Energy Efficiency Council submission to the South Australian Government's Energy Transition Green Paper

18 August 2023

Overview

The Energy Efficiency Council (EEC) welcomes the opportunity to make a submission to the design consultation to South Australia's *Green Paper on the Energy Transition*. The EEC is Australia's peak body for energy efficiency, energy management and decarbonisation.

Overall, the EEC strongly encourages the South Australian Government to ensure ambitious energy performance is a core component of any energy strategy.

We believe that a successful energy strategy should be holistic, designed to take up opportunities for improving energy supply, and equally embracing opportunities to optimise the way energy is used. Energy efficiency, energy management, demand response and electrification can all make a significant contribution to securing a low-emissions future at least cost and can help expedite the transition if implemented rapidly.

The EEC encourages the South Australian Government to consider prioritising 'shovel-ready' technologies that can deliver immediate emissions reduction at low cost. Key amongst these are technologies that boost energy efficiency, and electrification, underpinning a rapid decarbonisation of the energy system, while reducing energy bills for consumers.

Energy efficiency and efficient electric technologies are also key to fully capitalising on South Australia's nation-leading early investments in renewable energy generation. However, policy certainty is needed to prioritise these technologies and ensure the skills and supply chains are in place to progress the transition. Implementing such policies represents a 'no regrets' pathway as energy efficient electric technologies are widely available and cost-effective today. As such, they present far less risk compared with supporting some of the supply-side technologies referenced in the Green Paper, which face significant hurdles to commercial deployment. Investment in nascent technologies that could prove important in the future certainly has its place. However a holistic strategy should balance such investments with a focus on deploying low emissions technologies that are available now.

Finally, South Australia already has strong foundations for a net zero energy system, and could make better use of existing policies, technology and infrastructure to deliver the transition at least cost. Planning now to ensure the skills, expertise and supply chains are available to complete the transition is essential, and will ensure that South Australians can capture the greatest possible benefits from the transition.

1. The energy transition requires holistic policy

The Green Paper has a strong focus on the supply side of the energy system. While transitioning to low-emissions energy supply infrastructure is challenging and requires significant attention and resources, efforts to manage and reduce energy demand – when, where, how and how much energy is used – should be considered equally important in policy to drive the transition.

Efforts to optimise energy demand and match it to low-cost renewable energy supply will directly support the Government's objectives, by:

- ***Reducing energy-related emissions immediately***. While South Australia has an enviable record with renewable energy penetration, energy use remains a substantial source of emissions in South Australia. Any measures that can shift energy demand from fossil fuel sources such as gas and oil to renewable energy resources has an immediate effect on emissions. Optimising energy demand to make greatest use of South Australia' renewable energy resources is the fastest way to reduce energy-related emissions.

- ***Right-sizing new energy supply infrastructure requirements.*** Optimising energy demand can reduce the need to build new energy infrastructure. For example, minimum energy performance standards on refrigerators reduced Australian energy demand by around 360MW in 2017 – equivalent to a medium-large gas fired power station. [1] Reducing the amount of new energy infrastructure that must be built to supply energy demand directly reduces the cost of the transition, and speeds up achievement of a net or near-zero emissions energy system.

- ***Promoting energy affordability.*** Where households and businesses can achieve optimal energy use that takes greatest advantage of low-cost renewable energy, both the direct cost of their energy and the indirect costs their energy use imposes on the energy system are minimised. This directly reduces energy bills for households and businesses.

- ***Distributing the benefits of the energy transition equitably***. Demand-side interventions that improve energy performance have long been understood to have a range of benefits. These include improving health and wellbeing, improved productivity, increased energy security and resilience and reduced demands on public finances.[2] These benefits accrue to both consumers and the community at large. However, in the absence of demand-side participation in the energy transition, consumers are likely to bear significant costs without having access to the maximum possible benefits associated with the transition.

1.1 The Green Paper should incorporate an energy performance strategy

The Green Paper places significant emphasis on the contribution of customer-owned energy supply infrastructure to the energy transition – principally solar photovoltaic systems and battery energy storage systems. While these technologies will be a valuable part of the new energy system, their deployment without accompanying efforts to improve the energy performance of households and businesses will lead to unnecessary costs.

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[1] Collyer, A, 2019, *Independent review of the Greenhouse and Energy Minimum Standards Act*, Australian Government, Canberra.
[2] International Energy Agency 2019, *Multiple benefits of energy efficiency*, IEA, Paris.

As the EEC's recent report, *Clean Energy, Clean Demand* makes clear, optimising energy performance reduces the size of energy storage infrastructure needed to operate a near-100% renewable energy system. Energy performance improvements can include increasing the energy performance of buildings, as well as commercial and industrial process improvements that improve energy productivity and reduce energy demand. Examples include:

- Building thermal shell improvements like insulation and window treatments to reduce heat transfer and energy wastage;
- Replacement of old, inefficient appliances and equipment with newer, efficient models
- Incentivising dynamic load shifting, moving energy use to times of abundant renewable supply on a real-time basis
- High-quality electrification, where inherently inefficient fossil fuel appliances are replaced with high-efficiency electric appliances.

South Australia's strategy to drive the energy transition should encompass an ambitious energy performance improvement program, tailored to local circumstances.

Energy performance improvements that reduce energy demand during critical demand periods – where there is a substantial mismatch between energy demand and low-cost energy supply – will make a significant contribution to facilitating the energy transition at lowest cost with the highest possible degrees of reliability and security.

The approach to managing periods of excess supply from solar PV outlined in the green paper should more holistically consider the demand-side of the energy system beyond consumer-owned energy storage and tariff reform. An ambitious agenda to better manage these periods – starting with deployment of simple technologies like heat pump hot water systems that are set to take advantage of the midday solar peak – could reduce energy bills and emissions more quickly and at lower cost than relying on batteries and solar curtailment to deal with periods of high solar generation. However, a more holistic view of the energy transition – including energy performance – is needed to unlock these potential benefits.

Recommendation 1:

South Australia should develop an ambitious energy performance strategy as part of its suite of policy measures to drive towards net zero.

1.2 Make the best use of existing technologies, infrastructure and policy

South Australia has done an exceptional job of introducing renewable generation into its electricity system and will yield the benefits of this early achievement for decades to come. However, despite the large amount of low-cost renewable electricity generation available, South Australia continues to have the highest-priced electricity in the National Electricity Market. In large part, this is due to high regulated network costs in South Australia.[3]

[3] Australian Energy Market Commission 2021, *Residential energy price trends 2021*, AEMC, Sydney.

An energy transition that relies exclusively on the supply side of the energy system is likely to exacerbate this state of affairs. However, an energy policy that better balances energy demand and supply will make better use of existing energy infrastructure, reducing the need for new network expenditure. The International Energy Agency estimates that digitalisation and demand flexibility could help extend life and improve utilisation of existing grid assets, saving around **USD$1.8 trillion** to 2050.[4]

There are a range of opportunities to use existing assets to play important roles in a future energy system. Incentivising a greater degree of grid awareness and connection amongst assets – such as encouraging smarter operation of commercial and public buildings to support grid stability, or integrating industrial load into the grid to create dynamic energy demand that is responsive to grid conditions – is an opportunity to buttress grid security, reliability and affordability at a much lower cost than new infrastructure solutions like battery energy storage or network augmentation.

A holistic energy policy should not only incentivise investments in energy supply, but also create opportunities for driving better value out of existing assets. Existing policies – such as the Retailer Energy Productivity Scheme – could be harnessed and expanded to better take account of the changing energy landscape. For example, the Peak Demand Response Scheme being implemented by New South Wales is seeking to encourage investments in demand response capacity that will help manage the impacts of peak demand in the energy system through peak shaving, peak shifting and peak demand response. This responds to the reality that energy demand is no longer a uniform, fungible quantity – a unit of energy demanded during a peak or critical period event imposes costs on the energy system that are several orders of magnitude greater than a unit of energy demanded at midday on a bright day in late spring.

Recommendation 2:

The South Australian Government should harness opportunities to make the best and most cost-effective use of existing energy supply infrastructure through improving energy performance.

1.3 Prioritise low-cost, shovel-ready technologies

The transition to a net zero economy (and a near-zero emissions energy system) will require development and deployment of a range of technologies. In some areas of harder-to-abate emissions, emissions reductions will rely on technologies that have not yet been developed, and it is appropriate that there is government support towards attempting to develop these technologies to a level where they can feasibly be deployed.

However, in the energy sector, a range of solutions already exist for a wide range of decarbonisation needs. Efficient electric technologies have been identified as the least-cost, most rapid pathway to decarbonise building operations, and are immediately applicable to a subset of transport, commercial and industrial activities. Prioritising deployment of these technologies will be the fastest route to decarbonising a significant portion of South Australia's emissions at low cost.

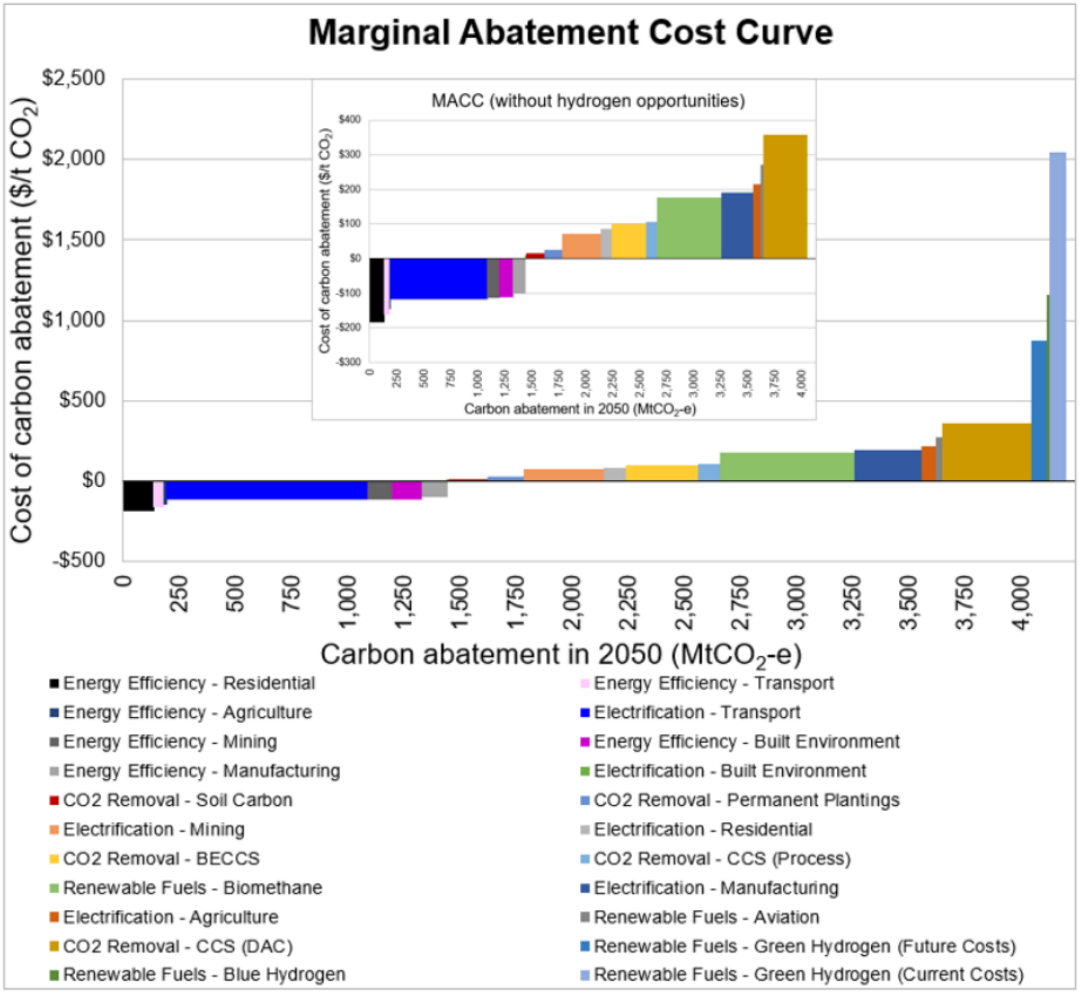
Recent research by Northmore Gordon has demonstrated that energy efficiency and electrification interventions are the lowest cost methods of reducing

[4] International Energy Agency 2023, *Energy efficiency – the decade for action*, IEA, Paris.

emissions (see Figure 1). Methods based on hydrogen or carbon capture and storage technology are likely to be much higher-cost avenues to a net zero economy, and should be pursued only when other, lower cost options are unavailable.

Efficient electric technologies are ready for deployment in a wide range of applications, and can start reducing emissions right away. A strong strategy would take advantage of those opportunities today, while keeping an eye to the future for technology developments that may help to address harder-to-abate emissions.

Figure 1 – Marginal abatement cost curve for Australian emissions reduction. Source: Northmore Gordon 2023, Energy efficiency scenario modelling.



Recommendation 3:

The South Australian Government should prioritise deployment of existing, proven technologies in the short term to capitalise on immediately-available emissions and bill reduction opportunities.

2. Efficient electrification should underpin South Australia's transition

Given South Australia's large investment in low-emissions renewable energy technology, there is a substantial opportunity to capitalise on that investment by prioritising efficient electrification in a range of applications. Electric equipment is inherently more efficient than fossil-fuelled equipment, with an 'energy efficiency dividend' of up to 300-400% in some situations. Ensuring that electrification is efficient and high-quality will not only maximise the benefits of the energy transition and previous investments in renewable energy, but will also reduce the amount of primary energy that must be harnessed to satisfy South Australia's energy needs.

Research conducted for the Australian Sustainable Built Environment Council, as well as a growing consensus of research globally, demonstrates that electrification is the quickest and lowest cost route to decarbonising building operations.[5] Electrifying a large portion of the transport fleet is also likely to decarbonise these activities most rapidly, with Australia's uptake of electric vehicles rapidly accelerating as a result of increasing affordability. Around 7 per cent of new vehicles purchased in July 2023 were battery electric vehicles, up from around 3.8 per cent of vehicles purchased in 2022 and 0.8 per cent in 2020.[6] Many commercial and industrial processes can be at least partially electrified, taking advantage of cost and emissions savings as well as productivity improvements.

Adopting electrification enables immediate emissions reduction using existing, proven technologies and can be coupled with low-cost renewable energy generation. However, care should be taken that *efficient electrification* is pursued to unlock the greatest benefits from electrification. Ensuring that new electric equipment is high-efficiency and flexible will place the lowest possible demands on the energy system, achieve a rapid transition at the lowest cost possible, and ensures that consumers will derive significant benefits from the energy transition. Low-quality electrification, where little regard is afforded to the overall impacts of the new demands placed on the energy system, could negate many of the benefits of electrification to both consumers and the community.

South Australia could encourage efficient electrification in a variety of ways. This could include through upgrades provided in the REPS program; by working with commercial and industrial businesses to incentivise well-planned electrical upgrades, and by creating frameworks to allow for greater integration of equipment with the grid (particularly heavy consumption equipment, like EV chargers, pool pumps or large HVAC systems). Similarly, the South Australian Government can influence national initiatives to ensure that minimum performance standards and labelling support consumers to make efficient choices that will save emissions and reduce energy bills.

Recommendation 4:

The South Australian Government should embrace *efficient electrification* as the primary means to achieve the energy transition at least cost.

[5] Australian Sustainable Built Environment Council 2022, *Unlocking the pathway: why electrification is the key to net zero buildings*, ASBEC, Sydney.
[6] Federal Chamber of Automotive Industries 2023, *New Vehicle Sales Achieve Record July Result*; Electric Vehicle Council 2023, *Australian Electric Vehicle Industry Recap 2022.*

3. Skills and supply chains

South Australia's early progress in the deployment of renewable energy has given it a lead in the energy transition compared with other domestic and international jurisdictions. While this means that South Australia is benefitting from early access to the necessary technologies, expertise and skills, ongoing attention is needed to preserve South Australia's position in an increasingly competitive market.

Developing an energy performance strategy would unlock the vast employment potential of the demand side, which on average, tends to create more jobs per million dollars of investment than any other part of the energy sector.[7]

3.1 Skills and employment

Energy efficiency, energy management and deep decarbonisation are activities that will provide substantial employment opportunities if deployed at scale. Jobs to design, finance, execute, commission, operate and maintain energy efficiency improvements are high-quality jobs which help build a more productive and competitive economy. The International Energy Agency estimates that globally on average, every million dollars invested in building energy efficiency creates nearly 15 jobs, higher than solar PV (12 jobs / million dollars) and electric cars (7 jobs / million dollars)[8]. Closer to home, modelling undertaken for the EEC found that modest energy efficiency programs could create an additional 120,000 FTE job-years in Australia.[9] However, these additional jobs will not be available without a clear policy signal to embrace energy efficiency, electrification and energy management in the transition.

Energy efficiency and demand-side activities share many skillsets with other clean energy jobs, such as electrical trades and engineering. Care must be taken to ensure that sufficient skilled workers are available both for the introduction of new energy supply, as well as activities that will make existing energy demand more efficient and productive.

The Energy Efficiency Council continues to press all Australian governments to fund a comprehensive Australian Energy Employment Report (AEER) that will be used as the basis to determine where critical skills gaps may exist in the energy sector. Although an initial survey ran in 2023, it was a self-selected survey rather than a comprehensive, quantitative analysis of where energy-related employment existed in the economy. The data gleaned from a comprehensive AEER will be invaluable in planning for the future energy workforce, which will be essential to the orderly transition.

Like other jurisdictions, South Australia is likely to continue to face skills and labour shortages in the near term. However, the pressing need for a variety of skilled energy workers is unlikely to diminish so the South Australian Government should invest in education and training to ensure a suitably qualified future energy workforce – for both the supply and demand sides of the energy system – is available to meet the state's needs.

Adopting frameworks to ensure quality and safety in a range of professions will also help to ensure South Australia's energy transition is not derailed by quality and safety issues. For example, professional certifications can help bridge the gap

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[7] International Energy Agency 2020, *Sustainable Recovery: World Energy Outlook Special Report*, IEA, Paris

[8] Ibid.

[9] Green Energy Markets 2019, *Energy efficiency employment in Australia*, EEC and ESIA, Melbourne

between licenced and unregulated trades – providing higher assurance of safety and quality, while keeping a relatively low regulatory and administrative burden. The Energy Efficiency Council runs a professional certification program for a number of trades and professions, including insulation installers, energy management system advisors and others. These certifications can provide governments with a level of assurance and comfort, enabling easier integration of these types of activities into government programs where appropriate.

3.2 Supply chains

Countries around the world are rapidly increasing the deployment of a wide range of clean energy technologies, including energy efficiency technologies spurred by climate policy and other factors such as the invasion of Ukraine. The EEC understands that although global manufacturing capacity is being scaled up, Australia is one of several regions competing for the limited supply of clean energy technologies, with only limited indigenous manufacturing capacity.

It is therefore imperative that the South Australian Government provides clear policy signals in its energy strategy. Clearly indicating the importance of efficient electrification will encourage global suppliers to invest in supply to South Australia, ensuring South Australians are not left without access to efficient electric technologies that will save them money and help rapidly reduce emissions. Alternatively, failing to adequately plan for an efficient electric future may mean that South Australians are a lower priority for global equipment suppliers, having flow on effects to the quality and competitiveness of products available to South Australians.

South Australia could demonstrate a strong commitment to assisting consumers access high-quality efficient electric technologies through the implementation of a sustainable household loans scheme, where householders are provided with no- or low-interest loans to retrofit their homes with efficient appliances. Such a scheme has been successful in other jurisdictions, and could work in South Australia to help combat cost-of-living pressures.

Recommendation 5:

The South Australian Government should provide strong policy signals to incentivise business investment in technology and skills that will facilitate a vibrant demand-side energy ecosystem.