



SUBMISSION TO THE INDEPENDENT REVIEW INTO THE FUTURE SECURITY OF THE NATIONAL ELECTRICITY MARKET

Abstract

As one of the worlds' most urbanised nations, Australia's capital cities will be instrumental to the implementation of climate and energy reform.

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INTRODUCTION

The Council of Capital City Lord Mayors (CCCLM) appreciates the opportunity to provide a submission to the *Independent Review into the Future Security of the National Electricity Market* (the ‘Finkel Review’ or ‘Preliminary Report’). The CCCLM represents the interests of the Lord Mayors (and ACT Chief Minister) of Australia’s eight capital cities. Together, the capital cities account for over two-thirds of Australia’s population and economy. The latest ABS population projections forecast an increased concentration with 5.5 million of the additional 7 million persons expected by 2031 to live in capital cities.

As one of the worlds’ most urbanised nations, Australia’s capital cities will be instrumental to the implementation of climate and energy reform. Cities will be the site of many of the dramatic changes in consumer behaviour and technological change highlighted in the Finkel Review.¹ The CSIRO estimates that as much as 50 per cent of energy consumption by 2050 will occur through decentralised energy technologies, which will be primarily rolled-out in the capital cities. As Australia’s energy market rules were constructed in an era of centralised generation, there are a series of regulatory barriers for decentralised energy which act as anti-competitive barriers to entry or distort competition. In the aftermath of the South Australian black-out, the focus of many parties is large-scale energy, networks and market operations to improve energy security - but it is equally important that energy market rules are modernised for the efficient roll-out of decentralised energy technologies

The CCCLM Climate Policy includes three priorities for energy supply;

- Update and align the National Electricity Objective with Australia’s climate policy and targets as a first priority;
- Investigate initiatives that would have a positive effect on the uptake of building and district-scale renewable energy generation across Australia. Changes should be long-term, strategic decisions focussed on the need for cheap, secure and low-emissions power; and
- Review the implications of decarbonising the electricity supply. This would involve the investigation of the exit of high emissions intensive power stations from the electricity grid, and initiatives such as changes to national electricity market rules and AEMO rules, virtual net metering and the introduction of large scale alternative energy storage.

The CCCLM strongly endorses the key observations of the Preliminary Report:

- The transition to a lower emissions economy and energy system is underway and cannot be reversed;
- The energy market transition requires whole-of-system thinking, consistent long-term policy signals and a national commitment to integrate energy and emissions reduction policy;
- The integration of energy and emissions reduction policy needs to address the ‘energy trilemma’ – energy security and reliability, affordable energy and reduced emissions;
- The growth of renewable energy presents significant challenges to the security and reliability of the National Electricity Market (NEM). However, there are technical solutions which are not being facilitated because energy market rules, standards and frameworks ‘have not kept pace with the transition’;
- There is currently a ‘once-in-a-generation’ opportunity to reform the NEM and its governance.

¹ Internationally, cities and regions were included in the Paris summit for the first time at a Conference of the Parties. The C40 cities network has recently estimated cities can directly or indirectly implement 40 per cent of the Paris agreement. C40 (2016), *Deadline 2020: How Cities will get the Job Done*.

The key element of the CCCLM's submission is that genuine integration of climate policy and energy markets is urgent. Policy uncertainty is increasing energy costs for city businesses and residents, inhibiting the capacity of cities to efficiently contribute to emissions reduction and now challenging system security. Effective integration requires reform to **both** government policy and energy market governance:

- Australia needs national leadership to establish long-term targets consistent with the Paris Agreement (net zero emissions by 2050 or sooner) and policy frameworks aligned with these targets.
- Australia's climate targets need to be incorporated into the National Electricity Objective, or an equivalent mechanism to ensure alignment.

The Australian Energy Market Commission has recurrently stated over the past decade that climate change is out of scope for its determinations because it is not included in the National Electricity Objective. The exclusion of climate change from the considerations of energy rule makers has contributed to the inertia and conservatism in modernising rules that underpins the 'failure to keep pace' with the development of new clean energy technologies, consumer demand and business models. Inclusion of climate change is essential to ensure robust, long-term regulatory frameworks are established to maintain secure, affordable energy as transition occurs to meet Australia's international climate change commitments out to 2050.

The National Electricity Objective is no longer fit-for-purpose as the long-term interests of consumers has not been defined by the AEMC to include Australia's climate targets. A series of other jurisdictions internationally have integrated climate or environmental objectives into their energy rules objectives, including the United Kingdom, Denmark, New York, Ontario and California. The experience of these jurisdictions demonstrates that consideration of climate or environmental criteria can be effectively integrated and regulators are able to reconcile objectives that require trade-offs such as price, quality, security and lower emissions.

SUBMISSION

The Preliminary Report contains consultation questions for seven themes. Many of the consultation questions are technical matters that other parties are better placed to address. The CCCLM submission does not address each question, but instead provides comment on each of the seven themes based on the interests and perspectives of CCCLM members and policy.

1. TECHNOLOGY IS TRANSFORMING THE ELECTRICITY SECTOR

- 1.1 How do we anticipate the impacts, influences and limitations of new technologies on system operations, and address these ahead of time?*
- 1.2 How can innovation in electricity generation, distribution and consumption improve services and reduce costs?*
- 1.3 What other electricity innovations are you aware of that may impact the market in the future?*

The Preliminary Report highlights the important role that decentralised energy technologies will play in energy markets. In addition to new technologies, competition needs to be facilitated through different business models which are currently either not permitted or difficult to utilise under energy market rules. These include:

- District-based energy systems (which are commonplace through major international cities such as New York, Copenhagen, Barcelona, Seoul);
- Community-owned energy;
- Local energy trading and retailing;

- Virtual net metering across sites of the same organisation. For example, councils could locate renewable energy generation on one site and net it off from bills at other sites within the organisation. Lack of flexibility has stopped the implementation of projects because it is lower-cost to install a single, larger generation facility than multiple smaller facilities.

New business models for local energy generators are emerging which should be supported by the energy market rules to encourage peak time production and export and use of electricity networks where it is efficient to do so.

As Professor Garnaut notes: “Rational network design in contemporary circumstances would see evolution towards greater use of decentralised power, supported by a central transmission network designed to play a large role in balancing intermittent energy from different sources.”²

2. CONSUMERS ARE DRIVING CHANGE

2.1 How do we ensure that consumers retain choice and control through the transition?

2.2 How do we best meet the needs of vulnerable and hardship consumers?

2.3 How do we ensure the needs of large-scale industrial consumers are met?

2.4 How can price structures be made more equitable when consumers are making different demands on the grid according to their energy use and their investments behind the meter?

2.5 How do we ensure data sharing benefits and privacy are appropriately balanced?

The CCCLM commends the Preliminary Report’s inclusion of considerations for vulnerable consumers. As this report makes clear, those most vulnerable cannot insure themselves against rising electricity costs through technology advances like solar PV and high-efficiency appliances.

Consumers who can afford to leave the grid, or significantly reduce their grid consumption, can choose to utilise increasingly common solar and storage solutions. However, for those who cannot afford to leave the grid, they may be financially impacted by the remaining (fixed) network costs and demand response mechanisms without other policy or regulatory interventions. Furthermore, a new study from the University of Western Australia claims that current AEMO modelling greatly underestimates the future uptake of decentralised renewable energy, with the result that energy tariffs will increase significantly as the SWIS attempts to maintain prices supportive of increasingly redundant baseload power.³

There is a role for local government, in partnership with the Federal and State Governments, in identifying, addressing and protecting the needs of their vulnerable communities throughout the transition. Increasing the flexibility of retail markets and pricing will allow local government to play a role in creating or incentivising community energy opportunities, allowing the most vulnerable to be a part of the energy transition and limiting the growth of energy poverty.

3. THE TRANSITION TO A LOW EMISSIONS ECONOMY IS UNDERWAY

3.1 What role should the electricity sector play in meeting Australia’s greenhouse gas reduction targets?

3.2 What is the role for natural gas in reducing greenhouse gas emissions in the electricity sector?

3.3 What are the barriers to investment in the electricity sector?

3.4 What are the key elements of an emissions reduction policy to support investor confidence and a transition to a low emissions system?

² <http://reneweconomy.com.au/the-economics-of-the-future-energy-system-75051/>

³ <http://www.abc.net.au/news/2017-02-08/rooftop-solar-growth-could-fuel-big-power-price-hikes-uwa-report/8249748>

3.5 What is the role for low emissions coal technologies, such as ultra-supercritical combustion?

As one of the major sources of Australia's greenhouse gas emissions, emissions reduction in the electricity sector is central to meeting Australia's international climate change commitments. The CCCLM endorses the observations of the Preliminary Report that stable, long-term policy signals are required to unlock low-emissions investment. Each of the capital cities has climate or energy targets and initiatives (**see appendix 1**), and would welcome stronger coordination with other levels of Government.

Gas will have a role in the immediate future in Australia's electricity sector in maintaining reliable supply and reducing greenhouse gas emissions. However, whilst combined cycle gas plants in particular are lower-emissions than brown and black coal plants, in the longer-term they are also incompatible with the net zero emissions target by 2050 (without carbon capture and storage). There is a risk that the current focus on energy security could lead to the construction of gas plants (especially open-cycle gas plants) as a short-term response which embeds generation plant with a level of emissions that is incompatible with longer-term climate targets. It is notable that the reports of the Australian Energy Market Commission and Australian Energy Market Operator on the integration of climate policy and energy market preference gas plants as the technology most compatible with secure, reliable supply and the 2030 climate targets. Over-investment in gas plants could create a comparable problem currently being faced with coal plants, and the risk of costly premature retirements or other abatement options in decades to come. A long-term perspective on the energy trilemma is essential.

The CCCLM does not consider there is a role for ultra-supercritical combustion coal generators. As Appendix A to the Preliminary Report illustrates, the emissions intensity of these plants is only marginally lower than the current emissions intensity of the grid so they are not properly characterised as low-emissions technology. The CCCLM's climate policy includes a call for an investigation into mechanisms for the exit of high-emissions intensive power stations.

The assessment of energy analysts is that these plants are already more expensive than renewable energy - and the gap will widen as the cost of leading renewable energy technologies such as solar and wind power continues to fall rapidly. Consequently, the energy and finance industry has indicated they will not proceed with these plants as the risk of stranded assets that do not deliver a return in coming decades is unacceptably high. In this context, it would require large-scale subsidies and/or other forms of support to underwrite the financial returns of ultra-supercritical coal plants for them to have a role, which would be an extraordinarily poor use of scarce funds in the context of current budgetary constraints.

4. INTEGRATION OF VARIABLE RENEWABLE ELECTRICITY

4.1 What immediate actions could be taken to reduce the emerging risks around grid security and reliability with respect to frequency control, reduced system strength or distributed energy resources?

4.2 Should the level of variable renewable electricity generation be curtailed in each region until new measures to ensure grid security are implemented?

4.3 Is there a need to introduce new planning and technical frameworks to complement current market operations?

4.3.1 Should there be new rules for generator connection and disconnections?

4.3.2 Should all generators be required to provide system security services or should services continue to be procured separately by the power system operator?

4.4. What role can new technologies located on consumers premises have in improving energy security and reliability outcomes?

4.4.1 How can the regulatory framework best enable and incentivise the efficient orchestration of distributed energy resources

4.5 What other non-market focus areas, such as cybersecurity, are priorities for power system security?

4.6 How could high speed communications and sensor technology be deployed to better detect and mitigate grid problems?

4.7 Should the rules for AEMO to elevate a situation from non-credible to credible be revised?

Australia has an extremely high reliance on supply from remote power stations (the share of decentralised is amongst the lowest in advanced economies), which leaves our cities relatively exposed to extreme weather events such as those that were the catalyst for the South Australian black-out. The growth of distributed generation, demand management and energy storage is essential to improve network security as well as reduce network costs.

As Australia's energy market rules were constructed in an era of centralised generation and one-way power flows, there are a series of regulatory barriers for local, decentralised energy which act as anti-competitive barriers to entry or do not create a level-playing field for competition between technologies. For example:

- Notwithstanding some improvements through rule change processes, grid connection for distributed generation is typically slow, costly and uncertain;
- Power from local generation includes excessive network charges (e.g. charges for the transmission network) which is a barrier to precinct-scale developments and local energy trading;
- Retail tariffs have been re-designed to reduce the savings from energy efficiency and distributed generation.

In addition to market and network reforms currently under consideration, the CCCLM requests a direction through the Australian Energy Market Agreement to remove anti-competitive barriers and distortions for decentralised energy technologies.

Energy security is critical to all Australian major cities. Councils expect various levels of government and the governance bodies in the National Electricity Market (NEM) to focus on supply security irrespective of the % of variable renewable electricity (VRE). The current discord over the appropriateness of current state based renewable energy targets diverts effort from the planning and technical solutions required when embedding significant renewable energy sources in the supply mix. Solar and wind generation prices continue to fall and can be built in significantly shorter timeframes to clean coal or gas power stations. Without investment occurring in gas and coal power generation because of stranded asset risk, an increased % of VRE is inevitable and Federal and State government and NEM governance bodies should be focusing on market based and technical solutions that optimise supply security under this scenario.

5. MARKET DESIGN TO SUPPORT SECURITY AND RELIABILITY

5.1 Are reliability settings in the NEM adequate?

5.2 Is liquidity in the forward contract market for electricity adequate for the needs of commercial and industrial consumers and, if not, what can be done?

5.3 Are commercial and industrial users experiencing difficulties in obtaining quotes for supply?

5.4 What impact will an increasing level of renewable generation have on the forward contract market?

5.5 Rule changes are in process to make the bid interval and the settlement interval the same, both equal to 5 minutes. Are there reasons to set them to a longer or shorter duration?

5.6 What additional system security services such as inertia, as is currently being considered by the AEMC, should be procured through a market mechanism?

The CCCLM Climate Policy supports the expansion of large-scale battery storage, and therefore supports the rule change referred to in 5.5 which will increase competition from battery storage and lower consumer prices. Under the current bidding rules for wholesale electricity markets in which prices are averaged each half-hour over the 5-minute increments, there is evidence of strategic bidding by gas generators where they can exert market power to increase prices. Battery storage is faster-response than gas plants and their role would be

enhanced by price settlement on a five-minute basis. Removal of regulations that distort markets and exclude new technologies such as the settlement interval are essential to improve the flexibility of our energy system.

6. PRICES HAVE RISEN SUBSTANTIALLY

6.1 What additional mechanisms, if any, could be implemented to improve the supply of natural gas for electricity generation?

6.2 What are the alternatives to building network infrastructure to service peak demand?

6.3 What are the benefits of cost-reflective prices, and could the benefits be achieved by other means?

6.4 How can we ensure that competitive retail markets are working?

The key contributor to high prices is network investment; network costs account for around half of final prices in Australia whereas network costs are typically around 25 per cent of electricity prices in other developed markets. The CCCLM notes the very low contribution of demand management, energy efficiency and distributed generation, and the extensive opportunities they provide for cost-effective alternatives to building network infrastructure.

The Preliminary Report notes it is important that there be a systemic response to avoid regulatory and technical blindspots. One such regulatory blindspot is the regulation of renewable gas such as bio-mass and residual waste, which could develop a renewable gas market. Feasibility studies for the City of Sydney concluded there were sufficient renewable gas feedstocks within 250 kilometres of the City to provide all the gas required to supply a tri-generation network that could supply all energy needs by 2030. Germany is an example of a jurisdiction with an extensive renewable gas sector. Development of a renewable gas market would require regulatory reform to enable gas purchase agreements between generators and customers and a national accreditation program for GreenGas similar to GreenPower for renewable electricity.⁴

7. ENERGY MARKET GOVERNANCE IS CRITICAL

7.1 Is there a need for greater whole-of-system advice and planning in Australia's energy markets?

7.2 What lessons can be drawn from governance and regulation of other markets that would help inform the review?

7.3 How should the governance of the NEM be structured to ensure transparency, accountability and effective management across the electricity supply chain?

7.4 Are there sufficient outcome statistics for regulators and policy makers to assess the performance of the system?

7.5. What governance measures are required to support the integration of energy and emissions reduction policies?

7.5.1 Should the AEMA be amended?

7.5.2 Should the NEO be amended?

7.6 How can decision-making be appropriately expedited to keep up with the pace of change?

CCCLM policy is that the National Energy Objective should be updated and aligned with Australia's climate policy and targets as a first priority. The establishment of a stable, long-term climate policy by the Australian Government including long-term targets and better coordination with other levels of government is an essential but insufficient condition for effective integration of climate policy and energy markets.

The Australian Energy Market Commission has recurrently stated over the past decade that climate change is out of scope for its determinations because it is not included in the National Electricity Objective – the third leg of the 'energy trilemma' is not currently a consideration for energy rule making. The absence of climate

⁴ Further detail can be found here: http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0003/153282/Renewable-Energy-Master-Plan.pdf

change in the considerations of energy rule makers has contributed to the inertia and conservatism in modernising rules that underpins the 'failure to keep pace' with the development of new clean energy technologies, consumer demand and business models.

The rejection of the recent rule change submission by the City of Sydney, the Property Council and Total Environment Centre is a good example. The rule change proposed cost-reflective network charges for local energy generation – a Local Generation Credit (LGC) to reflect the reductions in network costs achieved by distributed generation substituting for power transported from remote generators. Currently, power exported by a generator in a capital city to a neighbouring building attracts the same network charge as power that travels from regional areas to the city, and there is no incentive to export at network peak times. Systems are being inefficiently under-sized to avoid export, consumers are increasingly turning to duplicate infrastructure and network tariffs impede the development of new business models such as local energy trading and community-owned energy. The CSIRO estimates up to 50 per cent of energy consumption by 2050 could be sourced from local energy. In that context, a price signal for the location of decentralised energy is an important structural reform to ensure efficient outcomes as our energy system is de-carbonised.

The AEMC rejected the rule change on several grounds. Firstly, the AEMC claimed that local energy generators could access network support payments. This claim is not credible; network support payments totalled \$11-\$13 million out of the \$45 billion of network expenditure from 2010 – 2015. The transaction costs of negotiating bespoke agreements are simply unviable for small and medium generators. Secondly, the AEMC commissioned modelling which found LGC would increase consumer prices, contrary to the modelling of the Institute for Sustainable Futures that found reductions in electricity bills between 2025-2030.

There are a variety of different assumptions that underpin the different results,⁵ but one is particularly worth highlighting in this context. The central AEMO projection for peak demand to grow just 0.2 per cent per annum to 2050 was used by the AEMC modelling, concluding there is limited network demand growth and investment to offset through a price signal for local energy generation. However, the AEMO forecast does not include electric vehicles or electrification of transport systems, and no alternative scenario was used to inform the decision by the AEMC. Given the significant errors in recent forecasts of peak demand, the timeframe of the forecast and the major changes to energy markets that will occur by 2050, a prudent response would be to acknowledge the level of uncertainty. If the AEMC was required to consider Australia's climate commitments to 2050, cost-reflective network charges for decentralised energy would have to be considered an important component of a long-term regulatory framework to achieve them at least-cost.

The AEMC response to the LGC rule change submission need not be the end of the story, but rather should mark the start of a conversation; in particular it remains critical that other initiatives, including the Finkel Review, are progressed to ensure appropriate incentives are provided for embedded generation.

The LGC rule change decision fits a wider pattern. There are many reform processes underway but they are slow, reform is invariably modest (and sometimes contradictory) and there is scope for greater consideration of their alignment with efficient long-term emissions reduction. For example:

- Rule changes to facilitate network extensions for large-scale renewable energy (scale-efficient network extension);
- Limited uptake of demand management and energy efficiency as an alternative to network augmentation, and slow reform of rules to create incentives for demand management by networks;
- Slow reform of network tariffs and the growth of standing charge tariffs that reduce incentives for energy efficiency and local generation.

The National Electricity Objective is no longer fit-for-purpose as the long-term interests of consumers has not been defined by the AEMC to include Australia's climate targets. A series of other jurisdictions internationally have integrated climate or environmental objectives into their energy rules objectives, including the United

⁵ For example, the AEMC modelling only included solar power (excluding other technologies such as co and tri-generation) and did not include avoided costs for the transmission network.

Kingdom, Denmark, New York, Ontario and California. The experience of these jurisdictions demonstrates that consideration of climate or environmental criteria can be effectively integrated and regulators are able to reconcile objectives that require trade-offs such as price, quality, security and lower emissions.

The CCCLM notes there are alternative mechanisms, such as issuing a Statement of Policy Principles pursuant to Clause 8 of the National Electricity Law. The Australian Energy Market Agreement already contains as one of its objectives to 'address greenhouse emissions for the energy sector, in light of concerns about climate change and the need for a stable long-term framework for investment in energy supplies', but it is not legally-binding.

CCCLM would welcome the opportunity to discuss the policy recommendations outlined in this submission in greater detail.

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APPENDIX 1 – CAPITAL CITY CLIMATE AND ENERGY TARGET INITIATIVES

Adelaide	<ul style="list-style-type: none"> • Carbon neutral by 2025 • 35% reduction in GHG emissions by 2020 (on 1990 levels)
Brisbane	<ul style="list-style-type: none"> • Average household emissions from energy, waste and transport will be less than 6 tonnes CO2-e by 2031 • Carbon neutral council operations by 2017
Canberra	<ul style="list-style-type: none"> • Carbon neutral by 2050 • 40% legislated reduction in GHG emissions by 2020 (on 1990 levels) • 100% renewable energy supply by 2020
Darwin	<ul style="list-style-type: none"> • Climate change action plan to reduce carbon footprint in city operations • Darwin achieved its target of 15% GHG emission reduction by 2016 (on 2008 levels) and currently has 12.5% renewable energy supply. Development of a new target is underway.
Hobart	<ul style="list-style-type: none"> • 17% GHG emission reduction by 2020 (on 2010 levels) Hobart achieved a 70% corporate emission reduction from 2000 levels in 2010, and a 20% community emission reduction from 1996 by 2010 levels • 35% energy consumption reduction by 2020 (on 2010 levels)
Melbourne	<ul style="list-style-type: none"> • Carbon neutral by 2020 • 25% of energy from renewable sources by 2018
Perth	<ul style="list-style-type: none"> • Reduce City of Perth operational emissions by 30% (BAU baseline by 2030) • Source 25% of the City's operational energy from renewable or low carbon sources by 2030 • Work with the community to achieve 30% reduction in city-wide greenhouse gas emissions (BAU baseline by 2030) • Work with the community to achieve 20% of citywide energy use from renewable or low carbon sources by 2030
Sydney	<ul style="list-style-type: none"> • Carbon neutral by 2050 • 70% GHG emission reduction by 2030 (on 2006 levels) • 50% renewable electricity supply by 2030