



South Australia's Green Paper on the Energy Transition

Submission by SA Power Networks
August 2023



Empowering South Australia

13 August 2023

Department of Energy and Mining

DEMenergytransition@sa.gov.au

Dear Sir/Madam,

SA Power Networks' submission to South Australia's Green Paper on the energy transition

South Australia's future prosperity is reliant on delivering clean, reliable and affordable energy, and ensuring every member of our community can share in its benefits. The electricity distribution system that we operate has a central role in this transition.

SA Power Networks is pleased to contribute to the co-design of a comprehensive energy transition policy, to leverage the opportunities and manage the risks associated with the State's journey to net zero by 2050.

South Australia continues to demonstrate its strong credentials in a consumer-led energy transition, with world-leading uptake of rooftop solar and extended periods where our State is being powered entirely by renewables. This has presented opportunities and challenges for South Australia's distribution network, which we have overcome through consistent State policy to support renewables, and through innovation and strong partnership with the SA Government. The SA Government's *Economic Statement* states our mission to 'capitalise on the global green transition' and, through a strong policy framework, we will continue to progress towards meeting our 2050 target.

The social, environmental, and economic issues associated with the energy transition are vast. This submission will focus on those intersecting with South Australia's electricity distribution network and the experience and aspirations of our 900 000 customers in meeting their energy needs.

The key areas of focus in our submission are:

1. South Australia requires an **integrated energy plan** that can manage State-based risks while still accounting for NEM level planning and progress.
2. For the benefit of the State and electricity consumers, we must continue to **unlock the significant economic and environmental benefits of customer energy resources** (CER).
3. The **latent capacity of our distribution network** must be leveraged to transport significant volumes of energy, to support the decarbonisation of homes, businesses, and transport.

4. **Demand side flexibility** will be critical to unlocking this spare network capacity, enabling customers to receive the full benefit from their energy-related investments, and ensuring an efficient transition for all customers.
5. Improving the **energy efficiency of buildings** will improve energy productivity, reduce energy bills and reduce the need to invest in energy infrastructure.
6. Ensuring the **electricity distribution network remains resilient and reliable**, will ensure that it remains a stable foundation for the new energy future.
7. There is a **high risk that some customers will be left** behind in the transition, owing to split incentives, inability to access capital or information to support decision making. Policy should explicitly address, and seek to mitigate, these risks.
8. 'Energy Transition' level **skills and workforce planning** will be needed for South Australia to effectively compete for resources to deliver the net zero target.

Our submission considers these key areas in the context of the 'opportunities and challenges' sections set out in the *Green Paper*. Underpinning each of these aspects are the key principles of safety, equity, affordability, reliability and resilience.

SA Power Networks looks forward to our continued collaboration with Government and industry to develop and deliver an energy policy which reflects and supports the long-term vision of our State.

Should you wish to discuss this submission, please contact Ms Cecilia Schutz, Manager Policy and Advocacy.

A handwritten signature in black ink, appearing to read 'Andrew Bills', with a stylized, cursive script.

Andrew Bills
CEO SA Power Networks

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South Australia's energy transition

The opportunity

Our vision for South Australia's energy transition is to solve the 'Energy Trilemma': To have no trade-off between the three objectives of clean, reliable, and affordable energy. South Australia is uniquely placed to achieve all three of these objectives due to our:

- Abundant renewable resources
- World-leading innovation in energy resource integration
- Significant latent capacity in the electricity distribution network
- Existing strong Government and industry collaboration

As South Australia's sole electricity distributor, our goal is to continue to transform our distribution network and services to support a consumer-led energy transition. We believe that, with the right long-term vision and policy settings, we can maintain electricity reliability while fully decarbonising and dramatically reducing customers' energy bills. Net zero scenario modelling commissioned by SA Power Networks shows that on average, across a range of scenarios, total household energy bills could be reduced by over 50% by transitioning to renewable electricity for their household and transportation energy needs.

While the future of abundant, affordable, clean energy is promising, it doesn't remove the cost-of-living pressures customers are feeling now. We believe that there are significant opportunities to respond to those more immediate challenges, without compromising longer-term goals.

The challenge

Distribution energy volumes are forecast to at least double between now and 2050 as customers continue to move from fossil fuels to electricity to meet their energy needs. The take-up of electric vehicles will be a key driver, but so will fuel substitution in the commercial and industrial sectors. As South Australia decarbonises, the distribution network could ultimately supply up to 80% of the State's end-use energy.

Without intervention, this could double the peak demand on the network and drive billions of dollars of unnecessary investment. However, provided these new applications are encouraged to use energy outside of peak demand periods, this increased energy volume will provide the opportunity to materially reduce electricity network prices and improve energy affordability.

We will also need to meet the challenge of continuing to integrate a world-leading level of customer energy resources such as solar and batteries onto the distribution network, with the capacity of these resources also forecast to at least double over the decade.

Further, as South Australia becomes increasingly reliant on customers energy resources to meet the State's energy needs, the need for a reliable and resilient network also increases. Our distribution network is the oldest on average in the NEM (by asset age) and will require increasing levels of investment to replace our ageing assets and ensure the network remains a stable foundation for the State's energy needs.

Although our business, within its own scope, is seeking to effectively address these challenges, we see the development of a long-term policy framework as a critical enabler for an effective and integrated whole of industry and Government response. We therefore strongly support the Government's Green Paper process.

The energy needs of South Australia

Australia is progressing well in its collaboration on national energy priorities, with a clearer policy framework emerging. Much planning at the NEM level is performed around Step Change as the 'central scenario' (AEMO's Integrated System Plan). The SA Government has stated that the Hydrogen Superpower scenario more closely aligns with its broader economic agenda. This highlights that, while we continue to support national collaboration, it would be highly desirable for South Australia to also have a State plan, which seeks to continue to leverage our unique opportunities, manage State based risks and minimise impacts of market volatility in the NEM.

Energy Transition Roadmap

An *Energy Transition Roadmap*, as canvassed in the *Green Paper*, should be a key aspect to support implementation of the State Vision which, as per the second Energy Transition Roundtable (August 4th) is currently under development. To deliver the Vision, we need to forecast a range of potential outcomes and impacts and be able to evaluate our State level policy response, at any point in time. The *Roadmap* should provide the mechanism to do that on a continuous basis.

A feature of the *Roadmap* should be ongoing (and regular) modelling of multiple, plausible scenarios, irrespective of whether one, such as Hydrogen Superpower, is treated as the preferred scenario. It should be used to understand the implications for a range of interdependent energy sources, and the most efficient trajectories for these - as is being undertaken in other jurisdictions such as the UK.

Through this type of planning, the SA Government (alongside stakeholders) would develop a better understanding of the strategic choices to be made to inform our response to those various scenarios. For example, the SA Government would develop clearer visibility of the most technically feasible and economic mix of investments in grid, distribution and consumer scale generation and storage, and renewable firming options. The development of suitable scenarios could also be valuable in determining potential future threats to security of supply, including shortfalls in capacity or underfrequency response, and identifying potential policy levers to address those threats.

The development of a *Roadmap* presents the opportunity to better harmonise supply and demand side policies in South Australia. This submission considers a range of 'no regret' policy decisions, focused on demand flexibility and efficient electrification, which would have a positive and material impact on the SA Power Networks

level of investment needed in storage and firming capacity in South Australia. Unlike the ISP, which accounts for a range of energy market trends and their subsequent impact on the ISP scenarios, South Australia must take the additional step of considering demand and supply-side policy interventions which would deliver the best whole-of-energy-system outcome.

Development and implementation

The development, ongoing refinement and implementation of a *Roadmap* would potentially require resources beyond a Taskforce, as contemplated in the *Green Paper*. Consideration should be given to an *Energy Transition Office of Government*, responsible for:

- Development, overarching management and ongoing refinement of the *Roadmap*, including coordination between stakeholders and facilitation of a Taskforce or similar
- Consideration of the interaction between State and Federal Government net zero and related policies and implementation in the South Australian context
- Undertaking scenario modelling to identify a suite of plausible net zero scenarios for South Australia, which would be updated regularly
- Ongoing engagement and consultation to inform policies and initiatives under the *Roadmap*
- Coordination of the *Roadmap* across South Australian government agencies

We also consider that it would be highly desirable if an *Advisory Board* was established, comprising key customer and industry participants, to provide advice and support to the *Energy Transition Office*. Not only would this provide a consultative mechanism, but it would also allow the Government to tap into much broader expertise than may be available in the Office or Government itself.

Recommendations

- Develop an *SA Energy Transition Roadmap* which includes modelling of plausible energy scenarios, their implications for a range of interdependent fuel sources, and the impacts of supply and demand side policy interventions
- Establish an *Energy Transition Office* to manage all work and coordination associated with developing and implementing the *Roadmap*
- Establish an *Advisory Board* of key energy stakeholders that could support the *Energy Transition Office* in undertaking its work

Current and future role of rooftop solar

Rooftop solar PV is the lowest cost source of electricity generation (*Appendix 1*) and, under current Step Change and Hydrogen Superpower scenarios of the ISP, would increase by 235% (5.17 GW) and almost 300% (6.5 GW) by 2050 respectively (*Appendix 2*). As noted earlier, the ISP does not consider a range of potential policy interventions.

The Institute for Sustainable Futures reported in 2019 that South Australia's actual potential rooftop solar PV capacity is approximately 17 GW¹. Rooftop Solar PV should be considered as another key 'Renewable Energy Zone', but without the significant infrastructure and land requirements to unlock it. Through State level planning and various policy interventions, there could be the potential for rooftop solar PV to satisfy an even greater percentage of the State's energy needs than contemplated in the ISP and SA could hit decarbonisation targets more rapidly and provide additional renewable generation to support green hydrogen production.

Table 5 Installed and potential capacity, by State

State	PV potential (GW)	Annual energy output (GWh)	Installed Capacity (GW)
NT	1	2,375	0.1
NSW	49	65,520	2
ACT	2	3,315	0.1
VIC	45	56,411	1
QLD	37	54,287	2
SA	17	23,516	1
WA	23	34,438	1
TAS	4	5,404	0.1

Image from 'How much rooftop solar can be installed in Australia' – a report prepared for the CEFC and Property Council, by the Institute for Sustainable Futures

We note that the current Federal Renewable Energy Target (RET) is set to expire in 2030. This would have broad negative implications for renewable electricity generation including the continued investment in

¹ [HOW MUCH ROOFTOP SOLAR CAN BE INSTALLED IN AUSTRALIA? \(cefc.com.au\)](https://cefc.com.au), p 15

rooftop solar. We encourage the SA Government to advocate for an extension of the RET, or replacement via a similar mechanism, to ensure the transition to renewable energy continues to accelerate.

For our State to continue maximising the consumer and broader market benefits of solar, and to fast-track decarbonisation, we must ensure that all South Australians can access rooftop solar. At present, there are around 190,000 rental households (22%) which are less likely to be able to access the benefits of solar and contribute to South Australia's efforts to decarbonise. Similarly, many businesses are locked out of direct access to install rooftop solar due to split incentives between owner and tenants. This issue and possible solutions are visited later in the submission.

SA Government's introduction of Smarter Homes regulations has been effective in developing backstop mechanisms to manage rooftop solar in system emergencies. With the introduction of Dynamic Export Requirements and Flexible Exports as a standard offering for exporting solar customers, some of these regulations are no longer necessary, at least in their current form. The Flexible Exports offering provides a more effective and much more secure solution for these capabilities, and we believe it is now appropriate to plan the retirement of Relevant Agent disconnect methods for *new* installations. We welcome the opportunity to work with the SA Government and AEMO to establish an appropriate retirement plan.

Recommendations

- The *SA Roadmap* should consider policy options which would maximise South Australia's potential installed rooftop solar PV capacity, including policies that would enable more South Australian households and businesses to install and access the benefits of rooftop solar.
- Advocate for an extension of the Federal Renewable Energy Target to support continued installation of rooftop solar beyond 2030.
- Plan the retirement of Relevant Agent disconnect methods for new installations.

Current and future role of storage

There is no question that energy storage, both large scale and in the form of small-scale batteries behind the meter, will play a crucial role in South Australia's future energy mix. As stated in the Energy Efficiency Council's *Clean Energy, Clean Demand Report*, however, 'consuming energy from stationary batteries is, and will remain, much more expensive than consuming energy at the time it is generated by wind and solar ... the wholesale cost of using energy generated by solar or wind and stored could be more than double the cost of using renewable energy at the time it is generated'².

Rather than addressing the future role of storage in isolation, therefore, we believe that the crucial issue is how South Australia should firm its energy supply in the most economical way. This will require maximising the opportunity to match supply and demand via flexibility in the first instance, to minimise the amount of storage required.

This submission has addressed various issues relating to 'energy management', with strong focus on flexible demand and energy efficiency in the built environment. By making the most of flexible demand and by improving the overall energy performance of buildings, we will be able to materially reduce the need for firming capacity.

Again, this highlights the critical need to use a South Australian *Roadmap* and associated modelling, to understand how investments in the demand-side (chiefly energy management) could radically influence the need for supply-side investment.

The *Roadmap* should also consider the significant opportunity for consumer scale, dispatchable storage. Household batteries, virtual power plants and EV vehicle-to-grid capability have tremendous potential and are areas where South Australia is already leading the Nation. Under the Integrated System Plan, 'orchestrated DER' (which includes the vehicle-to-grid capacity of the EV market), is the largest form of storage under the Step Change Scenario.

² *Clean Energy, Clean Demand Report*, Energy Efficiency Council, p47
SA Power Networks

The *Clean Energy, Clean Demand Report* provides a useful illustration of demand-side policy interventions could dramatically reduce the need for supply-side investment and achieve a far more efficiency whole-of-system outcome.

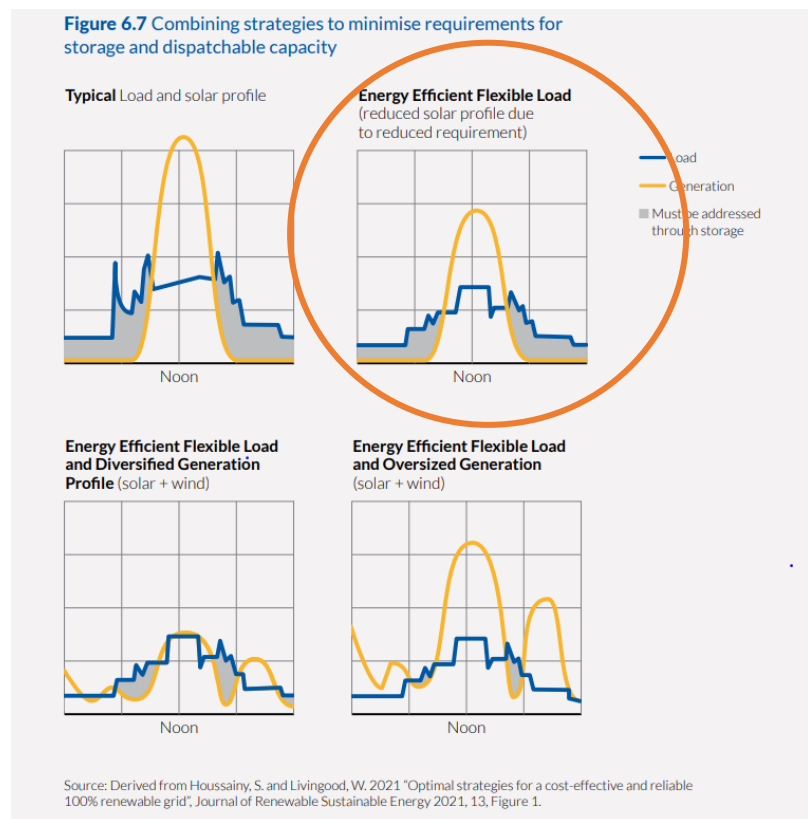


Image from 'Clean Energy, Clean Demand' – a report prepared by the Energy Efficiency Council, p 53

Recommendations

- Ensure that a South Australian *Roadmap* and associated modelling, incorporates policies/budget interventions in demand-side measures and how these would influence the need for investment in storage and firming capacity (and overall energy system cost).
- Ensure that the *Roadmap* has a clear focus on the significant capacity for consumer scale, dispatchable storage and that policy/budget interventions to maximise these opportunities are a key consideration of the overall investment mix.

Enabling demand side flexibility

An energy system such as South Australia's, which is dominated by variable renewable energy generation will rely on significant demand side flexibility for an efficient transition. We believe the following factors will be critical for unlocking demand side flexibility:

1. Enabling an open 'behind the meter ecosystem' through technical standards and compliance
2. Encouraging the uptake of 'smart' energy resources and appliances
3. A considered and coordinated roll-out of smart meters
4. Implementing cost reflective pricing
5. The availability of trusted, unbiased, and tailored advice upon which energy consumers can make informed decisions about their energy use and investments (*discussed in subsequent sections*)

The Behind the Meter ecosystem

Electrification of South Australia's households, industry and transportation will lead to an unprecedented increase in the volume of *energy* delivered by the State's distribution & transmission networks. If managed poorly, this transition also poses the risk of creating a major increase in peak *demand*.

This dilemma represents both a significant challenge and a profound opportunity – an increase in *energy* delivered leads to better utilisation of existing assets, driving down costs for all. On the other hand, an increase in peak *demand* requires significant network augmentation, and those would be borne by energy consumers.

Maximising the amount of energy delivered by the *existing* electricity network, whilst minimising the increase to peak demand is the key to efficient electrification.

Demand side initiatives, particularly those at the household level, are often overlooked as an efficient means of enabling the electrification transition. ARENA has estimated that *demand flexibility* can reduce new generation and storage costs by **\$8-18 billion**, whilst other studies have estimated that improved integration of demand side resources may achieve savings of **\$11.3 billion** in avoided or deferred distribution and transmission network capital expenditure.

South Australia is already leading the world on pioneering a standard approach to flexibility for solar PV systems, through the Dynamic Export requirements within the Smarter Homes regulations. This

approach has already been adopted in Queensland and Victoria and is under national consultation via the Australian Energy Market Commission (AEMC).

The Dynamic Export requirements have enabled residential solar PV systems to respond in real-time to changing conditions on the distribution network, maximising the quantity of renewable energy utilised in the energy system whilst managing system security and minimising the need for further infrastructure investment.

Looking beyond solar PV, we envision a future energy system based on flexibility, where:

- Customer loads are optimised around their own solar generation and time-of-use pricing
- Customers can opt-in both their load and generation to a flexible connection agreement and be rewarded for response to network limits
- Virtual power plant participation is extended beyond batteries, and customers are rewarded for “whole-of-home” participation in the market

The future is flexible – but there are steps to take before we get there.

Technology standards

Currently, customers are unable to realise the full value of their CER without engaging third-party providers to undertake bespoke integrations with their devices or being “locked in” to a single manufacturer’s ecosystem. Having clearly defined standards around device-level interoperability would enable customers to “plug and play” their equipment – ensuring that no matter what brand of equipment or energy retailer they choose, they will be able to maximise their savings and provide value to the network and the market.

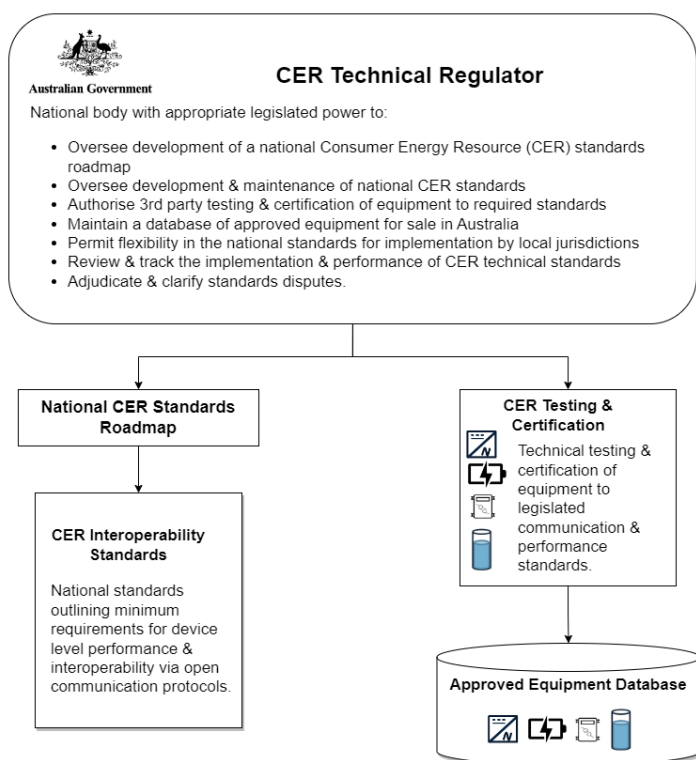
The pathway to this future is via device-level interoperability standards, facilitated by Government via technical regulation and supporting legislation. South Australia should work towards achieving this environment in a way that is consistent with national progress and builds on work done by the Energy Security Board.

South Australia has already demonstrated its ability to positively influence the national direction, through key initiatives such as the Smarter Homes legislation and Dynamic Exports Guideline. We should continue to be a leader and ‘model the way’ where national policy does not exist, but we should ensure

that these policies are developed in a way that is nationally scalable and coupled with advocacy at the national level.

This approach should involve advocacy for and active development of:

- National standards for CER communication and performance. These standards should cover, at a minimum:
 - Solar PV inverters
 - Battery storage systems
 - Electric vehicle chargers
 - Air-conditioning systems
 - Electric hot-water systems
- Legislation to prescribe compliance, testing and certification to those standards
- An approved equipment database



The implementation of this landscape is best managed nationally via a centralized body.

As per SA Power Networks' submission to the AEMC *Review into Consumer Energy Resources Technical Standards Consultation Paper*, we propose the establish of a National CER Technical Regulator, a body with the appropriate authority to develop, maintain and implement CER standards and associated compliance activities.

Compliance

Compliance to existing and future CER requirements is also of key importance. Without a well-managed compliance framework, the benefits of national CER standards and capabilities will not be fully realised. Areas of current concern for CER compliance will likely be amplified as more requirements are developed. These include:

- Managing the installation of only approved devices certified to relevant standards
- Correct commissioning of CER by electrical installers, including wiring and software configuration
- Ensuring that network connection limits are adhered to from the point of installation

The benefits of compliant CER installations are seen across the energy system – from consumer bills through to system security. Properly installed and commissioned CER, coupled with appropriately developed device standards, will ensure that behind-the-meter generation and load can respond dynamically to cost reflective pricing, conditions on the network and support system security during major disturbances.

SA Power Networks has strategies in place to drive compliance for our own connection requirements, as well as those prescribed via the National Electricity Rules. The task of compliance management however falls beyond the remit of SA Power Networks alone. We believe the Office of the Technical Regulator (OTR) will be critical in supporting a growing list of compliance related activities and will require:

- Stronger regulatory powers to enforce compliant installations and installation providers
- Increased capability for installation auditing
- Integrating requirements for electronic certificates of compliance (eCoC) and network connection/commissioning approvals
- Enhanced consumer protections and dispute resolution capabilities to ensure customers do not bear the costs of non-compliant installations

Encouraging the uptake of smart CER

Given the importance of demand-side flexibility in the future energy system, SA Power Networks recommends the development of policies that will accelerate the adoption of 'smart' CER and energy offers that reward and incentivise flexibility. For example:

- The current Retail Energy Productivity Scheme (REPS) could be modified to provide value for technologies like Home Energy Management Systems and demand response enrolled appliances. These values could be staked onto existing incentives to install more energy efficient appliances.
- Education and general promotion of smart homes should also be considered, along with support for pilots and trials to develop the necessary ecosystem to apply this opportunity at scale.
- SA Power Networks would also support appropriate, well targeted financial incentives to encourage adoption of these technologies.

Recommendations

- Facilitate the implementation of behind-the-meter interoperability standards via technical regulation and supporting legislation.
- Advocate Federally for establishment of a national body and governance model to progressively develop, implement and maintain national CER standards, testing, certification, product listing and associated activities.
- Uplift the capability and resourcing of the OTR to best manage compliance to existing and future CER installations.
- Enhance consumer protections to mitigate the impacts of non-compliant CER installations on customers.
- Consider appropriately targeted incentives for the uptake of 'smart' appliances and energy management systems, including a review of REPS.

Smart meters and cost reflective pricing

Smart meters will have direct consumer benefits, such as access to a wider range of energy services and innovative retail offers, and more timely usage information upon which they can make informed decisions. There will also be benefits for the network, which will flow to customers; Smart meters will enable 'solar sponge' time-of-use tariffs which reward customers for shifting loads into the middle of the day. This helps to maximise the local consumption of solar energy, enabling higher levels of solar to be

connected and enabling non-solar customers to share in the benefits through lower daytime prices. It also minimises network investment by taking pressure off electricity infrastructure at peak times.

Smart meters also provide visibility of local network voltage - data that is extremely valuable in planning and operating the distribution network to accommodate higher levels of rooftop solar at lower cost.

The Australian Energy Market Commission (AEMC) will soon make recommendations about changes to the regulatory framework for metering services, to accompany the accelerated roll-out of smart meters by 2030. In its Draft Report, the AEMC summarises the value of smart meter data to electricity distributors and our customers:

2.1.3

Smart meters will also help distribution network businesses to run their networks more efficiently and develop products that support more CER to be connected to the grid

Smart meters can provide DNSPs with significant opportunities for DNSPs to improve the utilisation of their networks, which could lead to lower average network costs for all customers in the long term. Smart meters can collect more granular data about the condition and capacity of the low voltage (LV) network. Through a combination of smarter network management and customer rewards, spare network capacity can be utilised by flexible CER, thus reducing the potential need for expensive future network augmentation.

DNSPs such as SAPN in SA and Citipower and Powercor in Victoria are beginning to offer 'solar soaker' tariffs in the middle of the day that allows households to consume electricity at very low or even zero cost. These developments have significant customer and stakeholder support across jurisdictions.

Innovative network approaches that support more CER to be connected also require more smart meters. A better understanding of the LV network capacity, through data collected by smart meters, allows some DNSPs to develop flexible export arrangements for customers with CER. Instead of relying on static export limits, DNSPs could offer CER customers significantly higher export capacity when the network has a significant capacity (or need) for electricity exports.

It is anticipated that the AEMC will support the provision of smart meter power-quality data to DNSPs at no cost, and we seek the SA Government's support and facilitation of this, irrespective of the final AEMC determination.

Notwithstanding the critical role of smart meters, policies will be needed to address the justified concerns of many South Australian consumers with regards to their continued roll-out. These include:

1. **Paying for potential associated building and wiring upgrade costs.** The AEMC addresses this in its issues paper and indicates that a State and/or Federal policy and budget response must be consulted on and delivered.

2. **Smart meters enable retailers to disconnect the customer remotely.** SA Power Networks aligns with customer advocates in considering that industry best practice is to increase (rather than decrease) personal interaction, prior to disconnection. We have been advocating federally for retailer-driven 'knock before disconnect' programs and would encourage the SA Government to support this advocacy effort.

3. **Time of use (TOU) tariffs could disadvantage some customers in the short term.**

Completing the transition to better tariffs like time-of-use is one of the most important outcomes enabled by the rollout of smart meters. It is a key step in enabling the energy transition and will benefit all customers in the long term. We recognise, however, that TOU tariffs can disadvantage some customers in the short term, including some customers in more vulnerable circumstances who have little opportunity to shift their use out of peak times.

As part of its review, the AEMC will potentially place a requirement on retailers to notify customers, at the time when they communicate on a meter changeover, that they will be changed to a TOU tariff. We believe that this requirement is essential.

Further, it will be important that these customers can access financial support, such as concessions and bill relief, but also financial support for resources which could enhance their ability to shift their energy consumption to off-peak times. In summary, we note that with the roll-out of smart meters, there is an additional layer of consideration to ensure that this financial support is targeted appropriately.

Cost reflective pricing

Cost-reflective network pricing is a key counterpart to smart and flexible buildings, as the critical tool for rewarding customers for demand-side flexibility and better network utilisation. SA Smarter Homes legislation and the roll-out of smart meters has delivered progress in this area. We believe that further progress could be made through joint Government/industry promotion of the benefits of TOU network tariffs (potentially as part of a broader smart/flexible buildings promotion strategy).

Recommendations

- Provide support to the AEMC's direction, through the review into the regulatory framework on metering services, to ensure the no-cost provision of smart meter power-quality data to SA Power Networks.
- Ensure that South Australia places obligations on retailers to inform customers if a meter change results in a change in customer tariffs, irrespective of the outcome of the AEMC review.
- In coordination with Federal Government, determine an appropriate State policy and budget provision for consumers requiring financial support for the installation of smart meters.
- At Federal level, advocate for policies to promote disconnection as a last resort (noting that this is a key policy area under consideration by the AER).
- Ensure that financial supports for customers (both current and future) are suitably adapted to account for the roll out of smart meters and short-term impacts on some customers.
- Consider an SA Government led education campaign, focusing on the consumer benefits of smart CER, TOU network tariffs and other elements of the smart and flexible home.

Decarbonising transport

EVs are likely to become the largest load in a customer's home. As part of our future network planning, we have forecast over 800 GWh of additional energy flowing through our network annually by 2030 – an increase of almost 10% - due to EVs. By 2050, EVs will have increased energy throughput on our network by 50% and our network will be the primary distribution system for transport energy for the State.

If EV charging occurs frequently during peak times, the transition to EVs has the potential to drive significant new growth in peak electricity demand, requiring significant upgrades to the distribution network. If EV charging is managed to occur mostly outside of the peak periods, our modelling suggests that South Australia has the potential to decarbonise the transport sector largely within our existing network capacity.

If integrated efficiently, South Australia could expect to see significant reductions in our average network price between 2030 and 2050 because of this additional energy throughput. All things being equal, a 100% increase in energy throughput would yield a 50% reduction in unit price. This means that ALL South Australians will benefit from the electrification of transport – not just EV owners.

EV charging: a key component of the behind the meter ecosystem

We have discussed the value of progressively shifting to a 'behind the meter ecosystem' approach to regulating appliance types. EV supply equipment (EVSE) is a key component of that ecosystem. We must have 'smart ready' charger standards and regulations to enable customers to incorporate their vehicle charging into a home energy management system and access energy offers that will save them money and integrate well with the electricity network.

In December 2022, the Energy Ministers Meeting agreed that to undertake the following:

- *Deliver nationally consistent and, where possible, internationally aligned standards and communications protocols for EV supply equipment (EVSE), cybersecurity, and smart functionality in Australia*
- *A common mechanism for EVSE data sharing*
- *Nationally align Service and Installation Rules*
- *Streamline network connection processes for consumer energy resources, including EVSE*

We note South Australia's positive work in this space, such as the Smart Charging Trials and enabling vehicle-to-grid connections. As work towards integrating EVSE progresses, it must be coupled with a federal push to harmonise standards. This is essential to give equipment manufacturers the impetus to develop capabilities that will enhance the consumer experience and value of EV ownership and ensure that network impacts of EV charging are minimised.

As noted earlier, we believe that the establishment of a national governance, testing and certification body for CER is a key component which could be advocated for at the Energy Minister's Meeting.

Public charging infrastructure

The South Australian Government has made strong progress with policies and State funding to establish a public charging network. The *placement* of public charging is a critical element in taking advantage of periods of peak solar generation.

A key issue to be considered by the SA Government, is the continued 'gaps' in the network where, until a sufficient EV market emerges, will not present a viable business case for the installation and operation of public charging. We believe it will be essential for SA Government to establish policy that ensures there are no gaps in the EV charging network. As an essential service provider, SA Power Networks can provide a 'charger of last resort' role where needed. We would welcome the opportunity to discuss the role of the distribution network in delivering solutions, including but not limited to the following:

- Fast charging in priority regional and remote sites
- Access to EV charging for South Australians who do not have the capability to charge at home (e.g. customers without off-street parking and rental tenants)
- Workplace and destination charging

As mentioned earlier, a shift to a transport system reliant on electricity as fuel will require the support of a robust and resilient electricity distribution network. As such, SA Power Networks is engaging with the government and community to ensure there is a shared understanding and support for a step up in investment in ageing assets over coming years, to ensure the network remains reliable and robust to meet future electrification requirements.

Data-sharing and EVSE Visibility

Managing the impact of electric vehicle charging on the distribution network is critical to maintaining an affordable, secure and decarbonised energy system. SA Power Networks' ability to access accurate, reliable data on the location and load of EVSE installed on our network is imperative to enabling efficient planning and operation of the distribution network in the future electrified world.

We recommend that the Government works with SA Power Networks to implement data sharing agreements for relevant EV and EVSE data. The focuses should be:

- Working with the Office of the Technical Regulator (OTR) to ensure that EVSE eCoC data be shared at a National Meter Identifier level
- The Department for Infrastructure & Transport (DIT) sharing EV registration data at a postcode level

Providing SA Power Networks access to these two existing datasets would be extremely beneficial in enabling efficient planning for network capacity without introducing any additional overheads on customers or electricians.

In addition to these state-based data sharing agreements, SA Power Networks recommends advocacy by the Government for expansion of AEMO's existing National DER Register to include EVSE data. Many of the processes which could be used to collect and share this data, already exist.

SA EV sales target

South Australia is currently a signatory to the non-binding COP26 declaration to "work towards" all new cars and vans being zero emissions by 2040. We consider that South Australia should consider making a stronger, public policy commitment to achieving this State target by 2035.

The ACT has set an aspirational target of 90% of new vehicle sales to be zero-emissions vehicles (ZEV) by 2030, and a phase-out of internal combustion engines by 2035. Following this is QLD with a 2036 target of 100% ZEV sales, and NSW with an interim target of 52% ZEV sales by 2030.

Our current targets should be reassessed, particularly given the likely implementation of a national fuel efficiency standard and South Australia's resultant ability to compete for the supply of a broader range of EV models.

Recommendations

- Advocate for a nationally consistent approach to EV supply equipment standards (noting that this would be the remit of a national CER standards, testing and certification body).
- In consultation with key stakeholders, including SA Power Networks, investigate the opportunity for SA Power Networks to provide a 'charger of last resort' function for the State's charging network.
- Work with SA Power Networks to establish data sharing arrangements with DIT for EV registrations and the OTR for eCoC data. This should be complemented by a Federal push to include EVSE data in AEMO's National DER Register.
- Make a strong public policy commitment to South Australia's EV sales target, which adequately accounts for the role which transport decarbonisation must play to meet our Net Zero 2050 target.

Efficiency in the built environment

Addressing the energy performance of buildings is one of the key levers to minimising whole-of-energy-system cost and delivering immediate and long-term cost savings to South Australians. While the discussion of smart CER and appliances focused on *shifting* energy use, this section focuses on energy efficiency, which is described as *‘using less energy to achieve the same or better outcomes’*³.

As South Australia continues to electrify, energy efficiency improvements should be considered as a key strategy that can provide immediate cost relief to consumers while at the same time progressing long-term decarbonisation objectives. To some extent, efficiency, particularly thermal efficiency, can also help improve the flexibility of customer energy use by increasing buildings’ ability to ‘ride-through’ particularly hot or cold weather conditions.

To highlight the real consumer impact of energy inefficiency, Better Renting recently reported that approximately 145,000 rental households would get an average benefit of \$2800 per year (\$4500 for the most inefficient rental properties) through basic energy efficiency upgrades. The total benefit in South Australia would be approximately \$410 million per year in rental properties alone⁴.

Beyond the consumer impacts, from an energy system perspective, leaky and inefficient housing stock is a big contributor to South Australia’s ‘peaky’ residential load; addressing the basic thermal efficiency of homes would have a material impact on peak summer and winter demand, and a subsequent impact on the need to invest in networks, storage and firming capacity.

As discussed earlier, the *Roadmap* must consider how demand-side policy interventions could influence whole of system planning and investment. Essentially, the *Roadmap* should treat energy efficiency as one of several interdependent energy sources.

³ Clean Energy, Clean Demand Report

⁴ Better Renting, Cost of Complacency analysis, [The cost of inefficient rental housing in South Australia - Better Renting](#)
SA Power Networks

Rental accommodation

As noted above, there are approximately 190,000 rental households in South Australia. In the current environment, landlords are generally not compelled to implement improvements required for tenants to derive benefit from the energy transition, including energy efficiency improvements and access to CER. As a result, rental tenants risk not benefitting from the energy transition, and may in fact be disadvantaged by it, and a high proportion of these are arguably the people who would value that benefit most.

This is an issue of equity, and it is also a major impediment to decarbonisation which is unlikely to be resolved without a targeted policy solution.

Minimum energy efficiency standards

Minimum energy efficiency standards for rental properties must be improved as a matter of urgency. This is a key aspect of the Australian Energy Regulator's current *Gamechanger* consultation and a recent Grattan Institute Report⁵. **South Australia's current *Residential Tenancies Act* reform is the appropriate opportunity to address this issue.** At a minimum, the Act should set minimum requirements for ceiling insulation, air-conditioning and draught sealing.

To complement the above, advocacy at national level for mandatory disclosures at the point of sale/lease is essential, along with further Federal funding for upgrades to social housing. Potential landlord incentives could also be explored and advocated for, such as an 'instant asset write-off' for investments in efficiency upgrades.

Removing split incentives

'Split incentives' are one of the biggest barriers to South Australian energy consumers participating in, and receiving the benefits of, the energy transition. These occur when those responsible for paying for energy bills (the tenant) are not the same entity as those making capital investment decisions (the landlord). Even though upgrades would in many cases provide a significant net benefit for the tenant, the split incentives act as a barrier to unlocking this potential for a significant number of residents and

⁵ Insert reference.

businesses. This issue often impacts South Australians in more vulnerable circumstances, who could arguably benefit most from reduced energy bills.

Other jurisdictions, such as the USA, are successfully piloting programs which could finance 'fixed installations' in a way which effectively and equitably assigns the costs and benefits of these installations.

One potential solution is the establishment of a targeted scheme to support rental households experiencing barriers to accessing the benefits of the energy transition. Such a scheme could provide eligible households with access to energy efficiency upgrades or a solar system at their home in exchange for a fixed fee. This could be financed through the financial benefit realised through such upgrades and be added to a property charge paid for by the tenant (such as the distribution component of the electricity bill).

Our initial assessment of similar schemes being applied in other jurisdictions, is that such an arrangement would be likely to benefit a high proportion of existing tenants, if designed well.

SA Power Networks is committed to improving the equity of access to new energy technologies and services for all South Australians and would be pleased to work with the South Australian Government and key industry and community stakeholders to co-design a program that achieves this outcome and provides a best practice model for other Australian jurisdictions.

It should be noted that this financial model could also support *any energy consumer* (ie not just rental tenants) who are experiencing a financial barrier to making these investments. It could potentially cover efficient fixed appliances, CER such as rooftop solar, batteries and EV supply equipment, and potentially other building efficiency upgrades.

Recommendations

- As a matter of urgency, and in consultation with key consumer groups, amend the *Residential Tenancies Act* to implement minimum efficiency standards for rental properties.
- To complement this, advocate at national level for:
 - Mandatory disclosures at the point of sale/lease
 - Further Federal funding for upgrades to social housing
 - Strong consideration of ‘instant asset write-off’ (or similar) incentives for landlords to invest in efficiency upgrades.
- Progress consultation with SA Power Networks and other key consumer and industry stakeholders on a targeted scheme to support households experiencing barriers to accessing the benefits of the energy transition, through innovative offers that ‘unwind’ split incentives

Efficiency upgrades to existing housing stock

Improving the efficiency of rental accommodation has unique challenges to be addressed, but similar priority should be placed on measures to improve South Australia’s broader existing housing stock. Currently, the Nationwide House Energy Rating Scheme (NatHERS) includes thermal efficiency, but not energy use.

SA Power Networks supports calls by the major banks and peak energy and property bodies to extend NatHERS in such a way as to create a national, standardised star-based rating system, measuring the energy efficiency of homes⁶. This move would help deal with the approximate eight million Australian homes which have not been subject to minimum standards for new builds, implemented in 2005.

To complement these measures, we strongly support consideration of further Federal and State funding support, in the form of subsidies, rebates or low/zero interest loans to stimulate investment in building efficiency upgrades. These should be targeted in a way which reflects the diverse needs of the South Australian community (ie level of financial (and other barriers) to access). This consideration is especially appropriate as Australia contemplates another recession and potential economic stimulus packages which could provide long-term economic benefit, as well as immediate cost of living relief.

⁶ [CBA, Westpac and NAB want star-based energy efficiency ratings for homes, like white goods \(afr.com\)](#)

At State level, there is a significant opportunity to reassess the design of the *Retail Energy Productivity Scheme*, with a view to better aligning it with the policy objectives identified through this consultation process. For example, expanding the scheme's objectives from energy efficiency to demand flexibility should be considered, and subsequently the range of technologies/resources which are covered by the Scheme.

Recommendations

- Advocate at national level for the extension of NatHERS to create a national, standardised star-based system, measuring the energy efficiency existing Australian homes.
- Implement further State policy and budget measures (and advocate for the same at national level) to provide financial incentives for building efficiency upgrades (with appropriate targeting towards those with greater barriers to access). These measures should be prioritised under long-term economic stimulus packages, rather than only short term policy/budget measures.
- Redesign the current Retail Energy Productivity Scheme to appropriately reflect the State's energy policy objectives (particularly demand flexibility and energy efficiency).

Current and future roles of hydrogen and natural gas

We believe that a *Roadmap* and associated technical and economic modelling is needed to understand the potential value, across a range of scenarios, for natural gas and renewable hydrogen.

Mining, manufacturing and recycling

SA Power Networks supports the principle that SA's abundant renewables should be a unique value proposition in promoting investment in South Australia.

It will be beneficial to encourage large industrial customers to connect to parts of the network with spare capacity. As a regulated distributor, we are unable to make prospective investments in the network in anticipation of the kind of industry growth which the *Green Paper* contemplates. A long-term growth strategy, and the identification of 'growth corridors' (or similar) would assist us in confidently planning and investing in the network.

Recommendation

- Develop a *Green Manufacturing Strategy* (or similar), as the basis for longer-term identification/planning for key infrastructure requirements, upon which SA Power Networks and other utility providers could confidently plan and invest in necessary network developments.

Education and Equity

Trusted, unbiased advice

Throughout SA Power Networks' Statewide consultation on our 2025-2030 Regulatory Proposal, the need for trusted, unbiased energy advice was a key area of focus for the community. While SA Power Networks will aim to continually strengthen the services it can provide to customers under the regulatory framework, the community acknowledged that SA Government partnership is needed to deliver a service which could make a real difference.

The Green Paper acknowledges that the current SA Government Energy Advisory Service will need to evolve to satisfy the needs of consumers in the current and future energy market. With the increasing complexity of the market, it is essential that customers can access a service which they trust, without commercial bias, and which is *tailored to their personal energy needs*. Education and advisory services need to make it much simpler for South Australians to make informed decisions about their energy use and investments.

SA Power Networks has strong visibility of the energy usage patterns of South Australian customers and no commercial interest in the decisions they make about retail plans or technologies. This visibility will only be increased through the roll-out of smart meters and CER which has a much more dynamic relationship with the network.

With SA Government leadership, and through collaboration with consumers and industry, we consider that South Australia could lead Australia in providing a service which:

- Provides customers with a prioritised list of investments or actions that would improve their individual energy outcomes
- Offers a list of pre-qualified vendors who might deliver those products or services
- Potentially makes available low-cost finance to make such investments

We suggest that a working group between the SA Government, SA Power Networks and key consumer and industry stakeholders should be formed to progress this concept.

To encourage consumers to engage and make proactive decisions about their energy use, the SA Government could also consider incentives for customers to compare energy bills to alternative retail offers, as per the Victorian Government's 'Power Saving Bonus'.

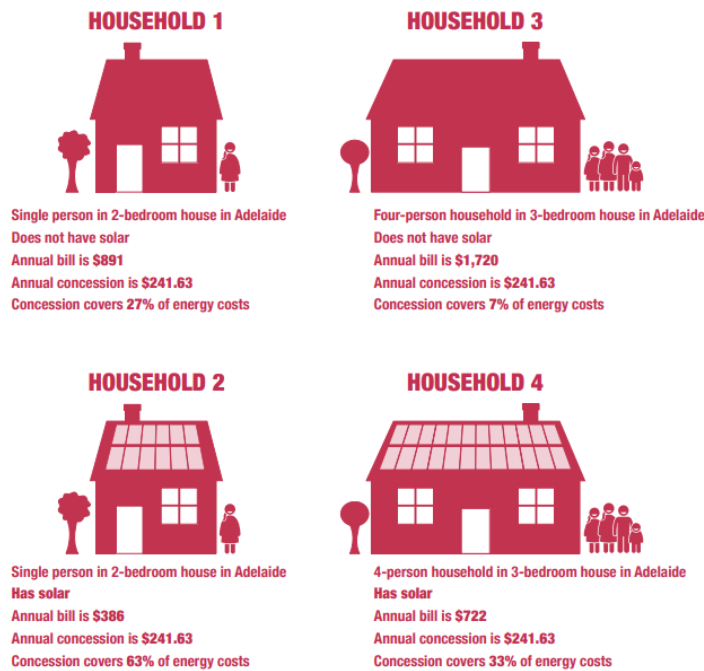
The Energy Concession

As discussed throughout this submission, the capability of our State's electricity distribution system to efficiently meet the energy needs of our customers, will contribute significantly to energy affordability. There are many South Australians who will need financial support throughout the transition, and while we do not play a direct role in that, we are acutely interested in ensuring that our customers can afford to use the energy they need to support their well-being.

Engagement with our customers has highlighted that there are opportunities to significantly improve the current energy concession. We note that various consultation processes are underway to reform the broader concession system, but given the growing impact of energy prices on overall cost-of-living, we believe it is justified to expedite consideration and action on the energy concession specifically. Most notably:

- The current energy concession is a flat rate subsidy which has no account for the relative need of a customer, depending on their consumption (*see image below*). We support the shift to a percentage-based subsidy (in Victoria this is 17.5% of energy usage and supply costs).
- Eligibility should be re-assessed to ensure that there is equity of access
- Around 30% of South Australians who are eligible for the concession aren't accessing it. Improved awareness and information, working to reduce associated stigma, and making it easier to apply (especially the process when switching retailers)
- Working towards national alignment

FIGURE 1 Household typology and outcomes of fixed rate energy concession



Reforming electricity concessions to better meet need: Summary Report 9

Image from 'Reforming electricity Concessions to better meet need' – a report prepared by SACOSS

Recommendations

- Establish a working group with SA Power Networks and key consumer and industry stakeholders to reform and re-brand the current *SA Government Energy Advisory Service*, with a view to providing South Australians with trusted, un-biased and simple advice upon which they can make much more personalised and impactful decisions about their energy use and investments.
- Consider a 'Power Saving Bonus' type incentive, as implemented in Victoria.
- In parallel to broader concession reform processes underway, work to expedite changes to the SA Energy Concession, in close consultation with consumer representatives.

Workforce

In its 2023 report⁷, *RACE for 2030* made key findings which illustrate the scale of Australia's energy transition workforce challenge:

1. Under the ISP Step Change scenario, the combined workforce for renewable generation, storage, and transmission construction needs to increase by 12,000 in just two years to 2025.
2. Overall electricity sector employment grows by 37,000 from 2023 to peak at 81,000 in 2049.
3. Under the Hydrogen Superpower scenario, the workforce needed would be up to twice as high in the 2030s and up to three times higher in the 2040s, with a peak of 237,000.

These projections do not include the workforce needed in energy efficiency, demand-side and energy management, or electrification, which could more than double those workforce projections.

Many of the critical policies need to be addressed at Federal level, including strategies to:

- Harmonise occupational licensing to maximise mobility of workers
- Reform temporary skilled migration
- Encourage and supporting workers (particularly at low or medium skill levels) in fossil-fuel industries to transition to clean-energy roles

Energy Transition Workforce Strategy

South Australia must be well positioned to advocate federally for our State's interests in these and other areas. For this reason, SA Power Networks strongly supports the development of an *Energy Transition Workforce Strategy*, as set out in the Green Paper. Development of the strategy should include consideration of:

- State level modelling of our “whole of energy transition” workforce requirements

⁷ [ISP2022_Workforce_v1.pdf \(uts.edu.au\)](#)

- A plan to more prominently and strategically promote career pathways in the energy transition, in much the same way as other “key growth sectors” such as defence and space have been promoted
- The strengthening and revision of fee-free training places and how South Australia should seek to influence Federal/State Skills Agreements to support the energy transition. ‘Areas of National Priority’ should include the energy sector.
- State level funding boosts for priority apprenticeships and to encourage greater participation of under-represented groups such as females, First Nations and mature-aged people
- Mapping regional and remote workforce needs and ensuring better integration with regional growth policies (in particular, services, infrastructure and affordable housing/accommodation)

Energy Skills Council

As the key advisory body to Government on meeting current and future industry workforce needs, the SA Government should consider changes to the current architecture and membership of the SA Skills Commission Industry Skills Councils. Specifically, the SA Skills Council model is inconsistent with the Federal Government model – the Powering Skills Organisation is specifically for the Energy, Gas and Renewables industries. It would make sense to better align with the National model.

Given the Skills Council’s remit around aligning skills and training with workforce needs, a key issue to be addressed by a revised Skills Council would be to prepare the workforce for distributed energy and the quickly changing nature of ‘behind the meter’ work, to support the growing momentum of smart and flexible buildings.

Other

Areas which the SA Government could also address include:

- Current ring-fencing prevents SA Power Networks (as a Registered Training Organisation) from training third parties unconditionally. Removing this constraint could provide benefit to SA’s energy industry. The SA Government should consider this opportunity and engage with SA Power Networks on implementing a change.

- Internationally, there is no clear skills or trade recognition pathway for electrical lines-people to transfer to Australia, despite this skill being listed on the Temporary Skill Shortage List. Further, Trades Recognition Australia (TRA) does not offer the Temporary Skills Shortage Assessment for electrical lines-people. If an offshore technical skills assessment process existed, SA Consumer Business Services could issue a provisional electrical workers' license.

Recommendations

- Develop a *State Energy Transition Workforce Strategy* to properly understand SA's energy workforce needs, better consider (and advocate for) the right Federal and State policy levers to deliver our workforce needs.
- Align the South Australian skills councils with the Federal model, with a particular focus on creating an energy specific council which would have the expertise to advise on the evolving skills and training needs of a distributed energy workforce.
- Assess the future benefit of removing current ring-fencing requirements relating to SA Power Networks' RTO function. Subject to this assessment, SA Government and SA Power Networks should engage on suitable next steps.
- Advocate at Federal level for TRA to implement a technical skills assessment process for electrical linespeople.

Appendices

Appendix 1:

Levelized cost of energy for different generation types:

Summary - LCOE Results	LCOE Result (c/kWh)
5kW Rooftop System	3.29
7kW Rooftop System	3.13
10kW Rooftop System	2.87
100kW Commercial Rooftop	4.33
4.99MW Solar Farm	4.28
50MW Solar Farm	4.05
Wind Farm (120MW)	3.19
Average 2022 SA Wholesale Price	16.03

Prepared by SA Power Networks

Appendix 2: SA specific data from the ISP

Step change	2023 (data is FY22- 23 actuals)	2030	2040	2050
GW rooftop solar installed capacity	2.20*	3.34	4.22	5.17
GWh generated from rooftop solar	2,600 (18% of actual generation)	4,117 (25% of total)	5,700 (27% of total)	6,774 (20% of total)
GWh Operational Demand (sent out)	11,541	11,990	15,348	26,640
GWh total all sources	14,141	16,107	21,048	33,414

Hydrogen Superpower	2023 (data is FY22- 23 actuals)	2030	2040	2050
GW rooftop solar installed capacity	2.20*	3.85	5.44	6.50
GWh generated from rooftop solar	2,600 (18% of actual generation)	4,726 (14% of total)	6,785 (6.7% of total)	8,127 (3.2% of total)
GWh Operational Demand (sent out)	11,541	30,265	93,907	244,814
GWh total all sources	14,141	34,991	100,692	252,941

*The 2023 rooftop PV installed capacity figure has not yet been reported by AEMO so the step change forecast figure for SA from the ISP is used. Linked in note 1 below.

Guidance notes:

1. The State-by-state breakdown of rooftop PV installed capacity and generation (rows 1 and 2) come from the AEMO ISP inputs and assumptions workbook <https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/inputs-assumptions-and-scenarios-workbook.xlsx?la=en>
2. To get the SA-only total consumption, AEMO's forecast data gathering portal was used - located at [NATIONAL ELECTRICITY FORECASTING \(aemo.com.au\)](https://aemo.com.au/national-electricity-forecasting) . This portal shows ISP data, but it was only able to show the operational demand forecast out to 2050 – ie scheduled loads only, excluding rooftop PV. Therefore, the grey row has been prepared to show the operational demand forecast and is the sum of rooftop solar generation and operational demand (representing *all* generation).
3. Wherever possible, actual reported data from FY2022-23 was used for the 2023 column. This is consistent with future dates because the ISP is modelled in financial years, and it ends in the financial year *ending* in 2050 (ie FY2049-50).
4. OpenNEM was used for the 2023 generation figures (again going off financial year 2022-23), since the official AEMO reporting lags by a few months and uses the same source data.