance results in a financial reward to the network, funded by customers.

The service performance targets are re-set at each regulatory determination to encourage even better service performance.

1 Power & Water Corporation, which has only recently come under the AER's ambit, will not have service standards defined until its next regulatory period

Avoiding 'rate of return' or 'cost-plus' regulation

Prior to incentive-based regulation, some previous utility regulatory regimes applied a so-called 'rate of return' or 'cost-plus' approach to regulation.

Most prevalent in older forms of United States court-based 'rate case' regulation, this involved exclusive reliance on networks actual past costs, with mechanisms to adjust consumer prices to reflect actual costs incurred, rather than a forecast of the efficient costs.

Such an approach embeds poor incentives for business efficiency, typically leading to higher than necessary costs for customers.

Current incentive schemes in operation

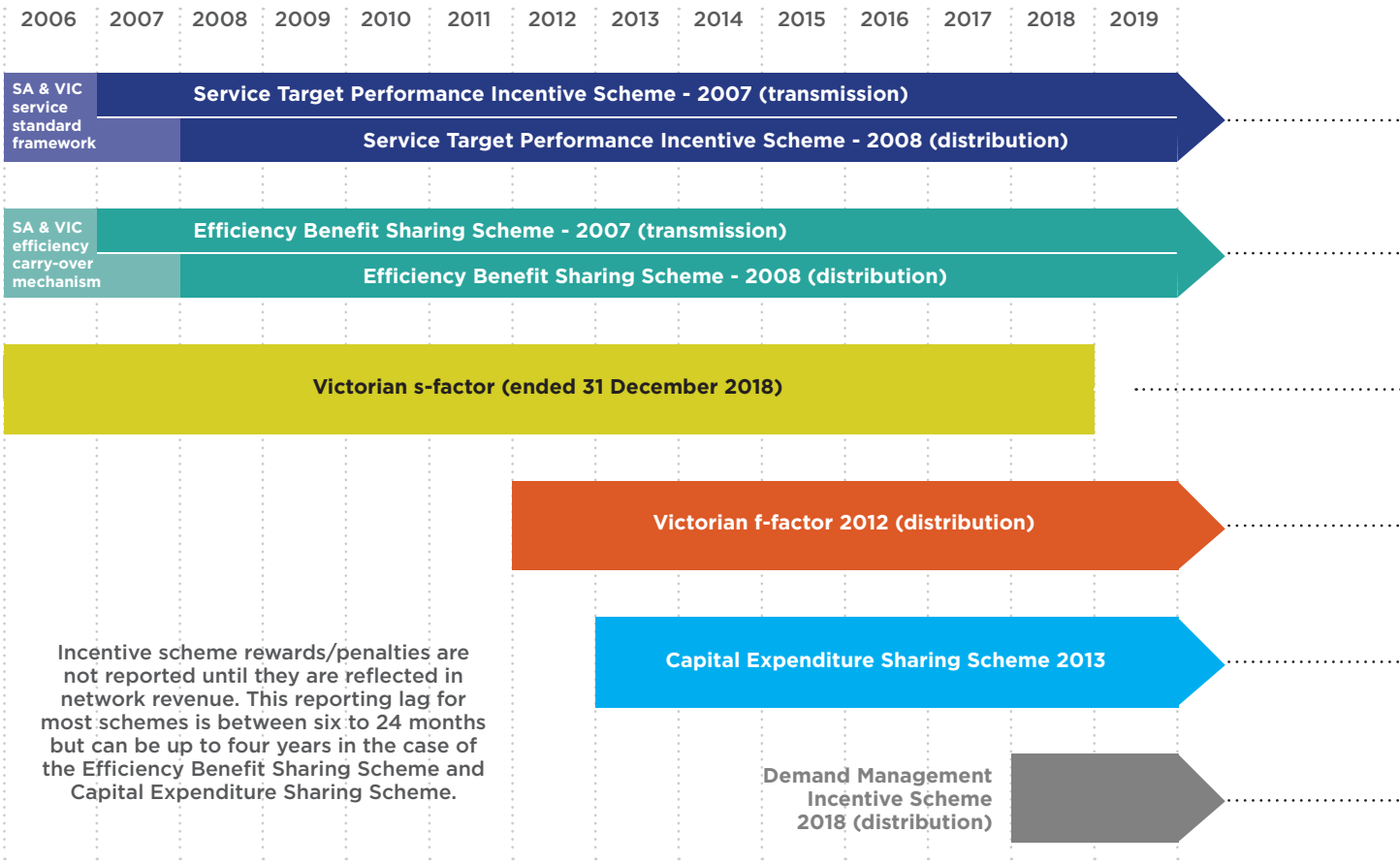
The current form of the incentive schemes was set as part of the AER's 2013 Better Regulation program.

This program was initiated in response to a 2012 Australian Energy Market Commission (AEMC) rule change and Council of Australian Government agreement to reform energy markets to be more consumer focused.

A summary of the various schemes and a timeline of their operation is shown below.

Whilst some incentive schemes have been in operation for quite some time, others have only recently been developed and applied.

Figure 1: Timeline and summary of AER incentive mechanisms



Some jurisdictions, particularly Victoria, had similar operating expenditure incentive schemes and reliability incentive schemes in operation prior to nationally based regulation by AER.

In addition, at their creation date, incentive schemes are not immediately applied to a network. Unless the regulator determines earlier effect, a new scheme generally applies to a network in their next regulatory period.

This means that when viewed at a total level, new schemes appear to have minimal impact to customers in the earlier years of operation but as more network businesses transition to the schemes, their impact becomes greater.

For example, despite its introduction in 2013, the capital expenditure incentive scheme (CESS) was first applied to relevant electricity networks in the 2015-16 year.

Given the rewards and penalties of the scheme are not shared with customers until the next regulatory period, key data for this scheme will only begin to be reported by networks in the coming years.

As other network's regulatory periods roll forward, they will also start to report this data. As such, it is not until closer to 2025 that all AER regulated electricity networks will be reporting CESS data, allowing for a fuller assessment of that scheme.

Service Target Performance Incentive Scheme (STPIS)	Applies to: Electricity networks
Customer benefit: Service performance is protected or improved even as networks seek efficiencies.	Sets parameters and service levels for the reliability of customer supply and customer service. Networks receive a monetary reward/ (penalty) for improvements/ (declines) in service performance.
Efficiency Benefit Sharing Scheme (EBSS)	Applies to: Electricity and gas networks
Customer benefit: Share in operating expenditure savings.	The benefit of operating expenditure underspends (or the cost of any overspends) is kept by the network for a set number of years. At the end of those years the savings (costs) are passed on to customers.
Victorian s-factor	Applies to: Victorian electricity networks
Customer benefit: Service standards do not suffer as a result of networks seeking efficiencies.	A superseded reliability scheme for Victorian electricity networks to ensure they delivered the services to customers they were paid to deliver. Final payments under this scheme ended on 31 December 2018.
Victorian f-factor	Applies to: Victorian electricity distribution networks
Customer benefit: Promotes network practices and planning decisions shown to reduce the risk of bushfires.	Victorian electricity distribution networks are incentivised to undertake bushfire risk reduction practices in those areas of the network that pose the greatest risk of harm to the Victorian community.
Capital Expenditure Sharing Scheme (CESS)	Applies to: Electricity networks
Customer benefit: Share in capital expenditure savings.	The benefit of any electricity network capital expenditure underspends (or the costs of any overspends) are kept by the business for a set number of years, before being passed on to customers.
Demand Management Incentive Scheme (DMIS)	Applies to: Electricity distribution networks
Customer benefit: Share in the savings of non-network demand management solutions.	Any forecast network cost savings arising from the adoption of specific non-network demand management projects (in place of traditional network solutions) are shared between networks and customers.

Features of incentive schemes

Symmetrical application

Incentive schemes apply efficiency gains and losses symmetrically - or in other words, networks can receive rewards, but they also receive penalties.

For example, under the EBSS:

- If actual operating expenditure costs are less than the AER allowance, the business receives a reward (positive amount that increases revenue)
- If actual operating expenditure costs exceed the AER allowance, the business receives a penalty (negative amount that decreases revenue).

It is worth noting that capital expenditure overspends are reviewed by the AER to ensure efficiency and prudency before being included in the CESS calculation.

Risks are adequately shared

Incentive schemes have been designed to encourage networks to make efficiency improvements in every year, but also to encourage continual efficiency improvements.

They do this by allowing networks to carry the reward/penalty for a set period and by re-setting the incentive scheme benchmarks for each regulatory period.

Five-yearly resets balance risks

Re-setting business allowances and benchmarks on a five-yearly basis appropriately shares the risk of network investments between customers and networks. Five years is long enough for investors to undertake efficiency actions, but not so long that the number of unknowns is too high.

Some jurisdictions have experimented with longer periods, however, if the regulatory period was longer forecasting risks and a greater number of unknowns could result in more volatile outcomes, potentially at a greater cost (higher prices) to customers.

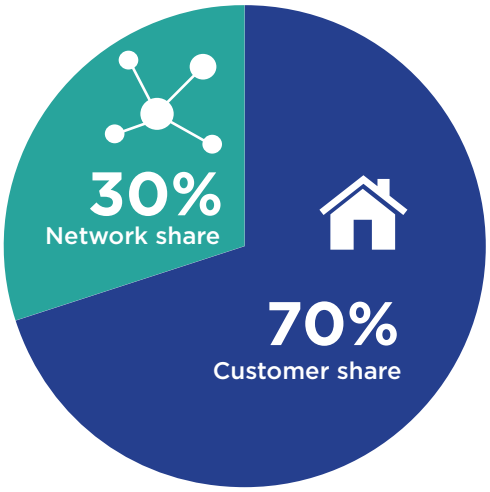
Time indifferent

Incentive schemes have been designed around the known delay between when actual business results occur and when they are reported by networks.

They do this by calculating the customer benefits in present value terms. Using present value eliminates any timing issues.

For example, assuming a 6 per cent real discount rate, the EBSS incentive scheme is designed to deliver 70 per cent of the present value of related payments to customers and the remaining 30 per cent to networks[2].

Figure 2: Benefit split of the EBSS incentive scheme



The benefits to customers arising from service performance improvements under the STPIS are also calculated on a present value basis.

2 *Better Regulation, Explanatory Statement, Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, Australian Energy Regulator, November 13, p.23.

Stability of regulatory signals is imperative

Returns from investments to improve business efficiency are not immediate

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

For example, moving to a cloud-based platform, providing iPads to field staff and developing required applications (apps) does not create immediate efficiencies – there may even be an initial but temporary decline in efficiency.

Staff training is required and apps will continue to be rolled-out as more tasks are automated and staff become more confident using the technology.

In time the full benefits are realised.

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

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

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

There has been a suite of regulatory changes for Australian energy businesses in recent years[3] and numerous reviews remain underway[4].

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

Regulatory uncertainty and investment

The 2018 Australian Infrastructure Investment Report[5] indicates the risks of significant policy and regulatory interventions to investor confidence.

The report indicates a significant decline in investor preference for regulated energy assets from 2015 to 2018.

In 2015, energy transmission and distribution assets were the third preferred infrastructure project for investors. By 2018 they were the eleventh preferred infrastructure project - only non-renewable energy generation (coal) is now less preferred.

The decline was attributed to widespread uncertainty in Australia's energy sector due to the frequent changes to Australia's national energy policy, a range of regulatory and market interventions and political risk.

Similarly, a recent Morgan Stanley report highlighted that Australia's regulatory environment is seen as having moderately higher risk than a number of other developed country investment destinations[6].

Australia's regulatory environment was assessed as being currently comparable in attractiveness to Brazil and environments across a number of Southeast-Asian economies and behind traditionally competing destinations for capital such as the United States.

3 For example, the reviews of the Rate of Return Guideline, Regulatory Taxation Approach and the Approach for Forecasting Operating Expenditure Productivity Growth for electricity distribution networks

4 For example, the reviews of the Value of Customer Reliability and ICT Expenditure Assessment

5 *Australian Infrastructure Investment Report 2018*, Infrastructure Partnerships Australia and Perpetual, 24 October 2018

6 *Regulated Utilities, A New Global Lens: Where to Invest in Regulated Utilities*, Morgan Stanley, 14 July 2019

Where does the 70:30 sharing ratio come from?

In establishing the current incentive schemes, the AER aimed to give customers the majority (at least 70 per cent) of the benefits from efficiencies and improvements made by networks operating under the schemes[7]. Networks receive 30 per cent (or less) of the benefits.

The real rate of return is important

In establishing the 70:30 sharing ratio, a 6 per cent real rate of return was assumed for calculating the present value.

A real rate of return larger than 6 per cent will deliver less of the benefits to customers.

A real rate of return lower than 6 per cent will deliver more of the benefits to customers.

The rate of return is a forecast of the cost of funds a network business requires to attract investment in its network. Or in other words, it is the rate that a network investor expects to receive for each dollar invested in the network.

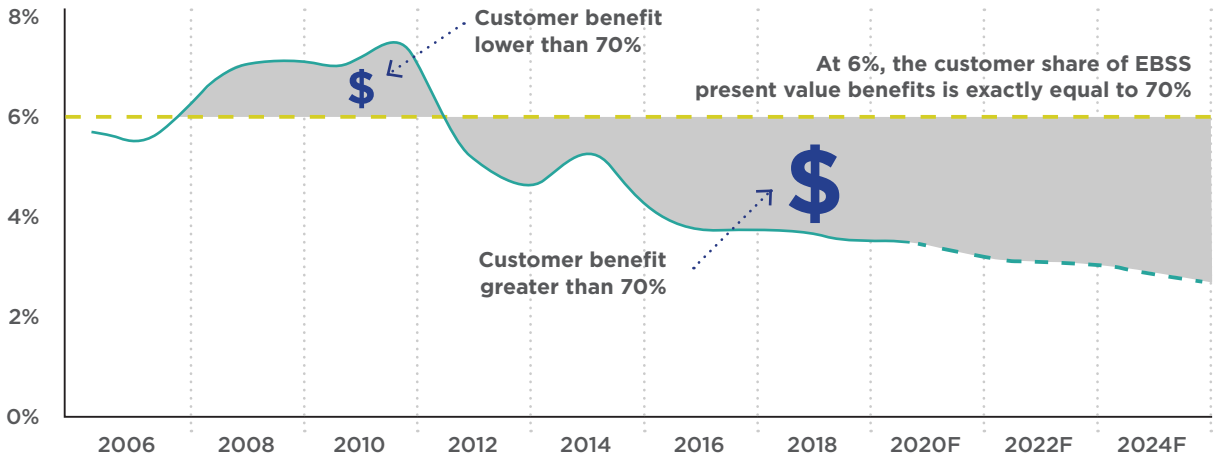
Each network has its rate of return determined by the AER as part of the regulatory determination process.

The chart below illustrates the average real rate of return from AER determinations and associated updates over the 2006 to 2020 period as well as networks forecasts through to 2024.

It is apparent that whilst, in most of the earlier years of the period under review, the real rates of return for businesses were higher than 6 per cent (and would have returned less than 70 per cent of the present value benefits to customers) they have been below 6 per cent since 2012 and are forecast to continue falling (returning more than 70 per cent of the present value benefits to customers).

This is important as the operating efficiencies achieved by networks operating under the EBSS since 2012 are not yet included in the analysis and the scale of benefits is expected to increase as more networks operate under the scheme.

Figure 3: Average networks actual and forecast real rates of return 2006 to 2024[8]



Source: Revenue Proposals and AER Access Arrangements, Determinations and associated annual updates

7 *Better Regulation, Explanatory Statement, Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, Australian Energy Regulator, November 13, p.23 and *Issues paper - Reviewing the Service Target Performance Incentive Scheme and Establishing a new Distribution Reliability Measures Guidelines*, Electricity distribution network service providers, Australian Energy Regulator, January 2017, p.33

8 Real Vanilla WACC rate

The Efficiency Benefit Sharing Scheme

How the EBSS works

The AER selects an appropriate efficient year's operating expenditure result as the starting point from which to forecast allowances for the next regulatory period.

Benchmarking outcomes and any forecast step-changes are applied to determine the final forecast.

As the regulatory period progresses, the EBSS allows network businesses to retain the reward for any underspend (or penalty for any overspend) for six years, regardless of which year within the regulatory period the under or over-spend occurs.

This avoids any potential bias as to when businesses achieve gains. It also benefits consumers by encouraging businesses to reveal their efficient operating expenditure level to the regulator.

The lower operating expenditure revealed by the business is used to reset the allowance in the next regulatory period. It also feeds into the regulator's operating expenditure benchmarking and allows for the setting of more challenging performance benchmarks for businesses in the future.

A simple example of how the EBSS operates is shown in **Appendix A**.

Figure 4: EBSS benefits to customers

At a 6 per cent real discount rate, customers receive 70 per cent of the present value of all network operating cost underspends

They also benefit through lower prices in future regulatory periods

Introduction of the EBSS

The first AER EBSS was introduced in 2007 for electricity transmission networks and 2008 for electricity distribution networks.

Both South Australia and Victoria had jurisdictional operating expenditure efficiency schemes in place for electricity businesses prior to their regulation by the AER in 2010 and 2011.

The current EBSS guideline was published in 2013 and introduced small refinements as part of the AER's Better Regulation program.

Network performance under the EBSS

- The EBSS comprises about 50 per cent of total reported incentive scheme amounts over the 2006 to 2018 period.
- Several networks have yet to operate under the EBSS so have made no benefits to date.
- Networks report incentive scheme payments in the year in which the reward/penalty is applied to revenue, not the year in which the reward/penalty occurs.
  - This means that any efficiency gains made by networks since 2012 are not yet reflected in the reported benefits.
- If the 6 per cent assumed real rate of return is replaced with the industry average annual real rate of return:
  - the benefits to customers from the scheme increase by $1.7 billion to a total of $4.5 billion.
  - This means the scheme delivers a greater share (79 per cent) of the present value benefits to customers.

The Service Target Performance Incentive Scheme

How the STPIS works

The STPIS incentivises electricity networks to maintain and improve service performance.

- Where performance improves, the network receives a reward linked to a percentage of allowed revenue.
- Where service performance declines, the network is similarly penalised.

Figure 5: STPIS benefits to customers

At a 6 per cent real discount rate, customers, customers receive at least 70 per cent of service performance benefits

They also benefit through reductions in the number and duration of unplanned outages

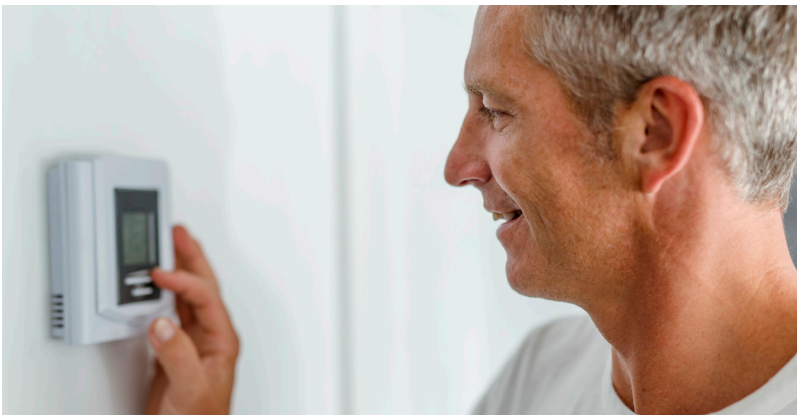
Any improvements to service performance must provide a benefit or be valued by customers

The STPIS is applied to *unplanned* outages, so it excludes planned outages, for scheduled maintenance and upgrades and extreme weather events like cyclones. It does, however, include most short-lived weather events like storms and winds.

Transmission networks are also subject to additional STPIS incentives to reduce the impact of planned and unplanned outages on the market.

STPIS targets are based on the network's average historical performance, typically over five years, but it may vary depending on the STPIS component.

In recognition of their inherent differences, transmission and distribution networks are measured against relevant service performance components under their respective STPIS guidelines.



Introduction of the STPIS

The first AER STPIS was introduced in 2007 for electricity transmission networks and 2008 for electricity distribution networks. Both South Australia and Victoria had equivalent service standard frameworks in place for electricity businesses prior to regulation by the AER.

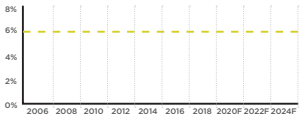
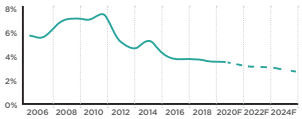
The STPIS schemes have been subject to minor amendments over time. The current transmission STPIS was published in 2015 and the distribution STPIS was last amended in November 2018.

Network performance under the STPIS

- The STPIS comprises about 50 per cent of total reported incentive scheme amounts over the 2006 to 2018 period.
- Several networks have yet to have STPIS applied to them so have received no benefits to date.
- Electricity networks report these amounts in the year in which the reward/penalty is applied to revenue, not the year in which the reward/penalty occurs.
  - This means that any performance improvements made by networks in the last two years are not yet reflected in the reported data.
- If the 6 per cent assumed real rate of return is replaced with the industry average annual real rate of return, the benefits to customers increase by $3.2 billion to a total of $6.6 billion (92 per cent of the benefits).

Incentive scheme benefits to customers

Figure 6: Estimated benefits to customers from the EBSS and STPIS 2006-2018[9]

Real rate of return	EBSS	STPIS*	Total*	Customer share of benefits	Customer with electricity only	Customer with both gas and electricity
6%						
	$2.9bn	$3.4bn*	$6.3bn*	78%	$546	$661
Actual industry average						
	$4.5bn	$6.6bn*	$11.2bn*	86%	$991	$1,175

* Excludes any benefits arising from the application of the STPIS to Ergon Energy and electricity transmission networks

Monetary rewards

Together the EBSS and STPIS comprise the bulk of incentive payments made to energy networks to date.

Whilst there has been a small amount of benefit to networks from the f-factor (Victoria only) and other schemes, these are outweighed by the penalties applied to Victorian electricity networks under the superseded s-factor true-up scheme.

Assuming a 6 per cent real rate of return for the EBSS (which gives a 70:30 split of customer to network benefits) and a 70 per cent share of STPIS to customers, these schemes are estimated to have delivered $6.3 billion of benefits to customers over the 13-year period to 2018.

The scale of customer benefits from both the EBSS and STPIS, as well as the split by energy type, is shown above.

Recent lower rates of return deliver an even greater share of benefits to customers than that envisaged in the design of the schemes. Customers will, on average, receive 86 per cent of the combined benefits from operating efficiencies and service improvements.

9 Estimated based on publicly available data. See Appendix B for more details on the methodology applied.

Service performance improvements

Over the 2006 to 2018 period customers have also benefited from service performance improvements associated with the STPIS.

The two STPIS measures relevant to most customers are:

- The average minutes power is not available each year; and
- The average number of unplanned power outages in each year.

Both measures have improved considerably over the 2006-2018 period.

Figure 7: STPIS reliability measures 2006-2018

Average minutes off supply per customer

2006	2018
145.4	110.0

- 35.4 less minutes without power
- 24% improvement

Average number of power interruptions per customer

2006	2018
1.8	1.1

- 0.7 fewer outages
- 37% improvement

Estimating the scale of incentives

Incentive scheme rewards to date

The value of efficiency incentive payments to energy networks is growing, but this is largely attributable to the increasing number of networks operating under the schemes.

Prior to 2015, networks in Queensland, New South Wales, Tasmania and the Australian Capital Territory (ACT) operated under limited or no incentive schemes. Even the 2018 data has yet to reflect the application of the EBSS and STPIS to all networks.

To put the scale of incentive scheme payments in context, the value of payments made to relevant networks were compared to their AER allowed revenues. This highlights that incentive payments form only a very small component of networks remuneration – no greater than 3.5 per cent (see Figure 8 below).

This steady uptake indicates that networks are sensibly making use of incentive schemes to incrementally improve productivity and efficiency.

Comparison to the United Kingdom

The proportion of allowed revenue attributable to incentive payments for Australian networks is lower than that received by their United Kingdom counterparts under the totex incentive mechanism (see Figure 9 below).

What does the future hold?

We expect the total value of incentive payments to Australian networks to grow over the next decade as all networks transition to operating under the incentive schemes and payments related to the CESS and DMIS begin to appear in reported data. This will translate into far greater benefits to energy customers than the amounts reported to date, especially given the low actual real rates of return.

However, after this peak it is likely that the scale of payments will decline somewhat as any earlier, easier efficiency gains (the 'low hanging fruit') are replaced by smaller, incremental, sustainable on-going efficiency improvements.

Figure 8: Network incentive payments – scale and proportion of allowed revenue 2011-18[10]

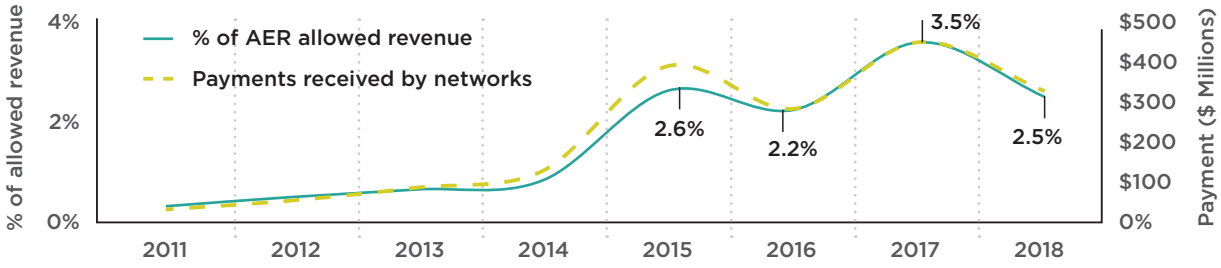
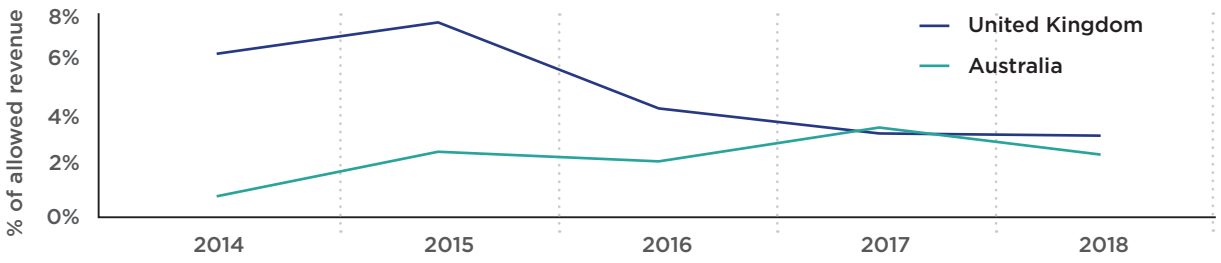


Figure 9: Rewards as a percentage of allowed revenue – United Kingdom vs Australia[11]



10 Revenue data prior to AER regulation is incomplete and so has been excluded from this analysis.

11 Australian data is based on the year the reward is included in revenue. United Kingdom data based on the total network share of the totex incentive mechanism and allowed revenue as reported in the relevant RIIO Financial Models, https://www.ofgem.gov.uk/network-regulation-riio-model/current-network-price-controls-riio-1/price-controls-financial-model-pcfm, 30 November 2018

APPENDIX A
Example of how the EBSS operates

The table below is from the AER's Explanatory Statement for the EBSS[12]. Annotations have been added to show how the benefits transfer from networks to the customer.

It demonstrates how the EBSS works by allowing the network to hold onto an operating expenditure saving made in one year for a further five years (six years in total) before it is passed on to customers.

It also shows how the present value benefits of the scheme are shared between the network and customers.

It is simplified as it indicates a difference between the allowance and actual operating expenditure in just one year (year three) of the regulatory period.

In reality, there is a result for each year and the respective amounts are summed together to determine the carryover amount into the next regulatory period. Each year's result will also impact the total amount of the associated network and customer benefits.

$M	Regulatory period 1					Regulatory period 2					Future
Year	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	
Allowance	100	100	100	100	100	95	95	95	95	95	95 p.a.
Actual	100	100	100	95	95	95	95	95	95	95	95 p.a.
Efficiency gain	-	-	-	5	5	-	-	-	-	-	Nil p.a.
Incremental efficiency gain	**-**	**-**	**-**	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**Nil p.a.**
Carryover calculation											
Year 1		-	-	-	-	-					
Year 2			-	-	-	-	-				
Year 3				-	5	5	5	5	5		
Year 4					-	-	-	-	-		
Year 5						-	-	-	-	-	
Carryover amount						**5**	**5**	**5**	**5**	**-**	**Nil on-going**
Full benefit to network	-	-	-	5	5	5	5	5	5	-	Nil on-going
Full benefit to customers										5	5 p.a. ongoing
Discounted benefit to network*	-	-	-	5	4.7	4.5	4.2	4.0	3.7	-	- Total 26.1 or 30%
Discounted benefit to customers*										3.5	58.7 Total 62.3 or 70%

* Assumes a real discount rate of 6 per cent

1. The saving from the prior year is held by the network for a further five years
2. Then the saving passes to customers
3. After six years, the present value benefit is passed on to customers into perpetuity
4. The present value benefits are shared, with customers receiving 70 per cent of the total scheme benefits

12 *Better Regulation, Explanatory Statement, Efficiency Benefit Sharing Scheme for Electricity Network Service Providers*, Australian Energy Regulator, November 2013 p.36

APPENDIX B
Methodology for estimating incentive payment benefits

Determined the level of incentive payments to networks for the period 2006-18

For electricity networks, the value of incentive schemes received is on the 'Revenue' sheet in the 'Economic Benchmarking Regulatory Information Notice' (RIN) submitted annually to the AER.

Gas networks are not obliged to report annually to the AER, so an estimate of the value of incentive scheme receipts has been taken from relevant AER access arrangements and previous regulatory determinations. As a result, the gas data should be considered indicative only.

Data was converted to real December 2018 dollars using CPI rates from the data file underlying the AER's 2018 Annual Benchmarking Report.

Obtained annual customer numbers for each network for the period 2006-18

Obtained electricity distribution network reported customer numbers for each year from the 'Operational data' sheet in the Economic Benchmarking RIN.

The customer numbers for each year for gas companies is not publicly available. Instead, current gas customer numbers were derived from business websites and applied retrospectively.

It is recognised that this assumption will understate the historical EBSS per gas customer benefit.

EBSS approach

1. Established the value of each network's annual EBSS result by comparing each year to the prior year. A decline in value indicated a reward 'rolling off' and an increase in value indicated a penalty 'rolling off'[13].
2. The individual network EBSS amounts were then summed together to determine the total EBSS reward/ penalty for each year for each type of network service i.e. gas, electricity transmission and electricity distribution.
3. Each total was then back dated 6 years. For example, the movement between 2006 and 2007 represents the roll-off amount from the 2001 year.

   Given reported EBSS amounts are only available up to 2018, the last roll-off amount captured by this analysis relates to operating efficiencies made by networks in the 2012 year.
4. Performed a present value calculation assuming a 6 per cent rate of return for each year's value for each type of network service for the period 2007-18.

   The first six years of present value were applied to the network, the latter years to the customer.
5. Determined the remaining present value of the customer share for each year's result into the future.
6. Summed the present value benefits to customers - those already received up to 2018 (step 4), as well as those yet to be received (step 5) - together to determine the total customer benefit.
7. For per customer results, the EBSS payments to networks were firstly converted to per customer amounts, using customer numbers for the relevant year.

   NB. Transmission per customer results were calculated using the sum of the relevant state's distribution network customers i.e. EBSS payments made to electricity transmission networks were assumed to be funded solely by the customers in the state in which the transmission network operates.
8. Transmission per customer results were then added to the relevant state's distribution network per customer results to give a total EBSS impact per customer by network service (i.e. gas and electricity).
9. A weighted average customer impact was established for each network service using distribution customer numbers for both gas and electricity.

   This weighted average result was then used in the present value calculation (steps 3 to 6) to determine the impact for gas and electricity customers.

STPIS approach

The customer benefits from the STPIS cannot be accurately derived using publicly available data.

Ideally, the actual annual performance by feeder type would be compared to the targets set by the AER in the relevant determination. Customer numbers and 'Normalised energy not delivered' by feeder type would also be required. The lost energy by feeder type could then be derived and multiplied by the relevant value of customer reliability (VCR) amount.

In the absence of this detailed data, we have derived a method to estimate the customer benefits of STPIS using publicly available data.

In determining a suitable approach, this analysis has considered only the distribution network STPIS and associated customer numbers. This is because most customers are connected to the distribution network.

1. The distribution network benefits for the STPIS were taken directly from the 'Revenue' sheet in the Economic Benchmarking RIN.
2. For each distribution network, the following steps and calculations were undertaken.
3. The VCR rates, including the SAIDI and SAIFI proportions, from the AER's 2009 STPIS Guideline were converted to December 2018 dollars.

13 The Victorian networks report smoothed EBSS values As such, the EBSS data reported for these entities is not technically a 100% true representation of the benefits from the EBSS. They are, however, the best result that can be determined using publicly available data. The same issue will apply to TasNetwork's 2018 and 2019 reported data given the network operated under just a two-year regulatory period in 2017-19.

4. The 'Aggregate VCR rates excluding direct connects' for each state from the 2014 AEMO VCR Application Guide were converted to December 2018 dollars.
5. The customer numbers by location on the network, the 'Whole of network unplanned SAIDI excluding excluded outages' the 'Whole of network unplanned SAIFI excluding excluded outages' and 'Energy not supplied (unplanned) GWh' were taken from the Economic Benchmarking RIN.
6. The annual rate of change in SAIDI and SAIFI was calculated.
7. The SAIDI and SAIFI contribution to the annual service performance result was derived by weighting the annual rate of change for each measure by the total annual rate of change for both measures.
8. The Energy not supplied (unplanned) GWh and customer number for each year was used to determine the average 'kWh lost per customer'.
9. By comparing one year's average 'kWh lost per customer' to the next, the 'Implied gained or lost kWh per customer' could be derived.
10. The respective share of the SAIDI and SAIFI contribution (from step 7) was then applied to the 'Implied gained or lost kWh per customer' to give the kWh share for each measure.
11. Where a network was operating under the AER's 2009 STPIS Guideline, the SAIDI and SAIFI customer benefit was calculated for each customer type (i.e. CBD, Urban, Other) by multiplying the 'Implied gained or lost kWh per customer' by the relevant customer number and the relevant VCR amount.
12. Where a network was operating under the 2014 AEMO VCR Application Guide, the SAIDI and SAIFI shares of 'Implied gained or lost kWh per customer' were multiplied by total customer numbers and the relevant state VCR value.
13. The SAIDI and SAIFI benefit amounts were then added together for each year.
14. Performed a present value calculation assuming a 6 per cent rate of return for each year's value for the period 2007-18.
15. Determined the remaining present value for each year's result into the future.
16. Summed the present value benefits - those already received up to 2018 (step 14), as well as those yet to be received (step 15) - together to determine the total scheme benefit.
17. Subtracted the networks share of STPIS benefits (from step 1) to determine the customer benefit.
18. Summed the results for each distribution network together to get a total industry result.
19. For per customer results, the STPIS payments to networks and the annual scheme benefits by network were firstly converted to per customer amounts, using customer numbers for the relevant year.
20. A weighted average customer impact was then established using distribution customer numbers.

    This weighted average result was then used in the present value calculation.

The limitations of this approach include:

- It assumes that previous jurisdictional reliability schemes operated in the exact same manner as the 2009 STPIS Guideline when in fact they likely contained differences that would alter the numbers reported by networks.
- The 'Energy not supplied (unplanned) GWh' is not normalised so it will overstate the amount of lost energy. This will exaggerate the 'Implied gained or lost kWh per customer' on a year to year basis for those networks exposed to major weather events.
- This was particularly obvious with Ergon Energy's results where the variance in year-to-year data rendered the results unreliable. As such, Ergon Energy has not been included in the STPIS analysis.
- The 'Energy not supplied (unplanned) GWh' will be impacted by circumstances unrelated to network service performance. For example, the increasing penetration of solar panels and batteries means that even if reliability is maintained 'Energy not supplied (unplanned) GWh' will naturally decline.
- It assumes that lost energy was evenly shared across all customers regardless of their location on the network.
- It assumes that each network operated their STPIS using:
  - the VCR rates and weightings for unplanned SAIDI and SAIFI from the AER's 2009 STPIS Guideline until the 2014 AEMO VCR Application Guide came into being and was applied in their next regulatory determination.
  - The VCR rates from the 2014 AEMO VCR Application Guide in regulatory periods beginning from 2015 onwards.
- It assumes that all customers experience the same SAIDI and SAIFI result, regardless of their location on the network. In reality, CBD and urban classified customers have greater service reliability than rural customers, however, there are very few CBD customers so the dollar impact would be small.
- Given the STPIS is intended to operate over the long-term and service targets are based on regulatory period averages, the 12 years of data available is small. This may distort the scheme results.
- Both network and customer benefits from transmission network's STPIS improvements are excluded from the analysis. The transmission STPIS benefits include enhanced competition in the wholesale market and improved power system resilience. There is no simple way of valuing these improvements.

Determining the average industry real rate of return

1. The real vanilla weighted average cost of capital (WACC) rates published as part of each AER (or previous jurisdictional) determination and access arrangement for the period 2001 to 2018 was obtained and noted in the year it occurred.
2. From 2015 onwards, this included any annual updates to the real vanilla WACC arising from cost of debt updates.
3. The relevant rates from decisions made in each year were then averaged to determine the average real rate of return for the industry in each year.
4. These rates were then applied to the relevant year's values in both the EBSS and STPIS present value calculations.

Energy Networks Australia

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

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