Blueprint Institute

From the ground up

A Blueprint for economic diversification in regional Australia

Powering the next boom: Part 2

Contents

This series

This paper is part of our Climate & Energy initiative, and the second instalment in our Powering the next boom: Priorities for energy reform in the coming decade, launched in October 2020. The series began with a frank assessment of Australia's lackluster progress on emissions reductions to date, as well as the challenges and opportunities we face in decarbonising our energy sector in the coming decades. Much has changed in a year, but Australia's journey to articulating a national strategy on climate and energy policy is far from complete. This paper continues to lay out our blueprint for a national climate and energy policy.

About Blueprint Institute

Every great achievement starts with a blueprint.

Blueprint Institute is an independent public policy think tank established in the era of COVID-19, in which Australians have witnessed how tired ideologies have been eclipsed by a sense of urgency, pragmatism, and bipartisanship. The challenges our nation faces go beyond partisan politics. We have a once-in-a-generation opportunity to rethink and recast Australia to be more balanced, prosperous, resilient, and sustainable. We design blueprints for practical action as a nudge in the right direction.

For more information on the institute please visit our website - blueprintinstitute.org.au

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Summary

Coal mining communities, and those that house our coal-fired generators, have long been the backbone of the Australian economy. These communities have supplied power to our homes, provided employment to millions of Australians, and brought foreign capital to our shores.

But, a massive change is already underway in our regions.

Coal-fired generators are rapidly closing—unviable in the face of competition from cheaper renewable sources of electricity. And globally, the days of insatiable demand for our coal exports are numbered. Though timelines vary by sector, and depend on dynamic global policy settings, jobs in these industries will not survive as the world shifts to a net-zero future.

It's in no one's interest to prop up industries that will inevitably fail. But the costs of decarbonisation should not be borne solely by the communities that rely on emissions-intensive industries. Over 50,000 Australian jobs depend directly on coal in the domestic and international market, along with another 120,000 indirectly tied to the industry.

Government has a responsibility to ensure the cost of decarbonisation does not fall disproportionately on the shoulders of regional Australians, because when regional Australia does well, all Australians do well.

Our Blueprint for regional Australia has three components. Australia must:

1. Empower communities

Establishing coal adaptation authorities, in regions which currently rely on coal mining or coal-fired generators to fuel their local economies, can empower regional Australians to deal with obstacles and seize the opportunities presented by a changing energy landscape. Serious funding can do justice to this effort. We propose providing authorities with $20 million of initial funding and five percent of ongoing coal royalties. With 10,000 workers across Australia at risk during the energy transition over the next decade, beginning to grow funds to support them and their communities represents prudent and cost-effective forward planning.

2. Renew economies

Developing a national coalfield and infrastructure renewal and repurpose strategy can ensure that regions can adapt and pivot toward new opportunities using their existing assets. Existing infrastructure should benefit communities economically and socially after mines and plants cease operations. Owners and operators must develop innovative regeneration plans for sites, with the Federal Government matching private investment to support adaptation. Other substantive opportunities for these regions exist, including via renewable energy zones, critical minerals, start-up incubators, and expanded finance and market access for regional carbon sequestration.

3. Support workers

Well-designed income insurance, early retirement packages, and job search and retraining services have been shown to be powerful tools to drive gainful employment for those who have taken the brunt of a shifting energy market. Governments could mandate operators develop proactive plans for worker displacement, which could be coordinated by newly formed coal adaptation authorities. Short-term wage subsidies should also be available as a last resort.

Critically important is the way in which these policies are introduced. Lessons from the success and failures of local and international examples are clear. Policies should be **proactive**—planned and implemented as early as possible. They should be **coordinated**—involving a wide range of impacted stakeholders. They should be **targeted** to local communities, rather than a one-size-fits all approach. And they should be **diversified**—supporting both labour demand and supply, and **multiplicative**—drawing in private funding and kick-starting growth.

Introduction

As the economy changes in a post-COVID world, and traditional industries begin to face new challenges, the government must give regional Australians the support and freedom they need to prosper. Abundant opportunities exist for regional Australian businesses, manufacturers, and industries to create new jobs and profit from new technologies, new demand for new materials, and new export markets. To help these industries thrive in the regions that need it most, governments have a responsibility to direct adequate support where it is required.

There is a feasible and necessary alternative to the two extremes of blind support for declining industries or government disregard of these regions. Economically rational policy that builds on past lessons from Australia and overseas, and is implemented proactively, can facilitate the transformation of the coal regions into centres for new productive industry. No policy is a silver bullet: structural change will always place strain on communities and have speed bumps. But denying the reality of this change is worse.

To believe that the market will be the sole solution to Australia's decarbonisation is foolhardy. As is assuming effective policies can be implemented after-the-fact. There are a litany of examples of the pitfalls of reactionary policy after a coal-fired generator closure and we outline many below. But, by drawing on domestic and international examples, governments can curate effective policy to lift the burden off individual workers and empower communities to drive local and sustainable economic diversification.

Not all coal jobs will disappear overnight. Our coal-fired generators and the thermal coal mines which supply them will likely be the first to go. Thermal coal exports will follow, as the global uptake of renewable energy gathers speed. Metallurgical coal is a key component of steel production across the world, and thus is afforded more stability. So a policy priority is to ensure workers in thermal coal have proactive and realistic opportunities for redeployment well before the world's last generators close. The framework we propose can then also be deployed to support an effective response to the displacement of metallurgical coal workers and other structural changes in the years ahead.

The task for governments is to ensure that regional businesses, industries, and people are empowered to embrace new opportunities where long-term profits, jobs, and opportunities await. Without proper support, many communities and individuals across Australia will feel the loss of coal and the jobs it provides deeply. The goal is not to prop up unsustainable industries, but rather prevent a handful of communities from shouldering the weight of a shifting national energy grid. A range of proactive policies will help communities to not only navigate decarbonisation, but also foster prosperity far into the future.

To develop a set of high-impact recommendations for Australia, the Blueprint Institute conducted detailed analysis of the specific issues faced by our regions with coal assets, identifying the specific challenges and opportunities each region is facing, reviewing demographic data, and interviewing impacted individuals to understand the specific context of each region. A detailed assessment was conducted of previous policies—both within Australia as well as internationally, identifying key lessons from past failures and success. This research was supplemented by the Blueprint Institute's ongoing research focussed on identifying economic growth opportunities for Australia, and the emerging and anticipated impacts of the changing economics of energy sources, both internationally and domestically.

The paper leads off with our Blueprint for regional economic diversification—a discussion of pragmatic and proven policy recommendations for how Australia can support our coal-producing regions to diversify and create sustained growth and opportunity. This is followed by an explanation of why impacted regions require an urgent policy response, and the nature of the specific challenges each region faces. The final section details the evidence base for these recommendations—a synthesis of a comprehensive global and local review of relevant policies.

A Blueprint for economic diversification

Drawing on lessons learned from domestic and international case studies, our Blueprint for regional economic diversification calls for multiple policy responses; not for a silver bullet, but silver buckshot. To ask for less or to offer simplistic solutions would be denying the complexity of the challenge that confronts us. The following policies form the basis of our blueprint for successful regional adaptation and diversification. As we face the challenges ahead we must empower communities, renew economies, and support workers.

1. Empower Communities

Any policy proposal with a hope of galvanising local support must be owned and determined locally. Australia's regions are a complex adaptive system, and each area is unique in its economy, geography, and demographics.

To account for regional differences, **coal adaptation authorities** should be established in communities within regions which currently rely on coal mining or coal-fired generators to fuel their local economies. These authorities would be staffed primarily by respected locals and tasked with studying issues relating to the energy shift while continuously engaging with communities, and developing and iterating strategies to respond appropriately. They would maintain distinct statutory independence while working with existing governments and agencies where appropriate.

Regional development efforts domestically and internationally have often been plagued by overlap and inconsistency. This proposal centres on community empowerment and decentralisation of decision-making and avoids a 'one-size-fits-all' approach being applied by distant bureaucrats without knowledge of the local context.

The knowledge, networks, credibility, and capacity of local leadership is essential to drive meaningful adaptation. Local governments with ongoing administrative responsibilities require support and are complemented by institutions tasked with aiding structural adjustment. Without additional support, they cannot be expected to drive the extensive public and private collaboration necessary to facilitate legitimate diversification.

Unfortunately, existing local agencies such as the 52 Regional Development Australia Committees and 56 Natural Resource Management Organisations nationwide are not fit-for-purpose and are insufficiently resourced to have a serious impact.

These authorities would also be responsible for conducting a thorough fact-finding mission, studying local industry and demographics to ensure that any recommendations are data-driven. By establishing employment information hubs, they would engage with the workers anticipated to be directly impacted. Hiring costs have a tangible impact on employment; the hub's coordination function would lower hiring costs for firms and job seeking costs for workers. This is likely to boost the total number of people employed in addition to making life easier for those seeking re-employment.

Adaptation authorities would be responsible for facilitating the implementation of policies on the ground, monitoring their progress, studying their impact, and responding to community feedback over time. This would enable those with the lived experience of an area to make informed and effective decisions.

Providing authorities with $20 million of initial funding and five percent of ongoing coal royalties

Each authority would be set up with $20 million from the Federal Government to cover all initial staffing, operations, and initiatives. But ongoing revenue streams would flow from the state level. For too long, state governments across Australia have relied upon our regions to balance their

budgets, redistributing the resources hard-won in mining communities to other areas. It's only fair that states return a dividend of those funds to assist coal workers in their hour of need. As some of our regional economies begin to feel the effects of the energy transformation, 5% of the royalties collected by state governments from the coal mining sector should be fed back into those communities that have formed the backbone of Australian economic growth.

The advantage of such a plan is that the value of coal royalties collected by each state is approximately proportional to the number of coal workers located within them. In states where coal royalties are minimal, additional funding approaches may be required. A similar approach is evident in the NSW Royalties for Rejuvenation program introduced in April 2021. See Table 1 for an example funding year.

An allocation of annual royalties on an ongoing basis would generate a substantial fund in proportion to the relative size of coal in the state economy. These revenues would be collected and held in state coal adaptation funds, located within each state's regional development departments, until required by local adaptation authorities.

These figures represent modest and justifiable contributions when compared to other domestic and international examples. With 10,000 workers across Australia at risk during the energy transition over the next decade, beginning to grow funds to support them and their communities represents prudent and cost-effective forward planning.

State	Coal Royalties collected in 2019-20	Royalties for Coal Adaptation Authorities
Queensland	$3.5 billion	$175 million
New South Wales	$1.6 billion	$80 million
Victoria	$78 million	$3.9 million

Table 1 Royalty payments from the coal mining sector to relevant state governments in 2019-20
Source Minerals Council of Australia

2. Renew Economies

Australia must renew regional economies by developing a national coalfield and infrastructure renewal and repurpose strategy.

Helping workers transfer to new jobs is only possible if new jobs exist in the first place. Fortunately, as coal-fired generators and coal mines close over the next three or so decades, the infrastructure that they rely upon will be freed up for new industries to use. Numerous inventive projects are being planned to ensure that the valuable infrastructure that has long supported the Australian economy can be reused, repurposed, and renewed to provide value and jobs to the regions. We now require federal coordination to ensure the best projects are enabled to succeed.

The Federal Government should consider providing financial and administrative support to coal mine and generator operators to develop renewal strategies for their infrastructure. Blueprint proposes that five years before mine or generator closure, operators must be mandated to conduct stakeholder engagement and subsequently determine the most economically and socially beneficial use of their infrastructure after close-down. To support innovative regeneration plans, the Federal Government would match private investment, from the operator or otherwise, up to a value of $100 million per asset. Such a figure is in line with existing government support for energy infrastructure investments, though in this case the benefits for local communities would be far greater.

Countless examples of possible projects exist, such as a data centre proposal set to transform decommissioned coal-fired generators and create 2,642 local jobs in Becker, Minnesota, to the conversion of generators in Burlington, Vermont, Chicago, Illinois, and Alexandria, Virginia into vibrant community centres of retail and hospitality. In Australia, the Woodlawn Eco-Precinct is built on a repurposed mineral mine in south-east New South Wales, and AGL is planning to repurpose its Liddell power station into a renewable energy hub for solar storage systems, grid-scale batteries, and a waste-to-energy facility.

Renewable energy zones

Alongside such repurposing projects, the Federal Government could financially support the states to turbocharge development of renewable energy zones to assist regional communities to pivot away from fossil fuels and onto industries that have far higher future potential. The Federal Government could leverage the States' efforts by predicating financial support for these infrastructure projects on beneficial regional economic development outcomes.

Already, states are leading the way with various renewable energy zones well underway. For example, NSW is developing new zones including in the Hunter and Central Coast regions which would bring in around $32 billion in private investment, 6,300 construction jobs and 2,800 ongoing jobs to regional areas by 2030. The New England Renewable Energy Zone has already attracted overwhelming interest from private investors, with 80 registrations offering to cover more than four times the available capacity.

These zones would not only guarantee direct jobs in impacted regions, but would produce the cheap, clean electricity required to sustain a variety of new and existing industries. These include green aluminium, steel, ammonia and hydrogen, sustainable synthetic fuel production, controlled environmental horticulture, transport and logistics, and enabling technologies. Research also shows that for every $1 million invested in large renewable projects, 12 new jobs could be created economy-wide for electricians, roofers, steel workers, machinists, engineers, truck drivers, research scientists, lawyers, accountants, administrative assistants and other roles. And short-term construction jobs could reach over 100,000.

Further government support should prioritise regional areas which will be affected by the energy transition with a raft of other innovative policy solutions, such as:

Supporting the development of critical minerals mining

Australia possesses a significant, untapped supply of the critical commodities necessary to produce clean technologies. Rare and critical minerals such as lithium and cobalt boast potential market sizes of $160 billion and $13.6 billion respectively by 2030. Investing more heavily into identifying and mining these deposits is a promising opportunity. Not every job will be immediately accessible to the skill set of retrenched coal workers. But there is no shortage of emerging opportunities for resilient regions to welcome these workers back into freshly diversified economies that can capitalise on the boom of demand for these minerals.

Starting up incubators in regional communities with favourable seed funding

Innovation is the way of the future—in energy, in agriculture, in technology, and beyond. The combination of research and development with entrepreneurial local start-ups can create entirely new businesses which will support the industries mentioned above. Business incubators could help to resource and mentor small business owners and emerging entrepreneurs, as well as providing favourable loans to get the best ideas off the ground. By taking equity in the companies they invest in, these incubators could learn from the world-leading Israel Innovation Authority. State governments could trial an innovation authority within one regional coal adaptation authority. A fund of $10 million per authority carefully allocated could attract private capital on a scale transformative to local communities. It is no surprise that other nations are considering these high-growth opportunities in their own diversification efforts.

Expanding the Emissions Reduction Fund to $10 billion by 2030 to support regional Australia

The Government's Emissions Reduction Fund plays an important role in incentivising carbon sequestration at least cost, and with that comes market opportunity. This market is lucrative for regional Australia, as vegetation, savanna burning, and agriculture account for over 80% of the credits sold. Unfortunately though, the effectiveness of the scheme has stagnated as its funding has dried up. In the first three Emissions Reduction Fund auctions, an average of 48 million tonnes of carbon abatement were purchased. In the last three, the average has plunged to five million. With current funding, the Emissions Reduction Fund pays $16 per tonne of abatement, which constrains its impact to small-scale endeavours.

A fivefold increase in current funding to $10 billion by 2030 would provide regional Australia with the foundations required to become a leader in a rapidly growing and expanding global industry. Under this plan, billions of dollars would be made available to farmers, Indigenous organisations, and carbon entrepreneurs in regional Australia.

3. Support workers

A raft of short-term labour market supports may be required in our coal-power communities. But they should be a last resort—ensuring that market forces are not distorted when the end doesn't justify the means. Unsurprisingly, discussions with coal employees reveal a strong desire for clarity and certainty over their job prospects. That's why flexible labour market programs that provide assurance to workers play a critical role in successful structural adjustment.

For those workers likely to be affected by the closure of coal-fired generators, government should place as much responsibility as possible back on coal generators to smooth their exit gracefully. This would disincentivize the run-until-fail approach with aging generators and ensure orderly closures. The evidence from Spain and Germany shows how doing so can smooth employment shifts for a substantial proportion of employees. Civil penalties imposed on stations closing earlier than the current required 42-month closure notice period should increase and be expanded to ensure that if this does happen, operators pick up the significant obligations to help their workers.

This should be complemented by a proactive plan for redundant workers, prepared before the closure date—something the AEMC could mandate all operators to put in place. This would allow many to find short- to medium-term direct reemployment even before plants close. For example, through reallocation to other plants or decontamination, restoration, and conversion ventures.

Local authorities will play a key role in working alongside coal generators and potential new private sector employers and investors to model projected timelines for redundancies and to provide transitional services. While each authority retains the liberty and responsibility to design the most effective programs with its respective community, we expect common approaches to emerge and federal funds should be made available for proposals across four key areas:

Short-term transitional income insurance for the first six months.

Transitional income insurance support could mimic the tiered JobMatcher system Blueprint has previously advocated for as standard best practice economy-wide (see Figure 1). This represents an opportunity to trial the system on a limited scale. Under the system, immediate support for the first six months of unemployment would give individuals the economic freedom to find high-quality job matches in the period following their exit from coal. Such a policy avoids the adverse incentives to remain outside of the workforce for longer than necessary and the requirement to complete unhelpful reskilling programs only to guarantee eligibility for concurrent income subsidies. Instead, individuals are financially enabled to choose whether they apply for a new job, retire, relocate, or undergo targeted retraining.

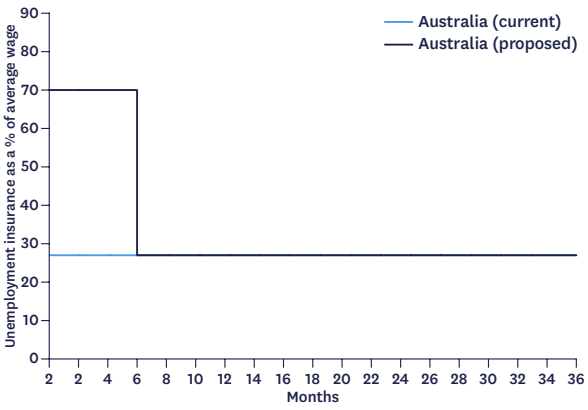


Figure 1 JobMatcher support compared to current unemployment support

Source Blueprint Institute Analysis

Expanded financial incentives for part- or full-time certification and upskilling through existing external providers.

Displaced workers need more than available jobs, they need the right skills to do them. The capacity to signal relevant skills and competencies is a crucial foundation for reemployment. Universities, TAFEs, and other certified VET trainers already provide a wide variety of opportunities for certification and upskilling. Instead of trying to deliver competing options internally, coal adaptation authorities

would advise workers on existing courses and work with external providers to fill any gaps in the market with newly designed qualifications. They would also liaise with local employers to discern the most demanded skills and to emphasise the value of workers' qualifications. Advertising opportunities through workplaces, certifying existing skills on the job, and allowing workers the flexibility to learn proactively while still employed all make an enormous difference to the success of retraining initiatives.

Wage subsidies to incentivise employment expansion.

Carefully targeted wage subsidies could be extended to firms who hire displaced coal workers in regions suffering a sufficiently large shock to employment. This would provide a clear signal of government commitment to revitalising the regions and would help overcome the first-mover coordination problem between interested businesses. By sweetening the deal, especially for labour-intensive firms, these subsidies would push businesses making threshold decisions to set up locally in the short- to medium-term, while aiming to drive self-sustaining activity in the medium to long run. This policy could also be expanded to support innovation by supporting start-ups in regional australia.

Last-resort, early retirement packages for workers aged over 60.

Some workers approaching the natural end of their career may not wish to pursue reemployment. In extreme circumstances where local authorities can demonstrate a lack of other options, voluntary early retirement packages, supported by coal-fired generators and mine operators, could be considered. All payments would be means-tested based on assets and income.

Australia's coal industry & communities

Key facts

- Currently, over 50,000 Australians are directly employed in coal, and another 120,000 indirectly.
- Coal-fired generators employ 4,500 direct workers, with over 5,000 jobs in thermal coal mining reliant on generator demand for their product.
- Coal is Australia's second-largest export, generating export revenue of $55 billion; in 2020, and contributing over $5 billion to state government revenue.
- Coal-fired power provides approximately 56% of power generation in the National Electricity Market.
- Since 2000, the number of coal-fired generators has fallen from 26 to 19. By 2050, only two are expected to remain.

The share of coal-fired power in Australia's electricity mix is inevitably in decline. As outlined in the Blueprint report Phasing down gracefully: Halving electricity emissions this decade, coal-fired stations are going broke, unable to compete with the growth of cheaper renewable alternatives. In Queensland, for example, a fall in wholesale electricity prices dented the profitability of coal-fired generators. In 2019 alone, combined profits of generators run by the Queensland government collapsed by 88%. This is not a blip—it is part of a much wider ongoing trend. Soon, coal-fired generation will be part of Australia's past.

Domestic coal-fired generation employs just over 10,000 permanent workers within generators and the thermal coal mines that feed them. The inevitable closure of generators over the next 30 years will displace workers and dampen the job market in these regions. Some generator workers may be hired to assist in temporary, post-closure remediation efforts or find similar work at other stations before they, too, are shut down.

But band-aid solutions are inadequate. Proper planning is key to ensure that this retrenchment doesn't severely impact the stability and economic viability of regional communities.

Perhaps more worryingly, structural decarbonisation around the world puts all of Australia's remaining coal mining jobs at risk. These include jobs involved in mining thermal coal, which supply the world's coal-fired generators, and those involved in mining metallurgical coal, which helps produce the world's steel. While coal mining has been part of Australia's economic backbone since the resources boom of the 2000's and is currently worth $39 billion in export value alone, this projected fall in demand is likely to severely impact over 50,000 workers directly employed in the industry. A breakdown of the jobs reliant on coal is shown in Figure 2.

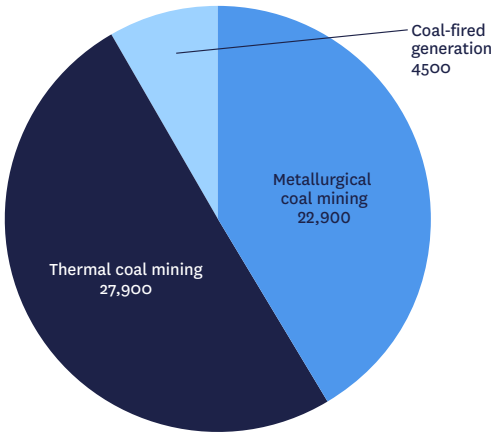


Figure 2 Sector employment by coal type
Source Labour Force Australia, ABS, Blueprint Institute Analysis

As our export markets move away from coal-fired generation, and businesses and governments attempt to find ways to produce steel without coal, these jobs are contracting at an increasing rate. And it is certain that an undeniable impact will also be felt in the wider economy, most heavily in the communities where high-paid workers from coal mines and power stations go shopping.

Immediate risk: jobs reliant on coal-fired electricity generation

Demand for thermal coal is likely to decline before that of metallurgical coal. Coal-fired electricity generation is rapidly approaching technological obsolescence. Coal power will increasingly struggle to compete in a world that has access to near-zero-marginal-cost renewable energy sources. Proof of that is fast emerging. In the past year, Stanwell Corporation, the owner of two Queensland stations, recorded a $720 million write-down in asset value due to falling wholesale energy prices. Energy Australia brought forward the closure of Yallourn power station by four years to 2028. And Delta Electricity rejected an $8.7 million Federal Government grant for a turbine upgrade to Vales Point power station, given uncertainty the plant would stay open to its forecast 2029 closure date. Even while this report was being written, EnergyAustralia announced that it will close the Mount Piper Power Station two years earlier than scheduled.

By 2050, just two of the 19 coal-fired generators currently operating in Australia are projected to remain open. Alongside these generators, those mines that supply them, which do not export their coal, will also shut down. This decline will mean that around 10,000 regional Australians will have to find other employment.

Long-term risk: jobs reliant on coal exports

Globally, coal-fired electricity capacity peaked in 2018, and the outlook for international demand seems to be in terminal decline. More than 85% of Australia's thermal coal exports are delivered to South Korea, China, and Japan (see Figure 3)—each of which now have net-zero pledges. Under the likely scenario that the world attempts to keep warming below two degrees, coal exports are forecast to decline 80% by mid-century.

Such a decline means that new thermal coal basins are now unbankable and Australian mining houses are fast exiting their thermal coal investments. BHP Billiton chose to cease its domestic thermal coal sales in 2020 and has announced plans to exit its thermal coal assets entirely. In the long term, 22,300 Australian thermal coal mining jobs are exposed to this global trend.

In contrast to the thermal coal sector, the almost 23,000 Australian jobs in metallurgical coal mining remain relatively more secure in the near term. It is expected that countries worldwide will continue to purchase metallurgical coal for use in industrial processes over the coming decades. This bodes favourably for the Australian metallurgical mining industry, which exports 99% of the metallurgical coal it digs out of the ground.

But over the next decade, alternative steel production methods are likely to challenge the future stability of our metallurgical coal exports. These methods replace coking coal with hydrogen as a reducing agent to make 'green steel'. So far, green steel production technology remains costly and does not yet pose a serious threat to traditional steelmaking methods and their suppliers. However, Europe and the US are already offering incentives for the market to expand. While green steel technology will unlikely be rolled out at scale before 2030, in the long term it will put the security of metallurgical coal mining jobs at risk.

Decarbonisation of the economy is inevitable, and it's taking coal with it. The only question is how to best equip ourselves and our regions for a new energy economy.

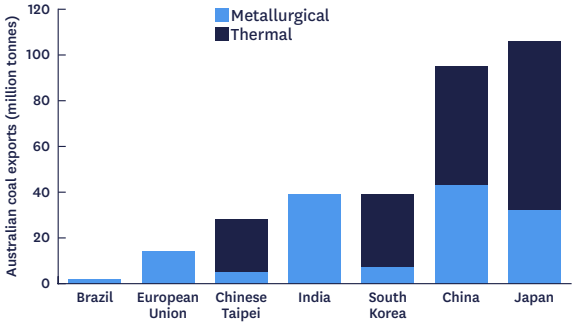


Figure 3 Australian coal exports 2019-2020

Source Resources and Energy Quarterly, Office of the Chief Economist

New opportunities on the horizon

Smart and supportive policies for regional Australia can create a multitude of new opportunities. With good planning, Australia can create new, globally competitive export opportunities. Our vast iron ore reserves and natural advantages in green hydrogen mean Australia is well-positioned to benefit as international demand for metallurgical coal declines in the long run in favour of green steel production. Fortescue Metals—one of the world's largest producers of iron ore—is due to launch the country's first green steel pilot this year in the Pilbara region of WA. A commercial-scale plant powered by wind and solar is set to follow. Such opportunities, with the right policy support, can provide new jobs and prosperity for regional Australia.

Coal jobs reside in the regions

The decline of coal-fired generation, and the eventual decline of coal mining is inevitable and the associated job losses will be uneven.

The majority of mining employment across Australia occurs in regional areas. Regional mining employees in New South Wales outnumber those in Greater Sydney by six to one. In Queensland, 69% of mining employees reside in regional locations. Similarly, coal-fired generators are predominantly located in proximity to coal mines in regional areas. Coal mining communities are concentrated around four key zones: Regional Queensland, the New South Wales Hunter Region and the Southern Coalfields, Victoria's Latrobe Valley, and the Collie Region in Western Australia.

Regional Queensland

Brisbane Hinterland

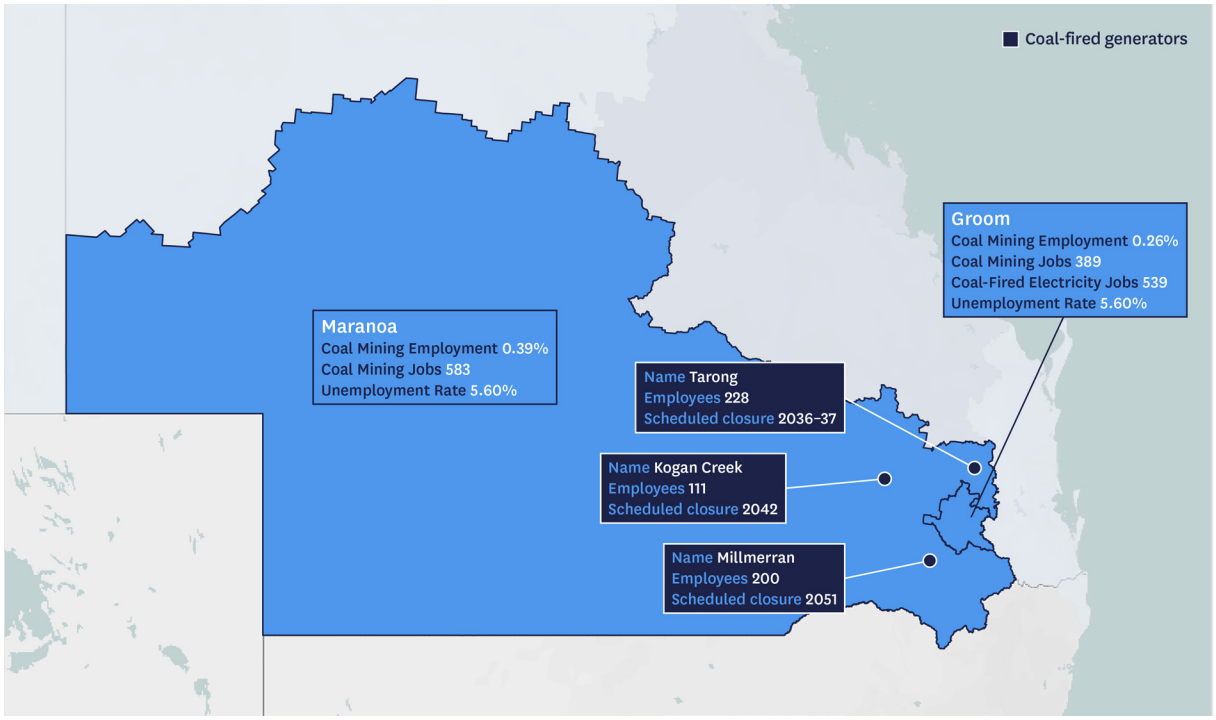


Figure 4 Brisbane Hinterland demographics and coal assets

Source Australian Bureau of Statistics, Company Websites, Blueprint Institute Analysis

Key facts

- Tarong, Millmerran, and Kogan Creek coal-fired generators produce 3,400MW of power collectively.
- The thermal coal assets of the Brisbane Hinterland employ over 1,500 workers (see Figure 4).
- The Year 12 completion rate in Millmerran is 29.4%.
- Cameby Downs coal mine has approval to extract 3.5 megatonnes of coal for export over a 75-year period—well beyond the point at which international demand wanes.
- Tourism in the Hinterland could provide new and expanding opportunities for the region.

For many decades, coal has been a vital economic pillar of the Brisbane Hinterland. The region hosts the Tarong, Millmerran, and Kogan Creek coal-fired generators, as well as several coal mines that feed them. Coal assets have been a staple of the region for so long that many have forgotten a time before them.

In Tarong, a township of about 180 people, more than 15% of the local workforce depends on coal. These jobs help maintain an unemployment rate close to the national average despite its low rates of high school completion and tertiary education. High coal wages help many of the local businesses prosper, even those not directly linked to mining.

But a future without coal is a tough reality that must be considered. The agricultural industry, although well-established within the region, does not have the capacity to employ those left behind once the generators close. There are other investments in energy infrastructure being made, but many will not have jobs that last beyond initial construction. New industry and economic diversification can help these towns prosper in the future.

Central Queensland

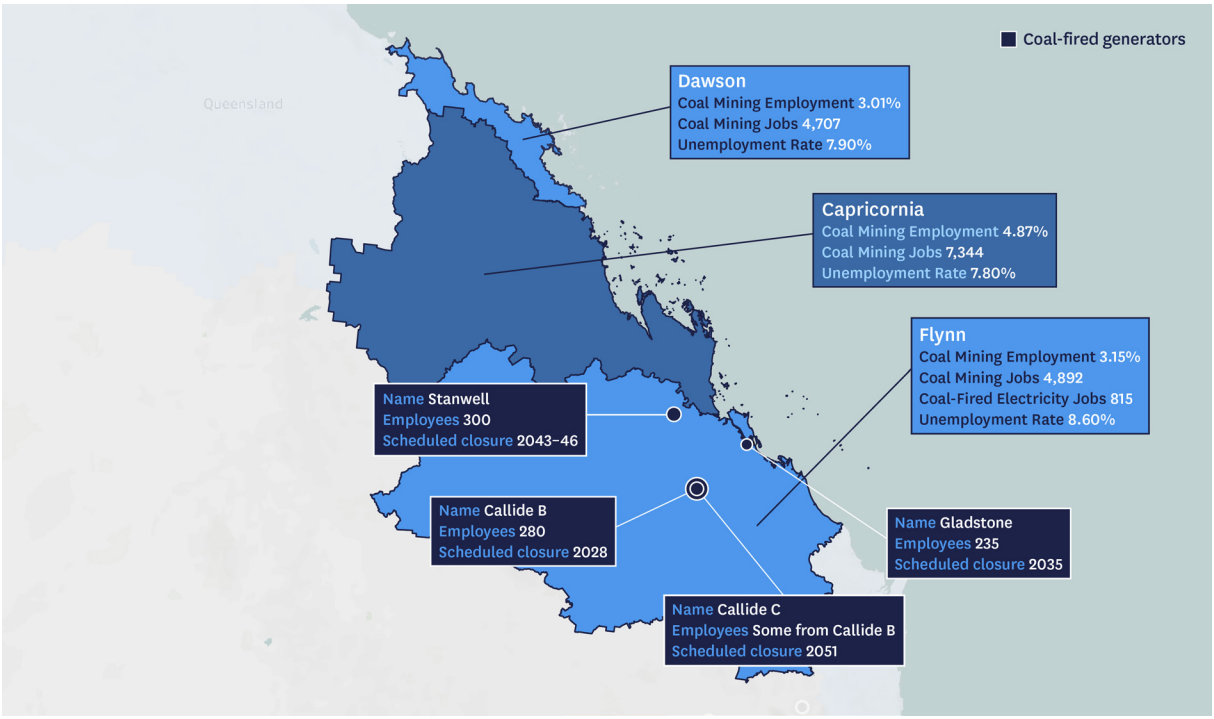


Figure 5 Northern Queensland demographics and coal assets

Source Australian Bureau of Statistics, Company Websites, Blueprint Institute Analysis

Key facts

- Coal mines and the generators they supply provide over 17,000 jobs across Central Queensland (see Figure 5).
- Metallurgical coking coal makes up 70% of coal production in the Bowen Basin.
- Coal mining is by far the biggest employer in the area, employing 25.3% of the workforce in the Bowen Basin and 21.7% in the Central Highlands.
- The Callide, Gladstone, and Stanwell coal-fired generators provide 8.3% of the national electricity market's generation capacity, equivalent to 4,600MW of power.
- Many local industries rely on coal, including alumina refineries and cementing plants, but future manufacturing opportunities could provide prosperity to the region.

In the future, some of the region's most well-known coal assets will stop producing. For the Callide and Boundary Hill coal mines this date is still far away. They are scheduled to operate until 2043 and supply the Callide B and C generators. Any surplus is exported to Asia. Timelines are different for the Gladstone generator which is scheduled to close in 2029. This brings a sense of unease to the community. According to a maintenance technician on site, many workers were attracted to the generator by job stability, and those who aren't planning to retire are willing 'to stay until they turn the lights off.' Some have been employed since they helped build the plant in the 1970s. Elsewhere, the Stanwell generator is not set to close before 2043, but in our interviews a mechanical turbine technician working there highlighted that uncertainty at Stanwell is growing as well.

That said, the prospects for the region to diversify its economy beyond coal are promising. With already established infrastructure, an international shipping port, and a skilled workforce, Gladstone has been earmarked as a major player in the future of green hydrogen. In nearby Biloela, wind resources provide potential for the town to remain an energy powerhouse. What's needed are policies to develop these new opportunities for job creation and growth.

Central Coast, New South Wales

Hunter Region

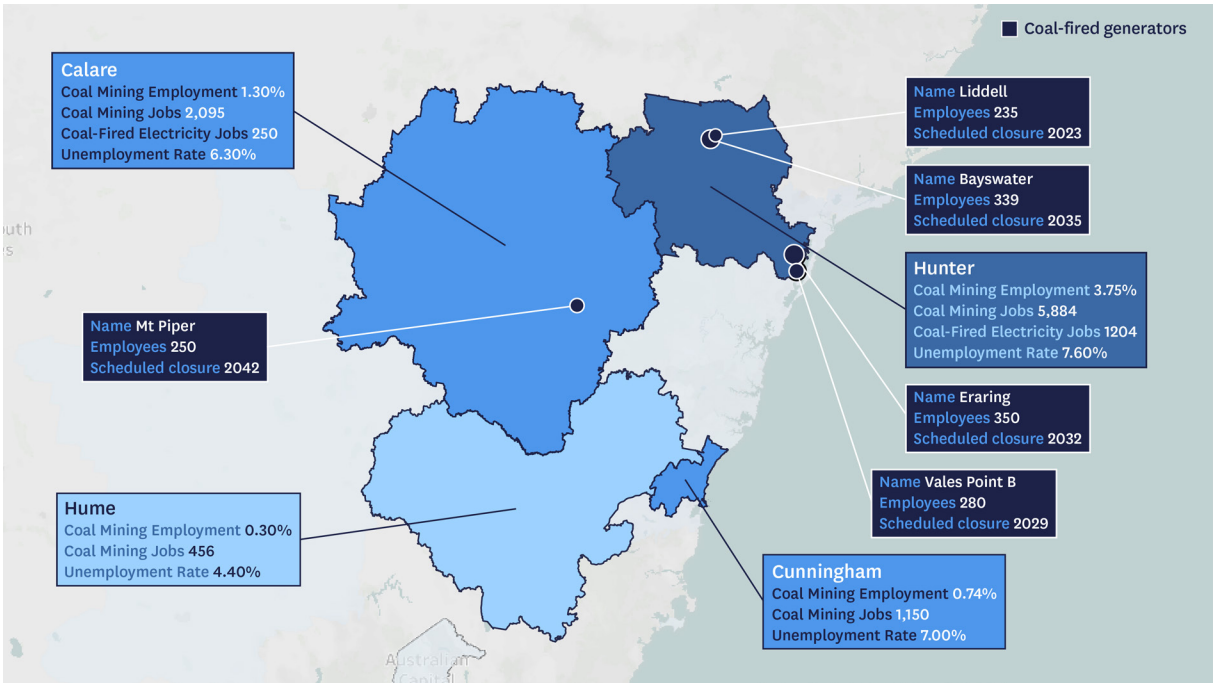


Figure 6 New South Wales demographics and coal assets

Source Australian Bureau of Statistics, Company Websites, Blueprint Institute Analysis

Key facts

- The Hunter's coal mines and generators provide over 7,000 mining jobs and support 3,400 supplier businesses in the region (see Figure 6).
- Coal accounted for 28% of the Hunter Valley's gross regional product in 2020.
- Almost 90% of the coal mined in the Hunter Valley is exported and burned in Asia.
- The five generators in Hunter and Calare supply over 40% of Australia's coal-fired power, equivalent to a staggering 100,000 megawatts of electricity.
- The Port of Newcastle is the world's largest coal export facility, transporting up to 165 million tonnes of coal across the globe each year.

Mining and heavy industry have formed a key pillar on which the Hunter Valley economy was built. Two shires in particular, Singleton and Muswellbrook, have been built around coal. Mining generates 58% of economic output and supplies 36% of jobs in the region.

With proper planning and support, both regions can adapt successfully to a different energy future. In Muswellbrook, only around 30% of students complete high school, and the percentage of people receiving government assistance is more than two times the Upper Hunter average. The phasedown of the coal industry, if poorly handled, could have a devastating impact on the community.

The retirement of all remaining generators by 2032 will be felt deeply in the broader Hunter region. Two will be shut down within the next five years, and the remaining could close sooner than anticipated. This unpredictability could have serious consequences: when coal prices fell to record lows between 2008 to 2014, a quarter of the mining workforce in the Hunter lost their jobs. Already, most mines are not operating anywhere near their approved capacity, and prospects will only worsen as global demand for thermal coal continues to decline. Calls for serious adaptation planning matter nowhere more than in the Hunter, and the region has so much to gain from renewable energy zones, and the potential to export green hydrogen through the Port of Newcastle.

Key facts

- The six underground mines in the region are NSW's only source of premium hard metallurgical coal and reach depths below 400 metres.
- The region's agriculture and small textile industry could be future drivers of growth in the region.
- Despite the many coal mines, there is little scope for increased production in the region, as new mines are largely replacing lost production from phased out old mines

The economy of Sydney's Southern Basin is driven by its agriculture, textile, timber, and wine industries. The basin also produces mostly high-quality metallurgical coal, and coal remains an important employer for the region. Over the past 150 years, mining has shaped the livelihoods of many people in the Illawarra. According to one mining employee, 'many have families who have all been coal miners: dads, uncles, and grandfathers who have been coal miners.' Any impact on the coal industry is likely to impact the whole community and their economy.

The inevitable closure of these mines will have a lasting ripple effect. Jobs will disappear, not just in coal mining, but also in the steelworks and the specialised engineering firms. An Illawara miner that we spoke with about the mine closure was concerned that the 'flow-on effect would be pretty bad' for the whole region. He noted that about 50% of mine workers may be able to fall back on their professional background as tradesmen, but many others had joined the mines straight from school. But with a plan to diversify the economy, alternative sources of employment and new opportunities can be found.

Latrobe Valley, Victoria

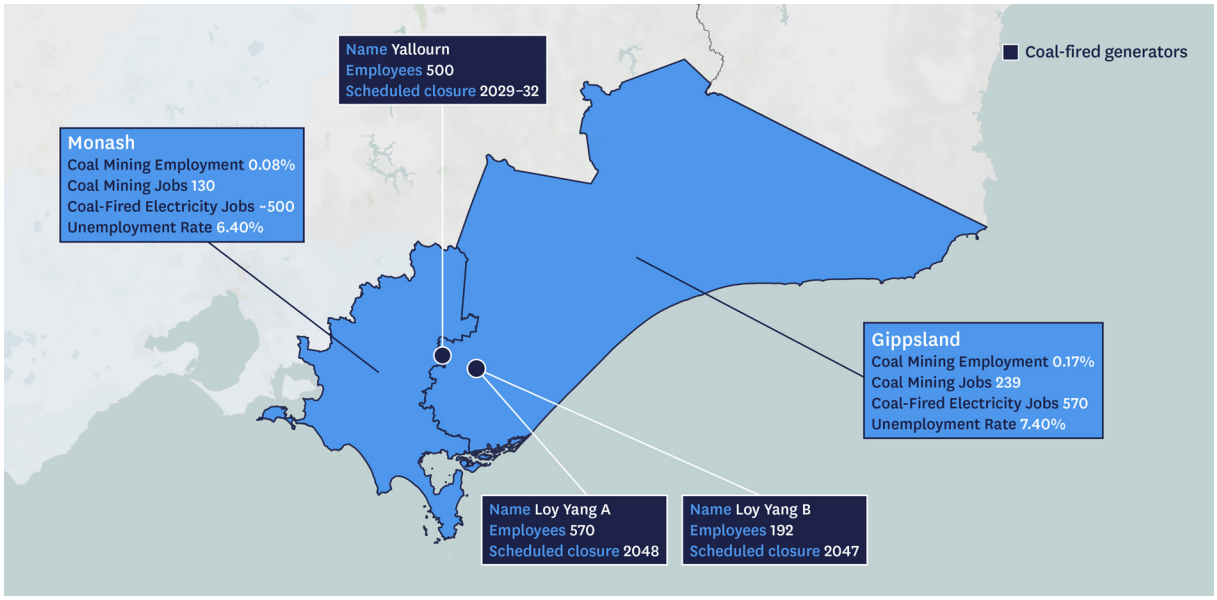


Figure 7 Latrobe Valley demographics and coal assets
Source Australian Bureau of Statistics, Company Websites, Blueprint Institute Analysis

Key facts

- 1,100 workers are directly employed in the region's coal-fired generators (see Figure 7).
- Coal in the region generates around 70% of Victoria's electricity, equivalent to almost 5,000 MW of output.
- The region has enormous brown coal reserves of 65 billion tonnes that are likely to remain in the ground as demand dries up.

The Latrobe Valley has a diverse economy including a strong retail sector, agricultural industry, and health sector. The region's biggest employer is the Latrobe Regional Hospital. Two large-scale, open-cut mines feed the three coal-fired power generators that remain following the closure of the Hazelwood generator in 2017. Yallourn, which currently provides more than 500 direct jobs, has broken down 50 times since 2017 and due to an inability to turn a profit and higher repair costs, its closure date was recently brought forward by four years to 2028. The two Loy Yang stations are currently scheduled to close in 2048, but recent resolutions by AGL shareholders cast serious doubt on this proposition. Victorian brown coal is not exported and it is not thought to be possible to do so following the State Government investigation of the prospect, so it is almost exclusively used in coal fired power stations.

In an interview with Blueprint, an ex-Hazelwood labourer explained the lack of notice workers received when Hazelwood shut. Previous announcements had forecast a 2027 closure, but an unexpected update gave workers less than six-months notice of closure. Many workers were left dazed; some had recently bought houses and some older workers had no idea how to transfer their skills into other industries. The worker said 'in the power industry, half those blokes know nothing else'.

Some proactive steps have been taken in the region, including the establishment of the Latrobe Valley Authority. Renewable energy projects can offer new employment, such as the nearby Star of the South offshore wind farm. It will employ 760 locals in construction and 200 ongoing whilst supplying 20% of Victoria's energy needs, and is in dialogue with Yallourn about workers. It has also created a register for workers interested in working on the renewable energy project.

Collie, Western Australia

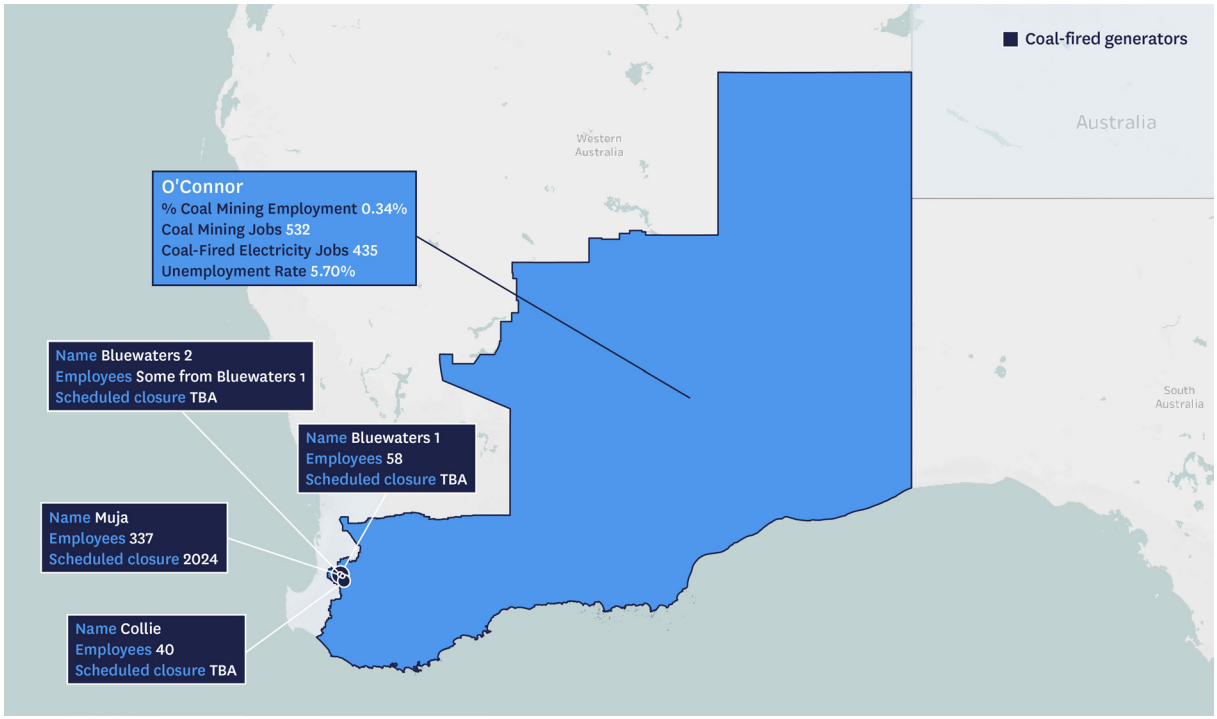


Figure 8 Collie demographics and coal assets

Source Australian Bureau of Statistics, Company Websites, Blueprint Institute Analysis

Key facts

- Collie's four coal-fired generators produce 1,500 MW of power—over a quarter of Western Australia's total electricity generation capacity.
- Coal accounts for approximately one-fifth of employment in the Collie region (see Figure 8).
- The majority of coal mined in the region is low-grade thermal coal, which is sold to the power stations with limited use for metallurgical applications.
- Innovative renewable energy projects could provide a significant amount of ongoing employment in the region.

The small town of Collie is nestled in the hills near Bunbury and not far from Mandurah; two thriving regional economies boasting tourism, retail, agriculture, wine, and creative industries. Most coal workers at Collie have worked in the coal sector for more than a decade.

One of Muja Power Station's four units is scheduled to close next year and another in 2024. More rooftop solar continues to enter the western grid and the coal generator has been operating 35% of the time.

Coal mines in the region supply the power station and will very likely wind down and close as the power station does. In 2017, some 200 workers at Griffin coal mine took a 35% pay cut to keep the mine afloat following losses of more than $50 million a year since 2011. More recently, Bluewaters' generators were written off as worthless by their owner.

A union member we spoke to from Western Australia conveyed a similar sense of unease and 'uncertainty [over] what will replace the current jobs'. Many of the local workers are experiencing mortgage stress, according to the union member. The interviewee also expressed worry that future demand for coal might slump. An increase in renewable energy production meant coal was 'not always being brought.' The worsening profitability of the mines and power stations over

the last six months had added to the anxiety in the workforce. It finally 'hit home,' the worker said, that their industry is finite.

The township still benefits from an established industrial hub with key linkages to Bunbury port, existing transmission infrastructure connections, and proximity to rich natural resources that include timber, agricultural land, and the mineral resources in the broader South West region. The job losses from the closure of Collie's coal assets will be highly localised; new sustainable industries that leverage the local workforce's existing strengths and skills can create prosperity and opportunity in the town in the future.

What works and what doesn't

Despite the challenges just described, a bright future for Australia's regions is entirely possible. But only if policymakers take action that enables regional Australians, businesses, and communities to adapt to the coming challenge.

When carefully designed and applied at the right time, policies aimed to support economic adaptation can be a catalyst for growth in regional economies. But what do sound policies look like? The World Bank offers a good starting point. To encourage regional adaptation Australia must build:

'Institutions that unite, infrastructure that connects, and interventions that target'

Infrastructure, research and development, high schools, and tertiary education are classic examples of investments that can support significant growth and enable regions to adapt to changes in circumstance. The effect of such investments is sustained even when the interventions are temporary. Studies in Germany show that local governments were able to maintain high levels of public spending long after beneficial policies had ended because their tax base had consistently improved. To be effective, policy interventions need to be combined with adequate human capital and innovation.

These results may be surprising to some. A classical view of market economics sees place-based policies as unnecessary and distortionary. Such a view argues that supporting some regions over others can block proper market signals which help to drive entrepreneurs and workers to where they generate most value.

But this overlooks the market failure that may occur when there are a lack of incentives for businesses to flock to regions with an uncertain future—much like those Australian regions currently reliant on our coal-fired generators and mines. It implies a first-mover problem: firms, when weighing their investment decisions, tend to value regions where other firms and the government invest, too. If there is not enough economic activity in these areas, firms may refrain from investing in them. Coordination failure ensues, and particular regions can become trapped in a downward economic spiral.

Global experience has shown that such spatial market failures can be resolved with effective policy. In a best-case scenario, wise public spending triggers a virtuous cycle that changes the equilibrium of a region for the long run. Indefinite public funding becomes unnecessary. The region simply thrives on its own.

There are further compelling socio-political reasons for using place-based policies to breathe life into structurally changing regions and help them to adjust to larger economic shifts. Even economic purists will agree that healthy regional communities are critical for a healthy and functioning state.

The Australian experience

Each year, Australian state and federal governments spend an average of $2 billion on regional job attraction schemes, decentralisation, universities, and infrastructure. Still, this large investment has overall done little to make regions grow faster—often as a result of incoherent design, imprecise planning, and policy overlap.

General programs such as Victoria's Regional Growth Fund and WA's Royalties for Regions often end up providing ad-hoc financial assistance, with inadequate project assessment and evaluation frameworks. Many regional grant programs lack a system to measure their effectiveness. Of those that did monitor results in the past, many have underperformed. Even so, there are exceptions. The Queensland 'Smart State' strategy, for example, has helped high-tech industries establish in Queensland.

Critics have suggested regional funding bodies should be overhauled. While this may resolve some problems and funding inefficiencies, it is unlikely to address the need for special assistance in communities experiencing a severe and persistent economic shock that will arise from the inevitable decline of coal.

A number of coal-fired power stations have already closed in Australia. However, the dominant government approach to date has been piecemeal and reactive, rather than coherent and proactive. Much can be learned from this patchwork of success and failure.

Port Augusta, Spencer Gulf (2016–)

Port Augusta has felt the pains of the decline in coal. Once South Australia's coal-fired powerhouse, the city saw the closure of its last coal-fired generator in May 2016. This was despite its operator's confident claims in 2013, that the station would remain open until 2030. Over 438 jobs were lost when the power station and the nearby mine that supplied it closed.

The transitional assistance the government provided to the Port Augusta community amounted to little more than a couple of ad-hoc grants which failed to adequately support its people. $240,000 was given to Regional Development Australia Far North to deliver career and job services to affected workers. An Upper Spencer Gulf and Outback Engagement Team and Task Force was also established by the state government. The task force saw the establishment of a $1 million Regional Job Creation Grant Program estimated to have created 111 new jobs across Whyalla and Port Augusta, but these programs had little impact because of their limited resources.

With no cohesive strategic plan in place to support Port Augusta's transition, a job gap quickly emerged. Of the relatively small number of displaced workers, roughly a third retired, a third found alternative employment locally, and a third relocated to look for work.

Anger and bitterness: How workers experienced Port Augusta's closure

A former mechanical turbine technician at Port Augusta experienced first-hand the uncertainty that came with the unexpected closure. Obscurity clouded the longevity of people's jobs, with the initial closure announcement giving workers an estimate of nine months to three years of continued operation. According to our interviewee, many felt 'a degree of anger' and 'concern over how people were bringing in money to support their families.' He personally spent the 18 months after the closure working casual jobs between periods of unemployment, before making the decision to work interstate at the Stanwell generator in Queensland for a few years, before returning home to his family in Port Augusta.

According to our interviewee, a lack of structured financial and resource support left the Port Augustian community feeling neglected, having to deal with the economic, social, and environmental ramifications of losing the power station on their own. They were left to watch helplessly as the state and Federal Government provided support and funding to the community of Hazelwood but not to them. The former technician said he and many others felt stranded and embittered following the plant's closure. The shared sense was one of 'nothing certain... going ahead.' His story of struggle navigating the jobs market after 15 years working at a power station epitomises the challenge felt by workers without proper support or guidance.

The lack of clear, articulated direction in both the closure and the aftermath are lessons that should inform future practice.

Hazelwood, Latrobe Valley (2016–)

While the rapid nature of the closure of the Hazelwood facility shocked the Latrobe Valley, some of the institutional responses succeeded in improving the outlook of the local economy, and the Latrobe Valley's unemployment rate was lower three years after closure than it had been beforehand. Hazelwood power station was a 1,600 megawatt brown coal generator in Victoria's Latrobe Valley that directly employed 495 people and around 300 contractors. Most of these workers were laid off following the station's sudden closure in March 2017. Policymakers were relatively successful in combining centralised governance, labour assistance, and investment attraction, with the Victorian Government committing over $690 million to support affected regions and workers, in addition to the Federal Government's $43 million package.

A centralised authority enabled an integrated response

The launch of the Latrobe Valley Authority is one such success. It created more than 2,500 jobs and generated $99 million in private investment in its first three years. Though it is officially a part of the state government, the Authority maintains strong policy autonomy. Enabling multi-level governance and local leadership to guide transition strategies, 90% of the Authority's staff are Latrobe citizens with strong community networks. This has created a fertile ground for collaboration and coordination among leaders from industry, government, universities, and the wider community. Together, they identified key industries for investment. In a survey, 83% of locals say the Authority has a positive impact on the Latrobe community.

Investment to transform

Strategies to attract fresh investment following the end of Hazelwood have so far had a positive impact. A newly created Economic Growth Zone offered business incentives worth $50 million, including stamp duty concessions and government fee reimbursements. This helped to attract a raft of new or expanding companies to the Valley. In addition, the $40 million Latrobe Valley Economic Development Program assisted former Hazelwood suppliers in expanding into new markets. The program also established the Latrobe Valley Economic Facilitation Fund, which has leveraged $94.4 million in private investment to support 40 forward-thinking businesses and create almost 1,000 new jobs.

By 2019, the Authority had successfully engaged 68 local businesses on small and large projects, enabling major projects to be launched in the region. Gippsland Solar has employed ex-Hazelwood workers while Earthworker Cooperative has begun locally manufacturing renewable energy appliances and components. The proposed 200 megawatt Delburn Wind Farm has the potential to inject more than $3 million a year back into the community.

Plans are now underway for construction of a Latrobe Magnesium plant that turns brown coal waste into a valuable mineral. During construction, employment for 75 onsite workers is anticipated with the potential for 374 local workers once the plant starts production by the end of 2022. A bill is also now before the Federal Parliament for the authorisation of offshore wind farms, supporting progress for the lauded Star of the South project. In addition to supplying up to 20% of Victoria's electricity, the project expects to generate 760 construction and 200 ongoing jobs in the Gippsland region.

This is alongside the development of Gippsland's 'Smart Specialisation' strategy which has consulted over 3,000 individuals and organisations to identify key sectors ripe for innovation and created a 'Food and Fibre, New Energy, the Visitor Economy, and Health and Wellbeing' strategy.

Two policy tools were also used to directly assist affected coal workers. Firstly, the Worker Transfer Scheme helped workers transfer to neighbouring power stations, where possible. The scheme offered incentives for older workers to retire early, which freed up positions. However, this scheme can only be seen as a temporary stop-gap as other generators begin to wind down their own operations.

Secondly, the Worker Transition Service offered targeted skill training to help retrenched Hazelwood workers and suppliers find new employment. It also provided emotional support as well as career and financial advice.

At the time of Hazelwood's closure, many of its workers were 40 to 50 years old, had highly specialised skills and no formal qualifications to readily transfer to other industries. In the face of these challenges, the Worker Transition Service has been broadly praised as a success: the majority of people that initially lost their job when Hazelwood closed had found new employment by mid-2019 (see Figure 9). Together, workers in retraining programs obtained over 2,800 accredited qualifications in a range of trades and industrial-related skills.

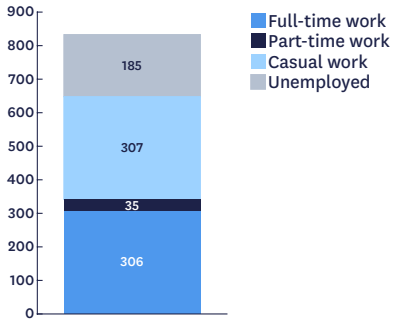


Figure 9 Employment outcomes for Worker Transition Scheme participants

Source Wiseman et al. 2020

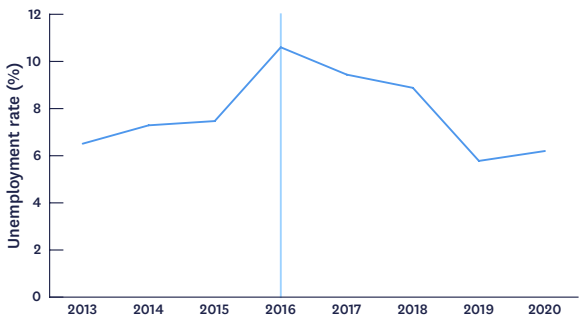


Figure 10 Latrobe Valley unemployment rate surrounding the Hazelwood closure and LVA establishment in 2016

Source National Skills Commission, Small Area Labour Markets (SALM)

As a result of these policies the jobless rate fell 2.5 percentage points in the three years following Hazelwood's closure (see Figure 10). By September 2019, two-and-a-half years after the plant was shut, an additional 11,200 people had found employment in the region. This is a testament to both the effectiveness of policy and the adaptive capacity of the community. However, Hazelwood's closure was sudden, and many retrenched workers struggled to find new work immediately—showing the importance of expeditious policy.

While concerns remain over the proportion of former workers engaged in casual work, the program clearly facilitated a difficult transition under short notice. Its success can largely be attributed to the ease of access it provided workers to personalised services and holistic support, as well as its effective engagement of key stakeholders and workers throughout the transition process.

Lessons are being learnt

Already, more and more governments and generator owners are realising the value of coordinating and consulting with stakeholders proactively to support regional adaptation. From Latrobe to Port Augusta, Australian policy is reflecting lessons from the successes and failures of past policy. In response to the 'fraught experiences on the east coast', the Western Australian government has appointed a working group of various Collie stakeholders in anticipation of the Muja coal-fired generator closure. $60 million from the Industry Attraction and Development Fund, along with $20 million from the Collie Futures Fund, has been allocated to fostering the region's economic diversification. Muja's operator, too, will address job losses with a Worker Transition Manager to respond to individual worker needs. AGL's closure of Liddell will follow suit with the proactive development of the Hunter Energy Transition Alliance and plans to become a renewable energy hub.

The international experience

Australia isn't the first to struggle with the localised consequences of a shift away from coal. Other countries have been facing a declining coal sector for decades. By learning from the vast range of policy responses tried and tested overseas, we can channel Australian resources and efforts into the policies that work and avoid those that don't.

United Kingdom

The United Kingdom failed to prevent entrenched unemployment and regional deprivation arising after the decline of the coal industry. As one of the earliest countries to experience a coal-related decline, the UK experience highlights the importance for governments to act proactively and quickly.

Historical decline

At its peak in 1920, the coal industry of the United Kingdom employed close to 1.2 million workers across England, Scotland, and Wales. However, those areas that were once burgeoning coal powerhouses filled with well-paid jobs, now represent some of the UK's most deprived areas rife with unemployment, poverty, and ill health.

Far from the centralised powers of Westminster, citizens in these regions frequently complain about being forgotten. Many blame the government for its failure to implement timely and targeted policies when the UK's coal economy began its drawn-out decline. In the 1980s the industry still produced around 130 million tonnes a year. By 2020, output had shrunk to just two million tonnes. Employment in the British coal industry moved in tandem, falling from 250,000 to just 1,000 jobs over the same period (see Figure 11).

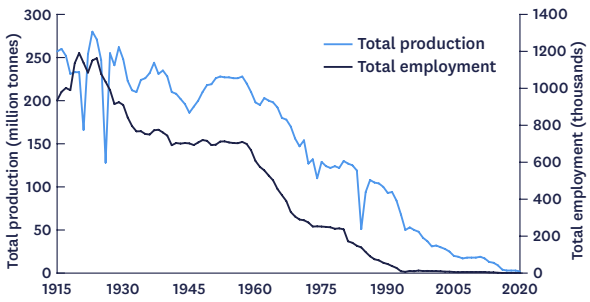


Figure 11 Decline of UK coal output and employment since 1915

Source UK Department for Business, Energy & Industrial Strategy 2019

Policy responses

The Welsh Development Agency has been credited with enticing over $7.6 billion in private investment into the country from numerous multinational companies including Ford, Toyota, Anglesey Aluminium, and Admiral Insurance PLC. Its venture capital division also drove entrepreneurship in the region, spending $88 million of its own money to attract over $400 million in private investment and create over 11,000 jobs. The Agency also created its own small business financing arm, the Development Bank of Wales, whose mission was to fund promising investment projects with potentially high multiplier effects for regional economic growth and employment. Through favourable loans and equity investments with an average business interest rate of just 6.4%, far lower than highstreet banks, it has now invested $940 million in Welsh businesses, attracting almost $1.13 billion from private sector investors.

But despite this extraordinary effort, and impact, these policy responses came far too late. Much of the capital investment and business support only began in the 1990s, when the damage had already been done. Structural issues with the local economy, such as the exodus of young people, were already entrenched. This ingrained a cycle of underinvestment and high unemployment which have left former coal regions economically underdeveloped and poorer than the rest of the United Kingdom. The employment rate in those coalfield areas is currently more than two percentage points behind the national average, and five percentage points behind the rate in the wealthy South East of England. People's health remains poorer and disability is more prevalent in former coal-dependent regions: 50% more residents claim the Disability Living Allowance than in the rest of the country.

Spain

While the shift away from coal-fired generators is ongoing, the collapse of coal mining in Spain is largely complete. The country's policy response offers valuable lessons for Australia. Spanish policymakers initially took stop-gap measures to deal with the decline—with little effect. However, their more recent approach demonstrates the power of proactive policy to solve crises in regional communities.

Early challenges

Spain's coal industry has been steadily declining for the past three decades (see Figure 12). By 2017, the Spanish coal industry's workforce had shrunk to just three percent of its 1990 peak of 45,000 people. By 2018, coal had dropped to a mere 2.3% of the country's primary energy production. By New Year's Eve that year, all Spanish coal producers had closed their mining operations.

The closure of 26 coal mines in the two years through 2018 affected 1,677 workers directly. A further 2,277 workers lost their jobs when the Spanish Government shut down all but four of Spain's 15 coal-fired generators in 2018. The final plants are due to go offline by 2025.

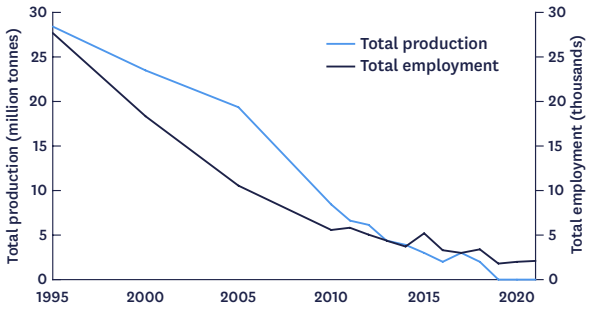


Figure 12 Domestic production of coal and coal employment in Spain, 1995-2021

Source IDDRI, INE, EIA

National policy to deal with this decline was reactive, mitigatory and therefore unsuccessful. Using a bunch of disjointed policy initiatives in isolation, the government has been criticised for creating a 'pensioner economy', throwing money at the problem as an insufficient band-aid for communities now devoid of regional employment and growth opportunities.

As a result, regional economies failed to develop viable industry alternatives to coal and most mining towns in Spain suffered an exodus of skilled workers. Since 2005, these towns have lost over 52,000 inhabitants—sometimes up to 40% of the local population. Policymakers tried to counter the impact with reactive spending, but focused on public infrastructure and income transfers instead of trying to attract new business (see Figure 13).

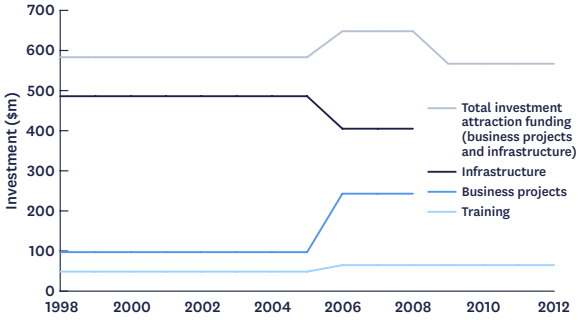


Figure 13 Spanish government spending on coal communities by spending type, 1998-2012

Source IDDRI

Learning from early mistakes

As the crisis in coal-dependent regions increased, the Spanish Government shifted gear. In 2019, it replaced the loose bundle of early policies with a more comprehensive framework to address the structural change.

To address immediate job losses, Spain created an 'Urgent Action Plan' for affected workers. The plan goes beyond the provision of early retirement and severance payments—a lesson learnt from the failed policy of previous years. The plan also seeks to keep employment buoyant in the short run by funding mine restoration projects, renewable energy projects, and the dismantling of generators. One restoration project in Southwest Asturias was able to generate as many as 534 jobs. Restoration projects can be regarded as effective short-term tools to prevent an immediate fall in employment. Yet they are rarely recognised as important policy levers in other parts of the world.

The Government also asked generators to come up with specific solutions to keep workers employed. In April 2020, it reached a joint agreement with trade unions and employer representatives that required generators requesting closure to explain in writing how they planned to support staff. Plans have varied from redirecting former

employees to generator dismantling work to re-employing workers to construct wind farms.

The Spanish Government also opened a new, purpose-built Institute and tasked it to support administrators, unions, businesses, and other related social partners with regional development projects that promote jobs.

By coordinating its policies, Spain can ensure that public money truly reaches enterprises which enjoy strong support from stakeholders and have realistic prospects of sparking new business activity in economically damaged regions. This strategy's seriousness about cultivating long-term economic alternatives to coal dependence must be applauded. It marks a shift from the simplistic ad-hoc spending that characterised earlier place-based policies in Spain.

Germany

The Ruhr region once produced coal for Germany's industrial economy. But a significant decline in the region is already being felt. Policymakers have been able to implement bold and timely action which has enabled the region to diversify before job losses hit.

An early, titanic shift

Germany's Ruhr District is often cited as a best practice example for managing dramatic structural change. Up until the 1950s, the Ruhr region, then Europe's largest industrial hub, was wholly dependent on coal mining, coal-fired generation, and coal-reliant heavy industries such as steel. However, over the next five decades, thousands of coal mining jobs in Germany disappeared. In 2007, when governments agreed to phase out all coal mining in the Ruhr within the next 12 years, the significance of coal as a major employer had faded to less than two percent of the region's employment—from more than 40% in 1955 (see Figure 14).

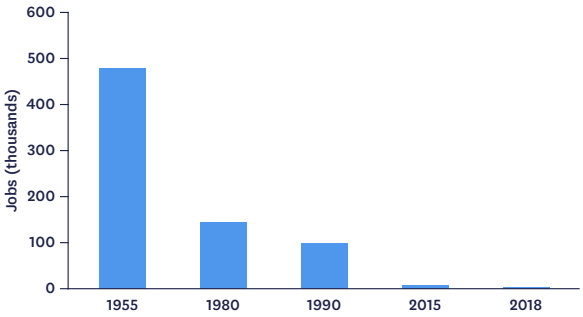


Figure 14 The decline of coal mining in Germany's Ruhr Valley since 1955

Source Kohlenstatistik Germany

In spite of this titanic shift, the services economy in the Ruhr began to expand. It had soon added nearly the same number of jobs in the region as coal and steel had lost. But problems remain: In 2021, unemployment in the Ruhr was 9.7%, compared to a national average of 5.6%. Yet, given the scale of industrial decline to which the region was exposed, a worse result would be expected in the absence of sound policy.

Major government projects drove the Ruhr diversification. Policymakers invested in building new universities and technical colleges. They also funded significant environmental restoration projects. These investments in education and in creating a greener, more liveable region slowed the pace of job losses and laid the groundwork for future growth industries.

As a result of these initiatives, the Ruhr developed a comparative advantage in alternative industries such as energy supplies and waste disposal. Its universities are leaders in environmental technology. Local policy proposals and regional development projects complemented the federal policy initiatives in the years after 1980, fuelling new business clusters and technology parks.

Diversification opportunities in the densely populated and urbanised Ruhr region of more than five million may be more accessible than in the coal regions of Australia, Britain, and Spain. Still, much can be learned from Germany's bold and proactive approach to rejuvenate its industrial heartland.

Current approach

As outlined in Phasing down gracefully: Halving electricity emissions this decade, Germany has prudently chosen to facilitate an orderly phaseout of coal-fired electricity generation. Like in Spain, policymakers in Germany recognised the need for a coordinated approach—a national framework for developing tailored, adaptable, and verifiable policies to help coal-reliant regions adjust to a new energy reality. With this in mind, the German federal government in 2018 created a dedicated new body, the Commission on Growth, Structural Change and Employment. Its goal is to come up with specific plans and new economic prospects for regions where coal used to be a mainstay.

The German government has also offered labour market support, in the form of financial incentives for power station operators to pay for the early retirement of its workers and an adjustment allowance of up to $64,000 per head to enable retraining. Such incentivised early retirement policies shrink the short-term labour supply in affected regions in line with the immediate decline in economic activity. Such policies, though, should only be used as a last resort as they remove potentially productive employees from the workforce.

State and federal governments agreed to make a combined $64 billion available to promote economic diversification in areas where coal-fired generators and coal mines are set to close by 2048 and in the shorter term, a further $3.2 billion in 2020 and 2021 has been made available to strengthen regional research institutions, transport links and infrastructure, to foster tourism and the digitisation of the region, as well as improve services and education for children and young people.

United States

From California to the Rust Belt, the American economy has undergone many dramatic changes in recent decades, and entire regions have had to adjust. Governments, however, frequently failed to anticipate the fallout from leaving market forces unleashed. Millions of people remain jobless or in precarious working conditions, as regional economies have struggled to renew themselves. But policymakers are trying to learn from past mistakes. They have begun to roll out a suite of grants and develop innovative policies to help regions embrace and overcome structural challenges.

Early failures

Policy between the 1960s and 1990s was plagued with inadequacy and stubbornness. When some 11 million jobs were lost during rapid deindustrialisation between the 1960s and 1980s, for example, the government opted for a reactive approach. Between 1979 and 1984 it made a few legislative changes designed to keep factories and plants open longer. But those did little to halt the economic decline of regions such as Detroit, Pittsburgh, Camden, Youngstown, and Akron. Moreover, when 1.4 million defence workers lost their jobs at the end of the Cold War, the stubborn attempt of policymakers to prolong expiring industries meant that regional adaptation programs were delayed and ultimately less effective than they could have been.

Current approach

The US has introduced various imaginative initiatives that have successfully repurposed and converted old, would-be defunct infrastructure, enabling regions to renew their economies in a changed world. In Mingo County, various repurposing plans have been undertaken, from an airport and aviation manufacturing on former surface mines, to new hospitality and accommodation businesses for trails tourism in the surrounding hills. Meanwhile, generators in Burlington, Vermont; Chicago, Illinois; and Alexandria, Virginia, have been effectively decommissioned and converted into vibrant community centres—some for less than $76 million. This has created opportunities for recreational, retail, hospitality, and commercial businesses to move in. Wider infrastructure development programs have also been successful. For example, the Tennessee Valley Authority has been able to create $8.9 billion in net benefits for the regional economy through new roads, canals, dams, and hydro-electric power stations.

The Partnerships for Opportunity and Workforce and Economic Revitalization (POWER+) Initiative has also been able to funnel over $328 million into nearly 300 projects covering more than 350 coal communities across 13 states. Most importantly, it has helped leverage over $1.1 billion in private investment and created or preserved over 23,000 jobs. And the initiative has not just helped businesses. Many workers from coal-reliant areas in Appalachia have also been given the opportunity to re-train and have found work in industries as diverse as technology and tourism. The program has exceeded most targets in the 81 projects that are already complete (Figure 15).

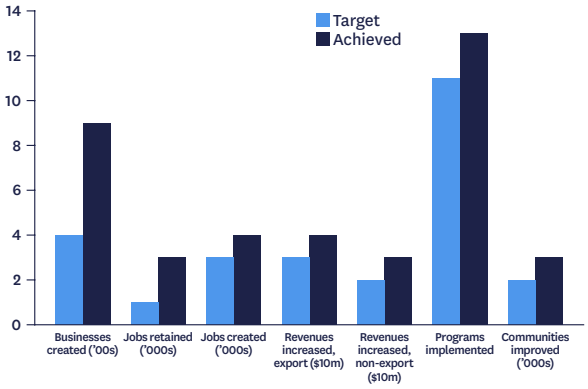


Figure 15 Targets and observed results of ARC POWER+ grants as of September 2020

Source ARC POWER+ Initiative Independent Evaluation

A proactive approach from the European Union

The European Union has launched a swathe of diversification policies to support regions, communities, and workers that will be disproportionately affected by the future energy transformation. The program, which is to be implemented across 2021-27, aims to retrain workers and mobilise at least $242 billion in private and public investment.

The European overarching policy framework consists of three pillars:

1. A diversification fund

A $65 billion fund will support the economic diversification of all territories of the EU (see Figure 16). Aimed at creating new opportunities for people and small business owners whose livelihood will be most impacted by the shift away from coal, the fund offers money for skills training, direct business support, and other measures. It hopes to spark new investments worth $140-173 billion in land restoration, infrastructure, technology, clean energy, small business, and startups that promise to accelerate a region's economic growth and long-term diversification.

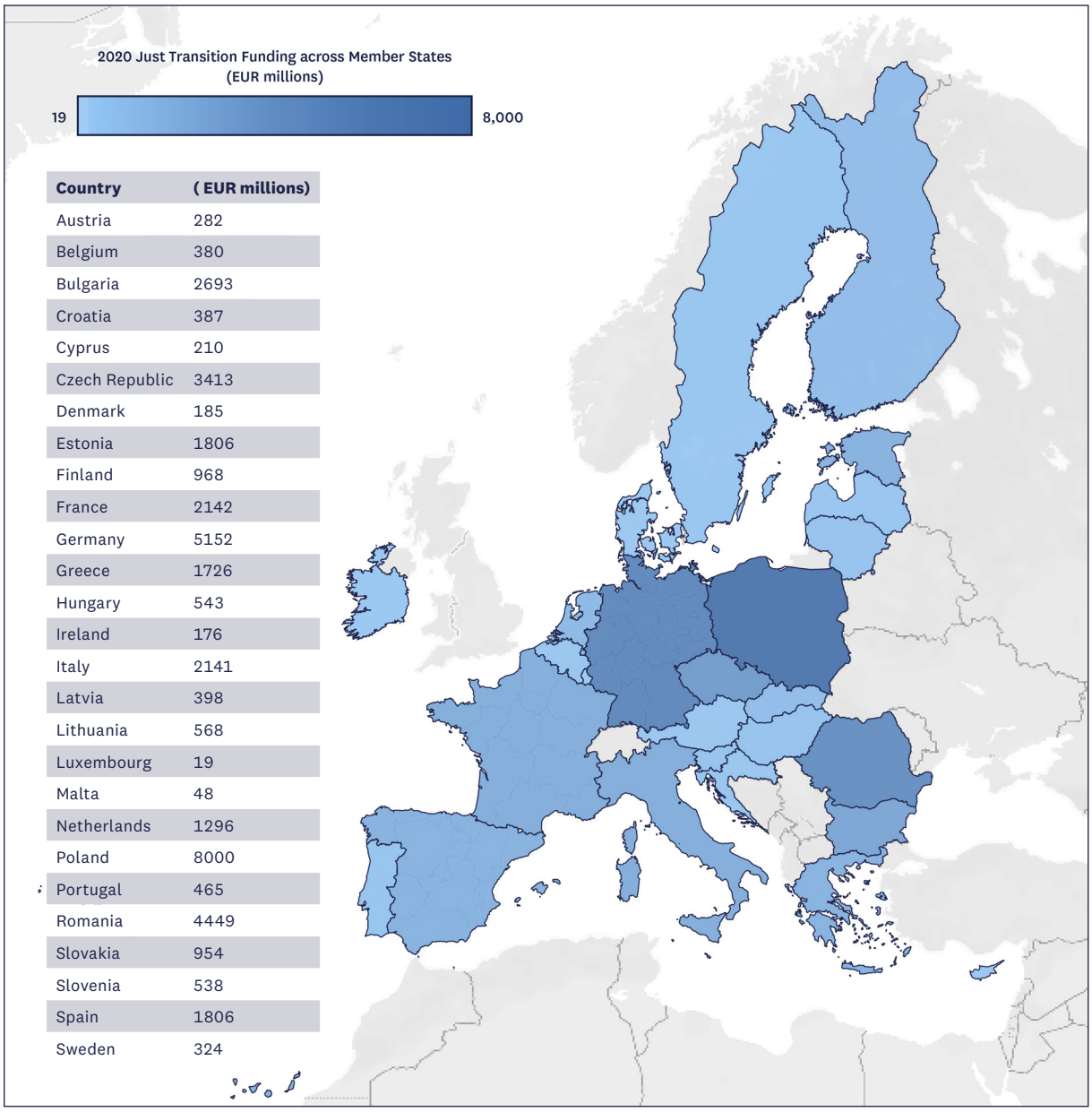
In order to access the money, EU member states must provide a detailed map of regions they deem eligible for funding. They will also need to match each euro of funding with national spending and money they may have received from the European Regional Development Fund and the European Social Fund Plus. This principle creates a strong multiplier effect: the EU commits when national governments are also fully committed.

2. InvestEU Scheme

A $2.9 billion financing scheme will support private-sector projects in energy and transport, decarbonisation, economic diversification, and social infrastructure. The aim is to mobilise an expected $72 billion in private investment. InvestEU will further facilitate education and training, including the reskilling and upskilling of workers who currently depend on a carbon-intensive economy and will be adversely affected by the move away from fossil fuels.

3. European Investment Bank public-sector loan facility

The European Investment Bank is another player in the EU's proactive policy framework. Its task is to lend money to regions that need to adapt to the low-carbon world. The Bank will lend up to $16 billion, with the hope of mobilising an additional $40-48 billion of investments. The EU budget will contribute $2.4 billion to the mission. Eligible projects will include energy and transport, heating, public transport, energy efficiency, and social infrastructure.



Country	(EUR millions)
Austria	282
Belgium	380
Bulgaria	2693
Croatia	387
Cyprus	210
Czech Republic	3413
Denmark	185
Estonia	1806
Finland	968
France	2142
Germany	5152
Greece	1726
Hungary	543
Ireland	176
Italy	2141
Latvia	398
Lithuania	568
Luxembourg	19
Malta	48
Netherlands	1296
Poland	8000
Portugal	465
Romania	4449
Slovakia	954
Slovenia	538
Spain	1806
Sweden	324

Figure 16 EU's diversification fund allocation by Member State

Source European Commission

Policy lessons for Australia

From these international case studies, it is obvious that regional diversification policy cannot be effective, nor successful, unless it is:

Proactive

Instead of stubbornly burying our heads in the sand, we need to be honest with communities, take the initiative, and plan as early as possible for the inevitable fallout. Waiting until the day a mine or generator closes is too little, too late.

Coordinated

On the ground, a wide range of stakeholders must collaborate and unite around an inclusive, common vision. At the state and national levels, leaders must coordinate efforts to ensure their approach is cohesive and aligned with those on the ground.

Targeted

Rigid, sweeping, top-down solutions consistently fail. What's needed are flexible, specialised strategies driven by data from the ground up. Success comes when local communities are empowered, buy in, and individuals have maximal autonomy to choose their own future.

Diversified

Sadly, there is no single silver bullet to guarantee perfect structural adjustment. Instead, a silver buckshot is needed. A variety of proposals must combine existing strengths and new opportunities to support both: labour demand (investment attraction) and labour supply (worker support).

Multiplicative

Regional communities cannot rely forever on government aid that is limited by nature. A forward-looking approach demands that any public funding should induce further private investment and kickstart a fresh cycle of sustainable economic growth.

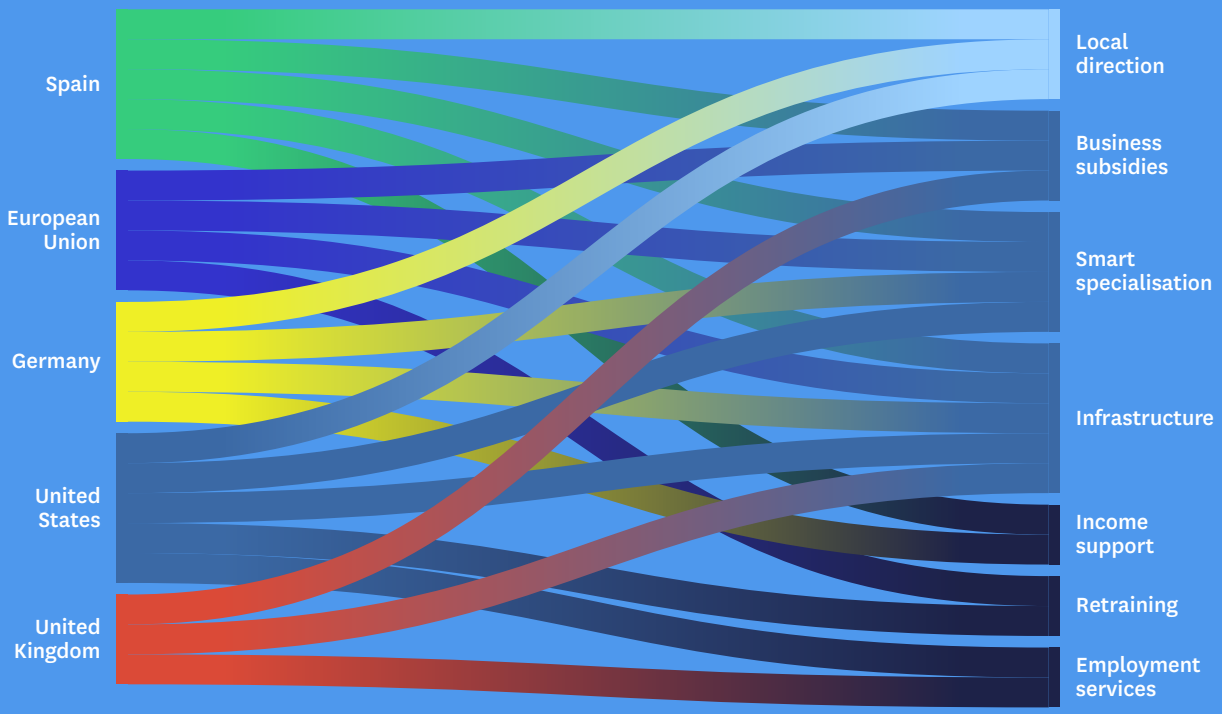


Figure 17 Key adaptation policies and principles implemented overseas
Source Blueprint Institute Analysis

Conclusion

The challenges faced by Australia's coal generators are nothing new. The world has seen a shift away from coal power over many decades, and many communities have been burnt by the pace and scale of that change. Some national responses have been moderately successful, others have been a disaster. Fortunately, Australia has the benefit of hindsight on our side.

Australia's response must be **proactive**—planned and implemented as early as possible. Policies should be **coordinated**, involving a wide range of impacted stakeholders. They should be **targeted** to local communities, rather than a one-size-fits-all approach. And finally they should be **diversified**, supporting both labour demand and supply, and **multiplicative**—drawing in private funding and kick starting growth.

There is no silver bullet for effective regional economic diversification, so we propose buckshot. Our Blueprint proposes state and Federal Governments coordinate their efforts and **empower communities**. To lead the way, we suggest the establishment of coal adaptation authorities funded with $20 million of initial funding and five percent of ongoing coal royalties.

We note that Australian governments must **renew economies** and pivot existing infrastructure for new economic opportunities. Abundant opportunities can be unlocked with foresight and coordination, including via renewable energy zones, development of critical minerals, start-up incubators, and expanded finance and market access for regional carbon sequestration.

Finally, our Blueprint calls for governments to **support workers** in the form of income insurance, early retirement packages, and job search and retraining services—along with short-term wage subsidies as a last resort. This effort would be greatly enhanced if governments mandate that operators develop proactive plans for worker displacement, which could be coordinated by our coal adaptation authorities.

There will, of course, be other structural changes on our horizon. If global demand for fossil fuels declines at the pace heralded by international climate commitments and finance, we can expect rapid changes in other domestic industries in the years ahead. We must also prepare for ongoing tumult in our major trading relationships, with potential detriment to one industry or another.

We really cannot predict what lies ahead. But once Australia embraces a mature conversation about the phasing down of coal-fired generation, an industry directly affecting around 10,000 jobs, we know we will be in a better position to confront the winds of change ahead of us.

Blueprint Institute is optimistic about the capacity of Australians to collectively plan a better future. We hope this Blueprint serves as guidance for the wild and wonderful structural adjustment challenges that await us.