Business case: Innovation fund

2025-30 Regulatory Proposal

Supporting document 5.7.7

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SA Power Networks

Empowering South Australia

Contents

Glossary

Acronym / term	Definition
AER	Australian Energy Regulator
AEMO	Australian Energy Market Operator
CAB	Community Advisory Board
Capex	Capital expenditure
CER	Customer Energy Resources
CESS	Capital Expenditure Sharing Scheme
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEM	South Australian Department of Energy and Mining
DMIAM	Demand management Innovation Allowance Mechanism
DNSP	Distribution Network Service Provider
DOE	Dynamic Operating Envelope
EBSS	Efficiency Benefit Sharing Scheme
EV	Electric Vehicle
EVM	Enhanced voltage management
GHG	Greenhouse Gase
ICE	Internal combustion engine
LV	Low voltage
MED	Major Event Day
NEL	National Electricity Law
NEM	National Electriity Market
NER	National Electricity Rules
Opex	Operating expenditure
RCP	Regulatory Control Period
Statcom	Synchronous Compensator
STPIS	Service target performance incentive scheme
VCAP	Vulnerable Customer Assistance Program
VPP	Virtual Power Plant

1 About this document

1.1 Purpose

This document provides the business case to establish an Innovation Fund to pursue innovation driven programs during the 2025-30 Regulatory Control Period (**RCP**) across three focus areas:

1. Enabling and Leveraging the Future Market;
2. Community Resilience; and
3. Sustainability Solutions.

1.2 Expenditure category

- Other non-network capital expenditure (**capex**)
- Other non-network operating expenditure (**opex**) - via an adjustment to the control formula rather than the opex forecast.

1.3 Related documents

Table 1: Related documents

Ref	Title
[1]	5.7.4 - CER Integration - Business Case
[2]	5.7.5 - Demand Flexibility - Business Case
[3]	5.10.1 - Fleet - Business Case
[4]	5.8.3 - Network Resilience mobile generation - Business case
[5]	5.2.2 – Strategic Asset Management Plan (SAMP)

2 Executive summary

Overview

This business case recommends new expenditure in the 2025-30 RCP to establish an Innovation Fund to pursue initiatives that are likely to return long-term customer benefits, but are difficult to identify at this point in time, either because the benefits are difficult to monetise, or because there is uncertainty at this point in time as to the optimal delivery method (including specific technology, system / process, or partnering arrangement). The total proposed expenditure is **$20 million** (June $2025) over the 2025-30 RCP, split 80 per cent into capex and 20 per cent into opex.

Drivers for change

In the rapidly changing energy landscape, innovation and use of new solutions is essential. Whether it emerges from research and development efforts, trialling of new technologies, testing new approaches to tasks or meeting evolving expectations of customers its goal remains the same: to find new cost-effective solutions that capture the opportunities and address the challenges we face in order to deliver long-term value to customers. This value is typically delivered through productivity enhancements, achieved via reduced cost or increased output.

Throughout our consumer and stakeholder engagement program for the 2025-30 RCP, customers expressed a desire for us to be innovative in how we respond to various challenges. These include those associated with a transitioning energy system, climate change, and need to reduce carbon emissions. Customer support for a number of innovative programs related to these areas further underscores this sentiment.

However, pursuing innovation programs via a Regulatory Proposal is challenging. While these programs will likely drive consumer benefits long term, justifying required expenditure via an up-front traditional cost / benefit analysis approach is challenging in the short term. This is because customer benefits are difficult to quantify during these initial stages of development due to uncertainties around the specifics of the end solution such as: the delivery model, market structure, technology effectiveness, and partnering arrangements. Further, the novel nature of innovation-based initiatives means there is a lack of precedents or existing examples where the solution has been applied to reliably estimate the resulting benefits.

To address this issue, the Demand Management Innovation Allowance Mechanism (**DMIAM**) is often used to fund innovation initiatives within the regulatory framework. However, its focus is restricted to managing network demand which limits the range of initiatives and programs that can be funded. Further, given the range of evolving challenges we face arising from the rapid pace of the energy transition in South Australia, funding under DMIAM is insufficient to cover the level of innovation required in the 2025-30 RCP.[1]

Since 2019, two distribution networks in the National Electricity Market (**NEM**), Ausgrid and AusNet, have funded innovation-based initiatives using Innovation Funds to meet their growing need for innovation.[2] [3] These funds apply similar governance and funding arrangements with: committees established to oversee innovation expenditure, principles upon which to assess funded projects, and commitments to return unused funding to customers along with exclusion of underspends from incentive schemes. Following the effectiveness of these funds, Ausgrid and Endeavour proposed similar funds for 2024-29.[4]

[1] SA Power Networks is one of the few networks in the NEM to completely utilise its DMIAM funding each period.

[2] Ausgrid's Revised Regulatory Proposal for the 2019-24 RCP included $42 million ($2018-19) for network innovation (in addition to their $6.67 million DMIAM which was accepted by the Australian Energy Regulator (AER) in its Distribution Determination.

[3] AusNet Innovation Fund $7.5 million ($2021) for the 2021-26 RCP which was accepted by the AER in its Distribution Determination.

[4] Endeavour Energy's 2024-29 Regulatory Proposal included $20m capex & $5 million opex ($2024) for an innovation fund. Ausgrid's 2024-29 Revised Regulatory Proposal includes $45 million ($2024/25) for an innovation fund.

Our proposed innovation fund

As endorsed by our Community Advisory Board (**CAB**), who are our partners in our engagement program, we propose to consolidate several categories of innovation initiatives into a dedicated 'Innovation Fund'. These categories of initiatives, identified as important to customers during our reset engagement, will target:

1. community resilience;
2. enabling and leveraging the future market; and
3. sustainability solutions.

The Innovation Fund will enable customer-supported, innovation-driven projects which otherwise, due to their novel nature, may not be justified if presented as stand-alone programs using standard cost-benefit analysis within business cases due to uncertainties regarding their future monetised benefits.

We plan to collaborate with our CAB to establish robust governance arrangements for the Fund, building on the innovation fund governance models used by other networks. We envisage this will include the formation of a CAB Sub-Committee (reporting to the overall CAB) which we will work collaboratively with to develop principles to determine when innovative programs are funded and to provide oversight of the programs. This will allow customers to be kept informed about the programs the fund enables, their current status, and the insights learned.

Drawing on the Innovation Fund models proposed by other Distribution Network Service Providers (**DNSP**s), we propose the following conditions:

- the fund will operate on a 'use it or lose it' basis, with any underspends returned to customers in the following RCP;
- no expenditure incentive benefits will accrue from any unspent innovation funding - both the Efficiency Benefit Sharing Scheme (**EBSS**) and Capital Expenditure Sharing Scheme (**CESS**) will exclude allowances for the fund;
- the funding is only applicable for the 2025-30 RCP, with opex excluded from base year adjustments;
- to maximise the customer benefits, findings from programs funded by the innovation fund will be shared nationally through public forums; and
- innovation fund programs will also seek funding in conjunction with other sources such as ARENA and South Australian Government.

3 Background

3.1 The scope of this business case

This business case recommends new expenditure in the 2025-30 RCP to establish an Innovation Fund to pursue a suite of programs related to research, trials and pilots covering leading edge technologies and new approaches to addressing challenges. The programs will address identified needs arising across three focus areas identified through our engagement program to be important to our customers:

1. **Community Resilience** – to mitigate the community impacts of network outages during severe weather events.
2. **Enabling and Leveraging the Future Market** – to increase the opportunities to procure network services from Customer Energy Resources (**CER**), enable greater activation of load flexibility and greater CER participation in the market, support future energy market reforms arising from the Energy Security Board's Post-2025 market review and manage increasing system security challenges.
3. **Sustainability Solutions** – to improve the sustainability of our business and reduce carbon emissions, including exploring pathways to electrify our heavy vehicle fleet.

These are also programs which:

- fall outside the scope of the DMIAM due to its focus on network demand management activities;
- are difficult to justify in Regulatory Proposals via business cases relying on traditional cost benefit analyses due to uncertainties surrounding long-term customer benefits, as is typically the nature of innovation-based programs; and
- respond to challenges or opportunities that arise during the 2025-30 RCP – with the energy system going through a rapid transition, an innovation fund provides for agility and flexibility to respond to circumstances.

This business case links to other expenditures described elsewhere in our proposal:

- our proposed Demand Flexibility program (refer **supporting document 5.7.5 - Demand Flexibility - Business Case**);
- our proposed Network Resilience program (refer **supporting document 5.8.3 - Network Resilience mobile generation - Business case**); and
- our proposed Fleet program (refer **supporting document 5.10.1 - Fleet Business Case**).

3.2 Our performance to date

SA Power Networks has a proven track record on innovation.[5] Our trials of novel technologies, systems and processes through various world-leading research programs have yielded substantial benefits for electricity users throughout the NEM as they have been adopted by other DNSPs.

For example, we have undertaken a variety of innovative programs to efficiently meet and manage network demand resulting from the growing amount of rooftop solar, batteries and other forms of CER connecting to our network. These programs have resulted in us leading the development of world-first solutions to efficiently integrate these resources, with a key innovation project underway to introduce flexible export limits for solar customers. These flexible limits (also referred to as 'dynamic operating envelopes', or **DOEs**) will enable us to materially increase the amount of solar on our network by 2025, significantly increasing the

[5] https://www.afr.com/work-and-careers/management/3me-tops-five-most-innovative-mining-and-agricultural-firms-of-2021-20211010-p58ysl.

value customers extract from their installed CER. These DOEs are now recognised as an industry wide best practice and are being implemented by networks across the NEM.

Our pursuit of innovation to benefit our customers is also evident through our consistently maximised use of the DMIAM to date. Programs funded under the DMIAM to date have included:

- **Grid Side Storage –** An investigation undertaken in conjunction with the University of Adelaide to explore the potential for Energy Storage systems to: defer or avoid network augmentation in areas where demand constraints are forecast, increase the hosting capacity of local networks and improve reliability.
- **Future Network Modelling –** Development of modelling to better understand the impacts residential energy storage systems may have on the network relative to their charging and storage capacity.
- **Residential Energy Storage** – A trial to study the performance of 100 energy storage systems within a trial area to the performance of these systems across a range of likely applications to determine efficient network operation and management.
- **Advanced planning –** A program to develop tools and processes to leverage data sources and hosting capacity models to improve our ability to plan the low voltage network by establishing a health index for each LV area which is used to rank performance and guide network remediation and augmentations.
- **Closed Loop Voltage Control –** A program to develop and trial algorithms that perform closed loop voltage control within a limited visibility environment within substations to increase export hosting capacity, provide demand response services and maintain power quality.
- **LV regulation trial –** A program to trial new technologies (such as Statcoms and on-load-tap changers) that can be used as potential solutions to address voltage constraints in the LV network and defer significant network augmentation.

We have also been active in drawing on other sources of funding such as ARENA and SA Government in addition to DMIAM funding. Where possible, partnerships are sought with groups such as SA Government and University of South Australia to pool resources and further engage in knowledge sharing.

Our past innovation efforts have provided significant value to customers, including:

- **Advanced VPP Grid Integration trial** (2017, $2.48 million), which involved technical development of DOE systems, integration with Tesla as a market participant and the recruitment and participation of 1,000 customers in South Australia.
- **Flexible Exports for Solar PV trial** (2020, $4.84 million), which developed capabilities to offer flexible connections for solar PV systems, the development of a national standard for this service (CSIP-AUS), a field trial with 150 customers and close engagement with the SA Government and the solar industry. Flexible Exports has already been adopted by the SA Government as part of its 'Smarter Homes' regulatory reform and was rolled out as a standard connection offering from 1 July 2023 in South Australia. Energy Queensland is planning to have a dynamic connection offering using this standard later this year and Victoria has committed to its introduction in 2024, paving the way for National adoption.
- **Market Active Solar trial** (2022, $2.1 million), which builds on the Flexible Exports trial, allows the capabilities developed in Flexible Exports and the CSIP-AUS standard, used by two third-party market participants (AGL and Simply Energy), to manage solar PV exports for market benefits. This pilot will allow even greater benefits for customers with Flexible Exports enabled solar PV systems and support the broader transition to 'smart', market aware, energy resources.

3.3 Drivers for change

3.3.1 SA Power Networks faces significant challenges in the 2025-30 RCP

Investment in innovation-based projects helps us find efficient solutions to present and future challenges, boosting our business efficiency, through cost savings or other improved customer service outcomes. The need for innovation during the upcoming RCP is higher than previous periods due to the large number of upcoming challenges facing our network. Our Strategic Asset Management Plan[6] highlights several of these challenges which include:

- aging infrastructure;
- increasing demand within an increasingly dynamic energy system;
- variance in the reliability our customers experience across the network;
- increasing risk of bushfires;
- increasing physical work volumes; and
- workforce sourcing constraints.

In addition to these challenges, the energy system is undergoing a transformative shift in how electricity is both generated and consumed.[7] This shift comes as consumers rapidly switch from firm centralised generation sources to rely more heavily on variable CER. South Australia is currently at the forefront of this transformation with:

- the highest ratio of rooftop PV generation to operational consumption in the NEM, with strong continued PV uptake; and
- electrification taking place with Australian Energy Market Operator (**AEMO**) forecasting that the 2025-30 RCP will see an increase in peak demand driven by electric vehicle uptake and switching from alternative energy sources.[8]

The network operating environment is also changing with increasing uncertainty surrounding the future impacts on the network from climate change. It is also evident from our engagement program, that our customers see value in us not only pursuing a level of network resilience to the effects of climate change, but also contributing to broader community resilience in partnership with other emergency services providers, critical infrastructure and community groups.

Our customers' preferences and expectations are evolving. For example, our engagement and willingness-to-pay research highlights a preference for reduced greenhouse gas emissions. While we plan to transition our fleet from internal combustion engine (**ICE**) powered vehicles to environmentally friendly alternative solutions, we face constraints with what can be achieved using current business practices such as scheduling of fleet use.

To navigate these challenges efficiently, we need the ability to adapt with innovative solutions. This demands new and improved methods for the provision and delivery of network services to ensure on-going efficiency and customer value in the long term.

6 **Supporting document 5.2.2 - Strategic Asset Management Plan (SAMP).**

7 AEMO, '2022 Integrated System Plan – June 2022', p 7.

8 See AEMO's Electricity Statement of Opportunities 2022.

3.3.2 The DMIAM is unable to fund the innovation required

While some innovation-based programs are enabled under the DMIAM, this mechanism is unable to meet our need to innovate over the 2025-30 RCP in respect of its service delivery to customers due to two reasons.

1. **The DMIAMs scope is limited**

   The scope of programs enabled by the DMIAM is limited by its objective which focuses on demand management projects that have the potential to reduce long term network costs. This means programs which focus upon aspects of the network service unrelated to demand management, for example, programs related to network resilience, pursuit of emissions reduction, or enablement of dynamic interactions by market participants, among other examples, fall outside the DMIAM's scope.

2. **There is limited funding available under the DMIAM**

   Funds are limited to $200,000 plus 0.075% of a DNSP's annual revenue requirement. In 2015-20 and 2020-25 we expect to have used the total available funding. We also expect there will be no reduction in the need to continue to direct the DMIAM to demand management initiatives, particularly given the extent of transformation and electrification occurring in the sector in coming years.

3.3.3 Expenditure incentive schemes cannot fund innovation programs

The CESS and EBSS are unable to fund innovation programs even when such programs result in capex and opex reductions, noting that:

- cost reduction benefits enabled by innovation-based projects often have long lead-in times which span across multiple RCPs. Therefore, these benefits are incorporated into the subsequent RCP expenditure forecasts and resultant AER expenditure allowances, meaning the DNSP does not receive an expenditure incentive payment for the reduced costs. Meanwhile, the EBSS could impose a penalty upon the additional expenditures necessary to undertake the project, thereby disincentivising the program;
- the CESS and EBSS only incentivise the pursuit of cost efficiencies by way of capex and opex and do not work more broadly to incentivise improvements in other aspects of service performance or value to customers that are not otherwise measured via the Service Target Performance Incentive Scheme (**STPIS**) or Customer Service Incentive Scheme; and
- the net result is an additional risk exposure for the DNSP due to EBSS and CESS penalties should it pursue innovation-programs not allowed for in its ex-ante expenditure allowances, while benefits of successful programs are foregone in future RCP determinations through lower revenue allowances.

3.3.4 Service Target Performance Incentive Schemes cannot fund innovation programs

The STPIS is also inadequate to fund innovation in the areas described in this business case, noting that:

- similar to the challenge faced with expenditure incentive schemes, the outcomes of innovation programs typically take place over multiple RCPs. Therefore, future benefits of innovative technologies which improve performance are accounted for when ex-ante expenditure allowances and expected service outcomes are forecast with each regulatory determination, and any STPIS reward foregone when targets are revised;
- the STPIS only incentivises improvements on performance measures relating to service reliability and telephone answering. Even for reliability, the STPIS excludes outages from Major Event Days (**MEDs**) in its performance measures despite MEDs and widespread and extended outages materially impacting customers and being a key concern as expressed via our engagement; and
- the STPIS is only suitable to drive implementation of tried and proven solutions that can deliver immediate service outcomes captured via the performance measures, and to disincentivise networks from choosing to underspend allowances at the expense of network service performance.

3.4 Industry practice

In recent years, distribution networks have navigated the challenges associated with funding innovation based initiatives via the regulatory framework by proposing specific innovation funds. Two key programs approved by the AER include:

- Ausgrid's 2019-24 Network Innovation Program, with an allocation of $42 million ($2018/19), supporting a diverse range of innovative network technology pilots[9]; and
- AusNet's 2021-26 Innovation Allowance, with an allocation of $7.5 million ($2021) to fund nine strategic innovation projects focussing on unlocking the benefits of the ongoing energy system transformation driven by customers' strong uptake of CER[10].

When proposed, these innovation funds included principles attached to the ex-ante allowances such as:

- innovation expenditure is excluded from expenditure incentive schemes;
- any unspent funding is returned to customers in the following control period;
- allowances do not form part of the opex base year;
- governance arrangements to provide oversight of programs funded by these allowances; and
- other funding sources for innovation to be sought where possible for use in conjunction with the fund.

Following the success of these Innovation Programs / Allowances, other programs have subsequently been proposed by DNSPs for the 2024-29 RCP including:

- Ausgrid's 2024-29 Revised Regulatory Proposal which included $45 million for the Network Innovation Program which will pursue workstreams related to Safe Intelligent Networks, CER Support & Enablement and Community Resilience[11]; and
- Endeavour Energy's 2024-29 Regulatory Proposal which allocated $25 million for an Innovation Fund to explore new technologies across four innovation themes, which encompass Orchestration & Distribution Service Operator capabilities, Electric Vehicles Services, Sustainability Solutions and Climate Resilience.

Some innovation funding is also available via the DMIAM and periodically from Government bodies such as ARENA, provided the objectives of those funding sources align with the proposed outcomes of new innovation projects. We have historically leveraged funding from these bodies as much as possible (such as our Market Active Solar Trial[12] and Flexible Export for Solar PV trial[13]), and will continue to do so in the 2025-30 RCP. However, the use of this funding using these bodies is usually restricted by the priorities of requirements of those funding sources and may restrict us from focusing on innovation projects which our customers have prioritised as identified through our consumer engagement program.

9 Ausgrid - 3.01 - Strategic Innovation Portfolio - April 2018 - PUBLIC.pdf (aer.gov.au).

10 AusNet Services Report Template (aer.gov.au).

11 Ausgrid – 2024-29 Revised Proposal.

12 https://arena.gov.au/projects/sa-power-networks-market-active-solar-trial/.

13 https://arena.gov.au/projects/sa-power-networks-flexible-exports-for-solar-pv-trial/.

4 The identified need

Throughout our consumer and stakeholder engagement program, customers expressed a desire for us to be innovative in how we respond to various challenges arising from a rapidly changing energy system and operating environment during the 2025-30 RCP. Three focus areas emerged during the engagement which face upcoming challenges where conventional network solutions may not be optimal or be unable to address going forward and would therefore benefit from innovative solutions.

4.1 Innovation Fund focus areas

4.1.1 Enabling and leveraging the future market

In recent years the rapid and sustained growth in CER uptake in South Australia, combined with the rapid pace of change in CER technology, have driven the need for considerable innovation in the way we plan and operate the network to meet these regulatory obligations.

In addition to the NER expenditure objectives in Chapter 6, NER section 4.3.4 requires each DNSP to "*co-operate with and assist AEMO in the proper discharge of the AEMO power system security responsibilities*" and "*cooperate with AEMO in relation to … each emergency frequency control scheme which is applicable in respect of the Network Service Provider's transmission system or distribution system*".

We expect this pace of change to continue to accelerate in the 2025-30 RCP, with strong continued growth in CER, increasing customer participation in Virtual Power Plant (**VPP**) and other aggregation schemes and the emergence of smart, connected loads such as EV chargers and other technologies. This continued and rapid evolution of customer-side technology will continue to drive the need for innovation in our business in at least the following three areas:

Integrating VPPs and other aggregated resources with the network

The ESB's Post-2025 Market Review predicts that VPPs and other aggregators will play a key role in the post-2025 market, and to do this effectively both market participants and AEMO will require new data and services from the DNSP to communicate the dynamic state of the network, to manage distribution network congestion and maximise market access for distribution-network connected resources.

We expect that there is a tremendous potential customer benefit in extending the capabilities of DOEs in an aggregated form to market participants like VPP operators and operators of CER. However, the precise nature of how these future services will be procured remains uncertain as do the future systems, technical standards and business process that will be required to support those services at scale.

We propose to fund our post-2025 investment in this area through the innovation fund because development of future solutions will depend on outcomes of NEM market reforms such as Flexible Trading Arrangements[14] and Scheduled Lite[15] that are still under development and on the future commercial models and operating regimes adopted by VPP operators and other aggregators as they begin to scale up beyond today's pilot schemes and engage in new market services in the post-2025 market.

[14] See: https://www.aemc.gov.au/rule-changes/unlocking-CER-benefits-through-flexible-trading.

[15] See: https://www.aemc.gov.au/rule-changes/integrating-price-responsive-resources-nem.

Enablement of active markets for non-network solutions

There is potential to manage the network more efficiently by procuring support services from VPPs and other aggregators as opposed to traditional network investment. As small-scale batteries and VPPs continue to grow through the 2025-30 period the opportunity to target local network constraints with such non-network solutions will increase. There are opportunities to test online platforms which facilitate the markets for addressing network constraints by enabling a tendering process for the provision of network support services.

Managing system security risks

Our role in supporting AEMO to maintain system security and frequency stability has grown and changed significantly even in the short period since the start of our current RCP, as small-scale rooftop solar has grown to become the dominant source of generation in South Australia at certain times. In the current RCP we have developed and deployed innovative solutions, such as our emergency voltage raise capability ('enhanced voltage management' or **EVM**), that were not envisaged at the time of preparing our previous Regulatory Proposal but which have proved invaluable in helping to maintain system security during two separate events where South Australia became separated from the rest of the NEM.

As South Australia's electricity system continues deeper into the uncharted territory of an increased reliance on variable distributed generation, AEMO will rely on an increasingly sophisticated combination of existing and new market mechanisms, DOEs and emergency backstops such as EVM to maintain frequency stability and manage minimum system load, particularly during contingency events such as interconnector failure.

Both AEMO and SA Power Networks will need to continue to innovate through the 2025-30 RCP to respond effectively and efficiently to these challenges as they arise. While we cannot predict the future scope of this work and hence cannot put forward an ex-ante business case, we envisage it will include the need for investment in new interfaces to exchange data on the operational state of the network and system between ourselves and AEMO, the provision of network services to support market participants participating in new market-based frequency support or emergency reserve services, and potentially new or enhanced backstop mechanisms activated at the distribution network.

4.1.2 Community Resilience

The climate in South Australia is changing and will continue to change. The State of the Climate 2020 report by the Australian Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organisation (**CSIRO**) found that the effects of climate change are now apparent in Australia. The report forecasts that the changing climate will lead to more frequent extreme weather events in South Australia, and longer and more intense fire seasons.[16]

These extreme weather events have implications for the electricity service we provide our customers, particularly in relation to the reliability of supply. For example, in late 2022 a series of intense storm fronts damaged the network and caused widespread outages impacting 163,000 customers – the largest event since the system-wide blackout in 2016.

Community resilience to these extreme weather events is also impacted when network supplies are interrupted as the effectiveness of key essential services such as communications infrastructure, emergency response providers, supermarkets, and transport rely on energy. Communities and providers of essential services also have limited information regarding the extent of their exposure to network outages and what vulnerabilities they face, and the extent to which they should act to efficiently address these vulnerabilities.

[16] CSIRO and Australian Bureau of Meteorology, *State of the Climate 2020*, November 2020.

There is therefore a need to support community resilience by helping the community mitigate the impacts of network outages during severe weather events. This includes the sharing of information between SA Power Networks, communities, and service providers such as operators of community critical infrastructure and essential service to better understand vulnerabilities associated with network outages during these events, and to explore co-ordinated innovative solutions to mitigate these vulnerabilities.

Recent advancements in technologies, such as energy storage systems, present potential solutions to improve community resilience to extreme weather events. However, if used in isolation for the purpose of network support, such solutions may be inefficient, but initiatives to test joint funding arrangements with third parties and various revenue sharing arrangements could change this, and drive customer value.

4.1.3 Sustainability Solutions

The need to reduce emissions is increasingly being recognised in decision-making processes. The National Electricity Law (**NEL**) and the National Electricity Rules (**NER**) have been updated to formally include emission reductions as an objective.

Feedback from our stakeholders re-enforces sentiments regarding the need for emission reductions. Our customers have consistently emphasised their concerns about climate change and their desire for us to adopt greener operations, particularly by reducing carbon emissions. Recognising the adverse impacts of climate change on our surroundings, society, and economy, we've set a target to achieve net-zero for our Scope 1 and Scope 2 Greenhouse Gas (**GHG**) emissions by 2035. [17]

We are being proactive in our approach to achieve our emissions target, starting with transitioning our passenger and light commercial vehicle fleet to EVs using current business models. Yet, complete electrification of our fleet faces barriers such as:

- the absence of readily available EV options for heavy vehicles used in the management and operation of our distribution network, necessitating customisation; and
- the challenges presented by needing to accommodate the charging requirements of an increasing EV fleet within the scheduling systems used to direct our workers in their field operations.

The innovation fund's focus on sustainability solutions will allow us to explore means to cost-effectively electrify our heavy fleet on a customised basis. Further cost-efficiencies surrounding the use of our EV fleet could also be realised through the development of modelling to scheduling and operational changes required to integrate electric vehicles into our fleet en masse.

4.2 Expected benefits from innovation

The Innovation Fund seeks to provide long-term benefits to all our customers through productivity enhancements to our business which result in either reduced costs, higher output or the enhancement of benefits received by customers and the broader NEM.

Table 2 summarises some of the potential customer benefits which may be realised from our Innovation Fund focus areas. Some of these benefits will have flow-on effects to all customers across the NEM, particularly when a technology improvement can be re-applied by other DNSPs or businesses.

[17] SA Power Networks Sustainability Report 2022.

Table 2: Innovation Fund benefits by focus area

Fund focus area	Initiative areas	Potential customer benefits
1. Enabling and leveraging the future market	▪ Provision of information on the dynamic condition / state of the network to third parties ▪ Improved management of system security challenges ▪ Enablement of broader electricity market reforms (such as two-way markets)	▪ Improved network and market visibility for market participants, improved market access via more effective and dynamic management of distribution network congestion in relation to the operation of aggregated resources. This has the potential to increase the available capacity of VPPs to trade in energy and frequency support markets, leveraging greater value from small-scale CER assets and potentially avoiding or deferring some investment in transmission-connected firming resources over the long term. ▪ New revenue streams for CER owners (including batteries and EV's) and third-party aggregators for providing network support services. ▪ Reduced network costs for all customers though targeted use of alternative non-network solutions. ▪ Reduced system security risk at times of minimum system load and greater opportunity for market-based measures to respond to contingency events before resorting to emergency backstops. ▪ Reduced electricity wholesale costs through improved alignment of electricity generation to demand
2. Community Resilience	▪ Information sharing to understand network related vulnerabilities ▪ Coordination and exploration with other utilities and emergency services agencies to mitigate the impacts of network vulnerabilities ▪ Other initiatives to support community resilience	▪ Cost-reductions from economies of scale arising from centralised and / or multi-purposed solutions. ▪ Minimised business downtime due to power outages. ▪ Lower insurance premiums for businesses due to reduced risks associated with power loss (e.g. spoilt food stocks). ▪ Improved essential service reliability. ▪ Health and safety benefits from improved functioning of heating & cooling and medical devices (particularly for the elderly and medically vulnerable). ▪ Maintenance of communication networks, helping residents stay informed and connected. ▪ Reduced stress and inconvenience for residents during extreme weather. ▪ Increased trust in local utilities and governing bodies to provide essential services. ▪ Less reliance on alternative power sources, which can pose risks if operated improperly or indoors.
3. Sustainability Solutions	▪ Exploration of solutions to electrify the heavy fleet on a customised basis. ▪ Field scheduling system improvements to efficiently integrate Electric Vehicles into our fleet en-masse.	▪ Reduction of air pollutants and greenhouse gases from tailpipe emissions ▪ EV's are typically quieter than ICE powered counterparts, leading to reduced noise pollution ▪ Reduced operating costs due to fewer moving parts and cheaper refuelling costs compared to ICE powered vehicles ▪ Testing and expansion of the marketplace for electrified heavy fleet vehicles. ▪ Increased demand for EV maintenance, charging infrastructure installation, and battery technologies allowing economies of scale to develop. ▪ Learnings from fleet scheduling practices can be applied across industries to driving productivity improvements.

4.3 Governance arrangements

In developing our Regulatory Proposal we identified some areas where we know we will need to invest in innovation in the 2025-30 RCP, and where stakeholders want us to innovate and support investment, but where there is some uncertainty around the scope, costs and benefits of individual initiatives. Hence if we were to include these ex-ante in our Regulatory Proposal we would risk over-investing (because we would have to factor in uncertainty) or under-investing (because we have insufficient information to make a business case capable of acceptance by the AER), neither of which would be efficient or deliver the best outcomes for customers.

The innovation fund gives us a means to ensure that we can deliver the innovation our customers, AEMO and other market participants expect and require of us in these areas in the 2025-30 RCP, but defer the final scoping of these programs until some of the outstanding questions around the future market are resolved and the costs and benefits are clearer. We can then prioritise our innovation program with guidance from our CAB to deliver the best outcomes for customers within the next RCP.

The governance arrangement will deliver a customer centric approach to ensure:

- customers are at the centre of the governance process;
- the projects maintain a focus on the potential to deliver customer benefits;
- the projects are truly innovative and adapted to the South Australian context;
- any unspent allowance is returned to customers; and
- collaboration and extensive sharing of all learnings is guaranteed.

4.3.1 CAB sub-committee

We propose introducing an Innovation Fund governance body that collaborates closely with and reports to our CAB, leading to the formation of the Innovation Fund CAB Sub-Committee (**Sub-committee**). This sub-committee, acting collaboratively with SA Power Networks, will ensure our programs pursue customer priorities. To do this, the sub-committee will work with us to refine the innovation investment principles and to provide oversight of project selection.

The sub-committee will convene a minimum of three times annually at our offices, with additional meetings as required. Sessions will be documented, with minutes systematically recorded. Early discussions will focus on streamlining governance, possibly via a committee charter. To empower the sub-committee in its duties, we'll provide essential business cases, reports, decision-making documents, and other relevant materials.

4.3.2 Regulatory treatment

We also recognise that an allowance for innovation funding requires different treatment to traditional expenditures that aim to deliver outcomes for Standard Control Services. Therefore, drawing parallels with the DMIAM, we suggest the following measures:

- innovation expenditure will be excluded from the CESS and EBSS incentive schemes - ensuring we are not rewarded for any un-spent funding and minimising the financial impact upon customers;
- funding will be provided on a 'use it or lose it' mechanism - unspent allowances would be returned to customers through a revenue adjustment in the subsequent RCP; and
- the availability of funding will be restricted to the 2025-30 RCP, allowing the AER to observe our practice with the innovation fund, feedback from our customers and reconsider the merit of any ongoing funding in the 2030-35 Determination. Consequently, the opex linked to innovation will not become a permanent addition to our base year opex, rather opex will apply via adjustment to the revenue control mechanism as per the DMIAM.

5 How the recommended option aligns with our engagement

We undertook comprehensive stakeholder engagement program for our 2025-2030 Regulatory Proposal involving more than 700 participants across 56 workshops and other activities around the state since the program commenced in late 2021. The timeline is shown below.

Our engagement has been structured around the four key themes for our regulatory proposal shown below.

Affordable and equitable energy supply

A reliable, resilient and safe electricity network

Enabling clean energy and unlocking future value for our state

Customer experience, choice and empowerment

As part of our engagement process, we undertook Focused Conversation workshops to 'deep dive' on priority topics with interested and informed groups of stakeholders to develop the detail of our proposal. Participants at these workshops included customers, community representatives from the CAB, representatives from the South Australian business sector, local and state government, the solar industry, electricity retailers, renewable energy technology companies and the electric vehicle sector.

The innovation fund focus areas set out in this business case were derived from various topics explored with stakeholders across a series of workshops focused on the 'Energy Transition' and 'Managing a safe, reliable and resilient network'.

5.1.1 Enabling and leveraging the future market

Topics related to integrating VPPs and other aggregated resources with the network were developed and explored with stakeholders through a series of three 'Energy Transition' Focused Conversation workshops.

Throughout our engagement process, stakeholders expressed a strong desire for us to be more innovative in how we respond to the rapidly changing energy system. Stakeholders challenged us to move beyond current practices and 'think outside the box' to keep up with the pace of change, particularly in relation to maximising the opportunities for CER to operate to its full potential as part of an efficient, low carbon energy system.

As noted in our Demand Flexibility business case, the Focused Conversations and members of the People's Panel, favoured a higher level of investment in Demand Flexibility and market enablement capabilities than we have put forward in that business case as our preferred option. Given the innovative nature of some of these capabilities, namely those relating to our future interfaces with VPPs, aggregators and the post-2025 NEM market systems, we formed the view that the development of these more advanced demand flexibility services is best pursued via the Innovation Fund, giving greater flexibility and optionality to target expenditure to developing the specific additional capabilities and services that will deliver the most benefit in the 2025-30 RCP as these opportunities become clearer. These capabilities accounted for around $1.5 million capex and $0.4 million opex of the investments originally endorsed by our People's Panel (as detailed in 'option 2' in our demand flexibility business case) that are no longer included in our preferred option in that business case.

Another initiative canvased in our engagement program was to pilot a streamlined flexibility services procurement process in South Australia in the 2025-2030 RCP, modelled on the schemes in place in the UK, to facilitate greater use of non-network solutions provided by CER aggregators. While stakeholders generally agree that we should actively seek opportunities to use non-network solutions in lieu of traditional network investments, many raised concerns that the future benefits of such a pilot were hard to quantify so far in advance. Stakeholders also felt that this kind of initiative should be a national one and so we should seek opportunities to collaborate with other DNSPs to co-design any pilot and share the costs.

Considering this feedback we removed this pilot, and the associated expenditure, from the recommendation carried forward to our People's Panel and now propose that this concept is best developed further as a potential project for our Innovation Fund.

5.1.2 Community Resilience

During our engagement, conversations were held with stakeholders on the topic of network resilience and implications upon community resilience. The conversation explored what role we as a DNSP should fulfill to support broader community resilience. During these conversations the importance of community-led programs and 'learning by doing' was recognised. Some key takeaways from these conversations were that:

- there is a desire for increased security of supply in regional areas;
- there is a view that storage is needed as it could yield statewide energy security benefits;
- we have a role to play in helping to improve community resilience for communities served by parts of the network that are at an elevated risk of extended outages during extreme weather events and other natural disasters; and
- we should consider data sharing opportunities with other critical infrastructure providers and emergency management stakeholders.

It was also recognised that such future resilience initiatives may not be able to be economically justified up-front to the AER given uncertainties around the benefits such as the future frequency of major event days.

The recommendation from the Network Resilience Focused Conversation was that we should establish a Community Energy Resilience Fund. It was considered this would balance our significant role in building community resilience and the need to partner with other stakeholders. A fund was seen as a flexible approach that would allow us to co-design initiatives with at-risk communities to test the most effective approaches to supporting community resilience.

The Peoples Panel supported the network resilience recommendation, and stated we should work with regional and remote communities and their representatives to decide on the best option for those areas. The panel also stated it would like to see a mechanism to ensure transparency of the investment and accountability of the funding – so that there was confidence where funding was being spent and its impact. As this aligns well with the governance and accountability framework we propose for the broader Innovation Fund, the proposed resilience fund has been incorporated the Innovation Fund.

5.1.3 Sustainability solutions

The topic of reducing emissions including via EVs was also key focus of our engagement program. One of the key themes that have framed our engagement under a desire to 'focus on what matters' to our customers has been the theme of the 'energy transition'.

In engaging on this theme, we undertook a series of deep dive workshops called focused conversations with a broad range of consumer, industry, government, and regulatory body representatives. In these Focused Conversations, we posed 3 scenarios:

1. a base case of continuing with our BAU approach of replacing vehicles with other ICE vehicles;
2. a cost-optimised scenario of replacing ICE vehicles due for replacement with an equivalent EV if it is fit for purpose and more cost efficient on a total cost of ownership basis; and
3. an accelerated transition to EVs by always choosing an EV in the last replacement cycle before 2030, if it is fit for purpose but irrespective of the total costs of ownership.

The Focused Conversations arrived at a recommendation that we should only incur expenditure that enables us to transition to EVs where it is more efficient compared to ICE vehicles on a total cost of ownership basis (on the basis of capex and opex) - this is the basis of our separate fleet expenditure business case.

However, customers were clear in their desire to generally see us progress toward greater levels of emissions reduction over time. This is driving us therefore to examine potential innovation that could serve to bring other types of vehicles into cost parity with ICE vehicles and to also examine more broadly how our business processes can be set up to accommodate an increasing transition to EVs in terms of our scheduling systems.

5.1.4 CAB engagement on innovation fund

We engaged with our CAB specifically to explore the merits of including an Innovation Fund in our Regulatory Proposal. We proposed that the fund:

- would only include initiative areas that had either been supported in our consumer engagement to-date, or were otherwise included within initiatives that we had communicated in our engagement;
- would not introduce any additional expenditure to what was put before the People's Panel; rather, the aim of the Innovation Fund would be to bring certain initiatives that were included in the scope endorsed by the People's Panel that were identified as having a significant innovation component under a new innovation governance framework;
- would include initiatives that have expected long-term benefits to customers that are hard to quantify at this time; and
- would include initiative areas that at this stage remain uncertain as to the specific delivery model, technology or partnering arrangement that will be used.

We discussed the three proposed focus areas for the fund, the specific initiatives identified under each one, and the key parameters for the fund outlined above, that is:

- that any under-spent funds should be returned to customers (funds to be excluded from efficiency incentive schemes) and that any fund opex should be excluded from the base year for future RCPs;
- a commitment to knowledge sharing from innovation activities funded through the fund, for the broader benefit of electricity consumers across the NEM;
- a commitment to seek opportunities to collaborate with other DNSPs to support nationally consistent approaches; and
- a commitment to seek opportunities to gear up value from the fund through external funding sources (eg ARENA or the RACE for 2030 CRC).

We also discussed governance arrangements for the fund, and the proposal that a CAB sub-group be formed as the governing body to:

- help define the innovation investment principles that would govern fund allocation;
- prioritise initiatives;
- provide oversight of project selection; and
- review project outcomes.

The CAB was supportive of the proposed approach and endorsed the inclusion of the Innovation Fund in our regulatory proposal.

5.1.5 Stakeholder submissions on Draft Proposal

Since conducting the People's Panel process, we published a Draft Proposal to play back how we have given effect to customer recommednations and to confirm that those recommendations remain valid given continued cost of living pressuress and to obtain further input to refine our Regulatory Proposal.

Submissions received on our Draft Proposal suggest that the recommendations of the People's Panel remain valid with respect to the innovation fund, this is noting that:

- members of the People's Panel affirmed that their recommendations, including in respect of the innovation fund as set out in this business case, remain current;[18]
- in other submissions:
    - some parties such as that from South Australian Council of Social Service[19] and the South Australian Department of Energy and Mining[20] (**DEM**) urged further consideration of the overall magnitude of our forecast capital expenditure in totality;
    - no submission received has raised concerns in relation to including an innovation fund;
    - the Energy and Water Ombudsman of South Australia (EWOSA) indicated support for developing an innovation fund. EWOSA also encouraged us to consider if we can better balance customer outcomes by directing some of the innovation fund to a Vulnerable Customer Assistance Program (**VCAP**) or a customer damages claim scheme. [21] We consider that the identified needs for this innovation fund are distinct from those of a VCAP and a damages claim scheme and hve therefore proposed separate expenditure for those two programs outside of the innovation fund;
    - the submission from DEM suggested that it would support the innovation fund providing that we can show that this is economically efficient and will provide efficiencies to customers long term. [22] Our business case here now seeks to provide our justification as to the potential long term customer benefits that could result from initiaitives in respect of the three innovation areas we propose for our innovation fund. We also note that our proposed approach to the innovation fund includes various safeguards to ensure that actual innovation initaitives funded are in fact likely to drive consumer benefits, and any unspent funds will be returned to customers; and
    - the Electric Vehicle Council outlined support for the innovation fund, commenting that they consider it would be appropraite for a portion of the proposed fund to be used for the purpose of providing public visibility of network capacity data. We have taken this suggestion on board

18 DemocracyCo, *Submission: SA Power Networks Draft Regulatory Proposal 2025-30*, 30 August 2023.

19 SACOSS, *South Australian Council of Social Service Submission on SA Power Networks' 2025-30 Draft Regulatory Proposal*, September 2023.

20 DEM, *South Australian Department of Energy and Mining – Submission*, October 2023.

21 EWOSA, *Submission to SA Power Networks: Draft Regulatory Proposal 2025-30*, 29 August 2023, p.4.

22 DEM, *South Australian Department of Energy and Mining – Submission*, October 2023.

and one of the three areas of innovation outlined in this business case for the innovation fund 'enabling and leveragiong the future energy market' will aim to explore options for providing greater exposure to the market on the dynamic condition of our distribution network, as outlined in Table 2.[23]

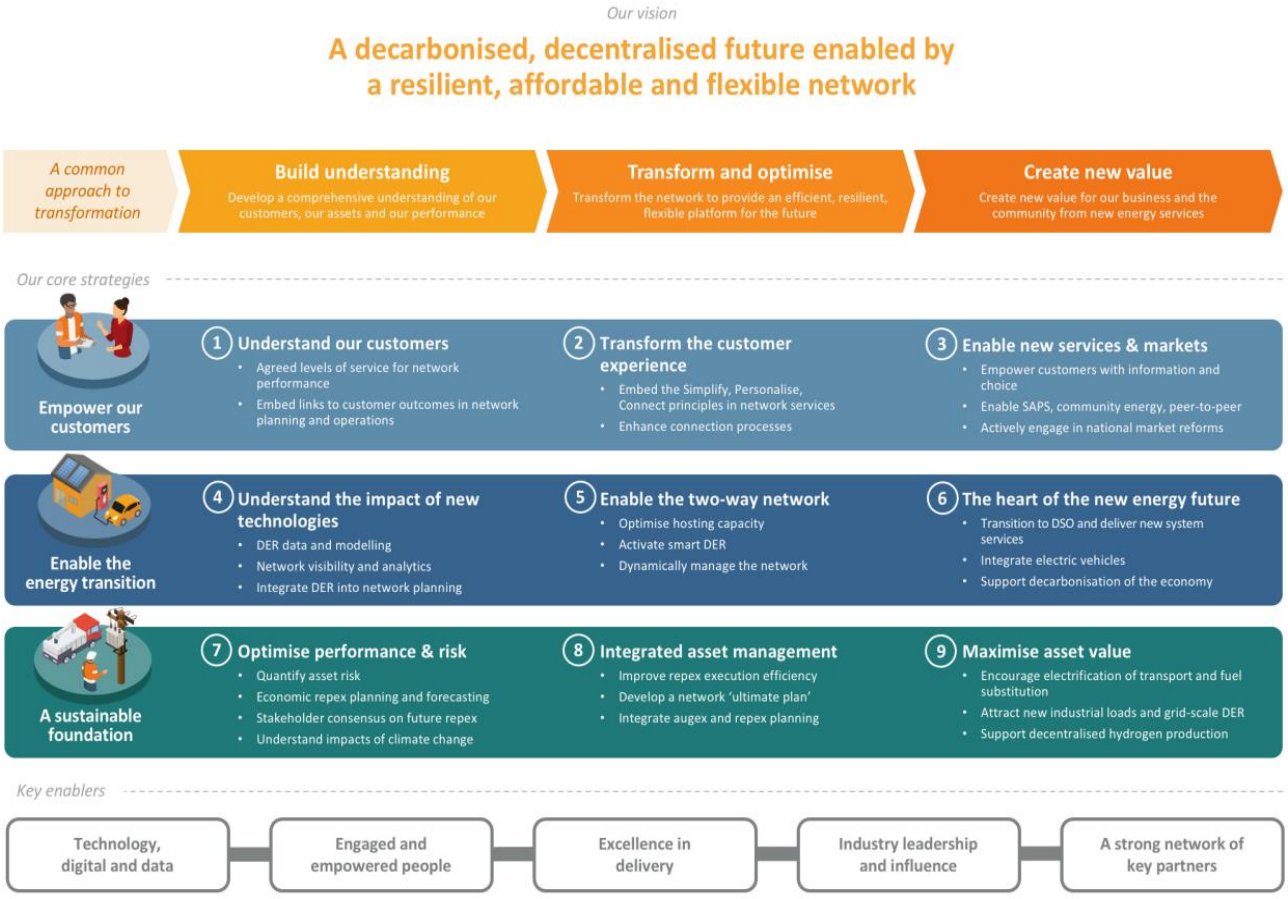
[23] EV Council, *EVC response to SAPN Draft Regulatory Proposal 2025-30*, August 2023.

6 Alignment with our vision and strategy

The Innovation Fund will enable us to pursue initiatives which will contribute to the pursuit of our Network Strategy vision for a decarbonised, decentralised future enabled by a resilient, affordable and flexible network. This is noting that the fund focus areas are aligned to our network strategies themes as follows.

- Enabling and leveraging the future market focus area - furthers the strategy to 'empower our customers', where we seek to enable new energy services and markets by empowering our customers with information and choice in relation to network services and enable new services customers may value such as peer-to-peer trading.
- It also supports our 'Enable the Energy Transition' strategy, where we aim leverage our core capabilities and network assets to support and enable the transformation of the energy sector, which includes facilitating the emergence of new markets and energy services. This will include enabling the two-way network by engaging CER to maximise opportunities to support the network, including through contingency situations where we provide support to AEMO and SA Government.
- Community Resilience focus area – supports our 'sustainable foundation' strategy by helping us understand and mitigate the impacts of climate change through identification and testing of innovative low-cost network solutions.
- Sustainability Solutions focus area – aligns with our 'sustainable foundation' core strategy, by encouraging electrification of transport and fuel substitution. The focus area will also allow us to pursue our climate change roadmap initiative to achieve net-zero Scope 1 and Scope 2 GHG emissions across our operations by 2035.[24]

Figure 1: Network strategy and vision



[24] SA Power Networks, '*2022 Sustainability Report*', pp 27 - 28