



**Submission to the Senate Standing
Committees on Environment and
Communications
Parliament of Australia**

**Inquiry into the retirement of coal
fired power stations**

Submission from: Andrew Stock, Climate Councillor, Climate Council of Australia

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About the Climate Council

The Climate Council is an independent non-profit organisation funded by donations by the public. Our mission is to provide authoritative, expert advice to the Australian public on climate change.

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About Andrew Stock, Climate Councillor

Andrew Stock is a Climate Councillor and energy expert with over 40 years experience in executive roles in energy businesses, spanning traditional energy suppliers, emerging energy technologies and renewables.

Andrew is a present and past Director of numerous energy companies, a Board Member of the Clean Energy Finance Corporation, and Chair of resources and energy Institute Advisory Boards at the University of Adelaide and University of Melbourne. He was the founding National President of the Australian Business Council for Sustainable Energy (now Clean Energy Council) and has served on various energy advisory committees.

He has an honours degree in Chemical Engineering from the University of Adelaide, and is a Fellow of the Institution of Engineers Australia, and a Graduate Member of the Australian Institute of Company Directors.

Summary of recommendations

Modelling for the Climate Change Authority shows for Australia to play its role in meeting the 2°C target required by the Paris Agreement requires the closure of two-thirds of Australia's coal power plants and an increase in renewable power (to 50 – 70% of electricity supply) by 2030.

Australia's coal plants are old, obsolete and polluting, and mainly owned by the private sector. These coal plants have been bought and sold well after climate science had unequivocally proven the clear link between increasing atmospheric carbon dioxide concentrations and rising temperatures, and thus after the need for rapid and deep abatement had been established.

Recommendation 1:

- Coal power plant owners should bear direct plant closure costs including redundancies, removal of power plant, remediation of site and associated coalmine, and recontracting with third parties to cover retail hedge exposures.
- Governments and regulators should ensure that plant owners provide financial security sufficient to cover realistic estimates of these closure costs, and ensure new owners do likewise where plant assets or company shares are sold or transferred.
- Governments should not subsidise the costs of keeping coal stations running.

Recommendation 2:

- The Finkel Review of the National Electricity Market (NEM) must ensure the NEM is structured to manage electricity sector transition and decarbonisation.
- The National Electricity Objectives should include emissions abatement as a fourth aim.

Recommendation 3:

- Scarce government funds should be deployed directly to retraining, relocation and re-employment of displaced workers, and other forms of support and investment relevant for impacted communities.

Recommendation 4:

- A national policy is needed to ensure government support for rural and regional communities impacted by coal power closures is applied in a consistent and equitable manner.

Recommendation 5:

- Retaining and increasing the existing Large Scale Renewable Energy Target beyond 2020 will remove the previous “stop-start-stop” policy approach uncertainty, allowing more effective assured workforce resourcing, and lower industry cost outcomes through productivity improvements.

Australia's Emission Reduction Challenge

Australia has proposed entering into an international commitment (Intended Nationally Determined Contribution – INDC) to reduce its emissions 26% to 28% below 2005 levels by 2030 under the Paris Agreement, subject to future five yearly reviews. These reviews are likely to see further reductions required in the period to 2030 and beyond to stay under the 2°C guardrail.

The 26% to 28% reduction commitment is measured in Government literature against 2005 emissions inclusive of Land Use, Land Use Change and Forestry (LULUCF). By this measure, by 2030, Australia's emissions will need to be 97 million tonnes per year (Mtpa) lower than 2015 levels, as 2005 LULUCF emissions were 87 million tonnes, whereas in 2015, they were 9 million tonnes, a 90% reduction (*Australia's 2030 Emissions Reduction Target, Commonwealth of Australia, 2015*; Table 1). This means that the rest of the economy may need to carry a lower burden than otherwise would be the case. If the benefit of LULUCF were excluded from the 2005 and 2015 emissions levels, reductions of 151 Mtpa would be needed against 2015 levels by 2030, a 55% increase in the abatement task.

Compared to other developed economies, Australia's 2030 commitment (measured relative to a 1990 base line, as is the case in the EU for example) is a far less demanding challenge. If Australia had adopted a 2030 target as ambitious as the EU target of 40% below 1990 levels, Australia's 2030 abatement target would nearly triple (Table 1). After "Brexit", the UK's legal commitment to reduce its emissions is 57% below 1990 levels by 2030, and at least 80% by 2050.

Table 1 - Australia's Emissions Reduction Challenge
(Millions of Tonnes)

Sector	1990 Emissions	2005 Emissions	2015 Emissions	Australian 2030 Commitment (28% less than 2005)	Emissions reduction required below 2015 levels by 2030	Equivalent EU 2030 Commitment (40% less than 1990)	2030 Reduction below 2015 levels (EU Equiv.)
Total Australia (incl. land use)	565	612	538	441	97		
Total Australia (excl. land use)	420	525	529	378	151	252	277
Electricity Generation	130	195	188	140	48	78	110
Direct Combustion	66	80	95	58	37	40	55
Fugitives	36	37	40	27	13	22	18
Transport	61	82	93	59	34	37	56
Agriculture	88	90	68	65	3	53	15
Industrial Processes	26	32	34	23	11	16	18

Decarbonising Electricity Generation – A 100 MTpa Challenge by 2030

Australia's electricity generation sector, dominated by coal and gas fired generation, is the largest greenhouse gas contributor. Direct combustion of fossil fuels is the second largest.

The electricity sector's proportionate share of Australia's current 2030 reduction commitment is 48 (MTpa) (approximately half the total). Power generation emissions are large concentrated point sources. Alternative commercial technologies exist to generate power with no or low emissions. Reducing direct combustion emissions in process industries (like the rapidly expanding LNG sector), transport sector emissions (particularly in aviation), and fugitives from fossil fuel extraction (including coal mining and coal seam gas) are far more difficult. Thus, it is likely that Australia's electricity sector will carry a larger and earlier emissions reduction burden, perhaps adding 50% to its proportionate share, bringing it to around 70MTpa.

Furthermore, as current aggregate country INDC commitments fall 25% to 30% short of the emissions reductions needed globally by 2030 to remain on the path to achieve the 2°C, further reductions in all sector emissions are likely to be required (*The Emissions Gap Report, A UNEP Synthesis Report, UNEP, 2016*). This may add a further 50% to the electricity emissions reduction challenge, bringing total Australian electricity sector emissions reductions to around 100 MTpa by 2030.

Summary of 2030 emissions reduction task for electricity sector:

Proportionate share Australia's commitment	- 48 MTpa
Scenario where electricity carries a greater share	- 70MTpa
Likely emissions reductions required to meet Paris Agreement	- 100MTpa

Current Federal Renewables Target Achieves Less Than Half the Sector Emissions Reduction Needed

The current 2020 large-scale renewables target of 33,000 GWh, given average current grid emissions intensity of around 0.95 tonnes per MWh, is only likely to reduce electricity sector emissions by around 30 million tonnes per year through fossil fuel displacement, leaving an abatement gap of 20 to 70 million tonnes per year.

Without additional renewable energy, proposals for the power generation sector, such as a declining emissions intensity target, or a price on carbon, are unlikely to drive sufficient fuel switching from coal to gas, to achieve the level of abatement required by 2030, let alone by 2050 when virtually all power generation needs to be zero emission.

For example, modelling by Jacobs for the Climate Change Authority has shown that to achieve the 2°C guardrail, around two-thirds of coal generation would need to close by 2030, and virtually all of it by 2050 (*Modelling Illustrative Electricity Sector Emissions Reduction Policies, Jacobs, Climate Change Authority Final Report, 2016*).

In the absence of a substantially higher renewables build beyond 2020, almost all of the current coal power plant fleet would need to be closed and replaced with new combined cycle gas plant to achieve the 2030 emissions reduction required of the electricity sector. This is a task arguably more challenging than achieving 50% renewables by 2030. The availability and affordability of the amount of gas that would be required is problematic, given:

- The inability of some Gladstone LNG projects to economically develop sufficient Coal Seam Gas (CSG) reserves at current LNG export netback prices to run at capacity (for example, see: *Santos takes \$US1.5b write-down on Value of GLNG project, Macdonald-Smith, Financial Review, 15 August 2016*), and
- Relatively high domestic gas prices (even though oil prices, to which LNG export prices are linked, are close to decade lows) making gas power production costs more expensive than renewables, and much higher than current prices.

More stringent emission reduction targets beyond 2030 would either strand these new gas assets, or their construction would lock in substantial future emissions well beyond 2030, a period when further deep abatement is needed.

A more logical approach would be to expand the current federal Large Scale Renewable Target to provide an investment and emissions reduction pathway beyond the current end date of 2020. Various states have proposed 2030 renewable targets in the range of 40 to 50%. This level of renewables by 2030 is directionally in line with the modelling done by Jacobs for the Climate Change Authority. That modelling shows 50% to 70% renewables must be deployed by 2030 to achieve abatement consistent with staying under the 2°C guardrail by 2050. It would be far preferable for industry investment certainty for that policy to be a federal one at a level consistent with state targets.

The more widely distributed nature of a larger renewable deployment, coupled with deployment of wind and solar technologies, will provide greater stability of overall generation volume. Remaining variability of renewables could be complemented by using existing gas pipeline and power plant infrastructure to provide peaking services, and enhanced rollout of grid and network scale battery storage (and potentially pumped hydro) to time-shift both demand and supply.

There are currently no specific federal programs beyond 2020 to achieve further deep and lasting emission reductions in the electricity sector. Furthermore, there is no current political or policy consensus on what programs are required for the electricity sector to achieve the deep abatement essential if the nation is to meet its 2030 target. Any such programs proposed must be supported by rigorous analysis to ensure required abatement will be delivered.

Australia's Coal Power Plant Fleet - Old, Obsolete and Polluting

Australia's coal fired power generation fleet is relatively old by international standards. By 2030, 65% of all coal fired power stations will be over 40 years old with 40% over 50 years old. Because of their age, 90% of Australia's coal power stations also use

obsolete subcritical technology. Age, obsolete technology and the high proportion of power generated by coal, explain why Australia's electricity is one of the dirtiest per MWh in the OECD.

Decisions to close coal power stations may have long gestation periods but will crystallise quickly once owners believe commercial circumstances are irretrievable. Most of Australia's power generation fleet is now owned by the private sector. Companies have a primary obligation to their shareholders to run profitable operations. An old coal power station, faced with either continuing losses as a result of inefficient and uncompetitive operations (for example, see *Flinders Operation Announcement 11, Alinta Energy, Jun 2015*), requiring major maintenance or modernisation expenditure (given the age of most coal plant), (for example, see *Hazelwood Power Station to Close at End of March 2017, Engie, 3 Nov 2016, Financial Review, 3 Nov 2016*) or losing its social licence to operate given excessive emissions, can rapidly become a major liability to a corporation.

It should come as no surprise that private owners will make decisions to close or sell, usually expeditiously, to stem monetary or reputational losses to the corporation, once they conclude the circumstances are unlikely to be irretrievable.

Direct Closure Costs Should be Borne by Station Owners.

The direct closure costs of each power station should appropriately be borne by the corporation rather than society in general. The direct closure costs for each large coal fired power station are likely to run to several hundred million dollars – redundancies, removal of power plant, remediation of site and associated coal mine, and recontracting with third parties to cover retail hedge exposures, are all major expenses. All domestic privately owned power stations have changed owners well after the science of climate change was soundly established and the need for deep emissions abatement has been well accepted. Current owners cannot realistically claim that these direct closure costs, brought about by age, inefficiency, technology obsolescence, and global response to climate change, are costs society should bear.

It is critically important that governments ensure current owners post strong financial security to fund all direct closure and rehabilitation costs. Given the likelihood that nearly all Australian coal power plants will close in the coming two decades¹, it is critically important that governments and regulators ensure that owners post adequate security and financial resources, backed by a strong corporate credit rated entity, cash or a cash backed bank guarantee, to fully cover realistic closure costs. Others have proposed other mechanisms to share these costs with other coal generators remaining in operation (for example, see *Brown Coal Exit: A Market Mechanism for Regulated Closure of Highly Emissions Intensive Power Stations, Jotzo & Mazouz, Crawford School of Public Policy, ANU, November 2015*), or in other ways. However, these mechanisms could expose all generators to the credit risk of every other owner. As it is likely that all coal plants will close in the coming two decades, the more important issue is that

¹Because the fleet is old and inefficient and forecasts show that in order to achieve the 2°C guardrail most of the coal power plants will have to close by 2030 (for example, see Jacobs 2016).

Governments act now to ensure each and every coal power plant owner posts realistic adequate security with government to cover all the direct closure and remediation costs of stations they own. This is currently not the case.

Power Station Sales to Undercapitalised Owners Should be Banned

A common strategy in the private sector is to sell a declining asset for a low price to another company in advance of closure, to lay off the closure costs. (This practice is pervasive in the mining, oil and gas, and chemicals/refining sectors). In the circumstances the coal power generation industry will face in the next two decades, it is also critical that governments ensure no transfer of asset or shares takes place for a coal power station unless the new owner posts equivalent adequate security to fully cover closure costs. If this is not done, society will inevitably be left to cover the expense. Some in government have extolled the benefits of selling an old state owned coal power station to an undercapitalised purchaser for a million dollars as it allowed the state to avoid the tens of millions in closure costs (for example, see *Gentrader Deal Cleaned Up: Vales Point and Cobbora, Media Release, NSW Treasurer, 19 November 2015*). In the absence of realistic cash backed guarantees covering future closure costs posted by the undercapitalised purchaser, the very risks the state was claiming it had laid off, may well come back to it in the future, if or when an undercapitalised new owner walks away, puts itself into administration or becomes bankrupt.

The National Electricity Market Does Not Control Corporate Build, Buy, Sell or Close Decisions

The current National Electricity Market (NEM) design and operation places no constraint on when a privately-owned power station will close, if circumstances in the sole view of its owner, make it non-viable. Similarly, there is no requirement in the NEM for an owner to invest in new plant, modernisation, emissions abatement, or even maintenance for reliability. These are all decisions corporates will make for their own particular reasons. Corporate circumstances will dictate investment or closure decisions.

Furthermore, the relatively high fixed costs of large coal power stations means that strategies such as progressive closure are unlikely to make commercial sense to a private owner (in the absence of state subsidies). As power volumes generated fall (eg through progressive closure of one and subsequent units in a multi-unit station), the same fixed cost burden must be carried by lower throughput, making the rest of the operations even less profitable, and accelerating closure, or increasing the size of the subsidy required to keep operating. Faced with these circumstances, it is likely that a private owner will prefer to close the whole station at the same time.

Furthermore, the NEM design was predicated on rising demand for power bringing forward new fossil fuelled capacity additions, with no emissions constraints. Today the industry is faced with the opposite – flat to falling demand, severe requirements for emissions reductions, an old obsolete fossil fuelled plant fleet, as well as technological disruption from new distributed zero emission generation and storage technologies.

Australia is not unique in this regard, with many western developed economies facing the same challenges. It is no surprise that many experienced industry players see the current NEM construct as ineffective and poorly serving the challenges of sectoral transition and disruption faced by the power industry. While other jurisdictions overseas may operate dispatch via a NEM-like market, they have other regulatory structures in place to manage the power industry transition, both plant closures and new technology rollouts, such as renewables and storage, in order that both are less disruptive and more ordered. The Australian NEM has no such regulatory arrangements. The Finkel Review must ensure that the NEM construct is fit for purpose for the demands of the major electricity sector transition and decarbonisation facing the nation in the next two to three decades.

Subsidising Existing Operations is Not a Wise Choice

Some may argue that governments could subsidise the fixed costs of keeping coal stations running longer as this would allow societal adjustment to take place over a longer timeframe, and possibly mitigate price shocks in the wholesale and retail power markets. This is potentially a very slippery slope. What costs would be underwritten, for how long, and what of closure costs? As outlined earlier, the cost burden of supporting the fixed costs of a multi-unit coal power plant increase markedly as progressively more units close. The case for continued state subsidised part operation would need to be compelling to offset these risks. It would also not be surprising in these circumstances to see intense lobbying by the other remaining power generators, claiming government interference in the “free market”, as inevitably a more complete station closure would likely benefit the remaining generators through higher prices and market share (for a period at least). Other generator requests of government for subsidy or claims of damages would likely follow. Scarce governments funds should be deployed in a planned way to support coal power workforces transition to new jobs in the growing power industry sectors, as this will lead to sustainable outcomes.

Transitions for Communities and Workers Impacted by Closures

Most Australian coal power plants are in rural or regional areas where there is little other major industry or a widely diversified economy. The power stations were built close to coal deposits, and transmission lines carried the power generated onward to demand in distant major cities. Often local rural towns have developed around the power station or mine. When the station closes, there is little alternative employment and potential social dislocation and disruption is substantial, and may become very long lasting. These social costs are likely to be borne by society more widely, either in a progressive way through re-training, relocation or diversified employment programs, or through costs of supporting the unemployed and socially disadvantaged.

Scarce government funds should be deployed to retraining, relocation and re-employment of displaced workers who were not of an age to retire, rather than subsidise the owners of an industry that is in structural decline. Encouraging station owners to cooperatively manage workforces such that displaced workers of younger age take jobs in remaining operating plants, while some of the retirement age workers in those plants retire, could mitigate the disruptive impacts on younger and middle aged

workers, as well as rural communities. Overseas examples of transitional programs for employees and communities impacted by power plant closures are numerous (for example, see *Supporting Coal Power Plant Workers Through Plant Closures, Power Magazine, 1 June 2016*).

A national policy is needed to support rural and regional communities impacted by coal power closures in a manner that has greater consistency and equity. Over the coming decade, many coal power stations will close. While timing of individual closures will remain uncertain under the current NEM, closures will happen at some point. It is important that a federal program is developed to provide a framework and structure for a consistent level of support to impacted communities (for example, see: *The Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative, The White House, USA, March 27, 2015*). Such programs have been proposed for other Australian industry sectors in transition (for example, see *Australia's Automotive Manufacturing Industry, Productivity Commission, 31 March 2014 – Section 7*).

As there is no current national framework or plan, communities impacted by the two most recent closure announcements - Pt Augusta, SA following the Northern closure, and La Trobe Valley, following the Hazelwood closure - have received vastly different levels of state and federal support. \$1million of State support in Pt Augusta's case, and \$85 million of State and Federal Support in the La Trobe Valley (Contrast: Northern - Federal Government – nil announced, *Support for Communities Affected by Alinta Closures, SA Dept of State Development, 11 Jun 2015* - \$1million, with Hazelwood - Government to Support Hazelwood Workers, Federal Government, 3 Nov 2016 - \$43million, and Labour Government to Support Hazelwood Workers, Victorian Premier, 3 Nov 2016 - \$42 million).

The transition underway in the power generation and use sectors is creating vastly more jobs than those lost (for example, see *Renewable Energy Jobs: Future Growth in Australia, Climate Council, 2016*). There will be tens of thousands of new skilled jobs in construction of renewable assets, skilled trades will be needed to rollout the new electricity system infrastructure, whether it be generation, transmission, or network assets as well at household level. Retaining and expanding the existing Large Scale Renewable Energy Target beyond 2020 will remove the previous “stop-start-stop” policy approach uncertainty, allowing more effective and assured workforce transitional planning and resourcing. State and Federal retraining programs for workers potentially impacted by coal plant closures will assist in reducing unemployment and ensure skilled electrical workers can be re-deployed into rapidly growing sectors like renewables, smart grids, and storage, with career opportunities using many of their existing skills. In addition, station removal and mine site remediation will require large work forces for several years, potentially a decade or longer, providing stable income for those less able to re-train or relocate.

There is also an opportunity to strategically review current major transmission assets that risk being stranded by station closures, and consider how best renewable and related power generation assets (eg pumped hydro, synchronous condensers etc) might be located to maximise existing transmission usage in a grid that will inevitably have far more variable zero emission and near zero short run cost generation assets. The ability

to use large scale existing transmission assets may mean wind resources less than the best available in a state may be better utilised to ensure future use is made of existing transmission investments which would otherwise be stranded.