DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

Energy Security Safeguard

Position paper

environment.nsw.gov.au

Cover photo: Stormsets, Nicholas Gonsalves/DPIE

Published by:

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ISBN 978 1 922493 71 2
EES 2021/0539
September 2021

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Part A: Overview of the Energy Security Safeguard

This paper sets out the NSW Government's position on the major features of the Energy Security Safeguard (the Safeguard) and responds to stakeholders' submissions on the Energy Security Target and Safeguard Consultation Paper.

The Safeguard is part of the NSW Electricity Strategy, the NSW Government's plan for a reliable, affordable and sustainable electricity system. Legislation to establish the Safeguard was passed by Parliament in May 2020 with an objective to improve the affordability, reliability and sustainability of energy through the creation of financial incentives for energy activities.

The Safeguard will include two schemes.

The existing **Energy Savings Scheme (ESS)** supports energy saving activities. The ESS will run until 2050, with an energy savings target gradually increasing to 13% by 2030 and an expanded set of eligible activities.

The Government will also establish a new **Peak Demand Reduction Scheme (PDRS)** to support activities that reduce demand at peak times, including flexible demand response.

Higher ESS targets and introduction of the PDRS are expected to deliver a net economic benefit for New South Wales of $1.2 billion. Households and businesses choosing to implement energy saving and peak demand reduction activities are expected to save an additional $3.6 billion on their bills between 2022 and 2040.

The two schemes will be aligned where feasible. Safeguard statutory reviews will cover both schemes. Targets for both schemes may be reviewed for the same reasons, including a forecast breach of the NSW Energy Security Target (EST).

The compliance year for the ESS will remain as the calendar year. The compliance period for the PDRS will be from 1 November to 31 March, which covers one summer period. This is administratively simple and aligns with the scheme's objective to reduce peak demand in summer.

The Government will continuously improve the design of incentives to ensure activities go beyond standard practice. The Government will continue to prefer to use complementary programs to address specific market barriers, rather than setting sub-targets for specific groups within either scheme.

Part B: Reforms to the Energy Savings Scheme

ESS targets, penalties and exemptions

The Government committed to increasing the ESS targets to 13% by 2030 and consulted on the rate of increase. Following the extension of the scheme to 2050, the target will continue at 13% until the end of the scheme. Table 1 sets out the new annual energy savings targets from 2022.

Table 1 New energy savings targets for the ESS (%)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	To 2050
Target	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.0

The scheme will retain the current penalty rate of $29.02 per notional megawatt hour (MWh) in 2020.

As an emergency response to the COVID-19 pandemic, the Government will provide small retailers with an exemption for the 2020 compliance year. The existing partial exemptions for emissions-intensive, trade-exposed industries will continue.

Fuel switching

The Electricity Strategy signalled the Government's intention for the ESS to cover a wider range of activities that reduce demand on electricity and gas networks. The Safeguard could also encourage switching from other fuels such as onsite, stationary use of diesel to more affordable alternatives.

The Government will expand the ESS to include fuel switching activities that reduce consumption for both grid connected and non-grid connected energy. These include:

- switching grid connected non-renewable gas or electricity for bioenergy, green hydrogen, solar thermal or other alternatives
- switching from non-grid connected energy, such as onsite, stationary use of diesel to an affordable alternative.

The new activities will include energy saving technologies also eligible under the Commonwealth Government's Renewable Energy Target (RET), including solar and heat-pump water heaters, solar irrigation systems and bioenergy technologies.

ESS incentives for these will be in addition to those available from the Small-scale Renewable Energy Scheme and the Large-scale Renewable Energy Target.

The Government will also amend the ESS Rule to remove new fuel switching activities from electricity to non-renewable gas such as natural gas and liquefied petroleum gas (LPG). This will help free up gas supply for industries in New South Wales that are heavily reliant on gas.

To ensure complementarity with the NSW Building Sustainability Index (BASIX), incentives for solar and heat-pump water heaters in homes will only be available where they replace existing electric or gas hot water systems.

The ESS will complement the Commonwealth Government's Emissions Reduction Fund (ERF) by providing an alternative pathway to encourage energy savings projects, including bioenergy projects. Projects claiming incentives through the ESS will not be eligible under the ERF.

Energy users will be able to source alternative fuels either on site or off site, but not via the electricity or gas network. Bioenergy projects must comply with regulatory requirements to protect environmental values such as biodiversity and air quality.

Certificate conversion factors will be calculated based on their non-renewable primary energy factors relative to grid electricity in New South Wales.

The obligation to meet energy savings targets will remain on the electricity sector only.

Part C: Peak Demand Reduction Scheme

Objectives, complementing national mechanisms and commencement

The ultimate objective of the Safeguard is to improve the affordability, reliability and sustainability of energy. Because a shortfall in firm capacity is most likely to occur at times of peak demand, peak demand reduction plays a critical role in improving reliability.

The immediate objective of the PDRS will be the creation of financial incentives to reduce peak demand for energy by encouraging peak demand reduction activities.

The PDRS will complement national mechanisms by:

- paying for the ability to reduce peak demand ('capacity'), while allowing other mechanisms to make operational payments
- not duplicating mandatory legal requirements and national dispatch mechanisms operated by the Australian Energy Market Operator (AEMO)
- including small customers by providing incentives for a broader range of peak demand reduction activities than national mechanisms
- considering the post-2025 market design in statutory reviews of the scheme.

Scheme liability and certificate creation will commence on 1 November 2022 for the 2022–23 compliance period. Accreditation of service providers can commence following gazettal of the scheme rule in the middle of 2022. The Government will collaborate with industry to develop rules for activities and provide a range of support for industry to accelerate the start of activities.

The Government will shortlist methods in the ESS Rule that can be adapted for eligible peak demand saving activities under the PDRS to accelerate the first version of the PDRS rules.

Peak reduction certificates

Certificates for the PDRS will provide a common unit of measurement for both scheme targets and activities, like energy savings certificates (ESCs) for the ESS. A peak reduction certificate (PRC) will represent 0.1 kilowatt (kW) of peak demand reduction capacity averaged over one hour.

To create certificates, activities will have to be available to reduce peak demand during a defined peak period. Certificates will be identified with the compliance period in which the capacity is available.

Accredited certificate providers (ACPs) will create certificates from activities using calculations that include capacity, duration and the likelihood that the capacity is available when needed ('firmness'). Certificate creation will require evidence that capacity is available during the defined peak period.

To allow for compliance period identification, evidence requirements and validity limits, certificates will have a status of one of: dormant, pending, active, surrendered or expired.

Targets and penalty rate

The peak demand reduction target for the PDRS will commence at 0.5% for the 2022–23 compliance period, gradually increasing to 10% by 2029–30, as shown in Table 2. The target will then remain at 10% until the end of the scheme in 2050. Target percentages will be applied to forecast one-in-ten year maximum demand. Exemptions will be considered when calculating individual targets for scheme participants.

Table 2 Peak demand reduction targets for the PDRS (% of forecast one-in-ten year maximum demand)

Compliance period	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	2029–30	To 2049–50
Target	0.5	1.0	3.0	5.5	7.5	8.5	9.5	10.0	10.0

The peak period during which activities will be required to be available will be from 2.30pm to 8.30pm Australian Eastern Standard Time (AEST) during the compliance period of 1 November to 31 March.

The penalty rate for the PDRS will be set at $2.26 per certificate in 2019–20 dollars, subject to indexation.

Liability and flexibility

The PDRS will have the same liable parties as the ESS to cover all electricity used in New South Wales. These are:

- all electricity retailers
- generators supplying directly to customers in New South Wales
- large energy users that purchase electricity directly from the National Electricity Market.

The PDRS will align with the ESS by extending exemptions for certain emissions-intensive and trade-exposed energy users and to some or all liable parties while they are affected by emergencies such as COVID-19.

The certificate target for the scheme as a whole will be calculated from the scheme percentage target, forecast peak demand and the length of the peak period.

Individual certificate targets for each liable party will be calculated from the scheme certificate target, the contribution of the scheme participant to actual peak demand on high demand days and any exempt load supplied by the participant during the same period.

Liable parties will be allowed to carry forward a portion of their liability to the next compliance period. The maximum carry-forward amount will be 20% in the first year and 10% in subsequent years.

Activities may reduce peak demand over several compliance periods, allowing certificates to be created in advance for each of these periods. Each certificate will be linked to the compliance period in which the peak demand reduction capacity is available.

Certificates will be valid for three compliance periods, beginning in the period in which the peak demand reduction capacity is available. After three compliance periods, the certificate will expire. To meet their liability, liable parties will be able to use any unexpired certificates, but not certificates linked to peak demand reduction capacity in future periods.

Peak demand reduction activities

The PDRS will encourage efficient peak demand reduction activities by enabling competition among peak demand saving, peak demand response and peak demand shifting.

The Government will adopt a collaborative approach to developing calculation methods. As part of this, industry may submit calculation methods to the Department of Planning, Industry and Environment for review. The Department will release guidelines on method development in the second half of 2021.

The Government will harmonise consumer protections under the PDRS with Australian Energy Market Commission (AEMC) principles where possible. As many of these issues are specific to individual peak demand reduction activities, the Government will consult with industry on how best to ensure consumer protection when developing the scheme rules and calculation methods.

The PDRS will build on the accreditation requirements of the ESS. The Government will provide training and information sessions on the PDRS to interested parties.

The Government will encourage location-based demand reduction by:

- adding a network loss factor to calculation methods to recognise the value of avoided network losses and encourage activities in regional areas
- publishing aggregated activity data at the local network level
- evaluating the impact of peak demand reduction activities on local reliability and local network constraints.

Part D: Energy Security Safeguard Administration

The Government is committed to continuous improvement of regulations to ensure their continued effectiveness and efficiency. This commitment extends to incorporating best practice administration and compliance of the schemes under the Safeguard.

The Government will align regulation, administration and compliance for the ESS and the PDRS where possible. The Government will appoint the Independent Pricing and Regulatory Tribunal (IPART) as the administrator and regulator of both the ESS and PDRS.

The findings of a review by KPMG, stakeholder feedback and further analysis by the Department have informed the Government's positions. The Department will continue to work with IPART to take action in each of the following areas over the next 12 months:

- ensuring roles and responsibilities are clearly defined by formally appointing IPART as administrator and regulator
- achieving continuous administrative improvement by monitoring performance using outcomes based key performance indicators (KPIs)
- improving stakeholder communication and engagement
- building the capability of Scheme Participants and ACPs to participate and comply with requirements
- ensuring compliance and enforcement action for the Safeguard is proportionate and effective by providing IPART with additional powers to prevent, detect and respond to non-compliance.

In addition, the Government will explore how digital technologies can be better adopted as part of Safeguard administration and using new ways to update the rules so they are easier to understand and apply. The success of the Safeguard relies on the ability of ACPs and other service providers to confidently engage with the rules, and undertake effective energy saving and peak demand reduction activities.

Implementation will require collaboration between IPART and the Department. The Department will be responsible for broader scheme promotion and ensuring service providers have the capability to deliver activities under the scheme. IPART will be responsible for ensuring service providers understand and are able to comply with the rules.

Part A: Overview of the Energy Security Safeguard

1. The NSW Energy Security Safeguard

In November 2019, the NSW Government (the Government) announced the creation of the Energy Security Safeguard (the Safeguard) to incentivise the rollout of cost-effective energy savings and peak demand reduction measures. The Safeguard includes two separate schemes:

- an Energy Savings Scheme (ESS) running until 2050, with an energy savings target gradually increasing to 13% by 2030 and an expanded set of eligible activities
- a new Peak Demand Reduction Scheme (PDRS) to support activities that reduce demand at peak times, including flexible demand response.

The second emergency COVID-19 response bill package, passed by Parliament in May 2020, amended the NSW *Electricity Supply Act 1995* (the ES Act) to establish the Safeguard and extend the ESS to 2050. Aligning with the ESS, the Government intends to legislate the PDRS to run until 2050.

This position paper sets out the Government's position on key issues for the design, implementation and administration of the Safeguard.

1.1 The Safeguard is part of the NSW Electricity Strategy

The Safeguard is part of the NSW Electricity Strategy (the Strategy), which sets out the Government's plan for a reliable, affordable and sustainable electricity future (NSW Government 2019a).

Meeting these objectives involves a three-layered approach:

1. supporting the market to deliver reliable electricity at the lowest price, while protecting the environment
2. setting an Energy Security Target (EST) to ensure New South Wales has enough generation capacity to cope with unexpected generator outages during periods of peak demand, such as heatwaves
3. ensuring the Government has sufficient powers to deal with an electricity emergency, if one arises.

The EST provides a signal to the energy market of the Government's expectation for investment in new equipment and infrastructure to improve reliability.

Energy savings and peak demand reduction from the Safeguard contribute towards meeting the EST. Increasing the Safeguard's targets is also one of the potential actions the Government may take to address forecast breaches of the EST.

1.2 Stakeholder consultation on the Safeguard

The Government released a consultation paper seeking stakeholder feedback on key issues for the design and implementation of the Safeguard in April 2020 (NSW Government 2020a). This consultation closed on 22 June 2020.

In June 2020, the Department of Planning, Industry and Environment (the Department) held three webinars to provide stakeholders with further information on the proposed reforms. These covered:

- reforms to the ESS, including higher targets and new fuel switching activities
- design of the PDRS, including objectives, liable parties and eligible activities
- Safeguard administration and regulation.

The Department also held one-on-one meetings with key stakeholders, including industry associations, large energy users, energy networks and energy retailers. Fifty-seven stakeholders (ZIP 14.7MB) provided written submissions. Of these, nine stakeholders provided written submissions responding to the questions in the consultation paper about administration. A further five stakeholders endorsed the submission made by the Energy Savings Industry Association (ESIA).

The Government also released the *ESS Draft Statutory Review Report*. Stakeholders (PDF 752KB) generally supported the review findings showing that:

- the ESS is meeting its policy objectives
- the objectives remain valid
- the overall scheme design remains appropriate for meeting those objectives.

The final ESS Statutory Review Report 2020 (PDF 774KB) was tabled in Parliament by 30 June 2020.

2. Safeguard targets, penalties and compliance periods

2.1 Energy savings and peak demand reduction targets

The Government will increase the energy savings target of the ESS from 2022, reaching 13% by 2030. The target will then remain at 13% until the end of the scheme in 2050.

The peak demand reduction target for the PDRS will commence at 0.5% for the 2022–23 compliance period, gradually increasing to 10% by 2029–30 (see section 2.3 for details of the PDRS compliance period). The target will then remain at 10% until the end of the scheme following the 2049–50 compliance period.

Table 3 sets out the targets for both schemes.

Table 3 Safeguard targets from 2022 to 2050

Year	ESS target (%)	Compliance period	PDRS target (%)
2022	9.0	**2022–23**	0.5
2023	9.5	**2023–24**	1.0
2024	10.0	**2024–25**	3.0
2025	10.5	**2025–26**	5.5
2026	11.0	**2026–27**	7.5
2027	11.5	**2027–28**	8.5
2028	12.0	**2028–29**	9.5
2029	12.5	**2029–30**	10.0
2030 to 2050	13.0	**2030–31 to 2049–50**	10.0

Under these settings, the Safeguard is expected to deliver a net economic benefit for New South Wales of $1.2 billion by 2040. Table 4 summarises the cost–benefit analysis.

Households and businesses choosing to implement energy saving and peak demand reduction projects are expected to save an additional $3.6 billion on their bills between 2022 and 2040.[1]

[1] Discounted using a discount rate of 7%

Table 4 Summary of cost–benefit analysis

Present value of incremental costs and benefits to 2040	ESS	PDRS
Scheme costs		
Government costs ($m)	–$50	–$42
Regulatory costs ($m)	–$377	–$192
Total costs ($m)	**–$427**	**–$234**
Scheme benefits		
Reduced wholesale purchase costs ($m)	$1,089	$130
Avoided network investment ($m)	$122	$235
Avoided cost of greenhouse gas emissions ($m)	$258	$21
Avoided cost of air pollution ($m)	$21	$2
Total benefits ($m)	**$1,490**	**$388**
Net economic benefit ($m)	**$1,063**	**$154**
Benefit–cost ratio	**3.5**	**1.7**

The penalty rate for the ESS will remain at $29.02 per notional megawatt hour (MWh), subject to indexation (refer to section 5 for further discussion). The penalty rate for the PDRS is set at $2.26 per certificate, subject to indexation (refer to section 12 for further discussion).

2.2 Conditions for reviewing the schemes

The ES Act requires the Minister for Energy and Environment to review the operation of the ESS every five years to determine whether its policy objectives and legislative settings remain valid and appropriate.[2] The Government will set a similar requirement for the PDRS.

The next statutory review of the ESS is due to be tabled in Parliament by June 2025. The first statutory review of the PDRS will be tabled at the same time. Either scheme may also be terminated if an equivalent national scheme is established.

The ES Act sets out the conditions under which the Minister may change the ESS energy savings targets and penalty rates by regulation.[3] Before changing targets or penalty rates, the Government conducts a review. The conditions include:

- harmonisation with another state-based or national scheme
- an under or over-supply of certificates
- significant changes to the ESS Rule
- significant changes to the policy or regulatory framework or the market conditions in which the ESS operates.

The Government will adopt similar conditions for reviewing the PDRS targets. In addition, the Government will review targets for both schemes if there is a forecast breach of the EST.

[2] ES Act Schedule 4A, clause 77

[3] ES Act Schedule 4A, clauses 8 and 17

2.3 Safeguard compliance periods

In the Safeguard consultation paper, the Government proposed setting the compliance period for the PDRS as the financial year. This was because a financial year covers the whole summer period when most peak events occur.

The compliance year for the ESS is the calendar year. To reduce administration costs, the Government proposed changing the compliance year for the ESS to the financial year to align with the PDRS.

Of the four stakeholders commenting on this issue, two supported setting the compliance year for the schemes as the financial year; however, the Independent Pricing and Regulatory Tribunal (IPART) and energy retailer AGL argued this would be administratively challenging.

The policy intent of the ESS is to reduce energy consumption over the entire year, whereas the purpose of the PDRS is to reduce peak demand during the summer period when demand is highest. The Australian Energy Regulator (AER) defines summer as beginning on 1 November and ending on 31 March (AER n.d.).

In January 2021, the Government consulted further with stakeholders about the compliance period for the PDRS, and whether the ESS and PDRS compliance periods should be aligned. Most stakeholders supported the PDRS having a compliance period which covers the summer months only.

The Government will retain the compliance year for the ESS as the calendar year. The compliance period for the PDRS will cover one summer period and be from 1 November to 31 March. This is administratively simple as it captures an entire summer period and aligns with the purpose of the scheme to reduce peak demand in summer.

3. Other Safeguard policy settings

3.1 Maturing technologies

The ESS has been highly successful in encouraging energy saving activities that would otherwise not have occurred (NSW Government 2020b, p.2). Between 2009 and 2019, approximately 68% of the energy savings supported by the ESS have come from commercial and industrial lighting upgrades. Over their lifetimes, these projects will save New South Wales 22,860 gigawatt hours (GWh) of electricity.[4]

An independent evaluation found the ESS has driven the emergence of a new lighting retrofit market segment, bringing forward most lighting retrofits by seven to 10 years (Common Capital 2017, p.xii).

LED lighting has now become the norm for new product sales in New South Wales (Beletich 2020, p.3). The question is no longer whether a more energy efficient light will be installed, but when. In response, the Government will update lighting methods in the ESS to ensure activities under the scheme go beyond standard practice (refer to section 4.3.2 for further detail).

The Government will continue monitoring the uptake of activities under the Safeguard schemes to understand the broader market and regulatory factors influencing change over time.

[4] Energy savings from upgrades completed between 2009 and 2019, see Table 2.4 in IPART (2020).

When required, the Government will modify baselines and remove incentives to ensure the Safeguard encourages energy saving and peak demand reduction activities that may not occur otherwise. The Government is committed to consulting stakeholders and providing appropriate notice before implementing significant changes to calculation methods and baselines.

3.2 Complementary programs

During consultation, one stakeholder suggested the Government introduce sub-targets for specific groups, such as the residential sector or low-income households.

> A target for the number of households should be set so the benefits of the ESS are less skewed towards commercial and industrial upgrades …a target for low income households would ensure the benefit of the ESS is provided to those households most in need. Eligibility should be broader than concession card holders to include people who are in a retailer hardship plan, on payment plans and/or holders of the Low Income Health Care Card. (Public Interest Advocacy Centre, advocacy group)

The 2015 ESS review examined alternatives such as sub-targets and certificate multipliers to encourage energy efficiency and bill savings among vulnerable households (NSW Government 2015a, pp.71–78).

The Government has decided to target the specific market barriers faced by low-income households by providing complementary energy efficiency programs. This delivers energy bill savings to vulnerable households more cost-effectively and is easier to administer than the other options considered (NSW Government 2015b, p.52). This may also apply to other sub-groups, if they face specific market barriers to implementing energy saving activities.

Under the Climate Change Fund 2017–22, the Government expanded its range of programs to ensure households and businesses can access the benefits of energy efficiency (NSW Government n.d. a). These include:

- support for low-income households to buy more efficient appliances and install solar or solar-battery systems
- energy saving upgrades for social housing clients to assist the state's most vulnerable households
- discounts on equipment upgrades for households and small businesses.

The Government also provides support for households to reduce energy bills through rebates (NSW Government n.d. b).

The Government regularly reviews the ESS Rule. Updated and new calculation methods help ensure all energy users have access to the scheme. The PDRS will also include a broad range of activities, covering both households and small businesses. Depending on the future of programs to support access, future scheme reviews may consider the need for sub-targets for cohorts experiencing energy bill pressure.

Part B: Reforms to the Energy Savings Scheme

4. ESS targets

The NSW Electricity Strategy announced the Government will set a more ambitious energy savings target for the ESS. The Safeguard consultation paper sought stakeholder feedback on the rate at which the target should increase, as well as key issues the Government should consider when setting scheme targets.

Final position

The Government will increase targets from 2022, reaching 13% by 2030 (Option 1). The target will then remain at 13% until the end of the scheme in 2050. Table 8 sets out the new annual energy savings targets from 2022.

4.1 Policy issue and options

The NSW Electricity Strategy announced that the Government will set a more ambitious energy savings target for the ESS.

By increasing the energy savings target, the Government aims to:

- improve energy affordability and reliability for households and businesses
- make emissions abatement available at lower cost, facilitating the transition to net zero emissions by 2050.

The energy efficiency market in New South Wales has undergone significant changes over the past five years. Commercial lighting upgrades, which have accounted for the majority of energy savings delivered under the ESS to date, are approaching market maturity. As the share of commercial lighting activities in the ESS reduces, new activities will need to be taken up to meet the scheme's increasing energy savings targets.

The Government consulted on the rate of target increase and the key issues for consideration when setting the target, including:

- the most promising opportunities once commercial lighting reaches market maturity
- support needed by industry to unlock these opportunities.

Based on stakeholder feedback, the Government considered three options for setting annual energy savings targets for the ESS.

The NSW Parliament has extended the life of the ESS to 2050. To give effect to this extension, the Government will set scheme targets to 2050.

4.2 Stakeholder submissions

Most of the stakeholders that commented on the ESS reforms supported the Government's decision to increase the target but had mixed views on the rate at which the target should increase.

Advocacy groups and the energy services industry supported a steeper ramp-up because:

- this would maximise the environmental and job creation benefits of the scheme
- the certificate surplus indicates the demand for energy efficiency activities supports a more ambitious target.

Some energy retailers, large energy users and IPART cautioned against increasing targets too quickly. EnergyAustralia and Origin Energy argued target increases should be conservative over the next few years to allow more time for the market to transition to new activities as incentives for commercial lighting reduce and the economy recovers from the impacts of the COVID-19 pandemic.

Table 5 Summary of submissions on ESS targets

Stakeholder group	Summary
Advocacy groups	Advocacy groups encouraged the Government to consider the ability of the scheme to address climate change, the financial benefits for NSW energy users, and the public health and wellbeing benefits when setting the target. The Nature Conservation Council of NSW argued that a steeper ramp-up would maximise benefits from a climate change perspective. Business NSW argued that there is scope for a more ambitious target and that the ESS can drive job-generating activity to support the economy during the COVID-19 pandemic.
Energy service industry	The energy service industry encouraged the Government to consider the current certificate surplus when setting the target, arguing that the surplus indicates sufficient demand for energy efficiency to support a higher target. The energy service industry also argued IPART's approach to scheme administration and some of the existing ESS calculation methods inhibit the uptake of new opportunities. Stiebel Eltron recommended the Government develop robust standards and methods for new opportunities, based on existing incentive schemes in Europe.
Electricity retailers	Origin Energy recommended that targets be relatively conservative for the next few years until there is an increase in market confidence with new supply options. EnergyAustralia further suggested that any changes that restrict activities or increase liabilities should be deferred to after mid-2021, assuming that supply side restrictions resulting from the COVID-19 pandemic will have eased by then. EnergyAustralia also proposed that the 2020 compliance year liability be extended into the first half of 2021 so that ACPs have more time to complete installations. The Australian Energy Council (AEC) and AGL stated that Australia's small market, with few local importers or manufacturers, hinders market development and the uptake of new opportunities. Both stakeholders also suggested that complex processes for registering new products and lack of auditing could hinder the uptake of new opportunities.
Electricity networks	Ausgrid encouraged the Government to consider the longer-term transition towards a higher mix of renewable energy generation in the electricity system when setting targets.
Large energy users	Large energy users cautioned that any target increase should not out-pace the ability of the industry to deliver activities to meet it. Large energy users raised concerns that a higher target could result in higher certificate prices, which would in turn increase cost pass-through to NSW consumers.
Government agencies	Waverley Council recommended that the target be set as high as feasibly possible and implemented quickly to help address climate change.

continued…

Stakeholder group	Summary
Government agencies, continued	IPART recommended that the target increase steadily and be announced well in advance to provide investor certainty. IPART also warned that an overly ambitious target could undermine the scheme by driving certificate prices above the penalty rate. IPART noted that there are potential technical, economic and capacity barriers to the uptake of new technologies under an expanded ESS. It also noted that to date, the technical complexity of certain calculation methods has been a barrier to the take-up of emerging technologies. IPART recommends that the Government consider simplifying calculation methods to address this barrier.

4.3 Analysis of key issues

Analysis for the Department indicates there are sufficient opportunities to support a higher target. These opportunities could save 10,400 GWh of electricity and 20 petajoules (PJ) of gas each year in New South Wales.[5]

Commercial lighting upgrades, which have accounted for the majority of energy savings delivered under the ESS to date, are approaching market maturity. New activities will need to be taken up to meet the scheme's energy savings targets.

Stakeholders had mixed views on the rate at which the target should increase. Advocacy groups and the energy services industry supported a steeper ramp-up, while some energy retailers, large energy users and IPART cautioned against increasing targets too quickly.

Based on the Department's cost–benefit analysis, a target of 13% by 2030 will deliver the greatest net economic benefit for New South Wales.

4.3.1 New South Wales has significant energy efficiency opportunities remaining

The energy efficiency market in New South Wales has undergone significant changes over the past five years. Commercial lighting upgrades, which have accounted for the majority of energy savings delivered under the ESS to date, are approaching market maturity. As commercial lighting incentives reduce, new activities will need to be taken up to meet the scheme's energy savings targets.

Analysis commissioned by the Department indicates opportunities to save 10,400 GWh of electricity and 20 PJ of gas each year remain in New South Wales.[6] Box 1 provides further details.

Stakeholder submissions also recognised New South Wales has substantial energy efficiency opportunities. Several submissions identified solar water heaters, heat pumps, building shell retrofits and building and home energy management systems as promising opportunities.

[5] Analysis by the Department using Energetics (2020).

[6] Analysis by the Department using Energetics (2020).

> There are many promising opportunities for energy savings, including but not limited to: industrial and commercial energy efficiency projects under project-based methodologies … heat pumps for space conditioning and hot water, building shell retrofits, including insulation and draught-proofing, and data analysis and in-home displays.
> (Energy Efficiency Council, energy services industry)

Approved standards and calculation methods are needed to enable uptake of new technologies. Planned updates and new calculation methods for the ESS include:

- heat-pump and solar water heaters for use in households and small businesses
- commercial and industrial heat-pump hot water systems
- updating existing activity definitions for air-conditioning and refrigerated cabinets to align with recent changes to Greenhouse and Energy Minimum Standards.

The Department is investigating alignment of method development and product registration of heat-pump and solar water heaters with the Victorian Energy Upgrade (VEU) program (refer to section 7.2 for further discussion of inclusion of these technologies under the ESS).

Box 1 – Energy efficiency opportunities in New South Wales

Analysis indicates there are opportunities to save 10,400 GWh of electricity and 20 PJ of gas each year in New South Wales.[7] The largest opportunities to reduce energy consumption in the state are:

- replacing electric and gas water heaters with solar or heat-pump water heaters
- building and home energy management systems
- building shell retrofits
- optimising motor systems
- waste heat recovery systems.

The Department commissioned the development of an uptake model to estimate the impact of the Safeguard schemes at different policy settings and targets (Common Capital 2020b). This model forecasts the annual uptake of energy efficiency opportunities by different sectors and end-uses.

The following types of activities are forecast to contribute the majority of energy savings under new targets once commercial lighting incentives reduce:

- commercial heating, ventilation and air-conditioning (HVAC) upgrades
- home energy management systems
- improved industrial processes and motor system upgrades.

See *Appendix A: Cost–benefit analysis and modelling assumptions* for further information on modelling assumptions.

4.3.2 Energy efficient lighting is becoming the norm

Commercial lighting upgrades have historically accounted for more than 70% of the certificates created each year (IPART 2020, p.13). In 2019, this declined to just over 50% with a shift towards small business and residential lighting activities. Overall, the total share of lighting projects fell from 74% in 2018 to 64% in 2019 (IPART 2020, p.15).

[7] Analysis by the Department using Energetics (2020).

As discussed in section 3.1, LED lighting has now become the norm for new product sales in New South Wales (Beletich 2020, p.3). In response, the Department is updating the three deemed lighting methods in the ESS to improve the delivery of lighting upgrades and ensure activities under the scheme go beyond standard practice.

Changes to the ESS lighting methods are expected to be introduced in 2022, with incentives for lighting upgrades reducing as the overall opportunity for energy savings from these technologies decreases.

4.3.3 Stakeholders supported higher targets but have mixed views on the rate of increase

Advocacy groups argued that the target should be increased quickly to help address climate change and facilitate job creation as the economy recovers from the impact of the COVID-19 pandemic.

> A steeper ramp-up will maximise the benefits of the scheme from a climate perspective. (Nature Conservation Council of NSW, advocacy group)

> Greater ambition on energy efficiency would also be in keeping with other aims of government policy. As the economy recovers from the COVID-19 pandemic, there is a desire for job-generating activity. Energy efficiency measures can accomplish this, while delivering benefits to recipients and the wider energy system and achieving lasting improvements to productivity and growth. (Business NSW, advocacy group)

Stakeholders from the energy services industry stated that the certificate surplus indicates the demand for energy efficiency activities supports a more ambitious target.

> The current oversupply of certificates must be considered which is, among other things, a sign that there is demand for energy savings supporting a much more ambitious target (Energy Conservation, energy service provider)

In contrast, some energy retailers, large energy users and IPART cautioned against increasing the target beyond the market's capacity to deliver energy saving activities. Origin Energy argued that the target should be conservative over the next few years because of the uncertainty around which cost-effective activities will be available to achieve higher targets.

> The key issue when deciding on new targets are possible constraints on the supply side of activities. This stems from the impending phase out of large volume activities from commercial lighting. Until market confidence increases in new supply options, we suggest that targets for the next few years be relatively conservative. (Origin Energy, energy retailer)

4.3.4 The Government is committed to giving at least 12 months' notice before changing scheme targets

EnergyAustralia encouraged the Government to defer any changes to the target until after mid-2021 due to the impact of the COVID-19 pandemic.

> We express caution until normal installation conditions return. Any changes that restrict accredited activities or add to obligations under the scheme should be deferred to commence after mid-2021, anticipating that by then the supply-side restrictions resulting from the COVID-19 pandemic may have eased. (EnergyAustralia, energy retailer)

The Government is committed to providing a notice period of at least 12 months before implementing any changes to the energy savings targets. The new energy savings target will come into effect from January 2022.

4.3.5 A target of 13% by 2030 will deliver the greatest net economic benefit for New South Wales

Based on stakeholder feedback, the Government modelled three options for setting annual energy savings targets for the ESS:

Option 1: A target increasing linearly to 13% by 2030

Option 2: A target increasing faster, reaching 13% by 2027

Option 3: A higher target, reaching 15% by 2030.

In all cases, the new target commences in January 2022. Under Options 2 and 3, the rate of target increase is slower in the early years and accelerates from 2025, providing the market lead-time to unlock new opportunities.

The Department has conducted an analysis of the three options in line with the NSW Treasury's guidelines for cost–benefit analysis (NSW Government 2015c, 2017). Table 6 shows the annual energy savings targets that were modelled as well as the current legislated targets.

Table 6 ESS target options from 2022 to 2030

Scenario	Annual energy savings target (%)								
Year	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Current target	8.5	8.5	8.5	8.5	–	–	–	–	–
Option 1	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
Option 2	9.0	9.5	10.0	11.0	12.0	13.0	13.0	13.0	13.0
Option 3	9.0	9.5	10.0	11.0	12.0	13.0	14.0	14.5	15.0

For the purposes of cost–benefit analysis, the Department considered the lifetime costs and benefits of targets to 2030 (Table 7). *Appendix A: Cost–benefit analysis and modelling assumptions* outlines the assumptions in the cost–benefit analysis.

Table 7 Cost–benefit analysis of ESS targets

Present value of incremental costs and benefits to 2040	Option 1	Option 2	Option 3
Scheme costs			
Government costs ($m)	–$50	–$50	–$50
Regulatory costs ($m)	–$377	–$449	–$581
Total costs ($m)	**–$427**	**–$499**	**–$631**
Scheme benefits			
Reduced wholesale purchase costs ($m)	$1,089	$1,123	$1,201
Avoided network investment ($m)	$122	$123	$141
Avoided cost of greenhouse gas emissions ($m)	$258	$276	$289
Avoided cost of air pollution ($m)	$21	$23	$24
Total benefits ($m)	**$1,490**	**$1,545**	**$1,655**
Net economic benefit ($m)	**$1,063**	**$1,046**	**$1,024**
Benefit–cost ratio	**3.5**	**3.1**	**2.6**

Based on the Department's analysis, Option 1 will deliver the greatest net economic benefit for New South Wales. In addition, under this option households and businesses choosing to implement energy savings projects are expected to save an additional $2.4 billion on their bills between 2022 and 2040.

To implement the extension of the scheme to 2050, the target will continue at 13% until the end of the scheme. As set out in the ES Act, the target can be reviewed under certain conditions and during the five-yearly reviews.[8]

4.4 Final position

The Government will increase targets from 2022, reaching 13% by 2030 (Option 1). The target will then remain at 13% until the end of the scheme in 2050. Table 8 sets out the new annual energy savings targets from 2022.

Table 8 New energy savings targets for the ESS (%)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	To 2050
Target	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.0

5. ESS penalty rates

The scheme penalty rate was set in 2009 based on economic modelling carried out at the time. The Safeguard consultation paper sought stakeholder feedback on whether the penalty rate is still set at an appropriate level.

Final position

The Government will retain the current penalty rate of $29.02 per notional MWh in 2020. IPART will continue to adjust the rate annually to account for increases in the Consumer Price Index (CPI).

5.1 Policy issue and options

Scheme participants can elect to meet their obligations under the ESS by surrendering energy savings certificates (ESCs) or by paying a shortfall penalty.[9] In setting the penalty rate, the Government aims to set a ceiling price on ESCs to ensure the scheme delivers a net economic benefit. The penalty rate is based on economic modelling carried out in 2009 when the scheme was established.

[8] ES Act, Schedule 4A, clause 8 and clause 77.

[9] The penalty will only be paid if a liable party has surrendered less certificates than its individual target, i.e. it has a shortfall of certificates.

IPART adjusts the rate annually to account for increases in the CPI. In 2020, the shortfall penalty rate is $29.02 per notional MWh (IPART n.d.). This equals a tax-effective penalty rate of up to $41.46 per notional MWh.[10]

In the Safeguard consultation paper, the Government proposed retaining the current penalty rate and sought stakeholder feedback on whether the penalty rate remains at an appropriate level.

5.2 Stakeholder submissions

Around one-quarter of the stakeholder submissions commented on the scheme's penalty rate. Most of these supported the Government's intention to retain it at the current level. Two submissions recommended the penalty rate be altered with reference to updated economic modelling.

Table 9 Summary of submissions on ESS penalty rates

Stakeholder group	Summary
Energy service industry	The energy service industry generally agreed that the current penalty rate is set at an appropriate level.
Electricity retailers	Electricity retailers and the AEC agreed that the current penalty rate is set an appropriate level. Origin Energy and Alinta Energy expressed support for maintaining the current penalty rate, acknowledging the market has traded well below the current rate and scheme compliance has been very high.
Large energy users	BlueScope Steel encouraged the Government to explore whether the penalty rate should be reduced to ensure it is within the limits of the expanded ESS cost–benefit analysis.
Government agencies	IPART acknowledged that the current penalty rate has provided enough incentive for liable parties to buy and surrender certificates to meet their energy savings targets; however, IPART believed the penalty rate should continue to be set with reference to the Department's most current modelling.

5.3 Analysis of key issues

The current penalty rate is set at an appropriate level, as:

- the penalty rate has encouraged scheme participants to meet their obligations by buying and surrendering certificates rather than paying penalties
- certificate prices have traded below the current penalty rate, indicating energy saving activities can be implemented at a lower cost
- the tax-effective penalty rate remains lower than the short-term cost of electricity supply, implying the cost of saving energy remains lower than the cost of additional supply.

[10] Civil penalties are not tax deductible and if the scheme participants operate at a net profit, they would pay the penalty using their post-tax income. The base penalty rate is therefore grossed up by the corporate tax rate of 30% to represent the amount of income the scheme participants would need to earn to pay the penalty. For 2020, the tax-effective penalty is $29.02/(1 – 0.30) = $41.46. Scheme participants who have an aggregated turnover of less than $50 million during the 2020–21 financial year have a lower company tax rate of 26% (ATO n.d.). For 2020, the tax-effective penalty rate for these scheme participants is $29.02/(1 – 0.26) = $39.22.

5.3.1 Scheme participants are choosing to buy and surrender certificates, rather than pay penalties

Many stakeholders believe that the scheme's high level of compliance and the trading price of certificates indicate that the penalty rate is currently set an appropriate level.

> The market has generally traded well below the current penalty and overall scheme compliance has been very high. This is clear evidence that the penalty is set at an appropriate level. (Origin Energy, energy retailer)

The ESC spot price has remained below the tax effective penalty rate and scheme participants have mostly complied with their energy savings obligations (NSW Government 2020b, p.3). In 2019, less than 1% of the energy savings target was met through penalty payments (IPART 2020, p.19).

These trends indicate that the current penalty rate provides an effective ceiling for certificate prices, encouraging retailers to buy and surrender certificates.

As scheme participants are meeting their obligations by buying and surrendering certificates, rather than paying penalties, the penalty rate remains effective in ensuring scheme compliance.

5.3.2 The cost of energy efficiency remains cheaper than the cost of additional supply

Two stakeholder submissions encouraged the Government to set the penalty rate with reference to updated modelling.

> In IPART's view, the penalty rate should continue to be set by reference to Department modelling with clear guidance provided to participants about when and how penalty rates and targets are reviewed. (IPART, scheme regulator)

> If there is room to reduce the penalty price under the expanded scheme to keep prices within the limits of the cost-benefit analysis carried out by the Department, then this should be seriously considered. (BlueScope Steel, large energy user)

The Government previously consulted on changing the tax-effective penalty rate to reflect the short-term cost of electricity supply (NSW Government 2015a, p.32). This would have effectively capped the cost of the scheme at the cost of increasing electricity supply in the short term. Following stakeholder feedback and cost–benefit analysis, the Government decided to retain the existing penalty rate (NSW Government 2015b, p.38).

In 2021 the short-term cost of electricity supply in New South Wales is forecast to be $60.44/MWh,[11] above the 2020 tax-effective penalty rate of $41.46. The cost of energy efficiency remains below the cost of additional electricity supply.

5.4 Final position

The Government will retain the current penalty rate of $29.02 per notional MWh in 2020. IPART will continue to adjust the rate annually to account for increases in the CPI.

[11] Short-term cost of electricity supply is the cost of increasing electricity supply in the short-term period where capital costs and fixed operating costs, such as building power stations and networks, are fixed. It is calculated by adding the fuel, operating and maintenance costs of power stations with the price of carbon emissions from grid electricity in New South Wales and the cost of air pollution. Fuel, operating and maintenance costs were calculated by the Department using data from the AEMO Integrated System Plan (AEMO 2020a). The value of emissions was forecast by the Department using European Union Allowance historic futures price data from Barchart (2020). The cost of air pollution is from NSW Government (2019b).

6. ESS exemptions

The ESS provides partial or full exemptions for emissions-intensive, trade-exposed industries. The Safeguard consultation paper sought stakeholder feedback on whether to expand exemptions to small electricity retailers, as they may face disproportionately high administrative costs of establishing and running scheme compliance systems.

Final position

As an emergency response to the COVID-19 pandemic, the Government is providing small retailers with an exemption for the 2020 compliance year. A full exemption will apply to retailers that have fewer than 5000 customers and have liable acquisitions of less than 30,000 MWh.

The existing partial exemptions for emissions-intensive, trade-exposed industries will continue.

6.1 Policy issue and options

The ESS provides exemptions for emissions-intensive, trade-exposed industries.[12] This is the only exemption under the ESS and aims to ensure New South Wales remains competitive with overseas industries that may not be subject to similar schemes or requirements.

Small electricity retailers may face disproportionately high administrative costs when establishing and running scheme compliance systems. This is recognised in the Victorian scheme, the VEU program, which exempts small retailers.

The VEU defines small retailers as those with fewer than 5000 customers, purchase less than 30,000 MWh from the National Electricity Market (NEM), or purchase less than 350,000 GJ of gas. Retailers with liable acquisitions under 30,000 MWh account for less than 0.5% of the total liable acquisitions in New South Wales.

In the Safeguard consultation paper, the Government considered expanding exemptions to retailers below a certain size to avoid inhibiting small energy retailers from entering the market.

6.2 Stakeholder submissions

Approximately one-quarter of the stakeholder submissions commented on small retailer exemptions. Stakeholder views were divided, with half supporting exemptions for small retailers and the other half opposing them or offering alternatives to full exemptions.

[12] Emissions-intensive, trade-exposed industries are listed under Schedule 6 of the Renewable Energy (Electricity) Regulations 2001.

Table 10 Summary of submissions on ESS small retailer exemptions

Stakeholder group	Summary
Advocacy groups	Public Interest Advocacy Group (PIAC) suggested small energy retailers could be given the option to pay into a fund supporting government-led energy efficiency programs for low-income households, if there is evidence the scheme inhibits small energy retailers from entering the market. This would only apply for the first two years of the retailer's operation.
Energy service industry	The energy service industry generally argued there is no need to provide exemptions to small retailers. Two submissions asserted that the active ESC market should make it achievable for small retailers to comply with their liabilities. Ecovantage stated that it would be reasonable to provide a modest level of exemption to small retailers.
Electricity retailers	Energy Efficiency Council (EEC) did not see a need to exempt small retailers, as scheme compliance has not been a barrier for new retailers to enter the New South Wales energy market. EEC instead recommended giving small retailers the option to pay into a fund that supports government-led energy efficiency programs during their first year of operation.
Large energy users	EnergyAustralia and Origin Energy did not support providing exemptions for small retailers.
Government agencies	IPART supported providing small retailers with exemptions. It stated that any exemption should be robust and include conditions to deter scheme participants from taking advantage of the system to benefit from the exemption.

6.3 Analysis of key issues

Analysis of exemptions under the ESS shows:

- new energy retailers are continuing to enter the NSW market
- exemptions for small retailers may impact market competition and scheme efficiency
- historically, small retailers have been able to meet their target obligations.

The COVID-19 pandemic had a negative impact on scheme participant compliance with their 2019 obligations, disproportionately affecting small retailers. These challenges are likely to persist into the 2020 compliance year.

6.3.1 New retailers are entering the New South Wales electricity market

Stakeholders acknowledged that the ESS has operated with a high level of compliance without exemptions for small retailers. Two submissions suggested the active certificate market enables retailers to meet their compliance obligations.

> Given that the whole market for ESCs is very active, it should not be overly burdensome for smaller retailers to comply with their liabilities.
> (Energy Savings Industry Association, peak body representing energy service industry)

One stakeholder submission stated that the ESS does not appear to be a barrier to new retailers entering the market in New South Wales.

> There currently does not seem to be a need to exempt retailers from the ESS, and compliance with the ESS does not appear to be a barrier for new retailers to enter the NSW energy market. (EEC, peak body representing energy service industry)

IPART reported there has been an increasing number of small electricity retailers entering the scheme as liable entities. In 2019, an additional 16 retailers became scheme participants (IPART 2020, p.6). This indicates the ESS has not prevented new retailers from entering the NSW energy market.

6.3.2 Exemptions could reduce market competition and scheme efficiency

EnergyAustralia and Origin Energy did not support the introduction of exemptions for small retailers. One submission stated that small retailer exemptions under a similar scheme in a different jurisdiction has had a negative impact on market competition. Another large retailer noted that Tier 1 retailers (AGL, EnergyAustralia and Origin Energy) are the retailers of last resort in New South Wales.

Exempting retailers would effectively eliminate the pass-through of scheme costs to their customers. This could allow them to offer cheaper energy, giving them a competitive advantage over retailers that are liable under the scheme.

6.3.3 Stakeholders recommended alternative options to providing small retailer exemptions

Two submissions suggested providing small retailers with the option to pay into a fund that supports government-led energy efficiency programs for the first one or two years of operation.

One submission recommended adopting a model similar to the ACT Government's Energy Efficiency Improvement Scheme (EEIS), which allows smaller (Tier 2) retailers to meet their target obligations by paying an Energy Savings Contribution (ACT Government n.d. a). This contribution is lower than the EEIS shortfall penalty rate (ACT Government n.d. b).

The ESS provides flexibility for scheme participants by allowing them to pay a shortfall penalty instead of surrendering certificates.[13] This provides new entrants with time to establish their administrative and certificate trading capacity without being guilty of an offence.

ESS penalty payments are deposited into the Consolidated Fund. Penalties paid by scheme participants to meet their energy savings obligation for the 2019 compliance year will be around $330,000.[14] As outlined in section 3.2, the Government invests in energy efficiency through the Climate Change Fund, which is levied on electricity customers.

6.3.4 IPART provided concessional treatment to certain small retailers due to the COVID-19 pandemic

Historically, most liable parties have successfully met their energy savings obligations by purchasing and surrendering certificates (NSW Government 2020b, p.3); however, the COVID-19 pandemic had a negative impact on scheme participants' compliance with their 2019 obligations (IPART 2020, p.20).

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[13] ES Act, Schedule 4A, clause 15.

[14] Analysis conducted by the Department by multiplying the 2019 shortfall penalty rate (IPART n.d.) by the certificate equivalent value of penalties paid by scheme participants in 2019 (IPART 2020, p.23).

In response to the pandemic, IPART provided concessional treatment to eight standalone, privately owned Tier 2 retailers that had a certificate deficit and requested an extension to meet their obligations. IPART granted (IPART 2020, p.20):

- a one-month extension to surrender additional certificates to meet their obligations (three retailers)
- a one-year extension to pay any subsequent shortfall penalty (five retailers).

For the 2019 compliance year, a total of 10 scheme participants elected to pay a shortfall penalty, compared to two scheme participants for the previous year (IPART 2020, p.23; IPART 2019a, p.24).

Of the 22 retailers with liable acquisitions under 30,000 MWh during the 2019 compliance year, almost half either received concessional treatment from IPART or paid a shortfall penalty.[15]

Challenges resulting from the COVID-19 pandemic are likely to persist into the 2020 compliance year and disproportionately affect small retailers. Removing the ESS target for small retailers (i.e. those with fewer than 5000 customers and liable acquisitions of less than 30,000 MWh) will provide the necessary support to those facing financial hardship. This will reduce the total energy savings target by less than 0.5% for the 2020 compliance year.

6.4 Final position

As an emergency response to the COVID-19 pandemic, the Government is providing small retailers with an exemption for the 2020 compliance year. A full exemption will apply to retailers that have fewer than 5000 customers and have liable acquisitions of less than 30,000 MWh.

The existing partial exemptions for emissions-intensive, trade-exposed industries will continue.

7. Fuel switching

The Government considered a range of issues in relation to the expansion of eligible fuel switching activities under the ESS. This section sets out the analysis and final positions on:

- whether fuel switching should be limited to grid connected energy or also include non-grid connected energy (section 7.1)
- how the ESS can complement other schemes such as the Renewable Energy Target (RET) and NSW Building Sustainability Index (BASIX) (section 7.2)
- where fuel can be sourced from when switching fuels (section 7.3)
- how to count energy savings from fuel switching activities (section 7.4)
- circumstances under which the Government should consider extending scheme liability beyond electricity (section 7.5).

[15] Analysis by the Department using IPART data on scheme participants' liable acquisitions for the 2019 compliance year. This analysis does not include scheme participants that did not sell or purchase electricity in New South Wales in 2019.

7.1 Eligible fuels

The NSW Electricity Strategy signalled the Government's intention for the Safeguard to cover a wider range of activities that reduce demand on electricity and gas networks. The Safeguard could also encourage switching from other fuels such as onsite, stationary use of diesel, to more affordable alternatives.

Final position

The Government will expand the ESS to include fuel switching activities for both grid connected and non-grid connected energy (Option 2). This includes:

- switching from grid connected non-renewable gas or electricity to bioenergy, green hydrogen, solar thermal or other alternatives
- switching from non-grid connected energy, such as onsite, stationary use of diesel to an affordable alternative.

The Government will amend the ESS Rule to remove new fuel switching activities from electricity to non-renewable gas.

7.1.1 Policy issue and options

The NSW Electricity Strategy signalled the Government's intention for the Safeguard to cover a wider range of activities that reduce demand on electricity and gas networks. This could include switching from natural gas to biogas or green hydrogen. Currently, the only eligible fuel switching activities under the ESS are between electricity and gas.

The Safeguard could also encourage switching from other fuels such as onsite, stationary use of diesel, to more affordable alternatives such as solar irrigation systems.

By expanding the eligible activities under the Safeguard, the Government aims to:

- improve energy affordability and reliability for households and businesses
- improve consumer access to a broader range of energy saving technologies
- help drive innovation to develop the circular economy and new business models for alternative energy sources
- make emissions abatement available at lower cost.

The Government proposed the following complementary options for fuel switching in the Energy Security Target and Safeguard consultation paper:

Option 1: **Include fuel switching for grid connected energy,** where eligible activities would be expanded to include fuel switching activities that displace grid connected electricity or gas.

Option 2: **Include fuel switching beyond grid connected energy,** where eligible activities would be expanded to include fuel switching activities for both grid connected and non-grid connected energy. This would allow, for example, onsite use of diesel on farms and factories to be replaced with more affordable alternatives.

7.1.2 Stakeholder submissions

Twenty-six stakeholders commented on this topic, with the majority broadly supporting expansion of the ESS to include a wider range of fuel switching activities.

Several stakeholders suggested the residential sector has significant opportunities to save energy by installing solar and heat-pump water heaters.

Six stakeholders supported expanding the scheme to include fuel switching beyond grid connected energy (Option 2). Several stakeholders suggested there is a significant opportunity to reduce onsite diesel consumption in the agricultural sector by switching to other fuels.

Large energy users and the Energy Users' Association of Australia (EUAA) suggested limited fuel switching opportunities are available for large industrial and commercial businesses and sought further consultation on the introduction of these activities into the ESS.

Table 11 Summary of submissions on expanding eligible fuels

Stakeholder group	Summary
Advocacy groups	Advocacy groups supported expanding the scheme to include fuel switching activities such as solar water heaters, heat pumps, and bioenergy. The National Irrigators' Council believed a scheme that provides incentives to switch from stationary diesel would be strongly supported by the agricultural sector. PIAC argued the scheme should be expanded to include technologies that facilitate transport electrification.
Energy service industry	The energy service industry mostly supported expanding the scheme to include more fuel switching activities. Energy service providers working in the agricultural sector strongly supported expanding the scheme to include activities that switch from onsite diesel to bioenergy, solar thermal, or solar photovoltaics (solar PV). ReAqua Solar Pumping and Farm Renewable Consulting stated that many farmers are interested in switching from diesel to solar powered irrigation pumping but the adoption of these technologies has been hindered by the limited incentives to do so.
Electricity retailers	Energy retailers supported expanding eligible fuel switching activities to include solar water heaters, heat pumps, and bioenergy. AGL supported including fuel switching beyond grid connected energy but argued there will be barriers to take-up. These are primarily due to the cost of developing and installing new technologies as they enter the market. Origin Energy stated fuel switching activities should be incentivised by the scheme if they lead to efficiency gains. It also noted many of the potential fuel switching activities proposed in the consultation paper, such as green hydrogen, are longer-term options unlikely to have significant uptake in the next few years.
Electricity networks	Ausgrid suggested expanding the scheme to include activities that facilitate electrification of the transport sector, specifically battery or hydrogen powered vehicles.

Stakeholder group	Summary
Large energy users	EUAA supported expanding the scheme to include more fuel switching activities but suggested this will be of little benefit to large industrial and commercial businesses. BlueScope Steel asserted the expansion of the ESS to include a wider range of fuel switching activities requires further investigation and targeted consultation with large energy users.
Government agencies	IPART supported fuel switching where this resulted in an energy efficiency improvement. Waverley Council supported the proposal to provide incentives for switching from fossil fuels to renewable energy.

7.1.3 Analysis of key issues

Analysis for the Department indicates there are opportunities to save 717 GWh of electricity, 15 PJ of gas and 138 megalitres (ML) of diesel each year in New South Wales through fuel switching activities.

Most stakeholders supported expanding the scheme to include a wider range of fuel switching activities and believed there are significant opportunities in the residential and agricultural sectors. Solar water heaters, heat pumps, solar irrigation pumps and bioenergy were strongly supported for inclusion in the ESS.

Expanding the scheme to include more fuel switching activities would widen the opportunities and maximise consumer choice for energy efficiency solutions. Modelling by the Department indicates expanding the scheme to include more fuel switching options would increase the net economic benefit of the ESS by $483 million by 2040.

New South Wales has significant opportunities to save energy and improve affordability by switching fuels

Analysis indicates there are opportunities to save 717 GWh of electricity, 15 PJ of gas and 138 ML of diesel each year in New South Wales through fuel switching activities.[16] These include:

- replacing electric or gas water heaters with solar or heat-pump water heaters
- replacing onsite diesel irrigation pumps with off-grid solar irrigation systems
- replacing industrial or agricultural use of natural gas and liquified petroleum gas (LPG) with bioenergy and solar thermal solutions.

Several stakeholders identified these activities as promising opportunities for the ESS. For example, Waverley Council estimated that over 3900 owner-occupier households in its local government area have electric storage hot water systems. These can potentially be replaced with solar or heat-pump water heaters, which have significantly cheaper operating costs, saving households on their energy bill (NSW Government 2018, p.5).

Over 85% of energy consumption in the agricultural sector is fuelled by diesel (Department of Industry, Science, Energy and Resources 2019). Several stakeholders asserted there is a substantial opportunity to reduce onsite diesel consumption in the agricultural sector by switching to alternative fuels. One agricultural stakeholder noted that

[16] Analysis undertaken by the Department using Energetics (2020).

diesel fuel was their highest operating cost prior to installing a solar irrigation pump, which reduced their annual energy expenses by $170,000.

> National Irrigators' Council does not have the information about the number of diesel generators or pumps that might be able to be replaced in NSW. We would expect though that with over 5000 irrigating businesses and 25,000 farms (ABS 2017–2018), there is a significant potential. (National Irrigators' Council, advocacy group)

Large industrial and commercial energy users may have limited access to fuel switching opportunities due to the high capital costs of replacing plant equipment.

> It is the experience of the EUAA that in most cases fuel switching for large commercial and industrial is not a viable option given the level of capital already committed to plant and equipment and the capital intensity of replacement.
> (EUAA, peak body representing large energy users)

Some large industrial businesses are already transitioning away from grid supplied electricity and non-renewable gas to more cost-effective alternatives. For example, in 2019 MSM Milling became one of Australia's first large-scale food manufacturers to use biomass for thermal energy. The new biomass boiler reduced the manufacturing plant's thermal energy costs by 70% (ARENA 2019). These opportunities could become more accessible for large energy users as the technology matures and becomes more commonplace.

Most stakeholders supported expanding the ESS to include a wider range of fuel switching activities

Stakeholders generally supported expanding the scheme to include biomass, biogas, green hydrogen, solar and heat-pump water heaters. Six stakeholders strongly supported including activities that replace onsite diesel.

> There is not a scheme that I am aware of that rewards farmers for reducing their diesel use. If the ESS were to include switching from diesel to green hydrogen, solar or bioenergy, there would be significant uptake in the agriculture sector. (Farm Renewables Consulting, energy service provider)

Five stakeholders suggested the ESS should also provide incentives for rooftop solar PV, with three stakeholders arguing the technology is commercially mature and already receives sufficient incentives from other schemes. An additional three stakeholders suggested the scheme support solar PV in less commercially mature applications, such as irrigation pumps. Refer to section 7.2 for further discussion.

Some stakeholders suggested additional consultation is necessary before additional fuels are included in the scheme.

> Given the complexity and breadth of this topic, we believe that further targeted consultation with large energy users would be appropriate to flesh out the details of this expansion.
> (BlueScope Steel, large energy user)

Sections 7.2, 7.3 and 7.4 provide further detail on the implementation of fuel switching activities. The Government will consult with key stakeholders when developing rules and calculation methods for eligible fuel switching activities.

Expanding the ESS to include more fuel switching activities delivers a net economic benefit for New South Wales

Expanding the scheme to include a wider range of fuel switching activities increases the range of opportunities and maximises consumer choice for energy efficiency solutions. Figure 1 shows that expanding the ESS to include more fuel switching activities delivers a greater total energy saving. Analysis by the Department indicates an increase in gas and diesel savings and a slight reduction in electricity savings between 2022 and 2040.

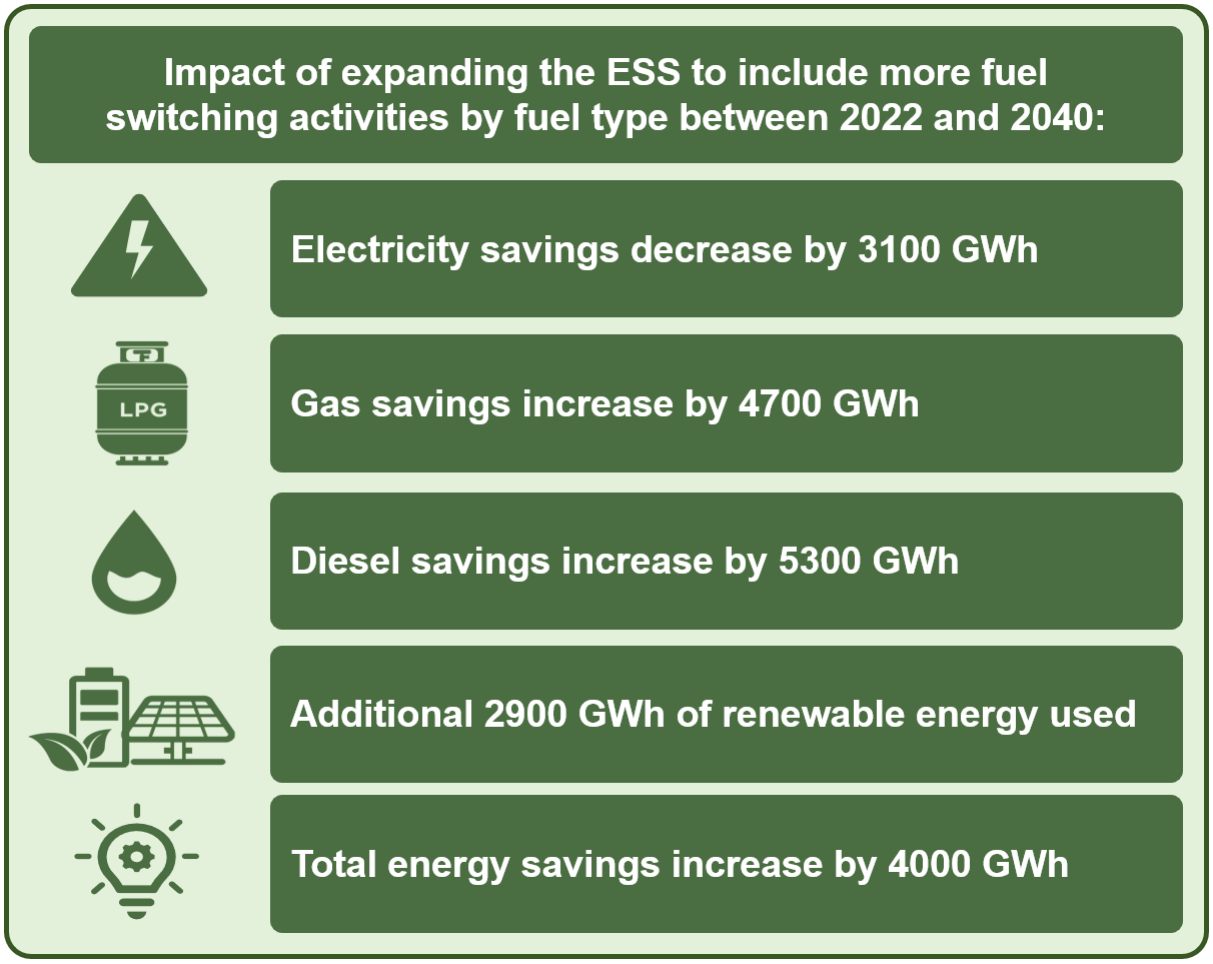

Figure 1 Change in energy savings by fuel type by expanding the ESS to include more fuel switching activities

Table 12 sets out the result of a cost–benefit analysis assessing the impact of expanding the ESS to include a wider range of fuel switching activities. Expansion of the scheme drives down the average ESC price, lowering the regulatory costs of the scheme and increasing the net economic benefit.

Table 12 Summary of costs and benefits of expanding the scheme to include more fuel switching activities relative to existing scheme settings

Present value of incremental costs and benefits to 2040	ESS with electricity and gas only	ESS expanded to include more fuel switching activities
Scheme costs		
Government costs ($m)	–$50	–$50
Regulatory costs ($m)	–$599	–$377
Total costs ($m)	**–$649**	**–$427**
Scheme benefits		
Reduced wholesale purchase costs ($m)	$836	$1089
Avoided network investment ($m)	$121	$122
Avoided cost of greenhouse gas emissions ($m)	$248	$258
Avoided cost of air pollution ($m)	$24	$21
Total benefits ($m)	**$1,229**	**$1,490**
Net economic benefit ($m)	**$580**	**$1,063**
Benefit–cost ratio	**1.9**	**3.5**

Removing incentives for fuel switching from electricity to non-renewable gas

Gas is an important source of energy for many industrial processes, but this gas usage may be better met through alternative solutions such as electrification (NSW Government 2021a). There is an opportunity to free up gas supply for NSW manufacturers by removing incentives to switch from electricity to non-renewable gas.

Electricity supply in New South Wales is also becoming less carbon intensive. Reducing emissions from gas supplied through the existing distribution network will be more difficult. This creates opportunities for households and businesses to electrify some end uses currently using gas, to take advantage of cheaper, reliable low emissions electricity. Likewise, we can avoid locking in long-life gas using assets.

The Government will remove ESS incentives for new fuel switching activities from electricity to non-renewable gas such as natural gas and LPG.

7.1.4 Final position

The Government will expand the ESS to include fuel switching activities for both grid connected and non-grid connected energy (Option 2). This includes:

- switching from grid connected non-renewable gas or electricity to bioenergy, green hydrogen, solar thermal or other alternatives
- switching from non-grid connected energy, such as onsite, stationary use of diesel, to an affordable alternative.

The Government will amend the ESS Rule to remove new fuel switching activities from electricity to non-renewable gas.

7.2 Complementing other schemes and regulations

Certain energy efficiency technologies are eligible for incentives from other schemes such as the Australian Government's Renewable Energy Target (RET) and Emissions Reduction Fund (ERF) or can be installed to comply with regulatory requirements such as the NSW Building Sustainability Index (BASIX).

As the objectives of the RET and the ESS are different, the two schemes can co-exist and reward the same technologies. Under the ERF, an emissions reduction project must not include any energy saving activity for which an incentive has been, or will be, claimed under a state-based scheme such as the ESS.

The Safeguard consultation paper sought stakeholder feedback on how the ESS can complement incentives and requirements under other schemes.

Final position

The Government will expand the ESS to provide incentives for energy saving technologies also eligible under the RET, including:

- solar and heat-pump water heaters
- solar irrigation systems
- bioenergy technologies.

The incentive will be in addition to that available from the SRES and the Large-scale Renewable Energy Target (LRET) (Option 2), with the ESS incentive calculated using the full deeming period as specified in the ESS Rule.

To ensure complementarity with BASIX, incentives for solar and heat-pump water heaters in homes will be available where these replace existing electric or gas hot water systems.

The ESS will complement the ERF by providing an alternative pathway to encourage energy savings projects, including bioenergy projects. Projects claiming incentives through the ESS will not be eligible under the ERF.

7.2.1 Policy issue and options

Certain energy efficiency technologies may be eligible for incentives from other schemes such as the RET and ERF or may be installed to comply with regulatory requirements such as BASIX.

Table 13 outlines the schemes and regulations that influence the uptake of technologies that the Government is considering including in the ESS.

Table 13 Technologies under consideration for inclusion in the ESS

Scheme or regulation	Technologies under consideration
Small-scale Renewable Energy Scheme	Solar and heat-pump water heaters Solar irrigation systems (powered by solar PV panels with a capacity of no more than 100 kW)
Large-scale Renewable Energy Target	Solar irrigation systems (powered by solar PV panels with a capacity of more than 100 kW) Bioenergy technologies that generate electricity of more than 100 kW

Scheme or regulation	Technologies under consideration
Emissions Reduction Fund	Bioenergy projects that reduce consumption of electricity or natural gas through the capture and combustion of agricultural waste, landfill gas, or wastewater biogas
BASIX	Solar and heat-pump water heaters in residential dwellings

The RET is legislated to operate until 2030 (Clean Energy Regulator 2018). Incentives from the SRES will gradually decline over the next decade as the scheme winds down (Clean Energy Regulator n.d.).

The spot price of large-scale generation certificates (LGCs) from the LRET has fallen by around 50% over the last two years (Clean Energy Regulator 2020a, p.25). This trend is likely to continue, as the current fleet of accredited power stations will generate enough energy to meet the LRET from 2021 (Clean Energy Regulator 2020b, p.22).

A decreasing incentive from the RET is likely to reduce take-up of renewable energy technologies. Where these can also save energy, the ESS could substitute for the decreasing incentives from the RET, helping improve energy affordability while reducing pressure on the electricity grid.

The principal objective of the ESS is to create a financial incentive to reduce the consumption of energy by encouraging energy saving activities. The primary objectives of the RET are to encourage renewable energy generation and reduce greenhouse gas emissions. The two can therefore co-exist and reward the same technologies.

The Government has identified three options for how the ESS could complement the RET.

Option 1: **Providing incentives in addition to those under the RET.** The Victorian Energy Upgrades (VEU) program and the South Australian Retailer Energy Efficiency Scheme (REES) provide incentives for solar and heat-pump water heaters that replace existing electric and gas hot water systems (ESC Victoria 2018b, pp.8–12; Essential Services Commission of South Australia 2018, p.38). These incentives are in addition to those under the SRES. The ESS could adopt a similar approach for technologies eligible under the SRES or LRET.

Option 2: **Gradually increasing deeming periods under the ESS to offset declining incentives under the SRES.** Systems installed by December 2021 receive the maximum 10-year deeming period under the SRES. This declines by one year each year (Clean Energy Regulator n.d.). Under this option, deeming under the ESS would start in 2022 and increase to 10 years by 2031.

Option 3: **Providing incentives only for activities that do not claim under the RET.** Under this option, incentives would be provided from either the ESS or RET, but not both.

Complementarity with BASIX and the ERF is discussed on page 30.

7.2.2 Stakeholder submissions

Twenty stakeholders commented on how the ESS could complement the RET. Many of these supported expanding the ESS to include technologies being phased out under the SRES. Stakeholders that work closely with the agricultural sector supported incentives for solar irrigation systems, which depending on size are eligible under the SRES or LRET

Five stakeholders suggested the ESS should also provide incentives for rooftop solar PV, with three stakeholders arguing the technology is commercially mature and already receives sufficient incentives from other schemes.

Large energy users suggested the technologies under the SRES do not require additional incentives or that this idea required further investigation. IPART cautioned it would be difficult for the ESS to provide incentives in addition to those under the SRES in a way that ensures additionality.

Table 14 Summary of submissions on how the ESS can complement the RET

Stakeholder group	Summary
Advocacy group	Advocacy groups supported including technologies that are being phased out under the SRES. PIAC argued that solar and heat-pump water heaters are out of reach for many households given their high upfront costs.
Energy service industry	The energy service industry mostly supported including technologies that are being phased out under the SRES. Stiebel Eltron asserted that the scheme should provide ESS incentives in addition to those provided under the SRES, similar to the VEU program. ESIA supported the ESS incentive gradually increasing to offset declining incentives under the SRES (Option 2). Mondo argued that fuel switching is an activity that requires multiple incentives to align and there is a role for the ESS to add to the stack of incentives available and guide investment toward fuel switching. EEC did not support providing incentives for renewable electricity generation technologies such as solar PV.
Electricity retailers	Electricity retailers supported including technologies that are being phased out under the SRES. AGL and AEC suggested the support for SRES technologies could be in the form of a multiplier that increases as the SRES declines. Both noted solar hot water systems are eligible for SRES Small-scale Technology Certificates (STCs) as well as South Australian Retailer Energy Efficiency Scheme (REES) gigajoule credits. EnergyAustralia supported expanding the scheme to include solar and heat-pump water heaters, and rooftop solar PV, dovetailing with the SRES scheme as it winds down. Origin Energy supported expanding the scheme to include solar and heat-pump water heaters but cautioned that partial subsidy under the ESS would need to be carefully implemented.
Electricity networks	Ausgrid supported expanding the scheme to cover technologies being phased out under the SRES, including small-scale hot water system replacement activities and solar PV systems that reduce electricity consumption from the grid.
Large energy users	Brickworks Building Products did not support the scheme covering small or large-scale solar generation technologies. BlueScope Steel recommended that incentives for technologies under the SRES be included only if the benefits outweigh the costs of inclusion.
Government agencies	IPART suggested expanding the scheme to include technologies being phased out under the SRES would be difficult to implement in a way that would ensure additionality of installations under the ESS. Waverley Council supported the proposal to provide incentives for technologies that are being phased out under the SRES.

7.2.3 Analysis of key issues

By adding to incentives under the RET, the ESS can encourage energy saving activities that otherwise would not take place as:

- high upfront costs remain a barrier for uptake of bioenergy technologies, solar irrigation pumps and solar and heat-pump water heaters
- declining incentives from the RET will reduce uptake of certain energy saving technologies
- uptake in New South Wales of solar and heat-pump water heaters is significantly lower than in Victoria and South Australia, where the equivalent state schemes both top up SRES incentives.

Rooftop solar PV is commercially mature and does not require further government support.

BASIX encourages the uptake of efficient water heaters in new dwellings. The ESS can complement BASIX by encouraging solar and heat-pump water heaters that replace electric and gas hot water systems in existing dwellings.

Under the ERF, an emissions reduction project must not include any energy saving activity for which an incentive has been, or will be, claimed under a state-based scheme such as the ESS. The ESS can complement the ERF by providing an alternative pathway to encourage energy savings projects.

Most stakeholders supported expanding the ESS to cover technologies under the RET

The upfront cost and payback periods for solar and heat-pump water heating remain relatively high (George Wilkenfeld and Associates 2019, p 7). Several stakeholders stated that without continued financial support, solar and heat-pump water heaters will not be able to compete with cheaper, less efficient electric and gas water heaters.

> The AEC is concerned that without continued financial support, solar and heat-pump water heaters will be passed over in favour of cheaper, less efficient and potentially higher emission water heaters. (AEC, peak body representing energy retailers)

Solar irrigation systems and bioenergy technologies face similar obstacles. Declining incentives from the SRES and LRET will likely reduce uptake.

> ReAqua distributes solar pumps through a network of over 150 Dealers across the country. The business undertakes an 'Understanding Customers' survey on these dealers on a yearly basis. When Dealers were asked 'What are the main barriers for those actively seeking quotes from committing to install solar pumping systems?' 66% of respondents said the biggest barrier was 'Upfront costs'. (ReAqua Solar Pumping, energy service industry)

Several stakeholders working closely with the agricultural sector strongly recommended the ESS should support installation of solar irrigation pumps and bioenergy technologies.

ESIA suggested the ESS should provide incentives for solar and heat-pump water heaters and behind-the-meter solar PV greater than 100 kW, but avoid 'double dipping' with the RET. In contrast, the EEC and Brickworks Building Products argued that the ESS should not support solar PV as it is already commercially viable and is subsidised by other schemes.

The NSW Solar Bonus Scheme, which provided a subsidised feed-in tariff to more than 146,000 households, closed in December 2016 (NSW Government n.d. c). AEMO predicts continued strong growth in the uptake of rooftop solar PV and forecasts New South Wales to have the second largest installed capacity by the end of the 2025 financial year.[17]

[17] Based on the rooftop solar PV central scenario from the AEMO 2020 Input and assumptions workbook (AEMO 2020b)

BlueScope Steel recommended that incentives for technologies under the SRES be included only if the benefits outweigh the costs of inclusion. Analysis by the Department indicates expanding the ESS to include certain RET technologies, along with other fuel switching activities, provides a net economic benefit for New South Wales (see section 7.1.3 for details).

ESS can drive additional uptake of RET technologies

Section 7.2.1 described three ways in which the ESS could complement the RET.

Under Option 1, ESS incentives would be in addition to those from the RET. This would provide the greatest support for overcoming the high upfront costs associated with technologies eligible under the RET. It would also align with both the VEU program and the REES, which top up the SRES incentive based on emissions abatement and energy savings, respectively (Energy Matters n.d.). As a result, uptake of solar and heat-pump water heaters has been stronger in Victoria and South Australia than in New South Wales (Figure 2).

Figure 2 Number of electric and gas water heaters replaced by solar or heat-pump water heaters in New South Wales, Victoria and South Australia under the SRES[18]

Around half the stakeholders commenting on the issue supported this option, while a further three stakeholders noted the upfront cost of RET technologies remains prohibitively high even when taking the existing incentives into account.

Option 2 would see deeming periods under the ESS dovetail with decreasing incentives from the SRES. Conceptually, this matches the pace at which incentives are phased in under the ESS with the rate at which they are withdrawn from the SRES.

In the early years when the deeming period from the ESS is short and later years when the deeming period under the SRES approaches zero, it may not be economical for ACPs to operate under both schemes. As declining deeming periods do not apply under the LRET, this option would not allow the ESS to support bioenergy technologies or larger solar irrigation pumps. Around half of stakeholder submissions supported this option.

Option 3 would require a system monitoring certificate creation across the different schemes, adding to the administrative complexity of the ESS.

[18] Analysis undertaken by the Department using data provided by the Clean Energy Regulator (2020c).

ESS can complement BASIX requirements

BASIX sets requirements for water and energy usage for all new residential dwellings, as well as alterations and additions to dwellings that require development approval from council and cost $50,000 or more (NSW Government n.d. d). BASIX encourages the uptake of solar and heat-pump water heaters in new dwellings.

The requirement to meet BASIX energy targets encourages the uptake of solar and heat-pump water heaters in new dwellings. Installations of hot water systems to comply with BASIX energy targets are not eligible to create certificates under the ESS (NSW Government 2020c, p.5).

BASIX energy targets do not apply to the replacement of a water heater, either as a standalone upgrade or part of a major renovation. The ESS can therefore complement BASIX by providing incentives for solar and heat-pump water heaters that replace electric or gas hot water systems in existing dwellings.

This approach would align with the VEU program, which only provides incentives for solar and heat-pump water heaters that replace existing electric and gas hot water systems (ESC Victoria 2018b, pp.8–12).

ESS can continue to complement the ERF by providing an alternative pathway for energy savings projects

Energy efficiency projects claim an incentive under the ERF or the ESS. Projects under the ERF must not include any energy saving activity for which an incentive has been, or will be, claimed under a state-based scheme such as the ESS.[19]

The ESS complements the ERF by providing an alternative pathway for energy savings projects (NSW Government 2020b, p.13). The ESS can continue to complement the ERF by providing an alternative pathway to encourage the uptake of energy saving technologies, including bioenergy projects.

7.2.4 Final position

The Government will expand the ESS to provide incentives for energy saving technologies also eligible under the RET, including:

- solar and heat-pump water heaters
- solar irrigation systems
- bioenergy technologies.

The incentive will be in addition to that available from the SRES and the LRET, with the ESS incentive calculated using the full deeming period as specified in the ESS Rule.

To ensure complementarity with BASIX, incentives for solar and heat-pump water heaters in homes will be available where these replace existing electric or gas hot water systems.

The ESS will complement the ERF by providing an alternative pathway to encourage energy savings projects, including bioenergy projects. Projects claiming incentives through the ESS will not be eligible under the ERF.

[19] See clause 21 of the Commonwealth Carbon Credits (Carbon Farming Initiative) Rule 2015.

7.3 Eligible sources of fuels

Fuels may come from different sources. Feedstock for bioenergy projects can be sourced from inside or outside an activity or site boundary. Alternatively, renewable energy can also be delivered through the electricity or gas distribution network. The Government has considered where alternative fuels can be sourced from, as this influences which fuel switching activities will be eligible under the scheme.

Final position

The Government will adopt Option 3 and expand the scheme to include fuel switching activities that source alternative fuels on site or off site (but not via the electricity or gas network).

All bioenergy projects must comply with regulatory requirements to protect the environment and human health.

7.3.1 Policy issue and options

Feedstock for bioenergy projects can be sourced from inside or outside an activity or site boundary. Renewable energy can also be delivered through the electricity or gas distribution network. Where alternative fuels can be sourced from influences which activities will be eligible under the scheme.

Option 1: **Fuel sourced from within the same production process,** where non-renewable energy must be displaced using waste by-products within a single production process.

Option 2: **Fuel sourced on site,** where fuels displacing non-renewable energy can be sourced across different production processes within the site boundary.

Option 3: **Fuel sourced on site or off site,** where fuels to displace non-renewable energy consumption can be sourced within the site boundary or off site (but not via the electricity or gas network).

Option 4: **Fuel sourced on site, off site or from the electricity or gas network,** where fuels can be sourced within the site boundary, off site, or from the electricity or gas network.

Box 2 provides an example of each of these options.

Box 2 – Examples of fuel switching projects

Example 1: Fuel sourced from within the same production process

Natalie is an engineer for a large paper and pulp manufacturing facility. During a routine inspection of the site's equipment, she identifies an opportunity to use black liquor (a waste by-product) generated during pulp processing to displace some of the site's electricity demand.

Based on Natalie's advice, the facility installs a new recovery boiler to burn the black liquor. The heat from the boiler produces high-pressure steam, which is used to generate electricity in a turbine. This in turn displaces grid-supplied electricity required for pulp processing, lowering the site's energy bill and demand on the grid.

Example 2: Fuel sourced on site

Stanley owns a farm with 8000 pigs, which produce a significant amount of piggery waste. Stanley is interested in switching energy sources to reduce his operating costs.

After engaging a consultant and undertaking a site assessment, Stanley decides to invest in a covered anaerobic pond and cogeneration unit. The new system converts methane captured from the site's piggery waste into biogas, which is then used to generate electricity. It also produces heat that Stanley can use for his farrowing and weaning sheds.

The covered anaerobic pond and cogeneration unit allow Stanley to operate independently from the grid for most of the year, significantly reducing his energy bill and total operating costs.

Example 3: Fuel sourced off site

Jiang is a poultry farmer in regional New South Wales. His farm does not have access to the gas network so he must regularly order tanks of LPG to fuel his gas boiler.

Due to volatile gas prices, Jiang decides to replace his boiler with a new biomass boiler. He is able to fuel the new boiler using poultry litter sourced on site, as well as crop residues and surplus straw purchased from nearby farms at a cheaper, more stable price than LPG.

Example 4: Fuel sourced through the grid or distribution network

Amara is an operations manager for a large food manufacturing company, which is seeking to reduce its carbon footprint. This prompts Amara to explore ways to transition the company toward renewable energy.

Amara researches accredited renewable energy suppliers in New South Wales and finds a retailer that injects biogas from a landfill into the gas network. She decides to switch retailers and enters into a contract to purchase the biogas sourced from the landfill.

7.3.2 Stakeholder submissions

The six stakeholders that commented on this issue had a range of views on where fuels should be sourced from for fuel switching activities.

Nature Conservation Council of NSW argued biomass derived from native forests should not be eligible. Two stakeholders suggested providing incentives for switching to biogas delivered through the gas network, while two stakeholders cautioned against this.

IPART supported fuel switching where this occurs within the same industrial process.

Table 15 Summary of submissions on eligible sources of fuels

Stakeholder group	Summary
Advocacy groups	Nature Conservation Council of NSW argued biomass derived from native forests should not be eligible. PIAC argued switching to hydrogen or biogas delivered through the gas network should not be included. Bioenergy Australia suggested biogas delivered through the gas network could make a significant contribution to the ESS, as well as support regional jobs in biogas production and reduce organic waste to landfill.
Energy service industry	369 Labs supported providing incentives to link biogas plants with residential energy users through retailer power-purchase agreements.
Large energy users	Brickworks Building Products stated the efficiency of their brick kilns is dependent on the specification of gas delivered via the network. Brickworks Building Products cautioned against activities that inject biogas or hydrogen into the network, suggesting this could impact the efficiency and operation of their manufacturing equipment.
Government agencies	IPART supported the ongoing allowance of fuel switching where this resulted in an energy efficiency improvement, such as displacing electricity or gas by using waste by-products from within the same industrial process.

7.3.3 Analysis of key issues

Expanding the ESS to include activities that source fuels from both on site or off site will maximise consumer choice and the available opportunity for fuel switching. Restricting eligible activities to those that use waste by-products sourced within the same production process or site would exclude a wide range of opportunities to save energy, lower energy bills and reduce demand on the grid.

The ESS helps households and businesses implement energy saving activities by upgrading, changing the usage or implementing other enhancements to end-user equipment. It is not a role of the scheme to encourage supply-side measures such as injecting biogas into the network.

All bioenergy projects will need to comply with regulatory requirements in place to protect the environmental values of New South Wales.

Allowing fuels to be sourced from off site maximises consumer choice

Expanding the ESS to allow fuel to be delivered from on site or off site (Option 3) would maximise consumer choice for fuel switching and could encourage innovation in new energy technologies.

Some facilities may wish to switch to biomass or biogas but have insufficient feedstock available on site, making the implementation of Option 2 challenging in practice. Allowing facilities to purchase feedstock would support the development of new business models for alternative energy sources and create more opportunities for sites to switch fuels.

IPART supported the inclusion of activities that displace electricity or non-renewable gas by using waste by-products from within the same production process (Option 1).

> IPART supports the ongoing allowance of fuel switching where this represents a true energy efficiency activity – for example, displacing gas or electricity by the use of waste gas, waste wood, and by-products like black liquor that have come from within the same industrial process. This is part of the production process so represents a true reduction in energy consumption. (IPART, scheme regulator)

Many opportunities to reduce energy consumption by using waste by-products do so across different production processes. Restricting eligible activities to those that use waste by-products sourced within the same production process would exclude a wide range of opportunities to save energy, lower energy bills and reduce demand on the grid. An example of this would be heating a poultry shed by burning crop residues or surplus straw in a biomass boiler.

The ESS helps households and businesses implement energy saving activities

Two stakeholders recommended expanding the scheme to include projects that inject biogas into the network as a means of delivering renewable gas to consumers across New South Wales (Option 4).

> The production of these cleaner fuels will provide external benefits to NSW that are especially important at this time... Utilising a certification scheme, biogas injected into the gas network in regional NSW can be supplied to the 1.4 million customers of the NSW gas network. (Bioenergy Australia, advocacy group)

The primary object of the ESS is to 'create a financial incentive to reduce the consumption of energy by encouraging energy saving activities'.[20] To meet this object, activities under the scheme must involve an upgrade, changed usage or other enhancement to end-user equipment (NSW Government 2020c, p.4). Incentivising the supply of renewable energy via the electricity grid or gas network does not result in an energy saving and therefore is not aligned with the primary object of the scheme.

Switching to an energy provider that delivers renewable energy into the network does not require such an upgrade, change in usage or enhancement. Sites that produce surplus amounts of energy may choose to feed this back into the grid. As the ESS encourages energy saving activities, the surplus energy fed into the grid would not be eligible for incentives under the scheme.

Further, one large natural gas user suggested activities injecting bioenergy and hydrogen into the gas network can have an adverse impact on the energy efficiency and operation of sensitive manufacturing equipment.

Bioenergy projects must comply with regulatory requirements

Without adequate controls, the burning of biomaterials can lead to a net increase in greenhouse gas emissions, adverse local air quality impacts and loss of biodiversity and other environmental values. In its submission, the Nature Conservation Council of NSW raised the adverse environmental impact of sourcing biomaterials from native forests.

In New South Wales, the collection and burning of biomaterials is regulated to protect environmental values, such as biodiversity and air quality.

[20] See Part 1, Schedule 4A of the ES Act.

To be eligible under the ESS, all projects must obtain appropriate licensing and comply with the regulatory requirements. For bioenergy projects these include, but are not limited to, the following:

- ***Protection of the Environment Operations Act 1997***, which sets the statutory framework for managing air quality in New South Wales and establishes the licensing scheme. The Act requires proponents of activities listed under Schedule 1 to obtain an environment protection licence establishing site specific air emissions limits. Scheduled activities include, for example, electricity generation, energy recovery, and waste disposal thermal treatment.
- **Protection of the Environment Operations (General) Regulation 2009**, which prohibits the use of native forest biomaterials in electricity generation, with exemptions for certain types of legally cleared native vegetation and waste.
- **Protection of the Environment Operations (Clean Air) Regulation 2010**, which sets air emission concentration standards for industrial and commercial activities.
- **Integrated Forestry Operations Approvals (IFOAs)**, which set out requirements for harvesting native timber within state forests, including establishing the timber volume caps and harvesting intensities that are permissible in each region. IFOAs include a requirement that harvesting operations must have a primary objective of producing high value products, such as flooring and construction timber, and operations cannot occur solely for producing biomaterial.
- **NSW Energy from Waste Policy Statement**, which sets out the policy framework and overarching criteria that apply to facilities in New South Wales proposing to thermally treat waste or waste-derived material for the recovery of energy.
- **NSW Environment Protection Authority's Eligible Waste Fuels Guidelines**, which define eligible waste fuels that may be thermally treated to recover energy in accordance with the NSW Energy from Waste Policy Statement.

The Government will consult stakeholders when developing the rules for fuel switching activities to ensure rigorous standards are in place to protect the environment and human health.

7.3.4 Final position

The Government will adopt Option 3 and expand the scheme to include fuel switching activities that source alternative fuels on site or off site (but not via the electricity or gas network).

All bioenergy projects must comply with regulatory requirements to protect the environment and human health.

7.4 Certificate conversion factors

The ESS uses certificate conversion factors to calculate ESCs for fuel switching activities between electricity and gas.

The certificate conversion factor for gas is based on the primary energy factor of natural gas relative to grid electricity in New South Wales.

Under the current ESS Rule, the definition of 'gas' includes biogas (NSW Government 2020c, p.68). This means no ESCs are generated by switching from natural gas to renewable gas. There are no certificate conversion factors for other fuels such as diesel.

Final position

The Government will retain the current electricity certificate conversion factor. Certificate conversion factors for the other fuels will be calculated based on their non-renewable primary energy factors relative to grid electricity in New South Wales. Table 17 sets out the final certificate conversion factors for each fuel.

The definition of gas will be amended in the ESS Rule to clearly define biogas as a unique fuel type.

The Government will review certificate conversion factors every five years or if the energy mix of the NSW electricity grid changes significantly.

7.4.1 Policy issue and options

Fuel switching can deliver significant bill savings for households and businesses that choose to implement such activities, but which are hindered by market barriers such as high upfront cost and bounded rationality.

The ESS uses certificate conversion factors to calculate the number of ESCs created by activities that reduce the consumption of electricity and gas. The certificates express energy savings in notional megawatt hours, which allows for the value of energy savings from different fuels to be compared.

Under the ESS Rule, the definition of 'gas' includes biogas (NSW Government 2020c, p.68). As a result, no ESCs are generated by projects that switch from non-renewable to renewable gases. There are no certificate conversion factors for other fuels such as diesel.

To provide an incentive for different fuel switching activities, the scheme needs to have a unique conversion factor for each eligible fuel type. In the Safeguard consultation paper, the Government considered differentiating between renewable and non-renewable energy options through a 'primary energy factor' and a 'non-renewable primary energy factor'.

7.4.2 Stakeholder submissions

Ten submissions commented on how energy savings should be counted for fuel switching activities. These stakeholders believed that the Government should consider units of energy saved and greenhouse gas emissions avoided when counting savings from fuel switching activities.

Table 16 Summary of submissions on counting energy savings from fuel switching activities

Stakeholder group	Summary
Energy service industry	Energy service industry stakeholders recommended that the process needs to be kept simple. ESIA recommended that all fuels be converted to a MWh equivalent and have an appropriate emissions factor.
Electricity retailers	AGL suggested a flexible certificate allocation based on their emissions abatement and fossil fuel offsets. ERM Power recommended that emissions reductions should be considered.

continued…

Stakeholder group	Summary
Electricity networks	Ausgrid encouraged the Government to review the ESS certificate conversion factors, seeking consultation, and also recommended conversion factors to account for the long-term transition of the electricity grid toward net zero emissions.
Government agencies	IPART recommended only the actual energy savings, and not the volume of fuel switched, should be counted. Waverley Council recommended the units of energy saved and tonnes of avoided greenhouse gas emissions should be considered.

7.4.3 Analysis of key issues

Fuel switching activities can reduce the consumption of non-renewable primary energy, delivering bill savings and improving reliability. Certificate conversion factors based on non-renewable primary energy recognise the value of saving non-renewable primary energy.

The current definition of 'gas' under the ESS includes biogas. To allow certificates to be created by switching from non-renewable to renewable gases, biogas needs to be recognised as a unique fuel type.

The certificate conversion factor for gas is based on primary energy

The current certificate conversion factor for gas is based on the primary energy factor of natural gas relative to grid electricity in New South Wales (NSW Government 2015b, p.23). Primary energy factors reflect the total amount of energy required for extracting, processing, compressing and transporting energy to where it is consumed (i.e. the end-use equipment).

The number of ESCs generated when switching from gas to electricity is calculated by subtracting the increase in electricity consumption from the gas savings, after multiplying them by their respective certificate conversion factors (NSW Government 2020c, p.8).[21]

The same approach will also be used when switching to other fuels.

Fuel switching activities deliver bill savings by reducing consumption of non-renewable primary energy

Biogas projects typically replace non-renewable gas at the same efficiency. Biomass projects could potentially use more energy because the efficiency of a biomass boiler is generally lower than that of a gas boiler (Energetics 2018, p.8).

By replacing non-renewable primary energy with renewable primary energy, these upgrades can deliver bill savings and reduce pressure on the electricity or gas network (see examples 1, 2 and 3 in Box 2 above).

Similarly, replacing electric or gas hot water systems with solar or heat-pump water heaters reduces consumption of non-renewable primary energy, reduces energy bills and can reduce pressure on the electricity or gas network. Switching from diesel to solar irrigation pumps also reduces consumption of non-renewable primary energy and operating costs.

[21] Under the ES Act, the current electricity and gas certificate conversion factors are 1.06 and 0.39 certificates per MWh, respectively.

Certificate conversion factors based on non-renewable primary energy recognise the value of fuel switching

Primary energy factors can be broken down into a renewable and non-renewable component (ISO 2017, p.94). These reflect the renewable and non-renewable energy required for extracting, processing, compressing and transporting energy to where it is consumed (i.e. the end-use equipment). Basing certificate conversion factors on non-renewable primary energy recognises the value of saving non-renewable primary energy.

The International Standard ISO 52000-1 sets out factors for primary and non-renewable primary energy (ISO 2017, p.94). Using the ISO default values:

- ensures that certificate conversion factors for different fuels are calculated on the same basis
- updates the certificate conversion factor for gas, increasing the incentive for reduced non-renewable gas consumption.

Technologies such as solar PV generally require little or no non-renewable energy to deliver the final energy to the end-use equipment. Therefore, these types of technologies can be assigned a non-renewable primary energy factor of zero.

Non-renewable energy such as electricity, diesel or petrol is often consumed to gather, process, store and transport biomaterials, and therefore has a non-renewable primary energy factor greater than zero.

Table 17 provides a comparison of certificate conversion factors using primary and non-renewable primary energy factors. Box 3 illustrates the impact of the number of ESCs created using each approach.

Table 17 Certificate conversion factors for each fuel type based on their primary and non-renewable primary energy factors[22]

	Primary energy		Non-renewable primary energy	
Fuel	Primary energy factor	Certificate conversion factor	Non-renewable primary energy factor	Certificate conversion factor
Electricity[23]	2.70	1.06	2.50	1.06
Natural gas and LPG (updated)	1.10	0.43	1.10	0.47
Diesel	1.10	0.43	1.10	0.47
Biogas	1.40	0.55	0.40	0.17
Biomass	1.20	0.47	0.20	0.08
Biofuels	1.50	0.59	0.50	0.21
Onsite renewables[24]	1.00	0.39	0	0

[22] Certificate conversion factors based on primary energy are calculated by dividing the electricity certificate conversion factor by the ratio of the primary energy factor of electricity to the primary energy factor of each fuel. The same method is used to calculate the certificate conversion factors based on non-renewable primary energy.

[23] Primary and non-renewable primary energy factor for grid electricity calculated by the Department using data from the Australian Energy Update (Department of Industry, Science, Energy and Resources 2019).

[24] Includes, but not limited to, solar PV electricity for irrigation pumps and green hydrogen generated on site.

Box 3 – Comparison of certificate conversion factors based on primary energy and non-renewable primary energy

Thomas is an engineer for a food manufacturer. As part of the company's goal to reduce energy bills, he decides to replace a gas boiler with a biomass boiler. The biomass boiler will be fuelled using sugarcane bagasse and rice husk from a nearby farm.

The new biomass boiler is expected to generate 120,000 MWh of thermal energy over its lifetime, displacing 100,000 MWh of natural gas sourced from the network.

Number of ESCs created using certificate conversion factors based on primary energy:

Number of certificates = (Gas savings x Gas certificate conversion factor)
– (Biomass consumption x Biomass certificate conversion factor)
= (100,000 x 0.43) – (120,000 x 0.47)
= –13,400

The project would not receive incentives under the ESS.

Number of ESCs created using certificate conversion factors based on non-renewable primary energy:

Number of certificates = (Gas savings x Gas certificate conversion factor)
– (Biomass consumption x Biomass certificate conversion factor)
= (100,000 x 0.47) – (120,000 x 0.08)
= 37,400

For this particular project, the certificate conversion factors based on non-renewable primary energy would generated 37,400 ESCs.

The Government will redefine biogas as a unique fuel under the ESS

Under the current ESS Rule, the definition of 'gas' includes biogas.[25] The same certificate conversion factor is applied to biogas and non-renewable gases, such as natural gas and LPG. As a result, projects that switch from non-renewable gas to biogas do not create any ESCs.

The Government will redefine 'gas' in the ESS Rule so that biogas is recognised as a unique fuel type.

7.4.4 Final position

The Government will retain the current electricity certificate conversion factor. Certificate conversion factors for the other fuels will be calculated based on their non-renewable primary energy factors relative to grid electricity in New South Wales. Table 18 sets out the final certificate conversion factors for each fuel.

[25] Under the current ESS Rule, the definition of 'gas' is any fuel listed in *National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Cth) Schedule 1 Part 2—Fuel combustion—gaseous fuels* or liquefied petroleum gas.

The definition of gas will be amended in the ESS Rule to clearly define biogas as a unique fuel type.

The Government will review certificate conversion factors every five years or if the energy mix of the NSW electricity grid changes significantly.

Table 18 Final certificate conversion factors for each fuel type

Fuel	Certificate conversion factor
Electricity	1.06
Natural gas and LPG	0.47
Diesel	0.47
Biogas	0.17
Biomass	0.08
Biofuels	0.21
Onsite renewables[26]	0

7.5 Extending scheme liability

In 2015, the Government added gas efficiency and fuel switching to the ESS. Scheme liability was retained on the electricity sector only as the potential for cross-subsidy was low.

The Safeguard consultation paper sought stakeholder views on whether and when the Government should consider extending scheme liability beyond the electricity sector.

Final position

The Government will retain scheme liability on the electricity sector only. The Government will monitor the scale of non-electricity activities and will consider extending liability beyond the electricity sector if cross-subsidy from the electricity sector to other sectors becomes material.

7.5.1 Policy issue and options

Liable acquisitions under the ESS include electricity sales only. In 2015, gas efficiency and fuel switching were added to the scheme without extending liability to the gas sector because (NSW Government 2015b, p.17):

- most primary energy users in New South Wales use electricity for at least 70% of their primary energy needs. Therefore, most gas users would still contribute to the ESS from the majority of their energy use and the potential cross-subsidy is modest
- the subsectors of the economy that rely on gas for most of their needs typically use it as a chemical input or in gas-fired power plants. As a result, these subsectors are more likely to have limited opportunities for gas savings and the potential for a cross-subsidy is minimal.

With the addition of new fuels and fuel switching activities, the scale of non-electricity savings delivered through the scheme may increase. The Safeguard consultation paper sought stakeholder views on whether and when the Government should consider extending scheme liability.

[26] Includes, but not limited to, solar PV electricity for irrigation pumps and green hydrogen generated on site.

7.5.2 Stakeholder submissions

Around one-quarter of the stakeholder submissions commented on scheme liability. Around half of the submissions supported extending scheme liability beyond the electricity sector. Some stakeholders stated that extending liability should be considered if cross-subsidy from electricity to gas customers occurs at a material level.

Table 19 Summary of submissions on ESS scheme liability

Stakeholder group	Summary
Advocacy groups	Bioenergy Australia did not support extending scheme liability to the gas sector. PIAC supported extending scheme liability to gas.
Energy service industry	ESIA did not state a preference on whether liability should be extended beyond the electricity sector but did recommend that the energy savings target be increased if liability is extended. ESIA also noted that extending scheme liability to the transport sector could provide significant energy saving opportunities.
Electricity retailers	Origin Energy did not support extending liability to the gas sector, suggesting that the added complexity to calculate liability including gas sales would deliver marginal benefit. AEC and EnergyAustralia supported extending liability to all types of energy suppliers, including petrol, diesel, and gas retailers and wholesalers if more fuel switching activities are brought into the scheme. Enova Energy and ERM Power supported extending scheme liability to the gas sector.
Large energy users	Brickworks Building Products did not support extending scheme liability beyond the electricity sector.
Government agencies	IPART suggested there would be value in extending scheme liability to gas retailers if it appeared that cross-subsidy was occurring at a material level. Waverley Council encouraged the Government to consider extending the scheme to the transport sector.

7.5.3 Analysis of key issues

Analysis of scheme liability shows:

- most energy users in New South Wales use electricity for most of their primary energy needs
- reduced consumption of electricity will continue delivering the majority of savings under the ESS.

Most energy users in New South Wales use electricity for most of their primary energy needs

In 2015, the Government added gas efficiency and fuel switching to the scheme without extending liability to the gas sector. This was because the potential cross-subsidy between electricity and gas users was modest at the time (NSW Government 2015b, p.23).

One stakeholder asserted that there would be value in extending scheme liability to gas retailers if cross-subsidy was now occurring at a material level.

> There would be value [to extend scheme liability to gas retailers] in circumstances where it appeared that cross-subsidy from electricity to gas consumers was occurring at a material level. (IPART, scheme regulator)

Liable electricity retailers pass on the costs of purchasing certificates to their customers through their electricity bills. Most energy users in New South Wales use electricity for at least 70% of their primary energy needs.[27] Consequently, most energy users contribute to the ESS through the majority of their primary energy use, which means the potential cross-subsidy between electricity and other energy users remains modest.

Reduced consumption of electricity will continue to deliver the majority of savings under the ESS

Two stakeholder submissions suggested that scheme liability should be expanded beyond the electricity sector because of the Government's intention to expand the scheme to include additional fuels and fuel switching activities.

> As the ESS contemplates broadening the efficiency embodied in fuel conversions of all types, we encourage the NSW Government to broaden the definition of liable entities to include all businesses involved in selling energy, irrespective of form. This would see petrol, diesel and gas retailers and wholesalers falling within the scheme. (EnergyAustralia, energy retailer)

Gas efficiency has accounted for 5% of energy savings delivered under the ESS since the scheme was expanded beyond electricity following the 2015 scheme review (IPART 2020, p.10). Expanding the scheme to include new fuels and fuel switching activities will create more opportunities for non-electricity savings.

Scheme liability may need to be extended beyond the electricity sector if non-electricity, or non-grid connected energy savings, increase significantly, resulting in electricity users subsidising a significant number of non-electricity efficiency upgrades.

7.5.4 Final position

The Government will retain scheme liability on the electricity sector only. The Government will monitor the scale of non-electricity activities and will consider extending liability beyond the electricity sector if necessary.

[27] Analysis by the Department using Energetics (2020).

Part C: Design of the Peak Demand Reduction Scheme

8. Scheme objectives

The NSW Electricity Strategy outlined the NSW Government's plan to introduce a certificate scheme to encourage dependable peak demand reduction, as part of the Energy Security Safeguard.

The object of the Safeguard is to improve the affordability, reliability and sustainability of energy through the creation of financial incentives that encourage 'energy activities', in this case peak demand reduction. While the Peak Demand Reduction Scheme (PDRS) will contribute to all three Safeguard objectives, its main focus is to improve reliability.

Final position

The Government will set the principal objective of the PDRS as the creation of financial incentives to reduce peak demand for energy by encouraging peak demand reduction activities.

Sub-objectives will reflect the three Safeguard objectives, with the main focus on improving reliability:

- main sub-objective: improve reliability by reducing NSW peak demand
- other sub-objectives:
  - improve affordability by placing downward pressure on NSW wholesale electricity prices
  - improve sustainability by increasing load flexibility.

8.1 Policy issue

The NSW Electricity Strategy announced the Government's plan to introduce a certificate scheme to encourage dependable peak demand reduction. Like the ESS, the scheme will require liable parties to purchase and surrender peak demand reduction certificates (PRCs).

The Strategy is the Government's plan for a reliable, affordable and sustainable electricity system that supports a growing economy. The strategy contains complementary actions, many of which contribute to all three objectives while having a greater focus on one or two of them.

This section considers the main focus for the PDRS, which will guide most other aspects of scheme design and performance.

8.2 Analysis of key issues

Because a shortfall in firm capacity is most likely to occur at times of peak demand, peak demand reduction plays a critical role in improving reliability. The scheme will focus on this objective.

The electricity system has become more dynamic over time. While demand is becoming variable, the nature of supply is also changing due to ageing power stations and increase in intermittent energy generation. As set out in the NSW Electricity Strategy, the Energy Security Safeguard and the Energy Security Target (EST) are two measures to avoid a shortfall in firm capacity, most likely to occur at times of peak demand.

In May 2020, the Government established the Energy Security Safeguard. Its objective is to improve the affordability, reliability and sustainability of energy through the creation of financial incentives that encourage 'energy activities'. For the PDRS, the 'activities' will be peak demand reduction activities.

Because a shortfall in firm capacity is most likely to occur at times of peak demand, peak demand reduction plays a critical role in improving reliability. This will be the main focus of the scheme. Where relevant, the design of the scheme will be aligned with the EST; for example, targets for the scheme will be based on the one-in-ten year peak demand forecast.

Peak demand reduction can also contribute to improving:

- affordability of electricity by reducing wholesale prices during peak periods
- sustainability of electricity by increasing load flexibility in response to variable renewable generation.

Because generation is deployed from the cheapest to the more expensive as demand rises, higher demand drives higher prices (AEMO 2020c). Hence reducing peak demand can put downward pressure on prices during peak periods; however, peak demand occurs for only a few hours each year so peak demand reduction is likely to have a more modest effect on prices than year-round energy savings. Further, price peaks can also be the result of generator or network outages so are a less predictable basis for designing a certificate scheme.

While the scheme's targets are designed to moderate the one-in-ten year maximum demand forecast, the capacity made available by the scheme can be deployed by other market mechanisms across multiple high demand events.

Rooftop solar presents opportunities for consumers and reduces greenhouse gas emissions; however, it is also contributing to a decline in minimum demand from parts of the electricity system. Low minimum demand can bring challenges to the electricity grid, such as voltage management and frequency control. Some types of demand reduction can shift demand from peak times to times of low demand; for example, controlled solar-battery systems.

While low demand is becoming a significant issue is some states, it has not yet become one in most of New South Wales. If this becomes a greater problem in the state, the Government will consider giving it greater priority at future statutory reviews.

8.3 Final position

The Government will set the principal objective of the PDRS as the creation of financial incentives to reduce the peak demand for energy by encouraging peak demand reduction activities.

Sub-objectives will reflect the three Safeguard objectives, with the main focus on improving reliability:

- main sub-objective: improve reliability by reducing NSW peak demand
- other sub-objectives:
    - improve affordability by placing downward pressure on NSW wholesale electricity prices
    - improve sustainability by increasing load flexibility.

9. Complementing national mechanisms

The Government consulted on the best ways for the PDRS to complement national mechanisms. The scheme can both complement existing mechanisms and prepare the NSW market for the demand side initiatives under the national post-2025 market design reforms.

Final position

The PDRS will complement national mechanisms by:

- paying for the ability to reduce peak demand ('capacity') while allowing other mechanisms to make operational payments
- not duplicating mandatory legal requirements and national dispatch mechanisms operated by the Australian Energy Market Operator (AEMO)
- including small customers by providing incentives for a broader range of peak demand reduction activities
- considering the post-2025 market design in statutory reviews of the scheme.

9.1 Policy issue and options

The consultation paper outlined the national mechanisms contributing to peak demand reduction. The main option proposed to complement national mechanisms was that the PDRS would pay for capacity, allowing other mechanisms to pay when demand response is used or the stored capacity is discharged.

9.2 Stakeholder submissions

Sixteen stakeholders commented on the ways the scheme could complement national mechanisms, including 11 that supported this approach. Three stakeholders did not support a state-based scheme. Suggestions from stakeholders included focusing on the residential sector, sufficiently incentivising peak demand reduction activities, allowing participants to access revenue streams from different schemes, and being adaptable to proposed changes in the national regulatory framework.

Table 20 Summary of submissions on complementing national schemes

Stakeholder group	Summary
Advocacy groups	Business NSW and PIAC supported the scheme complementing the AEMC Wholesale Demand Response Mechanism (WDRM) with PIAC highlighting the opportunity to reach residential households. PIAC suggested the scheme exclude liable parties from having contracts to provide similar demand responses under two different schemes. It noted the scheme design should also provide lessons for future reforms.
Energy service industry	Enel X and Tesla recommended the scheme allow value stacking with national schemes to further incentivise reducing peak demand. Enel X noted the need for flexibility in the scheme to accommodate changes in the national market. It also highlighted the PDRS will lower the barriers to participation, which will provide a kick-start to WDRM. Tesla supported the proposed approach of complementing national schemes and suggested capacity payments needed to be sufficiently high to incentivise the uptake of beneficial assets such as batteries.

continued…

Stakeholder group	Summary
Energy service industry, continued	ESIA supported the scheme complementing the Australian Energy Regulator's Demand Management Incentive Scheme (DMIS) but noted the initiative to date has not been effective in supporting peak demand reduction in New South Wales. Knauf Insulation recommended the scheme be run in parallel with broader national emission reduction targets. Mondo recommended that the PDRS should complement price signals within the NEM. Solar SG proposed the scheme design be compatible with complementary schemes (such as Frequency Control Ancillary Services) to allow participants access to more than one revenue stream. Clean Energy Council (CEC) agreed with the principle that the scheme is not trying to duplicate arrangements with customers.
Electricity retailers	AEC recommended contracts be managed by participants' electricity retailers. AEC and AGL noted networks may curtail loads outside the scheme. The PDRS should clarify if these activities are also eligible under the PDRS. ERM Power recognised differences between the scheme and the WDRM. It recommended the scheme be harmonised with the Victorian Energy Upgrades program. Origin Energy supported a separate Peak Demand Reduction Scheme to allow its distinct policy objectives to be more effectively pursued. Alinta Energy believed price signals under the NEM effectively reduce peak demand.
Electricity networks	Ausgrid noted an opportunity for the scheme to complement the WDRM by facilitating the participation of residential and small to medium enterprises in peak demand reduction. It also noted the scheme would contribute to industry understanding as two-sided market options were considered. Endeavour Energy noted by complementing other national programs and mechanisms, the PDRS will ensure that customers can benefit from any reduction in the need for and cost of network investment.
Large energy users	EUAA and BlueScope Steel did not support the PDRS, citing duplication with the proposed WDRM. EUAA believed this could add to consumer costs. BlueScope Steel noted there are network schemes at the local level. It recommended that the Government monitors the effectiveness of the WDRM once implemented before introducing the PDRS.
Government agencies	IPART supported complementing national schemes, suggesting the PDRS be rolled up to a national scheme, if a national scheme is introduced. AEMC noted its work on two-sided market design to transition to the future energy market, facilitating small customer involvement in demand response opportunities. It agreed the PDRS could support the WDRM.

9.3 Analysis of key issues

The PDRS can complement national mechanisms by:

- providing dependable payments based on available capacity, which add to irregular dispatch payments in response to peak events
- offering incentives to all energy users from large to small and for a broader set of eligible activities.

Scheme reviews will consider post-2025 market design.

9.3.1 Scheme will complement national mechanisms by encouraging dependable peak demand reduction capacity

Many stakeholders, including advocacy groups, energy management companies and their peak bodies, and some electricity retailers supported the introduction of a state-based scheme for peak demand reduction.

> Origin considers the current NSW Energy Savings Scheme (ESS) to be relatively well designed and managed and supports its extension. We also support demand response activities being contained in a separate scheme as good policy design. This will allow for similar but distinct policy objectives to be pursued in a more effective manner. (Origin Energy, energy retailer)

BlueScope Steel, Alinta Energy and large energy user peak body EUAA did not see a need for the PDRS, given developments in the NEM (including the introduction of the WDRM).

Irregular payments in response to peak events alone may not be enough to incentivise deployment of significant demand response capacity. Capacity-based markets provide reasonably certain availability payments rather than uncertain curtailment payments (Brattle Group 2015, p.47). By providing dependable payments based on available capacity, the PDRS can provide an additional, complementary incentive. This was recognised by several stakeholders, including the AEMC.

> The peak demand reduction scheme could complement the wholesale demand response mechanism and provide additional incentives to consumers and demand response service providers (DRSPs) to provide wholesale demand response. (AEMC, energy market body)

The Government will not duplicate national dispatch mechanisms operated by AEMO. Rather it will provide incentives to make peak demand reduction capacity available to the market. For demand response activities, the PDRS rules will specify how activities will demonstrate they are dispatchable (see section 11 on evidence requirements).

Certain peak demand reduction activities are undertaken to meet mandatory legal requirements. Examples include AEMO's Reliability and Emergency Reserve Trader (RERT), the Retailer Reliability Obligation (RRO) and the demand response capability requirements for certain appliances. These activities will not be eligible under the PDRS.

As noted by AEC and Ausgrid, distribution network businesses and energy users may have agreements outside of the PDRS to reduce demand at peak times. Demand reduction capacity related to these agreements may not be eligible under the PDRS, depending on the terms of these agreements.

9.3.2 The scheme will include small customers

By providing incentives for peak demand saving, response and shifting, the PDRS covers a broader range of activities than the WDRM. In contrast to the WDRM, which includes large energy users only (AEMC 2020, p.iii), the PDRS will offer incentives to energy users of any size. The potential benefits of the PDRS for households and small businesses were recognised by several stakeholders, including PIAC and Business NSW.

9.3.3 Scheme reviews will consider post-2025 market design

The Energy Security Board (ESB) is considering a suite of electricity market reforms under its post-2025 market design program (ESB 2020); see Box 4 for details.

One element of the post-2025 reforms is the two-sided market, which will provide a framework for valuing demand side participation such as dispatch of demand response. By supporting investment in peak demand reduction capacity, the PDRS can help energy market participants prepare for a two-sided market.

Most elements of the post-2025 market design are still being developed. The Government will consider the final design of the post-2025 market in rule development and statutory reviews of the PDRS.

Like the ESS, the PDRS will include a provision to terminate the scheme if a national scheme with the same outcomes is established.

Box 4 – Post-2025 market design

The ESB released a consultation paper on design of the post-2025 market in September 2020 (ESB 2020). This included initiatives to address the following challenges in the NEM:

- meeting consumer needs
- managing variability and uncertainty
- need for capacity replacement
- valuing demand flexibility and integrating distributed energy resources (DER).

The following initiatives are relevant to the PDRS.

The **Resource Adequacy Mechanisms** initiative considers whether the current NEM design will deliver adequate resources at lowest cost to consumers. Reform options include:

- strengthening of the Retailer Reliability Obligation, requiring retailers to hold qualifying contracts to meet the forecast shortfall for a ‘one-in-two year’ peak demand event
- introduction of a decentralised capacity market, requiring retailers to produce capacity to meet reliability obligations
- establishment of an operating reserve mechanism to establish a service-based operating reserve market.

The **Scheduling and Ahead Mechanisms** initiative considers establishment of new markets to coordinate the delivery of energy and essential services, including energy storage, demand response and DER.

The **Two-Sided Markets** and **Valuing Demand Flexibility and Integrating Distributed Energy Resources** initiatives promote greater consumer participation in the NEM. Options include:

- facilitating and better valuing flexible demand and DER in the NEM
- establishing a consumer protection framework
- developing participation requirements, as well as compliance and performance arrangements that make it simple for DER to provide services into all markets.

9.4 Final position

The PDRS will complement national mechanisms by:

- paying for the ability to reduce peak demand ('capacity') while allowing other mechanisms to make operational payments
- not duplicating mandatory legal requirements and national dispatch mechanisms operated by AEMO
- including small customers by providing incentives for a broader range of peak demand reduction activities
- considering the post-2025 market design in statutory reviews of the scheme.

10. Scheme commencement

The Government intends to introduce the PDRS, or some of its elements, as soon as possible. The consultation paper invited stakeholder feedback on:

- a reasonable start date for the scheme
- elements of the scheme that can be brought forward, such as the early creation of certificates ahead of surrendering requirements
- support needed by industry to prepare for the introduction of the scheme.

Final position

Scheme liability and certificate creation will commence on 1 November 2022 for the 2022–23 compliance period. Accreditation of service providers can commence following gazettal of the scheme rule in the middle of 2022.

The Government will collaborate with industry on the detailed scheme design and provide a range of supports for industry, including:

- training and information sessions on the scheme
- pilots and trials of scheme elements, including measurement and verification of peak demand reduction from certain technologies
- promotion of the scheme to energy users
- financial and technical support for energy users to reduce costs of participation.

The Government will shortlist methods from the ESS Rule that can be adapted into methods for calculating peak demand savings under the PDRS. These will form the first version of the PDRS Rule and operate in parallel with the ESS Rule. Activities using these methods and implemented from the commencement date of the PDRS Rule may create certificates once the PDRS commences in 2022.

For other activities, prospective certificate providers will be able to submit a registration of intent. Subject to assessment, these projects will be eligible to generate PRCs once certificate creation commences.

10.1 Policy issue and options

The Government intends to introduce the PDRS, or some of its elements, as soon as possible.

The Safeguard consultation paper sought feedback on a reasonable start date for the scheme that would balance industry needs to prepare for the introduction of the scheme with the broader benefits that would flow from timely implementation.

The consultation paper also sought feedback on elements of the scheme that can be brought forward, and any support industry might need to prepare for the introduction of the scheme.

10.2 Stakeholder submissions

Twenty-two stakeholders commented on a preferred commencement date for the PDRS. Advocacy groups and the energy service industry supported an early commencement date.

Others, including electricity retailers, Ausgrid and some large energy users highlighted the need for further consultation and sought more information about the scheme. IPART pointed out it will need time to ensure the necessary framework and systems, including IT systems, are in place before scheme commencement.

Four stakeholders suggested elements of the scheme that could be brought forward, including eligibility for the scheme and early creation of certificates.

Eleven stakeholders commented on industry support needed to prepare for the scheme's introduction. Key themes were collaboration and information sharing before scheme commencement, training and information sessions, promotion of the scheme, pilots and trials, and financial and technical support to reduce participation costs.

Table 21 Summary of submissions on PDRS commencement

Stakeholder group	Summary
Advocacy groups	PIAC and the Nature Conservation Council of NSW supported the PDRS commencing as soon as possible, citing the environmental and economic benefits this would provide. PIAC also noted other benefits such as accelerating technological advances. National Irrigators' Council supported introducing the scheme early, highlighting the need for the scheme design to be clear, consistent and simple. PIAC sought promotion of the scheme to ensure quick uptake, highlighted the need to reach participants who are disadvantaged or vulnerable, and supported faster accreditation of social enterprises.
Energy service industry	EEC, ESIA, Tesla, Knauf Insulation, Ecovantage, Energy Conservation and Solar SG favoured early commencement of the scheme, believing this would generate economic benefits, bringing forward impacts and cost savings for customers. Enel X suggested the scheme should be implemented by the time the WDRM commences in October 2021, and no later than April 2023 when Liddell is scheduled to close. ESIA suggested eligibility for the scheme could start earlier than liabilities for activities with existing methodologies under the ESS. ESIA and Ecovantage highlighted the need for data and data capture methods to be more transparent. EEC asserted that industry will need to be consulted and provided with guidance to prepare for the scheme commencing. ESIA and Energy Conservation sought further consultation with industry on scheme design. EEC suggested funds to trial energy management upgrades. Solar SG suggested a pilot trial of the scheme to prove the business model.

Stakeholder group	Summary
Electricity retailers	AGL and EnergyAustralia highlighted the need for adequate time before commencement due to the scheme's complexity. Origin Energy supported 1 July 2022 as a feasible start date. AGL believed a commencement date in 2023, 2024 or later, was reasonable. EnergyAustralia recommended the commencement of the scheme follow implementation of changes to the ESS and completion of the 'Five-Minute Settlement Rules'. It noted due to the complexity of the PDRS, participants may need time to prepare. It requested further consultation on detailed design of the PDRS. AGL supported early creation of certificates to provide liquidity to the market. AEC, AGL and ERM Power noted industry needed to be sufficiently informed to prepare for the scheme and to ensure uptake. Origin Energy supported early creation of certificates if there are credible calculation methods in place. AEC sought further details of the cost–benefit analysis of the PDRS. It requested the Government conduct a trial of the PDRS so its costs and benefits can be assessed.
Electricity networks	Ausgrid noted the need for more information before commenting on a commencement date, suggesting a phased launch to allow the market to mature and time for appropriate reporting systems to be developed.
Large energy users	EUAA recommended deferring introduction of the PDRS until at least 2024, to determine the effectiveness of the WDRM. Brickworks Building Products sought active engagement with large electricity consumers on the scheme's opportunities, including information sessions. It also sought a focus on minimising project accreditation costs. Brickworks Building Products suggested further analysis of the impacts of the scheme on large energy users and a review of large user exemptions prior to commencement. BlueScope Steel recommended that the Government monitors the effectiveness of the WDRM once implemented, before considering introducing the PDRS.
Government agencies	IPART noted that it is the proposed administrator and regulator of the new scheme. It requested collaboration and co-design to determine a commencement date and detailed scheme design. IPART highlighted the need to have the necessary frameworks, including IT, rules and compliance, in place before scheme commencement.

10.3 Analysis of key issues

The PDRS can support economic recovery following the COVD-19 pandemic, as projects supported under the scheme can generate economic activity and jobs. Households and businesses implementing projects under the scheme will also benefit from lower electricity bills.

Advocacy groups and the energy service industry supported the scheme commencing soon. Most stakeholders highlighted the need for detailed design, including:

- consultation on calculation methods and technical guidance
- interaction with national programs such as the WDRM and five-minute settlement under the NEM
- frameworks to support scheme administration and regulation.

Some retailers and industry representatives advocated certificate creation commencing ahead of scheme liability, highlighting the need to ensure a sufficient supply of certificates to meet liability.

Stakeholders made a range of suggestions on supports industry needs to prepare for the scheme, including:

- training and information
- promotion of the scheme to ensure participation of vulnerable and disadvantaged households
- pilots and trials to support certificate providers
- fast-tracking of demand saving activities that are also eligible under the ESS.

10.3.1 The PDRS can support economic recovery following the COVID-19 pandemic

Energy and peak demand savings projects supported by the Safeguard can generate significant economic activity and jobs, particularly in small to medium sized enterprises and regional areas. The ESS is already estimated to support more than 1600 jobs in New South Wales (EECCA 2017, p.25). Stakeholders also recognised the potential of the PDRS to create jobs and boost investment.

> [The scheme] can be used as a mechanism to boost employment and help stimulate the economy following the COVID-19 pandemic recession. (PIAC, advocacy group)

The scheme will also provide bill savings for households and businesses in New South Wales.

> Energy bills continue to be a high concern for NSW households…. The Safeguard provides ways to alleviate this cost of living pressure by providing households with ways to reduce their energy bills. (PIAC, advocacy group)

> …would support the implementation of initiatives for demand reduction and fuel switching activities as soon as possible. Both initiatives offer the potential for benefit for both emission and cost reduction for farm businesses. (National Irrigators' Council, advocacy group)

Modelling conducted by the Department shows the scheme will lower electricity bills by $1.2 billion for households and businesses choosing to implement peak demand reduction activities under the scheme.[28]

[28] Discounted using a discount rate of 7%. Electricity bill saving calculation is based on activities that reduce electricity consumption or shift usage to off-peak periods when electricity is cheaper. Customers who participate in peak demand response activities may also be eligible for dispatch payments from other sources such as the WDRM or energy retailer incentive payments. These dispatch payments are not included in the bill saving estimate.

10.3.2 Some stakeholders supported early commencement, most called for detailed design

Recognising the benefits of the scheme, ESIA recommended the scheme commence in 2021. Other advocacy groups and industry representatives recommended the PDRS commence as soon as possible.

> The speed that the peak demand reduction scheme can be introduced will be limited by the speed that the Government of NSW can design and introduce the peak reduction scheme, rather than the speed for industry to ramp up to deliver the scheme…The earlier that energy management companies can start to manage demand, the earlier that energy management can ramp to support economic recover[y]. (EEC, peak body representing energy service industry)

> Farm businesses are making decisions about their energy costs now, and the soon[er] any incentive to move to cleaner alternatives or to reduce peak demand can be introduced the better. (National Irrigators' Council, advocacy group)

Submissions from industry representatives and certificate creators noted that calculation methods and technical guidance must be developed in consultation with industry.

> Industry must be involved in the development of the methods, whether Default Factor or M&V or otherwise. Methods must be intuitive and viable in their real-world implementations, or the market will respond with no uptake. (Energy Conservation, energy service industry)

Electricity retailers requested further explanation or consultation on detailed design.

> In order to prepare for the introduction of the scheme, industry will require detailed and clear explanations of how the new activities and regulations will work, well ahead of introduction, so that we can be across compliance before the new scheme starts. (AGL, energy retailer)

Origin Energy suggested the scheme could commence in July 2022 while AGL suggested 2023–24 or later. EnergyAustralia suggested due to its complexity, the commencement of the PDRS should be delayed until the NEM has moved from half-hourly to five-minute intervals.[29]

Large energy users and some retailers requested further, detailed cost–benefit analysis of the scheme, including interaction with the WDRM and impacts for large energy users.

Section 9 discusses how the PDRS complements the WDRM, section 11.3.1 considers the scheme's relationship to five-minute settlement, while section 12.3.2 and Appendix A provide further details on cost–benefit analysis.

IPART highlighted the need to have the necessary frameworks in place to support scheme administration and regulation. These include:

- rules to support the different elements of the scheme such as accreditation of certificate providers
- a compliance framework to ensure appropriate creation of certificates
- an integrated IT system covering both the ESS and the PDRS.

As the PDRS will have financial and regulatory impacts on liable parties, the Government is committed to providing at least 12 months' notice before liability commences. This is consistent with the notice period for changes to the ESS target.

[29] These intervals are used by AEMO to match demand with supply as needed. AEMO uses this system to determine which generators are dispatched and the price these generators receive for their services.

10.3.3 Stakeholders made suggestions on supports industry needs to prepare for the scheme

The consultation paper sought feedback on supports needed by industry to prepare for the introduction of the scheme. Supports requested by stakeholders include:

- training and information sessions for energy users and the energy service industry, covering opportunities for peak demand reduction as well as requirements under the scheme
- promotion of the scheme in collaboration with community organisations to ensure participation of vulnerable and disadvantaged households
- pilots and trials to help certificate providers develop business models and improve risk management
- fast-tracking of demand saving activities using existing ESS methodologies
- programs that enable third party organisations to facilitate demand savings.

Some retailers and industry representatives advocated certificate creation commencing ahead of scheme liability, highlighting the need to ensure a sufficient supply of certificates to meet liability.

> AGL's view is that certificates will need to have the ability to be created early, well in advance of the retailers' liability commencing, to provide some liquidity in the spot market. (AGL, energy retailer)

When the Government created the ESS, it allowed early commencement of activities which then were eligible to create certificates from the start date of the scheme. The PDRS will follow a similar approach. It will recognise activities from the commencement date of the PDRS Rule, with certificate creation from these activities starting from the first compliance period.

10.4 Final position

Scheme liability and certificate creation will commence on 1 November 2022 for the 2022–23 compliance period. Accreditation of service providers can commence following gazettal of the scheme rule in the middle of 2022.

The Government will collaborate with industry on the detailed scheme design and provide a range of supports for industry, including:

- training and information sessions on the scheme
- pilots and trials of scheme elements, including measurement and verification of peak demand reduction from certain technologies
- promotion of the scheme to energy users
- financial and technical support for energy users to reduce costs of participation.

The Government will shortlist methods in the ESS Rule that can be adapted for eligible peak demand saving activities under the PDRS. These methods will form the first version of the PDRS rules. Activities using these methods and implemented from the commencement date of the PDRS rules may create certificates once the PDRS commences in 2022.

For other activities, prospective certificate providers will be able to submit a registration of intent. Subject to assessment, these projects will be eligible to generate PRCs once certificate creation commences.

11. Peak reduction certificates

Certificates for the PDRS will provide a common unit of measurement for both scheme targets and activities, like energy savings certificates (ESCs) for the ESS.

Final position

The certificate will reflect the scheme's main focus on reliability.

A PRC will represent 0.1 kW of peak demand reduction capacity averaged over one hour.

To create certificates, activities will have to be available to reduce peak demand during a defined peak period. Certificates will be identified with the compliance period in which the capacity is available.

ACPs will create certificates from activities using calculations that consider capacity, duration and the likelihood that the capacity is available when needed ('firmness'). Certificate creation will require evidence that capacity is available during the defined peak period.

To allow for compliance period identification, evidence requirements and validity limits, certificates will have a status of one of: dormant, pending, active, surrendered or expired.

11.1 Policy issue and options

As a certificate scheme, the PDRS will require liable parties to meet targets by surrendering certificates created from peak demand reduction activities. Hence, targets and activities must have a common unit of measurement.

Targets represent the need for peak demand reduction capacity, for the time that it is needed to improve reliability. The scheme's certificate will need to capture both these dimensions.

Certificates created from activities must also represent capacity, but only for the time it is available to meet the need. An individual activity can contribute to reducing demand during a peak event (and hence generate certificates) even if it only does so for a shorter period. To allow certificates to be traded, there must be a standard unit that allows them to be added to meet the target.

The consultation paper proposed four elements of PRC calculations: capacity, timing, duration and an availability factor.

11.2 Stakeholder submissions

Sixteen stakeholders commented on how the scheme's certificates could best capture capacity, timing, duration and the availability factor. Two stakeholders suggested certificate design should be linked to scheme objectives.

Eleven stakeholders commented on who would be best placed to manage the financial risk that capacity is not available when needed. Suggestions on who should manage the risk included the market, government, certificate providers and aggregators.

Several stakeholders recommended the PRCs be based on peak demand reduction performance, rather than estimated capacity.

Table 22 Summary of submissions on certificate elements

Stakeholder group	Summary
Advocacy groups	**Certificate elements** PIAC recommended the design of certificates be linked to the type of outcomes and scheme benefits, i.e. if the target is to: • produce network benefits, it supported reducing 10% Probability of Exceedance estimates of peak demand, and • reduce wholesale prices, it supported the targeting of high wholesale price events, irrespective of weather. **Managing uncertainty** PIAC highlighted that aggregation will help mitigate scheme uncertainty and risks. This, it believed, would mean the accuracy of individual certificates within an aggregated group was not of critical importance. PIAC suggested the Government was better placed to manage the risk than small energy consumers such as households. It recommended the scheme protect energy users from any harm from demand reductions on site. PIAC suggested mitigating risk with participants and liable parties through certificate design, certificate expiry, carry-forward allowances, aggregation and adjusting certificate values if outcomes were not met. In addition, PIAC believed certificate providers should be accountable for making demand reductions by assessing realised demand.
Energy service industry	**Certificate elements** ESIA and Ecovantage recommended the scheme focus on 5–9pm (ESIA) or 6–9pm (Ecovantage) on hot summer days with adjustments if the timing of peak demand changed. Edge Electrons noted that accurate customer energy monitoring is critical through either smart meters or other measurement methods. Enel X agreed certificates should measure capacity in kW or MW and duration in 30-minute intervals like AEMO and other network businesses. It supported either a time-based trigger (with optional price-based requirements), or a spot price-based trigger, recognising the latter imposed more risks to certificate creators. **Managing uncertainty** Where certificates are based on expected performance, Enel X suggested the availability factor be based on demand reduction capability testing prior to the certificate being validated. Solar SG proposed certificates be generated based on performance rather than deeming. Tesla recommended the scheme rely on market-based signals and treat technologies based on their response time and notice period differentially. Ecovantage suggested the financial risk only applies to load switching/management as there is no risk associated with load reduction. It elaborated PRCs should cover only the cost of efficient infrastructure and that other market signals would ensure dispatch occurred. Ecovantage believed a contract with a demand response service provider is essential and that participants who also controlled peak gas and hydro generators may have a disincentive to dispatch peak demand reduction. continued…

Stakeholder group	Summary
Energy service industry, continued	Enel X believed certificate providers are best placed to manage the risk, consistent with other aggregator programs in the NEM. It suggested when appropriate, the risk could be shifted to energy consumers via contracts. It also suggested penalties on certificate providers when capacity is not available, proportionate to the degree of underperformance. Mondo suggested the wholesale energy market and its participants manage the risk. EEC suggested aggregators bear the risk for demand response activities. ESIA suggested the risk was primarily with non-permanent demand reduction activities. It suggested managing the risk by tying certificate duration with demand reduction contract periods. It also recommended the Government provides price signals for demand response for small customers given some aggregators profit from high wholesale prices.
Electricity retailers	AEC requested consultation on the scheme's design. Origin Energy supported a pragmatic approach to the scheme, balancing accuracy and simplicity. **Managing uncertainty** AEC recommended the scheme value actual peak demand reductions, rather than deemed reductions, which they considered to be less reliable. To support this, the AEC suggested trialling technologies, and then prioritising technologies with high firmness. AGL questioned how the scheme would deliver benefits when the focus is on capacity and not dispatch. It suggested a flexibility factor to allow for adjustments based on behavioural responses and load shifts due to technology. It also suggested the PDRS consider how different firmness in capacity can be treated. Alinta Energy highlighted the importance of accuracy when creating certificates. It sought a strong focus on modelling and trials to ensure the robustness of new technologies in relation to firmness, duration and delivered capacity. AEC and AGL suggested the market will allocate the risk through agreements and contracts. EnergyAustralia recommended that PRCs attached to a participation contract only be administered by a customer's incumbent electricity retailer. It believed this would reduce complexity, avoid imprecise assumptions and implementation delays. It recommended the PRCs should only be based on peak demand reduction performance, rather than assumed benefits of technologies that might not be realised.
Electricity networks	Ausgrid noted the complexities involved and recommended further consultation. **Managing uncertainty** Ausgrid suggested market participants in the NEM should manage the risk. It also noted there is a role for Government to ensure the market operates effectively and the reliability target is met.
Large energy users	Brickworks Building Products suggested the scheme not require a demand management contract between an end-user and a third party, just like the WDRM.

Stakeholder group	Summary
Government agencies	AEMC recommended a focus on the scheme's primary objective and the need for good scheme design. **Certificate elements** AEMC suggested different types of certificates if there were multiple objectives and having programs targeting specific times and locations where appropriate. **Managing uncertainty** IPART suggested certificates relate to actual peak demand reduction rather than capacity, unless the capacity is backed by a guarantee of use when needed. It noted that historical nameplate capacity may not be a reliable indication for future performance of the equipment.

11.3 Analysis of key issues

The PRC should reflect the scheme's main objective by measuring peak demand reduction capacity at peak periods.

To provide certainty for certificate providers and energy users, the scheme will specify a fixed peak period when peak demand reduction capacity must be available. Because peak demand is time specific, certificates should reflect that capacity needs to be available in a specific compliance period.

Several stakeholders noted the risk of peak demand reduction capacity not being available during peak events. The framework for calculating certificates needs to account for the likelihood that capacity is available. Evidence requirements will need to balance the risk of capacity not being available and the cost of measurement and verification.

11.3.1 Certificates will reflect the scheme's reliability objective

PRCs should reflect the scheme's objectives. This was recognised by stakeholders in their submissions.

> The design of certificates should be dependent on the types of outcomes and benefits sought by the scheme. (PIAC, advocacy group)
>
> It will be important to focus on the primary objective of the scheme in designing the scheme's certificate and managing the risk of non-delivery. Where there are multiple objectives, multiple types of certificates could be considered. (AEMC, energy market body)

As discussed in section 8, the main focus of the PDRS is to improve reliability. As reliability depends on having enough capacity when needed, the certificate will be expressed in capacity terms, i.e. megawatts (MW) or kilowatts (kW). To allow smaller activities to contribute to the scheme, certificates will be in the smaller unit, kW.

Certificates also need to reflect the time dimension of peak events. The time aspect of the certificate unit needs to allow short duration activities to be added up to cover the whole peak period.

The Government considered several options for this. One option proposed by Common Capital (2020a, p.67) uses five-minute measurement of demand reduction capacity 'because it is the standard time period for the NEM [and] most likely to align with the Wholesale Demand Response Mechanism and future two-sided market mechanisms…'. However, this option would burden the certificate registry with keeping track of nearly a billion certificates over the initial life of the scheme to 2030.[30]

[30] For the targets outlined in section 12 below.

Under a second option, a certificate could represent average demand reduction capacity over the whole peak period (Common Capital 2020a, p.143). The Government will define a fixed peak period for the purpose of activities (see section 11.3.2 below). However, any change to the peak period resulting from a future review would mean that certificates created after the change represent a different amount of peak demand reduction than before the change.

A third option is a fixed time unit independent of the peak period, such as an hour, half hour or two hours (Common Capital 2020a, p.66). This would keep the number of certificates more manageable for the registry. It would allow short duration activities to be added up, by using the same approach as the ESS to allow summation of implementations of an activity before rounding to the nearest whole number of certificates (NSW Government 2020c, p.8). This would ensure that the scheme can include activities for which each implementation creates a fraction of a certificate.

Of the possible fixed time units, one hour is the simplest and easiest to explain.

Hence, one PRC will represent 0.1 kW of peak demand reduction capacity averaged over one hour. A PRC represents the capacity made available by the scheme and is not equal to a kWh of energy saving, because some of the capacity will only be used if needed; for example, for peak demand response.

11.3.2 Certificate creation will need evidence of capacity, time and availability

Targets will be met with certificates created from peak demand reduction activities. To create certificates, activities will need evidence on the capacity they are making available and the time the capacity is available for.

Because activities are intended to help reduce peak demand, they need to be available when needed. This raises four issues:

1. When is peak demand reduction capacity needed within the year?
2. When is peak demand reduction capacity needed between years?
3. How will certificates account for the likelihood the capacity is available when needed?
4. How will activities demonstrate the capacity is available when needed?

These issues are covered below.

Activities can create certificates during a defined peak period

Although AEMO forecasts when maximum demand is likely to occur, there is uncertainty about when it will happen.

To provide certainty to certificate providers and energy users, stakeholders supported a fixed peak period for certificate creation.

> Certificates could be based on times when the flexible capacity is expected to be most useful. Peak demand periods are primarily driven by weather conditions and the time of day. Therefore, focusing on peak demand intervals during the summer peak season would be most likely to deliver on the objective of the scheme. (Enel X, energy service provider)

The Government will adopt this approach. This does not mean that each individual activity must reduce demand for the entire peak period. It simply indicates the window of time during which the activity must be available. The definition of a certificate as 0.1 kW averaged over an hour allows multiple activities available for shorter durations to be added together. For example, an air-conditioner set to reduce its demand by 0.1 kW for 10 minutes would create one sixth of a certificate for each time its demand can be reduced during the peak period. Certificates from multiple activities can be added up before being registered as a whole number of certificates.

The fixed peak period during which activities must be available will be based on the intervals in which demand is forecast to exceed the targeted reduction. This will be calculated based on AEMO's 2030 forecast system maximum demand by half-hour interval.[31]

Because annual maximum demand is forecast to continue to be in the hottest months, activities will need to be available from 1 November to 31 March.

Figure 3 illustrates this concept. The actual peak period is set in section 12 on scheme targets.

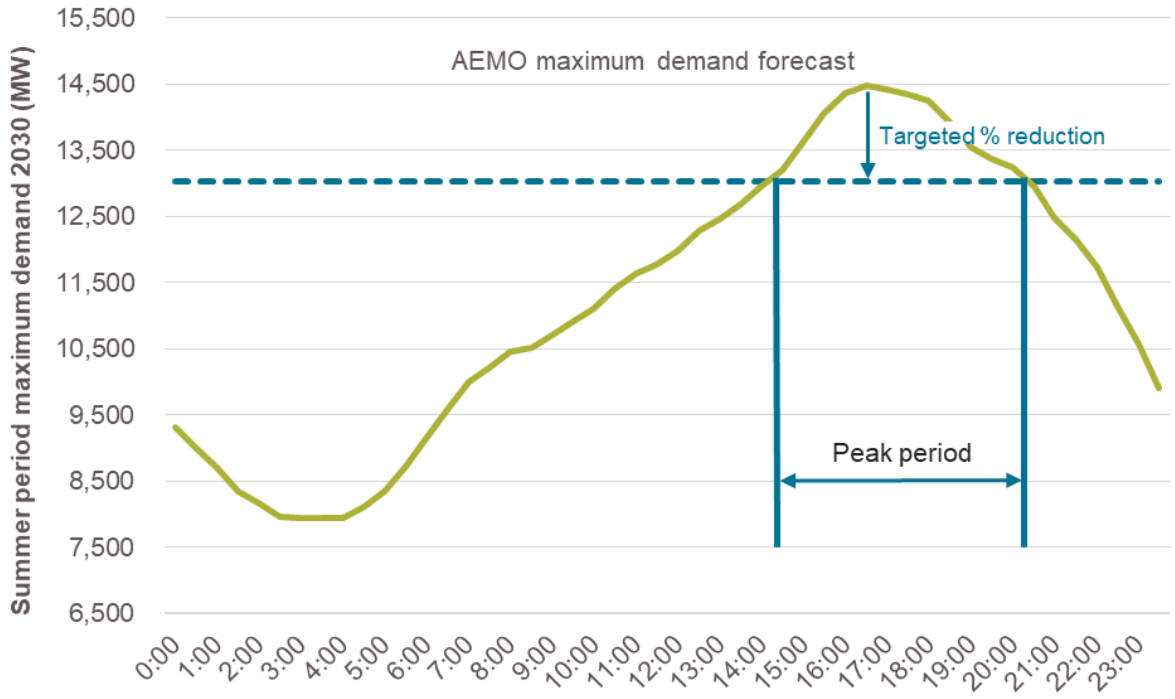

Figure 3 Defining the peak period

Certificates will identify the compliance period in which the capacity is available

Peak demand is time specific. Peak demand reduction is needed each year.

Common Capital (2020a, p.31) found that 'In each of the markets examined in the literature review, capacity is purchased for a specific delivery year.'

For this reason, each PRC will be identified with the compliance period in which the capacity is available, rather than when the activity initially takes place. For example, an eligible activity in 2022–23 may reduce peak demand by 0.2 kW averaged over an hour during peak periods for five compliance periods. The activity would be awarded two certificates per compliance period between 2022–23 and 2026–27.

This will not prevent certificates being created at the time of the activity ('forward creation') but they cannot be surrendered by a liable party until the compliance period identity of the certificate. In the example above, certificates identified with 2025–26 cannot be used until 2025–26 to meet the target in that period. This will allow a forward market in PRCs and reduce compliance costs for those activities for which forward creation is suitable.

The extent of forward creation for any particular activity will depend on the evidence required (covered below).

The length of validity and expiry of certificates is dealt with in section 14 on ensuring flexibility.

[31] Maximum demand for different intervals may occur on different days, not just on the day of annual maximum demand.

Certificates will account for the likelihood that capacity is available

The purpose of the scheme is to provide dependable capacity to reduce peak demand. Each certificate represents 0.1 kW of dependable capacity averaged over one hour during peak periods.

This does not mean that every activity must be 100% certain that its peak demand reduction capacity is available when needed.

As highlighted in a stakeholder submission:

> [A]ggregation will help mitigate uncertainty and reduce risks of the scheme. The accuracy of certificate issuing for individual participants within an aggregated group –particularly individual households – is not of critical importance and must not be a barrier to implementation. (PIAC, advocacy group)

Rather than requiring certainty, the scheme's rules will provide methods for activities and certificate calculations that account for the probability that capacity will be available when needed. This could be through 'firmness factors', measurement and verification or methods submitted by applicants for accreditation.

For example, an industrial activity that can reduce demand every second day would have a firmness factor of 0.5. This would account for the risk that the capacity is needed two days running. Likewise, a commercial activity that normally shuts down for a month in mid-summer (not because of the scheme) would have a firmness factor of 0.8 to reflect the fact that it is available four months out of five in the compliance period. Scheme rules will establish specific firmness factors, formulae and methods.

Certificates will need evidence that capacity is available when needed

The ESS requires evidence that activities save energy. Likewise, PDRS certificate providers will need to demonstrate that their peak demand reduction capacity is available when needed. Evidence requirements will need to balance the risk of capacity not being available and the cost of measurement and verification.

For example, in the case of peak demand response activities, some stakeholders suggested that certificates should be calculated based on dispatch, rather than the capacity itself.

> [T]he certificates should relate to an actual effect of reducing peak demand – not merely the capacity to do so. (IPART, scheme regulator)

As discussed in section 9, the PDRS is designed to complement national schemes such as the WDRM. Therefore, it will not duplicate the AEMO's dispatch system nor provide dispatch payments in addition to the financial incentives under the WDRM; however, dispatch of demand reduction may be used as evidence of capacity being made available.

Common Capital (2020a, pp.85–98) suggested ways to demonstrate availability, ranging from default factors to various types of evidence including:

- testing of dispatch
- must bid obligations
- contracts or licences
- measurement and verification.

The need to be flexible in the type of evidence required was highlighted by some stakeholders.

> The Peak Demand Reduction scheme should not require a demand management contract to exist between an end user and a third party. A large electricity user may become a direct AEMO participant under the Wholesale Demand Response Mechanism and does not need to enter a contract with a third party to provide demand response into the National Electricity Market. (Brickworks Building Products, large energy user)

> It is important for the peak demand reduction scheme to work in a complementary way with the wholesale demand response mechanism and the dispatch process in relation to demand response; for example, by supporting capacity that is capable of meeting the requirements of NEM processes. (AEMC, energy market body)

The PDRS rules will set out evidence requirements (or require the scheme administrator to issue evidence requirements). The Government (or scheme administrator) will consult on the rules or separate evidence requirements.

The rules will adopt a risk-based approach in determining the evidence required for each calculation method. In general, activities that do not require ongoing activation, such as most peak demand saving and some peak demand shifting activities, will have simpler requirements. Activities that may require ongoing activation, such as peak demand response and some peak demand shifting activities, will be subject to additional requirements.

An option proposed by Common Capital (2020a, p.93) is that some or all certificates should not be tradeable until after certificate providers have provided evidence of performance. This is particularly relevant to dynamic activities such as peak demand response. The rule and scheme administrator will take a risk-based approach to this.

11.3.3 Status of certificates

Peak reduction certificates will need to allow for different statuses because of compliance period identification, evidence requirements and validity limits (see section 14 on flexibility). PRCs will be one of:

- pending: created in advance, waiting for verification, cannot be traded or surrendered
- dormant: created in advance, waiting for their compliance period identity, can be traded, cannot be surrendered
- active: during the validity period for three years starting with the compliance period identity, can be traded and surrendered against liabilities for the periods for which they are valid
- surrendered: removed from the market after being used by a liable party to meet its target or after voluntary surrender
- expired: after three years from compliance period identity, can no longer be traded or surrendered.

The certificate registry will also need to allow for certificates to be withdrawn; for example, pending certificates that cannot be verified, or forfeited (e.g. as a result of action against non-compliance by an ACP).

11.4 Final position

The certificate will reflect the scheme's main focus on reliability.

A PRC will represent 0.1 kW of peak demand reduction capacity averaged over one hour.

To create certificates, activities will have to be available to reduce peak demand during a defined peak period. Certificates will be identified with the compliance period in which the capacity is available.

ACPs will create certificates from activities using calculations that consider capacity, duration and the likelihood that the capacity is available when needed ('firmness'). Certificate creation will require evidence that capacity is available during the defined peak period.

To allow for compliance period identification, evidence requirements and validity limits, certificates will have a status of one of: dormant, pending, active, surrendered or expired.

12. Setting the scheme target and penalty rates

The PDRS targets are the amount of peak demand reduction capacity the scheme aims to make available each compliance period. Targets need to balance the opportunity for peak demand reduction with the cost of implementation and deliver the greatest net economic benefit for the NSW economy.

The penalty rate helps ensure compliance by creating an incentive for liable parties to purchase and surrender certificates. It also acts as a 'safety valve', capping scheme costs at an economically efficient level.

Final position

The peak demand reduction target for the PDRS will commence at 0.5% for the 2022–23 compliance period, gradually increasing to 10% by 2029–30. The target will then remain at 10% until the end of the scheme in 2050. Exemptions will be considered when calculating individual targets for scheme participants. Table 26 sets out the scheme targets from 2022–23.

The peak period during which activities will be required to be available is from 2.30pm to 8.30pm AEST during the compliance period of 1 November to 31 March.[32]

The penalty rate for the PDRS will be set at $2.26 per certificate, subject to indexation.

The Government will review PDRS targets, penalty rates and the peak period for activities when certain conditions are met, in a similar way to the ESS. In addition, the Government will review targets if there is a forecast breach of the EST.

12.1 Policy issue and options

The PDRS targets are the amount of peak demand reduction capacity the scheme aims to make available each compliance period.

The Safeguard consultation paper presented a preliminary cost–benefit analysis of the scheme and sought stakeholder feedback on the size and cost of the peak demand reduction opportunity in New South Wales. In setting scheme targets, the Government considered three options (see section 12.3.2). As the PDRS will run until 2050, the Government will set scheme targets to 2050.

Scheme participants must pay a penalty if they fail to meet their peak demand reduction target for the compliance period (i.e. they have a shortfall), unless the shortfall is carried forward to the next period.

The consultation paper set out the role of penalty rates in ensuring compliance and capping scheme costs. The Government proposed adopting a similar approach to the ESS where liable parties that pay the penalty are not required to 'make good' the shortfall in certificates in the subsequent period.

12.2 Stakeholder submissions

Eight submissions commented on the size of the peak demand reduction opportunity available in New South Wales. ESIA suggested a target of 3000 MW reduction by 2030, while EEC suggested demand response could add at least 20% capacity to the electricity system. Other stakeholders identified specific opportunities for peak demand reduction.

[32] The NEM is operated on AEST (it does not adjust for daylight saving).

The consultation invited stakeholder feedback on penalty rates as part of the approach to scheme liability. Responses are set out in Table 23, with stakeholders focusing on other aspects of scheme liability.

Table 23 Summary of submissions on setting the scheme target

Stakeholder group	Summary
Advocacy groups	PIAC recommended reductions in long run marginal costs be considered as they may indicate costs that have been avoided due to the PDRS.
Energy service industry	EEC and ESIA suggested the scheme could be more ambitious than proposed in the consultation paper. EEC suggested demand reduction could provide at least 20% capacity in the energy market. ESIA suggested a 3000 MW reduction target by 2030. It noted that there are low-cost opportunities available in the residential and small business sectors. Knauf Insulation, Next Energy and Powerpal suggested specific opportunities for peak demand reduction. Knauf Insulation highlighted opportunities in retrofitted housing insulation, estimating retrofitted ceiling insulation could reduce peak demand in New South Wales by approximately 205 MW. Next Energy estimated there were 400,000 second or additional fridges in New South Wales, a large proportion of which were old. It believed replacing them with efficient models would reduce peak demand. Powerpal suggested there are opportunities with in-home display units, costing $30 each in Victoria and estimated to be compatible with at least 650,000 homes in New South Wales.
Electricity retailers	Origin Energy proposed the Government should undertake further analysis of potential activities for inclusion in the scheme. It also noted regulations relating to the installation of smart meters should be reviewed to reduce costs.
Electricity networks	Ausgrid estimated there was significant opportunity for peak demand reduction through smart controls on devices such as air-conditioners and using smart meters to facilitate consumer behavioural change.

12.3 Analysis of key issues

Stakeholder submissions and analysis commissioned by the Department show New South Wales has significant opportunities to reduce peak demand. These include opportunities across peak demand saving, response and shifting for residential, commercial and industrial electricity customers.

The Department conducted a cost–benefit analysis on three options to set scheme targets to 2029–30 to maximise the net economic benefit for New South Wales. Based on this, a target of 10% by 2029–30 will deliver the greatest net economic benefit.

At a certificate price above $3.22, the benefit–cost ratio of the scheme falls below 1.1. After accounting for the tax treatment of penalties, this equals a penalty of $2.26. Modelling for the Department indicates certificates will be created by activities at a significantly lower cost than $3.22.

12.3.1 New South Wales has significant opportunities to reduce peak demand

Stakeholder submissions suggested that there are significant peak demand reduction opportunities in New South Wales, but that market barriers prevent this from being realised.

> The size of the peak demand reduction opportunity is significant. For example, the residential air conditioning load on peak summer days in Ausgrid's network area is about 1500 MW or over 10% of state peak demand and typically 40-50% of local suburban peak demand.
> (Ausgrid, electricity network)

> [T]here is a much greater capacity to engage in demand response but that it is hampered by lack of knowledge, as well potentially, by lack of appropriate equipment.
> (National Irrigators' Council, advocacy group)

Common Capital (2020a, pp.110–112) confirmed NSW electricity customers across all market segments can conduct a broad range of activities to reduce their demand during peak times. While the technical potential is large relative to forecast NSW peak demand, the opportunities range in cost.

The scheme will provide a financial incentive to implement the lower cost opportunities. The incentive required to unlock these lower cost opportunities is often cheaper than the alternative of supplying electricity at peak times. The cost-effective potential is the amount for which the benefits of the scheme (i.e. avoided peak electricity supply) exceed the costs, mainly the cost of providing incentives. The next section considers the target level that captures this cost-effective potential with the greatest net economic benefit.

One stakeholder argued that some large energy users, such as food processors, may not be able to reduce electricity demand during peak times due to the nature of their business operations. As discussed in section 15, the PDRS will cover a wide range of eligible activities including peak demand saving and shifting, which do not cause a loss in service to the end-user.

12.3.2 Target of 10% will provide the highest net economic benefit to New South Wales

The Government modelled three options for peak demand reduction targets for the PDRS:

Option 1: A target reaching 5% by 2029–30

Option 2: A target reaching 10% by 2029–30

Option 3: A target reaching 15% by 2029–30.

To align with the EST, targets were modelled based on AEMO's one-in-ten year maximum demand forecast. In all cases, the target commences in the 2022–23 compliance period.

The Department analysed the three options in line with NSW Treasury's guidelines for cost–benefit analysis (NSW Government 2015c, 2017). Table 24 shows the annual peak demand reduction targets that were modelled for each option.

Table 24 PDRS target options to 2029–30

Scenario	Annual peak demand reduction target (%)							
Compliance period	**2022–23**	**2023–24**	**2024–25**	**2025–26**	**2026–27**	**2027–28**	**2028–29**	**2029–30**
Option 1	0.5	0.5	1.5	2.5	3.5	4.0	4.5	5.0
Option 2	0.5	1.0	3.0	5.5	7.5	8.5	9.5	10.0
Option 3	0.5	2.0	5.0	9.0	11.5	13.5	14.5	15.0

As the scheme establishes a new market to encourage peak demand reduction activities, the target trajectory under all options follows a sigmoid curve (S-curve). Slower target increases in the early years of the scheme allow the market time to develop and mature, so it can meet higher targets in later years.

For the purposes of cost–benefit analysis, the Department considered the lifetime costs and benefits of targets to 2029–30. Appendix A outlines the assumptions underpinning the cost–benefit analysis and provides results for sensitivity testing.

Based on the Department's analysis, Option 2 will deliver the greatest net economic benefit for New South Wales (Table 25).

Table 25 Cost–benefit analysis of PDRS targets

Present value of incremental costs and benefits to 2040	Option 1	Option 2	Option 3
Scheme costs			
Government costs ($m)	–$42	–$42	–$42
Regulatory costs ($m)	–$51	–$192	–$430
Total costs ($m)	**–$93**	**–$234**	**–$472**
Scheme benefits			
Reduced wholesale purchase costs at peak times ($m)	$32	$130	$278
Avoided network investment ($m)	$52	$235	$371
Avoided cost of greenhouse gas emissions ($m)	$7	$21	$17
Avoided cost of air pollution ($m)	$1	$2	$2
Total benefits ($m)	**$92**	**$388**	**$668**
Net economic benefit ($m)	**–$1**	**$154**	**$196**
Benefit–cost ratio	**0.99**	**1.7**	**1.4**

The scheme cost is equivalent to $31,500 per 1 MW of capacity available for a year (MW-year),[33] which is less than several large overseas capacity markets. A review of international capacity markets found most cost more than $30,000 per MW-year (Common Capital 2020a, p.43). Pre-activation payments under the RERT were equivalent to between $60,000 and $70,000 per MW-year (AEMO 2020d, p.32).

Households and businesses choosing to implement peak demand reduction projects are expected to save $1.2 billion on their bills.[34]

The Department calculated the times when demand is forecast to be more than the targeted reduction. Peak demand reduction activities must be available during these times. A 10% target for 2029–30 translates to a peak period during which activities must be available from 2.30pm to 8.30pm AEST between 1 November and 31 March (refer to section 11.3.2 for further discussion).[35]

[33] As the peak period is 6 hours in duration, 1 MW-year under the PDRS reflects 1 MW of capacity available for 6 hours.

[34] Discounted using a discount rate of 7%.

[35] The NEM is operated on AEST (it does not adjust for daylight saving).

As the PDRS will run until 2050, the target will continue at 10% until the end of the scheme. The ES Act will set out the conditions under which the Minister may change the target and the requirement for regular reviews.

12.3.3 A penalty rate of $2.26 per certificate creates a cost-effective incentive to reduce peak demand

The penalty rate has two key functions (Common Capital 2020a, p.68–69). These are to:

- ensure compliance by creating an incentive for liable parties to purchase and surrender certificates
- act as a 'safety valve', capping scheme costs at an economically efficient level.

The penalty will only be paid if a liable party has surrendered less certificates than its individual target, i.e. it has a shortfall of certificates. The penalty is paid per certificate for the number of certificates that the liable party is short of its individual target.

To create an effective incentive for scheme compliance, the penalty rate should reflect the cost of the most expensive activities needed to meet the target; however, setting the penalty rate at this level risks a large proportion of certificates being sold at prices close to the most expensive activities, making the scheme not cost-effective.

A way to cap scheme costs at an economically efficient level would be to consider the average price at which certificates are expected to be created; however, this approach risks scheme participants paying the penalty price for a portion of their liabilities, as the penalty rate would be below the price of some activities.

Modelling for the Department indicates that using the NSW Treasury's 10% discount rate sensitivity test, a certificate price of $3.22 for the most expensive activities would deliver a benefit–cost ratio of 1.1.[36] After accounting for the tax treatment of penalties, this equals a penalty of $2.26 per certificate.[37]

The majority of activities are expected to be created below this cost, creating reasonable 'head room' for the market to supply peak demand reduction capacity rather than pay the penalty.

The Government will review the penalty rate at the first statutory review of the PDRS, or if any conditions for reviewing targets and penalties are met.

12.4 Final position

The peak demand reduction target for the PDRS will commence at 0.5% for the 2022–23 compliance period, gradually increasing to 10% by 2029–30. The target will then remain at 10% until the end of the scheme in 2050. Exemptions will be considered when calculating individual targets for scheme participants. Table 26 sets out the scheme targets from 2022–23.

The peak period during which activities will be required to be available will be from 2.30pm to 8.30pm AEST during the compliance period of 1 November to 31 March.[38]

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[36] 1. The standard discount rate of 7% yields a higher penalty rate. 2. Refer to Appendix A for further details about modelling.

[37] Figures are in $2019–20. As mentioned in the ESS reforms section, civil penalties are not tax deductible. If scheme participants operate at a net profit, they pay the penalty using their post-tax income. The base penalty rate is therefore grossed up by the corporate tax rate to represent the amount of income the scheme participants would need to earn to pay the penalty. The corporate tax rate is 30% for larger companies and 25% for those with an aggregated turnover less than $50 million from July 2021.

[38] The NEM is operated on AEST (it does not adjust for daylight saving).

The penalty rate for the PDRS will be set at $2.26 per certificate, subject to indexation.

The Government will review PDRS targets, penalty rates and the peak period for activities when certain conditions are met, in a similar way to the ESS. In addition, the Government will review targets if there is a forecast breach of the EST.

Table 26 Peak demand reduction targets for the PDRS (% of forecast one-in-ten year maximum demand)

Compliance period	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	2029–30	To 2049–50
Target	0.5	1.0	3.0	5.5	7.5	8.5	9.5	10.0	10.0

13. Establishing liability for the scheme

The PDRS will require liable parties to surrender certificates to meet target obligations. This section discusses who liable parties are and how liability is determined.

Final position

The PDRS will have the same liable parties as the ESS to cover all electricity used in New South Wales. These are:

- all electricity retailers
- generators supplying directly to customers in New South Wales
- large energy users that purchase electricity directly from the NEM.

The PDRS will align with the ESS by extending exemptions for certain emissions-intensive and trade-exposed energy users and to some or all small retailers while they are affected by emergencies such as COVID-19.

The certificate target for the scheme as a whole will be calculated from the scheme percentage target, forecast peak demand and the length of the peak period.

Individual certificate targets for each scheme participant will be calculated from the scheme certificate target, the contribution of the scheme participant to actual peak demand on high demand days and any exempt load supplied by the participant during the same period.

13.1 Policy issue and options

The Safeguard consultation paper considered all aspects of establishing liability for the PDRS.

13.1.1 Liable parties and exemptions

The consultation paper proposed that liable parties under the ESS become liable parties under the PDRS. It also proposed possible exemptions under the scheme, similar to arrangements under the ESS.

Under the ESS, liable parties are all electricity retailers, certain generators (those who supply directly to customers in New South Wales) and large energy users (those who purchase electricity directly from the NEM). Exempt parties under the ESS include certain emissions-intensive and trade-exposed energy users.

13.1.2 Determining individual certificate targets

Individual certificate targets for each liable party require methods to both convert the scheme percentage target into certificates and allocate the target among liable parties.

The consultation paper identified three options to convert the target into certificates:

Option 1: Applying the target to forecast peak demand for several years in advance, to give a fixed number of certificates

Option 2: Applying the target to forecast peak demand annually (preferred)

Option 3: Using the target to set a ceiling price which then caps the number of certificates.

Because maximum demand events have both a capacity and a duration, it will also be necessary to use the target to establish the peak period duration.

As the PDRS benefits the electricity sector, the scheme target will be allocated to liable parties based on their contribution to the relevant aspect of electricity use in New South Wales. The consultation paper identified two options for allocating the PDRS target:

- contribution to system-wide peak demand less exemptions
- contribution to total liable electricity purchases less exemptions (preferred, to align with the ESS).

13.2 Stakeholder submissions

Eighteen stakeholders commented on liable parties, exemptions, allocation of targets and liabilities. Most stakeholders supported adopting the same liable parties for the PDRS as for the ESS, with some stakeholders arguing against exemptions. The proposed approaches to determining allocation of targets and individual targets were also largely supported.

Table 27 Summary of submissions on scheme liability

Stakeholder group	Summary
Advocacy groups	While PIAC supported liable parties matching the ESS, it did not support the default exemptions for energy intensive and trade-exposed industries, seeking further evidence of how and which of these industries would be disadvantaged by the scheme. PIAC supported the preferred option of setting individual targets based on the liable party's proportion of contribution to liable activities.
Energy service industry	The energy service industry broadly supported the preferred approach to liability, with explicit preferences stated on the following aspects: • liable parties (EEC, ESIA, Ecovantage, Edge Electrons, Mondo) • allocation of targets (Mondo, ESIA) • determining individual targets (Mondo, EEC, Ecovantage).
Electricity retailers	Origin Energy supported the proposed approach to liable parties, allocation of targets and determining individual targets. ERM Power and EnergyAustralia also supported liable parties being energy retailers. Although EnergyAustralia opposed exemptions for small retailers, it agreed with the exemption for trade-exposed industries.

continued…

Stakeholder group	Summary
Electricity retailers, continued	AGL, Enova Energy, ERM Power and Origin Energy supported the preferred allocation of targets (Option 2 – liable purchases). Origin Energy and ERM Power emphasised the importance of simplicity and consistency with the ESS. Enova Energy argued while Option 1 (contribution to peak demand) may be more logical, the aim of the scheme was to improve market functionality, benefiting all consumers through lower wholesale prices and reliability. EnergyAustralia supported Option 3 (ceiling price) for determining individual targets as this would reduce the likelihood of liable parties being subject to penalty pricing. Origin Energy preferred Option 2 and strongly opposed Option 3, as it believed this would result in increased uncertainty, be cumbersome to manage and result in unnecessary costs.
Electricity networks	Ausgrid proposed the target allocation should consider regional/local conditions, in addition to system-wide peak demand. It noted this would become increasingly important as the energy system becomes decentralised.
Large energy users	BlueScope Steel proposed the allocation of liability should be based on the principle of causer pays. It believed allocating liability based on electricity purchased could penalise electricity users with large flat loads who do not cause peak demand events. Similarly, Brickworks Building Products proposed liability be based on the share of total peak demand (less exemptions) and not annual energy consumption. An anonymous stakeholder proposed that food and agricultural businesses be exempted from the scheme as they often have no option to reduce their electricity usage during peak demand periods.
Government agencies	IPART supported the preferred approach in the consultation paper. AEMC noted that the preferred allocation approach may disadvantage retailers with commercial and industrial customers that have high consumption but do not contribute significantly to peak demand.

13.3 Analysis of key issues

As the PDRS benefits the electricity sector, liable parties should cover all electricity used in New South Wales, as is the case with the ESS. Using the same liable parties for the PDRS is administratively simple and gives retailers and large energy users a direct incentive to reduce their liability by reducing their peak demand. Exemptions will also be aligned to the ESS.

Determining individual peak demand reduction targets for each liable party is more complex than for the ESS. The scheme regulator will need to calculate a scheme certificate target from the percentage reduction target and the length of the peak period.

Liable parties will then calculate their individual targets from their contribution to actual peak demand and any exempt loads.

13.3.1 The PDRS will have the same liable parties and exemptions as the ESS

The consultation paper proposed that liable parties under the ESS become liable parties under the PDRS. Common Capital (2020a, pp.72–73, 80–81) conclude that the PDRS should have the same liable parties as the ESS because this approach:

- gives retailers and large energy users a direct incentive to reduce their liability by reducing their peak demand, including for customer groups not currently covered by national mechanisms, such as small customers
- reduces compliance costs because retailers and large energy users already have systems in place to participate in the ESS
- harnesses synergies between the ESS and the PDRS by allowing liable parties to purchase certificates for related projects under both schemes
- encourages closer commercial relationships between retailers and peak demand reduction service providers
- is consistent with international capacity schemes, where liability typically falls on retailers or their regulated equivalents.

Stakeholders generally supported the proposal that the liable parties under the ESS become liable under the PDRS, but had differing views on exemptions.

> PIAC does not support the default exclusion of small retailers or trade exposed industries. (PIAC, advocacy group)
>
> We accept the extension of exemptions to emissions intensive trade exposed industries. (EnergyAustralia, energy retailer)
>
> The seasonal nature of our business means that when the crops are ready they must be processed … This means that we will not have the ability to create Peak Reduction Certificates and would be required to purchase certificates for the energy we use, further impacting our competitiveness with imported products … we suggest food and agriculture businesses should be exempt. (Anonymous stakeholder)

The consultation paper proposed that exemptions should be similar to arrangements under the ESS.

The ESS has an established mechanism to grant exemptions to emissions-intensive and trade-exposed sites, ensuring they can compete with suppliers in countries without similar requirements (see Box 5 for details). This is based on exemptions from the Commonwealth Renewable Energy Target (RET). Aligning PDRS exemptions with the ESS would be simpler than developing different methods for each scheme.

In addition, both the ESS and PDRS will allow the Minister to temporarily exempt some or all small retailers while they are affected by emergencies such as COVID-19 (see section 6).

All ESS exemptions are partial exemptions, allowing these sites to create certificates from peak demand reduction activities. As discussed in section 15, the scheme will include a broad range of activities, allowing the widest possible range of energy users to create peak demand reduction certificates.

Box 5 – Exemptions under the ESS

Under the ESS, certain emissions-intensive and trade-exposed energy users are either fully exempt or partially exempt:

- When energy users are **fully exempt**, the relevant liable parties (either themselves, or their electricity retailers) are not required to surrender ESCs. Fully exempt energy users are not able to create ESCs from energy saving activities on their sites.
- When energy users are **partially exempt**, the relevant liable parties are only required to surrender ESCs on the non-exempt portion of their electricity load. Partially exempt energy users are able to create ESCs from energy saving activities on their sites.

The Government assesses eligibility for exempt energy users every year and publishes decisions through exemption notices. Currently all exempt energy users are partially exempt at 90%, meaning 10% of their electricity use is liable load under the ESS.

13.3.2 The PDRS scheme certificate target will be set each compliance period

The consultation paper considered three options for setting the annual scheme certificate target. The scheme certificate target could be:

Option 1: fixed, by applying the scheme percentage target from section 12 to forecast peak demand for several years in advance

Option 2: calculated each year by applying the scheme percentage target to forecast peak demand for the coming compliance period only (preferred)

Option 3: floating with a cap set by a ceiling price.

A fixed number of certificates each compliance period would provide certainty on certificate demand every year; however, it would reduce flexibility because the Government would need to conduct a target review to increase or reduce the total liability when the forecast maximum demand changes.

Calculating total scheme certificates each compliance period would respond to changes to peak demand but provide less certainty on certificate demand every year to certificate providers (Common Capital 2020a, p.80). Most stakeholders supported this option. The ESS also calculates certificate liability each year.

A floating certificate target with a price ceiling would provide more certainty on price but less certainty on the actual demand reduction capacity made available. EnergyAustralia supported Option 3, but Origin Energy believed it would result in increased uncertainty, be cumbersome to manage and incur unnecessary costs.

On balance, calculating the total scheme certificate target each compliance period will provide enough certainty for liable parties and certificate providers while also being flexible to respond to changes in system peak forecasts. Because of differences between energy savings and peak demand reduction, the next sections outline how the PDRS will use a different approach from the ESS to allocate the scheme certificate target among liable parties.

13.3.3 The annual scheme certificate target will be the peak demand reduction multiplied by the length of the peak period

As discussed in sections 8 and 12, the Government will set peak demand reduction targets as a percentage reduction on forecast one-in-ten year maximum demand. Because the PDRS is providing capacity in advance of the need, the calculation of the scheme certificate target will use the forecast for the summer matching the compliance period.

PRCs will have both a capacity and time dimension. The target capacity dimension is the reduction in peak demand. This will be defined as the maximum demand multiplied by the scheme percentage target. The target time dimension will be the duration of the peak period. This was defined in section 12.3.2 as six hours (2.30pm to 8.30pm AEST).

In practice, before each compliance period the scheme regulator will determine the **scheme certificate target** to achieve the target reduction over the duration of the peak period by calculating:

1. the **demand reduction** equal to the forecast one-in-ten year peak demand for the coming compliance period multiplied by the scheme target reduction in percentage terms
2. the **scheme certificate target** by multiplying the demand reduction by the peak period of 6 one-hour intervals.

Box 6 provides a worked example.

Box 6 – Calculating the scheme certificate target for a compliance period

Step 1: Determine the forecast system peak demand

The scheme regulator will refer to AEMO's Electricity Statement of Opportunities issued each year, and in particular the POE10[39] medium scenario for the same summer as the compliance period.

For example, for the 2025–26 compliance period, the forecast system peak for the 2025–26 summer is 14,000 MW.

Step 2: Determine the demand reduction

The scheme regulator calculates the demand reduction by applying the scheme target to the system peak demand.

If the scheme target for 2025–26 is 5%, then:

Demand reduction in kW = system peak demand in MW × scheme target × 1000
= 14,000 MW × 5% × 1000
= 700 MW × 1000
= 700,000 kW

Step 3: Calculate the total scheme certificate target

The scheme regulator calculates the scheme certificate target by applying the demand reduction to the peak period:

Scheme certificate target = demand reduction × length of peak period × 10
= 700,000 kW × 6 × 10
= 42,000,000 PRCs (each PRC = 0.1 kW over 1 hour)

13.3.4 The PDRS will allocate individual certificate targets based on contribution to actual peak demand and exempt loads

The consultation paper considered whether the scheme certificate target should be allocated among liable parties based on their contribution to peak demand (Option 1) or electricity purchases (Option 2).

Using electricity purchases places a higher liability on parties that have a high consumption over the year, regardless of their contribution to peak demand. It is the simpler option as it would use existing data from the ESS, and was supported by many of the stakeholders.

However, it is less equitable and effective at reducing peak demand.

> [Option 2] may disadvantage some retailers that primarily serve commercial and industrial customers that have high consumption but do not contribute significantly to peak demand (though this may be affected by exemptions). (AEMC, energy market body)

> If the Government were to pursue the PDRS, the allocation of the liability should be based on the principle of causer pays. Allocating liability and scheme cost based on electricity purchased, while simple, is not the most equitable allocation method as it could penalise large flat loads that do not cause peak demand events. (BlueScope Steel, large energy user)

[39] POE10 (10% probability of exceedance) means that the maximum demand forecast is expected to be exceeded one year out of 10. This is also referred to as the one-in-ten year forecast.

Allocating individual targets based on contribution to peak demand would place a higher liability on parties that contribute more to peak demand, regardless of their energy consumption during the year. This is more equitable as it adheres to the 'causer pays' principle. It also creates an incentive for liable parties to reduce peak demand outside of the scheme and may help support dispatch for small and medium sized customers not covered by the WDRM or other market mechanisms (Common Capital 2020a, p.81).

The cost-recovery mechanism under the RERT (less exemptions) uses the same approach, so data to calculate liabilities are readily available.

The PDRS will allocate individual targets based on contribution to peak demand because it is fairer and more effective than using electricity purchases, without compromising simplicity.

A single maximum demand event may be short and could reflect unusual contributions to peak demand. Hence, the scheme will use a bigger sample of high demand periods. The Reserve Capacity Mechanism in Western Australia's Wholesale Electricity Market (WEM) uses this approach. It assesses each market customer's contribution to system peak over the 12 half-hour intervals with highest system demand over four days.[40]

The PDRS will broadly align with this approach by assessing liable parties' contributions to system demand between 2.30pm and 8.30pm AEST on the four days with the highest system demand during November to March.

In practice, **individual certificate targets** will be calculated after the compliance period in these steps:

1. The scheme regulator will publish the four days with the highest actual demand for the previous compliance period.
2. Scheme participants calculate and report their **individual liable demand** by:
    a. calculating their **average liable demand** between 2.30pm and 8.30pm AEST from individual demand minus exempt load demand for each of the four highest demand days
    b. calculating individual liable demand from the average of liable demand on the four highest demand days.
3. The scheme regulator calculates the **scheme liable demand** by summing all scheme participants' individual liable demands.
4. The scheme regulator allocates the scheme certificate target to scheme participants in proportion to their contribution to peak demand by:
    a. dividing scheme liable demand by each scheme participant's individual liable demand, to determine their proportional contribution
    b. multiplying their proportion by the scheme certificate target, to determine their individual certificate target for the compliance period.

In practice, the scheme regulator may also calculate and publish a **liability factor** for the compliance period by dividing the scheme certificate target by system liable demand. Scheme participants can confirm their individual certificate targets by multiplying individual liable demand by the liability factor.

Like the ESS, scheme participants will lodge annual statements with the scheme regulator. For the PDRS, these will be in two parts. The first will cover individual liable demand to allow calculation of individual certificate targets. The second part will provide details of PRCs surrendered and any carry forward of a peak demand reduction shortfall for the compliance period.

[40] Twelve (12) Peak South West Integrated System trading intervals means, for a hot season, the three trading intervals with the highest total sent out generation on each of the four trading days with the highest maximum demand in that hot season, as published by AEMO in accordance with clause 4.1.23A, where the maximum demand for a trading day is the highest total sent out generation for any trading interval in that trading day (Economic Regulation Authority 2020)

13.4 Final position

The PDRS will have the same liable parties as the ESS to cover all electricity used in New South Wales. These are:

- all electricity retailers
- generators supplying directly to customers in New South Wales
- large energy users that purchase electricity directly from the NEM.

The PDRS will align with the ESS by extending exemptions for certain emissions-intensive and trade-exposed energy users and to some or all small retailers while they are affected by emergencies such as COVID-19.

The certificate target for the scheme as a whole will be calculated from the annual scheme percentage target, forecast peak demand and the length of the peak period.

Individual certificate targets for each scheme participant will be calculated from the scheme certificate target, the contribution of the scheme participant to actual peak demand on high demand days and any exempt load supplied by the participant during that period.

14. Ensuring flexibility

Flexibility arrangements under the scheme refers to certificate carry-forward and expiry provisions. Carry-forward provisions allow liable parties to carry forward a certain portion of their liability to the next compliance period. Expiry provisions could allow certificates to be valid for one or more years.

Final position

Liable parties may carry forward a portion of their liability to the next compliance period. The maximum carry-forward amount will be 20% in the first compliance period and 10% in subsequent periods.

Certificates will be valid for three years, beginning in the compliance period in which the peak demand reduction capacity is available. After three years, the certificate will expire.

14.1 Policy issue and options

The key goal of flexibility is to smooth short-term mismatches between certificate demand (obligations) and certificate supply (implementation of eligible projects), without compromising on scheme objectives (Common Capital 2020a, p.69).

Liable parties will be required to surrender the number of certificates equivalent to their target every compliance period or pay a penalty. As an alternative to paying penalties, the ESS allows liable parties to carry forward some of their shortfall to the subsequent compliance period. The Safeguard consultation paper sought stakeholder feedback on the implications of allowing carry forward in the PDRS.

Certificates created under the PDRS reflect the amount of peak demand reduction capacity available each compliance period. The consultation paper discussed two options regarding certificate expiration: annual expiry and non-expiry. A third option, where certificates expire after a set number of years is also possible.

14.2 Stakeholder submissions

All 10 stakeholders that commented on carry-forward arrangements for target shortfalls supported the carry forward of liabilities in some form.

Sixteen stakeholders commented on certificate expiry, of which 13 supported certificates being transferrable to future compliance periods.

Table 28 Summary of submissions on carry forward of liabilities and expiry of certificates

Stakeholder group	Summary
Advocacy groups	**Carry forward of liability:** PIAC supported the proposed approach to cap the liability, as it believed this would help lower scheme costs. **Certificate expiry:** PIAC supported certificates being transferrable to future compliance years, as the scheme is aimed at providing capacity rather than realised peak demand reduction.
Energy service industry	**Carry forward of liability:** ESIA, Ecovantage, Energy Conservation and Mondo supported the proposed approach to allow the carry forward of liabilities. ESIA and Ecovantage recommended the PDRS adopts a similar approach to the ESS. Energy Conservation noted it was not obvious carry forward would adversely impact dependable peak capacity and that it could arguably incentivise projects, which achieved savings over multiple years. Edge Electrons suggested liabilities be allowed to be carried forward on a three-year rolling basis. **Certificate expiry:** Ecovantage, Enel X, Energy Conservation, Mondo, Next Energy and ESIA suggested that certificates should be transferable to future compliance years. Enel X noted the advantages of transferrable certificates outweighed the potential reduction in certainty of the peak demand reduction. The advantages stated were consistency with the ESS, lower transaction costs and increased certainty with certificates. Edge Electrons suggested early expiry of certificates may increase consumer costs. Energy Conservation believed this approach would not adversely impact dependable peak demand reduction capacity, as observed under the ESS. Mondo stated this approach would reduce scheme complexity and contribute to the upfront capital costs of projects. It also suggested certificates have no expiry date to reduce complexity and complement current operational incentives for 'dispatch' provided by the market. Tesla also supported non-expiry of certificates to maximise flexibility and ensure customers maximise savings.
Electricity retailers	**Carry forward of liability:** Alinta Energy and ERM Power supported carry forwards of 10% to 20% of certificates. Origin Energy supported allowing carry forwards of at least 10% of liability, believing this would smooth potential price shocks, citing the role of carry-forwards in the ESS in mitigating the impact of COVID-19. **Certificate expiry:** Enova Energy and Origin Energy supported certificates being transferrable to future years to reduce costs and market volatility. AGL supported non-expiry of certificates and noted this would mean businesses would not be penalised for greater uptake in earlier phases. Enova Energy believed this would also increase price stability and provide more flexibility to the market.

continued…

Stakeholder group	Summary
Electricity networks	**Carry forward of liability:** Ausgrid highlighted the need for careful Government consideration of the risks and benefits of carry-forward arrangements. **Certificate expiry:** Ausgrid preferred certificates to expire annually given peak demand reduction is time-critical and dependent, and that the availability of peak demand reduction varied year to year.
Government agencies	**Carry forward of liability:** IPART supported the proposed approach as it provided flexibility to participants in meeting their obligations, provided an alternative to penalty payments and assisted electricity retailers to manage cash flow issues. IPART did not believe carry-forward provisions would have a significant impact on dependable peak demand reduction capacity but did recommend a review after implementation. **Certificate expiry:** IPART suggested there is value in certificates having an expiry date longer than a year. Annual expiry of certificates could result in a shortfall, meaning liable parties would pay penalties rather than surrender certificates. IPART noted an expiry date would help ensure that targets in a particular year are not met by activities undertaken some years ago and avoids certificates existing in perpetuity. IPART cited the ongoing surplus of certificates in the ESS as evidence that a well-designed scheme would continue to drive the uptake of peak demand reduction activities regardless of the available number of certificates.

14.3 Analysis of key issues

The key goal of flexibility is to smooth short-term mismatches between certificate demand and certificate supply, without compromising scheme objectives.

All stakeholders supported the introduction of carry-forward provisions in some form. Most stakeholders supported certificates being used in future compliance periods.

Carry-forward provisions will help avoid price shocks, while imposing a time limit on certificate validity will support the creation of dependable peak demand reduction capacity.

14.3.1 Carry-forward provisions help avoid price shocks

Allowing carry forward of liability helps avoid supply and demand mismatches and price volatility at the end of compliance periods, if liable parties underestimate their certificate requirements (Common Capital 2020a, p.82). All stakeholders commenting on the issue supported the introduction of carry-forward provisions in some form.

> A modest amount of borrowing (at least 10%) should be allowed for under the scheme … The purpose of allowing borrowing is to smooth potential price shocks. A good example of this is provided by current restrictions on energy efficiency activities due to COVID-19, which has impacted supply of activities in other similar state schemes. Those schemes which allow borrowing (such as the NSW ESS) have coped far better with this exogenous shock and have not required intervention by Government. (Origin Energy, energy retailer)

One option is to allow for unlimited carry forward of liability; however, this would weaken the demand for certificates, potentially resulting in certificate prices that are unsustainably low for certificate providers. Unlimited carry forward would also risk demand reduction capacity not being available in the summer that it is needed, undermining the effectiveness of the scheme (Common Capital 2020a, p.82).

The 10% carry-forward allowance of the ESS has worked without incident. A similar provision in the PDRS would help liable parties manage the uncertainty of their certificate requirements (with a higher allowance in the first year).

14.3.2 Limited certificate validity supports creation of dependable peak demand reduction capacity

Most stakeholders commenting on certificate expiry supported certificates being transferrable to future compliance periods.

> We support option 2 where certificates will not expire. Carry over is an important function of the ESS and results in lower transaction costs. It will also mean that businesses are not penalised should they encourage greater uptake at an earlier phase (rather than seeking to stagger roll outs to meet certificate needs). (AGL, energy retailer)

Annual certificate expiry risks arbitrarily penalising those certificate providers that generate surplus activities in compliance periods with certificate oversupply, deferring future activity (Common Capital 2020a, p.82). In periods with undersupply, as noted by IPART, scheme participants would meet part of their obligation by paying penalties rather than through the creation of peak demand reduction capacity.

However, peak demand reduction is time-critical and time-dependent. Without expiry, the scheme risks paying for more capacity than reasonably required (Common Capital 2020a, p.82), or for capacity that is available at the wrong time.

As an alternative to annual expiration, IPART suggested imposing an expiration date of greater than 12 months on certificates. On balance, allowing up to three years for certificates to be surrendered would balance the need for flexibility and dependability (Common Capital 2020a, p.82).

14.4 Final position

Liable parties may carry forward a portion of their liability to the next compliance period. The maximum carry-forward amount will be 20% in the first compliance period and 10% in subsequent periods.

Certificates will be valid for three compliance periods, beginning in the period in which the peak demand reduction capacity is available. After three years, the certificate will expire.

15. Peak demand reduction activities

Many activities provide capacity to reduce demand at peak times, and competition among these will deliver the most efficient outcome. Like the ESS, the PDRS will provide a range of methods for calculating peak demand reduction capacity.

As the scheme will create a market for new and emerging products and services, existing consumer protection frameworks may need to be reviewed to ensure consumer rights are protected.

The Government consulted on whether to recognise that the value of peak demand reduction differs by location, such as by using location-based multipliers or activities that are specific to certain locations.

Final position

The PDRS will encourage efficient peak demand reduction activities by enabling competition among peak demand saving, peak demand response and peak demand shifting.

The Government will adopt a collaborative approach to developing calculation methods. As part of this, industry may submit calculation methods to the Department for review. The Department will release guidelines on method development in the second half of 2021.

The Government will harmonise consumer protections under the PDRS with the AEMC's principles where possible. As many of these issues are specific to individual peak demand reduction activities, the Government will consult with industry on how best to ensure consumer protection when developing the scheme rules and calculation methods.

The PDRS will build on the accreditation requirements of the ESS. The Government will provide training and information sessions on the PDRS to interested parties.

The Government will encourage location-based demand reduction by:

- adding a network loss factor to calculation methods to recognise the value of avoided network losses and encourage activities in regional areas
- publishing aggregated activity data at the local network level
- evaluating the impact of peak demand reduction activities on local reliability and local network constraints.

15.1 Eligible activities

15.1.1 Policy issue and options

The consultation paper identified three types of activities that may be eligible for incentives under the scheme. These are:

- **peak demand saving**, recognising the additional peak benefit of energy efficiency activities
- **peak demand response**, controlling certain technologies to temporarily reduce operating load at peak times
- **peak demand shifting**, routinely changing appliances or equipment to shift energy use away from peak periods to other times.

Calculation methods allow certificate providers to create certificates from eligible activities.

The consultation paper sought feedback on any other activities that should be included in the scheme, as well as which calculation methods should be developed first.

15.1.2 Stakeholder submissions

Nineteen stakeholders commented on eligible activities under the scheme. Most provided suggestions and comments on the types of activities they would like included with some stakeholders providing specific examples.

Ten stakeholders commented on which calculation methods should be prioritised. Suggestions ranged from prioritising methods providing the largest reductions in peak demand to incentivising demand reductions by households and small to medium businesses.

Table 29 Summary of submissions on eligible activities and priority calculation methods

Stakeholder group	Summary
Advocacy groups	**Eligible activities:** Business NSW suggested opportunities in the small business sector were largely untapped and are likely to become more important as reforms to the energy market progress. PIAC highlighted the importance of including residential technologies. National Irrigators' Council noted opportunities available to irrigators, such as new variable speed irrigation pumps. **Priority methods:** PIAC recommended prioritising calculation methods for household demand response, noting methods should be based on conservative assumptions and evaluated on outcomes achieved. NSW Farmers noted there are opportunities with batteries.
Energy service industry	**Eligible activities:** Enel X and Mondo supported the proposed activities. Mondo noted the need to consider technologies that deliver both demand savings and demand response. EEC sought the inclusion of a broad range of measures. ESIA highlighted the need for flexibility in the scheme to allow new technologies to demonstrate their demand reduction potential. Industry recommended including the following activities: • replacing old refrigerators to reduce peak demand (Next Energy) • cogeneration facilities, especially biogas (Bioenergy Australia) • insulation and draft-proofing building upgrades (EEC) • retrofitting opportunities in the residential sector with a government pilot to develop policy supports (Knauf Insulation) • virtual power plants (VPPs) and community-scale batteries on the distribution network (CEC). **Priority methods:** Industry suggested the following methods be prioritised: • HVAC (ESIA) • activities that are scalable and offer the largest overall peak demand reduction, such as HVAC and battery energy storage systems (Mondo) • methods using 'energy saving meters' with mutual recognition of meters approved in other jurisdictions (Knauf Insulation). Energy Conservation suggested the ESS' Project Impact Assessment with Measurement & Verification (PIAM&V) method could be adopted to verify large demand savings. Together with Solar SG, it also supported deeming methods. Enel X recommended limiting deeming methods to technologies where no behavioural response is required (such as peak demand saving).

Stakeholder group	Summary
Electricity retailers	**Eligible activities:** Origin Energy supported the scheme incentivising a range of cost-effective peak demand reduction activities, including residential behavioural response, controlled devices (such as air-conditioning and batteries), peak demand shifting and electric vehicle (EV) charging. It also recommended removal of regulatory barriers to smart meter installation. AEC suggested the scheme prioritise batteries and behavioural demand response. AGL generally agreed with these priorities and noted the need to review activities to ensure their effectiveness. **Priority methods:** Origin Energy recommended prioritising methods for residential behavioural demand response, controlled devices, routine shifting of demand (such as hot water and pool pumps) and EV charging at off-peak times. Origin Energy noted that residential methods should not be disadvantaged when compared to commercial and industrial methods. It also noted its support for both deemed and measured methods.
Electricity networks	**Eligible activities:** Ausgrid suggested a need to consider whether the scheme in the future would need to address minimum demand or local voltage management issues. The result could be greater adoption of emerging technologies such as smart meters, smart home energy management systems and energy storage. Endeavour Energy suggested the scheme include multiple technologies such as demand response enabled air-conditioners, batteries and electric vehicles. Essential Energy noted that the PDRS should only provide incentives for additional activities, rather than switching from existing load control activities. **Priority methods:** Ausgrid recommended prioritising calculation methods for small retail customers and suggested deemed methods are cost-effective for smaller customers due to lower transaction costs for certificate providers. It also suggested leveraging methods used for other schemes when developing methods, such as the WDRM.
Large energy users	**Priority methods:** Brickworks Building Products recommended prioritising calculation methods that contributed the greatest potential peak demand reduction within the short to medium term, covering both large and small consumers.
Government agencies	**Eligible activities:** IPART supported the introduction of peak demand response and shifting activities. It noted peak demand saving activities already received incentives under the ESS, potentially resulting in the double counting of savings and additional administrative complexity. AEMC noted the importance of ensuring the capacity is additional. It also noted the PDRS should not encourage inefficient behaviours.

15.1.3 Analysis of key issues

Most stakeholders supported the PDRS including a wide range of activities and identified a number of methods that could be prioritised for development.

IPART argued the PDRS should not incentivise peak demand savings rewarded under the ESS. The ESS values all energy savings equally and does not recognise the full value of energy savings at peak times. The PDRS can recognise the additional peak benefit of these technologies, above and beyond the year-round energy savings rewarded by the ESS.

Stakeholders recognised the scheme can support a broad range of activities

Most stakeholders supported the proposed types of eligible activities, highlighting the following activities:

- residential behavioural change, insulation and draught-proofing, and replacement of old appliances such as refrigerators
- HVAC (residential and small commercial)
- smart meters, smart home energy management systems and batteries
- electric vehicles, including both controlled charging and discharging to the grid.

IPART suggested peak demand saving activities are less well suited for the scheme. It noted many peak demand saving activities already received incentives under the ESS and potentially national schemes. This could lead to the double counting of savings and added administrative complexity to avoid these overlaps.

As set out in the consultation paper, the ESS values all energy savings equally and does not recognise the full value of energy savings at peak times. The PDRS can recognise the additional peak benefit of these technologies, above and beyond the year-round energy savings rewarded by the ESS. Rules and methods will be set to ensure incentives from the two schemes do not duplicate each other.

To ensure the peak demand reduction capacity will be available when needed, the PDRS may require a contract or agreement to activate the technology for peak demand response and shifting activities. Refer to section 11 for further discussion.

Peak demand reduction activities undertaken to meet mandatory legal requirements will not be eligible under the scheme (see section 9).

The Government will develop calculation methods in collaboration with industry

In general, stakeholders supported deemed methods for simple activities, where these are based on evidence. Enel X recognised the need for measurement and verification for more complex projects, such as behavioural demand response.

Stakeholders suggested a wide range of activities for which calculation methods could be prioritised. These include methods for:

- household demand response, including behaviour change, controlled devices, routine shifting of demand (such as hot water and pool pumps) and EV charging at off-peak times
- activities delivering the largest overall peak demand reduction with the ability to scale, such as HVAC (residential and small commercial) and battery energy storage systems (commercial and industrial)
- certifying peak demand reduction using ‘energy saving meters’.

As a large number of technologies across residential, commercial and industrial sectors can create demand reduction capacity, the Government will work with industry to identify which priority calculation methods to develop first.

15.2 Consumer protections

15.2.1 Policy issue and options

The consultation paper identified the need for consumer rights to be protected, outlined the key principles for doing so and sought stakeholder feedback on the key issues and mitigation measures that the Government should consider.

15.2.2 Stakeholder submissions

Eleven stakeholders commented on consumer protection considerations under the scheme. A key theme in the submissions was the need for a principles-based consumer protection framework to provide sufficient flexibility to allow for adaptation to changes in technologies and markets.

Table 30 Summary of submissions on consumer protections

Stakeholder group	Summary
Advocacy groups	PIAC believed the National Energy Consumer Framework provided sufficient protections for most activities and suggested protections be commensurate to the potential harm to consumers.
Energy service industry	Tesla highlighted the opportunity to leverage existing product safety processes, such as those of the Clean Energy Council, to ensure consumer protections. Knauf Insulation believed a key consumer protection issue was the lack of accurate information in real time on the energy savings delivered. To support consumer protection, it proposed paying for performance. Edge Electrons noted safety risks from broken return neutral wiring and sought support for technologies that mitigated this risk. It also suggested voltage regulation to reduce customer usage and improve solar output.
Electricity retailers	AGL emphasised customer choice and proposed allowing consumers to override or opt-out of contractual arrangements to control their devices. It also sought a guarantee that consumers would not be worse off under the scheme as well as creation of a third-party dispute resolution mechanism. Origin Energy supported strong consumer protections for retail offerings. It also supported a principles-based consumer protection regime to enable adaptation to rapidly changing technologies and market offerings.
Electricity networks	Ausgrid and Endeavour Energy agreed with the proposed approach. Ausgrid noted reforms needed to fit within existing consumer protection frameworks and to consider who bore the risk of forecasting errors. Endeavour Energy highlighted the need to address emerging gaps in the consumer protection framework due to technological advances. Where consumer protections permitted, it sought information on consumer participation in their network service area. AEC noted that there may be a need to adopt a ‘better off overall’ test for energy users participating in the PDRS.
Government agencies	Energy and Water Ombudsman NSW highlighted the need for consumer protections to keep up with technological advances given electricity is an essential service. It also noted the scheme needed to be accessible to all consumers, especially vulnerable consumers. AEMC noted the proposed framework will adopt the principles from its own review of consumer protections and offered to provide input to the department in this area.

15.2.3 Analysis of key issues

Most stakeholders agreed with the proposed consumer protection framework and highlighted issues that should be considered. Many of these are specific to individual peak demand reduction activities and are best addressed in the scheme rules and calculation methods.

The Government will consult on consumer protection issues when setting up scheme rules and calculation methods

Many stakeholders commenting on the issue agreed with the proposed consumer protection framework. Key issues raised by stakeholders include:

- product accreditation and safety requirements
- technical and installation safety requirements
- consumer choice and the right to opt out
- third-party resolution mechanism
- consumer access to the scheme
- consumer financial protection.

As many of these issues are specific to individual peak demand reduction activities, the Government will consult with industry on these issues when setting up the scheme rules and calculation methods.

The Government will harmonise consumer protections under the PDRS with the AEMC's principles where possible.

15.3 Qualification requirements for certificate providers

15.3.1 Policy issue and options

Under the ESS, only ACPs can create ESCs. The PDRS will adopt a similar arrangement. The consultation paper sought feedback on qualification requirements for certificate providers.

15.3.2 Stakeholder submissions

Eight stakeholders commented on the qualifications certificate providers should be required to have. Six of these specified their support for qualifications to align with ESS requirements. Suggestions from the remaining stakeholders include training and accreditation in peak demand reduction (Endeavour Energy), alignment of qualifications with installation requirements (AGL), and the importance of experience combined with qualifications (Energy Conservation).

Table 31 Summary of submissions on certificate provider qualifications

Stakeholder group	Summary
Advocacy groups	PIAC suggested the scheme have similar qualification requirements to ACPs under the ESS.
Energy service industry	ESIA and Ecovantage agreed the scheme should adopt ESS qualification requirements. Enel X suggested the ESS provides a useful starting point that could be supplemented by AEMO's requirements under the RERT and that AEMO could accredit and monitor certificate providers. Energy Conservation suggested a combination of experience and professional qualifications is desirable. In addition, certificate providers should employ people with the necessary experience and qualifications.
Electricity retailers	AGL recommended the scheme align qualifications to installation requirements, which may be device specific. It also encouraged consideration of where accountability lay for an underperforming device.
Electricity networks	Endeavour Energy suggested training and accreditation in areas related to peak demand reduction would assist in capability development.
Government agencies	IPART noted that under the ESS, certificate providers were responsible for ensuring they were suitably qualified. IPART recommended this continue and noted any additional requirements would increase barriers to entry. IPART noted the level of qualification required should be dependent on the activities included in the scheme.

15.3.3 Analysis of key issues

Stakeholders supported the PDRS building on the accreditation requirements of the ESS and provided suggestions for certificate provider capacity development.

The PDRS will build on the accreditation requirements of the ESS

Most stakeholders recommended the PDRS adopts existing requirements under the ESS. Enel X recommended the PDRS aligns with requirements under the RERT.

Endeavour Energy suggested training programs can improve the capacity of certificate providers. As discussed in section 10, the Government will provide training and information sessions on the PDRS to interested parties.

15.4 Location-based activities

15.4.1 Policy issue and options

Peak events that are caused by network constraints may only occur at the local network level. Peak demand reduction in these areas is of greater value than in areas where there is spare network capacity.

The consultation paper suggested the Government could consider including location-based multipliers or activities that are specific to certain locations in the PDRS, and sought stakeholder feedback on the issue.

15.4.2 Stakeholder submissions

Eighteen stakeholders commented on the issue of location-based activities. Thirteen stakeholders broadly supported location-based savings, with several of these highlighting the need to validate outcomes or suggesting introduction at a later stage. Four stakeholders were opposed to location-based activities at this stage. IPART did not express a preference but noted that some link to the location of activities is a common feature of similar schemes.

Table 32 Summary of submissions on location-based activities or multipliers

Stakeholder group	Summary
Advocacy groups	PIAC supported the use of location-based multipliers, provided outcomes are validated to ensure they are well targeted. It suggested multipliers would be most beneficial to realise network benefits. PIAC supported the use of additional incentives such as a high constraint area factor or multiplier for regional areas. It also suggested bushfire affected areas be targeted or supported through complementary measures, possibly funded through grants or other direct payments.
Energy service industry	Edge Electrons, Energy Conservation and Mondo supported recognition of location-based savings. Mondo recognised the costs and complexities of developing highly granular location signals, and suggested a basic model in which the scheme prioritised certain postcodes based on either the intended network investment or underlying network demand. Energy Conservation believed recognition of location-based savings should focus on where there was congestion or the AEMO forecasted reliability gaps. Edge Electrons believed currently available data allowed for the targeted incentivisation of voltage regulation (VR) and power factor correction (PFC) technologies by location. EEC, ESIA and Solar SG supported recognition of location-based savings but suggested this could be included at a later stage. Enel X and Tesla believed recognition of location-based savings would be ineffective, add unnecessary complexity and act as a disincentive to participants.
Electricity retailers	Origin Energy suggested the recognition of location-based savings should be considered when more detailed methods have been developed. It noted it may be too complicated to build into the scheme at this stage. ERM Power suggested the scheme complement existing network service arrangements by offering an additional revenue stream for projects that support local network areas. AEC and AGL supported adopting a regional multiplier as exists under the ESS. AEC suggested more granular location-based multipliers or activities would be complex to implement and could risk excluding the very customers targeted. EnergyAustralia opposed the proposal, because of the added complexity.
Electricity networks	Ausgrid and Endeavour Energy supported the proposal. Ausgrid recognised network investments were largely driven by local variations in demand. Both Ausgrid and Endeavour Energy highlighted opportunities for the proposal to provide non-network solutions in locations where peak demand was expected to constrain the network.
Government agencies	IPART noted some link to the location of activities is a common feature of similar schemes, such as the SRES. It suggested any location-based multiplier needed to be responsive to changes in the network.

15.4.3 Analysis of key issues

Activities under the PDRS should support its objectives. The scheme is focused on overall system reliability. Location-based demand reduction can improve reliability at the local level and reduce local network costs.

Stakeholders supported using location-based multipliers, like the regional network factor in the ESS. Another option to encourage location-based demand reduction activities is for the Government to provide location-based information about activities implemented under the scheme.

A network loss factor will help recognise the value of location-based savings

Section 8 establishes the principal objective of the PDRS as the creation of financial incentives to reduce the peak demand for energy by encouraging peak demand reduction activities. This will contribute to all three Safeguard objectives, with the main focus on improving reliability.

Activities under the scheme should support these objectives. Location-based demand reduction can do this by helping to maintain local reliability and reduce local network costs. Several stakeholders suggested location-based multipliers or activities be considered for inclusion in the scheme, including multipliers to support uptake in regional areas.

> Energy system benefits can be increased by targeting peak demand reduction activities in areas where there are constraint issues. Regional areas, often constrained sites, should then be targeted using additional incentives, such as a high constraint area factor or multiplier. (PIAC, advocacy group)

The ESS rule already includes a regional network factor in certificate calculations to reflect differences between regional and metropolitan network loss factors (NSW Government 2015a, p.70). As line losses are higher in regional areas, this encourages activities in regional areas.

The PDRS rule will take a similar approach to account for the fact that line losses differ among the three NSW distribution areas. One kilowatt of peak demand reduction capacity at an installation site is worth slightly more than one kW to the statewide energy system after including line losses. The network loss factor will allow consistent treatment of line losses between certificate calculation methods and the scheme target.[41]

Network loss factors will be uniform within each distribution area. Recognition of network constraints at a more local level would be too complex for a statewide scheme at this stage of its development. For example, two identical activities in two locations have equal value for statewide system reliability but different values for local network reliability.

The Government will also encourage location-based demand reduction activities by providing location-based information activities implemented under the scheme. This could include:

- publishing aggregated activity data at the local network level
- evaluating the impact of peak demand reduction activities on local reliability and local network constraints.

[41] Certificates are initially calculated at the point of end use of the energy. Scheme targets are calculated from system wide peak demand as sent out by generators. Lines losses occur in transmission and distribution from generators to end users.

Energy service providers could use the framework provided by the PDRS to prove the amount of demand reductions delivered at each location, potentially creating PRCs. Where network service providers use this information to meet their regulatory obligations, they could then voluntarily surrender the certificates to ensure the peak demand reduction is not double counted.

15.5 Final position

The PDRS will encourage efficient peak demand reduction activities by enabling competition among peak demand saving, peak demand response and peak demand shifting.

The Government will adopt a collaborative approach to developing calculation methods. As part of this, industry may submit calculation methods to the Department for review. The Department will release guidelines on method development in the second half of 2021.

The Government will harmonise consumer protections under the PDRS with the AEMC's principles where possible. As many of these issues are specific to individual peak demand reduction activities, the Government will consult with industry on how best to ensure consumer protection when developing the scheme rules and calculation methods.

The PDRS will build on the accreditation requirements of the ESS. The Government will provide training and information sessions on the PDRS to interested parties.

The Government will encourage location-based demand reduction by:

- adding a network loss factor to calculation methods to recognise the value of avoided network losses and encourage activities in regional areas
- publishing aggregated activity data at the local network level
- evaluating the impact of peak demand reduction activities on local reliability and local network constraints.

Part D: Energy Security Safeguard administration

16. Achieving best practice administration

The Government will align administration and compliance between the ESS and the PDRS where possible. This will include accreditation requirements, certificate registry and assessment of compliance of scheme participants, with modifications specific to the PDRS where these are necessary.

IPART will be the administrator and regulator of both the existing ESS and the new PDRS.

The consultation paper outlined the Government's vision for excellence in administration and operation of the Safeguard and sought stakeholder feedback on how to move closer to best practice.

The Department engaged the consultancy firm KPMG to review the administration and compliance of the ESS. The scope of the project was to:

- research what constitutes best practice administration and operation
- review the current operation of the ESS
- make recommendations on how to achieve best practice.

The review was informed by a literature review, inter-jurisdictional comparisons with similar schemes in other states, a limited number of interviews with key stakeholders and other regulators, stakeholder submissions for the Safeguard consultation paper and past correspondence to the Department from stakeholders about the administration of the scheme.

Since this review was completed, the Department and IPART have been working together to identify improvements to the way the Safeguard is administered. This includes looking at the supporting systems, processes and frameworks for both the Department and IPART. IPART has already begun work on implementing some of the changes outlined in this paper.

17. Formalising roles and responsibilities

The Department is responsible for designing and developing the policy framework and legislation for the Safeguard.

IPART is the administrator and regulator of the ESS and the PDRS. Its current functions are set out under the ES Act. The Act also allows the Minister to assign additional functions via a formal appointment.

Various stakeholders have expressed confusion about the roles and responsibilities of the Department and IPART.

Final position

The Minister will formally appoint IPART as the administrator and regulator of the ESS and the PDRS. The appointment will clarify IPART's roles and responsibilities and add new functions.

17.1 Policy issue and options

The objective of the Safeguard under the ES Act is to improve the affordability, reliability and sustainability of energy through the creation of financial incentives that encourage the consumption, contracting or supply of energy in particular ways.

The Safeguard is established by legislation, as set out in Table 33.

Table 33 Safeguard legislation

Legislation		Function
The Act	*Electricity Supply Act 1995* (ES Act)	Sets the framework of the Safeguard
The Regulation	Electricity Supply (General) Regulation 2014	Describes core functions of the administrator and regulator
The Rules	Energy Savings Scheme Rule of 2009 (amended 2020)	Establishes eligibility requirements and calculation methods
	Peak Demand Reduction Scheme Rule (coming in 2022)	Establishes eligibility requirements and calculation methods
	Scheme Regulator Exemptions Rule No 1 of 2016	Authorises the regulator to make rules for exempt electricity loads
Ministerial Orders	Energy Savings Scheme (Electricity Load Exemptions) Order (made each year)	Sets out exemptions for Scheme Participants' emissions-intensive trade-exposed facilities
	Energy Savings Scheme (Small Retailer) Order 2020	Provides an exemption from ESS liabilities for small retailers for 2020

The ES Act sets out the roles and responsibilities of IPART as follows:

The **administrator**:

- assesses applications for accreditation to undertake eligible activities and to create certificates
- monitors compliance of ACPs
- assesses applications to be a Measurement and Verification Professional or auditor and monitors their performance
- assesses emerging lighting technologies and accepts them for use in the ESS
- manages an online certificate registry and portal.

The **regulator**:

- assesses and determines whether scheme participants meet their annual targets, either by surrendering certificates or paying a penalty
- reports annually to the Minister on the compliance of scheme participants.

Under the ES Act, the Minister has the power to assign additional functions to the administrator and regulator.[42]

The Department is responsible for the policy framework and the design of the Safeguard. The Department's functions include:

[42] In sections 54 to 57 of the ES Act

- undertaking statutory reviews and recommending amendments to the legislative framework in response to these
- developing and recommending updates to relevant rules and ministerial orders
- engaging with stakeholders on rule changes, reviews and use of the scheme
- promotion of the scheme to stakeholders, and broader development of stakeholders' capability to participate in the scheme.

Figure 4 illustrates this relationship.

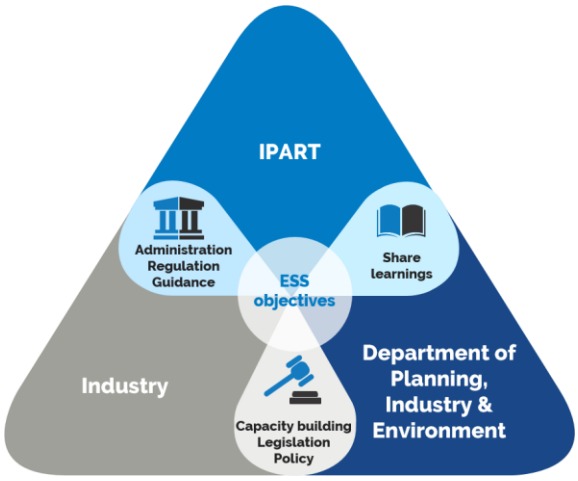

Figure 4 Safeguard roles (IPART 2020)

The Safeguard consultation paper sought feedback on what is working well with the administration of the ESS, and what could be improved for the Safeguard.

17.2 Stakeholder submissions

Five stakeholders provided responses to the question on what was working well with the administration and regulation of the ESS.

PIAC considered the current administrator to be satisfactory. The EEC recognised the Department's efforts in improving the operations of the ESS. ESIA recommended that a new administrator be established. Ausgrid called for greater efforts to understand customer experience. IPART identified the administrative and compliance features necessary to support the integrity of schemes under the Safeguard.

Table 34 Summary of submissions responding to the question of what is working well with the administration and regulation of the ESS

Stakeholder group	Summary
Advocacy group	PIAC suggested the current arrangement for IPART was satisfactory and should be carried to the PDRS.
Energy service industry	EEC recognised the Department's efforts in improving the operations of the ESS. ESIA recommended that a new administrator be established, suggesting this focus on best practice industry development to support the delivery of scheme objectives, while continuing to ensure scheme integrity. ESIA cited the Clean Energy Regulator as an example of an efficient and effective regulator.

Stakeholder group	Summary
Electricity networks	Ausgrid recommended greater efforts to directly understand consumer experiences to help guide the administration and regulation of the scheme.
Government agencies	IPART noted that there are a number of key features necessary to support the integrity of the new schemes. These included rules that are clear and enforceable, consistency and fairness in administration, clear enforcement powers, and an integrated IT system that supports both schemes. IPART also recommended there be a common regulatory framework that supports both schemes, including where possible, the integration of systems and processes.

17.3 Analysis of key issues

Stakeholders sought improvement to the administration of the ESS and drew attention to approaches used by administrators of other similar schemes.

By formally appointing IPART as administrator and regulator of the ESS and PDRS, the Minister can confirm IPART's functions and clarify the Government's expectations.

17.3.1 IPART's current role focuses on regulatory functions

Stakeholders expressed a need to reform IPART's role. In its submission, EEC argued IPART had taken a compliance-focused approach to the ESS, which substantially held back the scheme, and suggested IPART's role should be reformed.

ESIA noted IPART's original role was to regulate comparatively few large government and privately-owned utilities and agencies, rather than the types of small-to-medium-sized enterprises that deliver most energy saving activities under the ESS. ESIA also drew on the Clean Energy Regulator as an example of best practice, highlighting its role in supporting industry development.

IPART's submission stated stakeholders can be confused about its role versus that of the Department, suggesting this could be resolved if the different functions were made clearer.

17.3.2 Appointing the regulator and administrator will clarify roles, functions and performance expectations

For a regulator to be effective it needs to have clear objectives and functions. It needs to be able to coordinate actions with other relevant bodies to achieve the desired regulatory outcome (OECD 2014, p.29). The Government agrees with IPART's suggestion that the roles and responsibilities of IPART and the Department should be clarified. Formally appointing IPART as administrator and regulator will clarify roles and include additional functions not listed in the ES Act.

In addition to the regulatory functions, IPART will continue to collaborate with the Department on:

- developing and implementing a stakeholder engagement plan including a joint register of stakeholder engagement activities
- building the capability of Safeguard participants, with a focus on ensuring they understand and are able to comply with the rules

- reviewing and updating IPART's risk and compliance framework for the Safeguard.

IPART has already commenced work on these activities. It will also continue to have responsibility for the development and maintenance of the IT platform for supporting administration and regulation of the Safeguard.

IPART will also be required to report to the Minister on an agreed set of key performance indicators (KPIs) for the Safeguard.

The additional functions and work outlined above are described in more detail throughout this paper.

17.4 Final position

The Minister will formally appoint IPART as the administrator and regulator of the ESS and the PDRS. The appointment will clarify IPART's roles and responsibilities and add new functions.

18. Measuring and monitoring performance

The Government is committed to effective performance monitoring by its regulatory agencies and ensuring a customer-centric focus for its services.

Final position

The appointment of IPART will include a requirement to develop KPIs that measure the efficient and effective administration of the Safeguard to support the achievement of scheme outcomes. The KPIs will need to be approved by the Department, and IPART will be required to report against these KPIs to the Minister on an annual basis.

IPART will also be required to review and update the KPIs on a regular basis to ensure they remain relevant and appropriate.

18.1 Policy issue and options

The Government remains committed to introducing KPIs for the administration of the Safeguard. The consultation paper sought stakeholder feedback on KPIs and service standards that should be considered.

18.2 Stakeholder submissions

Four stakeholders commented on KPIs and service standards. Stakeholders suggested both KPIs that were focused on outcomes such as the promotion of scheme goals and KPIs that were focused on processes such as query response times. IPART recommended that KPIs and service standards be identified after scheme details are clearer to avoid any unintended consequences.

Table 35 Summary of submissions on what KPIs and service standards should be considered for the administrator and regulator

Stakeholder group	Summary
Energy service industry	ESIA recommended KPIs for administrator response times to ACPs, auditors and measurement and verification professionals.
Electricity retailer	ERM Power recommended positive KPIs that promote broad uptake of the schemes and achievement of underlying scheme objectives.
Electricity networks	Ausgrid argued the introduction of the new PDRS suggests a need for new KPIs to track the performance of the scheme, inform stakeholders and consumers and help guide the changes and improvements. Ausgrid recommended the KPIs include measures of firm demand reductions.
Government agencies	IPART suggested the identification of KPIs should wait until after the details of the scheme are clearer and therefore it is known what IPART is regulating. IPART noted that it is important to ensure the KPIs do not drive unintended consequences, such as poor decision-making to meet deadlines. It anticipated that any KPIs would encompass things like expected timeframes for enquiries and routine tasks.

18.3 Analysis of key issues

The adoption of outcomes-based KPIs will be an iterative and ongoing journey that IPART has already commenced. Stakeholders supported both the adoption of outcomes-based KPIs and continued reporting against process-based KPIs.

IPART will be responsible for developing and reporting against KPIs, which will include measures related to the Government's vision of being customer-centric.

18.3.1 Adoption of outcomes-based KPIs will be an iterative and ongoing journey

Performance evaluation is recognised as an integral part of best practice regulation. The NSW Government Guide to Better Regulation notes best practice for regulators is to report against outcomes-based performance indicators alongside process-based indicators such as the timeliness of decision-making and approval processes, and indicators of compliance and enforcement activity.

Commonwealth regulators are required to report against outcomes-based KPIs in the Commonwealth Regulator Performance Framework (Commonwealth of Australia 2014). The framework requires reporting against outcomes-based KPIs in six focus areas and includes regulatory actions being proportional to risk, and regulators actively contributing to the continuous improvement of regulatory frameworks.

ERM Power and Ausgrid both supported the adoption of outcomes-based KPIs. ERM Power supported KPIs that promote uptake of the schemes and achievement of their objectives. Similarly, Ausgrid argued for the need for new KPIs, especially for the PDRS, to track the performance of the scheme, inform stakeholders and consumers, and help to guide the changes and improvements. There was also support for process-based KPIs such as response times, from ESIA.

The development, monitoring and reporting of KPIs requires supporting processes and systems to collect and present the required information. These processes and systems take time to develop and require feedback to reflect what has been learned along the way. For

these reasons, it is recognised the adoption of outcomes-based KPIs will be an iterative and ongoing journey. This approach is consistent with IPART's views that the KPIs should be developed after details of the schemes are clearer, avoiding any potential unintended consequences.

IPART has recognised the need to develop outcomes-based KPIs and has begun the process of developing them. Preliminary work to date has focused on IPART's strategic aspirations and objectives. This work will also review existing measures of administrative processes, which IPART already reports on in its annual report to the Minister.

Box 7 – Examples of regulators using KPIs

Example 1: Clean Energy Regulator

The Clean Energy Regulator (CER) is an independent statutory authority in the Australian Government. The CER is responsible for administering schemes to reduce greenhouse gas emissions and increase the use of renewable energy.

The CER's strategic plan is set out in its Corporate Plan 2019–23 (Clean Energy Regulator 2020e). This plan maps out the CER's purpose and objectives, including KPIs and performance measures for each objective. The KPIs identified are additional to those already required under the Commonwealth Regulator Performance Framework.

The CER reports progress against the KPIs in its Annual Performance Statement, which is included in its annual report. For each objective and related KPI, the CER provides an overview of the actions taken and relevant factors influencing outcomes and achievements. The CER then reports whether it has met the target set out in the performance measure, substantially met the target or has not met the target.

Table 36 CER example of objective and related KPIs, measures and results

Objective: Engaged, active and compliant participants			
KPIs: Our support, engagement and communication activities with participants result in their compliance and successful participation in our schemes			
Performance measure	**Result 2019–20**	**Target**	**Comment**
Level of participant satisfaction with engagement and guidance provided	92%	80%	Target met
Proportion of participant contacts resolved at first interaction	68%	70%	Substantially met target
Number of Australian carbon credit units issued	15,476,458	16,700,000	Substantially met target
Number or renewable energy certificates (LGCs and STCs) validated	LGCs: 30,496,990	LGCs: 31,000,000	Substantially met target
	STCs: 40,267,622	STCs: 32,000,000	Target met
Our engagement and communication activities assist participants to successfully participate in our schemes	Achieved	Achieved	Target met

Source: Clean Energy Regulator Annual Report 2019–20 (Clean Energy Regulator 2020d)

Example 2: Environment Protection Authority

The vision of the NSW Environment Protection Authority (EPA) is to become a world-class regulator. KPIs are expected to be one way in which the EPA monitors progress towards achieving this vision.

EPA's vision builds on existing performance reporting. Currently, the EPA reports to Treasury on progress against 15 outcome measures. In addition, the EPA has an internal requirement to report on its progress towards its Strategic Plan. A sample of performance measures in this plan are reported against in the annual report.

The EPA Board uses this performance reporting to help inform its assessment of the EPA's performance.

To achieve its vision, the EPA is currently considering how to update its Strategic Plan. This has involved internal consultations on how this vision is best reflected in the EPA's purpose, priorities, values and principles. There has also been consultation externally to identify industry trends and how these could be utilised to achieve the vision.

The update of the new Strategic Plan is expected to result in changes to related reporting frameworks and performance measures, including KPIs.

Table 37 Example of commitments in the EPA Strategic Plan 2017–21 and related outcomes and measures

Best practice environmental regulation: Hold people and organisation to account through licensing, monitoring, regulation and enforcement. Hold ourselves to account by making evidence-based decisions and monitoring our decisions	
Outcome	**Measure**
Leadership – The EPA provides local, state and national leadership on emerging environmental issues	None
Enforcement – Enforcement action reflects the seriousness of the non-compliance and leads to improved compliance, redresses harm and acts as a deterrent to re-offending	• 90% prosecution success rate (excluding litter and test cases)
Compliance – High levels of regulatory compliance are maintained	• At least 99% of environment protection licence conditions are complied with • Annual reduction of licences with non-compliance to conditions (environment protection licence annual returns)
Regulatory risk – EPA regulatory efforts target highest-risk locations	• 100% of licences are risk-assessed in the risk-based licensing framework • 100% of high-risk licences are inspected every six months • 100% of sites declared to be significantly contaminated land have regulatory instruments in place, or under preparation, to manage the contamination
Evidence-based decision-making – EPA decisions are based on rigorous science and best information available	• The EPA is viewed as a credible source of information on environmental issues (stakeholder surveys)

Source: EPA Strategic Plan 2017–21 (EPA 2018)

18.3.2 IPART will develop KPIs and report progress towards achieving relevant scheme outcomes

The Government remains committed to ensuring the Safeguard is administered efficiently and effectively. As discussed in section 20, responsibility for the scheme is shared between the Department and IPART.

IPART will be required to develop KPIs that monitor progress on achieving scheme outcomes in relation to scheme administration. These KPIs will be developed in discussion with the Department and give due consideration to stakeholder feedback. The KPIs will reflect the Government's expectations for the administration of the ESS and PDRS, the objectives of the Safeguard and IPART's strategic objectives.

The KPIs will draw on best practice frameworks including the Commonwealth's Regulator Performance Framework and examples such as those from the EPA and CER.

Reporting against KPIs will facilitate transparency with stakeholders on the administration of the schemes. Stakeholders will be able to identify IPART's focus areas and its progress against performance measures. IPART can also better demonstrate the activities it is undertaking and related challenges and opportunities.

18.3.3 The Government's vision is to be customer-centric

IPART will be required to include measures that relate to the efficient administration of the Safeguard, including in relation to supporting the Government's vision of being the world's most customer-centric government. Stakeholders are also supportive of a focus on service levels.

The NSW Customer Commitments set out the underlying principles for how the customer experience can be improved to achieve the Government's vision (NSW Government 2020d). Embedding the Customer Commitments and principles of customer-centricity is one way IPART can improve stakeholder experiences. The Commitments are discussed in detail under section 19, including their use in the development of the IPART Stakeholder Engagement Charter.

Openness and transparency are also underlying themes in best practice regulation, including when interacting with regulated entities (Commonwealth Government 2014, pp.4, 24). For example, the monitoring of complaints from the public, external stakeholders and internal government officers should be a routine process. As part of best practice, information from such processes should be used for continual improvement and evaluation (NSW Government 2019c, p.17).

Stakeholder feedback supported a focus on service levels. ESIA sought performance indicators for administrator response times to ACPs, auditors and measurement and verification professionals. Consistent with this, IPART anticipated in its submission that KPIs would include expected timeframes for enquiries and routine tasks.

18.4 Final position

The appointment of IPART will include a requirement to develop KPIs that measure the efficient and effective administration of the Safeguard to support the achievement of scheme outcomes. The KPIs will need to be approved by the Department, and IPART will be required to report against these KPIs to the Minister on an annual basis.

IPART will also be required to review and update the KPIs on a regular basis to ensure they remain relevant and appropriate.

19. Improving communication and engagement with stakeholders

Stakeholder submissions emphasised a need for improved communication and stakeholder engagement by IPART.

Best practice administration underlines the need to take a customer-centric approach to communication and engagement with participants. This is a key policy priority for the Government.

Through the process of developing and implementing complementary stakeholder engagement plans for the Safeguard, IPART and the Department can improve how they engage and communicate with stakeholders.

Final position

The Department will work with IPART on the development and implementation of complementary stakeholder engagement plans for the Safeguard. The plans will include a joint register of Safeguard activities and events.

19.1 Policy issue and options

Putting the customer at the centre of everything we do is a key policy priority for the Government (NSW Government 2021b). The NSW Government's vision is to become the world's most customer-centric government by 2030 (NSW Government 2021c, p.4).

Although the consultation paper did not present options for more customer-centric communication and engagement with stakeholders, stakeholder responses to other matters emphasised its importance.

19.2 Stakeholder submissions

Four stakeholders commented on stakeholder engagement.

ESIA recommended that a customer service culture be established by the administrator. AGL welcomed the Government's focus on putting the customer at the centre of everything it does. Ausgrid called for greater engagement with end-user customers, not just scheme participants. IPART noted care needs to be taken with the concept of 'customer-centric' when referring to a regulatory scheme.

Table 38 Summary of submissions that referenced customer-centric communications and stakeholder engagement

Stakeholder group	Summary
Energy service industry	ESIA recommended that a customer service culture be established by the administrator, recognising that delivery of the ESS objectives is dependent on the businesses that deliver projects under the scheme.
Electricity retailers and networks	AGL welcomed the Government's focus on putting the customer at the centre of everything it does. It noted that customer choice and comfort are important principles in the design, ongoing administration and regulation of both the ESS and the new PDRS.

Stakeholder group	Summary
	Ausgrid encouraged greater efforts to engage with end-user customers to better understand their experience with the scheme, rather than receiving their views filtered through service providers. It suggested that this could be achieved through a customer research program.
Government agencies	IPART noted that care needs to be taken with the concept of 'customer-centric' when referring to a regulatory scheme. It stated the ultimate customers of the Energy Security Target and Safeguard are the people of New South Wales.

19.3 Analysis of key issues

Stakeholder feedback on improving communication and engagement with stakeholders was concerned with:

- communication and engagement within a regulatory framework
- adopting a customer-centric approach and engaging with end-user customers.

19.3.1 Best practice regulators engage transparently with stakeholders

The Australian Government's Regulator Performance Framework, which applies to Commonwealth regulators, emphasises that:

- communication with regulated entities is clear, targeted and effective, and
- regulators are open and transparent in their dealings with regulated entities (Commonwealth of Australia 2014, pp.18, 24).

The Organisation for Economic Co-operation and Development (OECD) has published best practice principles for regulatory policy. Australia is a signatory to these principles and has committed to implement best practice through the Council of Australian Governments Regulatory Reform Plan (NSW Government 2020d, p.2). One of the best practice principles is engagement:

> Good regulators have established mechanisms for engagement with stakeholders as part of achieving their objectives. The knowledge of regulated sectors and the businesses and citizens affected by regulatory schemes assists to regulate effectively. (OECD 2014, p.89)

The OECD guideline Creating a Culture of Independence notes that a regulator's legitimacy also rests 'on its engagement with the industry to exchange information, consult when taking regulatory decisions, ensure compliance and respond to complaints' (OECD 2017, p.12). Like the Australian Regulator Performance Framework, this guideline also promotes transparency on stakeholder engagement:

> Regulators should lay out and make publicly clear what are the ways through which they engage with public and private stakeholders so that opportunities for contributions are clear and accessible.
>
> Instructions on how to engage with the regulator should be presented on websites and circulated.
>
> Engagement processes should support the perceived and actual integrity, impartiality, competency and objectivity of the regulator. (OECD 2017, p.13)

The OECD guideline also recommends providing feedback to stakeholders so key decisions, and the justifications for them, are placed on the public record (OECD 2017, p.13).

19.3.2 Taking a customer-centric approach is an expectation of the Government

This is reflected in the Premier's Priority of 'putting customer at the centre of everything we do' (NSW Government 2021b).

The vision of the NSW Government is to become the world's most customer-centric government by 2030 where customers will regard NSW public services as trustworthy, effective and easy (NSW Government 2021c, p.8).

IPART's submission emphasised that its responsibility is to provide general information and guidance so stakeholders can make informed decisions about compliance. IPART noted this is different to providing individual advice to stakeholders, which could potentially undermine its independence. In March 2021 IPART published its Stakeholder Engagement Charter for the ESS. The charter sets out expectations for stakeholders and IPART when they engage (IPART 2021).

While IPART does not have a direct relationship with ESS end-user customers, it does provide information on its website for businesses and householders involved in the scheme. The information for householders explains how households can access the ESS, the types of upgrades covered, how to participate and what to do if they have concerns about a supplier. If a householder is unhappy with a supplier operating under the ESS they can report them to IPART, NSW Fair Trading or the Australian Competition and Consumer Commission. IPART also requires all ACPs working with households to provide this information to the householder prior to the energy savings upgrade being implemented.

In addition, the Department provides information for end-use customers on its website, energysaver.nsw.gov.au. This includes simple information for households and businesses on how to participate in the ESS such as project examples and a searchable list of approved ACPs.

A formal, documented and transparent approach to stakeholder engagement will enable IPART to maintain its independence as a regulator whilst also taking a customer-centric approach to stakeholder communication and engagement.

19.3.3 IPART and the Department will develop stakeholder engagement plans

The NSW All of Government Communications Framework recognises customers do not distinguish between departments and entities, and emphasises communication needs to be respectful, effective and coordinated (NSW Government 2020f). As such the Department and IPART will coordinate stakeholder engagement for the Safeguard.

IPART has already commenced developing a stakeholder engagement plan for the Safeguard. To ensure coordinated and consistent messaging, the Department will also develop and implement a stakeholder engagement plan.

IPART and the Department will develop the engagement plans in consultation with each other to ensure they are complementary. Taken together, the plans should cover engagement and communication across the spectrum of Safeguard stakeholders and end-user customers. The plans will include:

- common engagement and communication principles
- clearly defined roles and responsibilities
- details of engagement approaches and activities that are specific and measurable
- a commitment to publishing and communicating reasons for major scheme changes
- a commitment to delivering stakeholder forums

- a commitment to review the information for end-use customers to ensure households and businesses can easily access the scheme
- indicative timeframes for different forms of engagement
- information on complaints handling procedures.

The engagement plans will align with the All of Government Communications Framework and the NSW Government Customer Commitments. The plans will build on work started by IPART in developing its engagement charter for the ESS. Box 8 provides examples of stakeholder engagement strategies in use by other regulators.

IPART and the Department will also develop a joint register of planned stakeholder engagement activities and events with a commitment to collaborate on activities wherever possible.

Box 8 – Examples of stakeholder engagement strategies

Example 1: State Insurance Regulation Authority (SIRA) and SafeWork NSW

The SIRA and SafeWork Better Regulation Stakeholder Engagement Strategy identifies SIRA and SafeWork's stakeholders, outlines engagement principles and makes specific and measurable commitments (NSW Government 2016a). For example, the plan states SIRA and SafeWork will be impartial and objective by:

- engaging widely with stakeholders, taking account of a wide range of views
- providing individual stakeholders with regular opportunities for direct access and bilateral engagement.

The strategy sets out how SIRA and SafeWork will interact with their stakeholders across an engagement spectrum of information, consultation, involvement, collaboration and empowerment. It provides specific examples of what this looks like.

The plan has measures of success including:

- stakeholder feedback via consultations, online surveys, webinars and social media
- one-on-one interactions with stakeholders
- annual customer satisfaction surveys
- improved complaint resolution
- satisfaction with website accessibility.

Example 2: Essential Services Commission (ESC)

The ESC regulates participants and products in the Victorian Energy Upgrades (VEU) program, which is similar to the NSW ESS. ESC's Stakeholder Engagement Framework was released in 2018 and contains:

- a charter of consultation and regulatory practice that describes the ESC's commitment to engagement
- a community of practice, an internal engagement champion group actively involved in improving the quality of engagement
- ongoing evaluation and assessment of engagement activities to facilitate continuous improvement.

The plan describes the range of ways in which the ESC engages with stakeholders and provides specific examples of these.

The charter of consultation and regulatory practice includes principles for engagement that stakeholders can expect from the ESC as a regulator. The principles include timeliness, cooperation among regulators, stakeholder consultation and engagement, and accountability and transparency.

The final section of the plan covers 'engagement in practice – timeframes and submissions' This section provides specific examples of how stakeholder engagement will be carried out for specific activities and expected timeframes (ESC Victoria 2018a).

The ESC also publishes an engagement plan for the VEU program on its website. The plan outlines priorities for the year 2020–21 and includes:

- its vision and objectives
- specific engagement objectives for 2020–21
- lists of engagement activities for the year, and
- measures of success (ESC Victoria 2021).

19.4 Final position

The Department will work with IPART on the development and implementation of complementary stakeholder engagement plans for the Safeguard. The plans will include a joint register of Safeguard activities and events.

20. Capability development

The success of the Safeguard relies on the ability of ACPs and other service providers to confidently engage with the rules and undertake effective energy saving activities.

To facilitate this, the Department and IPART need to work together to promote and provide capability development activities to service providers and other stakeholders.

Final position

The Government recognises that the primary responsibility for ensuring effective participation in the schemes lies with industry, i.e. with the ACPs and Scheme Participants. The Government also acknowledges that both the Department and IPART should be actively supporting the capability development of key stakeholders to ensure scheme outcomes are met.

The Department will be responsible for broader scheme promotion and working with industry groups and ACPs to support service providers and installers to build capabilities to deliver activities under the schemes. IPART will be responsible for initiatives that support ACPs, Scheme Participants, Measurement and Verification Professionals and auditors to improve their understanding and build their capability to comply with scheme requirements.

Consistent with the focus on scheme outcomes, the Department and IPART will increase coordination and collaboration on capability development initiatives, in consultation with stakeholders.

20.1 Policy issue and options

The Government consulted on a range of options and activities to further develop capability, including:

- whether the administrator and regulator or the Department should be responsible for developing the capabilities of participants
- improving stakeholder consultation for the development of evidence requirements
- adding more real-world examples to method guides
- introducing early lodgement of projects, including an eligibility check by IPART
- providing more education to ACPs and service providers following rule changes.

20.2 Stakeholder submissions

Stakeholder submissions supported the Department being responsible for developing the capability of service providers to deliver effective activities. IPART noted it has a role in developing guidance materials and processes to ensure compliance and that broader capacity building is the role of the Department. Both IPART and EEC suggested industry associations can play a role in developing capabilities.

Stakeholders recommended a range of activities, including workshops and training, to develop the capabilities of service providers.

Table 39 Summary of submissions on developing service provider capability

Stakeholder group	Summary
Energy service industry	**Roles and responsibilities for capability development** Energy Conservation, ERM Power and the EEC supported the Department being responsible for developing the capability of service providers. The EEC also saw a role for industry associations. **Ways to develop service provider capability** Energy Conservation suggested workshops, minimum certification standards, and locally developed training. The EEC recommended training, accreditation, and funds for 'trial and development' of new approaches for delivering energy management. ERM Power recommended ongoing training and early guidance on eligible activities. The ESIA recommended that the scheme administrator conduct deeper engagement to gain a better understanding of the industry and learn from best practice industry development.
Electricity retailers	**Ways to develop service provider capability** AGL recommended the use of in-house workshops, webinars, online learning toolkits, and refresher training.
Electricity networks	**Roles and responsibilities for capability development** Ausgrid noted that capability development seems to be better delivered by the Department, allowing IPART to focus on scheme administration. **Ways to develop service provider capability** Ausgrid encouraged the Department to establish improved stakeholder relations to better understand both service provider and consumer experiences. It noted that improved communication with scheme participants will help inform how to improve service provider capabilities and performance.

Stakeholder group	Summary
Government agencies	**Roles and responsibilities for capability development** IPART considered itself to have a role in developing the capability of service providers to understand and meet evidence requirements. IPART considered the role of the Department as developing knowledge of the scheme broadly and promoting it among businesses and the community. It further noted that service providers and industry associations also had a role to play in developing capabilities. **Ways to develop service provider capability** IPART noted that it uses a number of methods to develop service provider capabilities to identify and understand their obligations. It is currently working on improvements, including the review of guidance material, allowing on-demand access to online workshops, and delivering regular stakeholder forums. IPART flagged that early 'eligibility checks' by IPART would require significant additional resourcing to be implemented effectively.

20.3 Analysis of key issues

Capability development encompasses a broad range of activities beyond formal training.

Responsibility for supporting capability development under the schemes is shared between the Department and IPART. This responsibility will be clearly delineated between the two agencies to provide clarity to stakeholders.

IPART and the Department will increase coordination and collaboration on capability development initiatives to more effectively and efficiently utilise resources to address identified stakeholder needs. Industry groups will be consulted on these initiatives.

20.3.1 Capability development is more than just training courses

Capability development covers a broad range of activities and is not limited to formal training. The consultation paper provided examples of capability development activities. These activities included stakeholder consultation on the development of relevant activities, guidance materials, project reviews by IPART and training on rule changes.

Stakeholder suggestions reflected the view that capability development went beyond training courses. In addition to providing more conventional examples of training, stakeholder suggestions included better engagement, communication, online resources, guidance materials, trials and minimum certification standards.

20.3.2 Responsibilities for supporting capability development will be clearly defined

There is an opportunity to better define roles and responsibilities for supporting the development of stakeholder capabilities under the ESS and PDRS. Primary responsibility for capability development continues to lie with stakeholders such as industry groups, ACPs, service providers, installers, Scheme Participants, Measurement and Verification Professionals and auditors.

Stakeholders have expressed support for capability development activities to continue with many seeing the Department as supporting the capability development of ACPs and service providers. IPART suggested that it be responsible for supporting ACPs to build their capability as it relates to guidance materials and processes to ensure compliance.

IPART will be responsible for supporting participants' understanding and capacity to comply with scheme requirements, while the Department will be responsible for broader scheme participation and supporting capability building to deliver activities under the schemes. This delineation in responsibilities is also consistent with IPART's submission and current review of its compliance framework, which includes how best to utilise capability development activities to improve compliance.

20.3.3 IPART and the Department will increase coordination and collaboration on capability development initiatives

Stakeholders currently participate in capability development activities, which are delivered separately by IPART or the Department. Better coordination and collaboration between IPART and the Department would allow more strategic delivery of capability development activities to effectively and efficiently use resources to address identified stakeholder needs.

IPART and the Department will better coordinate and collaborate on capability development initiatives, in consultation with stakeholders. While it may be appropriate for IPART and the Department to deliver individual activities separately, increased coordination and collaboration will better communicate upcoming activities to stakeholders, increasing awareness and participation. Stakeholder consultations on capability development initiatives will allow stakeholder needs to be better identified and addressed.

Consultation with stakeholders is consistent with the ESIA suggestion that there be deeper engagement with industry to gain a better understanding. EEC and IPART also saw a role for industry associations in capability development.

20.4 Final position

The Government recognises that the primary responsibility for ensuring effective participation in the schemes lies with industry, i.e. with the ACPs and Scheme Participants. The Government also acknowledges that both the Department and IPART should be actively supporting the capability development of key stakeholders to ensure scheme outcomes are met.

The Department will be responsible for broader scheme promotion and working with industry groups and ACPs to support service providers and installers to build capabilities to deliver activities under the schemes. IPART will be responsible for initiatives that support ACPs, Scheme Participants, Measurement and Verification Professionals and auditors to improve their understanding and build their capability to comply with scheme requirements.

Consistent with the focus on scheme outcomes, the Department and IPART will increase coordination and collaboration on capability development initiatives, in consultation with stakeholders.

21. Compliance and enforcement

The Government's aim is to ensure compliance and enforcement action for the Safeguard is proportionate and effective. To achieve this, the Government considered a range of options, including additional powers for IPART.

IPART has responsibility for setting and implementing appropriate compliance processes and procedures based on the legislative framework. The expansion of the ESS and introduction of the PDRS will make it necessary to update the risk and compliance framework, including processes for reporting of suspected non-compliance or fraud by stakeholders and processes for complaints and appeals. IPART has already commenced this work.

Final position

The Government will:

- amend the legislation to enhance the powers of the administrator and regulator to improve its ability to prevent, detect and respond to fraud and non-compliance
- amend the legislation to clarify and streamline administration by:
  - updating the administrative review sections
  - allowing for the introduction of a binding schedule of fees for audits, should this be deemed necessary in the future
  - introducing a rolling certificate registration period
  - allowing an additional three months for preparation of the annual compliance report
  - clarifying the accreditation variation provisions.

21.1 Policy issue and options

NSW Treasury reports that compliance costs New South Wales between $11 and $87 billion every year. Even small improvements to our regulatory framework have the potential to drive significant economic benefits (NSW Government 2020g, p.1).

For Safeguard activities to effectively reduce energy consumption or peak demand, ACPs and service providers must understand and comply with the requirements. The administrator needs to be able to provide clear guidance on rule interpretation, evidence requirements and information on how ACPs are permitted to market their services under the Safeguard.

The administrator must identify compliance risks and have proportionate and effective powers and strategies that cover a spectrum of prevention, detection and response to those risks.

The Government consulted on nine options for reform of compliance powers and sought advice on best practice compliance and enforcement.

21.2 Stakeholder submissions

Six stakeholders provided feedback on the compliance and enforcement framework. Energy service industry stakeholders supported proportionate enforcement action, asserting the need for measured efforts to enhance compliance, and the need to balance any reforms or

additional powers with the functioning of the scheme. One energy service industry stakeholder recommended the audit regime be streamlined.

IPART supported the compliance and enforcement options presented in the consultation paper.

Table 40 Summary of stakeholder submissions on compliance and enforcement

Stakeholder group	Summary
Public advocacy group	PIAC asserted that it is important to balance compliance and enforcement enhancements with scheme functioning.
Energy service industry	ESIA noted that some ESS participants have chosen to cease engagement, or not engage, due to compliance costs and risks. ESIA recommended the ESS audit regime be streamlined. It suggested a process be established for publishing administrator and regulator decisions, and their rationale, for any technical ruling on new accreditations, requirements, measurement verification and audit findings. It proposed the establishment of an audit technical committee and a measurement and verification professional technical committee. With membership from IPART, auditors, measurement and verification professionals, ACPs and the Department, the committee would review new cases and contested decisions. ESIA also suggested IPART take a non-binary proportional approach to compliance. This would permit IPART to determine a proportion of total certificates are invalid, as opposed to fully invalid. It recommended creating certificate set-aside provisions for contested certificates. It also recommended that a simpler, less costly, and more extensive appeals process is needed. EEC considered IPART's compliance-focused approach to the ESS had substantially held back the scheme. It recommended IPART's role in the ESS be substantially overhauled. ERM Power[43] stated that the compliance burden had expanded in recent years, with uncertainty around measurement and verification standards persisting. It recommended compliance be based around existing audit standards with the role of the external audit panel and IPART to be clarified.
Electricity retailer	ERM Power suggested further efficiencies could be achieved by reducing the audit requirements imposed on obliged retailers, particularly when liabilities can be assessed with AEMO data. It recommended the duration between audits be extended to at least every second compliance year.
Electricity networks	Ausgrid supported measured efforts to enhance compliance with the scheme.
Government agencies	IPART supported the proposed options noting they are consistent with the powers of a modern regulator and align with the powers of other NSW regulators and the Victorian Essential Services Commission. IPART also requested the power to issue binding guidance material to address loopholes and clarify requirements in the ESS Rule as they are identified.

[43] ERM Power was both an ACP and a Scheme Participant. Their submission responses have been categorised according to the stakeholder group their comments were applicable to.

Three stakeholders commented on the provisions that enable the NSW Civil and Administrative Tribunal (NCAT) to review decisions made by IPART. The ESIA called for a simpler process. ERM Power noted the process was not broadly understood. IPART supported the current review process but noted that the level of understanding about the process varied among stakeholders. In its submission, IPART committed to promoting greater understanding among stakeholders of the review and complaints provisions.

Table 41 Summary of submissions on provisions for the NCAT review of scheme regulator and administrator decisions

Stakeholder group	Summary
Energy service industry	ESIA recommended a simpler, less costly process that includes categories of ESS decisions not available under the current process.
Electricity retailer	ERM Power did not consider the NCAT review process to be accessible or broadly understood.
Government agencies	IPART supported the current review provisions. It recognised that the level of understanding and awareness of the internal and external review opportunities varied among stakeholders. IPART committed to promote greater understanding and clarity among stakeholders.

21.3 Analysis of key issues

Prevention, detection and response are key pillars underpinning a robust fraud control framework (KPMG 2014, p.8). Positive compliance outcomes will be achieved where the greatest effort is focused on prevention, and decision-making is transparent.

Stakeholders, including IPART, have sought more consistency and clearer guidance to assist with interpretation of the ESS Rule.

Stakeholders indicated that the high cost of, and focus on, compliance is creating a barrier for some participants and is holding the scheme back. They asked for administrative decisions and their rationale to be published, and for appeals processes to be simpler.

The extension and expansion of the ESS and creation of the PDRS provides opportunity to consider stakeholder feedback and revise the compliance framework to improve compliance outcomes.

The Government is responsible for ensuring IPART has the appropriate compliance toolkit to detect prevent, detect and respond to compliance matters. IPART is responsible for reviewing, updating and implementing the compliance framework for the Safeguard.

21.3.1 IPART needs a broader suite of powers

Prevention or persuasion, detection and response are key pillars underpinning a responsive compliance enforcement strategy. The ‘Ayres and Braithwaite Compliance Pyramid’ has become the foundation compliance model for a significant number of regulatory agencies including the Australian Tax Office (Stuart Hamilton 2012, p.483), the NSW EPA (EPA 2013, p.5) and within IPART’s own Compliance and Enforcement Policy, which applies to the ESS, as shown in Figure 5 below. Under the compliance pyramid the greatest effort is focused on prevention or persuasion with escalating responses up to the most serious compliance response.

Figure 5 IPART enforcement pyramid (IPART 2017, p.14)

For the responsive regulation method to be most effective a regulator should have the ability to use a variety of tools across the spectrum of escalating responses. This allows a regulator to better tailor compliance and enforcement responses to solve particular compliance problems. Enhancing the compliance powers available to IPART will ensure it is best able to take targeted and proportionate action.

The Government consulted on nine options for enhanced compliance powers. The powers should be proportional to risks, and fair and reasonable to participants and service providers. In considering enhanced compliance powers, the Government must balance the need for general and specific deterrence with the effective operation of the scheme.

The Government will amend the legislation to improve IPART's ability to prevent, detect and respond to non-compliant activities. These changes fall into three categories: prevent, detect and respond.

To improve the administrator's ability to **prevent** non-compliance, amendments will be made to:

- allow for better information sharing with other related regulators, such as NSW Fair Trading and the Victorian Essential Services Commission
- clarify timing of certificate creation
- allow for audit fees to be set if required to prevent audit misconduct.

To boost the administrator's ability to **detect** non-compliance, amendments will be made to:

- allow for the appointment of authorised officers to inspect premises and gather evidence
- improve processes for the provision of information by 'whistle-blowers'
- clarify the provisions related to the giving of evidence.

Amendments will also be made to allow the administrator to **respond** more appropriately when non-compliance is found, such as:

- introducing a civil penalty regime
- introducing new offences for conspiracy and obstructing the audit process
- giving more flexibility in relation to orders to surrender certificates
- extending the time for when proceedings can occur.

21.3.2 IPART is reviewing and updating the risk and compliance framework for the Safeguard

While effective compliance action is critical to protect the integrity of the Safeguard, controls should not create a disproportionate or unacceptable burden on parties involved in the schemes. Submissions from energy service stakeholders suggested compliance actions by IPART under the ESS have not been proportionate to the risks involved. Energy service stakeholders also suggested a process be established for publishing administrator and regulator decisions and their rationale.

The greatest effort in a responsive compliance strategy should be on prevention. The OECD guideline for regulators, Creating a Culture of Independence, also states that regulators should justify key decisions with robust and detailed empirical evidence for the public record. The guideline goes on to note that the evidence should be clearly and briefly summarised and published for the benefit of all stakeholders in a non-technical language (OECD 2017, p.13).

IPART has an overarching Compliance and Enforcement Policy that applies across all its regulatory functions. The policy outlines IPART's principles for compliance and enforcement, which are that IPART will:

- focus on outcomes
- prioritise according to risk
- be fair and transparent.

IPART applies a risk-based regulatory model to compliance and enforcement. The risk-based approach allows IPART to make the best use of its resources and minimise excessive costs to regulated entities by focusing on allocating resources to areas of higher risk and tailoring the enforcement response (IPART 2017, pp.4–5). IPART's approach to compliance is illustrated in Figure 6.

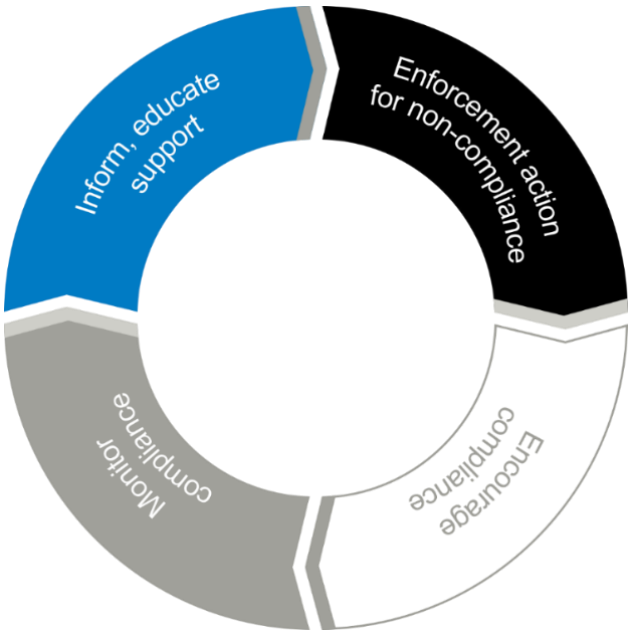

Figure 6 IPART's approach to compliance (IPART 2017, p.10)

These compliance principles were developed by IPART to align with the Government's approach to regulation (IPART 2017, p.4), as outlined in the Guidance for Regulators to Implement Outcomes and Risk-Based Regulation (Department of Finance, Services and Innovation 2016).

IPART's risk and compliance framework for the ESS, which sits under the IPART Compliance and Enforcement Policy, is under review by IPART for the Safeguard. The Department will work with IPART to consider feedback from stakeholders, including consideration of the compliance burden and processes for sharing information, as IPART undertakes its review.

The Department is responsible for considering whether fraud risk is being managed appropriately in the context of scheme design and development of the rules for the Safeguard. It will work with IPART to identify any unacceptably high residual risks and consider whether the Safeguard rules should be amended to address those risks.

21.3.3 Clear processes will strengthen fraud reporting

Detection of non-compliant or fraudulent activities is critical to effective compliance and enforcement action, as well as scheme integrity; however, there is currently no standardised and publicly available fraud reporting service for the Safeguard.

To help detect such activities, the Government recommends IPART update processes to allow stakeholders to report suspected non-compliance or fraud. These processes should protect the identity of people providing such information.

21.3.4 Improving transparency and accessibility of the administrative review process

Information for ACPs on the administrative review process is in the fact sheet 'How to have an ESS decision reviewed', available on the IPART website (IPART 2019b). If an ACP disagrees with a decision of IPART they have a right to have that decision reviewed, if it falls into one of the categories specified in the legislation, which include:

- a decision to refuse an application for accreditation
- a decision to cancel or suspend an accreditation
- a decision to refuse the registration of certificates
- a decision to impose or vary a condition of accreditation.

For types of decisions not specified in the legislation, ACPs need to independently seek judicial review of the decision for legal errors (i.e. go to court). This can be an expensive process for the parties involved (IPART 2019b).

Stakeholder feedback indicated the need to simplify the administrative review processes, expand them to cover other categories of decisions and improve stakeholder awareness of the processes. In its submission, IPART considered its arrangements for administrative review to be effective, but recognised that the level of understanding and awareness of the review opportunities varied among stakeholders.

The OECD's guideline for regulators on Creating a Culture of Independence recommends that regulators have easy, fair and timely complaints and appeals processes for regulators' decisions. Information on the quality and implementation of these processes should be published on accessible platforms (OECD 2017, p.13).

To address concerns that categories of decisions available under the administrative review process are too narrow, the Government will amend the ES Act to allow all entities authorised to exercise a function under the rules, such as approved Measurement and Verification Professionals, to seek administrative review of a decision. IPART will need to review and update its processes for appealing a decision in response to this legislative change. It will then need to communicate these changes to all affected stakeholders to ensure they understand how and when the administrative review process applies to them.

21.3.5 A binding schedule of fees could enhance future audit integrity

While IPART maintains a panel of authorised auditors, commercial negotiations between ACPs and auditors are not regulated and there is no set fee structure for audits. This creates a risk of the audit process being compromised through manipulation or undue influence.

Although this risk is currently small due to IPART's oversight of the audit process, the risk may increase with expansion of the ESS and the introduction of the PDRS. As such the Government will amend the ES Act to permit IPART to introduce a binding schedule of fees for audits, should this be deemed necessary in the future.

21.3.6 Other legislative amendments will improve administration

During the consultation process, the Government identified other opportunities to streamline scheme administration. The current provisions for certificate registration create a rush to register them before the end of the compliance period. This creates a bottleneck for processing registrations and for issuing the annual compliance report. Introducing a rolling registration period for certificates from the time of the energy savings activity and extending the deadline for the annual compliance report by three months will help address this issue.

The provisions relating to variation of accreditation create some uncertainty around the scheme administrator's ability to vary the scope of an ACP's accreditation. These provisions will be clarified to provide IPART with the ability to vary the scope of accreditation on application, in addition to being able to vary conditions of accreditation. This will prevent the need for unnecessary new accreditation applications.

21.4 Final position

The Government will:

- amend the legislation to enhance the powers of the administrator and regulator to improve its ability to prevent, detect and respond to fraud and non-compliance
- amend the legislation to clarify and streamline administration by:
    - updating the administrative review sections
    - allowing for the introduction of a binding schedule of fees for audits, should this be deemed necessary in the future
    - introducing a rolling certificate registration period
    - allowing an additional three months for preparation of the annual compliance report
    - clarifying the accreditation variation provisions.

22. Embracing a digital future

The ESS and PDRS schemes operate in an increasingly digital environment. It is the ambition of the Government to better utilise digital technologies to achieve scheme objectives; for example, supporting the rules with fit for purpose digital platforms designed to meet stakeholder needs.

Rules are the legislative instruments underpinning the ESS and PDRS. They need to be accurate, easy to understand, use and update.

Reviews of the Safeguard rules need to strike an effective balance between certainty for service providers and maintaining flexibility to address issues as they arise. The current review process for the ESS Rule[44] consists of a cycle of annual changes and major reviews every three years. Improvements to this process would better meet the needs of the expanded Safeguard.

Final position

The Government encourages the uptake of new digital technologies by its agencies to realise benefits such as improved user experience, better data availability and increased delivery capabilities.

The Department and IPART will continue to explore how to better utilise digital technologies to improve service delivery and streamline operations for all stakeholders. This is consistent with Government initiatives to improve outcomes through digitalisation. IPART is exploring a possible new digital platform for the Safeguard Registry and the Department is exploring writing the Safeguard rules as code for use in digital systems.

The current rule review process will be improved to make it more dynamic for the Safeguard. This reflects the changing needs for digital delivery of the schemes and for interoperability between the ESS and PDRS rules. The Department will investigate issues-based rule changes with increased levels of stakeholder engagement, raising major issues well in advance. Future rules may also refer more to external publications, to make use of external expertise and reduce the need for rule updates.

22.1 Policy issue and options

The Government has committed to exploring and implementing new and innovative ways of doing things in its Digital Government Strategy (NSW Government 2016b). The consultation paper explored how digital technologies could aid in customer-centric rule development, implementation and review. Areas identified for further investigation in the paper included: a single digital platform integrating the ESS Portal and ESS Registry, developing ‘rules as code’ to produce a complementary digital version of the rules, and implementing a more transparent and collaborative rule change process.

Much of the technical detail underpinning the Safeguard is in the rules. For the rules to remain relevant, they need to be updated for technological advances, changes in best practice and policy updates. However, frequent changes to the rules increase complexity for service providers and IPART.

[44] Energy Savings Scheme Rule of 2009

To streamline and improve the rule update process, the Government consulted on the following options:

- systematic reviews and updates by method or topic
- faster processing of low-risk rule change requests
- structural changes to the layout of the rules to make amendments and reviews more streamlined
- explore how to transition regulations and rules into computer code, so that regulations are easier to interpret and comply with.

22.2 Stakeholder submissions

Stakeholders supported the current rule review and three-year major rule review processes, while encouraging a more transparent and collaborative approach to the reviews.

One electricity retailer suggested developing ‘rules as code’ to streamline rule updates and their integration into service provider business systems. The same retailer also called for annual reviews of the PDRS for the first three years to ensure the rules were appropriate and effective.

Table 42 Summary of submissions on the annual rule review and three-year major rule review

Stakeholder group	Summary
Advocacy groups	PIAC recommended a more transparent and collaborative rule change process that includes consumer advocates.
Energy service industry	EEC stated that the current rule review process works well and noted the process provided industry with clarity about timelines for reforms to the scheme.
Electricity retailers	AGL considered three years to be a good period between major reviews, which allowed stakeholders to develop acquisition strategies. It recommended that the PDRS be reviewed every year for its first three years. AGL noted its support for implementing a more transparent and collaborative rule change process while acknowledging the current consultation processes were very good. It also supported developing ‘rules as code’.
Electricity networks	Ausgrid stated the current process was reasonable and balanced.
Government agencies	IPART supported structural changes to the layout of the rule and codifying the rule. IPART recommended faster processes for low-risk rule change requests outside of the annual rule review process.

22.3 Analysis of key issues

Stakeholder outcomes under the ESS and PDRS schemes are expected to be improved by the update of digital systems and processes. For example, the creation of a single digital platform to replace the ESS Portal and ESS Registry is expected to create efficiencies for stakeholders by making available ‘clean’, consolidated data.

Another area of interest is the digitalisation of scheme rules with benefits including increased consistency in interpretation, automation of manual processes, ability to test and model scenarios, integration with service provider software and long-term opportunities to harmonise the Safeguard with similar schemes in other states and the Commonwealth.

While there was stakeholder support for the current review process, opportunities for improvement have been identified. The Department will increase stakeholder consultation activities for rule updates and allow for references to external publications to reduce the need for rule updates. In addition, there will be annual reviews of the PDRS rule for the first three years after implementation.

22.3.1 Updated digital systems and processes will improve stakeholder outcomes

The Department and IPART are continuing to explore how to better utilise digital technologies, including the creation of a single digital platform to replace the ESS Portal and ESS Registry. The Department is drawing on the Government Digital Design Standards (NSW Government 2020e) to help guide the development of updated customer-focused digital services. As a first step, the Department and IPART have built a prototype to define scheme requirements and test stakeholder needs.

A key insight from this process has been the potential for clean, consolidated data to create the critical efficiencies required to scale energy savings. Access to 'clean data' provides unique benefits to different stakeholders:

- For policy-makers – enables informed, evidence-based decisions. Energy savings can be understood in real time, supporting better legislation development underpinning Safeguard delivery.
- For regulators – reduces the administrative burden and streamlines risk profiling so teams can know where to focus their efforts.
- For front-line teams – allows access to real-time data that augments existing business processes.

IPART will have responsibility for the development and maintenance of the IT platforms for the Safeguard.

22.3.2 The Government will improve service delivery with digitalised rules

Digital solutions to maximise consistency in Government communications including updates to the rules are currently being explored. This is also consistent with current Government policy with the Department for Customer Service developing a rules-as-code component of the NSW Digital Strategy (NSW Government 2020h, p.135). AGL also supported digitalising the rules in its submission.

The Safeguard rules are being digitalised as code with expected benefits including:

- simplification of rules, greater consistency in terminology, and fewer issues with interpretation
- automating the application of rules, such as eligibility checks, energy savings calculations, and compliance systems
- testing and modelling the outcomes of proposed legislative or rule changes through scenario testing
- automating the integration of rule changes into service provider software
- when digitalising the rules, the Department will collaborate with stakeholders to maximise cross-compatibility with participant and service provider software
- long-term potential to harmonise with other state and Commonwealth initiatives.

22.3.3 Current processes for review and release of the rules can be improved

The current review process for the ESS Rule aims to strike an appropriate balance between providing certainty and maintaining flexibility. The ESS Rule is subject to a major review every three years, with minor annual updates to address potential issues in the periods between major reviews. While ensuring methods and factors are up-to-date, the constant review cycle has given rise to stakeholder fatigue for some, and the perception that changes are simply for the sake of change.

Stakeholders were largely supportive of the current Rule update process though they did suggest some improvements. EEC and Ausgrid supported the current review process of the ESS Rule, and AGL noted the timeframes around the major and annual reviews were reasonable.

PIAC and AGL suggested there needed to be more collaboration and transparency in the rule change process with PIAC suggesting customer advocates should be included. As noted in section 19, stakeholder engagement plans will be developed by the Department and IPART. Activities related to the development and consultation on the rule change process will be detailed in these plans, improving collaboration and transparency in the process.

AGL suggested the PDRS Rule be reviewed annually for the first three years. Given the PDRS will be a newly created scheme, it is likely new elements will be added to the rules over the first few years, and that annual reviews will be required over this initial period as practical implementation issues arise.

IPART suggested faster processes for low-risk rule changes outside of the annual review process. The rules refer to technical documents outside the Safeguard such as Australian standards. Currently, the rule needs to be updated and approved by the Minister every time the technical document changes.

When drafting future rules, existing provisions in the ES Act will be used to refer to other publications as they apply at the time of use. When these other publications are updated, the rule will automatically refer to the most recent version. If no other suitable external publication exists, the rules may refer to a technical document to be published and updated separately by the Department. Where decision-making power is delegated from the Minister to the Department, processes for that decision-making will also be outlined in the stakeholder engagement plans.

22.4 Final position

The Government encourages the uptake of new digital technologies by its agencies to realise benefits such as improved user experience, better data availability and increased delivery capabilities.

The Department and IPART will continue to explore how to better utilise digital technologies to improve service delivery and streamline operations for all stakeholders. This is consistent with Government initiatives to improve outcomes through digitalisation. IPART is exploring a possible new digital platform for the Safeguard Registry and the Department is exploring writing the Safeguard rules as code for use in digital systems.

The current rule review process will be improved to make it more dynamic for the Safeguard. This reflects the changing needs for digital delivery of the schemes and for interoperability between the ESS and PDRS rules. The Department will investigate issues-based rule changes with increased levels of stakeholder engagement, raising major issues well in advance. Future rules may also refer more to external publications, to make use of external expertise and reduce the need for rule updates.

Appendix A: Cost–benefit analysis and modelling assumptions

This appendix provides an overview of the cost–benefit analyses for the ESS and the PDRS. It also sets out key modelling assumptions and outlines the approach to estimating the available technical energy saving and peak demand reduction opportunities and their uptake.

Energy Savings Scheme

Costs and benefits of the ESS

In line with NSW Treasury's guidelines (NSW Government 2015c, 2017), the central test of the cost–benefit analysis is a net public benefit test.

The costs for New South Wales of the ESS are:

- NSW Government costs in administering and managing the scheme
- compliance and regulatory costs on ACPs and scheme participants as a result of their involvement in the scheme, including the cost of the certificates.

Table 43 sets out how these costs were estimated.

Table 43 Economic costs of the ESS

Cost category	Source
NSW Government costs	Departmental estimate of IPART's cost associated with administering and regulating the scheme Departmental costs associated with managing the policy framework and the delivery of the ESS The ESS-related component of the Energy Efficiency Program
Compliance and regulatory costs	Forecast ESC prices (Common Capital 2020b) Surveys of administration costs for ACPs and scheme participants (Sapere 2017)

The benefits for New South Wales of the ESS are:

- avoided electricity generation purchase costs (including line losses)
- avoided natural gas, LPG and diesel supply costs (offset by increased cost of supplying biomass, biogas and hydrogen)
- deferred investment in electricity and gas networks
- avoided externalities, including the value of emissions savings and avoided health costs from air pollution.

Table 44 sets out how these benefits were estimated.

Table 44 Economic benefits of the ESS

Benefit category	Source
Avoided electricity generation purchase costs (including line losses)	Forecast incremental electricity savings including line losses (Common Capital 2020b) Forecast wholesale electricity prices (Aurora Energy Research 2020)
Avoided cost of supply of gas, diesel and LPG	Forecast incremental energy savings (Common Capital 2020b) Forecast gas wholesale price (Aurora Energy Research 2020) Forecast diesel wholesale price calculated by the Department relative to forecast crude oil prices Forecast LPG wholesale price from ACCC (2020), assumed to be constant
Deferred electricity and gas network costs	Forecast incremental reduction in electricity peak demand (Aurora Energy Research 2020) and gas consumption (Common Capital 2020b) The long-run marginal cost of NSW electricity distribution networks (Ausgrid 2019, p.64, Endeavour Energy 2019, p.88, Essential Energy 2019, p.14) The long-run marginal cost of NSW gas networks (Jemena Gas Networks 2020)
Avoided externalities: • value of emissions savings • avoided health costs from air pollution	Forecast by the Department using European Union Allowance historic futures price data from Barchart (2020) Air quality and public health co-benefits of implementing energy efficiency and clean energy measures in NSW (NSW Government 2019b)

Estimating energy saving opportunities

The Department maintains an 'energy efficiency opportunity list' that quantifies over 500 energy efficiency opportunities available to consumers in New South Wales. For each activity, the opportunity list shows:

- the amount of energy that can be saved
- the capital cost of implementation
- the total number of typical sites in New South Wales where the opportunity is applicable because of:
    - appropriateness (e.g. gas connection)
    - existing market share (i.e. whether users already have the technology).

The opportunity list draws on publicly available national and state sources, consultants' internal resources and evaluation of NSW Government energy efficiency programs.

The Department commissioned a consultant to update the energy efficiency opportunity list (Energetics 2020). The update involved:

- updating subsector energy consumption baselines
- reducing the size of the remaining opportunity based on the take-up of energy efficiency activities
- expanding the list to include the agricultural sector
- adding new industrial, commercial and residential opportunities
- adding a wider range of fuel switching activities.

Estimating the uptake of energy saving activities

The Department commissioned the development of an uptake model to estimate the impact of the Safeguard schemes at different policy settings and targets (Common Capital 2020b). Based on assumed demand for certificates under different target settings, the uptake model forecasts for the ESS:

- annual uptake of specific energy efficiency opportunities by different sectors and end-uses
- average certificate prices required for the market to meet scheme targets
- energy, peak demand and bill savings over time from uptake of eligible activities.

The key inputs to the uptake model are:

- energy efficiency opportunities
- forecasts of fuel retail prices by customer segment
- the willingness to pay for energy efficiency across different sectors using assumed average payback thresholds
- the maximum annual capacity of the market to take up cost-effective opportunities.

The uptake model forecasts certificate prices needed to encourage take-up

By overcoming market barriers to energy efficiency, incentives from the ESS lower the private costs of these opportunities. This reduces the payback period (i.e. the time it takes for a return on investment to be cost-effective).

The uptake model calculates the certificate price required for the activity to be considered cost-effective by consumers, and therefore taken up. This calculation considers:

- average payback thresholds
- cost of the activity, including:
  - incremental capital costs
  - maintenance costs
  - transaction costs
- energy bill savings.

The certificate price also considers administration and compliance costs for ACPs and scheme participants.

Table 45 sets out payback thresholds by sector (Common Capital 2020b).

Table 45 Payback thresholds for return on investment by market sector

Market sector	Payback threshold (years)
Residential – low income	1
Residential – high income	1
Small to medium sized business	1
Commercial	2
Industrial	2
Agriculture	2

The incremental capital and maintenance costs were estimated by Energetics (2020). Transaction costs reflect the time and effort needed to understand the opportunity and its benefits, source the right product and supplier at the right price, and oversee the installation. Based on a literature review of comparable policies in Australia and overseas, the uptake model assumes that transaction costs add 20% to the capital cost of a project.

Table 46 shows the sources for fuel prices used to calculate energy bill savings.

Table 46 Fuel price assumptions

Fuel type	Source
Electricity and gas retail prices	Prices forecast by Aurora Energy Research (2020) and analysis by the Department
Diesel retail price	Calculated by the Department based on forecast petrol retail prices (BITRE 2019)
LPG retail price	Sourced (ACCC 2020) and assumed to be constant
Biomass and biogas fuel price	Assumed to be zero for biomass and biogas feedstock sourced on site (Energetics 2018, p.5 and Stucley et al. 2004, p.72) The price of biomass sourced off site was based on biomass project case studies
Hydrogen fuel price	Sourced from KPMG (2020)

The S-curve estimates maturity of technology and speed of uptake

In any given year, only some of the total available technical opportunity can be taken up. The rate at which technologies are taken up is estimated through sigmoid curves (S-curves). These reflect how quickly technologies and services spread as the market matures from early adopters to mass market appeal.

In the uptake model, the S-curves impose a limit on the maximum proportion of market uptake each year.

Different sectors will adopt technologies at different rates. The uptake model classifies sectors as slow, medium or fast adopters (Figure 7). This influences the rate at which energy efficiency opportunities are taken up in that sector.

Residential and industrial activities are assumed to grow at a relatively slow rate, whereas commercial and agricultural activities are taken up at a medium rate.

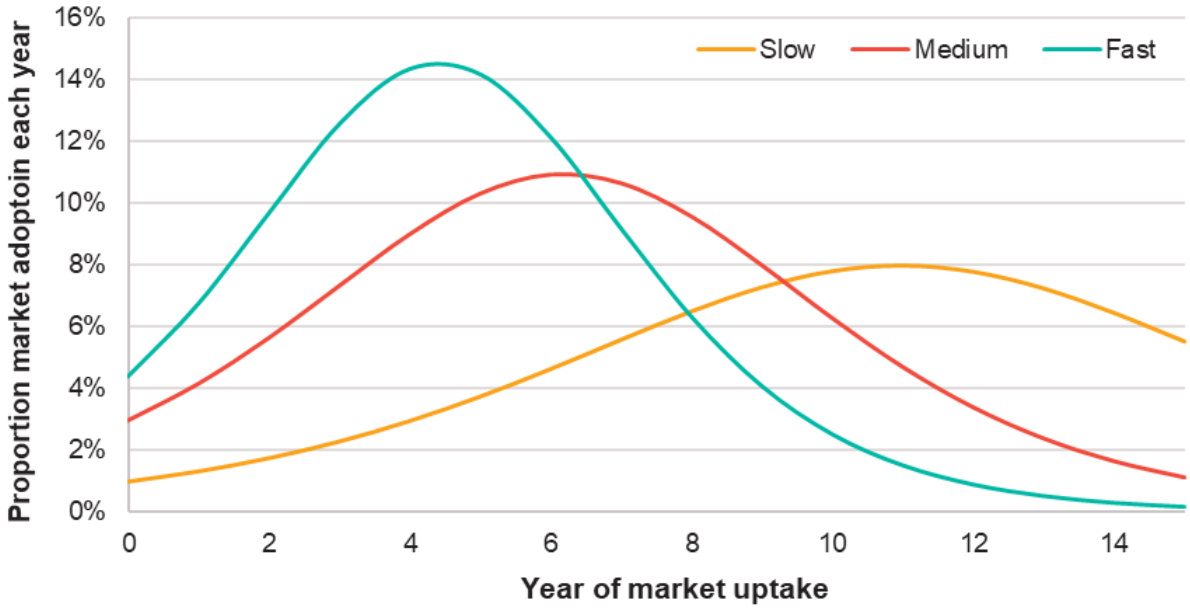

Figure 7 Rates of market adoption for energy efficiency and peak demand reduction activities

The uptake model assumes that the market will purchase the lowest cost activities that are available in each year.

Freeriding, spillover and rebound

Energy efficiency programs can be associated with 'freeriding', where participants receive financial incentive for activities that would have occurred anyway. Conversely, programs may have 'spillover' effects, such as consumers choosing to implement more energy efficiency measures than the activities they claim an incentive for.

The cost–benefit analysis accounts for freeriders and spillovers through a 'net to gross' energy savings ratio. This balances the amount of savings that would have been undertaken without the ESS (freeriding) with the amount of savings attributable to spillover.

Based on similar programs in comparable jurisdictions, the net to gross ratio is assumed to be a factor of 0.87. As a result, the projected energy and peak demand savings are discounted by 13%. This is consistent with the approach taken in the last ESS review (NSW Government 2015a, p.138). It is a conservative assumption as several studies in the United States have concluded that the impact of freeriders and spillovers net each other off (Haeri and Khawaja 2012, p.41).

The rebound effect occurs when energy efficiency activities result in fewer energy savings than expected due to either behavioural or other systemic responses (e.g. using an efficient space heater to improve thermal comfort where no heater was used before).

Energy savings may be overestimated if the rebound effect is not included in estimates of energy usage where relevant. It does not apply to all types of energy efficiency technologies; for example, a new energy efficient fridge will not operate for any more hours per year than the model it replaced.

The rebound effect has been found to be a benefit, not a cost, of energy efficiency policy (Gillingham et al. 2015, p.18). For example, a more efficient HVAC system allows homes to be kept at a more comfortable temperature and improves the productivity of residents. The Department does not currently include the rebound effect in its energy efficiency cost–benefit analyses but could do so in the future if the impact can be reliably quantified.

Incremental energy savings from higher ESS targets

The Department estimated the incremental energy savings delivered by higher targets using the uptake model and AEMO's operational demand forecast (AEMO 2020e).

Figure 8 shows the projected incremental energy savings expected under higher targets. As described above, energy savings are reduced by 13% to account for the net impact of freeriders and spillovers for the purposes of the cost–benefit analysis.

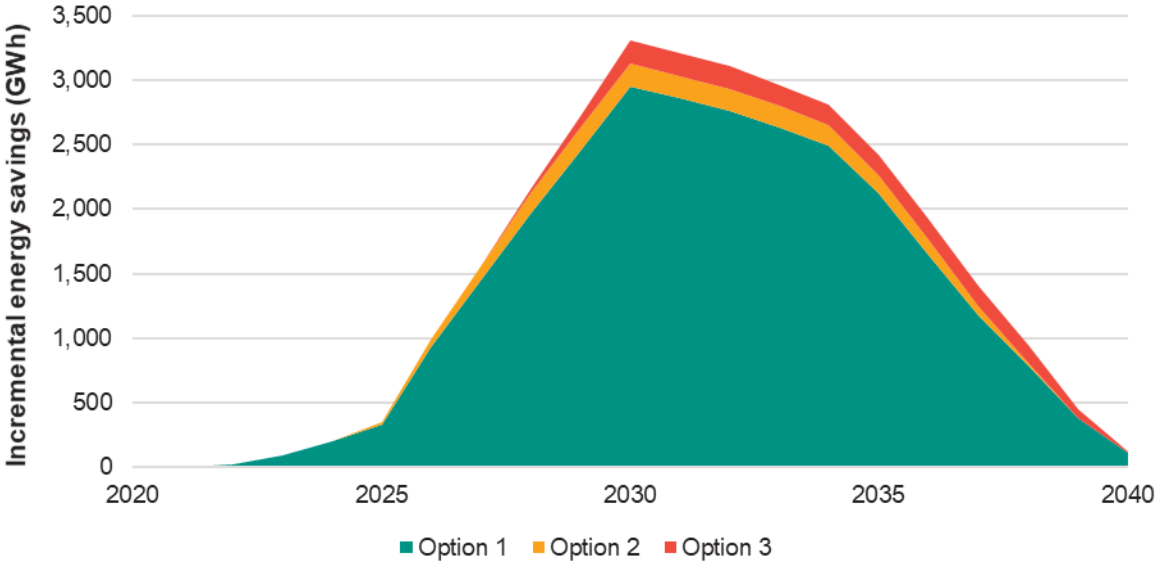

Figure 8 **Incremental energy savings relative to current targets**

Figure 9 shows the distribution of annual savings among different fuel types for the final target (Option 1). Gas and diesel savings increase as a proportion of total savings over time.

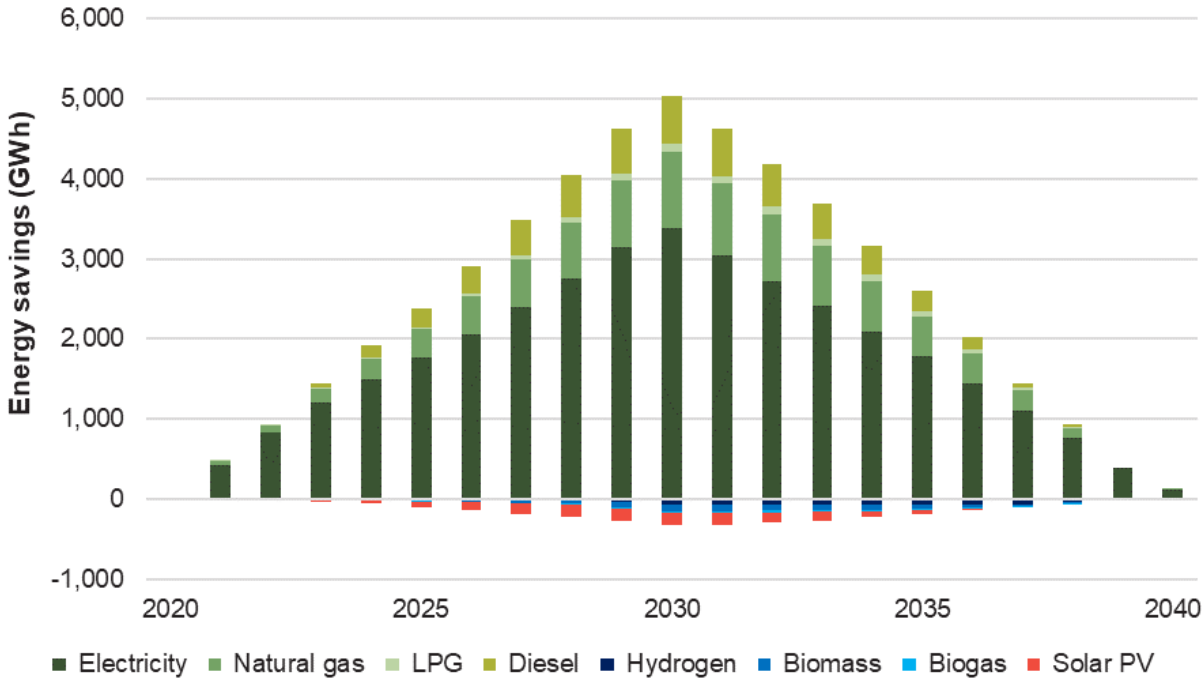

Figure 9 Annual energy savings by fuel type for the selected fuels[45]

Sensitivity analysis

In line with NSW Treasury advice, the Department tested the sensitivity of its analysis to different discount rates (NSW Government 2017, p.42). Table 47 summarises cost–benefit analysis results when the discount rate is decreased from 7% to 3% and increased from 7% to 10%.

Table 47 Cost–benefit analysis with different discount rates

Present value to 2040	Final position	Lower discount rate	Higher discount rate
Total costs ($m)	–$427	–$576	–$345
Total benefits ($m)	$1,490	$2,337	$1,087
Net economic benefit ($m)	$1,063	$1,761	$742
Benefit–cost ratio	3.5	4.1	3.2

The Department tested the sensitivity of its analysis under two scenarios where certificate prices required to meet targets are higher than anticipated.

Table 48 summarises cost–benefit analysis results if the cost of creating certificates is higher than assumed. This scenario:

- increased transaction costs from 20% to 30%
- reduced the payback threshold for the low-income residential sector to six months
- increased administration and compliance costs per certificate from $4.65 to $7.00 for deemed and metered baseline methods and from $6.50 to $9.00 for PIAM&V.

[45] Modelling included fuel switching from electricity to natural gas.

Table 48 Cost–benefit analysis with high certificate creation costs

Present value to 2040	Final position	Higher certificate creation costs
Total costs ($m)	–$427	–$534
Total benefits ($m)	$1,490	$1,490
Net economic benefit ($m)	$1,063	$956
Benefit–cost ratio	3.5	2.8

Table 49 summarises cost–benefit analysis results when electricity prices are 10% lower than forecast in the central assessment. This increases certificate costs as it reduces the bill savings benefits of energy efficiency activities.

Table 49 Cost–benefit analysis with lower electricity prices

Present value to 2040	Final position	Lower electricity price forecast
Total costs ($m)	–$427	–$457
Total benefits ($m)	$1,490	$1,490
Net economic benefit ($m)	$1,063	$1,033
Benefit–cost ratio	3.5	3.3

Peak Demand Reduction Scheme

Costs and benefits of the PDRS

Similar to the ESS, the costs for New South Wales of the PDRS are:

- NSW Government costs in administering and managing the scheme
- compliance and regulatory costs on ACPs and scheme participants as a result of their involvement in the scheme, including the cost of the certificates.

Table 50 sets out how these costs were estimated.

Table 50 Economic costs of the PDRS

Cost category	Source
NSW Government costs	Departmental estimate of the cost associated with setting up IT systems and other frameworks for administering and regulating the scheme Departmental estimate of IPART's cost associated with administering and regulating the scheme Departmental costs associated with managing the policy framework and the delivery of the PDRS
Compliance and regulatory costs	Forecast certificate prices (Common Capital 2020b) Estimate of administration costs for ACPs and scheme participants based on Sapere (2017)

The benefits for New South Wales of the PDRS are:

- avoided electricity generation purchase costs at peak times (including line losses)
- deferred investment in electricity networks
- avoided externalities, including the value of emissions savings and avoided health costs from air pollution.

Table 51 sets out how these benefits were estimated.

Table 51 Economic benefits of the PDRS

Benefit category	Source
Avoided electricity generation purchase costs at peak times (including line losses)	Forecast electricity consumption at peak times (Aurora Energy Research 2020) Forecast wholesale electricity prices at peak times (Aurora Energy Research 2020)
Deferred electricity network costs	Forecast incremental reduction in electricity peak demand (Aurora Energy Research 2020) The long-run marginal cost of NSW electricity distribution networks (Ausgrid 2019, p.64, Endeavour Energy 2019, p.88, Essential Energy 2019, p.14)
Avoided externalities: • value of emissions savings • avoided health costs from air pollution	Forecast by the Department using European Union Allowance historic futures price data from Barchart (2020) Air quality and public health co-benefits of implementing energy efficiency and clean energy measures in NSW (NSW Government 2019b)

Avoided electricity generation purchase costs at peak times

The avoided cost of purchasing electricity at peak times is the difference between the cost of system demand with and without the scheme. The cost of system demand is the sum of the cost for each 30-minute interval during the 'peak period'.

To capture the full effect of the scheme on prices and demand, the peak period is aligned with the period when demand reduction is needed for the highest target option (Figure 10). This is based on the intervals that exceed the targeted demand reduction on AEMO's POE10 maximum demand forecast for 2030.

For the calculation of avoided wholesale purchase costs at peak times, the peak period was from 1pm to 9.30pm AEST on working days.

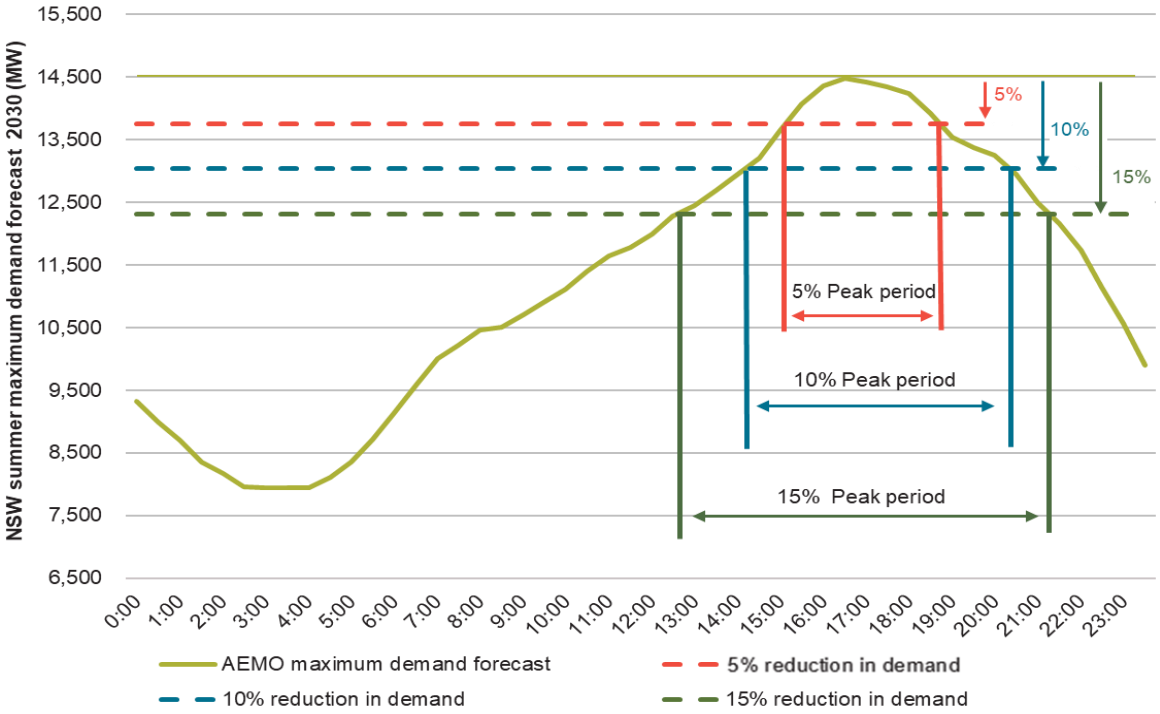

Figure 10 Modelling peak windows for different target levels in 2030

Adjusting for the cost of WDRM dispatch

Under the WDRM, retailers will pay AEMO for the customer's baseline level of energy consumption at the wholesale spot price (AEMC 2020, p.197). The cost–benefit analysis adjusts for the WDRM by including the cost of dispatch at the half-hourly spot price.

Estimating peak demand reduction opportunities

As discussed in section 15.1.1, three types of activities are eligible under the PDRS:

- peak demand saving, recognising the additional peak benefit of energy efficiency activities
- peak demand response, controlling certain technologies to temporarily reduce operating load at peak times
- peak demand shifting, routinely changing appliances or equipment to shift energy use away from peak periods to other times.

The energy efficiency opportunity list provides the size and cost of the opportunity for peak demand saving activities (Energetics 2020). For the purposes of modelling, peak demand saving opportunities were defined as any ESS electricity saving opportunity where the conservation load factor (CLF) is less than 0.6. CLF is the ratio of average demand reduction to peak demand reduction.

Common Capital (2020b) quantified peak demand response and peak demand shifting opportunities in New South Wales (see section 12.3.1).

PDRS activities need to deliver when demand is highest

Peak demand response is a dispatchable resource, meaning that it can be deployed as needed. Peak demand savings can be relied on as long as the technology is in place. Peak demand shifting can be routinely changed to shift energy use away from peak periods to other times, or in some cases used as a dispatchable resource.

The Department has assumed that peak demand saving and peak demand shifting opportunities are dispatched every day.

Peak demand response activities are dispatched based on the number of 'activation hours' for the relevant year's target. The uptake model calculates activation hours as the average number of hours in which system demand has exceeded the PDRS's targeted level of demand reduction. This is based on half-hourly demand data from AEMO for financial years 2015 to 2020 (AEMO 2020f).

Table 52 shows the activation hours for each year for the three target options.

Table 52 Activation hours[46]

Target	2023	2024	2025	2026	2027	2028	2029	2030
Low	2	2	3	6	9	9	13	13
Medium	2	2	6	18	32	41	51	51
High	2	3	13	41	78	118	143	143

For the PDRS to be effective, capacity must be available when system demand is highest. The uptake model uses AEMO's forecast to identify the peak period during which system demand exceeds the targeted level of demand reduction (AEMO 2020e).[47]

[46] Table is in financial years

[47] Maximum demand for different intervals may occur on different days, not just the day of annual maximum demand.

The model uses the relevant year's peak period to determine when demand response activities are dispatched. As targets increase, demand response is dispatched for longer periods. Figure 10 above shows that as targets increase, the peak period becomes longer.

Estimating the uptake of peak demand reduction activities

As for the ESS, the Department uses an uptake model to estimate the impact of the PDRS at different policy settings and targets (Common Capital 2020b). Based on assumed demand for certificates under different target settings, the uptake model forecasts for the PDRS:

- annual uptake of specific peak demand reduction opportunities by different sectors and end-uses
- average certificate prices required for the market to meet scheme targets
- peak demand, electricity and bill savings and other participant benefits over time from uptake of eligible activities.

The key inputs to the uptake model are:

- peak demand reduction opportunities
- forecasts of electricity retail prices by customer segment and tariff type
- the willingness to pay for peak demand reduction across different sectors using assumed average payback thresholds
- the maximum annual capacity of the market to take up cost-effective opportunities.

The following sections describe assumptions specific to the PDRS (for assumptions that apply to both the ESS and PDRS, refer to the Estimating the uptake of energy saving activities section within this appendix).

Uptake considers participant benefits as well as implementation costs

Like in the ESS, peak demand saving activities deliver bill savings due to a reduction in electricity consumption. Peak demand shifting activities, such as batteries, provide bill savings from shifting usage to off-peak periods when electricity is cheaper.

Customers that participate in peak demand response activities may be eligible for dispatch payments from other sources such as the WDRM or energy retailer incentive payments.

For commercial and industrial demand response, the dispatch price is assumed to be $10,000 per MWh. For residential demand response, it is assumed energy retailer incentive payments are $4000 per MWh. Demand response service providers (DRSPs) are assumed to pass on 50% of the dispatch payment from the WDRM to their customers (AEMC 2020, p.42).

Peak demand reduction is adjusted for firmness

The actual demand reduction delivered in any half-hourly period is adjusted for the expected certainty or 'firmness' of the activity. The firmness adjustment considers three main factors:

1. certainty that the system would normally be operating during a peak event
2. ability for the system to deliver demand reduction during the whole peak event
3. likelihood of participation during a particular peak event.

For demand response activities, Common Capital (2020a, p.142) used data published by the US Energy Information Administration to determine aggregate firmness, based on the difference between contracted and delivered demand reduction. Firmness for peak demand saving and shifting is based on estimates by Common Capital (2020a).

Peak demand reduction from the PDRS

Table 53 shows the impact of the PDRS on NSW peak demand to 2030. As described above, this is reduced by 13% to account for the net impact of freeriders and spillovers for the purposes of the cost–benefit analysis.

Table 53 Peak demand reduction (MW) to 2030[48]

Peak demand reduction	2023	2024	2025	2026	2027	2028	2029	2030
Option 1: Target at 5% in 2029–30	0	1	20	65	128	185	236	276
Option 2: Target at 10% in 2029–30	1	34	147	374	628	881	1,092	1,218
Option 3: Target at 15% in 2029–30	2	56	225	498	833	1,227	1,624	1,698

Sensitivity analysis

In line with NSW Treasury advice, the Department tested the sensitivity of its analysis to different discount rates (NSW Government 2017, p.42). Table 54 summarises cost–benefit analysis results when the discount rate is decreased from 7% to 3% and increased from 7% to 10%.

Table 54 Cost–benefit analysis with different discount rates

Present value to 2040	Final position	Lower discount rate	Higher discount rate
Total costs ($m)	–$234	–$296	–$198
Total benefits ($m)	$388	$559	$299
Net economic benefit ($m)	$154	$263	$101
Benefit–cost ratio	1.7	1.9	1.5

The Department tested the sensitivity of its analysis under three scenarios where certificate prices required to meet targets are higher than anticipated.

Table 55 summarises cost–benefit analysis results if the cost of creating certificates is higher than assumed. As for the ESS, this scenario:

- increased transaction costs from 20% to 30%
- reduced the payback threshold for the low-income residential sector to six months
- increased administration and compliance costs per certificate from $5 to $7.50.

Table 55 Cost–benefit analysis with higher certificate creation costs

Present value to 2040	Final position	Higher certificate creation costs
Total costs ($m)	–$234	–$256
Total benefits ($m)	$388	$388
Net economic benefit ($m)	$154	$132
Benefit–cost ratio	1.7	1.5

[48] The targets are based on AEMO's one-in-ten year forecast maximum demand and the projected peak demand reduction was modelled by Aurora Energy Research (2020). Peak demand reduction is incremental to the ESS, includes line losses and is shown in financial years.

Table 56 summarises cost–benefit analysis results when electricity prices are 10% lower than forecast in the central assessment. This increases PDRS certificate costs as it reduces the bill savings benefits of peak demand saving and shifting activities. However, eligible ESS activities receive more benefit from the PDRS, which reduces the cost of ESCs and results in an overall decrease in scheme costs.

Table 56 Cost–benefit analysis with lower electricity prices

Present value to 2040	Final position	Lower electricity price forecast
Total costs ($m)	–$234	–$228
Total benefits ($m)	$388	$388
Net economic benefit ($m)	$154	$160
Benefit–cost ratio	1.7	1.7

Table 57 summarises cost–benefit analysis results when dispatch payments are lower than assumed, which increases the contribution (and therefore certificate prices) required from the PDRS. Dispatch payments were adjusted as follows:

- commercial and industrial dispatch payment reduced to $5000 per MWh
- residential dispatch payment reduced to $2000 per MWh.

Table 57 Cost–benefit analysis with lower dispatch payment assumptions

Present value	Final position	PDRS lower dispatch cost
Total costs ($m)	–$234	–$265
Total benefits ($m)	$388	$388
Net economic benefit ($m)	$154	$123
Benefit–cost ratio	1.7	1.5

Appendix B: List of stakeholder submissions

The following stakeholders made submissions.

1 AGL
2 Alinta Energy
3 Ausgrid
4 Australian Energy Council
5 Australian Energy Market Commission
6 Bioenergy Australia
7 BlueScope Steel
8 Brickworks Building Products
9 Business NSW
10 Clean Energy Council
11 Ecovantage
12 Edge Electrons
13 Endeavour Energy
14 Enel X Australia
15 Energy & Water Ombudsman NSW
16 Energy Conservation
17 Energy Efficiency Council
18 Energy Mad
19 Energy Makeovers*
20 Energy Savings Industry Association
21 Energy Users' Association of Australia
22 EnergyAustralia
23 Enova Energy
24 ERM Power
25 Essential Energy
26 Farm Renewables Consulting
27 Firm Power
28 Green Connection Group*
29 Green Home Green Planet
30 Heathcote Resources
31 Independent Pricing and Regulatory Tribunal (IPART)
32 An individual
33 Integrated Business Planning Solutions Pty Ltd
34 Knauf Insulation
35 Lakin Consulting*

36 LED Saves
37 Mondo
38 National Irrigators' Council
39 Nature Conservation Council of NSW
40 Next Energy
41 NSW Farmers
42 Origin Energy
43 Powerpal
44 Primsal
45 Public Interest Advocacy Centre
46 Reaqua Solar Pumping
47 Shine On*
48 Solar SG
49 Stiebel Eltron
50 SunLED Energy
51 Tesla
52 The Green Guys Group*
53 TransGrid
54 Waverley Council
55 369 Labs

Notes:

Submissions marked with an asterisk endorsed the ESIA submission.

There were also two confidential submissions.

Abbreviations

ACP	Accredited certificate provider
AEC	Australian Energy Council
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
AER	Australian Energy Regulator
ARENA	Australian Renewable Energy Agency
BASIX	Building Sustainability Index
CEC	Clean Energy Council
CLF	Conservation load factor
CPI	Consumer Price Index
DER	Distributed energy resource
DMIS	Demand Management Incentive Scheme
DRSP	Demand response service provider
EEC	Energy Efficiency Council
EEIS	Energy Efficiency Improvement Scheme (ACT)
ERF	Emissions Reduction Fund
ES Act	NSW *Electricity Supply Act 1995*
ESB	Energy Security Board
ESC	Energy savings certificate
ESIA	Energy Savings Industry Association
ESS	Energy Savings Scheme
EST	Energy Security Target
EUAA	Energy Users' Association Australia
GJ	Gigajoule
GWh	Gigawatt hour
HVAC	Heating, ventilation and air-conditioning
IPART	Independent Pricing and Regulatory Tribunal
IFOA	Integrated Forestry Operations Approval
kW	Kilowatt
LED	Light-emitting diode
LGC	Large-scale generation certificate
LPG	Liquified petroleum gas
LRET	Large-scale Renewable Energy Target
M&V	Measurement and verification
ML	Megalitre
MW	Megawatt
MWh	Megawatt hour
NEM	National Electricity Market
PDRS	Peak Demand Reduction Scheme
PFC	Power factor correction
PIAC	Public Interest Advocacy Centre
PIAM&V	Project Impact Assessment with Measurement & Verification
PJ	Petajoule

POE10	10% probability of exceedance
PRC	Peak reduction certificate
PV	Photovoltaic
REES	Retailer Energy Efficiency Scheme (South Australia)
RERT	Reliability and Emergency Reserve Trader
RET	Renewable Energy Target
RRO	Retailer Reliability Obligation
SRES	Small-scale Renewable Energy Scheme
STC	Small-scale technology certificate
VEU	Victorian Energy Upgrades (program)
VPP	Virtual power plant
VR	Voltage regulation
WDRM	Wholesale Demand Response Mechanism

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