

## **SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW**

**Organisation:** Lock the Gate Alliance

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## Submission: Inquiry into Sustainability of Energy Supply and Resources

### Summary

Energy and resource markets and the New South Wales communities that supply them are on the cusp of profound change. This change presents an economic and social threat that requires proactive intervention *before* the change occurs. It also presents an opportunity to address some long-outstanding environmental and social impacts of mining: there will be significant environmental and social co-benefits from diversification, if it is undertaken well.

The intensive expansion of coal mining to supply the export market in the last two decades has brought considerable wealth and opportunity and profound negative environmental and social consequences for coal mining communities. Extensive areas of strategic farmland are covered by exploration licences for coal and coal seam gas. Long-established rural industries in the Hunter Valley have been forced into conflict with the mining industry by unclear Government policy that has moved decision-making outside the region, disenfranchised local people and failed to resolve land use conflict. More than a quarter of the strategic farmland in the Hunter region is owned by coal mining companies because of the state government's practice of allowing mines to proceed despite modelling demonstrating the operation will cause exceedances of noise and air pollution in the surrounding area. This has led to the depopulation of agricultural communities and the weakening of the social fabric of rural areas. The majority of the high security water in the productive Hunter Valley is owned by the coal mining industry and there are signs coal mining is adding to water stress in the Namoi Valley too.

Four of NSW's five coal fired power stations are expected to close in the next 17 years, all of which are in the greater Hunter region – two in Lake Macquarie and two in Muswellbrook. Ten years ago, it seemed feasible that gas-fired peaking plants could provide a "bridge" in a transition from predominately coal-fired electricity supply in NSW to one that is sourced predominately from renewable energy sources. However, over the last decade, delay in tackling greenhouse gas emissions and a structural shift in the east coast gas market caused by the initiation of LNG exports from Queensland has set fire to that bridge and made it impassable. The price of gas on the east coast has been irreversibly shifted upward by the opening of LNG exports from coal seam gas in NSW. It is neither sustainable nor economically desirable to allow coal seam gas in the Narrabri area to deplete groundwater and create the risk of contamination in order to produce a high-cost fuel that brings few jobs when compared with renewable energy.

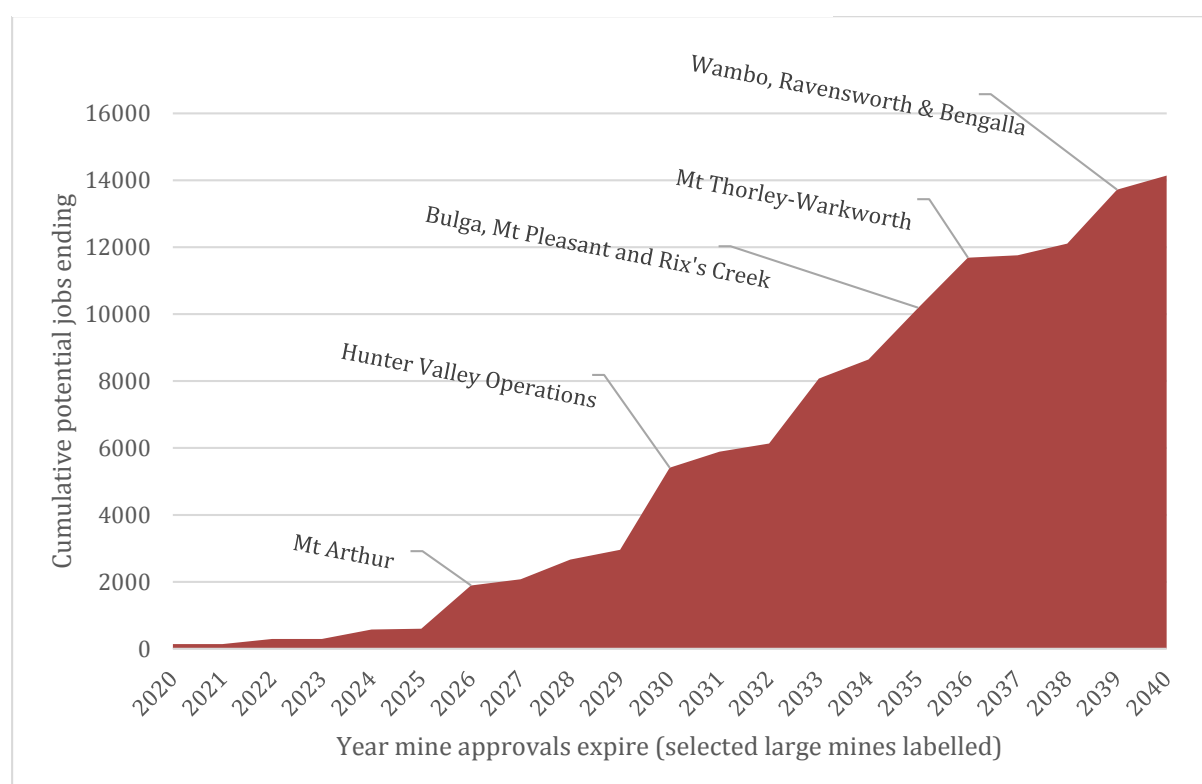
Globally, coal production began to decline for the first time this century in 2014 and this decline accelerated in 2015, when world coal production fell by 221Mt and consumption of coal, too, began to fall. NSW thermal coal exports peaked in 2015, and though its trajectory has not been consistent, there are credible forecasts that decline will continue to generally fall over the next two decades. The head of economic analysis at the Reserve Bank has observed, "Thermal coal is one of Australia's

largest energy-related exports. Together Japan, China and South Korea account for around 75 per cent of Australia's thermal coal exports and in all three countries there are plans to shift towards cleaner energy sources.” She cites BP’s energy projections which show a transition away from thermal coal globally if countries achieve the Paris climate agreement temperature goals and says that while the effect on Australia overall would be small,

... it is important to recognise that the negative consequences of such a transition will be focused on specific geographic areas and communities that are unlikely to be the same ones reaping the benefits. This can be particularly challenging if there are limited opportunities to find alternative employment, which is often the case for coal-mining areas. The question is then what can be done to improve the ability of local communities to manage these challenges?<sup>1</sup>

In addition to declining demand, there is also the reality of coal mines reaching the end of their commercial life. We examined the approvals of 35 operating NSW thermal coal mines and plotted their end dates with an estimate of the number of jobs currently supported at those mines. The latest approval date expiry is 2040, though we note that two mines have expansion plans that would extend mining beyond this date.<sup>2</sup> As shown below, the resulting cumulative potential loss of mining jobs in the Hunter, Western and Gunnedah Basin mines is 14,000 over twenty years, with very large coal mines, or clusters of closure dates labelled.

*Cumulative potential jobs ending if mines close as approvals expire*



<sup>1</sup> Alexandra Heath, Head of Economic Analysis, RBA. 5 June 2019 “Australia’s Resource Industry – A look into the crystal ball” <https://www.rba.gov.au/speeches/2019/sp-so-2019-06-05.html#fn6>

<sup>2</sup> This list of mines does not include two that are approved but have not yet proceeded to construction, Watermark and United Wambo, and two new mines that are seeking approval, Vickery and Bylong.

With dramatic changes underway in the countries that purchase New South Wales' export coal, there is an urgent need to invest in diversification in the local and regional economies that are currently dependent on the coal export industry, particularly the Hunter Valley. Experiences of coal decline in around the world have almost invariably left mining communities struggling with high unemployment and other social scars that last for a generation or more. This has occurred already in the Hunter region's past, as the experience of Cessnock demonstrates. Research has shown that early preparation for such turmoil before it occurs, and transparent and consensus-based inclusion of communities in that preparation gives them the best chance of avoiding the curses of structural adjustment.

In the last decade, attempts have been made in the Hunter region in particular to plan for diversification of the economy, but the evidence indicates that these plans have largely been unsuccessful. They have failed because the public was excluded from their development and implementation. They have failed because diversification requires transparent investment of funding, policy and time, driven by local knowledge.

Preparing coal communities for structural change is not about the Government making decisions to pre-maturely close down mining. Coal communities are understandably resistant to measures that will hasten the exit of mining companies and bring on the economic and social upheaval of structural adjustment. Nevertheless, case studies around the world stress that anticipation and readiness are critical to regions navigating changes of this kind. For this reason, diversification and planning for mine rehabilitation must come first. Lock the Gate Alliance supports the Hunter Renewal roadmap, developed from within the region, and urges the Committee to support its recommendations for a regionally-based diversification taskforce and investment of public funds over the challenging two decades to come.

We also urge the committee to hold hearings for this inquiry in Newcastle, Singleton, Muswellbrook and in regional areas hosting NSW's renewable energy hubs to hear directly from local communities how the State Government can ensure there are positive social and environmental benefits from energy transition and economic diversification.

#### Recommendations

1. That the Committee hold public hearings in coal-dependent regions and regions experiencing renewable energy development including hearings in Newcastle, Singleton, Muswellbrook and the state's North West;
2. Review existing government funding initiatives, including Snowy Hydro, and prioritise funding towards the Hunter Valley within a diversification framework;
3. That NSW establish a Hunter Regional Diversification Taskforce, with carriage of a \$2 billion fund to invest in diversification projects in the Hunter region;
4. That this taskforce be comprised of a broad cross-section of the community, be based in the Hunter region and conduct public engagement and consultation in the development of its plans and programs;
5. That a funding mechanism be established to ensure that mining companies contribute at least half of the cost of diversification initiatives;
6. That the framework for mine rehabilitation be reformed to ensure the highest standard of mine rehabilitation is undertaken in a coherent regional framework and to maximise the regional job opportunities;
7. That the NSW Government undertake research to investigate:

- a. New South Wales' energy needs and the most environmentally low-impact and affordable pathway to secure those needs;
  - b. the trajectory for coal supply exported from New South Wales and global coal market decline consistent with carbon budgets for meeting the goals of the Paris Climate Agreement;
  - c. Measures and incentives to encourage fuel switching from gas to renewable energy, mapping out the potential for renewable energy to support revitalised manufacturing;
- 8. The NSW Government should remove impediments to the creation of a container terminal at the Port of Newcastle.
  - 9. The NSW Government should reject the proposed Narrabri CSG project as it will lock in high gas prices and do considerable environmental and economic damage.

## Table of contents

<b>Summary</b>	<b>1</b>
<b>Introduction</b>	<b>6</b>
<b>Part 1: Status and forecasts of energy resources and markets</b>	<b>7</b>
Background: NSW coal industry	7
Emerging trends in energy supply and exports	8
Gas markets and the burning bridge	12
<b>Part 2: Effects on regional communities, water security, the environment and public health.</b>	<b>14</b>
Water security	14
Hunter region	14
Namoi region	15
Social impacts	16
Climate change	18
<b>Part 3: Opportunities to support sustainable economic development in regional</b>	<b>20</b>
Review of other experiences of structural adjustment	20
Coal communities already understand structural adjustment	20
Overseas experiences	22
Recent Hunter region attempts at diversification planning	24
Options for diversification	25
<b>Conclusion</b>	<b>26</b>
Recommendations	27

## Introduction

Lock the Gate Alliance is a network of people, businesses and community groups that are concerned about the impacts of coal and unconventional gas on people, water and landscapes. In New South Wales, we work with communities in the Hunter, North West and Illawarra regions affected by coal and coal seam gas mining and exploration and advocate for the protection of farmland, water resources and rural communities from the impacts of these industries.

We are grateful to the Committee for the opportunity to make this submission and share our perspective on the sustainability of energy supply and resources, the environmental and social impacts of energy resource extraction in regional New South Wales and opportunities for regional diversification. In our experience, regional communities are connected, diverse and closely attached to community and the environment. In mining communities, conflict over specific mining projects and their impacts masks deeply-held shared priorities: the importance of place, a desire for economic opportunity that does not come at the expense of community, culture and the environment, and the need for local autonomy to make decisions about how to share and manage natural resources in the interests of future generations.

The concentration in Sydney of decision-making power about energy and resources has led to alienation, disempowerment and damage in mining communities. All mining and energy projects in NSW are “state significant development” which means decisions about these projects are made by people outside the region where they will be undertaken and have their most profound effect. Similarly, the policies affecting where and how such projects proceed are generally developed in Sydney. There has been a lack of balance, a lack of consideration for the future, and a lack of transparency and accountability in the management of energy resources. We urge the Committee to hold public hearings and formal visits to mining regions and regions that are seeing an expansion of renewable energy development. It is our hope that the recommendations of this inquiry will recognise the need for transparent, candid and inclusive planning for New South Wales’ energy future.

This submission is in three parts, corresponding to three elements of the inquiry’s terms of reference:

1. Status and forecasts of energy resources and markets, particularly the mining and export of coal, but touching on gas markets;
2. Effects on regional communities, water security, the environment and public health, particularly the effects of mining;
3. Opportunities to support sustainable economic development in regional and other communities likely to be affected by changing energy and resource markets, including the role of government policies.

We would be very pleased to have the opportunity to address the Committee directly about these matters at a public hearing.

## Part 1: Status and forecasts of energy resources and markets

### Background: NSW coal industry

NSW has 41 operating coal mines producing around 250 million tonnes of raw coal annually. Of these mines, 15 are in the Singleton and Muswellbrook area. The Hunter Valley produces nearly 60% of the coal mined in NSW and also hosts two coal power stations which produce around 30% of NSW's electricity and are the largest domestic consumer of NSW coal.<sup>3</sup> The Hunter also accounts for 55% of the jobs in coal mining in NSW<sup>4</sup> and hosts the world's biggest coal exporting port.

Other coal mining areas are Mudgee (five mines) Gunnedah (seven mines), Lithgow (three mines, one power station), Lake Macquarie (six mines and two power stations), and Wollongong (five coking coal mines, a steel works and an export terminal). A list of NSW thermal coal mines and their markets, job numbers, coal reserves and expected end dates is provided in Appendix A. As this inquiry is focused on energy, we have concentrated our submission on the thermal coal industry, while recognising there are mines that produce both thermal and coking coal, and mining and burning coking coal has similar environmental risks and consequences as thermal coal. When we describe the Hunter Valley coal chain in this submission, we are including not just the mines in the Hunter Valley proper but the mines in Mudgee and Gunnedah, which also send coal through the Hunter to Newcastle for export.

The Hunter Valley and Gunnedah Basin are the heart of Australia's thermal coal industry. In 2017, operational and prospective mines in the Hunter Valley coal chain had marketable reserves of 4,893 million tonnes of coal, annual production of coal for sale of around 190 million tonnes and an expected average remaining mine life of nearly 30 years.<sup>5</sup> The nine biggest coal mines in NSW are in the central part of Hunter Valley and together occupy about 30,000 hectares of land. Of this footprint, only around 30% is under active rehabilitation.<sup>6</sup>

This industry employs around 14,000 people, more than half of them in the Hunter Valley, where up to 40% of people rely on the mining industry for their livelihoods.

Coal has played an important role in shaping communities in Lithgow, Gunnedah and the Illawarra, but it is in the Hunter Valley that coal mining remains most dominant environmentally, culturally, socially and economically. In Lithgow, mining accounted for 11% of employment in the 2016 census, having fallen from 15% at the 2011 census. In Wollongong, there are reportedly 1,200 people employed mining, which is 1.5% of the total and 626 less than the 2011 census. Mining is still the largest single industry employer in the Cessnock area but there are more people unemployed in Cessnock than there are people working in the mining industry.

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<sup>3</sup> Summary statistics from NSW coal services.

<sup>4</sup> Upper Hunter Industry Scenarios Report. August 2016. Provided by the NSW Department of Premier and Cabinet.

<sup>5</sup> ARTC submission to the Hunter Rail Access Taskforce (HRATF), May 2017.

<https://www.accc.gov.au/system/files/ARTC%20-%202017%20HVAU%20-%20HRATF%20submission%20to%20Draft%20Decision.PDF>

<sup>6</sup> Lock the Gate Alliance. November 2018. *Mind the Gap: how fixing mine rehabilitation shortfalls could fuel jobs growth in the Hunter Valley*

[https://www.lockthegate.org.au/fixing\\_the\\_holes\\_mine\\_rehabilitation\\_reform\\_can\\_deliver\\_for\\_jobs\\_and\\_the\\_environment](https://www.lockthegate.org.au/fixing_the_holes_mine_rehabilitation_reform_can_deliver_for_jobs_and_the_environment)



In Singleton and Muswellbrook, the dependence on mining is more severe. Mining contributes 58% of the economic output of Muswellbrook and Singleton and employs around 40% of people<sup>7</sup>. The rest of the region is less dependent and better able to adapt to change, but those two areas have vulnerability and instability as a result of coal mining's dominance.

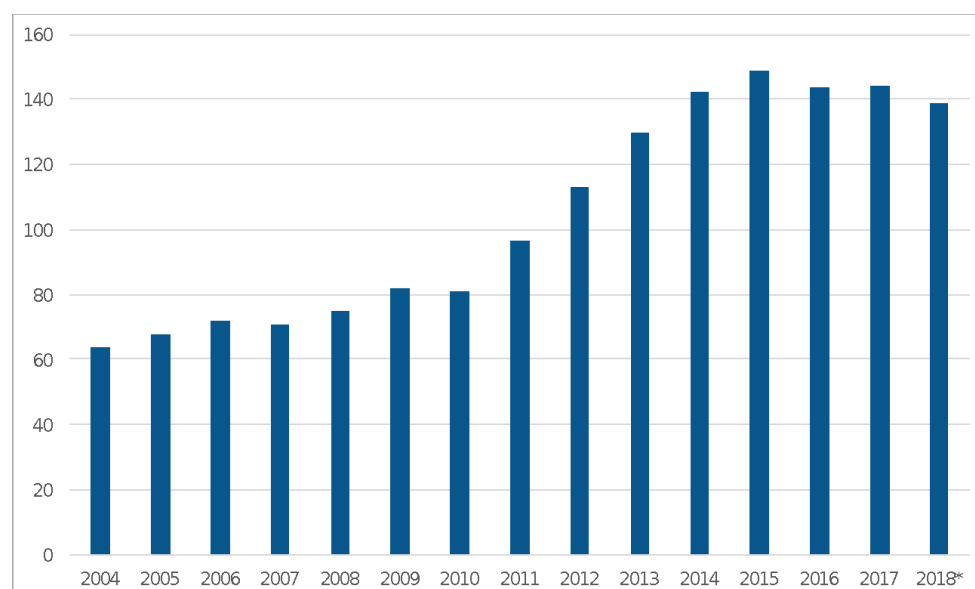
## Emerging trends in energy supply and exports

There is considerable dispute about when and how swiftly changes in coal demand will come and it is impossible to predict this with any certainty, but there is little dispute among mainstream analysts that such change is coming, whether in one decade or more slowly.

On the domestic energy side, four of NSW's five coal fired power stations are expected to close in the next 17 years, all of which are in the greater Hunter region – two in Lake Macquarie and two in Muswellbrook.<sup>8</sup> In early 2016, the NSW Government initiated the *Upper Hunter Industry Scenarios Project*, "aiming to develop a common understanding of the region's needs for long term industry transition." The reasons provided for this included restructuring of the coal mine sector, the forecast closures of Liddell and Bayswater power stations in 2022 and 2035, and water security planning. The next two decades will be times of profound change for the Hunter region and other coal communities, though the pace and quality of that change is unknown.

Globally, coal production began to decline for the first time this century in 2014 and this decline accelerated in 2015, when world coal production fell by 221Mt and consumption of coal, too, began to fall. NSW thermal coal exports peaked in 2015 as Figure 1 shows.

Figure 1: NSW coal export volumes (Mt). Source: IEEFA November 2018. 2018 figure is an annualised projection based on data for the first nine months of fiscal year 2017-18.



<sup>7</sup> Perry, Neil and Gillian Hewitson. UWS. *Weathering the Storm: the case for transforming the Hunter Valley*. January 2019.

<sup>8</sup> Aurora Energy. May 2019. *Aurora Energy Research analysis of AEMO's ISP Part 2: economics of coal closure*. Estimated closure timelines are Liddell 2022, Vales Point in 2028, Eraring in 2035 and Bayswater in 2036.

Though the decline of coal globally and locally has not been consistent, the Office of the Chief Economist expects coal import volumes to decline in NSW's current three largest customers, Japan, South Korea and China, partially offset by anticipated increased imports to India. The most recent *Resources and Energy Quarterly* noted, "There have been growing signs that Japan will pivot away from thermal coal at a faster pace than initially expected" and that South Korea's imports would also decline "as transition accelerates."<sup>9</sup>

Similarly, the head of economic analysis at the Reserve Bank has observed, "Thermal coal is one of Australia's largest energy-related exports. Together Japan, China and South Korea account for around 75 per cent of Australia's thermal coal exports and in all three countries there are plans to shift towards cleaner energy sources." She cites BP's energy projections which show a transition away from thermal coal globally if countries achieve the Paris climate agreement temperature goals and says that while the effect on Australia overall would be small,

... it is important to recognise that the negative consequences of such a transition will be focused on specific geographic areas and communities that are unlikely to be the same ones reaping the benefits. This can be particularly challenging if there are limited opportunities to find alternative employment, which is often the case for coal-mining areas. The question is then what can be done to improve the ability of local communities to manage these challenges?<sup>10</sup>

The International Energy Agency's *World Energy Outlook* every year publishes scenarios for the future of energy use globally that have implications for NSW coal sector, given its reliance on export markets. In 2018, the *World Energy Outlook (WEO 2018)* presented three scenarios and described a world at a crossroads, not only for climate change, but for deadly air pollution, water constraints, energy affordability and lifting people around the world out of energy poverty. It presents three possible paths forward, only one of which (the "Sustainable Development Scenario") avoids catastrophic climate change, reduces deaths from air pollution and provides for affordable universal energy access.

Our current trajectory (the IEA's "Current Policies Scenario") "leads to increasing strains on almost all aspects of energy security." And yet, there is also a "huge" gap between announced policies (the "New Policies Scenario") and agreed goals for climate change, universal energy access and clean air. The New Policies Scenario is the one generally cited by the NSW coal mining industry, but this pathway is *not* consistent with meeting shared goals for climate change, air quality and affordable universal energy access. In the words of international experts on the matter, the New Policies Scenario is "a business as usual scenario that charts a dangerous course to a world with between 2.7°C and 3°C of warming."<sup>11</sup> The only World Energy Outlook scenario that could meet these goals is the Sustainable Development Scenario under which global demand for coal steeply declines over the next two decades to be nearly 60% lower in 2040.

Putting questions of demand aside, there will inevitably be a reduction in coal mining in the Hunter region as economic resources of coal are exhausted. A mine life assessment commissioned in 2016 to inform the Hunter Valley rail access undertaking used available information about coal reserves, mining operations and projects across the Hunter Valley coal chain to estimate remaining mine life,

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<sup>9</sup> Office of the Chief Economist. *Resources and Energy Quarterly*, June 2019.

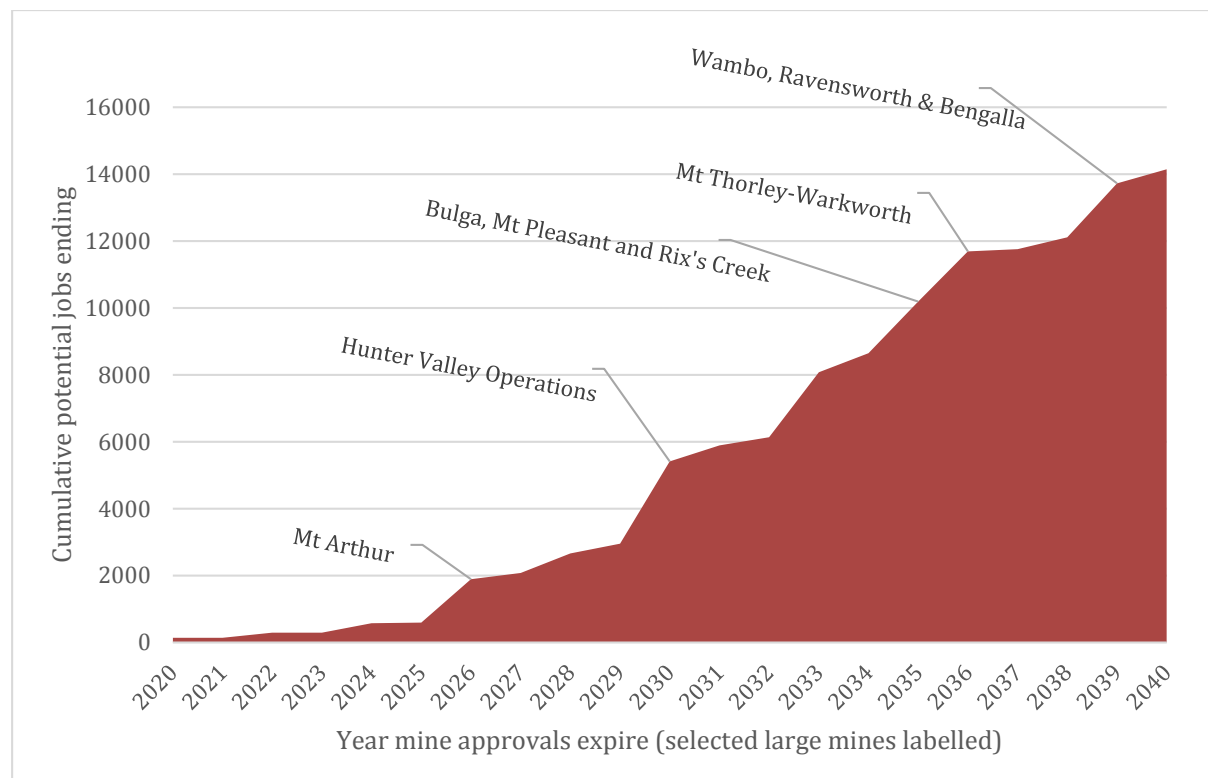
<sup>10</sup> Alexandra Heath, Head of Economic Analysis, RBA. 5 June 2019 "Australia's Resource Industry – A look into the crystal ball" <https://www.rba.gov.au/speeches/2019/sp-so-2019-06-05.html#fn6>

<sup>11</sup> "Joint letter to the IEA" 2 April 2019. *Mission 2020*. <http://www.mission2020.global/letter-to-iea/>

including prospective mines, of just over 30 years.<sup>12</sup> We note that it has taken more than that length of time for Germany's Ruhr Valley to undertake a structural adjustment of its coal mining industry.

We examined the approvals of 35 operating NSW thermal coal mines and plotted their end dates with an estimate of the number of jobs currently supported at those mines. The latest approval date expiry is 2040, though we note that two mines have expansion plans that would extend mining beyond this date. The resulting cumulative potential loss of mining jobs in the Hunter, Western and Gunnedah Basin mines is shown in Figure 3, with very large coal mines, or clusters of closure dates labelled. The complete list of mines in this chart is in Table 1.

Figure 3: Cumulative potential jobs ending if mines close as approvals expire



This list does not include mines that have been approved but have so far not proceeded to development or which are not yet approved. These are Watermark on the Liverpool Plains, which was approved in 2015 and United Wambo in Singleton, approved this year and the proposed Vickery and Bylong mines. These mines are not expected to together employ 14,000 people, so even if they proceed, which is uncertain, they will not offset the decline of employment as existing mines wind up.

<sup>12</sup> Castaglia Strategic Advisers. August 2016. "Mine Life Analysis: Data and Methodology" appended to Hunter Valley Rail Access Taskforce submission to the 2017 draft rail access undertaking.

Table 1: NSW thermal coal mines jobs, reserves and end dates

<i>Mine</i>	<i>Company</i>	<i>District</i>	<i>Est jobs</i>	<i>Coal reserves</i>	<i>Consent expiry</i>
<b>Newstan</b>	Centennial	Newcastle	140	68.3	2020
<b>Rocglen</b>	Whitehaven	Gunnedah	unknown	12	2022
<b>Muswellbrook</b>	Idemitsu	Hunter	154	8.4	2022
<b>Ashton</b>	Yancoal	Hunter	281	51	2024
<b>Stratford</b>	Yancoal	Newcastle	22	45	2025
<b>Mt Arthur</b>	BHP	Hunter	1027	785	2026
<b>Clarence</b>	Centennial	Western	267	46.7	2026
<b>Chain Valley</b>	Delta	Newcastle	186		2027
<b>Liddell</b>	Glencore	Hunter	288	27	2028
<b>Springvale</b>	Centennial	Western	298	49.5	2028
<b>Mangoola</b>	Glencore	Hunter	293	90	2029
<b>Hunter valley operations</b>	Yancoal	Hunter	1867	616	2030
<b>Austar</b>	Yancoal	Newcastle	495	46	2030
<b>Tarrawonga</b>	Whitehaven	Gunnedah	unknown	85	2030
<b>Bloomfield</b>	Bloomfield	Newcastle	93	11.7	2030
<b>Narrabri</b>	Whitehaven	Gunnedah	250	550	2031
<b>Mt Owen</b>	Glencore	Hunter	230	80	2031
<b>Myuna</b>	Centennial	Newcastle	244	17.2	2032
<b>Werris Creek</b>	Whitehaven	Gunnedah	Unknown	17	2032
<b>Ulan</b>	Glencore	Western	834	163	2033
<b>Wilpinjong</b>	Peabody	Western	595	66	2033
<b>Boggabri</b>	Idemitsu	Gunnedah	514	129	2033
<b>Maules Creek</b>	Whitehaven	Gunnedah	569	620	2034
<b>Bulga</b>	Glencore	Hunter	919	225	2035
<b>Mount Pleasant</b>	Mach Energy	Hunter	350	474	2035
<b>Rix's Creek*</b>	Bloomfield	Hunter	276	67.7	2035
<b>Mt Thorley-Warkworth</b>	Yancoal	Hunter	1497	229	2036
<b>Airly</b>	Centennial	Western	70	33	2037
<b>Moolarben</b>	Yancoal	Western	352	278	2038
<b>Wambo</b>	Peabody	Hunter	280	98	2039
<b>Ravensworth</b>	Glencore	Hunter	433	167	2039
<b>Bengalla</b>	New Hope	Hunter	900	208	2039
<b>Total est jobs</b>			<b>14,144</b>		

Finally, the Australian Rail Track Corporation's latest capacity strategy shows that contracted export coal volumes of 193.5Mtpa to the Port of Newcastle are roughly steady out to 2024 after which contracted volumes begin to decline, falling to 152Mtpa in 2026.<sup>13</sup> In developing its strategy, ARTC identified new mining projects that *may* come online in that time and increase rail network volumes even though the companies behind these projects have not contracted to do so. The bulk of this

<sup>13</sup> ARTC Hunter Valley Coal Chain Capacity Strategy March 2019. <https://www.artc.com.au/uploads/2019-HVCCS-consultation-draft-final.pdf>

hoped-for future coal is in the Muswellbrook and Gunnedah area, including mines that have been subject to considerable conflict from local farming communities. These include West Muswellbrook, Vickery South, Watermark, Bylong and Dartbrook.

As the above analysis shows, the need for diversification in the Hunter region is independent of whether or not Australia and New South Wales take action to mitigate climate change. Experiences in coal mining communities in Australia and around the world reveals a familiar pattern of decline and difficulty that can only be averted in the Hunter with consensus-building, careful planning and serious investment. This need has been identified by many in the region, including business and local government, exemplified by the comments of the Port of Newcastle CEO, Craig Carmody, at the inquiry into the Port's sale arrangements:

As the world's largest coal port at the Port of Newcastle we know a thing or two about global trading and certainly about the coal industry. I can also tell you that the Port of Newcastle needs to diversify. We are highly reliant on coal and our community is highly reliant on coal. We have to diversify our economy.<sup>14</sup>

### Gas markets and the burning bridge

Ten years ago, it seemed feasible that gas-fired peaking plants could provide a “bridge” in a transition from predominately coal-fired electricity supply in NSW to one that is sourced predominately from renewable energy sources. However, over the last decade, delay in tackling greenhouse gas emissions and a structural shift in the east coast gas market caused by the initiation of LNG exports from Queensland has set fire to that bridge and made it impassable.

The price of gas on the east coast has been irreversibly shifted upward by the opening of LNG exports from coal seam gas in NSW. It is important context for this inquiry that there is contemporaneous analysis indicating that this was a deliberate corporate strategy of gas company Santos: in 2011 Santos stated in its Annual Report that one of the key goals for the organisation was “increasing exposure to oil-linked gas prices.” Despite gas production on the east coast tripling in the last decade, local users are no longer able to obtain gas at prices they describe as sustainable, because gas prices have also tripled as a result of export parity pricing and a poorly regulated market with little competition.<sup>15</sup> The most recent ACCC report on gas supplies has acknowledged that gas retailers are charging very high margins which are greater than the cost of acquiring and selling gas under market conditions.

Higher gas prices are now also contributing to high electricity prices. Analysis conducted for the ACCC found that in the short term, a \$1/GJ rise in gas prices would lead to a \$3.60/MWh rise in wholesale electricity prices in NSW.<sup>16</sup> AGL is proposing to partly replace the lost capacity of the Liddell power station closure by building a new gas power station at Tomago, north of Newcastle,

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<sup>14</sup> Craig Carmody. Public hearing, Inquiry into the impact of the Port of Newcastle sale arrangements on public works expenditure in NSW. 31 January 2019.

<https://www.parliament.nsw.gov.au/lcdocs/transcripts/2166/31%20January%202019%20-%20Corrected%20-%20Port%20of%20Newcastle%20sale%20arrangements.pdf>

<sup>15</sup> See for example the [latest ACCC report](#) which indicates that gas prices are now \$10-12/GJ which is three to four times historical prices.

<sup>16</sup> Forrest, Morrison and Kemp. May 2018. “Impact of gas powered generation on wholesale market outcomes.” Available here: <https://www.accc.gov.au/system/files/Appendix%208%20-%20HoustonKemp%20-%20Impact%20of%20gas%20powered%20generation%20on%20wholesale....pdf>

but it is far from clear that this development, if it is approved and constructed, would be the most sensible option for New South Wales in terms of sustainability, security and affordability. Wind and solar PV are cheaper forms of bulk energy than combined cycle gas turbines, and in some cases, the cost of newly built renewable energy and storage is cheaper than generating electricity at existing gas power stations.

Indeed, AGL itself has made the argument that the price of gas has “resulted in gas-fired generation being largely withdrawn from the market” and that “the energy transition we have all been anticipating will skip ‘big baseload gas’ as a major component of the NEM’s base-load generation and instead largely be a case of moving from ‘big coal’ to ‘big renewables’” on the grounds that renewable energy firming with storage is cheaper.<sup>17</sup> This highlights the importance of action by the NSW Government to plan for and support the development of firming renewables in NSW as a high priority.

We note that no new gas-fired stations have been added to the grid since 2012 and previous plans to build them have been shelved, including AGL’s own Dalton gas power station proposal. Given accepted analysis that the price of gas will now remain high, the environmental risks and social resistance to coal seam gas development and advice from climate scientists about the limited carbon budget remaining to keep within the global temperature goals of the Paris climate agreement, firming the grid with storage technology makes more sense.

In the age of increasingly cheap renewable energy and in a country blessed by some of the best wind and solar resources in the world, the solution to both lowering industry power bills and lowering pollution is to support NSW industry to get off gas. The technologies for manufacturers to electrify away from gas are already available, and the NSW Government should provide a package of support to enable companies in NSW to make the shift. The Clean Energy Finance Corporation, Australian Industry Group & the Energy Efficiency Council released the *Australian Manufacturing Gas Efficiency Guide* last year which shows that the majority of Australian manufacturers can reduce their gas use by 25% at an upfront cost of less than \$50,000 with a less than 5 year payback.<sup>18</sup> In 2015, the Australian Renewable Energy Agency (ARENA) commissioned a report into *Renewable Energy Options for Australia’s Industrial Gas Users* which found that there were economic or close to economic renewable energy options to reduce gas usage across all mass markets and some large user industry sectors.<sup>19</sup> The NSW Government could support fuel-switching away from gas by supporting commercial trials of technologies, providing low interest loans and grants, and delivering a one-stop shop for industrial energy users to access advice, information and referrals in relation to fuel-switching and energy efficiency.

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<sup>17</sup> “A future of storable renewable energy” Brett Redman, CFO, AGL Energy Limited. Presentation to Macquarie Securities conference. 2 May 2017

<sup>18</sup> [www.cefc.com.au/media/files/energy-relief-in-sight-for-australian-manufacturers-with-practical-new-efficiency-guide/](http://www.cefc.com.au/media/files/energy-relief-in-sight-for-australian-manufacturers-with-practical-new-efficiency-guide/)

<sup>19</sup> <https://arena.gov.au/assets/2017/05/ITP-RE-options-for-industrial-gas-users-Summary.pdf>

## Part 2: Effects on regional communities, water security, the environment and public health.

The impacts of the extraction of energy resources need to be part of any consideration of the sustainability of energy supply and resources in New South Wales. Though the economic contribution of coal mining has been substantial, the cumulative environmental, social and economic costs have not been weighed in the balance. Too often, the interests of mining companies have been conflated with the interests of the regional communities where these companies operate. Too often, mining is presented as the only pathway to economic opportunity and development and it is a pathway that comes with severe and lasting trade-offs in lost landscapes, polluted, diminished or degraded air, water and soils, social conflict and damaged natural and cultural heritage.

In this section, we summarise some of the effects of coal and CSG mining on regional communities, water security and the environment, highlighting the importance of pursuing economic diversification opportunities that are available that do not have such negative impacts on local communities, existing industries and the environment.

### Water security

#### Hunter region

Coal mining and power stations are large water consumers and there is evidence these industries are contributing to water insecurity in the Hunter and Namoi regions. A plan to diversify regional economies needs to consider this context and the future of water security.

Extensive open cut coal mining in the Hunter Valley has already and continues to profoundly affect aquifers and surface water in the region. Mine pits are generally set back at least 150 metres from the alluvium and the river channel, but large volumes of water flow into the pits from the porous rock aquifer that comprises the coal seam and this effect extends to alluvial aquifers of the river and its main tributaries and the river itself. In 2016, the industry reported that it collectively took 22.1GL of passive inflow from groundwater. The vast majority of this comes from porous rock aquifers that are the target coal seams of the industry, but some comes from the alluvium because of hydrological connectivity between these aquifers.

According to the Greater Hunter Regional Water Strategy, the mining industry holds nearly 60% of the high security water in the Hunter regulated river, a circumstance which puts agricultural production at risk from extended drought, since it is general security licences that first experience reduced allocations in dry times. The Regional Water Strategy's review of previous rainfall patterns and overlay of current entitlements over the 1930s drought of record highlights this vulnerability. If the 1940's drought of record were repeated, General Security licence holders in the Hunter, which are predominately agricultural users, would go without entitlements for 12 years, devastating agricultural production in the region and further entrenching the region's economic dependence on the mining industry. General Security licence holders in the Hunter Regulated River have this year been given reduced allocations for the first time since the Millennium Drought.

The modelling undertaken for the Greater Hunter Regional Water Strategy found that increased evaporation due to rising temperatures will result in "an average decrease of 19% in General Security annual water allocations across all modelled scenarios. In scenarios where mining losses are



included the general security allocations decreased by up to 24%.”<sup>20</sup> The “mining losses” are direct losses from the river system as a result of mining drawdown of groundwater and alteration of hydrology and has been calculated as reaching up to 12GL a year if mine expansions continue.<sup>21</sup> In addition, evaporation from mine storages in the Hunter is reportedly around 33.7GL, which is similar to the 39.5GL of water lost to evaporation from the two large storages in the system, Glennies Creek and Glenbawn Dams.<sup>22</sup>

A Mid Hunter Groundwater Study commissioned by the NSW Department of Primary Industries – Water considered the effects of mining on groundwater in the central part of the Valley where mining is concentrated. That study found that there is an area of 977km<sup>2</sup> of the Hunter Valley likely to be affected by more than 2 metres drawdown as a result of open cut mining. This includes 123km<sup>2</sup> of alluvial water sources, 68km of the Hunter River and 31km of the Wollombi Brook.<sup>23</sup> According to the Hunter Unregulated River background document, it takes years to decades for water to travel from the unregulated river surface to the porous rock aquifers that comprise the exploited coal measures.<sup>24</sup> This means the drawdown we are seeing now, as summarised in the Mid Hunter Groundwater Study, may be the result of mining twenty years ago and we are yet to see the extent of the last ten years of substantially increased mining activity.

In general, the mining industry uses far less than its entitlement in actual river pumping and sources most of the water it uses from rainfall capture and groundwater inflow to pits. Surface water take by the mining industry provides up to half the water used by mines to run their operations. According to aggregate figures released by the NSW Minerals Council, the mining industry in the Hunter region extracted 5.7GL from the Hunter River system in 2016, but the industry captured 40GL of rainfall runoff which would otherwise be part of the surface water flow.<sup>25</sup>

To put the industry’s water take in context, mining industry surface water take, which in 2016 was 5.7GL of licenced pumping and 40GL of rainfall and run off capture is equivalent to 5.75% of the mean annual flow of the Hunter River at Singleton.<sup>26</sup>

## Namoi region

The Namoi has not yet been subjected to coal mining to the extent the Hunter region has but it is at considerable risk because it begins from a more water constrained baseline. The Namoi Valley is experiencing its lowest inflow, its worst drought, since 1918, and there is no indication of relief

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<sup>20</sup> NSW Department of Industry. *Greater Hunter Regional Water Strategy*. November 2018. [https://www.industry.nsw.gov.au/\\_data/assets/pdf\\_file/0008/196055/greater-hunter-regional-water-strategy.pdf](https://www.industry.nsw.gov.au/_data/assets/pdf_file/0008/196055/greater-hunter-regional-water-strategy.pdf)

<sup>21</sup> CSIRO Bioregional Assessment. Hunter subregion. Section 3-4 “Impact and risk analysis” July 2018. <https://www.bioregionalassessments.gov.au/assessments/3-4-impact-and-risk-analysis-hunter-subregion>

<sup>22</sup> Upper Hunter Mining Dialogue. Detailed Water Use Infographic 2016.

<sup>23</sup> EMM, for Department of Primary Industries – Water. *Mid Hunter groundwater study final draft report*, 7 April 2015.

<sup>24</sup> *Water Sharing Plan – Hunter unregulated and alluvial water sources: Background document*. 2016.

<sup>25</sup> Upper Hunter Mining Dialogue. Detailed Water Use Infographic 2016.

<sup>26</sup> Mean annual flow of the Hunter Regulated River in Singleton is 794,100ML according to the background document for the Hunter Regulated River Water Sharing Plan dated March 2017.



coming soon. General security licence holders have zero allocation in the Lower Namoi and have had since August 2017.<sup>27</sup>

Against this backdrop, the Maules Creek coal mine is experiencing difficulty obtaining water to run its operations and is buying groundwater licences at prices three times the average. In a Regional Drought report in February, WaterNSW noted that it was “working with mines to identify alternate water supplies (e.g. groundwater) in case it doesn’t rain and there are no river flows.” Maules Creek landholders have experienced dramatic loss of groundwater bores since the mine began operation. This has coincided with the onset of drought, when reliance on groundwater intensifies. In March, Whitehaven successfully bid for a groundwater licence at auction, paying three times the highest bid offered by agriculturalists.<sup>28</sup> The dynamic was repeated in August, when Whitehaven again bought water entitlements at an elevated price. The Department of Industry – Water’s “hierarchy of water priorities” includes coal mining operations with basic human water consumption under its definition of “critical human needs,” described as “non-human consumption requirements that a failure to meet would cause prohibitively high social, economic or national security costs” meaning it takes priority over stock water, environment and water for electricity generation.<sup>29</sup>

Nearby, the wholly new Vickery coal mine is proposed that will exacerbate water insecurity in the district.

The Namoi River drains into the Murray Darling Basin, a river system already stressed with intensive usage and salinity. Farming communities believe that risks to the highly productive alluvial aquifer posed by coal mining, and the water demand of the mines, have been underestimated. Recent evidence from the Werris Creek and Maules Creek coal mines adds weight to this concern. Unlike the Hunter, the Namoi does not regularly flush, so salinity, once brought to the surface and released into the river system, may not be able to be easily removed. In addition to the expansion of coal mining at proposed mining projects like Watermark and Vickery South, coal seam gas production is proposed below a recharge aquifer for the Great Artesian Basin in the Pilliga forest.

## Social impacts

One trend that the inquiry should note is the profound social and economic change that has been wrought in the Hunter over the last twenty years as a result of the mining boom and its after effects.

The Hunter faces considerable challenges when mining declines because of the large number of people employed in the industry who earn high wages from a relatively low skill-base. According to the ABS, median household income in Singleton is \$200 a week more than the NSW median and the proportion of people with a university degree is less than half the state average. After coal mining, the second highest industry of employment is defence, and the third highest is take-away food service.

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<sup>27</sup> WaterNSW. 11 January 2019. Namoi Valley Water Allocation Update.

<sup>28</sup> Ellicot, John. 1 March 2019. “Farmers say they are priced out of water auctions by miners” *The Land*. <https://www.theland.com.au/story/5931279/water-war-mines-beat-farms-at-water-auction/>

<sup>29</sup> See this slide show for an explanation of the hierarchy of water priorities. Coal mining is not specifically cited in the presentation as a critical need, but was made in personal communication to farmers present at the drought briefing. [https://www.industry.nsw.gov.au/\\_data/assets/pdf\\_file/0007/217195/Managing-water-shortages-in-NSW-Dol-public-information-sessions.PDF](https://www.industry.nsw.gov.au/_data/assets/pdf_file/0007/217195/Managing-water-shortages-in-NSW-Dol-public-information-sessions.PDF)

The Cessnock area, next door to Singleton, gives some insight into the struggles a regional community faces after a mining downturn. During a recent Senate inquiry, the Mayor of Cessnock, Bob Pynsant spoke of the long term social and environmental costs of mining in his region: "Council wants to note that not all mining impacts are direct. Community impacts of mining build over time. Impacts accrue and accumulate to leave a legacy of compounded and complex economic, social and environmental costs not fully comprehended or accounted for under the current approval or make-good requirements."<sup>30</sup>

Following the construction of large open cut coal mines like Rix's Creek, Mangoola, Wilpinjong and Maules Creek, small rural communities like Camberwell, Wybong, Wollar and Maules Creek have been depopulated. Those residents that have not been bought out by the coal mines are left stranded as the fabric of their community vanishes, including disbanded RFS units and closure of local schools and events.

The cause of this trend centres on the Government's Voluntary Land Acquisition and Mitigation Policy (VLAMP). This policy was formalised in late 2014 but its adoption made official an existing practice of the NSW Department of Planning to recommend approval of large-scale coal mining projects even if these projects were predicted to inflict noise and air pollution impacts on surrounding areas beyond the limits set down in NSW regulation and policy. Instead of requiring mines to meet these pollution standards, consent is granted to exceed them on the proviso that the mine must buy-out landholders on a specified list of properties deemed likely to experience unacceptable impacts.

One perverse consequence of this practice is the number of people denied these acquisition rights under the policy. The dividing line between those that are granted or denied acquisition rights is drawn by computer modelling of noise and dust pollution, based on parameters provided by the mining company and presented in the company's Environmental Impact Statement. If your home or more than 25% of your property is not predicted by the model to experience dust and noise beyond the allowable exceedances of the air and noise pollution standards, you cannot be granted acquisition rights by the decision-maker. These people become trapped with air and noise impacts that are intolerable, but are unable to leave. Even if the pollution effects are tolerable, the displacement of neighbours tears at the fabric of the community. Small communities are left unable to muster rural fire service crews or the critical mass of people needed to maintain other social services, like running local halls or supporting neighbours in need. Shops close because of lost customer base. People find themselves stranded, unable to sell to anyone, with their sole asset worthless and their social and community infrastructure vanished. The situation facing satellite landholders around the village of Wollar is a case in point, but so is the situation in Bulga and Maules Creek.

As a result of the policy, including prior to its formal creation in 2014, extensive areas of farmland, rural properties and villages are being emptied of people and productive activity. According to Lock the Gate's analysis of land titles in the Hunter Valley and Namoi region, coal companies own more than 702,000 acres of freehold land in these two regions - an area greater than the size of the entire Australian Capital Territory.<sup>31</sup> There is reason to believe this is an underestimate and we are aware

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<sup>30</sup> Transcript, Singleton public hearing of the House of Representatives inquiry "How the mining sector can support businesses in regional economies." 5 November 2018.

<sup>31</sup> The full details of this research and methodology is available here:  
[http://www.lockthegate.org.au/flogging\\_the\\_farm](http://www.lockthegate.org.au/flogging_the_farm)

that substantial further land purchases have occurred in the years since this research was undertaken.

In the Muswellbrook Local Government Area, coal companies own 24% of all freehold land and 23% of all mapped Biophysical Strategic Agricultural Land. In the Singleton Local Government Area, they own 15% of all freehold land and 27% of all mapped Biophysical Strategic Agricultural Land. This area includes nearly 3,000 hectares of equine critical industry cluster land and 2,225 hectares of wine industry critical industry cluster land.

In the Namoi Valley, the recent experiences of farming communities surrounding Boggabri indicate that large-scale coal mining has been disruptive and damaging and that commitments and promises about positive benefits outweighing negative environmental and social consequences have not been kept. People in the small community of a Boggabri are concerned that the scale of mining now proposed by Whitehaven is too large for the town to cope with. The 500 people, mostly men, expected to form the construction workforce for the new Vickery coal mine is 58% of the population of the town.

## Climate change

During the “critical decade” for climate change<sup>32</sup>, which comes to an end in 2020, NSW production of saleable black coal has reached 1,485 million tonnes cumulatively.<sup>33</sup> As Table 1 shows, when burnt this coal is estimated to have produced 3.5 gigatonnes of carbon dioxide from 2010-2018.

The *NSW Climate Change Policy Framework* specifically endorses the Paris Agreement on climate change. That framework also lists among NSW’s roles in climate change “Advocate for Commonwealth, COAG and international action consistent with the Paris Agreement.” “Action consistent with the Paris Agreement” means consistent with nationally determined commitments, but also consistent with the goals of the agreement, which are to limit warming to below 2 degree above pre-industrial temperatures and to investigate the more stringent temperature goal of 1.5 degrees warming.

We note that at 2 degrees warming, there will be an 87% chance each year that temperatures in the Coral Sea will be high enough to cause the kind of mass bleaching of the Great Barrier Reef we witnessed in 2016 and there would be a 77% chance each year that we would experience the extremes of heat at came in the “Angry Summer” of 2012/13.<sup>34</sup> At 2 degrees of warming, Australians can expect significant water shortages, reduced agricultural production, significant extinction of wildlife and plants and security challenges from tens of millions of people in our region of the globe being threatened by coastal flooding.<sup>35</sup>

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<sup>32</sup> Coined in Steffan, Will. *The critical decade: climate science, risks and responses*. Climate Commission Secretariat, Department of Climate Change and Energy Efficiency, 2011.

<sup>33</sup> Based on NSW saleable black coal production reported by the Office of the Chief Economist each year.

<sup>34</sup> See “Why 2 degrees of global warming is much worse for Australia than 1.5 degrees” <https://theconversation.com/why-2-of-global-warming-is-much-worse-for-australia-than-1-5-77548> based on “Australian climate extremes at 1.5 °C and 2 °C of global warming” published in *Nature Climate Change*, April 2017.

<sup>35</sup> Climate Institute Fact Sheet, April 2015

[http://www.climateinstitute.org.au/verve/resources/TCI\\_Why\\_2C\\_matters\\_Factsheet\\_290615.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_Why_2C_matters_Factsheet_290615.pdf)

Table 2: CO<sub>2</sub> from NSW coal production in global context

	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	cumulative
NSW black coal prod'n (Mt) <sup>36</sup>	157	167	185	197	196	191	198	194	1,485
Est CO <sub>2</sub> (Mt CO <sub>2</sub> )	376.8	400.8	444	472.8	470.4	458.4	475.2	465.6	3,564
Global coal-based CO <sub>2</sub> <sup>37</sup>	13,967.2	14,857.5	15,044.4	15,117.7	15,084.7	14,705.2	14,474.9	14,574.3	117,825.9
NSW share of coal-based CO <sub>2</sub>	2.7%	2.7%	2.95%	3.13%	3.12%	3.12%	3.28%	3.19%	3.02%

In the context of global carbon dioxide emissions from coal, NSW black coal has produced an increasing proportion of global emissions from coal over the last decade. Over the entire decade, cumulative emissions from burning black coal produced in New South Wales is estimated to be equivalent to 3% of global carbon dioxide emissions from coal. This is a substantial contribution to a global issue that is already causing significant damage and loss of life, and is forecast to disrupt the natural resources and weather systems that underpin New South Wales' prosperity and safety.

Consideration of the downstream emissions from exported coal has been part of the NSW coal mine assessment framework since *Gray v Minister for Planning* in 2006 and the introduction of the *State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007*. It has only been recently, since the judgement in *Gloucester Resources v Minister for Planning and Environment 2019* (aka the Rocky Hill case) that this consideration has formed part of a determination decision to withhold planning consent for a new coal mine.

Given the export orientation of NSW coal mining industry, global carbon budgets and trajectories for meeting the temperature goals for the Paris climate agreement are useful context for the committee. For example, the IPCC's Special Report on limiting warming to 1.5 degrees found that to achieve this goal of the Paris Climate Agreement, coal use would need to steeply decline to about 1-7% of global energy by 2050.<sup>38</sup> Climate Analytics has analysed the implications of the Paris Agreement for coal use and found that to reach the Paris Agreement temperature goals, global emissions from coal need to fall by around three quarters by 2030. Achieving the Paris Agreement goals would require the phase out of coal power in all OECD countries by 2030. This includes Australia and two of the largest customers of thermal coal exported from the Hunter region, South Korea and Japan. This would need to be followed by a phase out in China by 2040 and the rest of the world by 2050.<sup>39</sup> This work is in keeping with a landmark study from 2015 that found that for a scenario that keeps global warming below 2°C with at least a 50% probability, over 80% of coal reserves would have to remain unused globally, including in Australia.<sup>40</sup>

<sup>36</sup> Data from Office of the Chief Economist *Resources and Energy Quarterly* 2019.

<sup>37</sup> Data from <http://www.globalcarbonatlas.org>

<sup>38</sup> Rogelj, J et. al. "Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development." *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways*. 2018.

<sup>39</sup> Climate Analytics. Implications of the Paris Agreement for Coal Use in the Power Sector. November 2016. <https://climateanalytics.org/publications/2016/implications-of-the-paris-agreement-for-coal-use-in-the-power-sector/>

<sup>40</sup> McGlade & Ekins, "The geographical distribution of fossil fuels unused when limiting global warming to 2 °C" *Nature*. 7 January 2015,

## Part 3: Opportunities to support sustainable economic development in regional

It is important to recognise the social, cultural and economic embeddedness of coal mining in generational coal mining communities in regions like the Blue Mountains, Illawarra and the Hunter region. Coal's material role in shaping identity, a sense of place and social and cultural institutions in generational mining regions needs to be acknowledged and must be the foundation for any effective diversification strategy.

We recommend that the Committee ensure that diversification measures are continuous with the proud mining history of these regions, building on their knowledge, traditions and identities, as has occurred in Germany's Ruhr Valley.

A review of experiences of structural adjustment in other resource-intensive regions in Australia and worldwide highlights that it is crucial that adjustment processes be embedded in the community and locally-led because "the overall fortunes of regions when presented with structural change are tied to the diversity of the regional economy, or the ability of the region to diversify."<sup>41</sup>

In Muswellbrook and Singleton, lack of economic diversity means that workers currently cannot move into alternative employment while remaining in the region. Thus, when coal prices and demand fluctuated from highs of \$166 in 2008 to lows of \$83 in 2014, employment in the coal mining industry fell by 25% in the three years from 2011/12- 2014/15. This dramatic change had flow on effects across the economy of the Upper Hunter. Coal production did not fall over this period.

### Review of other experiences of structural adjustment

What we've learned from reviewing literature and meeting people from other coal mining regions is that for structural adjustment to be successful, there must be broad public participation and resources and investment support must be shared with community broadly, rather than solely being delivered to affected individuals and businesses.

A review of experiences of structural adjustment in other jurisdictions is instructive for NSW. The experiences of other mining regions provide detailed insight into specific actions with regard to supporting individuals and regions through revitalisation rather than decline with the contraction of coal mining. We would be happy to discuss these in more detail with the Committee, depending on the desired level of policy detail, but provide an introductory overview here.

### Coal communities already understand structural adjustment

It is a common feature of coal mining and resources communities that they have had previous experience of structural adjustments, either because of commodities cycles, changing global markets or government decisions like privatisation of the electricity sector. These communities have direct understanding about the successes and pitfalls of such processes and this is knowledge the NSW

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<sup>41</sup> Stephen Jones and Chai Tee, August 2017. "Experiences of Structural Change" Australian Treasury. [https://static.treasury.gov.au/uploads/sites/1/2017/08/p2017-t213722-Roundup\\_Experiences\\_Structural\\_Change.pdf](https://static.treasury.gov.au/uploads/sites/1/2017/08/p2017-t213722-Roundup_Experiences_Structural_Change.pdf)

Government and the industry need if they are to manage transition and diversification processes in a way that leads to greater sustainability, prosperity, security and opportunity.

Economic adjustment to a low-carbon future began in the Latrobe Valley before the abrupt announcement of the closure of Hazelwood power station in March 2017. In 2010, Latrobe City Council published its plan called *Positioning Latrobe City for a Low Carbon Emission Future*. The plan recognised that employment in Latrobe City at that time was “heavily reliant upon the income obtained from electricity generation and coal mining activities, with about 3,100 (or 11%) jobs linked directly to these sectors.” The position paper noted that, “Following the privatisation of the electricity sector in the 1990s, the Latrobe Valley faced substantial adjustment issues and experienced severe economic decline. Although assistance was ultimately provided through the Latrobe Valley Ministerial Taskforce process, the provision of this assistance earlier in the transition would likely have reduced the economic and social toll and shortened the transition period.”

The closure of Newcastle’s BHP steelworks in 1999 is often cited as a successful example of structural adjustment. When the steelworks closed, the “pathways” process for affected workers was complemented by the establishment of the Hunter Advantage Fund. Newcastle’s steelworkers and the city by that time had also had previous experience of decline. The late-1990’s steel closures came at the end of more than a decade of decline of the industry. Analysis by the Hunter Valley Research Association in 2011 suggested that the Newcastle and Hunter economies diversified following the first major redundancies in the 1980s and that this diversity allowed the region, viewed as a whole, to successfully adjust to the final closure of the steelworks. Overall, unemployment declined after peaking in 1999.<sup>42</sup>

The Hunter has also already had experience of the lasting effects of coal mining’s decline. In its submission to the Senate inquiry, Cessnock Council wrote about the long term social, economic and environmental legacy of mining that has left the district struggling:

Unless regions have incurred opportunities to leverage private investment, retain and sustain industries that remain productive, or are able to capture resilience through diversification of economy; many have experienced decline. Cessnock City is one which faces major social and economic devastation under post-mining legacies combined with a lack of investment in critical infrastructure to support diversification and sustain industries into the future.

Indeed, there is already a social and economic deficit in the Hunter region. The social impact assessment for an expansion proposed at the Mangoola mine in Muswellbrook shire reveals a failure of the mining industry more broadly to deliver social benefits for the area. Muswellbrook has lower levels of education attainment than NSW, higher unemployment, and ranks poorly compared to other NSW LGAs in break-and-enter, drug offences, domestic violence, and property damage. It is on the cusp of the lowest quintile for social disadvantage according to the Social Health Atlas of Australia. These challenges come off the end of a ten-fold increase in coal production in the Muswellbrook area in the first fifteen years of this century indicating that the extreme wealth captured by the mining companies has not benefited Muswellbrook broadly.

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<sup>42</sup> Stephen Jones and Chai Tee, August 2017. “Experiences of Structural Change” Australian Treasury. [https://static.treasury.gov.au/uploads/sites/1/2017/08/p2017-t213722-Roundup\\_Experiences\\_Structural\\_Change.pdf](https://static.treasury.gov.au/uploads/sites/1/2017/08/p2017-t213722-Roundup_Experiences_Structural_Change.pdf)

## Overseas experiences

It's broadly agreed globally that the leading example of socially just structural adjustment in a resource economy has taken place in Germany's Ruhr Valley over the last half a century. The consensus-based "German model" has seen the phase out of black coal mining in the Ruhr Valley since the 1970's and has transformed the regional economy. More recently the region's transformation has been taking place as a result of Government climate change policy, and the process known as *Energiewende* – energy transition – which will see the brown coal industry phased out too. To give a sense of scale, in terms of population and gross domestic product, the North-Rhine Westphalian economy, of which the Ruhr is the largest district, is comparable in size to Australia.

There are a range of research papers examining the German model of industry adjustment and how it can be applied to other regions. Like Australian coal regions, the Ruhr has faced waves of decline that began in response to economic changes, though environmental considerations have always played a role. The coal and steel-based economy went through a sharp decline in the 60's and 70's, causing massive job losses in those traditional sectors.

The coal transition process involved the supported retirement, retraining or redeployment of a huge mining workforce, which was over 250,000 people in the 1970's and is less than 5,000 now. It also invested in new initiatives in the region, shifting it to a services economy. A public sector trust called the RAG Foundation is charged with permanent financing of "the eternity tasks" which includes mine dewatering and groundwater purification and it also promotes education, science and culture in the mining regions. Crucially, the processes of change management in Westphalia were undertaken using strong and sincere participatory governance with the people affected by those changes.<sup>43</sup>

The Ruhr is now a diverse service-dominated economy and a cultural centre. One services growth area where the Ruhr and the Hunter may have parallels if a container terminal is built in Newcastle is in modern logistics. Other growth areas were in environmental diagnostic analysis, remediation project design, emission and pollutant monitoring, environmental management and project implementation.<sup>44</sup>

Nevertheless, despite being cited world-wide as a positive case study, the Ruhr region has still been saddled with high unemployment. This is a persistent common feature of former coal mining regions, even after many of the former miners would have reached retirement age or quit the workforce.

In other parts of the world, structural decline in coal mining has occurred relatively swiftly, though the effects are lasting. In southern Poland, approximately 230,000 jobs left the mining sector in the space of just nine years in response to economic pressure. In the Dutch case, government climate change policy saw 75,000 coal jobs end in a 10 year time frame.<sup>45</sup> A synthesis report examining transition experiences in coal communities in Poland, the UK, Czech Republic, the Netherlands, US and Spain concludes that:

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<sup>43</sup> See Schelelmann, Philipp. "Governance of Low-Carbon Energy System Transitions: A Case Study from North-Rhine Westphalia, Germany." *The Governance Brief*. Issue 32, 2018.

<sup>44</sup> Taylor, Robert. July 2015. "A Review of Industrial Restructuring in the Ruhr Valley and Relevant Points for China" Institute for Industrial Productivity.

<sup>45</sup> Ben Caldecott, Oliver Sartor, Thomas Spencer, Lessons from previous 'Coal Transitions' High-level Summary for Decision-makers, *IDDRI and Climate Strategies*. 2017.



*In the longer term, all of the coal transitions studies have left long-term effects on specific regions, often with high dependency ratios (non-working to working population), low educational attainment, below average wages and wage stagnation, environmental problems related to site remediation, etc. This often appears to be a legacy – at least in part – of a failure to anticipate and prepare for the transition. The scale of the challenge therefore mustn't be underestimated.*

This is consistent with local experience in Cessnock and the Latrobe Valley. If New South Wales is to prevent this legacy being repeated, active planning and preparation is crucial.

Important insights from these experiences should inform the findings of this inquiry, namely: The importance of anticipation, the length of time adjustment takes, the scale of investment needed, the importance of local conditions and local knowledge and, crucially, the degree of acceptance in the community about the need for adjustment.

The scale of investment needed is dramatic. Limburg in the Netherlands has seen one of the very few planned and reasonably successful coal mining transition processes in the world. It's been estimated that regional reinvestment in new economic activities also cost about 300-400,000€ per long-term job created.<sup>46</sup> The time horizons are beyond the scope usually allowed in contemporary Australian politics, spanning a quarter or a half a century. Crucially, the slower the change, the easier it is, which argues against deferral: "A strong theme emerging from the case studies is that when there is a failure to anticipate and prepare for the transition with sufficient lead time, 'economic realities' can overtake the process and limit the range of options for different actors."

For a model of how to undertake the participatory planning that makes for successful transition processes, we can also look at the current activities underway in Taranaki in New Zealand. Like the Hunter region, Taranaki in New Zealand is a regional economy that combines agriculture, tourism and energy resources. In April 2018, the New Zealand Government announced it would not be issuing any permits for offshore oil drilling. This unexpected announcement triggered the beginning of the Taranaki 2050 process. The oil and gas sectors contributes 40% of the regional economy in Taranaki and employs up to 60% of people in the region, directly or indirectly. Like the Hunter, the emerging hydrogen industry represents a significant new opportunity for the region to be part of New Zealand's low-emissions future. The Taranaki 2050 process was an initiative of the Regional Development Agency, Venture Taranaki, but was co-designed with the people of the region who over six months developed a Taranaki 2050 roadmap using a bottom-up, transparent and inclusive process offering the people of the region the opportunity to shape the roadmap through open and targeted workshops, surveys and working groups. A draft roadmap was developed and released for feedback in May 2019 and the final Taranaki 2050 Roadmap was adopted and launched in July 2019.

Global and local case studies highlight the importance of local conditions, and therefore, local knowledge and control, in shaping these changes: "regional revitalisation, in ideal conditions, is a bottom-up process shaped by local communities and their leaders, with in-depth knowledge of local situation."<sup>47</sup> For this to occur, there must be candid social dialogue about the causes and necessity of preparation for change. There is understandably going to be significant fear and uncertainty in any community that is facing considerable change and adjustment which is being driven by global economic forces largely outside their control. Therefore, the measures recommended by the inquiry

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<sup>46</sup> Ben Caldecott, Oliver Sartor, Thomas Spencer, Lessons from previous 'Coal Transitions' High-level Summary for Decision-makers, *IDDRI and Climate Strategies*. 2017.

<sup>47</sup> *ibid*.



and adopted by the Government need to be positive, beneficial and regionally directed, and come with an open public process, accessible to all.

### Recent Hunter region attempts at diversification planning

The NSW government has tried more than once in the last decade to plan for diversification in the Upper Hunter and a review of these attempts is useful to understanding why they have not so far been successful. An Upper Hunter Diversification Project in 2011 was supposed to have considered “the future of the region and the emerging business and employment opportunities over the next 20-25 years.” The 2011 diversification report found that of the six local government areas it considered part of the Upper Hunter (Great Lakes and Gloucester were included), Singleton and Muswellbrook had coal mining, mining services and power generation in the top three drivers of their local economies.<sup>48</sup> Like more recent projects, this one saw the future use of rehabilitated mine sites as a key aspect of diversification opportunity. The final report from the project proposed a number of actions, including establishing a diversification taskforce and “an Economic Diversification Projects Fund... to support innovative diversification projects in the region” that would be partly funded by Government, Councils and mining companies.

There has been little to no public disclosure or discussion of this work, but a taskforce of one kind was constituted a few years later and developed further work resulting in the 2017 Upper Hunter Diversification Action Plan. In the intervening time, the volume of coal being produced in the region continued to increase and economies of Singleton and Muswellbrook became even less diverse. When the 2011 diversification strategy was created, for example, direct employment in mining accounted for 30% of jobs in Singleton.<sup>49</sup> In 2018, according to the *Weathering the Storm* report, that proportion has grown to 40.6%. Mining accounted for 20% of jobs in Muswellbrook according to the 2011 diversification project and in 2018, it was 31%.

In 2014, the Hunter Research Foundation unsurprisingly found in its report on Upper Hunter Economic Indicators that the region had a “high level of dependence” on coal mining. At that time, a downturn in coal prices had led to thousands of job losses in the mining sector. The HRF reflected that “The threat posed by the Upper Hunter Region economy’s exposure to coal mining and power generation as the key employment sectors, is creating concern for local businesses, and State and local government planners.”<sup>50</sup>

In 2016, the Department of Premier and Cabinet developed the Upper Hunter Scenarios Project that fed into the creation of the *Upper Hunter Diversification Action Plan 2017*. The scenarios report looked into the future of the major industries of the region: mining, energy generation, agriculture and tourism. One key weakness of this plan is that the scenario for coal mining is based on World Coal Association material that uses the WEO “New Policies Scenario.” That is, despite the NSW Government’s stated commitment to the Paris climate agreement, the Government’s current “diversification plan” for the Upper Hunter assumes that the temperature goals of that agreement will not be met and the Upper Hunter, and the rest of the state, are heading towards catastrophic climate change.

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<sup>48</sup> Upper Hunter Economic Diversification Project March 2011. Report 2 of 3: Directions and Opportunities Report

<sup>49</sup> Upper Hunter Economic Diversification Project. Report 2 of 3: Directions and Opportunities Report

<sup>50</sup> “Upper Hunter planning required” March 2014. HVRF.

[http://www.hrf.com.au/uploads/OpEd\\_Upper\\_Hunter\\_March2014.pdf](http://www.hrf.com.au/uploads/OpEd_Upper_Hunter_March2014.pdf)

The scenarios project led to the adoption of the *Upper Hunter Diversification Action Plan* in 2017. This plan accepts the need for “sustainable economic transition” for the Hunter region in part because of a 33% decline in coal mining jobs and the planned closure of Bayswater and Liddell power stations, but also because of the water security risks identified in this submission and because “Open cut mining operations are fragmenting highly productive industries and lands” and “Land use uncertainty is impacting on investment in diversified industries.” A key weakness of the plan was though it identified land use conflict as an issue affecting non-mining industries in the region, no actions or policies were developed or proposed to resolve that conflict.

The process of developing this plan was also severely weakened by a failure to include civil society or the wider public in the dialogue and development of the plan or its implementation and a lack of commitment to policy change and financial investment from the state government. The “Upper Hunter Industry Leaders’ Forums” was an government-industry collaboration, including industry associations and companies involved in the region’s major industries, but no civil society organisations. The plan did not engage members of the public in its development or implementation and most people in the region, including those whose livelihoods currently depend on the coal mining industry are unaware of its existence. Very few people in the Hunter region know that this plan exists. This closed-shop approach has meant the Hunter has so far failed to establish one of the key pre-conditions for successful structural adjustment: public acceptance that such adjustment is necessary.

The Hunter Renewal project, which we describe in more detail below, was established to overcome this silence and denial in the public sphere. This inquiry is another opportunity to do that, which is why we recommend conducting public hearings in Newcastle and Singleton and involvement of the community in the diversification process.

## Options for diversification

Local and regional particularities can and must be identified that provide options for diversification in NSW mining communities. In the Hunter region, some obvious assets and opportunities stand out. Firstly, the Port of Newcastle already provides global access to markets for regional producers. The Port has outlined an ambitious agenda that can drive diversification in the region with the right policy and support. This includes green hydrogen exports and “green” steel development, as well as the development of a container terminal that can greatly expand opportunities for food and industrial manufacturing. Analysis of the economic potential of creating a container terminal at the Port of Newcastle indicates that it could create over 4,600 jobs “in diverse industries across the region, such as transport, manufacturing, agriculture, services and construction. Lower freight costs will stimulate \$800 million in additional exports in industries such as agriculture, food processing and manufacturing by 2050.”<sup>51</sup> Other assets include the rail network, high voltage transmission lines and existing expertise in engineering and logistics.

The *Weathering the Storm* report considered a number of options for diversification of the Hunter’s economy, building on the region’s existing strengths, skills and assets. The report identified a positive transition scenario which sees 595 more jobs created than would be lost from coal mining and a positive direct change in local wages and salaries of some \$35m in 2040.

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<sup>51</sup> AlphaBeta, December 2018. *Global Gateway for NSW: the economic impact of a container terminal at the Port of Newcastle*. Prepared for the Port of Newcastle.

A range of approaches was used to identify options for structural adjustment, including where the Hunter already has comparative advantage, and where the region imports products that could be made locally. The positive adjustment scenario is based on the modelling of the following:

1. The potential for agriculture (particularly grape growing, horse farming and poultry farming) to provide new employment and income using land currently occupied by coal mining.
2. The replacement of Bayswater and Liddell power stations with renewable energy and storage of the same capacity.
3. Future expectations for tourism, manufacturing, transport and warehousing based on extrapolating growth rates and trends.
4. The continuous development of a renewable energy industry which exports renewable energy products and skills to other regions.
5. Environmental remediation, especially mine rehabilitation, which provides opportunities to transfer mining workforce skills in heavy and civil engineering.

The benefits of large expenditures on renewable energy and remediation will be greater where the income and supply-chain effects are retained within the region, which suggests the need for large-scale subsidisation of growth industries to support the renewable energy and remediation plans.

This last point is important. In past experiences of structural adjustment and regional development of new industries, Government support has been critical. For example, the Wran Government's decision in the 1980's to offset employment losses from structural adjustment in the steel industry by transferring the state's major bulk grain export facility from Glebe Island to Port Kembla. Currently, large scale renewable energy projects are predominately being built in areas with the most abundant solar and wind resources west of the divide, the State Government has hampered the efforts of the privatised Port of Newcastle to diversify and agricultural growth is constrained by water insecurity and the uncertainty of extensive coal and gas exploration licences affecting mapped strategic agricultural land.

## Conclusion

Hitherto, the environmental and social impacts of resource extraction have been accepted as a necessary evil for the greater good these resources have contributed to local and regional communities and New South Wales more broadly. The contribution of coal mining to the social and cultural fabric of the Hunter region is part of a longer, generational history of coal miners and their communities using their labour to bring up the fuel that has driven economic development for two centuries while at the same time striving for social and civil protections and rights that we all now enjoy. With the advent of technologies that can cheaply and reliably produce and store energy without the need for resource extraction, the environmental and social damage inflicted by the mining industry makes less sense. The countries that purchase coal from Australia face the same choices we do and are opting for energy options that use less water, do not create air pollution and do not require costly fuel burning.

There is now the opportunity and need for New South Wales to invest in the communities that have contributed so much to New South Wales, by locating new jobs and opportunities in new industries in coal mining communities.

Previous structural adjustment processes here and overseas have demonstrated that such changes result in lasting negative consequences if communities are not provided with honest information about the scale of the threats they face, not given the opportunity to lead and not provided with the resources to develop positive alternative economic opportunities.

## Recommendations

1. That the Committee hold public hearings in coal-dependent regions and regions experiencing renewable energy development including hearings in Newcastle, Singleton and the state's North West;
2. Review existing government funding initiatives, including Snowy Hydro, and prioritise funding towards the Hunter Valley within a diversification framework;
3. That NSW establish a Hunter Regional Diversification Taskforce, with carriage of a \$2 billion fund to invest in diversification projects in the Hunter region;
4. That this taskforce be comprised of a broad cross-section of the community, be based in the Hunter region and conduct public engagement and consultation in the development of its plans and programs;
5. That a funding mechanism be established to ensure that mining companies contribute at least half of the cost of diversification initiatives;
6. That the framework for mine rehabilitation be reformed to ensure the highest standard of mine rehabilitation is undertaken in a coherent regional framework and to maximise the regional job opportunities;
7. That the NSW Government undertake research to investigate:
  - a. New South Wales' energy needs and the most environmentally low-impact and affordable pathway to secure those needs;
  - b. the trajectory for coal supply exported from New South Wales and global coal market decline consistent with carbon budgets for meeting the goals of the Paris Climate Agreement;
  - c. Measures and incentives to encourage fuel switching from gas to renewable energy, mapping out the potential for renewable energy to support revitalised manufacturing;
8. The NSW Government should remove impediments to the creation of a container terminal at the Port of Newcastle.
9. The NSW Government should reject the proposed Narrabri CSG project as it will lock in high gas prices and do considerable environmental and economic damage.

**Attachments included with submission**

*Weathering the storm: The case for transforming the Hunter Valley*, Western Sydney University Business School, 2019