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By email: NEMSecurityReview@environment.gov.au

RE: Independent Review into the Future Security of the National Electricity Market

Environment Victoria submission on the Preliminary Report

We wish to congratulate the Review on the production of the Preliminary Report, which comprehensively addressed the issues in this space. We welcome the opportunity provided by the Review for public submissions to this critical national debate.

Environment Victoria is one of Australia's leading independent environment groups. With more than 40 member groups and tens of thousands of individual supporters, we've been representing Victorian communities on environmental matters for over 40 years. Through advocacy, education and empowerment Environment Victoria seeks significant and enduring solutions that will safeguard the environment and future wellbeing of all Victorians.

1) [Overview](#)

This Review provides an opportunity to fundamentally re-frame the way we think about energy in Australia.

The reality is that a transition to zero net emissions and 100 percent renewable energy is both imperative and inevitable. Australia is already experiencing the impacts of climate change. Recent heatwaves and storms demonstrate the increased pressure that global warming will continue to place on our electricity system.

Far from being the problem, as some incorrectly suggest, renewable energy is in fact a fundamental part of the solution.

The challenge is how to make the transition to 100 percent renewable energy as quickly as possible *while* safeguarding affordability, security and reliability.

Even the national industry association representing Australian electricity networks and gas distribution businesses, Energy Networks Australia, has recently said that energy consumers do not have to sacrifice security of supply or affordability to achieve a low emissions future if action is taken now.¹

Hence, this Review must go beyond "deliver[ing] a blueprint outlining national policy, legislative and rule changes required to maintain the security, reliability and affordability of the NEM" as outlined on p. 5 of the Issues Paper. Instead, the Review presents an opportunity to design a market that is fit-for-purpose in the 21st century and that can unlock the huge potential of the transformation of the energy market that is underway and which will continue to gather pace.



This transformation of the NEM is occurring in two related dimensions – from fossil fuels to renewable energy, and from a centralised to increasingly decentralised energy supply and utilisation system. In the context of this transformation, this submission focuses on the opportunities for addressing the key question:

“How can we drive a rapid transition to zero net emissions and 100 percent renewable energy, while ensuring the NEM delivers security, reliability and equitable access to affordable energy services for all?”

It also highlights the significant and complementary contributions which can and must be made by efficiency and demand management in achieving these objectives.

2) Transition from fossil fuels to renewable energy is imperative

a. Committing to 2 degrees means planning a zero emissions NEM

Electricity generation is the single largest source of greenhouse gas emissions in Australia. Therefore the electricity sector has a significant role to play in meeting Australia’s obligations to avoid catastrophic climate change.

The Preliminary Report considers Australia’s obligations under the Paris Agreement, represented by the Australian government’s commitment to reduce greenhouse gas emissions by 26-28 percent below 2005 levels by 2030 (p. 19). Parties to the Paris Agreement have committed to holding the increase in the global average temperature to well below 2°C above pre-industrial levels. However, the emissions reduction targets committed to by the federal government of 26-28 percent (from 2005 levels) by 2030 are consistent with 3-4 degrees of warming.² This extent of global warming would have devastating consequences for all Australians and every sector of our economy.

If future Australian governments are to meet obligations under the Paris agreement, as well as fulfil their broader obligation to act in the best interests of the Australian people by taking strong action on climate change, the National Electricity Market will need to be capable of delivering emissions reductions commensurate with best practice scientific and economic advice.

One example of current best practice advice, a December 2016 report by CSIRO and Energy Networks Australia, shows that Australia could reach renewable energy levels in the high 90 per cent without compromising the reliability of the grid. Achieving a zero emissions grid powered by wind and solar (as recommended by the Climate Change Authority) is not only feasible but will be \$100 billion cheaper than building more coal and gas supply.³

However, the current uncertainty caused by continually changing policy settings in this space is hindering investment in low emissions and renewable technology. This uncertainty also contributes to the “barriers to exit” of aging coal generators that need to be retired if we are to make significant cuts to our climate pollution.

The long term nature of capital investment in the electricity market must be recognised in planning for a NEM that can meet the challenges of the energy trilemma.



b. The case for a national plan to retire coal power stations

The reality is that Australia will need to replace its fleet of ageing coal-fired power stations in coming years. Not only do we need to rapidly decarbonise to meet our emission reduction obligations, but many in Australia's aging fleet of generators are operating past their scheduled closure dates, causing serious workplace and safety concerns.

Eight coal-fired power stations have closed in Australia in the past five years, with Hazelwood soon to become the 9th. As investors become increasingly concerned about the long term viability of coal power, and maintenance costs of older stations continue to rise, we can expect more coal power to be withdrawn at short notice. The chaotic nature of this trajectory results in unsatisfactory outcomes from an environmental, energy security and economic perspective, not to mention giving very little notice to workers and communities affected by power station closures. On average, these nine power station closures have given workers and communities just four months' notice – hardly enough time to develop alternative sources of economic activity and employment.

The Australian Energy Market Operator (AEMO) has estimated that meeting the current (inadequate) federal climate targets will require the closure of around 8700 MW of coal-burning power stations before 2030.⁴ Other analyses suggests that to meet more ambitious climate targets that are consistent with the Paris Agreement, all coal plants in Australia will need to be retired by 2030 or 2035.⁵

There is currently no policy mechanism that ensures this coal capacity is removed in a managed way. This means that (a) there is no certainty that it will happen, and (b) there is no system in place to manage the consequences of power station retirements.

A coherent national plan for the retirement of coal fired power stations is necessary to ensure smooth transition as the energy market decarbonises.

Actively managing the orderly phase-out of coal-fired electricity will:

- Deliver better emission reduction outcomes;
- Allow for mitigation of energy security and price risks;
- Encourage investment in new clean energy capacity and new jobs;
- Provide more certainty to communities near coal power stations and creating clearer signals to start planning regional economic diversification.

This is far preferable to not planning. Allowing the situation to unfold chaotically and without intervention:

- Risks short-term increases in emissions, at precisely a time when no increase to emissions is acceptable;
- Leaves renewable energy investors without adequate certainty;
- Gives no certainty to communities;
- Makes it harder for governments to openly prepare for changes to regional economies.

There is broad support for a planned phase out of coal power.



AGL and EnergyAustralia have both called for plans to retire coal generators.⁶ Elsewhere, the Chief Finance Officer of AGL (owners of Loy Yang A, Bayswater and Liddell power stations) has said that “a planned phase-out of coal plants is needed to reduce the risk of blackouts, because it will send a signal to the market that more renewable energy should be built.”⁷

The Business Council of Australia has said “Victoria needs a managed transition away from coal-fired electricity generation. Given the profile of Victoria’s coal-fired generation fleet, a more managed transition policy would seek to minimise the risks of this transition on system security and individual communities throughout Victoria.”⁸

In November of 2016 a Senate Inquiry into the retirement of coal power stations recommended that the ‘Australian Government adopt a comprehensive energy transition plan’ and ‘develop a mechanism for the orderly retirement of coal fired power stations.’⁹

The key elements of a national energy transition framework should include:

1. A plan for the orderly phase-out of coal-fired power stations over time, as well as comprehensive mine rehabilitation;
2. Support for a just transition for mine and power station workers and affected communities; and
3. Active mitigation of energy market implications of coal power station closure, such as energy efficiency and demand management. (see below for more detail)

While there is a tendency to prefer market-based mechanisms, there is no compelling reason to use a market instrument in this situation. A market mechanism to retire coal power stations does not guarantee a clear timeline of retirements that would provide certainty to communities and investors. For that reason, we suggest that direct regulation, while unfashionable in the energy market, would provide superior outcomes in current circumstances.

c. “Clean coal” technology will not assist in addressing the energy trilemma

With an emissions intensity of 0.76 to 0.845tCO₂-e/MWh,¹⁰ new ultra-supercritical combustion coal is a highly inappropriate response to reducing emissions and combatting global warming, without the presence of carbon capture and storage (CCS).

Replacing existing coal capacity with ultra-supercritical combustion is also a more expensive option than building new renewable energy capacity.

Research released by Bloomberg New Energy Finance in February of this year concludes the Levelised Cost of Energy (LCOE) of a new ultra-supercritical coal-fired power station in Australia is \$A134-203/MWh; significantly higher than the LCOE of new-build wind at \$A61-118/MWh), or solar \$A78-140/MWh. Once the cost of carbon capture and storage technology is added, which the Preliminary Report notes would be necessary for any new coal capacity to be built, the estimated LCOE is around \$A352/MWh – or around three times the cost of wind or solar.¹¹

New coal will also not adequately address security challenges, given the need to transform our grid to one that can support 100 percent renewable energy, newer and more flexible measures are needed to provide inertia to the grid.



d. The importance of state-based targets

State-based renewable energy targets have proven to be an important component in driving investment in new renewable energy. Far from being seen as problematic, these targets (in particular through reverse auction and contracts-for-difference) provide a number of advantages:

- Competitive pricing for new generation
- Investment certainty and bankability for project developers
- Allowing for planned integration of renewable energy into the grid

Given the decarbonisation imperative we face, schemes that ensure the delivery of more renewable energy projects should be seen as a positive. Placing caps on these schemes also risks limiting the cheapest form of new generation, thus adding to concerns about security of supply.

3) The contribution efficiency and demand management can make to the energy 'trilemma'

The Issues Paper provides a comprehensive overview of the challenges facing the national electricity market, and in particular the transformation of the grid into an increasingly distributed and de-centralised system and the impact of new technology (including solar PV, battery storage and electric vehicles).

However, we consider that there is scope for the Review to give more attention to issues beyond how energy is supplied to consumers and at what price, and to look more broadly at the contribution that efficiency and demand management can make to delivering the 'energy trilemma'.

a. Emission reductions

Simply put, we cannot achieve a rapid transition to a zero net emissions economy without a significant investment in energy efficiency. The International Energy Agency recently identified improving energy efficiency as the number one global action to achieve peak emissions by 2020 and significant declines by 2030.¹² In Australia's case, where our electricity system is highly emissions-intensive by international standards, the emissions reduction benefits of efficiency (or avoided consumption) are likely to be even higher.

Furthermore, improving energy efficiency provides the least cost abatement compared with other emission reduction options – in many cases at zero to negative cost because efficiency investments generate cost-savings by reducing waste (see Figure 1).¹³



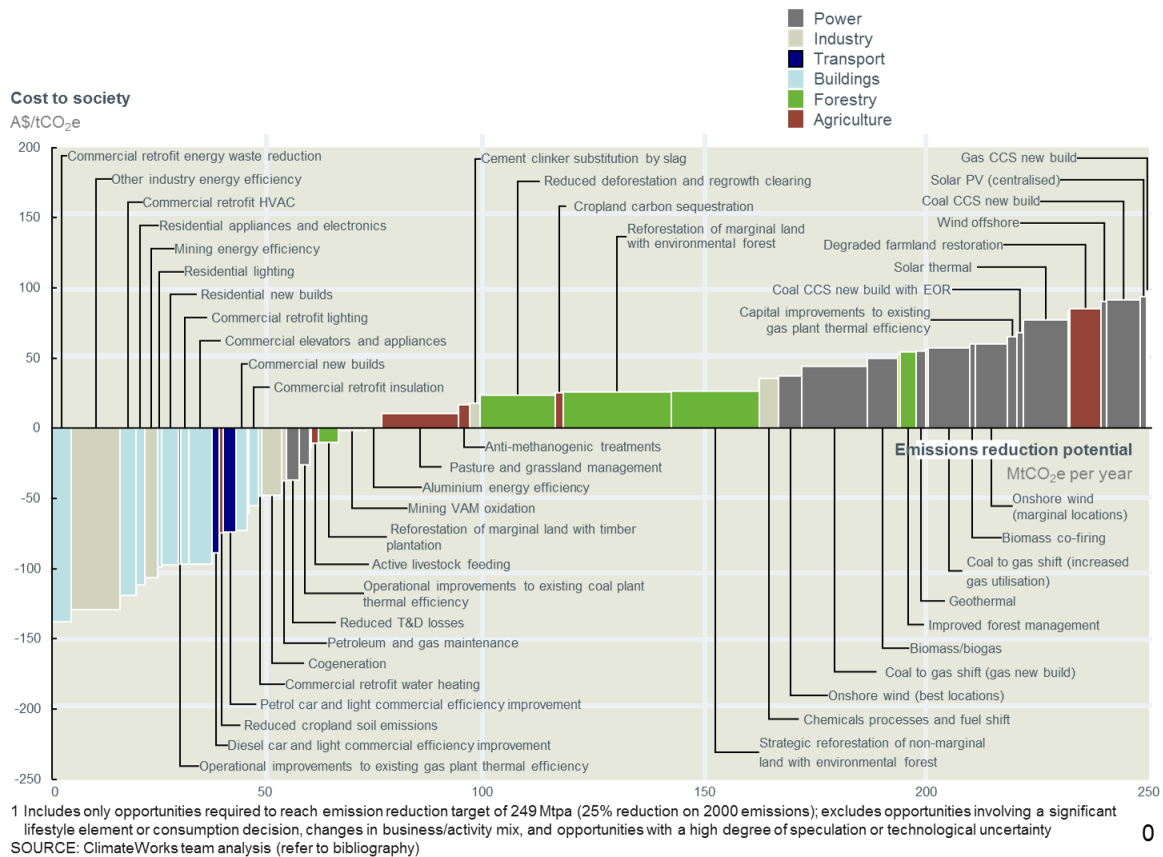


Figure 1. Marginal abatement cost curve, Australia

Improving efficiency and hence reducing demand, particularly peak demand, also makes the transition to renewable energy faster and cheaper by delaying or avoiding the need for investment in costly supply infrastructure.

Beyond emission reductions, improving energy efficiency and energy productivity* also delivers significant economic benefits by reducing the waste of expensive energy inputs. The 2014 2xEP Roadmap estimates that doubling energy productivity would deliver a 2.8 percent increase in GDP by 2030, equivalent to a gain of \$59.5bn GDP (2010\$) in that year. Australia improved energy productivity by a meagre 1.1% per annum between 1992 and 2012, suggesting that there is significant scope for improvement.

b. Affordability

While affordability is a key concern of the Review, discussion within the Issue Paper is frequently framed in terms of a narrow focus on the price paid by consumers for electricity and gas.

However, affordability is a function of both price and consumption. As energy prices rise, reducing consumption by improving efficiency is an obvious and effective way to manage costs and maintain

* Defined as the ratio of economic output per unit of energy consumed

affordability. There are significant opportunities for improving the efficiency of residential, commercial and industrial energy use across the Australian economy.

For example in Victoria's climate zone, upgrading residential building efficiency can reduce electricity and gas costs by 40 percent, translating into annual savings of up to \$1,000 for the average household.¹⁴ However, low-income and vulnerable households – those who need the savings from efficiency the most – are likely to be missing out due to unaffordable upfront costs of upgrades, a lack of information and/or because they rent.¹⁵ Retailers have a large and growing problem with customers experiencing financial hardship unable to pay their bills.¹⁶ Without intervention to assist these customers reduce consumption (through retrofitting and appliance replacement), energy hardship and disconnection rates are likely to continue to worsen. However, current market arrangements do not require regulators and retailers to prioritise policies and programs which would drive efficiency improvements.

Raising efficiency standards for new buildings could also achieve cost-effective savings in energy use of up to 49 percent,¹⁷ as well as deliver complementary health and well-being benefits. The current review of the National Construction Code is an ideal opportunity to drive a significant improvement in new building performance and compliance across Australia, so as to reduce long term building running costs and improve affordability for consumers.

Upgrading the efficiency of commercial buildings can cut HVAC costs by 40 percent and lighting costs by up to 80 percent.¹⁸ The recently axed Energy Efficiency Opportunities Program delivered an estimated net financial benefit of \$800 million to Australian businesses, while delivering emissions abatement at an average cost of minus \$95 per tonne CO₂e.¹⁹ There are also significant opportunities for increasing the efficiency of industrial, commercial and residential gas use, thus minimising pressure for additional supply.²⁰

As well as reducing overall consumption, measures such as insulation or efficient appliances also deliver affordability benefits by helping consumers minimise usage during periods of peak demand (and hence peak prices), such as during heatwaves or cold snaps. Peak prices make up a significant proportion of overall electricity and gas costs for many consumers.²¹

Reducing the incidence and severity of peak demand events also impacts on affordability by delaying or avoiding the need for investment in additional supply infrastructure – a key driver of rising wholesale prices in recent years.²²

And finally, more than a million Australian households have responded to rising prices and affordability pressures by investing in rooftop solar in recent years. However, many Australian households including low-income households, apartment dwellers and renters are currently locked out of the clean energy revolution and are missing out on this option for managing affordability. The Review should be examining opportunities for addressing the pricing and regulatory barriers preventing equitable access to renewable energy by all Australians, particularly disadvantaged households.

c. Reliability and security

Much recent debate including much of the discussion in the Issues Paper has addressed the question of security and reliability from the perspective of episodic failures of supply to meet spikes in



demand. However, there has been less focus on the equally important opportunities we have to influence demand to better match supply, particularly with the transition to a more a de-centralised and distributed system.

As mentioned above, efficiency measures targeting consumption that typically occurs during peak periods (such as insulation and efficient heating and cooling appliances) act to moderate demand spikes and hence reduce the risk these pose to supply reliability, particularly in extreme weather events such as heatwaves or cold snaps. However, detailed end-use data which would inform targeted investment is not currently available.

Furthermore, as more households and businesses adopt demand management and storage technology, there are additional opportunities to build on efficiency savings through consumers exercising more control over the timing of their usage. This greater consumer control within the system can manifest both as an actual reduction in peak demand, as well as ‘demand shifting’ as consumers choose to consume electricity and gas outside of peak price periods. Efficiency and demand management also free up more electricity from distributed generation and storage for export to the grid, as well as make additional gas supplies available for other users. All of these outcomes reduce the reliability risks associated with periods of very high demand outstripping supply and avoid the need for additional supply.

Environment Victoria endorses the Preliminary Report’s conclusion that higher penetration of renewable energy into the grid is possible without risking system security if alternative sources of synthetic inertia generated from renewable sources can be harnessed and effectively integrated into the grid. Potential sources of synthetic inertia include intelligent wind turbine controllers, battery storage and possible re-tooling of existing turbine infrastructure in the Latrobe Valley.²³ However, as is noted in the Report, current market arrangements were not designed with this outcome in mind, and will need significant reform to ensure the transition to a 100 percent renewable energy grid does not jeopardise security of supply.

4) Recommendations:

The Australian economy is currently under-investing in efficiency and demand management measures, and resisting the urgent need to plan for supply change, both of which could make a significant contribution to the energy trilemma of affordability, reliability and security, and emissions reduction.

Some of the opportunities for reforming the National Electricity Market so as to drive the rapid transition to a zero net emissions grid, and encourage greater investment in efficiency and demand management include:

1. A national plan to phase out coal-fired power stations

On current trajectory, Australia will have emitted its share of the global carbon budget for staying under 1.5 degrees in the next six years.²⁴ With 30 percent of Australia’s emissions originating in the electricity sector, there is an urgent need to deliver rapid decarbonisation in this industry, which will require a planned phase-out of Australia’s fleet of coal-fired power stations. While coal power stations are already closing, they are closing in an *ad hoc* manner and with unpredictable timing, which gives no certainty to the energy market, renewable energy investors, workers or communities.



In reforming regulations to help create the energy market of the future, we need to explicitly accept that coal generators need to close, and need to close much sooner than the lifespans currently proposed by their owners. A national plan for an orderly phase-out, which sets clear timelines for the retirement of each generator well in advance, will help create the certainty craved by all stakeholders.

Environment Victoria recommends that the Federal Government work with States, not against them, to create a national plan for transitioning our energy system. More detail on how to manage the phase-out of coal-fired power stations is available in Environment Victoria's submission to the current Senate Inquiry into the retirement of coal-fired power stations.²⁵

2. Reform the National Electricity Objective (NEO)

The National Electricity Objective (NEO) currently frames the obligation to serve the long term interests of consumers in terms of “price, quality, safety, reliability, and security of supply”. Using ‘price’ as a proxy for affordability ignores the critical role that efficiency and demand management can play in reducing the amount and timing of energy consumption so as improve affordability even in the context of rising prices.

A re-framing of the NEO to replace ‘price’ with ‘cost’ would create an obligation to minimise overall cost to consumers, providing an incentive and driver for greater investment in efficiency and demand management by system managers and regulators.

Focusing on ‘cost’ rather than ‘price’ would also create an obligation to internalise the full environmental and health costs of fossil fuels in energy market decision-making. At present, emission reduction objectives constitute an externality that is largely ignored by market bodies and participants.

Acting in the long term best interests of consumers necessarily requires strong action to reduce emissions so as to avoid catastrophic climate change and the food and water security, health and conflict risks we face at a regional, national and global level. As Australia's energy supply is highly emissions intensive and emissions reduction targets cannot be met without transitioning to a zero net emissions grid, it is appropriate that the rules governing the NEM also explicitly articulate an emissions reduction objective.

3. Energy pricing reform

Current tariff structures comprising high fixed charges, high minimum usage requirements and declining block tariffs distort price incentives to consumers to invest in efficiency. They also act to deprive low-income and vulnerable customers of the full cost-saving benefits of efficiency measures or behaviour changes they implement. These distorting tariff structures must be formally excluded from the market.

Electricity market rules also need to be reformed to support a fair price for rooftop solar. Currently rooftop solar owners who sell their excess power to the grid receive only about 20 percent of the price charged by the retail companies when they on-sell that same electricity to another consumer. Not only does this represent an unjustified windfall benefit to the retailers, but it fails to reflect the



wider environmental and system security benefits of that solar power, particularly when it provides additional supply at times of peak demand.²⁶ It is grossly unfair that small-scale generators are paid a few cents for power supplied at times of peak demand which helps the retailer avoid buying additional power at high peak spot market prices.

Energy market reform is also required to support the continued growth of the community power sector, which seeks to ensure equitable access to the clean energy revolution for all Australians, including low-income and vulnerable households, apartment dwellers and renters. Relevant recommendations of the National Community Energy Strategy, including fair pricing for grid connection, regulatory changes to support micro-grids and enable Virtual Net Metering, should be considered within the Review.

4. Require AEMO to identify and publish efficiency opportunities across the network

The Australian Energy Market Operator should be required to publish an annual statement of efficiency opportunities alongside its current Electricity Statement of Opportunities, which currently assesses only supply adequacy across the network. This would assist suppliers of efficiency products and demand management services to identify and capitalise on the most valuable opportunities for investment.

5) Conclusion

The energy system is undergoing rapid change. If this change is ignored, or if we try to constrain it within the old paradigm of centralised electricity and passive consumers, it will lead to poor outcomes for all concerned. If we recognise the opportunity that is being provided – to decarbonise our electricity sector, to increase the equity in the provision of electricity services, to become more efficient and smarter in how we use energy, to empower consumers – then regulators and policy makers can ensure that technological change leads to widespread community benefits.

We encourage the Review to take this opportunity. Thank you for receiving this submission, and we would be happy to provide any further information to assist with the next steps of the Review.

Regards,

A handwritten signature in black ink, appearing to read "N. Aberle".

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