

**Submission
No 47**

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Name: Professor Peter Sheldon

Date Received: 27 August 2019

Please note, due to current time constraints, I have submitted my 2018 report that looks at this topic in a broader sense but also cites evidence from NSW.

The Ruhr or Appalachia?

Deciding the future of Australia's coal power workers and communities

IRRC Report for CFMMEU Mining and Energy



**Peter Sheldon
Raja Junankar
Anthony De Rosa Pontello**

October 2018

Table of contents

Foreword	<i>i</i>
The brief	1
1. Explaining key terms in this context	2
<i>Just Transition</i>	2
<i>Decent work and quality jobs</i>	2
<i>Structural change and structural adjustment policies</i>	3
2. Executive Summary	5
<i>The challenge</i>	5
<i>The situation</i>	6
<i>Concrete proposals</i>	9
<i>Culture and decision-making processes</i>	11
3. Introduction: The challenge	12
4. Research design and sources	15
5. Climate change structural adjustment, jobs and economic development	17
6. Structural adjustments and unjust transitions	22
<i>Large-scale job losses for the industry's workers</i>	22
<i>Community and regional dimensions of unjust transitions</i>	24
7. Structural adjustment: the successful cases	26
<i>Singapore's Second Industrial Revolution</i>	26
<i>Ruhr Region, Germany, late 1950s to 2017</i>	28
<i>Limburg Region, Netherlands</i>	35
8. Structural adjustment: a marginally un/successful case	39
<i>Newcastle steelworks, 1999</i>	39
9. Structural adjustment: unsuccessful cases	41
<i>The Valleys, South Wales UK</i>	41
<i>Appalachia, USA</i>	44
<i>Australian coal-fired power stations</i>	47
10. Learning from successful <i>and</i> unsuccessful examples	50
<i>Frameworks and approaches</i>	50
<i>Industry workers and job losses: structural adjustment and labour supply</i>	54
<i>Economic challenges for towns and regions: structural adjustment policy and labour demand</i>	57
<i>Decision-making and consultative approaches</i>	67

Bibliography	69
Appendix 1	74
Appendix 2	76

Foreword

Making smart decisions about structural change

Australia's coal-fired power stations will all close in the next two or three decades. We know this because the companies that operate the 23 power stations currently operating nation-wide have told us so.

Despite the empty rhetoric of some, it is unlikely that the economic case for investing in new coal-fired power stations in Australia will stack up. Those who currently own and operate coal power stations have no plans to build new ones.

The bad news is that the transition in how we produce power will bring great change to the workers and communities we have relied on to provide Australian homes and industry with reliable energy over many decades.

The good news is that we have the lead time to make smart decisions about what that change looks like—or at least, we now have the lead time after being caught unprepared by earlier closures, including Hazelwood in 2017.

We have the choice to manage this structural economic change so that individuals, families and regions aren't abandoned to unemployment, low-value jobs, poverty and associated health and social decline. Even better, we have the evidence about what works to deliver just transitions for coal power workers and communities, with skills, jobs, opportunities and hope for the future.

Communities grow around power stations and the mines that supply them. They are unique communities bonded in many cases by history, geography, difficult and dangerous working conditions and good unionised jobs. They are also uniquely vulnerable in their heavy dependence on the coal power industry.

This analysis of transitions in resource economies internationally and here in Australia provides valuable insights into the ingredients of success and the wide scope of outcomes.

The Appalachian region in the United States is a heart-breaking story of industry transition characterised by short-term, reactive and fragmented responses to closures of coal mines, resulting in entrenched, intergenerational poverty and social dysfunction.

Compare this with the transition away from a heavy reliance on coal mining in Germany's Ruhr region, where forward planning, investment in industry diversification, staggering of mine closures and a comprehensive package of just transition measures delivered a major reshaping of the regional economy with no forced job losses.

Central to these vastly different outcomes is the presence of a national, coordinated response. To this end, a major recommendation of this report is the establishment of a national, independent statutory authority to plan, coordinate and manage the transition.

In the energy debate to date, the impact of the transition on workers and communities has been almost completely ignored. This is an omission we can't afford. After all, the costs of investing in a Just Transition need to be balanced against the costs of doing nothing and abandoning whole communities to a bleak future.

While global trends suggest that Australian export coal for steelmaking and energy production will be in demand for decades to come, coal-fired power generation in Australia is winding down. On the information available, there are no excuses for not taking action to protect the best interests of those affected.

I thank Peter Sheldon and the team at UNSW Sydney's Industrial Relations Research Centre for this important piece of work. I call on all power industry stakeholders to engage with its findings and consider how we can work together to deliver a Just Transition for coal power workers and communities.

Tony Maher
CFMMEU National President
October 2018

The brief

The Industrial Relations Research Centre at UNSW has carried out this project for the Construction, Forestry, Maritime, Mining and Energy Union—Mining and Energy Division (CFMMEU). The CFMMEU sought a description of what would constitute a “best practice” structural adjustment program for coal power regions that would:

- ◇ minimise and preferably eliminate forced redundancies
- ◇ enable voluntary redundancies and early retirement to be spread across power stations and dependent mines in a region, or across the country
- ◇ provide successful transfer of workers to alternative quality jobs
- ◇ provide alternative economic development for the regions that would maintain or improve the situation of the regional community.

It was recognised that regional development opportunities are usually case-specific; that what might be an option for the Latrobe Valley in Victoria would not suit Collie in Western Australia. In this situation the CFMMEU sought advice on the architecture and scale of a successful regional development scheme.

It was expected that best practice would draw on international rather than only Australian experience.

1. Explaining key terms in this context

Just Transition

In recent years, the labour movement has, in a number of countries, promoted the notion of Just Transition. Its purpose has been to insert social justice and employment fairness dimensions into climate policy development. Major international bodies, including the United Nations, have embraced Just Transition principles and these have also entered the Paris Agreement (Doorey, 2017)

Thus, the United Nations Framework Convention on Climate Change (UNFCCC) (2016: 16), adopted the International Labour Organization (ILO) (2015) principles for a Just Transition. In noting that there was no “one size fits all” response available, the UNFCCC (2016: 16) argued that:

These policies also need to provide a just transition framework for all in order to promote the creation of more decent jobs, including, as appropriate: anticipating impacts on employment; adequate and sustainable social protection for job losses and displacement; skills development; and social dialogue, including the effective exercise of the right to organize and bargain collectively.

More specifically, for the ILO (2015: 12) this involves, among other things, that transition policy:

pay special attention to the industries, regions, communities and workers whose livelihoods might experience the hardest impacts of the transition;

and

formulate accompanying policies through social protection, including unemployment insurance and benefits, skills training and upgrading, workforce redeployment and other appropriate measures to support enterprises and workers in sectors negatively impacted by the transition to sustainable development.

Decent work and quality jobs

According to the UNFCCC (2016: 14), decent work entails “jobs that provide adequate incomes and social protection, safe working conditions, respect for rights at work and effective social dialogues.” Stroud and colleagues (2013:13) take this further, emphasising “skilled and satisfying work” aspects that we might also categorise under “quality jobs”. It is imperative then to construct a transition that is not built on low-skilled, low-paid and irregular employment or situations where workers lose access to skills development and to core labour rights.

For the ACTU (2016: 4), it means:

- ◇ Stable work with predictable pay, wages and entitlements;
- ◇ Adequate hours and pay, especially compared to previous jobs;
- ◇ Opportunities for training and lifelong education; and
- ◇ A dignified retirement.

Structural change and structural adjustment policies

Structural change involves a sustained change to the structure (or composition) of the economy or a part of it, like a region, town or industry. It can result from changes in the behaviours of consumers, of employers and/or of government (Jones and Tee, 2017: 3). Some structural change occurs rapidly and abruptly, perhaps caused by the effects of war, recession or dramatic technological change. Other structural adjustment—like industrialisation or the subsequent shift from the dominance of manufacturing to services—can emerge over decades.

The Productivity Commission (2012: 6; see also Jones and Tee, 2017: 8) listed six main drivers of structural change. They are: technological change; consumer behaviour; demography; global shocks and transformations; natural resource discoveries; and government policy.

Arguably, all but demography will play a role in forthcoming closures of Australia's coal-fired power stations. Global recognition of the climate change crisis, for example through the Paris Agreement and its implementation, represents a global transformation. The development of solar and wind power for electricity generation represent both technological change and the discovery of new natural resources. Rapid expansion of roof-top solar, for example, reflects a change to consumer behaviour in the context of supportive government policy. That policy has and will also shape the development of commercial-scale renewable energy development, including through battery storage as in South Australia, and pumped-hydro-electricity.

Structural adjustment involves adaptation to these sorts of changes. It can appear as changes in the size of economic activity (for example, from larger to a smaller firms); its market focus (for example from domestically- to export-oriented production); its composition (for example its mix of sectors); or its ownership profile (for example from public to private). It may respond to economic challenges and/or opportunities within a firm, local economy or industry or within the environments in which they operate (Productivity Commission, 2012).

Some structural adjustment occurs autonomously, when economic actors engage in sustained, adaptive change. However, governments may also intervene through structural adjustment policies when they are persuaded that adaptation processes produce harms that require some correction. This particularly occurs where:

- ◊ structural change produces severe and systemic adaptation difficulties for those affected;
- ◊ the change itself flows from government policy, and/or;
- ◊ it has the potential to inflict serious harm on individuals, industries and communities (Jones and Tee, 2017: 6; Schulz and Schwarzkopff, 2016: 4).

All three of these circumstances are highly relevant to the future closure of Australia's coal-fired power stations.

Structural adjustment policies can have diverse goals. They can:

- ◊ seek to stop or slow structural change;
- ◊ facilitate change; or
- ◊ support and compensate those affected in their efforts to adapt and sustain themselves, whether as businesses, localities or individuals.

Policies can target particular interests and/or be made generally available, and provide direct or indirect measures of, financial and/or in-kind support. In-kind support may involve information, consultation, coordination, counseling and training (Aither, 2014; OECD, 2016; Productivity Commission, 2012: 24). Experts like Beer (2015: 37) argue that for structural adjustment policies to be effective, they require not just "anticipatory planning" but realistically long-term horizons.

2. Executive Summary

The challenge

The making of coherent and science-based Australian policy regarding climate change has struggled to overcome three interconnected arguments. They are:

- ◇ Global climate change either does not exist, or it is not caused by human activity. It therefore requires no response;
- ◇ To address climate change by doing without coal-fired electricity will (needlessly) undermine Australia's economy and some of its major industries; and
- ◇ That choice means the employment prospects and living standards for those working in the coal-fired energy sector—in power stations and linked mines—will inevitably suffer severely. So too will the towns and regions where that activity is located.

The first argument is fallacious on both scientific and policy grounds. The second and third arguments represent realistically pessimistic scenarios in the absence of planned, concerted, productive policy and action.

The third argument raises a fundamental ethical consideration for the Australian community. Adopting science-based climate change priorities is necessary and good policy. However, all new policies can bring winners and losers.

Coal-fired power industry workers and their communities have provided Australia with energy for many decades. For this, they have also suffered from working and living in polluted or dangerous environments. In the absence of sufficient policy-making forethought and attention, they will now also carry the heaviest costs of the new national climate change priorities.

Those costs would show up as unwelcome early retirements, unemployment, underemployment, insecure employment and work that is lower paid, less safe and less skilled. Overall, these produce reduced incomes and personal assets, both before and after retirement.

This report responds to challenges arising from the third argument. It highlights structural adjustment policy options that would remove or minimise those costs for the industry's workers and their communities. To do this, it presents evidence from experiences in Australia and abroad that show how those costs can best be shared more widely. More promising, it also indicates how Australia might reduce those costs by fostering new forms of economic activity that can overcome potential declines in employment, personal wealth and living standards.

Within international discussions and documents, including under the United Nations (ILO, 2015; UNFCCC, 2016), this optimistic scenario comes under the heading “Just Transition”. International evidence strongly suggests that this type of more optimistic scenario is very practicable. However, for a Just Transition to occur, Australia needs clear-minded, coherent legislation, policy and action.

The purpose is to produce pre-emptive, longer-term planning and implementation for power station and mine closures and their aftermaths that may stretch over decades.

The situation

Australia's commitment to the 2015 Paris Agreement has made necessary the linking of energy generation policy to policy on climate change. The 23 coal-fired power plants currently operating in Australia are, on the whole, aging. Many are coming to the ends of their commercial lives. Heavily reducing carbon emissions from Australia's energy sector will inevitably shorten the commercial lives of some of them. Nonetheless, the industry's current economics reward those generating companies who can “sweat” their plants longest. For Victoria's power stations using brown coal, their closures will also likely bring the closure of their attached mines.

Recent predictions suggest that all coal-fired power stations will close by 2050 and, quite possibly, by 2035 (Evidence before Senate Committee, 2017: 16-19). Irrespective of any short-term government vacillation and inconsistency on climate policy, the science, economics and politics of climate change will mean that no new coal-fired power stations will be built to take their place.

This brings dramatic structural adjustment challenges for the industry, and particularly, its workers and their host localities. Recent evidence of challenges met poorly comes from the May 2016 closures of South Australia's two coal-fired power stations.

It is clear that Australia must engage in a clean-energy transition at a national scale. This will replace coal-fired energy with much lower carbon-emitting sources. Gas may provide one bridging solution. However, industry economics suggest that Australia will shift its generation needs to commercial-scale renewable sources — particularly solar, wind and hydro — linked to large-scale battery (or pumped-hydro) storage plus distributed systems like roof-top solar.

Currently, law, policy and practice allow owners of coal-fired power stations to make all decisions regarding closures: when and how it suits them. The clear inference is that those decisions should be left only to the owners' commercial considerations. This was evident in the South Australian cases but also, in 2017, for the Hazelwood plant in Victoria. Further, those owners have no social responsibilities to workers or host communities beyond the scarce regulatory requirements.

This has manifested in a series of ad hoc closures, typically after very short periods of notice. Notifications also occur without prior planning as to their effects on the workforce, beyond legal entitlements owed, or the local community and region. Those owners also often leave polluted and degraded landscapes in their wake. Yet, in 2015, AGL gave formal notice of its intention to close Liddell (NSW) power station in 2022. In 2017, it provided greater detail of its intentions for a clean-energy transition of the site. This demonstrated what power plant owners can and should do to open the process towards a Just Transition.

Lack of pre-planning, coordination and preparations together with short notice have left many retrenched workers and their communities with very difficult transition problems. Because of lack of subsequent support, some problems—like intergenerational unemployment, poverty and poor physical and psychological health—continue and worsen with time, becoming entrenched and systemic.

These people, their families and communities have been left to carry the main costs of structural adjustment. This represents a very unfair transition.

To begin to achieve fairness requires a structural adjustment policy tailored for this situation. It would need to link adoption of a clean-energy transition to a jobs-creating, economic-development transition at local and regional scales. This would represent a clean-energy, economic-development transition.

However, a Just Transition requires more than this. It has to address the needs of those workers and communities potentially negatively affected by closures. This means focusing on both labour supply and labour demand, and the quality and quantity of each. As the Senate's Environment and Communications Reference Committee (Senate Committee) (2017: 70) argued:

It highlights the need for an orderly closure process to be facilitated by government on a nation-wide basis, with closures announced ahead of time to give certainty to investors, take into account impacts on the broader electricity system, and allow for a just transition for affected workers and communities.

Crucial to all this is mandatory early consultation and planning—marked by information-gathering and sharing, phasing, openness, and engagement.

The international evidence suggests patience, long-term commitment as well as sufficient funding are necessary for success. It also clearly points to the insufficiency of leaving these matters only to the owners and to government. A range of other stakeholders must be part of these processes, starting with unions representing those workers.

Essential is a new national regulatory structure as well a change in policy culture. As each local case may be different, national policy-making will need to adapt to local circumstances.

International and Australian evidence is that this requires a framework that combines cohesive and well-funded top-down leadership, coordination and funding with bottom-up engaged participation, knowledge and creativity.

The fundamental broad requirements for effective structural adjustment policy towards a Just Transition for Australia's coal-energy industry are:

1. That legislation, public policy and practice ensure that owners of power stations and mines also prioritise the longer-term interests of their workers and their community before, during and after any closures. This accords with proposals from the Senate Committee (2017) on this topic, and from the OECD (2016) for structural adjustment in Australia more generally. In practice, this would mean:
 - a. Owners posting sufficient guarantees or bonds to cover the practical implications of the above point, particularly for site rehabilitation; and
 - b. Owners engaging as equals with other concerned parties in the planning and decision-making processes and providing them with the information and access as needed.
2. Consistent, engaged top-down leadership with sufficient funding from the highest level of government: the Australian (Commonwealth) government. In practice, this would mean:
 - a. The establishment of a national, independent statutory authority to plan, coordinate and manage an orderly, staged set of closures in ways that produce a Just Transition as well as a clean-energy transition. For simplicity, we use the ACTU's (2016) proposed title for this body, Energy Transition Australia (ETA).
3. Consistent, engaged coordination across all levels of government—federal, state and local—plus regional coordinating bodies where these exist. In practice, this would mean:
 - a. The ETA having a tripartite structure, processes and culture which explicitly embed these types of coordination in ongoing ways.
4. Recognition of unions, alongside owners and government, as full partners to information gathering and sharing, planning and negotiations over processes and outcomes. In practice, this would mean:
 - a. The ETA having a structure, processes and culture which explicitly embed these types of engagement alongside and on par with owners and government representatives. In European countries with successful records of Just Transition, formal tripartite membership was important for developing clearer strategies, better operational effectiveness plus social consensus and engagement from below.
5. Structured networks for consultation, information gathering and distribution with other local stakeholder and civil society groups. In practice, this would mean:
 - a. The ETA having a structure, processes and culture which explicitly encourage, support and work with these types of bottom-up engagement.

The most immediate objectives must be to ensure that:

- a. There is sufficient new employment offering decent work; and
- b. Retrenched employees have the skills to get and do those jobs.

Solving these challenges is of most immediate benefit to the workers involved and their families. It is also essential to the sustainability of the communities in which many of them live.

We therefore first summarise our report's concrete proposals for improving labour demand through local/regional economic development. We then summarise our proposals regarding labour supply and support for individual workers.

Concrete proposals

Economic development for communities and labour demand

Coal-energy localities and regions are often heavily dependent on that industry. Some are quite remote. A key policy goal for many of them should be greater economic diversification. This will assist with recovery from closures through generating local economic development.

International experience suggests three strategies as most useful for promoting diversification and new employment to replace jobs lost through closures. If well designed, each can support or reinforce the other two:

1. Cluster policy

Promotion of clusters for particular industries or linked service activities has proven a highly successful way to encourage and develop new, high tech industries and services. This has worked especially well where universities, technical colleges and research institutes—new or existing—develop close working ties with these clusters. Technology transfer works particularly well through joint involvement in technology parks and startup hubs. They can also be good sources of decent work and, in particular, quality jobs.

Governments can help through funding applied research, infrastructure and in marketing initiatives to attract inbound investment and highly skilled workers.

2. Strengthening local factors to boost development

This strategy emphasises building new initiatives from existing local strengths (or sometimes, even apparent weaknesses). These strengths may include local forms of economic specialisation, knowledge and skills, local institutions and recent experiences. Thus, they may have something to do with activities planned for closure. Crucial here, at least in the early stages, is public sector investment.

Substantial public-sector investment in supportive local infrastructure can be enormously effective, not just in creating new jobs but in underpinning or fostering cluster initiatives. Among the most effective investments are those into:

- a. education and training; and
- b. fostering private sector innovation and entrepreneurship to rebuild sectors and areas.

A highly effective use of public investment targets universities and technical colleges. It brings immediate employment for building and other on-site works, and then continuing employment for large numbers of people across many and very different job classifications. These mostly represent decent work and quality jobs. Some of these jobs require inbound recruitment, helping to combat local population drift while adding to local consumption patterns and demand for local services. Others will provide opportunities for locals, including those made redundant through plant closures.

Investment in transport and communications infrastructure can have similar immediate and longer-term employment boosting potential. As for education and research, the economic development—and employment—effects can be both direct and indirect.

3. Funding labour-intensive regional projects

These typically involve measures like site rehabilitation. Using many of the same skills used in power stations and mines, this can be decent work that lasts for more than a decade. There are many occupations and trades involved but this may be a particularly useful employment bridge for less (formally) skilled workers exiting power stations and mines and nearing retirement.

By rehabilitating damaged environments, these projects also improve the health of local people and make the locality more attractive to other forms of investment, particularly for service industries like tourism, health precincts and retirement villages. They also increase the attractiveness of the area for those joining universities, technology parks and clusters.

Supporting individual workers and improving labour supply

4. Labour pooling among nearby power stations or mines

This requires well-planned and phased sets of closures. Some workers, particularly those who are older and more senior, move sequentially to still-operating facilities.

5. Early retirements

This requires additional funding to allow these workers to retire with dignity.

6. Retraining

Crucial for many workers seeking to transition to new, more skilled jobs is the provision of relevant training. International and Australian evidence shows that the training-to-re-employment transition is most effective when it is provided **ahead** of retrenchments and, wherever possible, it includes job experience in the new industry, occupation or organisation.

There will also need to be a more individualised approach to skills recognition and training needs. Particular thought is needed for planning the entire process for older workers who may be more pessimistic as to their chances.

7. Income maintenance and support

This bridging financial support may be necessary until retrenched workers re-enter employment with decent work. It should be substantially higher than standard unemployment benefits in recognition of the Just Transition principle that individuals should not bear a disproportionate burden. Further, mortgage and rent support—for a defined period—will be useful to avoid these workers losing their accommodation and, for a mortgagee, largest personal asset.

8. Relocation and travel assistance

This may be very useful where new employment is some distance away and either requires complete relocation or long and expensive commuting.

These measures will also contribute to sustaining communities in which those workers have lived and worked.

Culture and decision-making processes

This report calls for a focus on both top-down and bottom-up approaches, and for an equal prioritisation of labour demand and supply questions. Its starting point is the necessity for a Just Transition for these workers and their communities. The proposals advanced therefore require economic and industrial relations cultures conducive to a vision of Just Transition for individual workers and their communities.

Crucial here are notions of tripartite engagement, socially-acceptable outcomes, community participation and corporate social responsibility. The west European tradition of “social partnership”, which mandates a prominent role to unions and collective agreements in socio-economic policy making and implementation was very successful in countries like Germany and the Netherlands in supporting successful structural adjustment. So too, was their use of broad stakeholder consultation and engagement. The same has been evident in Singapore. All this helped manage consensus through the changes by providing avenues for workplace consultation, and upward feedback and pressure.

3. Introduction: The challenge

In many countries, policy efforts to address the practical implications of climate change science have encouraged the shrinking or even closures of important parts of domestic coal-fired energy industries, whether coal mines or power stations. Sometimes, climate change policy has only reinforced those industries' already difficult economic situations. An important implication of these closures has been enormous shedding of employment, often highly concentrated within a few local areas.

Employment in (west) German hard coal mining had already fallen from a peak of over 550,000 in the 1950s to approximately 33,000 in 2007. Under a pivotal agreement signed that year, this fell, as planned, to 9,600 in 2016. The plan was for all such production and hence employment to cease at the end of 2018 (German Coal, 2013; Schulz and Schwartzkopff, 2016: 11).

German political reunification in 1989 extended the focus to the former East Germany's brown coal mines and linked power stations. In the 1990s, over 113,000 people were still employed in those mines but, in 2000, only 11,000 mining and power station workers remained (Schulz and Schwartzkopff, 2016: 2).

In the USA, it has been estimated that 40,000 of the current 69,000 coal mining jobs will have to be eliminated over the next 20 years if the USA is to have any chance of meeting its carbon emissions reduction target (Pollin and Callaci, 2016a: 6).

In 2016, Australia's coal-fired power stations contributed 78 per cent of total electricity generation, while gas contributed almost 10 per cent (Senate Committee, 2017: 3). Expert evidence, including through submissions to the Senate's Environment and Communications Reference Committee (Senate Committee) (2017), indicates that, for Australia to meet its formal carbon reduction targets under the Paris Agreement, it must prioritise closing all its high-emission coal-fired power plants by 2050, with most to be closed by 2035. This situation reflects the growing role for renewable energy generation, coal-fired power plants' substantial contribution to national carbon emissions and that they represent large targets for policy and action, which are easily identifiable and open to evaluation (ClimateWorks, 2017: 17-20; Senate Committee, 2017: 16-19).

Furthermore, the Senate Committee pointed to expert evidence regarding existing over-capacity in the National Energy Market (NEM). Indeed, the Australian Energy Market Operator (AEMO) projected that, to reflect the growth in the use of renewable energy sources, coal-fired producers may withdraw some 63 per cent of their generation capacity in the next 20 years, particularly as many of these are near the end of their commercial lives (cited in Senate Committee, 2017: 26). Indeed, Denniss and Campbell (2015: 1) claim that some of those stations are no longer commercially viable but remain open because their owners wish to postpone the still greater costs they face with the necessary site remediation that awaits plant closure.

Still, commercial considerations mean that many would “cease operations in the medium term” (Senate Committee, 2017: 69). Climate policy considerations may speed up this process. They also mean that new coal-fired power stations won’t replace those closed. The Senate Committee called for Australian society to clearly recognise this reality. The next step was to forge a closer integration of climate change policy goals with those linked to security and cost of supply. It argued (2017:69):

The question is not if coal fired power stations will close, but how quickly and orderly these closures will occur, and what supporting policies, if any, will be in place to help manage the process.

From a range of data, we estimate that at the start of 2017, Australia’s coal-fired power industry directly employed approximately 8,000 people, whether as employees, contractors or those working in and around coal mines supplying coal to Australian generators. However, potential job loss figures are likely to be much higher if regional employment multipliers from these industries are included. For instance, if the estimated Latrobe Valley employment multiplier of 2.265 (Committee for Gippsland [CFG], 2016: 43) is representative of the industry in general, then the loss of 8,000 direct industry jobs would result in the loss of a further 18,120 jobs across impacted regions of Australia.

To date, decisions regarding closing/maintaining power stations in Australia have largely reflected each plant owner’s commercial considerations. By international standards, in pursuing those commercial interests, those owners face few obligations to the workers they will retrench (OECD, 2016: 127). Factors shaping their considerations include age and condition of the plant, relative costs of maintenance and renewal, projected demand and wholesale electricity price patterns, plant remediation and rehabilitation costs upon closure, costs of employee entitlements for those retrenched and likely effects of climate change policy relative to each plant’s greenhouse gas emissions profile.

Given this situation the Senate Committee identified an urgent need for the Australian Government to provide strong national policy leadership in such a way that the necessary transition would “be adequately planned for and implemented at the lowest cost to consumers, taxpayers, workers and communities” (2017: 69).

Aging plants tend to be heavier greenhouse gas emitters and polluters more generally. Furthermore, burning brown coal is more polluting than black coal in terms of greenhouse gas emissions and particulates emitted, many of which produce substantial public health risks. Power stations in Victoria and South Australia have depended on brown coal; those in the other states, on black coal. For this reason, policies that reflect climate change criteria are more likely to target brown coal-burning plants (Climate Change Authority, 2016:15; Senate Committee, 2017: 6) (see Appendix 1). Yet, poor policy design and their own favourable economics have kept brown coal power stations in operation.

With the March 2017 closure of Hazelwood power station in Victoria’s Latrobe Valley, ten coal-fired power stations had closed across Australia since 2012, removing 5,200 MW of installed NEM capacity (Senate Committee, 2017: 25). Those closed also included the

last two South Australian stations—Playford and Northern. This leaves 23 still operating. Liddell, in the Hunter Valley NSW, is slated next for closure, in 2022 (Senate Committee, 2017: 5. See Appendix 1). AGL's (2015) early warning of its intention to close Liddell is, for Australia, an unusual and very positive example of corporate decision making that allows for proper, well-planned and staged preparations and implementation.

Decarbonisation of electricity generation therefore clearly presents important choices for structural adjustment policy. It remains unclear which concrete options would best meet the goal of Just Transition and there are likely to be different sets of solutions for each case: a variety of Just Transitions.

The rest of this report is organised into seven sections. Section 4 briefly explains our design of the case study analysis and choice of sources. Section 5 introduces three dimensions of climate change-related transition that we use. Section 6 outlines the implications of structural adjustments that produce unjust transitions. This helps clarify our understanding of the need for measures that produce a Just Transition, and what happens when those measures are absent. Sections 7, 8 and 9 respectively introduce more and less successful case examples of structural adjustment. Section 10 develops lessons from comparison of those cases, including the need for bottom-up together with top-down approaches. It also includes information about current Australian examples of these proposals.

4. Research design and sources

This report uses a comparative case study approach based on primary and secondary sources. There are seven cases examined in their own right (and in more depth) plus others referred to in relation to particular points. The methods used are largely qualitative.

In choosing those seven cases, we sought a sample that displays both similarities and differences across different criteria. This helps to draw out more general findings and conclusions to then compare to the broader literature.

The overall presentation of the cases divides them according to whether they have been successful, unsuccessful or marginally un/successful. This is useful as lack of success may provide policy lessons as important as those we derive from successful cases. Moreover, by examining both the successful and unsuccessful, we can ascertain whether the factors that appear to explain success also appear to explain lack of success (see e.g. Jones and Tee, 2017: 9).

While most of our study cases come from the coal industry — mines and power stations — we also look at other examples. This is useful as it can highlight positive and negative factors that appear isolated to that industry rather than more widely distributed. Furthermore, by going outside the coal industry, there is the opportunity to take advantage of, and learn from, a wider range of experiences.

A third criterion has been to look at both Australia and overseas cases. It has the advantage of highlighting positive and negative elements in the Australian experience relative to those elsewhere. It also provides useful lessons that may not be apparent when only looking at the domestic situation.

Finally, and again for similar reasons, we chose cases at different geographical scales: local; regional; and national. The larger the scale — for example, regional rather than local, national rather than regional — the greater the complexity and coordination challenges involved in planning and implementing structural adjustment policies.

Other reports have developed useful frameworks to comparatively analyse and evaluate case studies of structural adjustment programs (see especially, Aither, 2014: 22-30; Weller, Sheehan and Tomaney, 2011). For this report, we have chosen to focus in depth on a few cases while also drawing on studies that have worked with a larger number of cases. This parallels the OECD's (2016) approach.

This report presents three very successful cases, three very unsuccessful cases and one that we would classify as marginally un/successful. In particular, it examines two of the most successfully innovative examples of structural adjustment policy—the Ruhr and Limburg—in greater detail. The cases chosen and their selection characteristics are as follows in Table 1:

Table 1: Selection criteria and outcomes of study cases

	Outcome	Industries	Location	Scale
Singapore	Successful	All sectors, especially manufacturing	Overseas	(Small) National
The Ruhr (Germany)	Successful	Coal and steel industries	Overseas	(Large) regional and local
Limburg (Netherlands)	Successful	Coal industry	Overseas	Regional and local
Newcastle, NSW	Marginally un/successful	Steel industry	Australia	City and regional
The Valleys (Wales, UK)	Unsuccessful	Coal industry	Overseas	(Smaller) regional
Appalachia (USA)	Unsuccessful	Coal industry	Overseas	(Very extensive) regional and local
Australia	Unsuccessful	Coal-fired power stations (and mines)	Australia	(Multiple) regional and local

We reviewed a range of literature on this and related themes. This assists in widening horizons for developing proposals and also in testing claims made, particularly by interested parties. Government and official reports, including those by international agencies, tend to be more reliable for a number of reasons. For example, the OECD (2016) report has the advantage of putting Australia's structural adjustment performance and capabilities into expert international comparison. Publications from tripartite international bodies, like the ILO (2015), tend to canvas a range of views rather than being the mouthpiece of any one interest.

In terms of reliability, the Australian Senate's Environment and Communications Reference Committee (Senate Committee) (2017) had the advantage that it also took, as evidence, oral submissions from a range of interested parties and subjected them to questioning. As a discipline for their accuracy, people giving oral evidence were subject to potential prosecution for contempt of the Senate if suspected of giving false or misleading evidence. Furthermore, the Senate Committee was able to weigh an array of diverse evidence submitted in its (majority) report and allow for dissenting minority reports.

We also drew heavily on peer-reviewed published academic research and reports of independent research institutes; as well as reports, submissions and other documents from more advocacy-based or special-interest groups.

5. Climate change structural adjustment, jobs and economic development

The main climate change challenge is for a clean-energy transition. This shifts the energy generation system from a high to a low-carbon emissions profile that will particularly rely on renewable sources like wind, solar and hydro, plus suitable storage capacity. For policy proposals that only focus on linking climate change abatement and energy generation, the key issues are emissions levels, system design, reliability and cost. These leave aside considerations of the economic and social implications of transition (e.g. Finkel et al., 2017). This narrower focus is understandable given the criteria those proposals may need to meet.

More holistic transition policy-making explicitly links clean-energy transition with opportunities for economic development. Greater investment in renewable energy generation and storage can create those opportunities plus others in linked activities. A plan for clean-energy, economic-development transition can constructively address well-founded fears of job losses, local economic decline and further under-employment and unemployment (e.g. ClimateWorks, 2017).

Where coal-fired power stations and mines are located in remote or economically dependent communities, their closure can spell dramatic challenges for local or regional economies. Thus, much thinking on clean-energy, economic-development transitions focuses on a “related varieties approach” of how structural adjustment might work. This approach seeks to gain synergies from working creatively with specific, existing local vulnerabilities and strengths in ways that maintain or even improve local investment and employment opportunities (see e.g. Weller, Sheehan and Tomaney, 2011: 72). We discuss this in more detail later.

Overseas, governments have fostered economic regeneration by supporting development of local “green” economies, with “green jobs” using “green skills”. This has also been the case for areas that had become de-industrialised in ways not linked to climate policy (Stroud et al., 2013). For example, the Scottish Government’s (2011) 2020 *Routemap for Renewable Energy in Scotland* aims for renewable energy to provide “the equivalent of 100 per cent of Scottish gross electricity consumption ... by 2020” (Allan, McGregor and Swales, 2017: 1271). It sees this transition as a mechanism for reindustrialising Scotland in ways that create bountiful investment and employment opportunities through low-carbon technologies.

A clean-energy, economic-development transition can benefit from “upstream” activities that *directly* advance and diffuse renewable energy technologies. These include related scientific research and engineering for the renewable energy sector, its manufacturing, retailing, installation, and servicing and maintenance activities. Development of a

dominant renewable energy sector becomes, in itself, a growth sector, and one which can develop deep roots in formerly coal-dependent regions (Allan, McGregor and Swales; 2017: 1271-72; CSG, 2016 and 2017; Pollin and Callaci, 2016a; Voices, 2016).

Indirect upstream activities can also play a part. For example, a local solar or wind farm may generate work in procurement, transport and logistics and various commercial and managerial services. Some of this may be done in-house. Renewable power generators may also use external organisations, some of whom may be local, including existing providers to coal-fired power stations. Therefore, not all of this work will produce “new” jobs to directly replace activity and employment lost with a power station’s closure. Some will go to existing firms and their workers, to help avoid aggregate job losses across the community or region.

Such firms will also continue to service other “non-green” organisations. Yet, by servicing renewable energy rather than coal-fired generators, they become, on average, increasingly “low carbon” or “green”, employing people in jobs that are lower-carbon or indirectly “greener” than previously. This makes identification, counting and valuing of green employment and the net cost of such a transition, very difficult (Allan, McGregor and Swales, 2017).

There may also be substantial “downstream” development and job creation benefits from a clean-energy, economic-development transition. These can include the spending capacities of those employed individuals. As well, the rates and taxes they and their employers pay increases government resources to financially support local development and employment. Another benefit may come from local knowledge spin-offs and diffusion of innovation flowing from the development and introduction of new energy technologies. We return to this in our discussion of clusters (below). Taking all these sorts of employment effects together, and looking at the US evidence, Pollin and Callaci (2016b: 2), estimate that, for example, US\$1 million invested in clean energy generation creates many more jobs (p. 17) than does that amount invested in “maintaining the existing fossil fuel infrastructure” (p. 5). Given the sums involved in energy generation, closing down coal-power jobs will thus create fewer redundancies than what a clean-energy economic-development approach will create.

Nonetheless, approaches that limit themselves to clean-energy and economic-development are often silent on the workers affected, beyond the levels of (un) employment created. This is because they tend to ignore the qualitative and quantitative characteristics of replacement jobs. For example, are the new jobs as secure as those lost? How do they compare for health and safety? Do they provide similar levels of pay and conditions? Do they entail more or less skilled work? Are there opportunities for training? What about access to representation through unions and other labour rights? How might the answers to these questions affect the workers’ families and wider communities?

Therefore, proponents of a Just Transition, in accepting arguments for a clean-energy economic-development transition, add goals of social justice for individuals and communities affected by power station and coal mine closures. Taking an optimistic view, UNFCCC (2016: 17) suggests:

The transition to environmentally sustainable economies and societies presents major opportunities and challenges for countries. The transition to low-carbon, environmentally and socially sustainable economies can become a strong driver of job creation, job upgrading, social justice and poverty eradication

Much existing employment in power stations (and connected coal mines) within advanced industrial economies displays many characteristics of decent work. This is certainly the case in Australia. Strong unionisation has produced greater employee voice and representation as well as higher levels of pay, security and benefits, particularly for blue-collar workers with fewer formally-recognised skills (Stroud et al., 2013).

For some, particularly older and longer-term coal industry workers, a Just Transition would provide ways for them to leave paid employment in a dignified and properly compensated and remunerated manner.

Just Transition should enable most of the other former workers to move from decent (high carbon-emitting) work to other decent work. This may be in lower-carbon areas of economic activity, but may also, at least for a few years, involve moving into surviving areas of high-carbon employment (Stroud et al., 2013).

This last point is important because some policy advocacy has projected what may be overly optimistic views regarding the speed and volume of “green job” creation. It suggests that new substitute low-carbon jobs will rapidly and inevitably emerge for those affected by power station closures (e.g. Allan, McGregor and Swales, 2017; Pollin and Callaci, 2016a). Implicit too is that new green jobs equate for quality and quantity with those lost, and that they will be readily accessible by retrenched coal industry workers—including those in power stations.

Yet, without careful planning and project management ahead of, during and after these closures, any transition out of decent, high-carbon work will likely be to one of a range of employment destinations:

- ◊ New, low-carbon energy sector jobs.
- ◊ Other green jobs.
- ◊ Other jobs that are not low-carbon or “green”.

Any of these might provide decent work. However, more likely, they will not.

Other destinations may include:

- ◊ Other forms of economic activity, such as independent contractors and small business owners, or in cooperatives.
- ◊ Retirement in ways that may or may not reflect a Just Transition; and
- ◊ Unemployment or underemployment.

Failure to achieve most of the necessary aspects of a Just Transition will mean that those workers exiting the industry, their families and communities will disproportionately bear the structural adjustment costs.

The role of government is crucial for confronting these challenges (ILO, 2015; UNFCCC, 2017). Examined cross-nationally, there appear to be two main responses:

- ◊ In some countries, it is expected that the state plays a leading role in leading, planning, funding and coordinating these structural adjustments through policy and programs.
- ◊ In others, the dominant approach is to minimise those types of interventions.

The first set of expectations explicitly works from a broad “stakeholder” perspective that prioritises communities and workers as well as plant owners and business more broadly. This type of approach offers fruitful opportunities for promoting Just Transitions. In a whole-of-government sense of this approach, the UNFCCC (2016: 19) argues that a Just Transition will require:

a country-specific mix of macroeconomic, industrial, sectoral and labour policies that create an enabling environment for sustainable enterprises to prosper and create decent work opportunities by mobilizing and directing public and private investment towards environmentally sustainable activities. The aim should be to generate decent jobs all along the supply chain, in dynamic, high value added sectors that stimulate the upgrading of jobs and skills, as well as job creation and improved productivity in more labour-intensive industries that offer employment opportunities on a wide scale.

The second set of expectations displays no commitment to Just Transitions. Derived from a “shareholder” perspective, it prefers to leave processes and outcomes to whatever decisions power station owners make and whatever market conditions prevail. In this scenario, at best, those affected may hope for ad hoc government intervention in response to electoral pressures. Typically, this results in ineffective transitions under most criteria (Aither, 2014; Gunsekera, 2008; Jones and Tee, 2017; OECD, 2016; Stroud et al., 2013).

During the 2000s, national governments in the USA, UK and Australia developed policies for transitioning to low-carbon economies. Embedded in the resulting programs were initiatives for education and training towards green jobs (McDonald, Condon and Riordan, 2012;

Stroud et al., 2013: 14). Nonetheless, changes of government have brought significant backtracking, with the re-assertion of narrowly sectional business-centred perspectives and/or climate change denialism.

Stroud et al. (2013: 23), in discussing their two cases of “market-based” approaches, saw “transition as not linked to the objective of decent jobs. As a result, transition was not tied to a specific set of objectives, which would then enable a framing of transition in particular ways.”

In European and some East Asian countries with stronger traditions of formal and informal institutional collaboration—across governments, business associations, unions and civil society organisations—such initiatives have been much less vulnerable to the electoral pendulum. This makes it much easier to maintain the direction and momentum of decarbonisation transitions. It also fosters a wider vision that accepts Just Transition considerations as normal.

Largely committed to a market-based perspective, Aither’s report (2014: 51) on Australia nevertheless admits that, for pragmatic reasons, governments will and even should intervene where local communities and industries face severe short-term crisis.

Such situations are likely to be viewed as highly inequitable by those needing to adjust, and the broader community and government may also share this view. Such situations may also be viewed as inefficient if the likely outcome of autonomous adjustment is increased long term social and economic costs (such as long term unemployment, welfare dependence, crime and health and wellbeing issues).

Just Transition policy aims to prevent and redress these impacts and prevent or mitigate their associated harms.

In investigating the future of closures of Australia’s coal-fired power stations, the Senate Committee (2017) brought together the often-separated elements of climate change and energy provision, energy price and security and Just Transition. After canvassing different views as to the role of government, it called for the Australian Government to actively lead and take responsibility for the process (see Appendix 2).

To understand better the importance of a Just Transition, it is useful to consider the implications, for those affected, of unjust transitions. We turn to this now.

6. Structural adjustments and unjust transitions

Large-scale job losses for the industry's workers

Large-scale losses of jobs within very short periods are the most immediate and intense costs of Australia's transition out of coal-fired power generation. Almost all other issues—whether they concern individuals or their communities—flow from the planning, nature, timing and implementation of these retrenchment decisions. When handled poorly, mass retrenchment decisions can create major risks of triggering negative life spirals for impacted workers, their families and communities (Price, Choi and Vinokur, 2002; OECD, 2016; Wanberg; 2012).

The scale and speed of job losses when a power station or mine closes can overwhelm local labour markets, particularly as many of those retrenched have similar skills. Where there is inadequate forward planning for a Just Transition, these situations of excess local labour supply limit the adaptive capacities of those workers and local labour markets before matters deteriorate rapidly. Australian and international evidence suggests that those workers displaced through structural adjustment processes tend to be male, older and with lower levels of formal education. The same tends to be true for workers in coal-fired power stations and mines. This makes more difficult their access to decent work in new growth industries (Jones and Tee, 2017: 16; OECD, 2016: 33; Weller, Sheehan and Tomaney, 2011: 56-57).

A number of potential outcomes therefore face retrenched workers. The most optimistic includes jobs of similar quality or better in terms of decent work. Much more likely scenarios are worse jobs that don't provide decent work but also unemployment, migration to find work in a different locality or retirement, desired or not (see (OECD, 2016: 39-41; Wanberg, 2012: 76). Some of those retrenched will seek to become self-employed or business owners, at times taking on further unwanted financial risk in the absence of other suitable options.

A number of studies suggest that in major structural adjustments—but in the absence of policy and programs that seek a Just Transition:

- ◇ about one third of affected workers finds similar types of decent work.
- ◇ another third is forced to accept a deterioration in their employment situation—including unemployment, and
- ◇ a further third takes early retirement, sometimes, unhappily and to their disadvantage for various outcomes (Weller, Sheehan and Tomaney, 2011: 81-82).

Overall, those affected suffer substantial and often enduring reductions in their annual incomes (Jones and Tee, 2017: 20; OECD, 2016: 39-44; Pollin and Callaci, 2016a: 5). We now focus on transitions that bring unemployment and then discuss lower quality employment.

Transitions to unemployment

Shared factors like older age and similar skills make any transition even more difficult in over-supplied local labour markets, particularly where a more remote location reduces local options. Older retrenched workers, those with longest job tenure and those living in remote areas are more likely to remain unemployed longer; these are often male workers. Furthermore, opportunities in the local labour market can contract as the closure impacts on dependent firms or through declining business confidence. This increases the risk that retrenched workers will become long-term unemployed. Long-term unemployment tends to atrophy the value of these workers' skills. They can also suffer, when seeking employment, from stigma attached to their unemployment status. Furthermore, long-term unemployment negatively affects families and communities through the risk of intergenerational transmission of unemployment. Many discouraged job seekers, especially older ones, just leave the labour market entirely (Jones and Tee, 2017: 16-18; OECD, 2016: 114, 117; Peetz, 2005: 297-98).

The retrenched also suffer major loss of income and employment benefits—including superannuation—reducing their retirement income and options. Substantial reductions in income threaten people's capacities to service mortgages, contributing to the loss of their homes—for many Australian workers and their families, by far their largest financial asset (Weller, Sheehan and Tomaney, 2011: 43-44). Financial stresses and heightened risks of mental health issues linked to an unwelcome sense of dependence, unemployment stigma, loss of income, purpose and reduced social interaction can also severely strain family relationships and cause marital and other close relationship breakdowns (Wanberg, 2012; Wiseman, Campbell and Green, 2017: 24).

Transitions to lower quality employment

Even where work is available locally, those jobs often do not provide decent work. This situation is worse in the remote or single-industry localities where some coal-fired power stations are located. The new jobs provide less job security. Typically, this means an unwelcome shift from permanent, full-time to part-time and particularly casual or contract work—including work of an on-call nature. It may also mean underemployment as the new job does not provide sufficient paid hours. Gaining sufficient paid hours may require finding and holding a number of insecure, low-quality jobs (Jones and Tee, 2017; OECD, 2016; Weller, Sheehan and Tomaney, 2011).

Those jobs also typically offer lower-skilled work and hence less opportunity for the formerly retrenched to break back into decent work (OECD, 2016: 42-3, 126; Peetz, 2005: 299-301). Taken together, this suggests those workers will suffer prolonged lower earnings even where hourly pay rates may be similar. In Australia, if employed as casuals, their superannuation accumulation also suffers, threatening their retirement living standards. Without supportive policies, employers are unlikely to support pre-closure skills development training to help these workers improve their labour market prospects upon retrenchment.

Particularly for non-unionised workplaces, the hourly pay rate and range of benefits available in destination jobs will most likely be lower too than in unionised power stations with union enterprise agreements (Peetz, 2005: 301-02; Wiseman, Campbell and Green, 2017: 24). The growth of “wage theft” where employers pay below (Modern) Award rates and avoid paying for compulsory overtime or penalty rates worsens these situations (Thornthwaite, 2018). Therefore, there is the strong risk that these workers will find themselves in a negative spiral of short-time, multiple insecure jobs, low pay and poor conditions and benefits. There is strong evidence too that those jobs also carry additional risks of occupational disease and injury and hazard exposures (Quinlan, Mayhew and Bohle, 2001).

Finally, the new jobs, whatever their conditions, may be very inconveniently located for impacted workers and require either much greater travel times and/or unwelcome relocation. The evidence is that such re-locations often take quite some time and face a number of barriers (Jones and Tee, 2017: 22). A shift to lower quality employment can therefore lead to the similar costs as a shift to unemployment.

Community and regional dimensions of unjust transitions

Losses of a power plant's economic activity and jobs, and of the incomes they produced, can have devastating impacts for host communities and regions. Direct major reductions in regional income can trigger negative multiplier effects, with varying degrees of severity, for individuals, firms, economic and civic institutions. This contributes to further increase regional unemployment as reduced local spending works its way through the local economy.

For example, prior to the closure of Hazelwood power station in March 2017, approximately 10 per cent of Latrobe Valley employment was in coal-fired power stations: 3,000 as direct employees, 1,000 as contractors (CFG, 2016: 7). A major Committee for Gippsland (CFG) report produced estimates that the loss of 1,400 of those jobs—equivalent to two of the local power stations closing—and their much lower spending would result indirectly in a further 1,771 regional job losses, in a situation where local unemployment had already jumped from to 9 per cent in the previous 12 months (CFG, 2016: 7).

Making this type of scenario worse are a locality's greater dependence on a coal-fired power station or mines; having a less diverse economy; and/or being located in a remote locality as these typically have more trouble encouraging new, inbound investment. A declining local economy and shrinking opportunities encourage some residents, particularly working-age people, to relocate in search of better work prospects. Those most likely to emigrate tend to be younger, with greater formal education and more portable and employable skills. This further reduces local income and spending, economic activity and investment attractiveness. Those unable to move can find themselves living in declining towns and neighbourhoods, with shrinking opportunities and access to services (Jones and Tee, 2017: 6-8; Weller, Sheehan and Tomaney, 2011: 43-44).

The Committee for Gippsland's report (CFG, 2016: 7) predicted that the closure of local power stations would create the direct loss of some 3,000 people from the region. However, with the flow-on effects, this might mean more than 7,000 people leaving in total.

Contracting populations undermine local house prices, making the costs of relocation ever more difficult for those who stay on (Weller, Sheehan and Tomaney, 2011: 43-44). Empty shops and houses reflect the negative spiral unleashed. This then undermines other areas of local economic and social confidence and with it, activity, employment and social amenity. Reinforcing the negative spiral—psychologically as well as economically—are subsequent closures of bank branches, post offices, schools and even hospitals. Closure of local businesses and emigration undermine council rates and other local government revenues and go hand-in-hand with reductions in civic and social facilities and reduced council spending on roads, parks and other infrastructure, many of which are also sources of local manual employment.

Examples of structural change and population collapses at much larger scale include the US cities Pittsburgh and Detroit. Pittsburgh had long been the leading steel city in the USA but its population declined by 29 per cent between 1970 and 1983. This was largely due to mass unemployment generated by the steel industry's decline (Jones and Tee, 2017: 14-15; Schulz and Schwartzkopff, 2016: 15). Then there is the dramatic story of the city of Detroit. Its population more than halved between 1970 and 2010 (1.5 million to 714,000) and the city's daily life suffered impoverishment and degradation, in part due to the crisis in its car making industry on which it depended so heavily (Jones and Tee, 2017: 14).

Unjust transitions also affect communities through degraded and polluted environments that power plants and mines sometimes leave after closing. The Senate Committee (2017: 9-12) noted numerous Australian examples of how such damage to the local environment and public infrastructure particularly harms coal-dependent communities. Sometimes this pollution not only poisons the ecologies of rivers and lakes and threatens town water supplies, but compromises alternative uses like agriculture, tourism, fishing and recreation.

7. Structural adjustment: the successful cases

Singapore's Second Industrial Revolution

Singapore became independent from Britain in 1965. Soon after, the new ruling party of this (then) poor island city-state, the People's Action Party (PAP), instituted a policy of low-wage, low-cost, low-technology, export-oriented industrialisation. Subsidiaries of foreign-based multi-national corporations (MNCs) and state entrepreneurship were the core employer actors. This highly successful strategy recognised Singapore's miniscule domestic commercial and financial markets and the very small scale of local family businesses (Huff, 1995).

At the same time, PAP developed a tripartite system for policy making and implementation. It gradually diffused this model beyond industrial relations and economic development to include technical education, public housing, health and social security. Although PAP's rule was authoritarian, its programs were relatively egalitarian and community-minded in inspiration. Furthermore, PAP also encouraged wider participation where top-down implementation had to take feedback from local communities into account (Huff, 1995; Sheldon, Gan and Morgan, 2015).

By the mid-1970s, Singapore's low-wage, low-tech industrialisation model was suffering competition from other, but cheaper, newly-industrialising, East Asian economies. The PAP leadership decided against responding by driving down wages or de-industrialisation. Rather it saw Singapore's future prosperity as depending upon attracting more capital-intensive, sophisticated foreign direct investment (FDI) and work in order to transition into a competitive advanced, high-tech economy (Rodan, 1989: 144-45).

Ahead of any crisis, PAP introduced a national-level structural adjustment policy (and program) in 1979: Singapore's Second Industrial Revolution. Existing FDI and export-oriented policies were now to operate from within an explicitly high-wage and high-technology framework (Sheldon, Gan and Morgan, 2015). Measures included quickly easing out low-skilled employment across the economy in order to reallocate workers to areas of labour shortages.

To help create a high-skills workforce, the government established a tripartite Skills Development Fund in 1979 funded by, in part, employer contributions. Higher skills training became a core of the modernisation of Singaporean industry and its new path (Pang, 1982: 202, 217-19). Concurrently, a three-year wage adjustment policy brought annual wage rises exceeding 12 per cent. Many low-wage employers had to revise their businesses, move off-shore, or close (Gan, Sheldon and Morgan, 2015; Rodan, 1989: 145). These and other government structural adjustment initiatives contributed to Singapore's enormous economic success over the following 15 years. In that period, it became one the world's most prosperous and high-tech countries.

Conclusion

Crucial to the success of Singapore's Second Industrial Revolution were that:

- ◇ The (PAP) government developed a vision for a stronger economy and better society in confronting external challenges – but ahead of any crisis.
- ◇ This vision contained many elements of a Just Transition.
- ◇ A high-wage, high-skills economy was both a means and an end and this helped build social consensus.
- ◇ Government-led tripartite bodies took responsibility for planning, coordinating and diffusing this major structural adjustment policy – complete with concrete program measures – to deliver that vision. This was highly effective top-down planning and implementation.
- ◇ The policy was able to take advantage of existing strengths, including societal consensus and policy-development expertise, and develop new ones.
- ◇ There was a planned, coordinated focus on ensuring sufficient labour demand for a highly-skilled, high-wage labour force.
- ◇ There was a planned, coordinated and well-funded focus on skills development to supply that highly-skilled, high-wage labour.
- ◇ There was growing use of community participation mechanisms, including some that were bottom-up, despite the compromising of democratic freedoms in other spheres.

Ruhr Region, Germany, late 1950s to 2017

The Ruhr District is a large, heavily populated region within the German state of North-Rhine-Westphalia (NRW). The Ruhr developed economically through its historical dependence on coal mining, coal power generation and coal-reliant heavy industries such as steel production. This made it Europe's largest industrial agglomeration and almost entirely depending on those industries, the owners of which were a few very large firms. Yet within very few years of their post-World War II reconstruction, a number of factors caused those industries to decline precipitously (Galgoczi, 2014: 217; Schulz and Schwartzkopff, 2016; Stroud et al., 2013: 16; Taylor, 2015: 1, 4–6). The scale and speed of these declines in a modern, democratic industrial society is hard to comprehend.

In 1957, employment in the Ruhr's coal and iron and steel industries peaked at about 807,400, or about 70 per cent of the region's total employment. Of these, 473,600 worked in coalmining. In 1960, the number of coalmining employees had fallen to 390,000; by 1980 to 140,000; and by, 1994, 77,600. By 2001, coalmining employment had shrunk to 39,000 and, in 2007, there were only 24,000 still employed in Ruhr coal mining, three-quarters of the German industry's total. By then, coal industry employment accounted for less than 2 per cent of total Ruhr employment. Iron and steel employment also fell dramatically, but less so than in coal (Taylor, 2015: 4–6; Galgoczi, 2014: 221, 222).

We divide these industrial declines and structural adjustment policy responses into two overlapping phases. The first, from the late 1950s to the near present, has been a set of long-run and interacting evolutionary responses to a dramatic collapse of economic activity and employment in coal and steel. The second has been the result of a 2007 tripartite agreement to close the remainder of coalmining in the Ruhr (and adjacent regions), but not coal-fired power stations or manufacturing.

The first phase, given the times, did not address climate change but it did seek to remediate and regenerate badly polluted natural environments. It also attempted to build a Just Transition for the workers and communities affected. The second phase, however, addresses clean-energy economic-development criteria through a Just Transition perspective. Over the last 20 years or so, measures from the first phase have therefore become enmeshed in the second.

The Ruhr closures to 2007: Phase 1

Ruhr adjustment programs prior to the 1980s were effective in some ways but also exhibited major shortcomings. Most notably, there was widespread reticence, at all levels, to accept that the Ruhr's heavy industries had entered a phase of historic, structural decline. This reflected a deep-seated sense of local identity linked to the region's traditional industry patterns. As a result, while governments invested substantially into economic diversification and mitigating the impact of job losses on workers, there was also still significant investment in propping up the Ruhr's failing hard coal industry (Galgoczi, 2014: 224-25; Taylor, 2015: 9; Schulz and Schwartzkopff, 2016).

This is not hard to understand. The Ruhr had no history of developing more diverse patterns of economic activity and had few small and medium size enterprises (SMEs). It also had a weak educational system with no university until 1962 (Taylor, 2015: 5). By the 1980s, policy makers had largely accepted the increasing urgency for diversifying the region's economy by sector and firm size. Nonetheless, generating popular enthusiasm for such a major transition remained a serious challenge (Taylor, 2015: 9; Bross and Walter, 2000: 23).

Some of this reflected the weaknesses of prioritising top-down change strategies. Structural adjustment policy-making and implementation were highly centralized. Seeking little input from stakeholders at local and district levels, (NRW) state-level institutions "directed pre-defined investments and projects" (Taylor, 2015: 9).

Yet, many projects, like the establishment of new universities and technical colleges as well as environmental clean-up schemes, were very successful in slowing the pace of job losses and laying important foundations for later developments. However, at the time, they largely failed to generate successful growth in the number of new SMEs.

Policy-making shifted in the late 1980s to redress these shortcomings by developing a new bottom-up approach. Broad, state-level guidance retained a major role in long-term planning for specific projects but design and implementation moved to the local level, and to local actors (Taylor, 2015: 9).

Despite these challenges, the process adopted succeeded in preventing mass outward migration and long-term economic decline. As a result, the Ruhr's average annual economic growth of 1.3 per cent between 1957 and 2000 while modest, was at least positive. The region achieved this despite the enormity of structural decline plus

recurrent cyclical crises for those two traditional industries. Over that period too, nearly the same number of additional jobs appeared in the Ruhr's previously very small service sector as were lost from coal and steel. This almost doubled the proportion of service jobs within regional employment (Taylor, 2015: 6; Galgoczi, 2014:226).

Crucial to all this, as Galgoczi (2014: 218) puts it were the active, collaborative management of these processes by federal and state governments as well as "restructuring processes ... embedded in an industrial relations culture in which workers' participation plays a major role."

Summary: How was this achieved?

1. Large-scale public investment to modernize infrastructure.
2. Large-scale public investment to develop strong university and technical education systems. This was perhaps the most important early initiative (Galgoczi, 2014: 224)
3. Investment in new leisure and cultural industries, including eco-tourism.
4. Investment in new service sector growth focused on building upon existing regional strengths. Ruhr examples of this "related variety" approach:
 - a. Strong capabilities in commodity transport, developed for the Ruhr's coal mining and heavy industries, lent themselves to assisting rapid regional development of "modern packaging and transport logistics planning, design, monitoring and control services" (Taylor, 2015: 7).
 - b. Similarly, the Ruhr developed robust environmental protection and environmental services industries in the wake of the regulation of plant closures and the remediation and rehabilitation of mines.
 - c. The same processes also encouraged substantial, longstanding initiatives to repair and protect the region's natural environment so heavily damaged by highly polluting industries over many decades (Taylor, 2015: 7; Wodopia, 2017:32). By the mid-2000s, there were some 100,000 people working in environmental technology research and development (Galgoczi, 2014: 228)
5. Re-industrialisation support policies focused on environmental technologies. Some encouraged suppliers of equipment to the coal mining, power generation and steel industries to shift to developing renewable energy systems (Galgoczi, 2014: 228). Weller, Sheehan and Tomaney (2011: 77) list examples like "[t]wo of the world's leading producers of wind turbine parts ... originally producers of coal-mining machinery in the Ruhr". (See also Wodopia, 2017:32-33 for other examples).

As a result of these various initiatives, Galgoczi (2014: 228) notes that the Ruhr has developed a comparative advantage in energy supplies and waste disposal, with a great deal of research and development going into “renewable resources, recycling and waste combustion”. These areas of high-tech manufacturing and services have developed in a region of 5.4 million inhabitants that, until 1962, had no university (Galgoczi, 2014: 225).

One highly successful case, the Emscher River development program, demonstrates the effectiveness of this bottom-up approach in establishing new business clusters (Taylor, 2015: 9). It involved:

- a. Establishment of umbrella programs to coordinate and support local initiatives.
- b. Bundling of resources from many sources: local and regional; public and private.
- c. Support for new planning and business networks.
- d. Establishment of innovation centres and of a technology park linked to the Dortmund Technical University.

Another excellent example is a program that helped promote these types of local initiatives. The NRW government established the Emscher Park Planning Company, for a 10 year period, to achieve particular NRW government-defined goals. It was to do this by coordinating locally-proposed projects and providing quality control for them. These projects targeted the environmental repair and industrial diversification and revitalisation of the Emscher River sub-region.

The company had operational autonomy from the government. Founded with only €18 million from the state, it “packaged and organized funding for the projects” from various other government programs and private sources rather than directly funding them itself. Yet, it ended up coordinating €2.5 billion in funding for projects under its purview (Galgoczi, 2014: 228-29; Taylor, 2015: 9-10).

Yet another example, Dortmund Technology Park, linked with Dortmund Technical University, was founded in 1988. That university’s Technology Centre has served as a very successful, university-supported incubator for startups. After five to seven years, the Centre requires startups to leave; three quarters of them have moved to the Technology Park. By 2013, the Technology Park included almost 300 companies and had created 8,500 jobs. (Taylor, 2015: 9-11).

Private sector support of public sector innovation in the Ruhr: An example

Initiativkreis Ruhr is a private development organisation established by 67 Ruhr-based companies. It focuses on innovation and corporate social responsibility. One of its initiatives was to establish a competition among municipalities, including city governments, to develop plans to achieve highly ambitious environmental targets and increased housing. Under competition rules, entries from contestant municipalities have to include broad participation by their populations and be replicable in other Ruhr municipalities (Taylor, 2015: 13-14).

In 2010, for example, Bottrop (population 116,000), won this competition. Like most Ruhr towns and cities, Bottrop had grown through coal mining and related heavy industries but had struggled heavily after those industries collapsed (Taylor, 2015: 14).

For the competition, Bottrop organisers collected the signatures of 20,000 people promising support — out of the 70,000 living in the pilot project area. They also formed a company with €500,000 from *Initiativkreis Ruhr* and €1.5m from other private sources to provide for the planned environmental efforts. Local inhabitants and institutions participated widely in specific, funded projects that often focused on the use of public and residential buildings. Through this method, over 200 projects had been launched by 2014 (Taylor, 2015: 13-14).

The impact of the competition and Bottrop's projects went well beyond Bottrop itself. Fifteen other cities which had participated in the competition subsequently created a network aimed at learning from the experimentation and solutions developed in Bottrop's many projects. (Taylor, 2015: 14).

By 2013, Ruhr unemployment remained high at 12.1 per cent compared with 9.1 per cent in NRW state, and the national rate of 7.4 per cent. Given that these two traditional industries had provided some 70 per cent of the region's employment in the mid-1950s, this was a remarkable achievement. It was also a significant improvement on the unemployment peak of 15.1 per cent between 1978 and 1988. Furthermore, that improvement came despite large-scale mine closures after the 2007 agreement and further heavy de-industrialisation. Indeed, local structural adjustment policies and processes have successfully prevented substantial population decline (Hospers, 2004; Taylor, 2015: 6, 7). Furthermore, successful structural adjustment programs generating major industry diversification and environmental improvement have significantly improved the Ruhr's economic resilience, growth potential and liveability.

The Ruhr closures from 2007: Phase 2

The second, much shorter phase arrived with a German Federal Government decision to phase out all subsidies for coal mining by 2018. This reflected EU Council policy. The outcome was to particularly hit the remaining black coal mining of the Ruhr and a couple of neighbouring areas. The parties to the 2007 agreement were the (consolidated) coal company, the representative union plus Federal and state governments. They chose to delay the final phase-out date to the end of 2018 “solely to ensure socially acceptable staff reduction” (Wodopia, 2017: 13), meaning one that met community expectations of fairness. Careful staggering of closures together with policies to support workers affected were thus practicable. The expectation is that there will be only 2,400 employees remaining at the end of 2018.

Prior to that, specific legislation mandated that the Federal and NRW governments were to fund structural adjustment in a reliable, ongoing way. From 2019, the mine-owning company—having reconstituted itself as a foundation funded by selling off its most profitable businesses—will have perpetual financial responsibility for the mines’ long-term, legacy liabilities: pit water management; permanent mining-related damage to buildings; land rehabilitation; and groundwater purification (Wodopia, 2017: 31).

With “socially acceptable staff reduction” came a comprehensive package of Just Transition measures for affected mineworkers. Regulating this structural adjustment are the 2007 agreement, the federal legislation, collective bargaining agreements and internal company programs.

Most importantly, through forward planning and staggering mine closures, the agreement partners were able to ensure that mine employees would benefit from:

- ◊ Re-location of about 10,600 employees within and to still-producing coal-fields.
- ◊ A generous early-retirement scheme that pays more to underground miners and compensates younger retirees for age-related gaps in their retirement pensions.
- ◊ Extensive opportunities for workers to transfer jobs within the company either as a temporary placement or through ongoing redeployment.
- ◊ Qualification/requalification through training and on-the-job certification
- ◊ External transition into the services sector, for example at Dortmund Airport and in health care (Wodopia, 2017).

Conclusion

Crucial to the success of the Ruhr's structural adjustment as a Just Transition have been that:

- ◇ There has been consistent engagement by highest levels of government — Federal and NRW state — to face severe external challenges.
- ◇ This began prior to the outbreak of industry crisis and has continued to develop in anticipation of future crises rather than as an ad hoc reaction to them. This has allowed for highly effective top-down planning.
- ◇ Those levels of government have collaboratively led, coordinated and funded planning and implementation together with municipal governments, employers and unions.
- ◇ They could thus successfully promote large-scale diversification of the Ruhr economy, a necessary foundation for a Just Transition there.
- ◇ To support economic diversification and regeneration of degraded areas, the public sector invested heavily in supportive infrastructure, higher education and training and in fostering private sector innovation and entrepreneurship.
- ◇ Public and private sectors prioritised a strategy of building new initiatives from the strengths of existing activities, skills and institutions, with the assistance of public sector investment mentioned above.
- ◇ The parties sought to ensure sufficient decent work was available, including for the newly higher-skilled workers, but also sufficient skilled workers for that work.
- ◇ The German tradition of “social partnership” mandates prominent roles to unions and collective agreements in socio-economic policy making and implementation. This helped manage consensus and legitimation through dramatic changes by providing avenues for workplace consultation, and upward feedback and pressure.
- ◇ All this transpired within a political economy and industrial relations vision and culture conducive to a Just Transition for individual workers and their communities. Crucial here are notions of socially-acceptable outcomes and corporate responsibility.
- ◇ These notions contributed to policies designed to deliver high-wage, high-skills industries and jobs, maintenance of mine employees' employment through the transition and substantial compensation for those induced to leave the labour market. This also reinforced social consensus.
- ◇ There was growing use of community participation mechanisms, including some that became increasingly bottom-up, from both public and private sectors.

Limburg Region, Netherlands

Overview

Limburg is a province in the Netherlands' south. It experienced major and rapid growth in coal mining output and employment in the early half of the 20th century before stabilising, in the 1950s, at very high levels of regional economic output and employment (Kasper and Knotter, 2013: 3). As a result, Limburg's regional economy became substantially reliant on coal mining for its employment and income. In 1965, approximately 75,000 jobs were in mines and firms supplying mines. Together they represented slightly over a third of Limburg's workforce (Gales and Holsgens, 2017: 6; Kasper and Knotter, 2013: 5).

However, from the mid-1960s, coal output and employment began to collapse rapidly. This was due to Dutch coal mines' increasing inability to compete with overseas coal producers and intense competition from cheap European natural gas. In 1974, the last Dutch coal mine closed. (Gales and Holsgens, 2017: 4; Kasper and Knotter, 2013: 2).

With the decline and ultimate closure of Limburg coal mining, regional unemployment rose to very high levels, in aggregate terms and relative to the rest of the Dutch economy. This remained the case for most of the period to 1990. In 1984, regional unemployment reached its peak at slightly over 20 per cent, while the regional component of unemployment (Limburg unemployment relative to Dutch unemployment) peaked at 6 per cent in 1978 (Gales and Holsgens, 2017: 11; Kasper and Knotter, 2013: 9, 14).

By 1990, decades of structural adjustment policy aimed at diversifying Limburg's economy and improving its employment outcomes had succeeded in reducing its unemployment to nearly half the peak level. It also eliminated Limburg's regional component. The regional component did resurface in the mid-1990s, but only to a very limited extent (Gales and Holsgens, 2017: 11; Kasper and Knotter, 2013: 1, 9). This was a major achievement; globally, it is very common for regions that lose such a major part of their economic activity so rapidly to also rapidly enter long-term stages of stagnation or permanent decline.

Factors explaining successful structural adjustment

Already in the early 1960s, key policy makers had begun to anticipate and accept the inevitable decline in demand for Limburg coal. This acceptance became official policy in 1965 together with planning to coordinate the decline in a staggered manner over the coming decades (Gales and Holsgens, 2017: 11). Engaging so early with this reality and the major challenges that were to follow allowed many of the individual and public costs of the coal industry's decline to be amortized over a long period rather than being born unexpectedly and suddenly. It gave the government, individuals

and companies time to prepare and adapt; and reduced the extent to which market mechanisms for absorbing newly unemployed people became strained beyond their limits (Caldecott, Sartor and Spencer, 2017; Gales and Holsgens, 2017).

A relatively high degree of consensus across the unions representing coal miners, the managers/owners of the mines and government proved crucial for successful implementation of this staggered approach and related policies. Especially important was consensus on the likely fate of the industry and the need to substantially scale it back in the near future (Gales and Holsgens, 2017: 6).

All the main stakeholder groups wanted to avoid the costs of a more rapid and unpredictable collapse. They shared a strong common interest in ensuring proper planning for the industry's gradual decline and in counterbalancing that decline with growth of other industries and employment opportunities. This opened greater collaborative possibilities for long-term planning (Gales and Holsgens, 2017: 6).

The Dutch central government took a hands-on role in transitioning coal mining workers, companies and the region as a whole into new and more advanced industries. This shaped the more highly centralized Limburg approach to structural adjustment policy compared to other successful regional examples, like the Ruhr.

The program enjoyed a number of other practical advantages. The policy vision was relatively stable over the course of decades and widely supported by relevant stakeholders. It was well funded. Furthermore, it conformed with many of the best practices of cluster policy for development (see below). As a result, it succeeded in managing regional diversification away from coal and substantially mitigating the worst impacts of this transition on workers (Caldecott, Sartor and Spencer, 2017; Gales and Holsgens, 2017).

Some key structural adjustment policy measures included:

- a. Reaching agreement with coal mining companies as to the timing of each mine closure and ultimate exit from the market.
- b. Those companies gained in terms of market certainty and through receiving subsidies for entry into new industries in the region.
- c. Significant funding increases for regional education, especially higher education. This included establishment of new universities and technical colleges.
- d. Substantial investment in infrastructure, especially for transportation.
- e. Directly assisting the transition away from coal by promoting innovation, hastening knowledge transfer and building regional skills and knowledge capabilities in areas of new potential growth.

- f. Limiting intergenerational transfer of unemployment. This was a major risk because children of mining workers were no longer able to follow local tradition by entering the same industry as their parents.
- g. Generous early retirement packages for older workers.
- h. Very heavy promotion and sponsorship of retraining for younger workers. Emphasis was on providing mine employees with on-the-job training in new industries before their mines shut. This was made possible by the planned and staggered schedule of mine closures.
- i. Supporting the development of regional business clusters. This was mostly through institutional support and funding for bodies that aimed to improve cooperation, innovation/research, and knowledge sharing among firms in the same industries or linked in the same supply chains.

(Gales and Holsgens, 2017; Kasper and Knotter, 2013)

Parkstad Limburg

In 2001, Parkstad Limburg commissioned the 'Situatieschets Parkstad Limburg', a project aimed at overcoming its initial failure to develop a shared vision (Loorbach and Rotmans, 2010: 239–241). The first phase involved technical experts studying technological, economic and institutional trends, both domestically and abroad. They used these to develop overarching structural development principles as well as evidence-based starting points for discussion.

A newly-established advisory board then used these research findings to inform and advise a forum, also newly-established but separate from the political arena. Comprising diverse regional stakeholders, this forum's task was to define shared regional problems and develop guiding principles for a desired regional development plan (Loorbach and Rotmans, 2010: 239–241).

Establishment of this forum further increased the participatory nature of development planning across Parkstad Limburg municipalities. An even wider mix of stakeholders later joined and, in smaller working groups, developed solutions for more defined issues identified by the main forum.

This process succeeded in developing a shared guiding vision and action plan for Parkstad Limburg. Its participatory nature has also helped to substantially increase public debate on and enthusiasm for development in the region. This has also contributed to generating a sense of shared optimism where previously a broad sense of negativity and self-pity had taken hold (Loorbach and Rotmans, 2010: 239–241).

While Limburg's early structural adjustment planning had been less broadly participatory, from very early this century, Limburg's regional government took important steps to widen stakeholder participation. One example, 'Parkstad Limburg', a regional body established in 1999, aimed to facilitating cooperation, across eight adjacent municipalities, in their transition from post-coal vulnerability to an innovative, environmentally-friendly district (see box on previous page).

Conclusion

Crucial to the success of the Limburg's structural adjustment policy were that:

- ◇ The highest levels of government — national and regional — consistently engaged in the face of severe external challenges.
- ◇ Crucially, this started prior to the outbreak of industry crisis. This allowed for highly effective top-down planning.
- ◇ National and regional governments collaboratively led, coordinated and properly funded planning and implementation working together with municipal governments, employers and unions.
- ◇ They could thus successfully promote effective diversification of the economy.
- ◇ The public sector invested heavily in supportive infrastructure, higher education and training and in fostering private sector innovation and entrepreneurship, particularly through clusters, in order to rebuild sectors and areas.
- ◇ They sought to ensure sufficient decent work was available, including for the newly higher-skilled, and also sufficient skilled, labour for that work.
- ◇ The Dutch tradition of "social partnership", which mandates a prominent role to unions and collective agreements in socio-economic policy making and implementation, helped manage consensus through change processes by providing avenues for workplace consultation, and upward feedback and pressure.
- ◇ All this transpired within a political economy and industrial relations culture conducive to a Just Transition for individual workers and their communities. Crucial here are notions of working collaboratively towards social responsibility.
- ◇ These notions contributed to policies designed to phase out existing mines in an orderly fashion, maintain, as much as possible, mine employees' employment through the process and provide substantial compensation for those leaving the labour market. All this reinforced social consensus.
- ◇ There was a firm, well-funded commitment to training mining employees, including through on-the-job training elsewhere, ahead of their retrenchment from mining.
- ◇ Similar opportunities went to young people who would no longer be able to get mining jobs.
- ◇ More recently, growing use of community participation mechanisms, including some that became increasingly bottom-up.

8. Structural adjustment: a marginally un/successful case

Newcastle steelworks, 1999

The Newcastle steelworks was, for most of the 20th century, an iconic pillar of Australia's industrialisation, and a flagship of Australia's largest corporation, BHP. Its large workforce (16,000 in the 1960s) and much larger indirect effect on employment, also made it a cornerstone of the economy of that city and the surrounding Hunter region. Steel, with coalmining and power generation, was also central to local identity for many decades (Jones and Tee, 2017: 9; *Newcastle Herald*, 2009).

Yet, with ageing technology and a scale that could not match its East Asian competitors, the steelworks already faced difficulties during the early 1980s. At that time, the Australian Government provided targeted structural adjustment financial assistance. This brought provided temporary respite for BHP but a major reduction in the workforce. It also helped spark a diversification of the local economy, with a particular shift into services (Gunasekara, 2008: 211, 212; Jones and Tee, 2017: 9).

The eventual closure in September 1999, was apparently still traumatic for the city despite two years' notice. In 1999, the Hunter Region's unemployment rate peaked at 10.4 per cent, one of Australia's highest rates (6.4 per cent for NSW as a whole). However, it would seem that unemployment in Newcastle was even higher. Apart from a sharp rise in 2001, those rates declined steeply over the following years (Jones and Tee, 2017: 9; Murphy, 2014; *Newcastle Herald*, 2009; Wilkinson, 2011: 6).

This structural adjustment process was contradictory in a number of ways. It had the Premier of NSW's fulsome rhetorical support but received too little government funding. As well, the language of partnership brought together the three levels of government, plus business, unions and community groups in meetings where top-down and bottom-up perspectives were expected to mesh.

However, attempts to build new economic development strategies for Newcastle and the Hunter foundered on tight controls the NSW government maintained over decision-making processes. Claims that the transition process was encouraging innovative economic initiatives—including high-tech start-ups—disguised the dampening effects of state government operational demands that initiatives conform to its own guidelines (Gunasekara, 2008: 212-19).

The company itself used the two years to assist its individual employees to transition after closure. This involved bringing in careers and recruitment advisers, programming individualised re-training and helping outplace employees ahead of retrenchments. It also assisted many longstanding and older employees with retirement transitions. This type of corporate accountability and social responsibility was rare in Australia (OECD, 2016).

Ultimately, the overall structural adjustment process was able to meet its operational target of creating 5,000 new jobs but many of the older workers, in particular, suffered heavily, leaving the workforce in despair (Murphy, 2014). Indeed, Just Transition criteria appeared much less important than an economic-development model. In the end, all the proposals for attracting major new industries, developing clusters, start-up hubs, and a high-skills strategy produced little in the early years (Gunasekara, 2008). This reflected the overly shortened expectations for this program.

Yet, by 2009 the region had diversified very successfully, supporting substantial employment growth in new or expanded manufacturing activities and service industries. Nonetheless, a substantial number of those new jobs were in low-wage and often insecure areas of human services (Jones and Tee, 2017: 9; *Newcastle Herald*, 2009; Wilkinson, 2011: 8).

Conclusion

This structural adjustment process was successful in two ways: operationally in terms of creating the jobs; and in process terms, by getting so many different interests and parties to work together in ways that generated optimism. Nevertheless, insufficient company and government funding and lack of autonomy for bottom-up engagement and enterprise undermined the potential for more innovative developments, local entrepreneurship and a shift to a more sophisticated economic structure. Overall then, Just Transition weaknesses included lack of attention to generating alternative decent work and the forced and unwilling retirement of many older workers without adequate compensation.

9. Structural adjustment: unsuccessful cases

The Valleys, South Wales UK

The Valleys is one of the UK's poorest regions and has recently had Wales' highest unemployment. For a century, coal mining was at the core of local industry, employment and identity, including its role as one of Britain's union strongholds. In 1921, the region's coal mines directly employed about 270,000 people — more than 20 per cent of total UK coal mining employment — and produced over 20 per cent of all UK coal output (Merrill and Kitson, 2017: 2–7; Welsh Government, 1985). However, the gradual decline and ultimate collapse of the region's coal mining over the following 70-odd years brought entrenched high unemployment, poverty and net worker outmigration (Merrill and Kitson, 2017: 2–6; Morgan, 2008: 23).

By 1939, mining employment was under 129,000 (Welsh Government, 1985) but hovered around 113,000 until the late 1950s when the mines shed 15,000 more jobs. In the 1960s, 50,000 of the remaining mining jobs were eliminated; during the 1970s, fewer than 30,000 jobs remained (Merrill and Kitson, 2017: 4–7; Government of Wales, 1998).

Finally, during the mid-1980s, through its program to close most of the state-owned coal industry, an aggressively anti-union UK government induced a long, bitter but unsuccessful national miners' strike. Upon the strike's collapse, the government closed the remaining coal mines in The Valleys (Merrill and Kitson, 2017: 8–9). It also closed or privatised local state-owned steelworks. This left the region bereft of alternative employment opportunities for those displaced — and their children — and greatly weakened unionism.

Over this long history of coalmining decline, various public policies have sought to assist regional development through diversifying beyond its reliance upon coal mining and to assist local residents and workers to adjust to this transition. Yet, these policies failed to reverse the region's structural economic decline even if some were marginally effective in achieving their discreet objectives (Merrill and Kitson, 2017: 14–17). Protracted economic development policy failures have led to a view of The Valleys as presenting, “the most intractable development problems of any older industrial area in the whole of Britain” (Fothergill, 2008: 3).

Between 1934 and 1976, British Labour governments implemented policy initiatives to foster economic development, employment transition and social welfare (Merrill and Kitson, 2017: 14–16). These were superficially similar to successful transition plans adopted in regions, in other countries, whose major industries were also in serious decline.

Some policies also included elements of Just Transition approaches discussed in this report: retraining and relocation allowances for retrenched miners; state funded housing; infrastructure and industrial development projects tax incentives and subsidies to attract new inbound business investment. There were also attempts to create input and feedback mechanisms among local institutions and state planning bodies (Merrill and Kitson, 2017: 14–16).

Nonetheless, these initiatives failed to provide the residents and workers of The Valleys with anything resembling a Just Transition. Research suggests there were four core weaknesses in the policies implemented in The Valleys:

1. The absence of an ambitious, stable overarching framework policy for transition planning.
2. Inconsistency and minimal coordination across the components of specific transition policies.
3. Failure to adequately incorporate serious consideration of local and sub-regional economic and geographic specifics into development planning.
4. Underfunding of key policies and initiatives.

These interrelated policy weaknesses inhibited The Valleys from achieving sufficient industrial diversification, capacity building and economic development. Nevertheless, they did provide a platform for possible later improvements in planning and implementation initiatives. However, instead, the election of the Conservative Thatcher government in 1983 substantially exacerbated those policy weaknesses. When the rapid closure of The Valleys' remaining mines swelled the local unemployed ranks, the main recent positive policy responses were:

- ◇ Generous redundancy payments for the early retirement of older miners.
- ◇ Generous redundancy payments for retraining of younger laid-off workers.

However, for younger workers these payments for retraining were not coupled with policies to generate sufficient demand for skilled labour (Stroud and Fairbrother et al., 2013: 19-20). Overall, the approach reflected the Thatcher government's views on structural adjustment. It gave some thought to labour supply and to miners transitioning to other industries, but too little thought as to how to foster the sort of labour demand that could employ ex-miners locally in decent work.

Rather, with unions greatly delegitimated and weakened by government policy, the government's transition model was to strongly support whatever autonomous choices businesses made. Suppression of wages and the introduction of top-down, business-directed government subsidies to inbound FDI for new manufacturing plants represented the government's main direct methods for generating employment. These dashed hopes for a structured, coherent long-term development strategy.

Instead, incoming MNEs tended to open local subsidiaries focused on low cost, less-skilled operations. They therefore hired mainly low-skill—and low-paid—machine operators; indeed, low wages became the selling point for FDI in South Wales. While these measures contributed to increasing employment in some parts of The Valleys in the short term, they did little to develop regional capacities that might generate self-sustaining development over the longer term. When MNEs eventually identified even cheaper overseas locations, they often moved their FDI elsewhere (Merrill and Kitson, 2017: 14–19; Stroud and Fairbrother et al., 2013: 19–20).

Policy efforts over the last two decades have shown more success in reducing regional unemployment, but to a lesser extent than in most other UK regions facing similar challenges (Beatty, Fothergill and Powell, 2007). What recovery has emerged in recent years has been almost entirely concentrated in parts of The Valleys closest to the coast and the Welsh capital, Cardiff; further inland, local economies have continued to stagnate (Morgan, 2008: 24–26).

Neither business nor government have appeared to prioritise building a more sustainable and successful regional economy for The Valleys. Attempts to bring a bottom-up, community-led focus have foundered on government insistence on controlling processes and funds and lack of social infrastructure. Overall, there have been too few employment opportunities for those re-trained. As well, an employer-led focus for the VET system did not help produce the employment demand for newly-retrained workers.

Conclusion

Crucial factors in the longstanding lack of success of structural adjustment policies for The Valleys:

- ◊ A national government unsympathetic to mineworkers and hostile to any role for unions engaging on workers' behalf.
- ◊ A government with little apparent active commitment to making The Valleys prosper through diversification and industrial up-lift.
- ◊ A government tied to a supply-side (neo-classical) view of development and job creation.
- ◊ Too little space allowed for real bottom-up initiatives to develop.
- ◊ Government initiatives were top-down and targeted subsidising businesses, including MNEs, rather than addressing the various, related challenges from mine closures.
- ◊ Too little thought given to furnishing sufficient labour demand.
- ◊ Too little thought given to improving the quality of labour supply through training and education.
- ◊ Insufficient attention to infrastructure spending, cluster development or locally-derived innovation.

Appalachia, USA

Appalachia is a broad mountainous region running north-south through 13 states, roughly parallel to the eastern US seaboard. Many areas of Appalachia have been both economically impoverished and heavily dependent on low-wage coal mining and related power generation after earlier, heavy declines in local manufacturing. Some areas have been impoverished for even longer despite their coal mining. In part, this reflects longstanding, fierce and effective employer resistance to unionisation among employees. This has increased the vulnerability of those areas to mine closures in recent years.

A major problem is the vast areas of land (and water) polluted and damaged by mining and mine abandonment. The spending of special federal government remediation and reclamation funding—collected as fees from mining companies—has been greatly insufficient. Without rehabilitation, those mine sites will continue to degrade through landslides, mine fires and subsidence and pollution of waterways will continue (Pollin and Callaci, 2016b: 22-23). Beyond this, there appears to be no federal agency or funding initiative that can project top-down leadership and so assist the plethora of often unconnected local, bottom-up initiatives.

Stroud and colleagues (2013: 17-18), identify a number of differing localised policy responses. These have largely been only partially successful or unsuccessful. A core weakness has been the overall failure to develop a unified regional transition strategy promoting better coordination and use of resources—including information. Due to the vastness of the region, its fragmentation across so many state and local government borders and the quite different levels of development and population density across Appalachia, it is not surprising that this lack of a unified regional strategy has hampered a more effective overall policy and program. As well, a number of the more economically vulnerable Appalachian states have public revenue structures that worsen their capacity to intervene to mitigate the relationships between coal mining and localised pockets of poverty (Taylor, Hufford and Bilbrey, 2017: 20).

Most policy responses to closures have been reactive and short-term in their horizons. In some areas, there were local projects to plan for transition ahead of closure through “early warning systems”, including through preventing lay-offs or assisting with employment transfers. These forward-looking local processes sometimes involved local government agencies working with other employers to identify emerging skill shortages and map industry sectors “for growth potential through the application of cluster analysis, which was then supplemented with expert local knowledge from training providers and local employers” (Stroud et al., 2013: 18).

However, most attempts at economic diversification have been top-down and employer-focused. One very important example was the choice for a general subsidising of

in-bound investment rather than for targeting promising development opportunities.

These generic measures were mostly ineffective for job creation because they made little effort to overcome the lack of suitably skilled local workers and necessary local infrastructure. This was particularly the case for more isolated and hence economically vulnerable localities.

Governments and employers sceptical of the notion of a green transition have largely led transition responses. One result has been insufficient support provided for the crucial roles of innovation and education and training in structural adjustment. This lack of political will and of collaborative institutions proved crucial in hindering provision of effective re-skilling/up-skilling and employment opportunities needed for a clean-energy economic-development transition.

Thus, displaced workers in Appalachia “were less likely to find alternative jobs when compared to other displaced US workers”, fewer also found re-employment (69 per cent compared to 74 per cent), and those re-employed experienced loss of earnings as a result (Stroud et al., 2013: 18). As employers have greatly weakened unionism or, in many areas, driven it out over the last decades, this has made it even harder to plan for and pursue a Just Transition.

In response to many of these failures, there have been some bottom-up local initiatives aimed at longer-term socio-economic sustainability. Particularly important here has been the involvement of local NGOs and community advocacy groups that have attempted to turn local strengths into new opportunities. These include stimulation of “green” employment, including by the Alliance for Appalachia. Skill shortages have hampered these initiatives too as have the coal industry-funded pretend grassroots campaign of “Friends of Coal”. That campaign has sought to polarise choices between jobs and the environment and defend the coal industry as essential to regional identity (Taylor, Hufford and Bilbrey, 2017: 11-12).

Conclusion

Crucial factors in the lack of success in Appalachian structural adjustment policies:

- ◇ Lack of Federal government engagement in planning, funding and coordinating a response; there was a lack of adequate, top-down leadership.
- ◇ An essentially reactive and ad hoc set of local responses to closures. There was no overall strategy and almost no pre-emptive planning.
- ◇ Lack of communication and resource sharing across local initiatives.
- ◇ Local and state initiatives were mostly top-down

- ◇ Local and state initiatives largely prioritised subsidising businesses in general rather than addressing related challenges from mine closures.
- ◇ Too little thought given to how to furnish sufficient labour demand.
- ◇ Too little thought about how to improve the quality of labour supply through training and education.
- ◇ Insufficient attention to infrastructure spending, cluster development or locally-derived innovation.
- ◇ Little top-level commitment to any sort of “green transition”.
- ◇ Little sense of societal responsibility for the retrenched or their children who would not find work in mines—or elsewhere.
- ◇ Weakness or absence of unions, plus existing local political cultures proved uncondusive to notions of an employee- and community-centred Just Transition.

Australian coal-fired power stations

Aither (2013) and OECD (2016) in their reviews of structural adjustment policies across a range of Australian sectors found a very mixed picture of achievement. The picture for Australia's coal-fired power stations would rank among the worst cases if compared to those they examined. Beer (2015) has a similarly pessimistic assessment of similar exercises for large-scale manufacturing.

As mentioned above, a crucial factor is the lack of any coordinated forward thinking and communication on the fate of the industry. Another is lack of input from non-owner stakeholders into decisions over timing and phasing of closures. In fact, the Senate Committee (2017: 70) found:

The experience of announced coal fired power station closures in Australia over the last four years shows that companies, on average, have given less than four months' notice to affected workers and communities of upcoming plant closures. From a national, long-term planning perspective, this is clearly unacceptable.

According to evidence to the Senate Committee (2017: 9-10), when the owner announced the impending closure of the "Northern" power station in the remote town of Port Augusta (SA), there was no plan to support the community in its transition. That community then received no financial support from either Australian or state government for at least six months after the plant closed in May 2016.

Bottom-up initiatives there, directed at a clean energy, economic development transition, have shown energy and foresight but have lacked top-down support. As a representative from local group, Repower Port Augusta, put it:

Since 2011, members of the Port Augusta community have pushed for solar thermal plants with storage to be built in the region creating new jobs and delivering on-demand clean power. This is a plan that should have been in place before coal closure was announced.

Closure of this plant was also accompanied by inadequate environmental mitigation. This left significant problems for the city council to deal with: "environmental damage, air pollution and emissions of ash and coal dust" (Senate Committee, 2017: 9).

The closure of the Latrobe Valley's Hazelwood plant in March 2017 raised similar criticisms regarding its effects on individuals and the community. As the Senate Committee (2017: 61, 62) learnt, there was no clear, transparent public decision-making process; the majority MNE owners, Engie, issued multiple mixed messages. They also did not consult with the local community nor, apparently, with the Australian and Victorian Governments. The final decision to close, announced on 3 November 2016,

represented a rapid shift and closure occurred only five months later, on 31 March 2017 (Wiseman, Campbell and Green, 2017: 18-19).

Having accepted no responsibilities, beyond those mandated by law, to its employees before closure, the company initially appeared to have done little to assist those retrenched afterwards. With no forward planning beyond the commercial aspects, the only stakeholder consultation appeared to be window dressing after the decision was made (Voices, 2016: 19). Nonetheless, Engie has committed to shoulder its costs of site rehabilitation for the power station (at \$439 million) and the mine (\$304 million), at amounts greatly above the site rehabilitation bonds that the company had committed to under Victorian law. Together, the rehabilitation projects should employ up to 250 workers until 2023, many of them Engie's Hazelwood employees (Wiseman, Campbell and Green, 2017: 19).

A representative from local community group, Voices of the Valley, (cited in Senate Committee, 2017: 63) said:

We are finding that a lot of the distress in the workers and within the community is around uncertainty, and we believe that the only way around that uncertainty is – the opposite of uncertainty – vision.

The Hazelwood, South Australian and other earlier Australian examples stand in decided contrast to the experiences in the Ruhr, Limburg and even Newcastle steel-works of giving substantial notice periods.

A recent positive sign has been the 2015 AGL announcement (confirmed during 2017) that it was closing Liddell power station in 2022 and that this would occur without forced redundancies. Of even greater interest – and contrast – was AGL's stated intention to plan for a site remediation that would allow for the company to transition it to power generation using renewable resources. The much longer advance notice period – seven years for Liddell as against only the five months Engie offered at Hazelwood – indicates a company choosing to take seriously its broader economic and social responsibilities. The commitment to very substantial renewable generation and storage at Liddell suggests it seeks to both meet its corporate financial goals and social-environmental ones (AGL, 2017 and embedded link).

When a company makes these announcements appropriately early and provides some supporting detail – as AGL has, it greatly improves the potential for those affected to develop plans for effective adaption by people, companies, and all levels of government.

Conclusion

The Australian experience in recent years with power station closures is that governments have avoided engaging with notions of structural adjustment policy beyond the most ad hoc and reactive responses. A first issue is the lack of public forward planning and notice. This reflects a deeply-embedded perspective in public policy and industry that sees plant closures as a private, commercial decision belonging wholly to the plant owners. There is no sense of accountability and social responsibility to workers, community or region, and little to the natural environment. All relationships are merely contractual and profit-seeking within constraints set by minimalist legislation (OECD, 2016; Wiseman, Campbell and Green: 2017: 8).

As Weller, Sheehan and Tomaney (2011) point out, this was also true of the Victorian Government's privatisation of the Latrobe Valley's power stations during the early 1990s, and their subsequent restructuring and shedding of employees under their new owners. According to Wiseman, Campbell and Green (2017: 13), "[by] the end of the privatization process, approximately 8,000 workers had lost their jobs and the Valley had become the most disadvantaged region in Victoria" whereas it had previously been an economically solid, industrial region.

Announced closures leave too little time for governments to react, even if they wished to. Further, governments in Australia have failed to accept their responsibilities to introduce a systemic approach to these challenges. Indeed, they seem actively hostile when a company, like AGL, appears to embrace important elements Just Transition best practice. They also seem largely unhelpful to local community groups seeking leadership and support. Instead, they appear more responsive to perceptions of electoral pressure. This response mix has generated very suboptimal outcomes.

However, immediately after Engie's announced closure of Hazelwood, the Victorian government announced the first of a series of major funding initiatives—for a total of \$266 million—for the workers involved, the industry's wider workforce and the region's development. The Australian government promised \$43 million. The Victorian government initiatives may represent an important first step to developing a Just Transition approach for the industry, although the approach has largely come from government not the plant owner. On that front, AGL's announcements about and intentions for its Liddell site represent a lesson. In the Hazelwood case, of crucial importance in securing much improved Victorian government support and some of the most promising initiatives was the role of the industry's unions in the Valley (Wiseman, Campbell and Green, 2017: 19-20, 22-23). At the end of the next section, we summarise some of the main initiatives decided.

10. Learning from successful and unsuccessful examples

This section combines the findings from our seven case studies and the broader literature on structural adjustment policies. Its purpose is to develop policy proposals aiming at best practice. The starting point needs to be the overall policy framework and processes for understanding and responding to impending closures.

Attention then turns to the broad but essential questions of ensuring sufficient labour supply and demand. Here, employment volume and quality are both crucial for finding ways in which different groups of retrenched workers might benefit from a Just Transition. This leads to the central but complex question of how localities and regions might directly benefit from Just Transitions and, at the same time, also contribute to decent work for those workers. We then discuss the sorts of decision-making and consultation cultures and processes that make these frameworks more successful in delivering these measures to individuals, communities and industries.

Frameworks and approaches

Aither (2014: 25) usefully proposed six variables for analysing structural adjustment situations. The closure of coal-fired power stations in Australia would score very highly on five of these six, namely:

- ◇ “severity” (or magnitude of change);
- ◇ “permanence”;
- ◇ “extent” (broad effects plus flow-on effects);
- ◇ “predictability” (is change foreseeable?); and,
- ◇ “sequencing” (related to past and future changes).

Only “speed” would score low for the local coal power industry as future closures may be a matter of some years or even decades away.

The very high scores for those other five variables offer further strong support for the need to seriously address Australia’s very poor record regarding closures of coal-fired power stations, particularly from a Just Transition perspective. Until now, there has been a highly inequitable distribution of costs and benefits. These inequities have severely disadvantaged and harmed former workers of closed power stations, and their communities.

The seven cases examined, together with the Australian and international literatures more broadly, suggest posing some general principles. Clearly, Australia’s existing, dominant

policy assumptions are inadequate. Any significant improvement related to power stations still operating will need to take into account those principles and the policy assumptions they give rise to.

A first step should be to embrace a Just Transition perspective exemplified by the Ruhr and Limburg cases. As German Coal Association CEO Wodopia (2017) put it, all thinking, discussion, planning and implementation needs to work from an idea of “socially acceptable staff reduction”: one that meets community expectations of fairness. In Australia, as a first step, this principle would force a welcome revision of existing assumptions regarding responsibility for making decisions about:

- ◊ Criteria for closures, and how these are arrived at;
- ◊ The timing of those closures, and their announcement;
- ◊ Necessary responses to those decisions, including funding; and
- ◊ The phasing of those responses.

In considering those matters, a new approach needs to abandon the principle that decisions on closures are solely the private commercial domain of power station owners, unencumbered by public interest criteria. This means significantly elevating consideration of other stakeholders, and primarily those of existing employees, other retrenched workers and their communities.

In fact, the Senate Committee (2017: 17) recommended that:

... this transition to a low-carbon electricity sector will also require coordination by a standalone statutory authority that can oversee the implementation of mechanisms to close coal fired generators and measures to support workers and communities, as argued for by various stakeholders to the inquiry.

In comparing the Australian situation to those in its other member countries, the OECD (2016: 12) called for legislation that would, “Strengthen employers’ responsibilities for workers they dismiss, notably by instituting and enforcing a longer notice period for collective dismissals ...” This directly confronts the existing, dominant principle of leaving all decisions to the unilateral whim of the owners, with minimal protections for other stakeholders. Government will need to legislate to ensure a regime of greater responsibilities for owners in this regard and a monitoring and enforcement framework to reinforce it.

The next questions relate to the content of those decisions that should now come under government oversight. Both the OECD (2016) and Aither (2014: 8-10; 55-63) found that planning and implementing a structural adjustment policy ahead of predictable structural change improves both the efficiency and the equity of policy outcomes. Best outcomes come when the highest relevant level of government autonomously takes charge of these processes in a structured, systemic and long-term manner. This is true whether the issue at hand is local economic regeneration and/or the potential fates of displaced workers.

That said, thinking of local impacts, as Beer (2015: 22) argues, one of the weaknesses in traditional Australian approaches to structural adjustment more generally has been very uneven government commitment to ongoing regional policies. Structural adjustment policies often stand as ad hoc regional development programs. For Beer (2015: 22, 24), the \$88bn governments spent, between 2000 and 2012, directly on 135 structural programs across a range of industries and localities have often produced sub-optimal results. In Europe, however, there is a tradition of working consistently to balance development across regions and in fostering localised “territorial development”. This can provide a ready base into which to build a Just Transition approach.

Nevertheless, in most circumstances, such planning needs to go beyond localities and regions. It requires a national policy framework. This matches the findings from our own case studies, both successful and unsuccessful. That is, strong, clear, cohesive top-down leadership, coordination and proper funding are essential.

The Senate Committee (2017: vii) thus also called for:

... the Australian Government [to] establish an energy transition authority with sufficient powers and resources to plan and coordinate the transition in the energy sector, including a Just Transition for workers and communities.

Such an Energy Transition Authority (ETA) appears to be the best way to organise the necessary top-down part of the transition process in an effective way. The lessons from our seven case studies and the international literature strongly support this recommendation.

An ETA needs to be well-designed and adequately resourced for the whole time needed to manage the longer-term implications of structural adjustments as the coal-fired power industry closes. Constituted in this way, the ETA would appear to be the crucial starting point for effectively bringing together a clean-energy transition, a clean-energy, economic-development transition and a Just Transition in ways that mutually benefit each.

In its submission to the Senate Committee (2017: 56-59), the ACTU (supported by the World Wildlife Fund-Australia) provided more detail as to the characteristics, role and functions it proposed for an ETA. Importantly, while it was to work closely with all levels of government, the ETA was to have “the freedom, independence and mandate to adopt a long-term approach to managing this transition” (p. 57). This would empower it also, if the ETA deemed this necessary, to review the various NEM regulatory bodies to ensure that their performance is consistent with a clean-energy transition. In particular, it would fall to the ETA to:

- ◇ oversee planning for and orderly closure of the power stations. It would be the ETA which had the responsibility to choose among the various models to determine the order and scheduling of these closures.
- ◇ manage “an industry-wide multi-employer pooling and redeployment scheme” to other power stations, and

- ◇ develop a labour-supply adjustment package for displaced power station workers. This would include funding retraining, job assistance support, early retirement compensation and travel/relocation support. (p. 57)

In relation to labour demand structural adjustment, the ETA would involve itself in the sorts of regional development initiatives evident in the Ruhr study case. A clean-energy economic development approach, from the ETA, encouraging new investment, for example in environmental technology and services, could also help ensure a Just Transition by creating decent work and quality jobs (Senate Committee, 2017: 58).

The evidence from Singapore, the Ruhr and Limburg also suggests the importance of a structured tripartite membership of and participation in such an ETA. It brings better information gathering and sharing, improved consultation and feedback, localised knowledge and understanding, creative thinking, fairness, consensus and legitimacy. So too do early signs of post-Hazelwood developments in the Latrobe Valley. Tripartism, when organised in ways that bring bottom-up voices to top-down decision making, brings better information gathering and sharing, improved consultation and feedback, localised knowledge and understanding, creative thinking, fairness, consensus and legitimacy. Indeed, the ACTU's proposal sees an oversight role for a tripartite ETA advisory board (employers, unions and government) that would report to parliament and the responsible minister (p. 57).

All the policy proposals that follow are therefore based on assumptions of the need for:

- ◇ **a central framework directed at closing coal-fired power stations. This framework should be designed to address challenges systemically, under which**
- ◇ **a suitably resourced and empowered Energy Transition Authority (ETA) that will provide and coordinate long-term pre-emptive planning, communication, coordination and action**
- ◇ **coordination that recognises the need for high-level, consistent engagement from a range of stakeholders, and**
- ◇ **power station owners to share closure decision processes with these other stakeholders within the ETA and through this framework that seeks Just Transition outcomes, and finally**
- ◇ **power station companies to now carry greater responsibilities for ensuring important elements of Just Transition measures.**

Central policy makers also need to seek and develop improved information on, and understanding of, any impending structural changes (OECD, 2016: 118). This should focus on the likely nature, scale and impacts of these changes and how these will affect people, organisations and communities. State and local governments (and intermediate regional coordinating bodies) also need to engage in economic forecasting and risk analysis. This is necessary for them to understand local economic capacity, institutional capabilities and those of the local workforce (OECD, 2016: 116).

To do this, government representatives and agencies need to work closely with affected local communities, particularly through employers, unions and local networks. Most useful is where those networks link different levels of government, public bodies, the plant owner, unions, employers in other industries and civil society organisations. It also has the advantage of making more apparent the strengths available in existing and pre-existing programs; apparent weaknesses can sometimes harbour potential advantages (through a “related varieties” approach). This parallels the Senate Committee’s (2017: 70) conclusions regarding the future closures of Australia’s coal-fired power stations.

Taken together, these proposals strongly indicate the need for:

- ◇ an overarching framework that brings strong, clear, cohesive top-down leadership, coordination and sufficient funding; together with
- ◇ encouragement of broad and open local consultation, and bottom-up initiatives, particularly through local networks that can tap into top-down funding and coordination. These will differ in size and focus depending on the local situation.

The Senate Committee (2017: viii) also called on the Australian Government to support the deployment of important parts of the renewable energy sector, particularly those parts like grid level battery storage “to encourage the utilisation of products that promote decentralisation of electricity production while enhancing the stability of the grid”. From a Just Transition perspective, it is important that as much of this and similar activity occurs in areas where coal-fired plants and mines are closing and that that these new jobs go to those retrenched through closures.

The international literature, particularly on the Ruhr, suggests that this will be important for how quickly, well and equitably a clean-energy transition can have positive effects for local and regional economic development and measures that bring Just Transition.

Industry workers and job losses: structural adjustment and labour supply

The best examples here come from Singapore and the Ruhr, and to some extent from Limburg. Similar lessons, but for opposite reasons, come from Appalachia, The Valleys and Australia’s previous power station closures and downsizing.

Older workers

A portion of these job losses would be absorbed through attrition—i.e. voluntary retirement of retirement-age workers. This is particularly helpful where the age composition of the workforce is skewed to older workers, commonly the case with power station and mine closures. It is important that the terms of their transition are generous given that many of them will otherwise face involuntary retirements.

Not all older workers will reach retirement age before plant closures, especially if these occur in a rapid, sporadic or uncoordinated fashion. This is of concern as workers near retirement age find it exceptionally hard to find new jobs and suffer severe health harms as one of the consequences (OECD, 2016; Peetz, 2005; Schulz and Schwartzkopff, 2016; Wanberg, 2012).

Thus, coordinated early retirement, with additional income-support transition funding, can help these workers make it to retirement while protecting their incomes and financial assets like their homes. Through this measure, the transition process can also buy more time for younger workers to stay employed in the industry for longer during the industry's decline. This is one of the measures successfully used in the Ruhr mine closures.

Younger workers

The Ruhr case also points to the value of regional pooling of workers among remaining plants and mines, wherever these are not too distant. If industry closures are planned and staggered, then workers from plants to be closed can fill expected vacancies in those still operating relatively nearby. In Australia, many of these power stations are relatively concentrated geographically (by Australian standards), whether in Victoria's Latrobe Valley, the Hunter region of NSW, near Collie in Western Australia or in and around Queensland's Rockhampton/Gladstone strip (ACTU, 2016: 12).

By minimising these workers' time spent without work, this measure can "smooth out" the pace of immediate job losses. It can particularly benefit workers less able to find alternative types of work that require their existing skills. As well, it takes some pressure off alternative employment solutions and the local labour market in a given period.

The ACTU (2016: 4) argues that older, more senior workers should get preference for these jobs as they are the ones most exposed to losing their places in the labour market. In addition, the Ruhr experience suggests that for many of them, these new pooled jobs will function as their employment bridge into voluntary retirement. For the receiving plants, it also reduces their costs of recruiting new staff or having to invest in extensive training of inexperienced workers.

Another important policy measure involves assisting workers to find alternative decent work in fields that require their existing skill sets. Crucial here is adjusting working arrangements to help workers transition to new jobs ahead of their retrenchment. For instance, negotiating part-time working arrangements can give them time to find new work. At the same time, it shares current work more broadly, ensuring that the majority can stay in their existing jobs for longer, even if on shorter hours.

Negotiating such agreements between employers and workers and their union is easier where the employer takes responsibility for their current workers as early as possible ahead of plant closure. Also important are relationships that are transparent and trusting.

Further assistance can come through sponsoring jobs fairs. As well, as in the Newcastle case, the employer should provide specialised job search and placement services (ITUC Frontlines Briefing, 2016: 15).

Retraining for new jobs

Retraining—especially when used as a preventative measure rather than a reactive response to plant closure—is the most effective method for preventing unemployment and long-term unemployment. This training needs to occur well before retrenchment to be most effective in the transition to decent work. It should also be provided without cost to those workers.

Apart from technical and professional workers, those working in coal-fired power stations and coal mines tend to have fewer and narrower formally-recognised skills, and lower levels of formal education. Their age and employment seniority profiles are important explanations for this situation. So too are the general profiles of their regions, which are often low by national educational standards. That was the case in the Ruhr and The Valleys and is also the case, for example in the Latrobe Valley. However, this situation works directly against those workers having positive post-retrenchment futures. It also makes their localities less attractive for new investment in industries with high-skills and high paying jobs (Jones and Tee, 2017: 13; OECD, 2016: 117; Schulz and Schwartzkopff, 2016: 13; Stroud et al., 2016; Wiseman, Campbell and Green, 2017: 21-22).

Nonetheless, many of these workers will have important informal skills and tacit knowledge. A first step should therefore be a process of skills audit and validation with recognition of prior learning (RPL) for those workers. This can have important morale-boosting outcomes, give workers more confidence and direction in their post-retrenchment futures, and help identify gaps requiring training. It is something that Australia already does well compared to international standards (OECD, 2016: 117, 119-21).

Training becomes especially useful if it is also linked with jobs that are likely to enjoy high growth in that region. A widely-perceived option is retraining for new renewable energy industry jobs where that industry develops as the coal-fired power industry closes. For example, a study for the German Government, “found that in 2006 the renewable sector had generated 259,000 direct or indirect jobs” with expectations of further substantial increases in that number (Weller, Sheehan and Tomaney, 2011: 77). However, in the Australian context of limited domestic manufacturing this path is less clear.

One of the challenges for upward skilling into new decent work is to provide relevant training opportunities and promote active engagement with it. Older workers, in particular, tend to feel more pessimistic about their chances and hence the usefulness of training. Providing pre-training counselling can help. Most useful is where these processes focus on workers’ own needs, interests, existing skills and aspirations in the context of the transitioning of their community’s economy. Here again, sensitively-used RPL methods can help. Finally, a range of relevant training options needs to be available, from the technical to communication and job-finding.

More generally, of crucial importance is a well-resourced VET sector that responds to workers' interests as well as those of the local community, including its current and potential employers. In this, Australia will need to greatly improve its VET performance of recent years.

Training and new formal qualifications may not be sufficient to ensure that workers transition effectively if they lack experience in their potential new jobs. The international evidence suggests that short-term placements in such jobs—ahead of retrenchment—substantially assist workers in successful transitions. Ideally, those placements should be phased with their training. Once again, this requires that power plant owners assume their responsibility for these workers. It also needs transparency regarding and sufficient funding for the potential host “training employers” (OECD, 2016: 125).

Income maintenance support during transition to new jobs

To qualify as Just Transition, special unemployment benefits for those unable to find a place in the labour market—at least for a defined period—should be closer to their previous wage than to (Australia's low) universal unemployment benefit. Structural adjustment policy could also include provision for an unemployment insurance scheme to help safeguard workers who lose their jobs due to the industry's decline.

It is vital that those who lose their jobs do not also find themselves without a roof over their heads. There could be provision for mortgage and rent relief, again for a defined period.

Relocation assistance

Australian workers tend to not leave where they live, even if they lose their jobs and their locality is struggling economically (Beer, 2015: 39). It may therefore be useful to assist workers who might wish to leave. If available jobs for retrenched workers require relocation, reimbursement funds up to some fixed amount should be made available to them. Some financial support would also be useful for those who, like the pooled workers, may find themselves constrained to long and expensive journeys to and from work.

Economic challenges for towns and regions: structural adjustment policy and labour demand

Our case studies—particularly for the early stages of the Ruhr transition, The Valleys, Appalachia and the Latrobe Valley—suggest that the least effective forms of government financial assistance are those that indiscriminately subsidise business investment or prioritise financial compensation for owners closing their power plants over the direct interests of their workers and communities. Planning for transition needs to take account

of the complexities of regional and local economies, their labour market dynamics and questions of equity.

Thus, according to Aither (2014: 52):

If governments are concerned about equity and community or regional impacts (rather than special interests), then an alternative approach to supporting industries would be to focus on the communities, and those who are most vulnerable (least skilled, lowest incomes), that need to adjust to new conditions.

Further, in this planning, a whole-of-government approach is important for supporting the timeliness, continuity and necessary volume of Just Transition public funding. This approach involves looking at the likely consequences, across the variety of government activities (and budgets), of a government decision in one area. Those consequences are then factored into calculations of overall costs and benefits. As well, consciously adopting this approach means greater information gathering and sharing, joint planning and implementation across government levels and portfolios. It can also encourage wider stakeholder engagement as a means to identify a more extensive range of likely consequences. As the Ruhr, Limberg and Singapore cases suggested, this contributes to improved transition processes and outcomes.

A good example would be closure of a highly polluting workplace, like a coal-fired power station. The immediate direct costs to government would include payment of unemployment and other benefits and loss of revenue from company and employee income taxes. However, if we look at the government's health budget, a likely consequence will be a decline in respiratory and cardio-vascular diseases. People living near the closed workplace as well as those who worked there would all be able to enjoy these health improvements (Environment Victoria, 2014: 8). This should reduce pressures on the government's health budget. Therefore, any Just Transition investment expenditure may, in net terms, be substantially lower than might be immediately obvious and that this situation can continue to improve with time.

In fact, the more resources—including time—invested thoughtfully into designing and implementing a locally-oriented, economic development-clean energy transition, the greater likelihood of it producing a Just Transition and, at the same time, at a much reduced overall financial cost. In particular, it is imperative to work to prevent and then counteract any potential negative socio-economic spiral that a major industry's decline can trigger. This is best achieved by expanding investment and jobs locally in other industries. The international and Australian evidence is again clear: economic diversification is crucial (Galgoczi, 2014; Jones and Tee, 2017; OECD, 2016; Productivity Commission, 2012; Shulz and Schwartzkopff, 2016).

There is no single set of measures appropriate to each local case as each presents a different set of advantages and challenges. Different factors will influence how expansive local job creation can be. Those factors include the dimensions of each investment choice and its multiplier effect, its location and how it is linked to other areas of activity.

In assessing risks and opportunities, one good way to start is with the role of each power station in its environment. This involves considering the following factors:

- ◊ Is the power station within a more remote local economy?
- ◊ Is there another plant in reasonable proximity to allow transfer of employees?
- ◊ What is the power station's role in its local economy and labour market?
- ◊ What roles can existing, emerging and future alternative economic activities play?
- ◊ What are the capabilities of local educational and training infrastructure and what might they be, if developed further?

There should be similar consideration of the power station workforce:

- ◊ Its size relative to local labour supply and demand
- ◊ Its composition by age, skill and experience relative to the local labour market.

More specifically, the literature on regional development outlines three potentially complementary policy mechanisms to encourage local economic diversification:

- ◊ developing industry clusters;
- ◊ strengthening existing local factors; and
- ◊ funding labour-intensive regional projects.

Cluster policy

This policy redirection aims to create sustainable clusters of new industries within a region. Where achievable, this is regarded as the best practice. This is because it not only generates new employment for those retrenched from declining industries, but it can also generate economic growth and dynamism to a degree unprecedented in those regions. If this occurs, cluster development offers the promise of decent work for future workforce generations. This is a crucial Just Transition consideration for coal-dependent regions where children (mainly sons) have followed their parents (mainly fathers) into secure employment in power stations and mines.

Not all localities are amenable or ready to foster one or more clusters. Without improvements in infrastructure and other support, very remote and isolated localities may struggle to develop clusters. Cluster policy needs to be fact-based in seeking and developing opportunities. Further, it is imperative to avoid a one-size-fits-all approach. Where it works particularly well, it involves close cooperation with businesses and science and technology (Schulz and Schwartzkopff, 2016; Stroud et al., 2013: 22).

The first step of cluster policy is to “identify specific regional potentials and locational factors” (Schulz and Schwartzkopff, 2016: 17). Its purpose is to uncover which, if any, combination of new high growth industries might have major potential competitive advantages if developed alongside each other. The second step is to develop a critical mass of businesses and suppliers in those industries within a region in such a way that they develop

Regions where clusters have been successfully built

The Ruhr

From an economic mono-structure, dependent on huge coal and steel corporations, to an economy with a diverse profile including eco-tourism, several leading universities, renewable energy manufacturing and high-tech hubs.

Central Coal District, (eastern) Germany

From 1991, this industrial heartland of the former East Germany experienced major deindustrialisation leading to mass unemployment. Subsequently, it expanded into new knowledge intensive industries such as optics, semiconductors, bio-technology and microelectronics, as well as several successful universities and research centres.

Pittsburgh, USA

Collapse of this “Steel City’s” main industry in the 1970s led to mass unemployment and population decline. However, since the 2000s, there has been a reversal of this downward trend and the city has developed strong robotics, information technology and healthcare industries.

Source: Schulz and Schwartzkopff, 2016.

a combination of highly competitive and cooperative relationships, and so tap into that competitive potential.

The research literature highlights a number of specific policy measures which have proven useful in helping regions to develop competitive industry clusters:

- ◇ Institutionalising cooperation between business and science.
- ◇ Financial assistance for applied research.
- ◇ Intensifying knowledge and technology transfer. For instance, supporting networking and cooperation among universities, research institutes, technical and professional education institutes and firms.
- ◇ Creating an attractive start-up climate, especially in regions where large enterprises are unlikely to open new branches in the near term. Funding “business incubators”—which can support new companies with infrastructure and advice—is one way to promote such a culture.
- ◇ Regional marketing initiatives to attract investors and workers in desired industries by highlighting a region’s advantages.

Also important are efforts to attract/retain personnel sufficiently qualified for these new sectors so that skilled labour supply matches any rising demand. The development of local research institutes, education and training facilities with links to growing industries is of great value for this too.

International research on best structural adjustment outcomes strongly indicates that opening and/or expanding universities is one of the very best ways to stimulate economic diversification, modernisation and a shift to high growth trajectories linked to bottom-up initiatives. This seems to be the case whether such initiatives are linked to transition from declining industries (e.g. Ruhr and Limburg cases) or not (Puuka and Marmolejo, 2008). In the Ruhr, universities have developed partnerships with emerging industries, technology parks and start-up incubators to stimulate local investment and employment.

In the Australian case, universities—through their ability to attract international students paying high tuition fees as well as normal living expenses—are also major sources of income and employment for the towns and cities that host them. Thus, expansion of universities, by attracting international students, creates temporary construction-related employment as well as ongoing employment within a university's workforce and for many businesses in town. Specialised industry and technology parks attached to universities, and sometimes on university land, have also proven very successful in Australia, as overseas.

The Committee for Gippsland (CFG) is a community organisation that brings together some 90 businesses and community organisations—including public sector, university and union representation. Its members together employ “nearly 10,000 people across the Gippsland region” (CFG, 2016; 2017: 9-10; Senate Committee, 2017: 64) which includes the Latrobe Valley. CFG (2016: 72-74) strongly promotes this type of knowledge-based cluster development.

CFG has identified continuing areas of local strength—electricity transmission and the dairy industry (including value-added dairy products)—as highly desirable, potential university-linked cluster projects warranting government funding. Moreover, it seeks support for local industry research, development and commercialisation of innovative, low emissions local (brown) coal products with export potential like fertiliser or hydrogen. These would be other examples of building a local strength from what appears to be a situation of weakness. However, it is not clear how these would mesh with the emphasis on recovering and highlighting the region's nature-based advantages or Australia's climate change remediation goals.

CFG also sees great potential for diversification through development of health care and retirement home precincts and has actively sought funding for a new (expanded) (West Gippsland) hospital as a key element for both. For the same reason, CFG has called for substantial funding for expansion of university and technical education in the region, explicitly targeting fee-paying students from China (CFG, 2016: 72; 2017: 9-10). Some of the

causes that CFG has championed are included in the Victorian government's structural adjustment package after the closure of Hazelwood (see below).

These may be useful opportunities for other coal power localities that have the required advantages: cheap land, good transport links, sufficient health infrastructure and suitable climate. However, not all existing coal-power localities will be appropriate for this strategy. Gippsland and the Hunter (and adjacent NSW Central Coast) already have university campuses that could be expanded or added to. So too have Rockhampton and Gladstone.

Strengthening local factors to boost development

To foster and develop new industries or expand and strengthen existing ones, it is crucial to not neglect traditional regional structural adjustment policies. These include investment in public works and other infrastructure, loans to local businesses, development of commercial spaces, marketing of local factors and investing in civic and social capabilities (Schulz and Schwartzkopff, 2016).

Public works investment can provide substantial shorter-term bridging employment. This type of work—which may last for a number of years—can provide transitional decent work for many of those retrenched. Those jobs obviously have direct and indirect employment creation benefits.

These measures can also support the “related variety” approach, through which regions and towns seek to use aspects of declining industries to forge new areas of activity or expand others (Weller, Sheehan and Tomaney, 2011). Public infrastructure spending for remediation and beautification and new public facilities at remediated sites can also make regions and towns more attractive for private investment and for existing or potential residents. It may be important for attracting Australian and international students, academics, technicians and professional and administrative staff and as well as those involved in start-ups. Raising local efficiency as well as amenity in these ways may mesh well with university development or expansion, and the introduction of scientific institutes and technology-related clusters.

Development of high quality, reliable transportation among major population centres is also valuable for encouraging clusters, and universities. For example, CFG (2016, 2017) calls for greater Australian government infrastructure spending on Gippsland's transport infrastructure—road, rail and port—to provide easier, faster and cheaper access for local producers to outside markets as well as for people and products coming to the region. Other attractions include ready access to quality civic, cultural, leisure and other social facilities.

There are persuasive arguments for re-purposing power stations, local mines and linked infrastructure, as well as the skills and knowledge power station workers and other locals have. In some cases, parts of the closed power station and mine infrastructure could be rehabilitated as a museum, entertainment or cultural centre, that would help promote the local tourist industry as well as improve local amenity.

Successful examples of new industries include the Ruhr's packaging, logistics and packaging industry, its waste management industry, and the reinvention of mining engineering suppliers as manufacturers for the renewable energy sector. Also evident are examples of developing agritourism and eco-tourism, and retirement and health facilities, like the Hunter Valley, Ruhr and Limburg. These are other paths the CFG has indicated as strong development options for Gippsland (CFG, 2016: 76, 78). Decarbonizing of agriculture, for example through re-forestation, could also be an employer of retrenched workers.

The Senate Committee (2017: 50) noted that using gas—which is much more efficient, and responds more rapidly to demand than coal—also emits less carbon. Any potential conversion of a coal-fired station to gas will reflect the costs of accessing a major gas pipeline. The choice of conversion and re-fitting for renewable energy—of whatever type—plus storage brings different sets of calculations.

Other major options include the growth of commercial-size renewable energy plants. Energy generation regions, like the Latrobe Valley or Hunter Region of NSW, already contain substantial transmission infrastructure. A logical option then is to build renewable electricity generation infrastructure at or near the sites of previous coal-fired plants or at other points near the transmission infrastructure. This would encourage transitioning workers to be part of this high growth industry.

In its submission to the Senate Committee (2017: 60), the Australian Manufacturing Workers' Union urged the use of solar-thermal power as, with storage, it is both renewable and a source of base/peak load power. According to the union, this technology uses a much larger workforce than solar-radiation power generation. Furthermore, the existing power station workers' skills would be highly relevant for running a solar-thermal power station. In this way, the transition could maintain decent work in situ and buttress the community while also encouraging investment from businesses linked to the new plant.

Another possibility is to use defunct mines for pumped water power generation and storage. Flooding closed open-cut mines can also offer water-based tourism and recreation opportunities. An interesting example is Kimberly, a mining town in Canada previously largely reliant on one very large mine. When this mine closed in 2001, Kimberly redefined itself as a holiday resort with a nature reserve and a flourishing culture and arts scene (Schulz and Schwartzkopff, 2016: 15).

Voices of the Valley (Voices), is a diverse, broadly-based Latrobe Valley activist organisation that emerged in 2014 to agitate for a proper inquiry in the wake of the catastrophic Hazelwood Mine fire that year (Voices, 2016: 18; Wiseman, Campbell and Green, 2017: 16-18). With some 2,300 members (p. 20), it seeks to sustain population, employment and services in the region by building on the Valley's long history at the core of Victoria's power industry. At the same time, it promotes diversification into new sectors. According to Voices (2016: 19), history has generated a Valley "full of very handy people, from farmers to electricians to engineers" (2016: 19). Using existing, local strengths conforms with what international best practice suggests.

This organisation proposes a green energy, green skills future for the Latrobe Valley based on a community-led structural adjustment process. This would be a bottom-up variant of Just Transition. It would seek collaboration across industry, governments at all levels, universities, community entities in order to properly investigate, plan and implement its vision. Again, this is what the best practice literature suggests.

Voices advocates community-owned worker cooperatives as a particularly suitable form of SME business model—perhaps in some form of joint venture with existing businesses. They particularly promote the idea of these cooperatives manufacturing solar panels and storage batteries in the Latrobe Valley (2016: 12). By being community-focused, they wish to insulate emerging activity from unwelcome effects of the international economy while also providing opportunities for often disadvantaged groups—like renters, low-income home owners and those in social housing—to engage with and even co-own segments of their proposed local, solar-powered energy sector (2016: 8-11). However, this spirit of bottom-up community initiative still recognises that it requires some top-down government financial support (Senate Committee, 2017: 63).

This approach would provide decent work for workers, many already with the necessary skills, transitioning from coal-fired power stations. It would also help the people of the Valley, a region suffering lower socio-economic, educational and other indicators of well-being (Weller, Sheehan and Tomaney, 2011), to improve their situations, while at the same time reducing other areas of Australian and state government expenditure. As Voices argue (2016: 23), such a Just Transition would reduce the numbers of people on welfare, claiming Medicare and “engaging with the justice system”. Indeed, the recent establishment, in the Valley, of the worker-owned Earthworker Cooperative solar hot water manufacturing plant aims to contribute in all these ways: environmental/climate change; employment and development; and decent work (Earthworker, 2017).

The Mayor of Muswellbrook (Hunter Valley), Councillor Rush, outlined to the Senate Committee (2017: 66) some of the innovative initiatives underway in Muswellbrook Shire to prepare for transition. In doing so he explicitly linked these innovations to existing and former strengths:

We have had an intimate connection with the provision of energy in our community for over 100 years, but we look forward to the day that we can continue that by providing renewable energy, albeit in a rural context. We are working with the University of Newcastle and Hunter TAFE, as well as a number of key agricultural stakeholders including the Farmers Federation, on how we can provide that renewable energy within that rural context. That includes feedstocks for biofuels, including green diesel, wind generation and, of course, solar, as well as pumped water storage by using the residual mining voids for reuse by providing essentially pumped water storage as a form of battery storage for some of the more intermittent forms of renewable energy provision.

Funding labour intensive regional projects

This option can create large, if transitory, boosts in employment. It can thus very usefully assist as a bridging mechanism while the other, more enduring employment generation measures (above) take effect. For example, remediation and restoration of closed mines, repair of environmental damage left by power plants, including ash dams, can employ retrenched workers for a number of years.

The types of jobs typically involved directly in coal mine rehabilitation include a variety of occupational classifications. They include environmental and technical managers, engineers, geologists, biologists, technicians, surveyors, heavy equipment operators, and general labourers. Much of this work will require similar skills used in mines and power stations. (Environment Victoria, 2014: 7). For power stations, the list would be similar but will also include building (and demolition) trades, industrial hygienists and other workplace health and safety specialists.

Addressing these issues means also attending to longstanding negative health impacts for local communities (Senate Committee, 2017: 9). It will also make the region more viable for new industries such as higher education institutions, agri- and eco-tourism and retirement villages and nursing homes. Existing and potential residents will also benefit from more liveable and attractive environments.

Environment Victoria (2014: 7) estimated that rehabilitation of the Latrobe Valley's coal mine sites could produce hundreds of new, secure, full-time jobs running over a number of years. However, the volume of work—and hence employment—would depend on levels of funding the plant owner (and/or government) made available. At the lowest funding level, the estimate was 254 jobs per year over 20 years; at the mid-level, 439 jobs; and at the upper level, 626. Estimates of economic benefits for the region rise more quickly at each point.

Therefore, funding levels available for rehabilitation activities represent an important limiting condition on likely post-closure employment. At present, the owners of Latrobe Valley's polluting brown coal mines have been allowed to post vastly inadequate mine-site rehabilitation bonds. Governments have done little to promote full-scale rehabilitation (Environment Victoria, 2014: 9-10). It is vital that government regulation play its part in guaranteeing the owners contribute sufficiently, and that the community's expressed expectations be listened to on this.

The Senate Committee (2017: vii) called for reviewing the current standard for funding the rehabilitation of power stations and coal mines against the costs of those activities. Proper remediation directly affects the local amenity of residents and is thus essential to a community justice sense of Just Transition. The Senate Committee (2017: 29-54) evaluated a number of different pricing/funding models for transitioning away from coal-fired generation. It seems the most promising is the Jotzo-Mazouz model (ibid: 40-45) which transfers most of the spending responsibility to power station owners and explicitly allocates funding to Just Transition measures.

The positive results for the Ruhr and Limburg strongly support these arguments as do the factors responsible for lack of success in The Valleys, Appalachia and previous Australian closures. It is crucial that the financial safeguards that owners provide are sufficient and do not require taxpayer subsidies that would reflect a lack of proper costing of employer liabilities (Aither, 2014; Productivity Commission, 2012).

With the Victorian government's funding of major structural adjustment initiatives after the closure of the Hazelwood power station and coal mine, we can see a number of encouraging signs of a Just Transition agenda prosecuted by local unions and, in particular, the CFMMEU Mining and Energy Division. As suggested above, these work strongly on adjusting both labour supply and labour demand, with consideration of both the number of jobs and the type and quality of those jobs. As well, these initiatives work both with the industry involved as well as fostering diversification. A number of them are very creative in their design and together they cover various aspects of the three approaches suggested above: cluster; strengthening local factors to boost development; and funding labour-intensive regional projects. They include the following (Wiseman, Campbell and Green, 2017: 20-24):

- ◇ A variety of support services for affected workers: financial, psychological, education and skills training.
- ◇ Support services to local businesses to help them hire.
- ◇ A support service to encourage investment in renewable energy projects in the region.
- ◇ Establishment of an Economic Growth Zone to encourage inbound investment.
- ◇ Establishment of a Hi-Tech precinct bringing together the (local) Federation University, technical colleges, the government and Fujitsu. This would appear to be the start of a cluster aimed at a few industries with existing local strength.
- ◇ A Worker Transition Centre—in partnership with the Gippsland Trades and Labour Council.
- ◇ Funding of voluntary redundancies at other local power stations to allow job openings for younger, former Hazelwood workers
- ◇ A worker transfer scheme that sees those younger redundant Hazelwood workers move to jobs in other Latrobe Valley power stations.
- ◇ A major fund to support development of local infrastructure projects.
- ◇ Energy efficiency upgrading of the homes of low-income residents.
- ◇ Public housing upgrades, which like the previous item, contribute to climate change goals, social justice outcomes for residents and employment creation.
- ◇ Construction and establishment of a major new state government public service office centre.

Furthermore, the Victorian government has committed to a major upgrading of the Gippsland railway line (\$345 million) outside the adjustment packages discussed above. This

initiative also has important climate change, social equity and employment creation benefits as well as benefitting other parts of the regional economy (Wiseman, Campbell and Green, 2017: 21).

Decision-making and consultative approaches

The broad Just Transition policy measures outlined above can together help overcome or mitigate the worst costs associated with the decline of the coal-fired power industry. How to prioritise these measures and to best specify their details are questions open to circumstances in each case. The answer will be contingent on the specific strengths, weaknesses and interests of different regions, towns and their stakeholder groups.

The success of a comprehensive Just Transition policy requires economic development, especially sustainable development. As this will probably require significant private investment, it is imperative that potential investors can feel confident that development policy will continue in a stable direction for quite some time. To achieve this stability requires significant political and social consensus on key aspects of Just Transition policy.

The processes through which specific strengths, weakness and interests are identified, the way policy is constructed, specified and implemented, and the way political consensus is reached, are therefore all critical questions (Aither, 2016; OECD, 2016; Schulz and Schwartzkopff, 2016).

The evidence from our study suggests that best practice utilises both *top-down* and *bottom-up* policy development processes. Sometimes they work in tandem but at other times, one may predominate given different stages of policy development and implementation.

The breadth and diversity of proposals suggests a whole-of-government culture. For this, the UNFCCC (2017: 16) argued that:

Coherent policies across the economic, environmental, social, education and training and labour portfolios need to provide an enabling environment for enterprises, workers, investors and consumers to embrace and drive the transition towards environmentally sustainable and inclusive economies and societies.

According to international evidence, critical here is for the Australian government to establish a tripartite Energy Transition Authority with the powers, funding and longer-term stability to research, plan, coordinate, communicate and a Just Transition program over the next few decades. The ETA will need to be constituted in a way that its work brings in governments at state and local levels as well as employers and unions. Its processes should also invite the contributions of local community groups, NGOs and other relevant parties.

Indeed, Stroud and colleagues (2013: 21) suggest that the: “key to any effective [green] transition is collaboration between a range of relevant stakeholders, including representatives of employers, trade unions, community groups, different levels of government

(namely regional and local) and educational institutions”. This was crucial for the success of Singapore’s Second Industrial Revolution and for the economic challenges successfully faced in the Ruhr and Limberg. Indeed, this is a very similar conclusion to the one that the UNFCCC (2016: 19) reached for its skills development agenda. The evidence in this report also supports this conclusion.

Certainly, the dramatic failures in structural adjustment in Appalachia, The Valleys and some previous mine closures in Australia indicate the risks of governments excluding unions and local community groups and leaving matters to the commercial interests of business—whether plant and mine owners or potential new investors.

Bibliography

- ACTU (2016), Sharing the challenges and opportunities of a clean energy economy – A Just Transition for coal-fired electricity workers and communities. (Contains many references) <http://www.actu.org.au/our-work/policy-issues/actu-policy-discussion-paper-a-just-transition-for-coal-fired-electricity-sector-workers-and-communities>
- AEMO (Australian Energy Market Operator), (2013), *100 per cent Renewables Modelling Outcomes*, July. Available at: <http://www.environment.gov.au/system/files/resources/d67797b7-d563-427f-84eb-c3bb69e34073/files/100-percent-renewables-study-modelling-outcomes-report.pdf> (accessed 22 April 2018).
- AGL (2017), 'AGL announces plans for Liddell Power Station', AGL ASX and Media Releases, 9 December. Available at: <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2017/december/agl-announces-plans-for-liddell-power-station> (accessed 13 December 2017).
- Aither (2014), *Structural Adjustment in Regional Australia Learning from experience, improving future responses*, Rural Industries Research and Development Corporation/Australian Government, Canberra. Available at: http://www.aither.com.au/wp-content/uploads/2016/10/15-110-NRI-Structural-Adjustment_online.pdf (accessed 9 November 2017).
- Allan, G., McGregor, P. and Swales, K. (2017), 'Greening Regional Development: Employment in low-carbon and renewable energy activities', *Regional Studies*, 51 (8), 1270-1280.
- Australian Renewable Energy Agency (2014), *Australia's off-grid clean energy market: Research Paper*, 8 October (prepared by AECOM Australia).
- Beatty C., Fothergill, S. and Powell, R. (2007), 'Twenty Years On: Has the economy of the UK coalfields recovered?' *Environment and Planning A*, 39 (7): 1654–1675.
- Beer, A. (2015), 'Structural adjustment programmes and regional development in Australia', *Local Economy*, 30 (1): 21-40.
- Bennett K., Beynon, H., Hudson R. (2000), *Coalfields Regeneration: Dealing with the consequences of industrial decline*, The Policy Press, Bristol.
- Bross U and Walter G.H (2000). *Socio-economic Analysis of North Rhine-Westphalia*. Fraunhofer Institute for Systems and Innovation Research. Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.6866&rep=rep1&type=pdf>
- Caldecott, B., Sator, O. and Spencer, T. (2017), *Coal Transitions: High level summary for decision makers*, IDDR and Climate Strategies. Available at: www.coaltransitions.org (accessed 24 November 2017).
- Climate Change Authority (2016), *Policy Options for Australia's electricity supply sector: Special review research report*, August. Available at: <http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/files/SR%20Electricity%20research%20report/Electricity%20research%20report%20-%20for%20publication.pdf> (accessed 20 October 2017).
- Climate Change Authority (2016), *Towards a Climate Policy Toolkit: Special Review on Australia's Climate Goals and Policy*, August 2016.
- Climate Council (2014), *Australia's Electricity Sector: aging, inefficient and unprepared*. Available at: <http://www.climatecouncil.org.au/uploads/f9ba30356f697f238d0ae54e913b3faf.pdf> (accessed 20 October 2017).
- ClimateWorks Australia (ClimateWorks) (2017), *Submission to the Review of Australia's Climate Change Policies*, ClimateWorks Australia, Melbourne. 8 May. Available at: <https://committeeforgippsland>.

- com.au/committee-gippsland-submission-2017-2018-commonwealth-budget/ (accessed 10 October 2017).
- Committee for Gippsland (2016), *Our Region Our Future—securing an economic future for Gippsland and Latrobe Valley*. Available at: <http://www.committeeforgippsland.com.au/docs/7108%20Committee%20for%20Gippsland%20-%202016%20Booklet.pdf> (accessed 10 October 2017).
- Committee for Gippsland (2017), *Submission to 2017-2018 Commonwealth Budget*, April 7. Dargaville, R. (2012), *The case for shutting down Hazelwood power station—some facts and figures*, 5 July 2012, Available at: <https://theconversation.com/the-case-for-shutting-down-hazelwood-power-station-some-facts-and-figures-7940> (accessed 15 November 2017).
- Denniss, R. and Campbell, R. (2015), 'Two birds. one little black rock: Solving the twin problems of incentives for retirement of coal fired generation and funding rehabilitation liabilities', *Policy Brief*, The Australia Institute, December. Available at: http://www.tai.org.au/sites/default/files/P157%20Two%20birds%20one%20little%20black%20rock%20%5BPRINT%5D_1.pdf (accessed 18 November 2017).
- Doorey, D.J. (2017), 'Just Transition Law: Putting labour law to work on climate change', *Canadian Journal of Environmental Law and Policy*, 30 (2), in press. Available at: SSRN: <https://ssrn.com/abstract=2938590> (accessed 25 September 2017).
- Earthworker (2017), 'Earthworker Energy'. Available at: <http://earthworkercooperative.com.au/earthworker-energy/> (accessed 20 April 2018).
- Environment Victoria (2014), *Preventing the Preventable: Policy Options for Accelerating Coal Mine Rehabilitation and Creating Jobs in the Latrobe Valley*, Environment Victoria Policy Report, October. Available at: <https://environmentvictoria.org.au/wp-content/uploads/2016/07/Preventing-the-Preventable.pdf> (accessed 22 December 2017).
- Finkel, A., Moses, K., Munro, C., Effenev, T. and O'Kane, M. (2017), *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future*, Commonwealth of Australia, Department of Environment and Energy, June. Available at: <https://www.energy.gov.au/sites/g/files/net3411/f/independent-review-future-nem-blueprint-for-the-future-2017.pdf> (accessed 18 December 2017).
- Fothergill, S. (2008), 'The Most Intractable Development Region in the UK', In Osmond, J. (Ed.) *Futures for the Heads of the Valleys*, Institute of Welsh Affairs, Cardiff: 3-11. Available at: <http://www.iwa.wales/wp-content/uploads/2016/03/valleys-with-crop-marks.pdf> (accessed 18 April 2018).
- Gales, B. and Holskens, R. (2017), *Coal transition in the Netherlands: An historical case study for the project "Coal Transitions: Research and Dialogue on the Future of Coal"*. IDDR and Climate Strategies.
- Gan, BKC., Sheldon, P. and Morgan, DE. (2015), 'Employer Association at Work: Competitive Tripartism and the Singapore National Employers' Federation (SNEF) 1980-2000' Paper Presented at the Society for the Advancement of Socio-Economics Conference, London School of Economics and Political Science, July 2-4.
- German Coal Association (German Coal) (2013): *Coal 2013: Partnering the Energy Transition*, German Coal Association. Coal Annual Report 2013.
- Galgoczi, B. (2014), 'The Long and Winding Road from Black to Green', *International Journal of Labour Research*, 6 (2): 217-240.
- Government of Wales Statistics & Research (1998), *Digest of Welsh Historical Statistics 1974-1996* Release date: 27 August 1998. Available at: <http://gov.wales/statistics-and-research/digest-welsh-historical-statistics/?tab=previous&lang=en> (accessed 19 April 2018).
- Gunasekara, C. (2008), 'Network Governance amidst Local Economic Crisis', *Australian Journal of Political Science*, 43 (2): 207-223.

- Hospers, G. (2004), 'Restructuring Europe's Rustbelt: The Case of the German Ruhrgebiet', *Intereconomics*, 39 (3): 147-156.
- Huff, W.G. (1995), 'What is the Singapore Model of Economic Development?', *Cambridge Journal of Economics*, 19 (6): 735-759.
- International Labour Organisation (ILO) (2015), *Guidelines for a just transition towards environmentally sustainable economies and societies for all*, Geneva. Available at: http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_432859.pdf (accessed 5 September 2017).
- International Trade Union Confederation (2016), *Frontlines Briefing: Climate Justice COP22 Special Briefing*. Brussels. Available at: <https://www.ituc-csi.org/ituc-frontlines-briefing-climate-18030> (accessed 5 September 2017).
- Jones, S. and Tee, C. (2017), *Experiences of Structural Change*, Economic Roundup, The Treasury, Australian Government, 28 August, Available at: <https://treasury.gov.au/publication/p2017-t213722b/> (accessed 17 November 2017).
- Kasper, J.D.P. and Knotter, A. (2013), *Na de mijnsluiting, herstructureren en reconversie in internationaal perspectief*. Roermond: Stichting Behoud Mijnhistorie. (English translation: After the mine closure, restructuring and reconversion in an international perspective. Roermond: Foundation for Keeping Mine History).
- Latrobe City Council (2016), *Draft Economic Development Strategy 2016-21*. http://www.latrobe.vic.gov.au/files/139a6c11-5fda-470e-9090-a63300e1bcf3/Eco_Dev_Strategy_2016_-_Email_version.pdf
- Lin, J. and Chang, H., (2009), 'Should industrial policy in developing countries conform to comparative advantage or defy it? A debate between Justin Lin and Ha-Joon Chang', *Development Policy Review*, 27: 483-502.
- Loorbach, D. and Rotmans, J. (2010), 'The practice of transition management: Examples and lessons from four distinct cases', *Futures*, 42: 237-246.
- McDonald, G., Condon, L. and Riordan, M. (2012), *The Australian Green Skills Agreement: Policy and industry context, institutional response and green skills delivery*, TAFE Directors Australia, Sydney, Available at: <http://library.bsl.org.au/jspui/bitstream/1/3201/1/The%20Australian%20Green%20Skills%20Agreement.pdf> (accessed 19 April 2018).
- Merrill, T. and Kitson, L. (2017), *The End of Coal Mining in South Wales: Lessons learned from industrial transformation*, GSI Report, International Institute for Sustainable Development. Geneva, May. Available at: <https://www.iisd.org/sites/default/files/publications/end-of-coal-mining-south-wales-lessons-learned.pdf> (accessed 19 April 2018).
- Morgan, K. (2008), 'Rival Visions: Relative Decline Or Regional Renewal? In Osmond, J. (Ed.) *Futures for the Heads of the Valleys*, Institute of Welsh Affairs, Cardiff: 19-35. Available at: <http://www.iwa.wales/wp-content/uploads/2016/03/valleys-with-crop-marks.pdf> (accessed 18 April 2018).
- Murphy, D. (2014), 'Newcastle's steely resolve masks painful scars from BHP shutdown', *Sydney Morning Herald*, 20 February. Available at: <http://www.smh.com.au/nsw/newcastles-steely-resolve-masks-painful-scars-from-bhp-shutdown-20140219-330y9.html> (accessed 10 December 2017).
- Nelson, T., Reid, C. and McNeill, J. (2015), 'Energy-only markets and renewable energy targets: Complementary policy or policy collision?', *Economic Analysis and Policy*, 46: 25-42. Available at: <https://doi.org/10.1016/j.eap.2015.04.001> (accessed 19 November 2017).
- Newcastle Herald* (2009), 'Ten Years after BHP', 29 September. Available at: <http://www.theherald.com.au/story/446711/ten-years-after-bhp/> (accessed 10 December 2017).

- OECD (2016), *Back to Work—Australia. Improving the re-employment prospects of displaced workers*, Paris.
- Pang, E.F. (1982), *Education, Manpower and Development in Singapore*, Singapore University Press, Singapore.
- Peetz, D. (2005) 'Retrenchment and Labour Market Disadvantage: Role of age, job tenure and casual employment', *Journal of Industrial Relations*, 47 (3), 294-309.
- Pollin, R. and Callaci, B. (2016a), 'A Just Transition for U.S. Fossil Fuel Industry workers'. *American Prospect*, Summer. Available at: <http://prospect.org/article/just-transition-us-fossil-fuel-industry-workers> (accessed 10 November 2017).
- Pollin, R. and Callaci, B. (2016b), 'The Economics of a Just Transition: A framework for supporting fossil fuel-dependent workers and communities in the United States', PERI Working Paper Series No. 423, University of Massachusetts Amherst, October. Available at: <https://www.peri.umass.edu/publication/item/762-the-economics-of-just-transition-a-framework-for-supporting-fossil-fuel-dependent-workers-and-communities-in-the-united-states> (accessed 14 April 2018).
- Price, R.H., Choi, J.N. and Vinokur, A.D. (2002), 'Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health', *Journal of Occupational Health Psychology*, 7 (4): 302-312. <https://dx.doi.org/10.1037/1076-8998.7.4.302>
- Productivity Commission (2012), *Annual Report 2011-12*, Commonwealth of Australia. Available at: <https://www.pc.gov.au/about/governance/annual-reports/2011-12/annual-report-2011-12.pdf> (accessed 17 November 2017).
- Puuka, J. and Marmolejol, F. (2008), 'Higher Education Institutions and Regional Mission: Lessons Learnt from the OECD Review Project', *Higher Education Policy*, 21 (2), 217-44.
- Quinlan, M., Mayhew, C. and Bohle, P. (2001), 'The Global Expansion of Precarious Employment, Work Disorganization, and Consequences for Occupational Health: A review of recent research', *International Journal of Health Services*, 31 (2), 335-414.
- Rodan, G. (1989), *The Political Economy of Singapore's Industrialization: National State and International Capital*, St Martin's Press, New York.
- Rodriguez-Pose, A. and Fratesi, U. (2004), 'Between Development and Social Policies: The impact of European Structural Funds in Objective 1 Regions', *Regional Studies*, 38 (1): 97-113.
- Schulz S and Schwartzkopff J (2016) *Instruments for a managed Coal Phase-Out: German and International Experiences with Structural Change*. E3G. Available at: https://www.e3g.org/docs/Experiences_with_structural_change_EN.pdf
- Schepelmann, P. (2010) From Beast to Beauty? Ecological Industry Policy in North Rhine-Westphalia. *Ekonomiaz* 75(3): 104–121.
- Schepelmann p, Kemp R, Klement J and Schneidewind U (2013) The Eco-restructuring of the Ruhr Area as an Example of a Managed Transition (Sustainability Transitions IST 2013 Conference, June 2013).
- Sheldon, P., Gan, B. and Morgan, D.E. (2015), 'Making Singapore's Tripartism Work (Faster): The Formation of the Singapore National Employers' Federation in 1980', *Business History*, 57 (3), 438-460. <https://dx.doi.org/10.1080/00076791.2014.983484>
- Stroud, D., Fairbrother, P., Evans, C. and Blake, J. (2013), 'Skill development in the transition to a "green economy": A "varieties of capitalism" analysis', *Economic and Labour Relations Review*, 25 (1): 10-27.
- Taylor, B., Hufford, M. and Bilbrey, K. (2017), 'A Green New Deal for Appalachia: Economic Transition, Coal Reclamation Costs, Bottom-Up Policymaking (Part 1)'. Just Transition in Appalachia project. April. Available at: https://www.researchgate.net/publication/318519586_A_Green_New_Deal_

- for_Appalachia_Economic_Transition_Coal_Reclamation_Costs_Bottom-Up_Policymaking_Part_1(accessed 21 April 2018).
- Taylor R (2015) *A Review of Industrial Restructuring in the Ruhr Valley and Relevant Points for China*. Institute for Industrial Productivity. Available at: <http://www.iipnetwork.org/Industrial%20Restructuring%20in%20the%20Ruhr%20Valley.pdf>
- The Senate, Environment and Communications Reference Committee (2017), *Retirement of Coal-Fired Power Stations: Final Report*, Commonwealth of Australia, March.
- Thornthwaite, L (2018), 'The Living Wages Crisis in Australian Industrial Relations', *Labour and Industry*, 27 (4): 261-69.
- United Nations Framework Convention on Climate Change (UNFCCC) (2016), *Just Transition of the workforce, and the creation of decent work and quality jobs*. Technical paper by the Secretariat, Paper number FCCC/TP/2016/7. Available at: <http://unfccc.int/resource/docs/2016/tp/07.pdf> (Accessed 25 September 2017).
- Voices of the Valley (Voices), (2016), *Jobs & Hope in the Latrobe Valley: One way forward*. Available at: https://d3n8a8pro7vhmx.cloudfront.net/voicesofthevalley/pages/284/attachments/original/1502510959/Transitioning_the_Valley_web.pdf?1502510959 (accessed 12 November 2017).
- Wanberg, C.R. (2012), 'The Individual Experience of Unemployment', *Annual Review of Psychology*, 63: 360-396.
- Weller, S., Sheehan, P. and Tomaney, J. (2011), *The Regional Effects of Pricing Carbon Emissions: An adjustment strategy for the Latrobe Valley*. Report to Regional Development Victoria, Centre for Strategic Economic Studies, Victoria University, November.
- Welsh Government (1985), *Digest of Welsh Historical Statistics 1700-1974*: Chapter 5—Coal. Available at: <http://gov.wales/statistics-and-research/digest-welsh-historical-statistics/?tab=previous&lang=en> (accessed 18 April 2018).
- Wilkinson, J. (2011), *The Hunter Region: An economic profile*, NSW Parliament Library Research Service, Available at: <https://www.parliament.nsw.gov.au/researchpapers/Documents/the-hunter-region-an-economic-profile/Newcastle%20and%20the%20Hunter%20GG%202.pdf> (Accessed 15 December 2017).
- Wiseman, J., Campbell, S. and Green, F. (2017), 'Prospects for a "just transition" away from coal-fired power generation in Australia: Learning from the closure of the Hazelwood Power Station, CCEP, Working Paper 1708, November, Crawford School of Public Policy, Australian National University.
- Wodopia, F-J. (2017), Coal Industry Restructuring in Germany. https://dl.dropboxusercontent.com/u/902980/Wodopia_Madrid_presentation_2015-shrunk.pdf . Submission 18 to the Senate Committee (2017).

Appendix 1

Table 1 Australia's operating coal fired power stations at 31 December 2016
(Senate Committee, 2017; 5)

Coal Fired Power Stations (Operating)						
State	Power station	Primary fuel type	Year of commissioning	Announced year of decommissioning	Age (years)	Capacity (MW)
NSW	Ering	Black coal	1982-84		32-34	2,880.0
NSW	Bayswater	Black coal	1982-84	2035	32-34	2,640.0
NSW	Liddell	Black coal	1971-73	2022	43-45	2,000.0
NSW	Mt Piper	Black coal	1993		23	1,400.0
NSW	Vales Point B	Black coal	1978		38	1,320.0
VIC	Loy Yang A	Brown coal	1984-87	2048	29-32	2,210.0
VIC	Hazelwood	Brown coal	1964-71	March 2017	45-52	1,760.0
VIC	Yallourn W	Brown coal	1975, 1982		34-41	1,480.0
VIC	Loy Yang B	Brown coal	1993-96		20-23	1,026.0
QLD	Gladstone	Black coal	1976-82		34-40	1,680.0
QLD	Tarong	Black coal	1984-86		30-32	1,400.0
QLD	Stanwell	Black coal	1993-96		20-23	1,460.0
QLD	Callide C	Black coal	2001		15	810.0
QLD	Millmerran	Black coal	2002		14	851.0
QLD	Kogan Creek	Black coal	2007		9	750.0
QLD	Callide B	Black coal	1989		27	700.0
QLD	Tarong North	Black coal	2002		14	443.0
QLD	Yabulu (Coal)	Black coal	1974		42	37.5
QLD	Gladstone QAL	Black coal	1973		43	25.0
WA	Muja	Black coal	1981, 1986		30-35	1,070.0
WA	Collie	Black coal	1999		17	340.0
WA	Bluewaters 1	Black coal	2009		7	208.0
WA	Bluewaters 2	Black coal	2010		6	208.0
WA	Worsley (Alumina)	Black coal	1982-00		16-34	135.0

Table 2 Australia's decommissioned coal fired power stations at 31 December 2016

(Senate Committee, 2017; 5)

Coal Fired Power Stations (Closed)						
State	Power station	Primary fuel type	Year of commissioning	Date of closure	Age (Years)	Capacity (MW)
NSW	Munmorah	Black coal	1969	Jul-12	43	600.0
NSW	Redbank	Black coal	2001	Aug-14	13	143.8
NSW	Wallerawang C	Black coal	1976-80	Nov-14	38	1,000.0
VIC	Morwell	Brown coal	1958-62	Aug-14	52-56	189.0
VIC	Anglesea	Brown coal	1969	Aug-15	46	160.0
QLD	Collinsville	Black coal	1968-98	Dec-12	14-44	180.0
QLD	Swanbank B	Black coal	1970-73	May-12	42	500.0
SA	Northern	Brown coal	1985	May-16	31	546.0
SA	Playford	Brown coal	1960	May-16	56	240.0

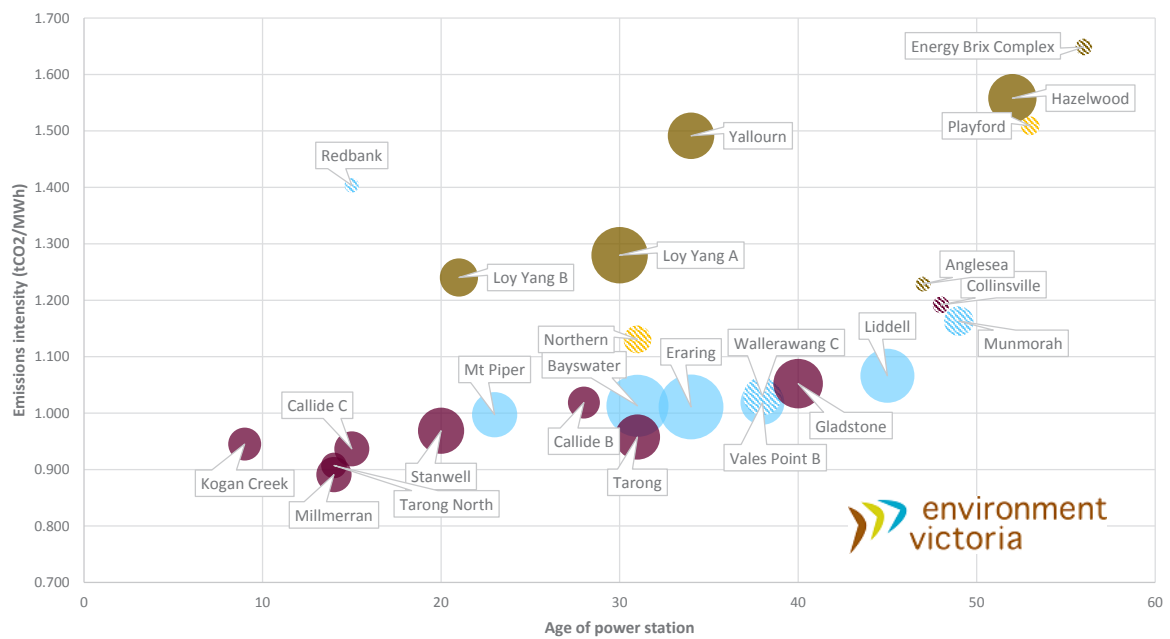


Figure 1 Coal fired power stations in the National Electricity Market

Source: Environment Victoria, *Submission 16*, p. 5. Figure Shows current and recently closed NEM power stations by age and emissions levels. From Senate Committee (2017: 7).

Appendix 2

Recommendations of the Senate, Environment and Communications Reference Committee (2017), *Retirement of Coal- Fired Power Stations: Final Report*, Commonwealth of Australia, March.

p. vii.

Recommendation 1

5.16 The committee recommends that the Australian Government adopt a comprehensive energy transition plan, including reform of the National Electricity Market rules.

Recommendation 2

5.17 The committee recommends that the Australian Government, in consultation with industry, community, union and other stakeholders, develop a mechanism for the orderly retirement of coal fired power stations to be presented to the COAG Energy Council.

Recommendation 3

5.18 The committee recommends that the Australian Government, through representation on the COAG Energy Council, put in place a pollution reduction objective consistent with Australia's obligations under the Paris Agreement in the National Electricity Objectives.

Recommendation 4

5.19 The committee recommends that the Australian Government establish an energy transition authority with sufficient powers and resources to plan and coordinate the transition in the energy sector, including a Just Transition for workers and communities.

Recommendation 5

5.24 The committee recommends:

- ◊ That the Australian Government commission a comprehensive and independent assessment of the health impacts of coal fired power stations.
- ◊ That the Australian Government develop a load-based licencing arrangement for coal fired power stations for adoption at COAG based on the New South Wales Load-Based Licencing scheme, with fees that reflect the health impacts and other externalities of power station emissions.
- ◊ That the Australian Government take additional measures to ensure compliance with the standards set in the National Environmental Protection (Air Quality) Measure and—in the case of sulphur dioxide and nitrogen dioxide—international best practice standards. In regions where these standards are exceeded such as the Hunter and Latrobe Valleys, coal fired power stations must be compelled to reduce emissions to levels below the NEPM standards.

p. viii.

That the Australian Government ensure a more rigorous assessment of power station emissions through an independent audit of reports provided through the National Pollutant Inventory.

Recommendation 6

5.27 The committee recommends that the Commonwealth and state energy ministers should undertake a national audit of likely rehabilitation costs for existing coal mines and power stations and assess these costs against the current provisions or bond arrangements.

5.28 The committee recommends that the Commonwealth and state energy ministers should also work to develop a common approach to setting rehabilitation bonds to ensure that rehabilitation costs are properly provisioned for.

Recommendation 7

5.34 The committee recommends that the Australian Government continue and expand the Renewable Energy Target beyond 2020 and consider adopting renewable energy reverse auctions such as adopted by the ACT to bring more new generation into the national electricity market.

5.35 The committee also recommends that the Australian Government support the continuing deployment grid level battery storage and of household solar and battery storage technologies, including making the necessary regulatory changes, such as aligning the settlement and bidding time periods in the National Electricity Market, to encourage the utilisation of products that promote decentralisation of electricity production while enhancing the stability of the grid.

Recommendation 8

5.40 The committee recommends that the Australian Government commit to not provide any direct funding, subsidies or other support for the construction of new coal fired power stations in Australia.

Recommendation 9

5.43 The committee recommends that the Australian Government reverse its ideological opposition to the introduction of a scheme for managing the transition in the electricity sector such as an Emissions Intensity Scheme or the setting of pollution intensity standards and commit to considering fairly all policy options.

The authors:

Peter Sheldon, Director of the Industrial Relations Research Centre, and Professor, School of Management, UNSW Sydney.

Raja Junankar, Visiting Professor, Industrial Relations Research Centre, UNSW Canberra.

Anthony Pontello de Rosa, Research Assistant, Industrial Relations Research Centre, UNSW Sydney.

Acknowledgements:

Davide Baresi

Research assistance

Jason Antony

Design, editing and typesetting



Cover photo: The Hazelwood brown coal power station that closed in March 2017, with the loss of approximately 750 direct jobs, and possibly more than a thousand in related industries.
Photo by Simpsons fan 66 at the English language Wikipedia