11 November 2016

Committee Secretary
Senate Standing Committees on Environment and Communications
PO Box 6100
Canberra ACT 2600

Retirement of coal fired power stations inquiry

Dear Sir/Madam

Energy Networks Australia welcomes the opportunity to make a brief submission to the Senate Inquiry into the Retirement of coal fired power stations. Energy Networks Australia is the national industry body representing businesses operating Australia's electricity transmission and distribution and gas distribution networks. Member businesses provide energy to virtually every household and business in Australia.

Transmission networks have a fundamental role in ensuring power system reliability and security. The closure of coal fired power stations in the National Electricity Market (NEM) naturally has implications for this function, as it will the overall structure of the NEM.

Energy Networks Australia supports evidence based policy frameworks which maintain high levels of energy security and reliability while achieving the required transition to a low emissions energy system at the lowest cost to customers.

Planning for transmission capacity

The energy transition is seeing the withdrawal of traditional centralised, 'synchronous' baseload generation and an increasing mix of different generation types at both a utility scale and at a micro-generation level. Maintaining system stability across the transmission network in the face of coal fired power station retirement and increased non-synchronous generation penetration requires detailed consideration of technical issues and appropriate planning for the transition pathways.

Transmission capacity, including interconnector capacity between NEM regions, is often recognised as one of the solutions available to address the instabilities introduced by the on-going closure of traditional 'synchronous' generation and accompanying reduction of inertia sources. For instance, the South Australian Department of State Development recently noted that, in South Australia:

> *"It is not expected that the trend of decreasing levels of inertia will reverse, unless a new interconnector is built to offer a redundant source of AC connection to the rest of the NEM"* [1] *(page 2).*

[1] Submission to the Australian Energy Market Commission's Consultation Paper on Emergency under-frequency and over-frequency control schemes.

Energy Networks Australia supports the need for any new investment in transmission capacity to be rigorously evaluated against other alternatives to ensure the most efficient and prudent solution for meeting the needs of electricity customers is implemented. Under the National Electricity Rules (NER), the Regulatory Investment Test – Transmission (RIT-T) requires a robust, economically sound assessment of alternative options to objectively evaluate proposed transmission infrastructure investment against other credible network or non-network alternatives and other emerging technologies.

Transmission businesses support the current Council of Australian Governments Energy Council's 'Review of the Regulatory Investment Test for Transmission' considering opportunities to fine-tune current features of the test to ensure timely and efficient decisions which provide market outcomes and security benefits that customers value.

In addition to interconnection and capacity considerations, transmission network service providers (TNSPs) also need to consider the impacts of a changing and diverse mix of generation on overall system inertia, protection systems, frequency control, voltage control, transient and oscillatory limits, network constraints, network flows, and power quality.

A flexible and resilient grid that accommodates the closure of incumbent coal-fired power stations therefore must take into account numerous technical and operational factors. System inertia has historically come as an intrinsic feature of most generation systems that have spinning mass which remain 'synchronous' to system frequency. The reduction of system inertia - including that provided by coal-fired generation sources - is normally assessed by those developing constraint equations which are used to plan and operate the network. Given the complex nature of electricity systems, the full implications following the removal of thermal stations may not be known for up to five to ten years. Consequently, the closure of coal fired power stations, particularly when combined with an increase in variable renewable generation which has lower intrinsic or 'synthetic' inertia capability, requires appropriate planning and assessment in order to avoid preventable implications for the stability of the power system.

The decommissioning of coal fired power stations may also necessitate the installation of additional reactive support to ensure power system security, or other additional costs for TNSP's which may need to de-commission assets located within the power station premises.

Energy Networks Australia is confident that, with a carefully planned approach and the appropriate policy and regulatory context, the technical and operational issues associated with coal fired station closures and/or high penetrations of renewables can be managed. However, this requires an integrated assessment of system security issues as they may emerge in either local or national circumstances.

Incorporating planned and projected coal station closures

In order to ensure appropriate planning for transmission capacity, interconnection and technical considerations, Energy Networks Australia considers there may be a need for revised arrangements to increase the potential time for transmission networks to consider

the impacts of forthcoming incumbent power station closures. Earlier notification would allow network businesses to:

- carefully consider potential investment in zones that are likely to retire coal-fired generation assets in their respective regulatory proposals, to the benefit of consumers
- negotiate new or alternative network support arrangements after the closure of these stations, and
- better manage amendments and outcomes to existing commercial connection agreements.

Energy Networks Australia acknowledges the challenges faced by AEMO in identifying potential generation closures in a dynamic market environment, particularly with uncertain and poorly integrated State and National carbon policy settings. Under the current NER, the Australian Energy Market Operator (AEMO), must produce a Statement of Opportunities by 31 August each year. NER sub-clause 3.13.3 (q)(3) requires AEMO to include in its annual Statement of Opportunities, information relating to planned *plant* retirements for a ten year forecast period. If after the publication of the statement of opportunities, significant new information becomes available AEMO must, as soon as practicable, publish that information in a descriptive form[2].

AEMO's 2016 ESOO Methodology states that:

> "…*the time-sequential modelling takes **industry-announced** new entry and generation capacity withdrawals and **assessed future generation withdrawals** from the generation outlook model…".* (emphasis added)

In the 2016 ESOO, which was published just three months before the closure was announced by ENGIE and eight months before the closure is now scheduled, the closure of the 1,600 MW Hazelwood power station or other Victorian generation units was not forecast over the ten year period to 2024-25[3]. The ESOO did evaluate a scenario, whereby to meet COP21, up to 800 MW of coal-fired generation is withdrawn in the region by 2024-25 in response to the COP21 commitment.

After the official announcement of the closure, AEMO noted that the five-month notification period:

> "*…is a key opportunity for NEM participants to respond to the announcement by adjusting their gas and electricity portfolios. The notice period is also valuable from an investment perspective as it provides an opportunity for supply side options to emerge".*

As noted in this submission, Energy Networks Australia considers the implications for system stability are too significant to rely on current frameworks which can result in short-term timeframes of notification, particularly where the unit size is significant and where future synchronous generation closures could increasingly approach 'tipping points' for system

[2] National Electricity Rules, Clause 3.13.3 (r)(3).
[3] AEMO, *Electricity Statement of Opportunities*, August 2016.

stability[4]. Given the likelihood of further closures of coal fired generation units in the NEM, a new mechanism is needed to assist TNSP's better manage the complexities of responding to changes in the generation mix, well in advance of the closure of the plant.

The COAG Energy Council recently restated its commitment to improve the integration of carbon and energy policy. At its latest meeting of 7 October 2016, the Council agreed that *"AEMO will provide it a 6 monthly update on the implications on security and reliability of current and proposed investment in the national electricity market".*

Energy Networks Australia recommends that the COAG Energy Council initiative be complemented by a detailed assessment of the impact of future synchronous generation closures (including coal-fired generation). It would be important for such an assessment to be informed by appropriate involvement of relevant network service providers, in addition to AEMO.

A better assessment of the impact of future coal plant closures would also be assisted by:

- Clear and enduring, nationally integrated, carbon policy frameworks which inform generation forecasting, network planning and better signaling of potential generator closures, and
- Improvements recommended by Energy Networks Australia to the current RIT-T, related to the evaluation of market and security benefits.

National carbon and energy policy frameworks

Energy Networks Australia have recently released analysis supporting the publication, *Enabling Australia's Cleaner Energy Transition*[5] which outlines seven steps to improved national carbon policy. This was supported by detailed economic analysis completed by Jacobs[6] which examined a variety of policy options to achieve Australia's current abatement target (i.e. emission reductions of 26 to 28% below 2005 levels by 2030) or an extended target of 45%[7]. The policy scenarios examined included:

- *Business as usual* – where the suite of current government policies continues, and major policy settings are adjusted to reach specific abatement targets
- *Technology neutral* – where the current suite of policies is adjusted to become technology neutral and elements of a 'baseline and credit' scheme, are introduced, and
- *Carbon price mechanism* – where all policies are removed and replaced by a carbon price on all emissions.

[4] AEMO, *Insights,* November 2016.
[5] Energy Networks Australia (2016), *Enabling Australia's Cleaner Energy Transition*, available from www.energynetworks.com.au
[6] Jacobs (2016), *Australia's Climate Policy Options – Modelling of Alternate Policy Scenarios*, available from www.energynetworks.com.au
[7] The outcomes of the 45% target scenario are reported, indicating similar results – i.e. lowest residential bill under a technology neutral approach.

The analysis demonstrated that the current 2030 target could be met in any of the three scenarios, with the main difference being the economic efficiency and outcome for customer bills. The lowest household bills in the technology neutral approach could be $216 per year lower on average over the period from 2020 to 2030, compared to the business as usual settings. Overall economic benefits from adopting either a technology neutral or a carbon price mechanism policy setting were between $0.9 and $1.5 billion over the decade.

Significantly, the technology neutral and carbon price scenarios – which did not have an expanded renewable energy target - saw significant increases in the level of renewable generation based on its economic merit in achieving carbon abatement. The 2020 Large-scale Renewable Energy Target was reached in all scenarios and the level of renewable generation continued to grow in each scenario out to 2030, as shown in Figure 1.

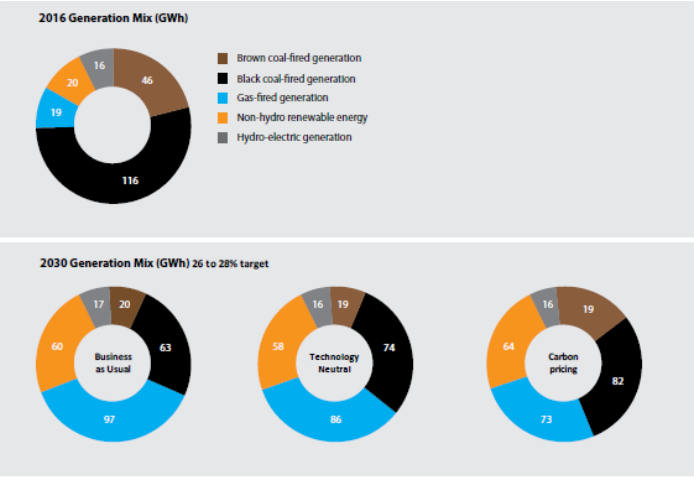
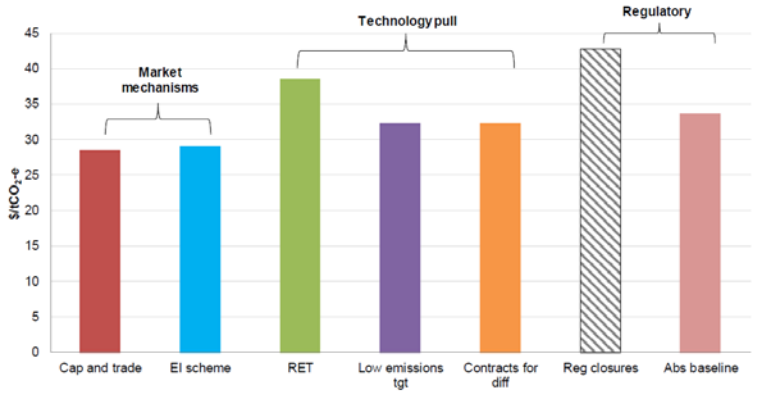


Figure 1: Impact of policy mechanism on NEM generation mix in 2030.

These analyses indicate that the introduction of an additional renewable energy target does not increase the efficiency or effectiveness of the growth in renewables. There is material evidence that a technology specific renewable energy target or regulatory closures would perform more poorly than technology neutral "indirect measures". The Climate Change Authority[8] also found that technology pull mechanisms, such as a renewable energy target and/or contracts for difference are a more costly approach to carbon abatement compared to market mechanisms such as a cap and trade or emissions intensity schemes (see Figure 2).

[8] Climate Change Authority (2016), *Policy options for Australia's electricity sector – special review research report,* p.10



Note: See Table 3 in Chapter 3 for a summary of the policies. 'EI scheme' = emissions intensity scheme; 'RET' = Renewable energy target; 'Low emissions tgt '= Low emissions target; 'Contracts for diff' = contracts for difference; 'Reg closures' = regulated closures, 'Abs baseline' = absolute baselines. Average direct cost of abatement over 2020–2050 using a seven per cent discount rate for resource costs. Direct costs are the additional costs arising from the policy in the electricity sector. Emissions not discounted. Figures account for the reduction in welfare from a fall in electricity demand compared to the reference case resulting from increased retail electricity prices. The regulated closures policy breaches the common cumulative emissions budget by about 200 Mt CO_2-e or 15 per cent, so the cost of abatement here is not directly comparable with other policies. See Appendix C.1. All dollar figures in this report are in 2014 Australian dollars unless otherwise specified.
Source: Climate Change Authority based on Jacobs 2016c.

Figure 2: Average cost of abatement by policy settings (2 degrees, 2020 to 2050) (CCA, 2016).

Energy Networks Australia strongly supports Australia's early transition to a cleaner energy system, achieving both current and future Australian abatement targets. It supports an enduring, stable and nationally integrated carbon policy framework based on consensus that uses lowest cost market mechanisms.

We trust this assists the inquiry.

Should you have any additional queries, please feel free to contact Norman Jip, Energy Network Australia's Senior Program Manager – Transmission on (02) 6272 1521 or njip@energynetworks.com.au.

Yours sincerely,

John Bradley
Chief Executive Officer