

Senate Environment and Communications References Committee Inquiry into retirement of coal fired power stations

Environment Victoria submission

Executive Summary

Australia is extremely vulnerable to the impacts of climate change. At current levels of warming, we are already experiencing impacts which have massive implications for our economy, infrastructure, food and water security, health and natural environment.

There is very little room for further emissions of greenhouse gases if global temperatures are to be kept below the 1.5°C limit agreed to in Paris last year. Australia's share of this carbon budget, even by a generous measure, equals less than four years of emissions at business-as-usual rates.

While decarbonisation is required across all sectors of Australia's economy, our earliest and largest opportunity to reduce climate pollution is through a managed phase out of Australia's fleet of coal-burning power stations.

The rest of the world is already moving away from coal and towards renewable energy. Last week's announcement by French corporation ENGIE that it will close its Hazelwood power station in line with its corporate strategy to "end its coal activities" is symptomatic of this change. Canada, the US and the UK are all taking steps to drive the closure of coal-fired power stations.

While change is inevitable for Australia's coal-burning electricity sector, how that change is managed is not. A window of opportunity exists to put in place plans to ensure that the costs and benefits of the transition to a cleaner economy are shared fairly while achieving urgent cuts to climate pollution.

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

- Deliver better emission reduction outcomes;
- Encourage investment in new clean energy capacity and new jobs;
- Provide more certainty to communities near coal power stations; and
- Create a context in which it is seen as acceptable for governments to acknowledge that job losses are coming, and to commit significant resources to mitigate the consequences of those job losses.

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.

Diverse industry stakeholders are articulating the need for an orderly phase-out, and many community leaders are already facing the challenge of transition and leading discussions in their communities.

A just transition process needs to encompass both an orderly transition *away* from coal, as well as a collaborative and inclusive transition *towards* a sustainable economy. All levels of government, community and business sectors have a responsibility to contribute to this energy transition and the community transition that goes with it.

It needs to recognise that the challenge goes beyond supporting workers directly employed in the electricity sector, although that will be important. Affected communities will also need investment over a sustained period of time to create new business and employment opportunities to account for the region-wide downstream impacts of the loss of coal industry jobs.

A coherent national energy transition framework needs to 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 such as price rises, through investment in energy efficiency to manage affordability.

A suite of policy options to withdraw coal generators is available, including carbon pricing, lifetime limits, emissions intensity standards and retirement auctions. An effective combination needs to be implemented, which may require multiple measures involving both state and federal governments.

To date, federal and state governments have committed a combined sum of approximately \$300 million to the Latrobe Valley in the wake of the announcement that Hazelwood power station will close in March 2017. With around 20 coal power stations around the country that will need to retire in coming years, an initial estimate of funding required to support communities through the transition could be upwards of \$6 billion.

Funding of this magnitude, over the medium to long term timeframe required to achieve lasting change, will require more than one-off payments to support piecemeal projects. It will depend on the creation of an institutional framework that generates revenue which can be directed towards predictable and ongoing support for affected communities.

As well as managing the socio-economic impacts of transition on directly affected communities, it will be equally important to mitigate the impact of potential electricity price rises on the wider community, particularly low-income and disadvantaged households.

Investing in residential and commercial efficiency is an obvious response to rising prices and is an effective strategy for managing overall costs. Strengthening the ambition of the National Energy and Productivity Plan and investing in state and local efficiency programs targeting vulnerable households, would more than offset the impact of any price rises flowing from the energy transition.

1. The reality of the challenge we face

1.1 Impacts of global warming

Australia is extremely vulnerable to the impacts of climate change.

Already, at about 1 degree of warming we have witnessed a record-breaking mass coral bleaching event affecting more than 90 percent of the Great Barrier Reef. Thirty-five percent of corals in the northern and central sections of the Reef are now dead.¹

We're experiencing more code red bushfire danger days every summer, more intense flooding in some areas alongside dramatic declines in rainfall in others. Western Australia has already experienced a 15 percent reduction in rainfall since the 1970s with serious implications for urban water supplies and one of the country's most productive agricultural regions.² The Victorian government's recently released *Water for Victoria* reveals that streamflows in many of river systems have declined significantly over the last twenty years, and could reduce by 50 percent in the next 50 years. This could have devastating impacts on food production, aquatic ecosystems and the communities who depend on these river systems.³

Sea level rise of at least one metre worldwide is already locked in due to 'unstoppable' melting of parts of the Antarctic ice shelf and Arctic sea ice, and could be as much as 3-5 metres if the entire West Antarctic ice sheet is lost. A one metre rise in sea level would completely inundate some nations, destroy some of the world's richest river delta agricultural land, and displace millions of people triggering global social conflict and migration. Sea level rise will also have a major impact on Australia's major urban centres and infrastructure which is concentrated on the coast. More than \$226 billion in commercial, industrial, road and rail, and residential assets around Australian coasts are potentially exposed to flooding and erosion hazards at a sea level rise of 1.1 m.⁴

The Stockholm Environment Institute has analysed the implications of just 1.5-2.0 degrees warming for Australia.⁵ Given that Australia's land, water and biodiversity resources are already stressed, the identified impacts will be extremely costly and highly disruptive for Australia's natural resource-based industries (such as agriculture and tourism), as well as pose severe threats to the food and water security of our cities where the vast majority of Australia's population live.

We are facing more frequent and more intense rainfall and flooding events, which will carry ever-larger damage bills and impose enormous human and infrastructure costs. The CSIRO has estimated that the price tag, nationally, on replacing homes and buildings damaged by extreme weather events and sea level rise between now and 2100 could top \$1.3 trillion.⁶

The health and well-being impacts of extreme weather are likely to fall hardest on the poor and vulnerable – those already living with chronic health conditions, in poor quality housing and with limited financial resources to act as a buffer. This is on top of the air pollution-related health

¹ ARC Centre of Excellence for Coral Reef Studies, 30 May 2016, <https://www.coralcoe.org.au/media-releases/coral-death-toll-climbs-on-great-barrier-reef>

² Climate Commission, *The Critical Decade: Western Australia Climate Change Impacts*, 2011

³ State Government of Victoria, *Water for Victoria*, Department of Environment, Land, Water and Planning, 2016

⁴ Climate Council, *Counting the Costs: Climate Change and Coastal Flooding*, 2014
<http://www.climatecouncil.org.au/uploads/56812f1261b168e02032126342619dad.pdf>

⁵ Stockholm Environment Institute, *Implications for Australia of a 1.5 degree future*, SEI Working Paper 2016-09, 2016, <https://www.sei-international.org/publications?pid=3009>

⁶ <http://www.abc.net.au/news/2014-12-09/damage-bill-for-extreme-natural-disasters-could-top-1-trillion/5955734>

impacts already being experienced by communities near coal-burning power stations such as the Latrobe Valley – already one of the most disadvantaged communities in Victoria.⁷

1.2 Australia’s carbon budget

In Paris last year, the international community agreed to limit climate risks by keeping global warming below 2°C, and preferably closer to 1.5°C above pre-industrial levels.⁸

According to the Stockholm Environment Institute analysis, there is very little room for further emissions of greenhouse gases if global temperatures are to be kept “well below 2°C” – much less below the less dangerous 1.5°C. This analysis notes that these are generous estimates of the available budgets, and argues that a reasonable likelihood of limiting warming to below 1.5°C implies a global carbon budget of less than (and perhaps significantly less than) 250 billion tonnes of carbon dioxide equivalent (Gt CO₂) from the start of 2015. Australia’s share of this budget equals less than four years of its current emissions.⁹

Climate outcome	Global budget	Australian budget	Years to exhaust Australian budget at current rates
1.5 deg, 66% change	250	1.75	3.4
1.5 deg, 50% chance	400	2.8	5.4
2 deg, 66% chance	850	5.95	11.4
2 deg, 50% chance	1150	8.05	15.4

Table 1. Global and Australian carbon budgets¹⁰

With the severe consequences of global warming and the time remaining, there is an urgent need to cut global emissions. As a highly developed and wealthy nation with very high emissions per capita, Australia needs to be part of the response to this situation. As noted by the questions put to Australia in the lead up to the Marrakesh Conference of the Parties, other countries are increasingly focusing on the extent to which Australia is taking its responsibility seriously.¹¹

1.3 Australia’s sources of emissions

The largest single source of greenhouse gas emissions in Australia is coal-burning power stations. Figure 1 below shows the coal-burning power stations in the National Electricity Market. It shows that a number of closures have occurred already, mostly of older generators but without a clear sequence or predictable pattern.

⁷ Jordan Ward & Mick Power, *Cleaning up Victoria’s power sector: The full social cost of Hazelwood power station*, 2015, <http://environmentvictoria.org.au/newsroom/report/cleaning-victoria%E2%80%99s-power-sector>

⁸ UNFCCC, *Adoption of the Paris Agreement*. FCCC/CP/2015/L.9/Rev.1., 2015 <https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>.

⁹ Stockholm Environment Institute, 2016

¹⁰ Global budget taken from Stockholm Environment Institute, 2016. Australia given a 0.7% share of global budget, balancing our share of global population and the size of our economy, as recommended by TCI, *Beyond the Limits*, 2016

¹¹ <http://www.smh.com.au/federal-politics/political-news/australia-facing-questions-at-un-over-post2020-climate-change-stance-20161011-gs0avq.html>

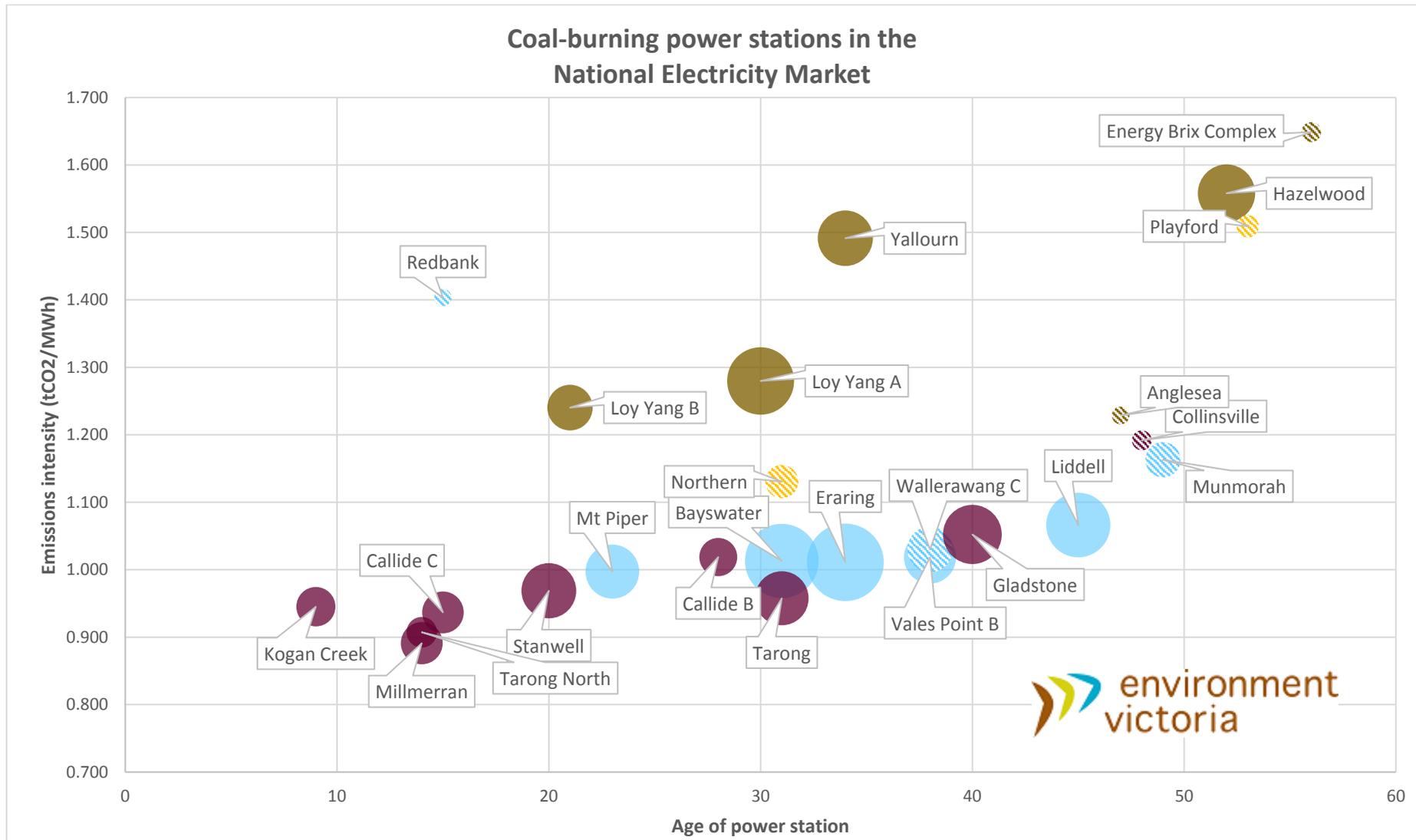


Figure 1. Coal-burning power stations in the NEM. The size of each circle represents the capacity of each generator. Victorian generators = brown circles; NSW = blue circles; QLD = maroon circles; SA = gold circles. Power stations that have closed in the past two years are represented by the diagonal lines through the circles.

While decarbonisation is required across all sectors of Australia's economy, our earliest and largest opportunity to reduce climate pollution is through a managed phase out of Australia's fleet of coal-burning power stations.

2. What's happening in the energy market?

Australia's energy system is undergoing a transformation, though it is not occurring at the pace necessary to properly address the challenge of global warming.

Until recently, rising electricity demand has been making the task of replacing coal-fired electricity with renewable energy more difficult. However, since the early 2010s the National Electricity Market has had significantly more capacity than will be needed for some years.¹² This excess electricity generation capacity in the NEM has created an opportunity to remove existing coal-fired generation with no short-term risk to the security of supply.

Over the past few years, a number of coal-burning power stations have closed, although none of the closures so far can be attributed to climate policies. All have been commercial decisions by corporate owners, likely based on a combination of factors such as the age of the plant, looming maintenance costs, the capacity factor at which the plant is operating, and corporate strategy including managing reputation. As coal power stations age, there will continue to be closures.

Investment in renewable energy has slowed, partly because of the excess coal generation that remains in the National Electricity Market. Even with the support of the Renewable Energy Target, renewable energy projects seeking finance are finding it difficult to compete with fully depreciated incumbent generators.

Without intervention to manage an orderly process, power station closures could occur in any location at any time. This presents two major problems:

1. The location of the next closure is likely to be unknown until very shortly before an official announcement. The consequence of this is that communities and governments are less likely to have been adequately preparing for the consequences of power station closure. As a case in point, there has long been speculation that Hazelwood would close. But at the time that the announcement made it official, there was no clear transition plan in place. Only after the announcement did the state and federal governments make significant and specific announcements about what would happen. This reduces the time available to diversify the regional economy.
2. The highest emissions generators are all in Victoria. These are also the generators with the lowest short-run marginal cost (see Figure 1 below). As a consequence, Victoria's brown coal generators tend to run at high capacity factor, compared to the more expensive black coal power stations in NSW and Queensland, many of which are only operating at 50-60%. If higher cost generators are producing less, they are likely to be less profitable, and therefore more likely to close. Black coal generators in NSW and Queensland are roughly 30-40% less polluting than Victoria's brown coal generators. The closure of a black coal generator could lead to an *increase* in output at Victorian generators, potentially *increasing* carbon emissions

¹² AEMO, "2014 Electricity Statement of Opportunities", 2014. <http://www.aemo.com.au/Electricity/Planning/Archive-of-previous-Planningreports/2014-Electricity-Statement-of-Opportunities>

despite the closure of a power station. A recent paper by the Institute for Energy Economics and Financial Analysis, concludes that government intervention is necessary to avoid these “sub-optimal emissions outcomes”.¹³

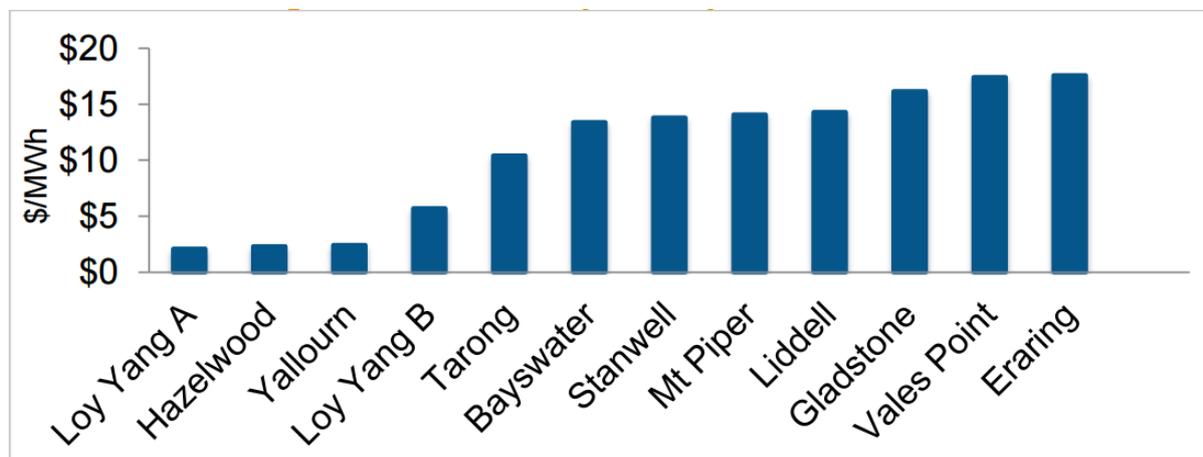


Figure 1. Total Short Run Marginal Costs, \$/MWh (2014/15)¹⁴

Further, a series of “barriers to exit” have been identified.¹⁵ These barriers reflect the fact that coal power stations are sometimes staying operational even though, in other circumstances, they might have been retired earlier. Key barriers include:

- Climate policy uncertainty
- Remediation costs, including mine rehabilitation and power station demolition
- The “first mover disadvantage” – that the first major closure will lead to an increase in wholesale prices, but the generator that closes does not benefit from this increase while their competitors do.

3. Status quo is failing climate and communities

3.1 Domestic emission reduction targets are grossly inadequate

It is widely accepted that Australia’s current emission reduction targets fall far short of meeting our responsibilities under the Paris agreement - that is, taking action consistent with keeping warming below 2 degrees at most. The Climate Change Authority considers that the Coalition’s target of a 5 per cent reduction on 2000 levels by 2020 is not a credible contribution to the global goal of keeping warming below 2 degrees, and would leave an unrealistically large and rapid (and hence more

¹³ Institute for Energy Economics and Financial Analysis, *Sub-Critical Australia: Risk from imbalance in the Australian National Electricity Market*, 2016 <http://ieefa.org/australias-east-coast-electricity-grid-dependent-sub-critical-coal-need-reform/>

¹⁴ Taken from IEEFA 2015, http://ieefa.org/wp-content/uploads/2016/05/Sub-Critical-Australia-Risks-From-Market-Imbalance-in-the-Australian-National-Electricity_May-2016.pdf

¹⁵ Clean Energy Council, 2014, *Australia’s power generation sector at the crossroads*

socially and economically disruptive) emissions reduction task for post-2020.¹⁶ Furthermore, as noted above, even achieving the goal of keeping warming to 2 degrees poses extreme risks to the climate, our food and water security and human civilisation.

Other analyses have suggested that to meet more ambitious climate targets, all coal plants in Australia will need to be retired by 2030 or 2035.¹⁷ The Climate Institute emphasises that if a staged phase-out is not implemented now, many power stations will need to be removed almost simultaneously around 2030 — clearly a more disruptive outcome for both the energy market and for communities where those power stations are located. It is also not clear that even removing all coal by as late as 2030 keeps Australia’s emissions within the available budget for two degrees of warming.

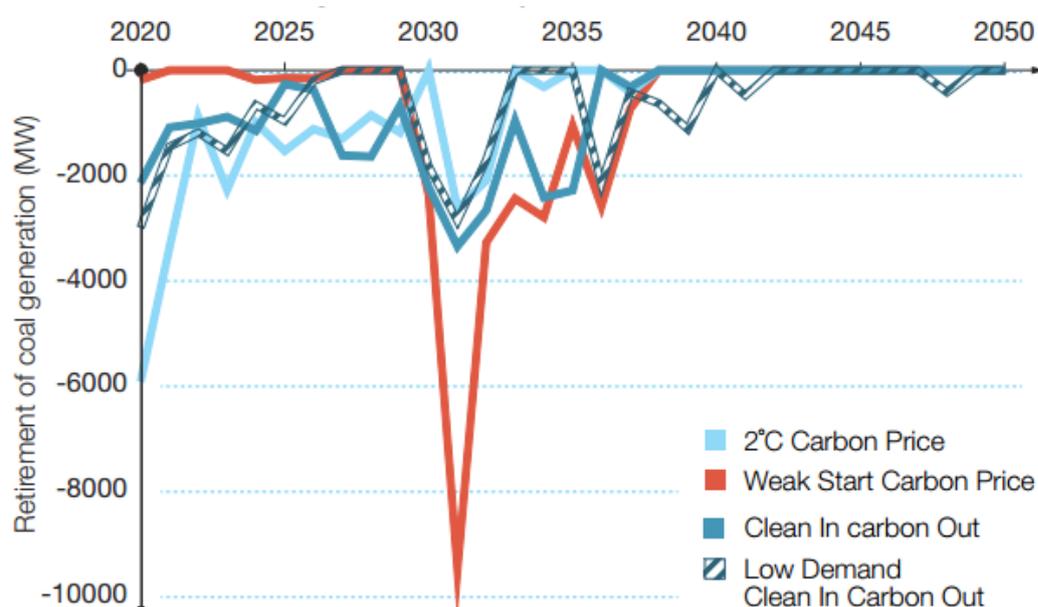


Figure 2. Annual retirement of coal generators by scenario¹⁸

3.2 Current policy cannot achieve even inadequate targets

The Australian Energy Market Operator, which controls the National Electricity Market (connecting Victoria, NSW, Queensland, Tasmania, South Australia and the ACT), has estimated that meeting the current federal climate targets, let alone more ambitious targets consistent with the threat, will require the closure of around 8700 MW of coal-burning power stations before 2030.¹⁹

¹⁶ <http://www.climatechangeauthority.gov.au/reviews/targets-and-progress-review/part-c/chapter-9-australia%E2%80%99s-2020-and-2030-goals>

¹⁷ The Climate Institute, *A Switch in Time: Enabling the electricity sector’s transition to net zero emissions*, 2016, <http://www.climateinstitute.org.au/a-switch-in-time.html>;

Teske, S., Dominish, E., Ison, N. and Maras, K., *100% Renewable Energy for Australia—Decarbonising Australia’s Energy Sector within one Generation*, 2016. Report prepared by ISF for GetUp! and Solar Citizens. <https://www.getup.org.au/campaigns/renewable-energy/homegrown-power-plan/the-homegrown-power-plan>

¹⁸ TCI, *A Switch in Time*, 2016

¹⁹ <https://www.aemo.com.au/media/Files/Other/consultations/nem/2016%20Consultation%20%20NTNDP.pdf>, 3.1.2

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 number of reputable analyses have suggested that the Federal government’s Direct Action Policy (DAP) and more specifically the Emissions Reduction Fund (ERF) will not be able to achieve the 5 percent cut to emissions that the Government has agreed to, let alone reductions consistent with Australia’s contribution to staying under a 2°C limit.²⁰ In fact, modelling by SKM MMA and Monash University’s Centre of Policy Studies found a likely increase in emissions by 8-10 percent by 2020.²¹ In a study by Reputex, emissions growth of 16 percent by 2020 was projected under DAP.²²

The “Safeguard Mechanism” of the ERF was intended to create a cap on total emissions, but the design of the mechanism means it provides no safeguard at all. Indeed, analysis by Environment Victoria found that emissions from the energy sector could theoretically increase by 120 million tonnes per year without breaching the safeguard mechanism. This included possible increases of 40-50 million tonnes from coal-burning power stations alone.²³

These predictions have been borne out, with emissions now again on the rise after beginning to decline under the previous Labor government’s carbon price policy.

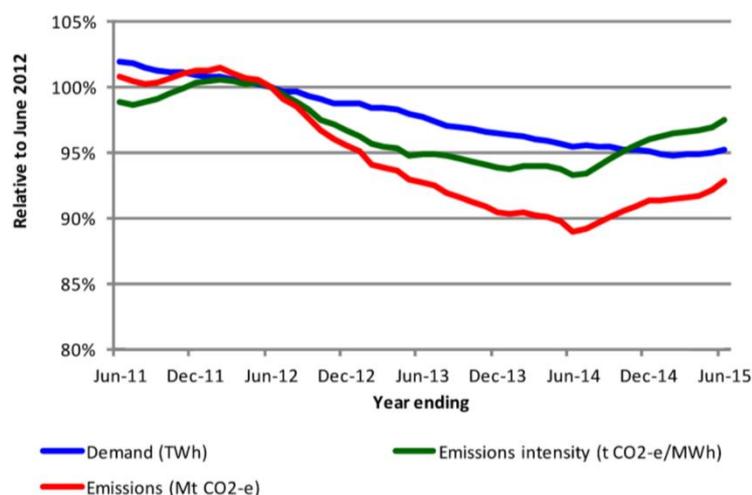


Figure 3. Increase in emissions from the National Electricity Market after repeal of the carbon price in June 2014.²⁴

In its “Blue Book” prepared for the incoming Coalition Government in 2013, Treasury said that “in the absence of a carbon price, the 5 per cent reduction target is unlikely to be met without significant budgetary or economic costs.”²⁵

²⁰ The Climate Institute, *How much can the Emission Reduction Fund Really Achieve?* Policy Briefer, November 2015

²¹ The Climate Institute, *Coalition Climate Policy and the National Climate Interest*, 2013

²² <http://www.reputex.com/publications/behind-the-numbers-adding-up-to-the-direct-action-plan/>

²³ <http://environmentvictoria.org.au/newsroom/report/submission-emissions-reduction-fund-safeguard-mechanism>

²⁴ <http://reneweconomy.com.au/one-year-on-from-the-carbon-price-australias-emissions-rebound-is-clear-65643/>

²⁵ <http://www.scribd.com/doc/38100930/Redacted-Blue-Book-Pt2> p24

To the end of 2015, almost half of the A\$2.55 billion allocated to the Emissions Reduction Fund has been used and some 92.8 million tonnes of emissions reduction “bought” at an average rate of almost A\$13.12 per tonne of CO₂. It has been estimated that the ERF would need well over A\$3 billion to buy all the emissions needed to meet its (inadequate) 2020 target.²⁶

Ultimately, the Emissions Reduction Fund (ERF) exerts no pressure on coal generators, and therefore plays no role in modernising our electricity supply. This is a significant problem when burning coal is the largest single source of emissions in the country, as shown in Figure 4 below.

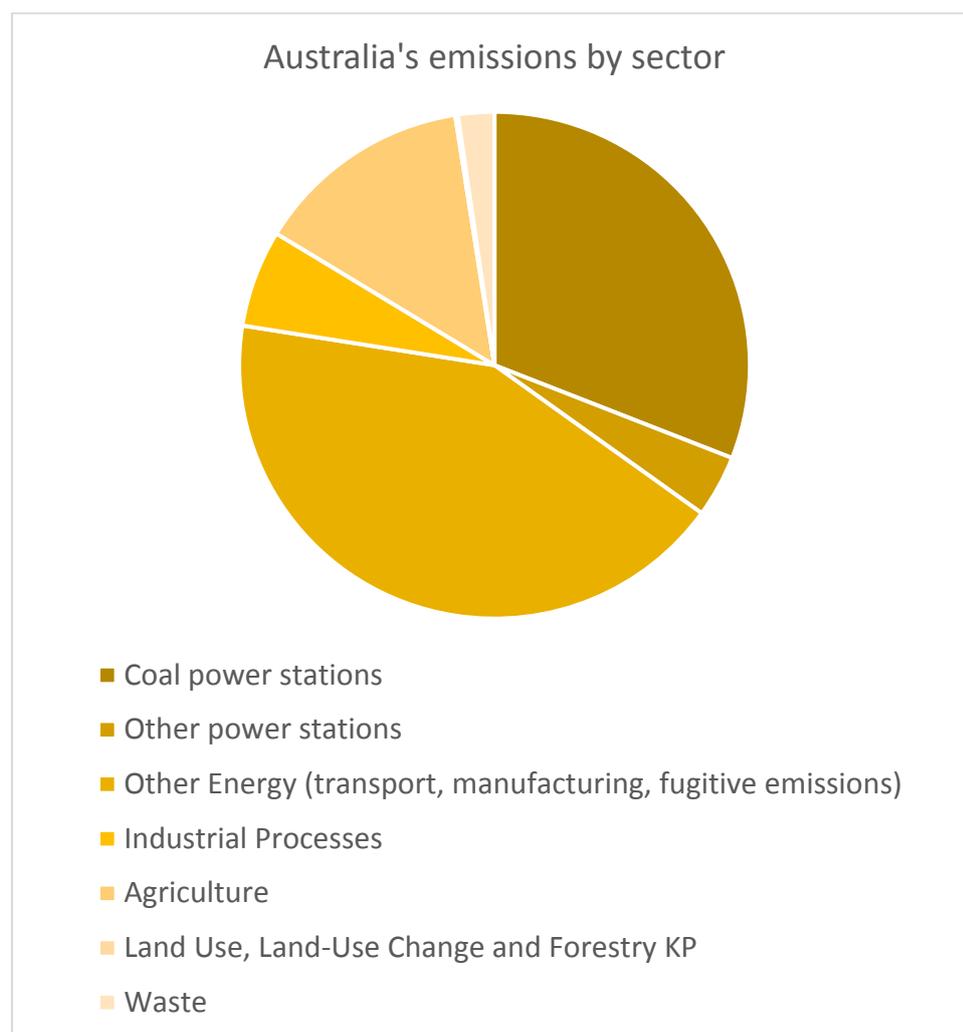


Figure 4. Australia's emissions by sector

²⁶ Christoff, P. 'Australia's climate targets still out of reach after second emissions auction', *The Conversation*, 13 November 2015, <https://theconversation.com/australias-climate-targets-still-out-of-reach-after-second-emissions-auction-50519>

3.3 *Lack of transition planning is failing communities*

Australia's coal-mining and coal-fired electricity generation sector is geographically concentrated in a few regional areas such as Victoria's Latrobe Valley, Western Australia's Collie and NSW's Hunter Valley, and until recently Port Augusta in South Australia.

The Latrobe Valley community and regional economy are still feeling the impacts of the poorly managed electricity sector privatisation in the 1990s, through high rates of long-term unemployment, low incomes and high rates of other indicators of social disadvantage.²⁷

The inevitable decline of the coal industry will be disruptive for these communities, in the same way that the decline of car manufacturing has hurt a number of areas, and perhaps in a similar way to how sustained drought affects (and will continue affecting) farming regions.

Alinta Energy's Port Augusta power station in South Australia's north, which is the city's largest employer, closed in 2016 with less than a year's notice, with the loss of 185 jobs. This followed closure of the company's Leigh Creek mine in 2015 with the loss of 250 jobs.²⁸ In Victoria, French energy giant ENGIE has just announced that Hazelwood power station - Australia's oldest and dirtiest - will close in March 2017. ENGIE has stated that this decision, as well as its decision to sell Loy Yang B coal power station, is in line with its own corporate "strategy to gradually end its coal activities and ... [concentrate] solely on low-carbon projects for power generation, renewable energy and natural gas".²⁹

While change is inevitable for Australia's coal-fired electricity sector, how that change is managed is not. Leaving the fate of ageing coal power stations in the hands of (often foreign) corporate owners denies communities any certainty and makes it harder for governments to be explicit about starting transition support early in the process—precisely when it is needed.

Governments should be able to acknowledge that industries are changing and that jobs in certain sectors will be lost. It is possible that governments may be averse to opening this conversation, but ultimately that helps nobody. The response to this should be to prepare for this eventuality, not to try to hold back change (which would involve locking in more climate pollution) or to put our collective heads in the sand and ignore the problem.

As experience from Australia and around the world has shown, when industrial change does come it may come very quickly, and the consequences for not being ready can be severe. In Wales, UK, where little to no transition planning occurred prior to the closure of the region's coal mines in the 1980s, the economic and social consequences have been profound and long-lasting. In contrast, in Rochester, New York, where transition planning started two decades before the city's main employer – Kodak – collapsed, the situation is more positive.³⁰

While there is justifiable concern in coal-dependent communities about the loss of jobs and downstream regional economic impacts, many community leaders are already facing up to the

²⁷ Birrell, B, 2001. *The Latrobe Valley, Victim of Industrial Restructuring*, Centre for Population and Urban Research, Monash University

²⁸ <http://www.abc.net.au/news/2016-05-09/port-augusta-s-coal-fired-power-station-closes/7394854>

²⁹ <http://www.engie.com/en/journalists/press-releases/hazelwood-power-station-australia/>

³⁰ Environment Victoria, *Life after coal: Pathways to a Just and Sustainable Transition for the Latrobe Valley*, 2016

challenge of transition. For example, Michael Rossiter, then-Mayor of the Latrobe City Council, wrote earlier in 2016:

“The transition away from brown coal is not the thing that we fear. What we fear is being abandoned.”³¹

Communities around coal power stations have already borne more than their fair share of the local health and environmental costs of coal. Analysis by Harvard researchers, using modelling developed by the US National Academy of Sciences, found that Victoria’s coal plants are responsible for air pollution that creates an annual health burden on the surrounding community of over \$660 million.³² This modelling is consistent with the Latrobe Valley community faring worse than the rest of the state on a range of health indicators.³³

These communities deserve a plan for an orderly and phased transition to a more diversified economy, to safeguard their future health and prosperity.

4. We need a coherent national plan

4.1 *Benefits of a managed transition*

Because much of Australia operates with an interconnected National Energy Market, a coherent national plan is essential to ensure a rapid but smooth transition away from coal power generation. Individual states can and should push ahead with ambitious plans to decarbonise their economies, but some level of integration and oversight is required.

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

- Deliver better emission reduction outcomes;
- Encourage investment in new clean energy capacity and new jobs;
- Provide more certainty to communities near coal power stations; and
- Create a context in which it is seen as acceptable for governments to acknowledge that job losses are coming, and to commit significant resources to mitigate the consequences of those job losses.

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.

³¹ “Don’t keep us in the dark on coal closures says Latrobe Valley”, Michael Rossiter, *Herald-Sun*, 29 April, 2016

³² Jordan Ward & Mick Power, 2015

³³ Hazelwood Mine Fire Inquiry: Final report <http://report.hazelwoodinquiry.vic.gov.au/part-four-health-wellbeing/health-wellbeing-background/health-latrobe-valley.html>

4.2 *There is broad support for a planned phase-out of coal*

Calls for a plan to manage the phase-out of coal-burning power stations are coming from many diverse sources.

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.”³⁴

Another AGL spokesperson has said “Policies that support the decarbonisation of the Victorian generation sector are welcome but it is critical the policy provides a clear pathway for a stable and orderly transition.”³⁵

A spokesperson for EnergyAustralia (owners of Yallourn and Eraring power stations) has said “We need an orderly, realistic transition from large, older coal-fired power stations.”³⁶

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.”³⁷

Professor Ross Garnaut (former Australian climate advisor) has called for Latrobe Valley power stations to be phased out within five years. “We have to get emissions from brown coal generation quickly onto a downward path... we could replace coal generation from other sources through a combination of energy efficiency and renewable energy generation.”³⁸

In November 2016, a group of prominent Australians called on the federal government to drive the phase-out of coal-burning power stations.³⁹

There is also strong public support for closing coal power stations. Polling commissioned by Environment Victoria and conducted by ReachTEL in June 2016 revealed that 70 percent of Victorians support the phase-out of coal power stations as part of a responsible policy on global warming.⁴⁰

4.2 *Energy market consequences*

As coal power stations close, there will undoubtedly be consequences for energy markets. These consequences (and how these flow through into the community) should be managed to reduce any

³⁴ <http://www.afr.com/business/energy/electricity/agl-energy-warns-of-blackout-risk-without-orderly-brown-coal-plant-closure-20160616-gpl73c>

³⁵ <http://www.latrobevalleyexpress.com.au/story/3978056/win-for-renewable-energy/>

³⁶ <http://www.latrobevalleyexpress.com.au/story/3978056/win-for-renewable-energy/>

³⁷ <http://www.bca.com.au/publications/victorian-renewable-energy-auction-scheme>

³⁸ <http://www.abc.net.au/radionational/programs/breakfast/australian-carbon-price-inevitable-garnaut/6985734>

³⁹ <https://www.theguardian.com/australia-news/2016/nov/07/quentin-bryce-in-high-powered-group-calling-for-coal-power-to-be-phased-out>

⁴⁰ <http://environmentvictoria.org.au/media/strong-support-phasing-out-polluting-coal-plants-victoria%E2%80%99s-key-marginal-seats>

negative outcomes, especially on the most vulnerable members of society. However, given the overarching importance of rapidly cutting climate pollution, these impacts should not be seen as a reason for governments not to manage an accelerated phase-out of coal-fired power stations. Indeed, managing the process will lead to better outcomes for all concerned.

Leading energy market analysts RepuTex have modelled the effect of closing a large brown coal power station and found that removing Hazelwood would not necessarily push prices up. “The closure of a large coal generator is likely to have a negligible impact on residential electricity bills,” said Bret Harper, associate director of research at RepuTex.⁴¹

This is consistent with analysis by academics at the Australian National University, which similarly found closing a large brown coal power station would have only a very small impact on prices.⁴² Victorian government modelling around the impacts of closing Hazelwood power station estimate the average residential power bill could increase by 4-8 percent.⁴³

It is important to note that it is widely expected that increasing the amount of renewable energy in the grid will ultimately drive power prices down, because wind farms and solar arrays have even lower short-run costs than coal generators. A report from the University of Technology in Sydney found that transitioning Australia to 100 percent renewable energy by 2050 would cost less than continuing on the current path.⁴⁴

5. Specific interventions

A range of policy options is available to governments at both the state and federal level to accelerate this energy transition. A just transition process which fairly shares the benefits and costs of change needs to encompass both an orderly transition *away* from coal, as well as a collaborative and inclusive transition *towards* a sustainable economy.

The key elements of a national energy transition framework are:

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 such as price rises, through investment in efficiency to manage affordability.

5.1 Policies to support orderly retirement of power stations

A range of policy measures exist to drive the transformation of Australia’s energy sector. Australia has typically focused on policies to push renewable energy into the market, but it is now clear that policies to withdraw coal capacity from the market are needed. It is possible that a combination of

⁴¹ <http://www.reputex.com/media-releases/media-release-cost-of-closing-brown-coal-generation-offset-by-falling-retail-electricity-prices/>

⁴² https://ccep.crawford.anu.edu.au/sites/default/files/publication/ccep_crawford_anu_edu_au/2015-11/ccep1510_0.pdf

⁴³ <http://www.abc.net.au/news/2016-11-02/hazelwood-closure-will-impact-electricity-pricing-pallas-says/7990306>

⁴⁴ <https://www.theguardian.com/environment/2016/apr/19/modelling-shows-move-to-100-renewable-energy-would-save-australia-money>

such policies will be most effective, with roles for both state and federal governments. Some policy options include:

- **Carbon price:** The carbon price introduced by the Gillard Government was effective at reducing Australia's emissions during its short operation (as shown earlier in Figure 3) — despite excessive compensation to polluters. However, credible modelling concludes that a carbon price alone will be insufficient to drive the necessary transformation in our electricity system. Even a politically unlikely carbon price of \$70–\$100 per tonne is inadequate to keep emissions within a 2 degree scenario.⁴⁵ A carbon price can be applied in different ways: it could apply to the whole economy, or to a selection of sectors, focusing on those with particularly high CO₂ emissions such as the energy sector. In addition to creating a clear price signal to reduce emissions, a carbon price also plays an important role in raising revenue that can be used for other purposes (see box below about New York state's carbon price).
- **Lifetime limits:** One option is to simply require plants to close (or to operate at near-zero emissions) once they reach a pre-determined age. This is the model now operating in Canada, and it has the effect of providing sufficient certainty for renewable energy investors to prepare the construction of zero-emissions replacement capacity towards a known timeframe. In Australia, it would have the effect of spreading power station closures around different states (as shown in Figure 1), rather than concentrating closures in one geographic area. The lifetime limit that is chosen must be informed by the carbon budget that remains.
- **Emissions intensity standards:** Unlike lifetime limits, setting emissions intensity standards is more likely to guarantee the most optimal emissions outcome—plants are closed in order of most polluting to least polluting per unit of electricity. A single standard that tightens over time, applied nationally, would affect all generators in Victoria's Latrobe Valley before causing retirements elsewhere, which potentially has implications for the stability of the grid. However, state-based standards could account for the different average emissions intensities in different states. This has been the centerpiece of President Obama's Clean Power Plan in the US: requiring different states to meet overall emissions intensity standards, which have been set in recognition of state-by-state peculiarities. It is expected this could lead to the closure of 30-49 GW of US coal capacity by 2020.⁴⁶ Emission intensity standards have been used in Europe for decades to reduce air pollution from coal generators (under the Large Combustion Plant Directive), and has led to the closure of 35 GW of coal capacity across 17 countries (and much improved air quality).⁴⁷ Figure 5 shows that the average emissions intensity of Australia's electricity sector is one of the worst in the developed world.

⁴⁵ The Climate Institute, *A Switch in Time: Enabling the electricity sector's transition to net zero emissions*, 2016, <http://www.climateinstitute.org.au/a-switch-in-time.html>

⁴⁶ USEPA, *Regulatory impact analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants*, 2014

⁴⁷ EEA, *Large Combustion Plants opted out under Article 4(4) of Directive 2001/80/EC*, 2014

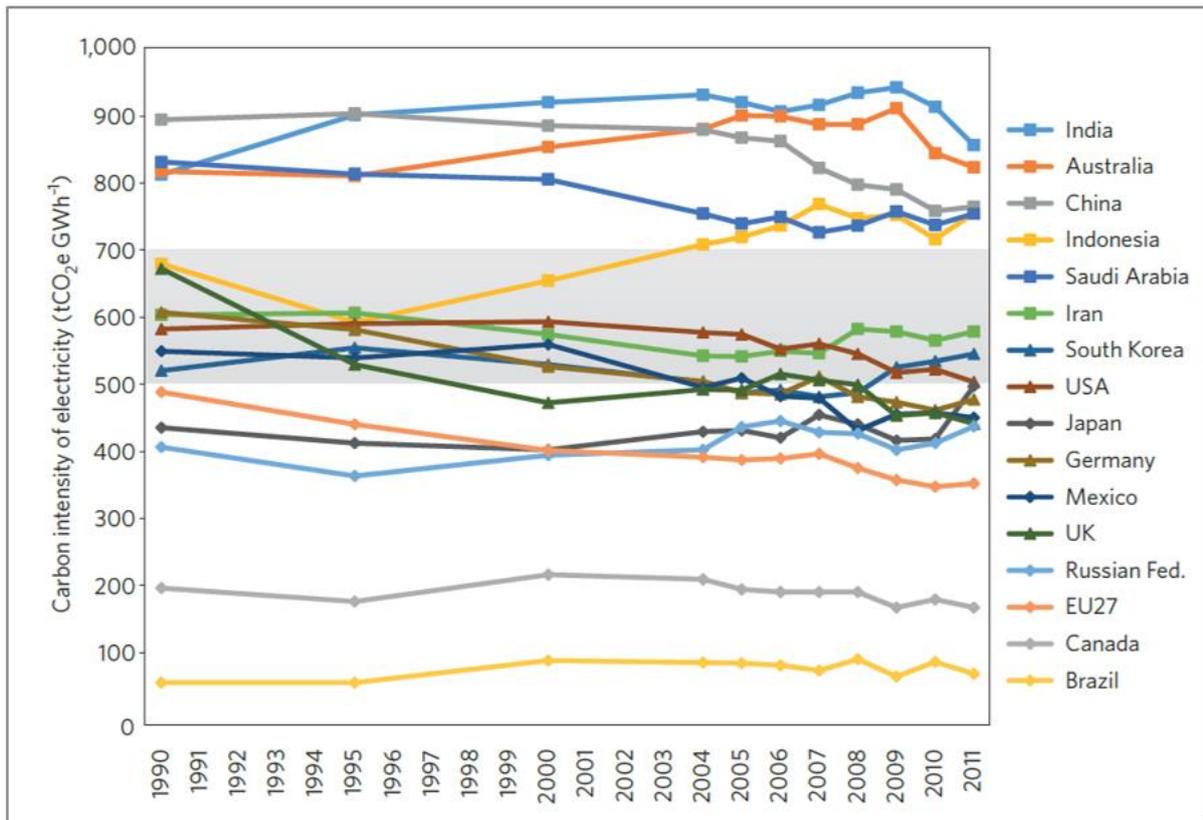


Figure 5. Global comparison of nation's emissions intensities.⁴⁸

- Retirement auctions:** More recently, a new idea for driving power station retirement has emerged—one that relies on reverse auctions in which generators bid for the price at which they will retire capacity, which is then paid for by the remaining generators.⁴⁹ The attractiveness of this approach is that it largely resolves the first-mover disadvantage, noted above as a major barrier to exit. Precise details for how such a scheme might work are still being developed. One limitation is that the “winner” of the auction—the power station to be closed—is not necessarily known until the moment of the auction, arguably making the process less certain for communities and workers (compared to the two above methods, which follow a far more predictable path of retirements). The reverse auction approach may be effective for a small number of initial retirements, but it is less suited ensuring the more comprehensive decarbonisation that is required.

Each of these options has pros and cons, and these can also be combined with various other policies to accelerate the exit of coal from the market and to push renewable energy into the market (such as contracts-for-difference, feed-in tariffs or certificate-based schemes such as the RET). It is important to consider the interaction between different policies. For example, contracts-for-difference to introduce renewable energy become cheaper to governments if the wholesale price of

⁴⁸ Kennedy C, ‘Key Threshold for Electricity Emissions’ (2015) *Nature Climate Change*, vol. 5

⁴⁹ Jotzo, F. and Mazouz, S. 2015, “Brown coal exit: a market mechanism for regulated closure of highly emissions intensive power stations”, *Journal of the Economic Society of Australia (Queensland)*
<https://ccep.crawford.anu.edu.au/publication/ccep-working-paper/6775/brown-coal-exit-market-mechanism-regulated-closure-highly>

electricity increases. Therefore policies to withdraw coal capacity (and its likely short-term increase in wholesale prices) can work well with a contracts-for-difference approach to renewable energy.

Mine rehabilitation is another factor that may need to be considered, though not all coal power stations in Australia own their own mines. In situations where the mine is owned by the same company as the power station, it is important that adequate plans are in place to ensure mine rehabilitation is done properly upon closure of the power station. This should include:

- Where possible, ensuring the workforce from the mine/power station are kept on to carry out the mine rehabilitation work;
- Making sure the community is closely involved in decisions about how rehabilitation is done and what the final land use will be;
- Having a clear regulatory focus on achieving agreed-upon criteria for success, rather than simply carrying out a prescribed list of rehabilitation activities with no accountability for outcomes;
- Ensuring adequate rehabilitation bonds or other financial assurance is in place - this provides greater certainty that rehabilitation work will be done, that it will be paid for by mine operators and that it will meet a standard that is acceptable to the community.

5.2. *A just transition for workers and affected communities*

While the electricity and coal-mining sectors are relatively small employers on a national scale, the jobs they support are concentrated in key geographic areas such as the Hunter Valley in NSW and Latrobe Valley in Victoria. And as these jobs tend to be relatively high paid, they make a significant contribution to regional economic activity.

A just transition requires that certain minimum requirements for protecting the rights of existing power workers are met:

1. As Australia's fleet of power stations are owned and operated by different private entities, unions have proposed that cooperation is needed to ensure older workers across the fleet are eligible for redundancy when one power station closes, allowing younger workers to re-deploy to remaining stations.⁵⁰ This is most important in regions that have multiple coal-fired power stations.
2. All employees taking redundancy must receive their full entitlements from their employer, as part of a comprehensive, industry-wide redundancy, relocation and retraining program funded by industry not the public purse.

However, the challenge goes beyond offering re-training and new employment for workers directly employed in the electricity sector, although that will be important. Jobs must also be created for the workers and businesses that rely on the downstream spending of those who currently work in the coal-fired electricity sector.

⁵⁰ "Hazelwood closure speculation: the community responds", *Latrobe Valley Express*, 26 September 2016 http://www.latrobevalleyexpress.com.au/story/4188710/hazelwood-closure-speculation-the-community-responds/?cs=1462&mc_cid=9e19195dfd&mc_eid=9412a2e2f6

Critical to a just transition is meaningful, open and transparent consultation between government, industry, local business, unions and the local community. The absence of such consultation during Victoria's 1990s privatisation process left the Latrobe Valley community feeling marginalised and disempowered.

This time, and particularly given the scale and time-frame over which this process must occur, coal-affected communities deserve a process which builds trust and ownership of the change process over time; draws on the knowledge, skills and resources of the local community – including often marginalised groups such as Indigenous peoples and women; and focuses on practical options to create hope for the future.

Furthermore, a just transition will require 'big picture thinking' that goes beyond piecemeal support for individual projects. It needs to be transformational, creating an environment (economic, physical and cultural) that fosters and catalyses innovation and investment in a diverse range of new industries and businesses. The Victorian government's response to the announcement of Hazelwood's closure covered tax incentives of this kind.⁵¹

Success will also depend on a whole-of-government approach, which knits together economic development, housing affordability and energy hardship initiatives to support comprehensive transition plans for communities near coal-fired power stations. Looking beyond traditional industries, arts and creative industry initiatives could deliver further economic dividends by fostering a vibrant and welcoming community culture that attracts skilled workers and entrepreneurs to the region.

Environment Victoria has recently published a report outlining some potential opportunities for sustainable economic diversification in the Latrobe Valley. These include investment in energy efficiency and renewable energy retrofits for both residential and commercial buildings, a State Energy Transition Centre, sustainable pre-fabricated housing construction, and solar hot water heating manufacture.⁵²

These ideas were a contribution to the ongoing conversation which is already being led by community members in the Latrobe Valley. However, while it is essential that discussion about transition away from coal must be driven by affected communities, the required changes cannot be left to those communities alone. All levels of government, community and business sectors need to be drawn into and contribute to this process.

To date, federal and state governments have committed a combined sum of approximately \$300 million to the Latrobe Valley in the wake of the announcement that Hazelwood power station will close in March 2017. With around 20 coal power stations around the country that will need to retire in coming years, an initial estimate of funding required to support transition could be upwards of \$6 billion.

Funding of this magnitude, over the medium to long term timeframe required to achieve lasting change, will require more than one-off payments to support piecemeal projects. It will depend on the creation of an institutional framework that generates revenue which can be directed towards predictable and ongoing support for affected communities.

⁵¹ <http://www.theage.com.au/victoria/latrobe-valley-set-to-gain-266-million-rescue-package-20161103-gshhqe.html>

⁵² Environment Victoria 2016

As outlined in the box below, one option is for revenue from a re-introduced price on carbon to be allocated to funding regional transition processes.

New York State Climate and Community Protection Act

New York State approved legislation in June 2016 which requires the state to reduce greenhouse gas emissions from major sources to zero by 2050, and source at least 50 percent of its electricity from clean energy by 2030.

The Act requires that 40 percent of the funds generated from any new market scheme established to meet the emission reduction targets must be used for research and development of energy programs in disadvantaged communities. It earmarks money from the state's Environmental Protection Fund toward building clean energy projects and improving energy efficiency in low-income housing areas, including solar installations, wind turbines and heat pumps.

The legislation also mandates that the state's energy transition create new jobs for the people likely to lose their jobs as New York shifts away from fossil fuels. These jobs in clean energy would have to pay well, involve training and career development opportunities and be available to members of all communities. Any major energy or climate project receiving financial support from the state must pay building service workers and construction workers fair wages and offer other protective policies for workers, such as workers' compensation insurance.

Source: <https://insideclimatenews.org/news/01062016/new-york-climate-change-legislation-zero-emissions-2050>

5.3. Mitigating wider community impacts

As well as managing the socio-economic impacts of transition on directly affected communities, it will be equally important to mitigate the impact of potential electricity price rises on the wider community, particularly low-income and disadvantaged households.

Importantly, rising prices do not necessarily translate into higher business or household energy bills. Business and domestic energy users spend more than \$110 billion on energy per year, which equates to about 8 percent of Australia's GDP.⁵³ Cutting energy consumption by improving efficiency is an obvious response to rising prices and an effective strategy for managing overall costs.

The Australian Government has set a target to improve Australia's energy productivity by 40 percent by 2030, and the COAG Energy Council signed off on a new 'National Energy Productivity Plan' (NEPP) in 2015. Analysis by ClimateWorks has found a near-doubling of energy productivity is both necessary and achievable,⁵⁴ and the Alliance to Save Energy is working with a range of businesses to develop pathways to double energy productivity by 2030. Its analysis finds that this would lead to investment of \$100 billion over 15 years, a 2.8 percent increase in real GDP, a \$30 billion reduction in energy spend in 2030, and a 25 percent reduction in greenhouse gas emissions.⁵⁵

⁵³ Australian Alliance for Energy Productivity, <http://a2se.org.au/>

⁵⁴ <http://climateworks.com.au/project/current-project/australias-energy-productivity-potential>

⁵⁵ Australian Alliance for Energy Productivity <http://a2se.org.au/>

Strengthening the ambition of the NEPP and fully implementing commitments to expand and/or strengthen efficiency standards and disclosure requirements for equipment and residential and commercial buildings, among other measures, would more than offset the impact of any price rises flowing from the energy transition. As noted above, it is also expected that growing renewable energy will, in the medium term, start putting downward pressure on prices.

Improving residential energy efficiency is a particularly effective strategy for mitigating price rise impacts on low-income and vulnerable households. The efficiency performance of Australia's housing stock is generally low - for example, homes built prior to 2005 in Victoria average less than 2 stars in terms of their efficiency performance. An efficient home can cut its energy costs by 40 percent, translating into annual savings of around \$1000 for the average Victorian household.⁵⁶

In its recent 'Life After Coal' report, Environment Victoria estimates that implementing a comprehensive residential efficiency program targeting low-income and disadvantaged households in the Latrobe Valley as part of a regional transition program, could generate household energy savings of up to \$58 million annually within ten years. The impact of these savings being available for spending elsewhere in the economy could support an estimated 200-300 jobs on an ongoing basis, over and above an estimated 340-620 jobs supported during the ten-year implementation phase.⁵⁷

6. Conclusion

Power stations around Australia are closing, but they are not closing quickly enough to respond to the climate challenge we face, nor are they closing in a way that adequately supports workers and communities. Allowing the situation to continue without intervention will lead to further *ad hoc* closures for which communities are poorly prepared, and will fail to reduce Australia's emissions at the necessary rate.

A range of policies are available to actively withdraw coal-burning power stations from the grid. These policies can, and need to, co-exist with other policies that ensure renewable energy is being brought online, helping to ensure security of supply and ultimately keeping the cost of electricity down.

Simultaneously, active transition planning for workers and communities is needed. Successful community transitions will be expensive and should be supported by an institutional and policy architecture that is capable of ensuring sufficient government funding and expertise is available for the diversification of regional economies.

Environment Victoria urges the committee to recommend the establishment of a national plan to manage the energy and community transitions, in line with the principles, objectives and details set out in this submission.

⁵⁶ Sustainability Victoria, 2014. *Victorian Households Energy Report*

⁵⁷ Environment Victoria, 2016