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# Transition to a post-carbon society: Linking environmental justice and just transition discourses

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## ABSTRACT

The Hunter Valley, in New South Wales, Australia, is a globally significant coal mining and exporting region. The Hunter economy's strong basis in fossil fuel production and consumption is challenged by civil society campaigns employing environmental justice discourses. This paper analyses how two civil society campaigns in the Hunter region ('Stop T4' and 'Groundswell') have countered the regional hegemony of fossil fuel interests from an environmental justice perspective. However, the discursive dominance of the 'jobs versus environment' frame hinders efforts to build solidarity amongst local environmental justice goals on the one hand, and workers and union aspirations for secure, quality jobs on the other. Long-term structural decline of global coal markets adds pressure for economic transition. We argue that campaigns to open up possibilities for transition away from fossil fuel dependency to a post-carbon society can be strengthened by engaging with the 'just transition' discourses that are typically associated with organised labour. Doing so can create synergy for social change by aligning community and labour movement interests. Inclusive social movement partnerships around this synergy must address structural disadvantage that creates social and economic insecurity if communities are to prevail over the fossil fuel sector's hegemony.

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## 1. Introduction

Increasing fossil fuel use has been central to the existence and growth of modern economies, and to the character of governance of modern societies. The promotion of economies framed around unlimited growth has emerged as a fundamental object of contemporary politics, and has structured relations among forms of energy, finance, economic knowledge, democracy and violence across local and global scales (Mitchell, 2009). Largely on the basis that fossil fuels use currently dominates the global energy system, the interests of fossil fuel sector actors dominate public policy discourses globally in areas related to energy use, including energy investments and subsidies, environmental protection, property rights, trade and development, and climate change (Goodell, 2006; Phelan et al., 2013). Fossil fuel actors' dominance over public policy related to energy is hegemonic (Gramsci, 1971), in that the particular interests of fossil fuel sector actors have been accepted more broadly as the general interest, and the structures of governance, socio-technical systems, and markets are framed around fossil fuel actors' interests (Pearse, 2009; Pearse et al., 2013). One consequence is ongoing fossil fuel dependency or "carbon lock-in" (Unruh, 2000: 818).

However, fossil fuel use is the key driver of anthropogenic climate change, which is undermining the stability of the Earth system (Intergovernmental Panel on Climate Change, 2013, 2014a, b). Growing recognition of the central role of fossil fuel use in

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driving climate change, along with rapidly changing energy economics, serves to undermine fossil fuel actors' hegemony in energy-related public policy. It is becoming increasingly clear that, in the context of climate change and energy economics, fossil fuel actors' particular interests are conflicting with, and undermining, the general interest (Levy, 2012). This recognition is reflected in a changing discourse around energy policies towards renewable, energy-efficient and flexible electricity systems, (Mitchell, 2016) and the emergence of sophisticated and globally-connected social movement campaigns for transition to a post-carbon future, a social movement that links multiple locations, issues, and communities (Bridge et al., 2013; Centre for International Environmental Law, 2011; Leggett, 2015; Pettit, 2004). Moyer et al. (2001) describes social movements as "collective actions in which the populace is alerted, educated, and mobilised, sometimes over years and decades, to challenge the powerholders and the whole society to redress social problem or grievances and restore critical social values" (Moyer et al., 2001: 2). Social movement campaigns aim to develop alternative cultures and narratives to win participation and support (Tan and Snow, 2015; Polletta and Gardner, 2015) and to hold governments and institutions to account through a "counter-democracy of surveillance from below" (della Porta, 2015: 264).

The social movement for a "post-carbon society" (Heinberg, 2004: 1) is fueled by alarm about the impacts of climate change and by aspirations for a more democratic, decentralized and decarbonized energy system that, together, signal the "End of Coal" (Thompson and Richards, 2015). Analysts, including investment bank Goldman Sachs (2013), highlight risks to investors and coal dependent economies from the emergence of the decline of coal, arguing that "thermal coal's current position atop the fuel mix for global power generation will be gradually eroded by the following structural trends: 1) environmental regulations that discourage coal-fired generation, 2) strong competition from gas and renewable energy and 3) improvements in energy efficiency" (Goldman Sachs, 2013: 1). Thus, energy analysts warn that, in this context, the global traded thermal coal market and Chinese coal imports peaked in 2013. Coal investments risk becoming stranded assets, and major US banks JP Morgan Chase, Bank of America Citigroup and Morgan Stanley have announced that they are backing away from coal (Heuskel et al., 2013; Caldecott et al., 2013; Leaton et al., 2013; Buckley, 2015; Corkery, 2016). Investment in renewable electricity now outstrips investment in fossil fuels (Mitchell, 2016). These developments constitute an energy revolution that creates economic insecurity for coal export-dependent nations, such as Australia, for workers in the industry and for coal communities, and provides impetus for transition for vulnerable communities. More than 30,000 Australian coal mining jobs have been lost in the last year, and a further 30,000 job losses are threatened in the next 12 months (Lannin, 2015).

Against this backdrop, this paper discusses two regional and local-scale campaigns in the Hunter Valley in New South Wales (NSW), Australia, that seek to amplify global drivers of change and add additional, locally-focused, counter hegemonic discourses to unsettle the fossil fuel historic bloc as represented by the coal mining and related fossil fuel-intensive industries (including the gas drilling industry) in the region. The campaigns respond to local communities' perceptions of environmental injustice, and challenge the dominant fossil fuel-based development narrative (Evans, 2010a; Munro, 2012; Pearse et al., 2013; Ray, 2012, 2014). 'Stop T4 Coal Export Terminal' (hereafter Stop T4), centred in the port of Newcastle, is a regional campaign which links community groups throughout the Hunter. It is focused on preventing the construction of the proposed T4 coal loading facility which, if built, would massively increase the Port of Newcastle's capacity to export coal. The Stop T4 builds from earlier social movement campaigns in Hunter Valley to stop new coal mines and increased coal exports from the region arising from environmental and climate justice concerns (Phillips and Ross, 1980; Evans, 2010b). 'Groundswell' is centred in the rural town of Gloucester, 120 km north of Newcastle and is a local campaign to protect a rural community from being overwhelmed by the environmental, social and economic impacts proposed new large-scale open-cut coal and coal seam gas mining projects.

The Hunter region (Fig. 1) is the historic heartland of the Australian coal industry. From the 19th Century, the Hunter has been Australia's major coal exporting region and accounts for almost half of Australia's coal exports. In turn, Australia accounts for almost a quarter of global trade in coal (World Coal Association, 2013). Over 150 million tonnes of coal were exported from the Port of Newcastle in 2013, more than 70% of the coal mined in the Hunter, making the port one of the world's largest thermal coal export ports by volume (Newcastle Port Corporation, 2015). Most coal exported from the Port of Newcastle is for electricity generation. The major importers of coal from Newcastle are Japan, South Korea and Taiwan, and more recently China. As well as a major exporter of coal, the Hunter is also a major coal-fired electricity generating centre nationally, accounting for 40% of Australia's electricity generation. More recently, major coal seam gas development has also been proposed in the Hunter region (NSW Trade and Investment, 2014). The Hunter economy's heavy focus on fossil fuel production and consumption makes it a "climate change hot-spot" (Evans, 2010a: 1) and a significant site of contestation about alternative social and economic development trajectories, pitting fossil fuel interests and civil society organisations in struggles regarding energy investments and jobs, and pathways to a post-carbon society.

We argue that social movements framed around two concepts, environmental justice and just transition, are challenging and disrupting hegemonic identities of individuals and communities that have defined the Hunter as a mining region for more than a century. Where, in earlier times there was "the spontaneous consent given by the great masses of the population to the general direction imposed on social life by the dominant fundamental group" (Gramsci, 1971) (that is, the fossil fuel historic bloc), now there are alternative identities being proposed (Cahill, 2005). Groundswell Gloucester, for example, challenges the fossil fuel-driven industrialisation of their "idyllic rural heartland" and declares the community "will not stand aside for mining companies to make a profit, while imposing long-term damage to our existing, sustainable agriculture and tourism industries" (Groundswell Gloucester, 2013). The website of the Hunter Community Environment Centre (HCEC) which coordinates the Stop T4 campaign declares that:

> "[In] regions, especially those like the Hunter who [sic] have a history of reliance on carbon intensive fossil fuel industries… the new [post-carbon] economy means opportunities for new industries, innovative business models and new jobs, but there is a significant risk that without proper planning we could see an extended period of social disruption and economic displacement" (HCEC, 2015a,b).

The T4 and Groundswell campaigns use an environmental justice frame, defined as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (US EPA, 2016) to advance their aspirations. The environmental justice concept emerged in the US in the early 1980s, particularly from struggles in the African American and Native American communities, around community campaigns regarding the harmful health

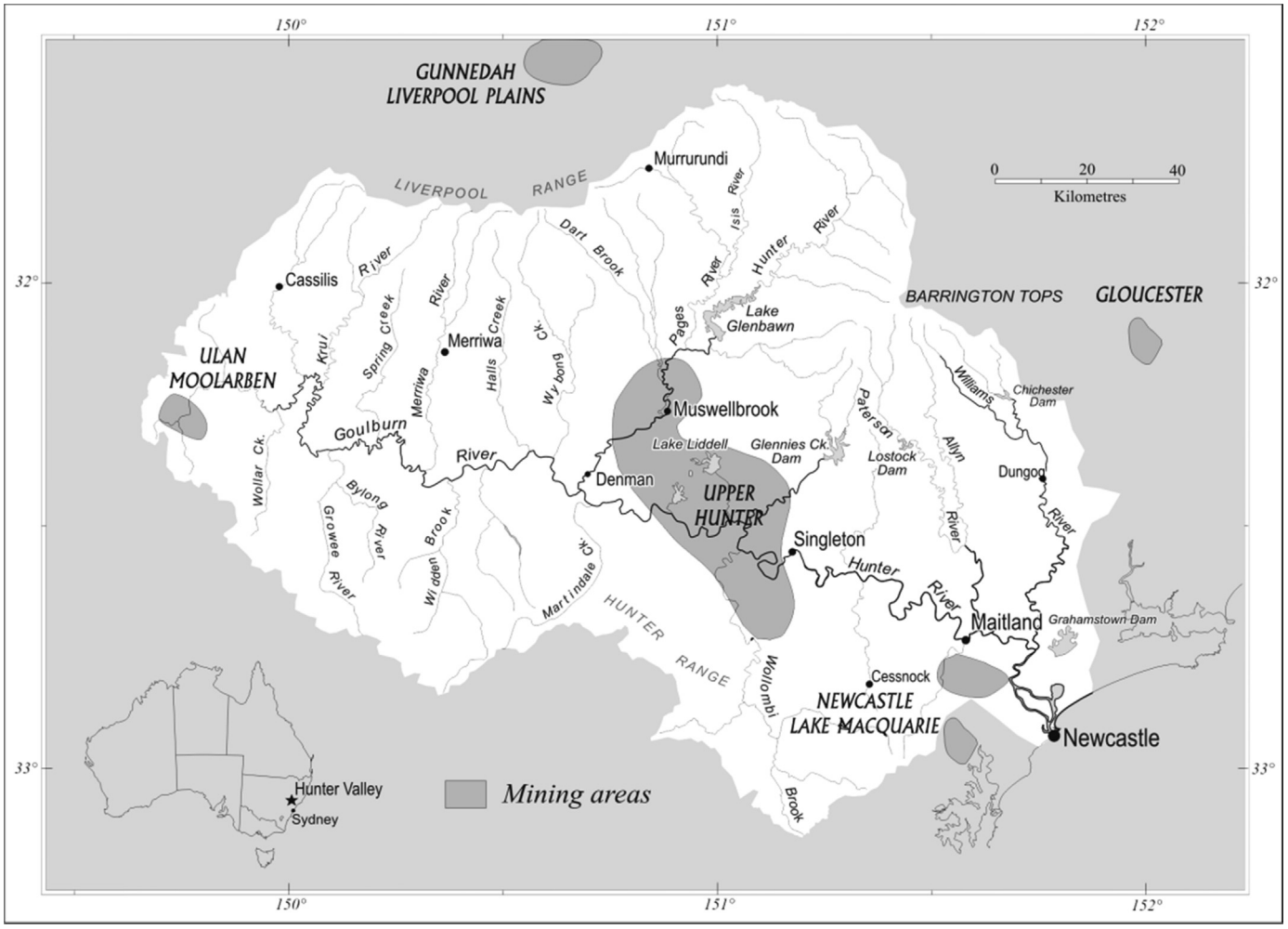


**Fig. 1.** Mining areas in and near the Hunter River catchment (Rey-Lescure, 2009, in Evans (2010a)).

impacts of landfill, mines, nuclear waste facilities, toxic chemical incinerators and other hazardous developments which are disproportionately located in or near poor and coloured communities. Consistent with Moyer's definition of social movement quoted earlier, the environmental justice social movement focuses on alerting, educating and mobilising the public to the inequitable distribution of environmental risks and benefits and campaigns to ensure fair and meaningful participation of affected communities in decision-making that effects their environments and well-being. Environmental justice is about procedural and distributional justice, not opposing development as such, and nor is it about the 'not in my backyard' (NIMBY) ideology where communities simply advocate shifting hazardous industries from one locality to another. The movement's scope extends also to recognition and protection of community ways of life, local knowledge, and cultural difference (Bullard, 1983, 1994, 2005; Camacho, 1998; Schrader-Frechette, 2002; Agyeman et al., 2003; Schlosberg, 2004, 2007, 2013; Sze and London, 2008). Climate justice shares the environmental justice focus on the systemic causes, and the differential, inequitable and unjust impacts of environmental change, but with a particular focus on climate change (Angus, 2009; Pettit, 2004; Walker, 2012; Baer and Burgmann, 2012; Schlosberg and Collins, 2014).

The other key concept discussed in this paper, the just transition concept, is described by the Canadian Labour Council (CLC), a pioneer in the field, as a political campaign to "ensure that the costs of environmental change [towards sustainability] will be shared fairly. Failure to create a just transition means that the cost of moves to sustainability will devolve wholly onto workers in targeted industries and their communities" (Canadian Labour Congress, 2000: 3). However, while there is potential synergy between environmental justice and just transition campaigns, a harmonious resolution of the two concepts is not guaranteed if the interests and aspirations within the community are poorly negotiated between the parties involved. A melding of environmental justice campaign goals on the one hand and labour movement goals on the other, is particularly challenged by the continuing hegemony of the 'jobs versus environment' discourse.

## 2. Hegemonic discourses

### 2.1. Hooked on the sudden rush of mining dollars

The fossil fuel sector has prevailed for more than 100 years in the Hunter, exercising its hegemony through the dominance of mining in the economic realm, the authority of the state, and the "consensual legitimacy of civil society" (Levy and Newell, 2005: 50). Its dominance is an outcome of social relations of production and reproduction as coal mining has provided material wellbeing and led to particular habitual, institutional, and discursive formations in the region that have formed 'mining' identities of individuals and

communities (Metcalfe, 1988; Winchester et al., 2000).

The hegemonic dominance of fossil fuel industry actors' interests in Australian political and economic life is an example of "contingent stability" (Levy, 2012). The socio-economic system and wider relationships are grounded in an alignment of economic, political and cultural forces that pattern economic relationships, institutional rules, and discursive frames of ideological leadership around issues of class, economic development, and environment (Gramsci, 1971; Levy and Newell, 2005; Phelan et al., 2013; Goodman and Salleh, 2013).

At a national scale, the hegemonic power of the fossil fuel interests over the Australian public has a material basis, through the structural integration of the Australia's coal resources into the global energy commodity chain and into the operations of energy and industrial companies and markets. The influence of the carbon lobby nationally on Australian climate and energy policy has also been well-documented (Pearse, 2007, 2009; Pearse et al., 2013). For example, what has been described as a "revolving door" (Pearse, 2007) for fossil fuel advocates between government ministerial, public service and industry lobby group offices exemplifies how the perverse resilience of the fossil fuel industry in the Australian political economy is engineered through a mix of coercive and non-coercive strategies. The coercive power of the fossil fuel lobby was powerfully demonstrated around 2009–2010 by the mining industry's multi-million dollar public relations campaign against the former Rudd and Gillard Labor Governments' 'Mineral Resource Rental Tax', and a 'Clean Energy Act' that included an emissions trading scheme with an initial three-year period of fixed carbon pricing, known in popular terms as the 'Carbon Tax' (Latimer, 2014). The industry claimed that the taxes would erode the industry's international competitiveness and jobs and exports for future generations (Minerals Council of Australia, 2012). The campaign had a significantly destabilising impact on a government the industry deemed hostile to its interests.

Over the last decade 'Newcastle Herald' journalist Greg Ray has extensively documented the hegemonic dominance of the Hunter coal industry (Kirkwood and Ray, 2005; Ray, 2005a,b,c, 2011, 2012, 2013a,b,c,d, 2014). He accentuates the industry's dominance with the appellation, "King Coal", and describes its influence thus:

> "Anything that stood in the way of the rapid transformation of coal reserves into hard cash was an obstacle to be removed by almost any means possible. Regulatory regimes were changed. Government departments were refocused… State budgets got hooked on the sudden rush of mining dollars until the thought of losing that cream on the budget cake became unbearable" (Ray, 2014).

Regionally, the hegemonic dominance of the coal industry over the Hunter region is significant in both material and cultural domains. Hunter coal is noted as the first profitable export from the British colony of Australia – a small shipment of coal, dug by convict miners at the mouth of the Hunter River at Newcastle and exported in 1801 to Bengal, India. As the industry grew, the culture of the coal industry had a significant influence on the culture of the region, with the harsh treatment of workers by magnates such as John Brown, a "coal baron who forged empire with iron fist" (Scanlon, 2005) provoking a countervailing culture of class-consciousness, social activism, larrikinism and unionism in the close-knit communities of the Hunter Valley, an identity that remains a prominent and proud part of the region's contemporary culture (Marsden, 2002; Metcalfe, 1988; Turner, 1979; Walker, 1945; Winchester et al., 2000). The Miners Federation, and its current iteration as the Mining and Energy Division of the Construction Forestry Mining and Energy Union (CFMEU M&E) has played a central role in struggles to protect and improve the working conditions and rights of workers locally, nationally and globally, and is influential within the Australian Labor Party (ALP) and the Australian Council of Trade Unions (ACTU) (Comerford, 1997; Gollan, 1963; Moore et al., 1998; Phillips and Ross, 1980; Ross, 1970; Thomas, 1983). Unions have had a conflictual relationship with the region's coal industry, on one hand generally supporting the expansion of the industry, while at the same time demanding an equitable returns of wealth to workers, their communities and the nation as a whole.

### 2.2. Hegemony and public understandings

At a larger scale, the fossil fuel sector's hegemony is evident in public understandings of the role of mining in Australian life. A survey, conducted in 2011 by the progressive think-tank, The Australia Institute, found many Australians hold misconceptions about the percentage of workers employed in the mining industry and the contribution that mining makes to the Australian economy. The Australia Institute found that on average people thought around 16% of the workforce was employed in mining, when according to the Australian Bureau of Statistics (ABS) the actual figure is 1.9%. Respondents also believed that mining accounts for more than one third (35%) of national economic activity when ABS figures showed that the mining industry accounts for around 9.2% of Gross Domestic Product – about the same contribution as manufacturing and slightly smaller than the finance industry (Richardson and Denniss, 2011). Furthermore, respondents believed coal royalties are ten times more important to State revenue than they are when, in fact, only two per cent of NSW government revenue comes from coal royalties (Campbell, 2014b: 2).

The conflict over the hegemonic power of coal in the public policy discourse in the Hunter with respect to the 'jobs versus environment' issue was demonstrated by recent decisions of the NSW Government's Planning and Assessment Commission (PAC). In March 2015, the PAC approved Rio Tinto's Mt Thorley Warkworth mine expansion, despite the fact the extension would require the removal of the village of Bulga, home to 350 people. John Krey, the spokesman for the Bulga Milbrodale Progress Association, declared the decision "is confirmation that the legal and regulatory system that governs mining is broken and that NSW residents cannot count on it to serve the public interest or protect our precious land, water and heritage" (Hannam, 2015a). In contrast, Peter Jordan, the northern district president of the mine workers' union, the CFMEU M&E, welcomed the decision, saying:

> "The Hunter region desperately needs this economic boost, because you only have to look over the last two years and we've seen almost 2000 coal miners in the Hunter lose their jobs. In just the last 18 months, unemployment in the region has risen from 5.8% to now 9%. The region could not afford to lose this mine, based on all of that" (Australian Broadcasting Corporation, 2015).

However, in August 2015, the PAC rejected a proposal to extend Anglo American's Drayton South mine to within one kilometre of the world-renowned Darley and Coolmore thoroughbred horse studs. During the Drayton process the PAC said it was "deeply saddened" by the implications of its recommendation on the 312 workers and 97 contractors at the existing Drayton mine who had hoped to work at the Drayton South expansion. It noted that "while mining is a far bigger sector than the thoroughbred breeding industry, the mining industry is not heavily reliant on this one mine" (quoted in McCarthy, 2015).

However, hegemony is dynamic and "has continually to be renewed, recreated, defended, and modified. It is also continually resisted, limited, altered, challenged by pressures not all of its

own" (Williams, 1977). As such, the political struggle for and against the fossil fuel historical bloc's hegemony is linked to interconnected politically, economically, culturally and ecologically transformative processes locally and globally. The change in the Earth's climate system caused by burning fossil fuels, including coal, since the beginning of the Industrial Revolution is an ecological reality that serves to undermine the coal historic bloc's hegemonic dominance across local and global scales and is driving the global shift to alternative fuels (Evans, 2008; Phelan et al., 2013). The economic realities of collapsing coal prices, structural decline in coal demand, and the increasing lack of economic competitiveness of coal against renewable energy also weaken the historic hegemonic dominance of coal in the Hunter.

### *2.3. Environmental justice and just transition: disruptive counter-hegemonic discourses*

Social movements challenging the particular set of social relations built around fossil fuels in the Hunter emerged in the late 1970s and early 1980s, with a more recently wave of activism since the mid-1990s. Both waves of social movement activism were driven by Hunter residents' concerns about destruction of landscapes and in particular rivers and aquifers, environmental health and especially air pollution, persistent state government inaction over risks, and the failure of governments to empower citizens to make decisions that affect their lives and wellbeing. Studies repeatedly show that people living in communities close to Hunter Valley mines and railway lines where coal is transported to port suffer significantly higher levels of coal dust and reported incidences of respiratory diseases, such as asthma, than people living in communities further away (Connor et al., 2004; Albrecht, 2005; Higginbotham et al., 2006, 2010). Higginbotham et al. (2006) identified increased levels of psychological stress in Hunter communities adjacent to mines with lower levels of stress in other Hunter communities not directly affected by mines. Higginbotham et al., (2010) specifically focused on the environmental justice impacts of fossil fuel developments on vulnerable, low-income, rural and urban communities living adjacent to mines, coal processing and export infrastructure.

While environmental justice is a common theme of both the 1970s/80s and contemporary social movements there are three significant difference between the earlier and contemporary surges of activism. Firstly, disquiet about climate change is a powerful global driver for transition and has drawn many activists, especially young people, into the contemporary campaign. Secondly, the contemporary regional campaign lacks organised labour movement participation, unlike the earlier campaign in which the Newcastle Trades Hall's Ecology Centre was the key organising centre. The third major difference is that the current campaign has spanned both a coal boom and an emerging period of structural decline of the global coal markets rather than an emergent mining boom that was the economic context of the 1970–1980s social movement.

The earlier social movement subsided because of the lack of sufficiently powerful counter-hegemonic social, economic and ecological forces, such as climate change and structural decline. The rapid growth in the number of well-paying coal mining jobs in the region coopted the labour movement into the region's fossil fuel industry with consequent disengagement from the community struggle against environmental injustices, which weakened local capacity to resist. However, the 1970s social movements built a broad and enduring counter-hegemonic force of residents.

Political campaigning for a just transition is another disruptive counter-hegemonic discourse in the Hunter, along with environmental justice campaigns. At the global and national scale, the organised labour movement has recognised and responded to the influence of climate change as a powerful driver of the need to transition to a post-carbon economy. The International Trade Union Confederation (ITUC) has responded by advocating the just transition concept as a "tool the trade union movement shares with the international community, aimed at smoothing the shift towards a more sustainable society and providing hope for the capacity of a 'green economy' to sustain decent jobs and livelihoods for all" (ITUC, 2009a: 1). The just transition concept has also been adopted by the United Nations Environment Program, the International Labour Organisation, and the World Health Organisation (United Nations Environment Program, 2007). At the national level, the Australian Council of Trade Unions (ACTU) 'Climate Change and Environment Policy', adopted at its May 2015 Congress, calls for a just transition which is described as: "taking a measured approach to restructuring to a lower carbon economy, and in particular ensuring that there are decent and good quality jobs available to workers in the new economy" (Australian Council of Trade Unions, 2012: 1). The ACTU and ITUC policies both highlight the need to engage affected workers and their representative trade unions in institutionalised formal consultations with relevant stakeholders including governments, employers and communities at national, regional and sectoral levels (Australian Council of Trade Unions, 2015; International Trade Union Confederation, 2009b).

Both the environmental justice and just transition social movements have a longer history and stronger social movement discourse in the United States than in Australia. Reflecting on lessons from these campaigns in the US and how there can be synergy between the movements, Farrell (2012: 62) notes that linking the two concepts requires a focus that goes beyond just one environmental issue and requires adopting a holistic approach in which campaigns for environmental change also include social issues such as access to affordable housing, quality education and healthcare into a broader understanding of the local 'environment'. A synergy of environmental justice and just transition campaigns challenges economic, social and political injustices that cause oppression and insecurity, including social and economic inequity based on class, gender, race and other oppressions. A successful synergy requires meaningful public participation in a conversation about community futures that draws on the expertise of the whole community.

Thus, a synergy of environmental justice and just transition concerns potentially builds foundations for a broad and united community campaign that addresses environmental, social and economic issues together. Social movements and campaigns that integrate environmental justice and just transitions have the potential to make communities more resilient and equitable and to engage community members who are vulnerable and marginalised in the 'old' economy and may remain so in the 'new' economy. Failure to engage marginalised communities and others who might be vulnerable and hostile to change raises the risk they might unite with hazardous industry and corporate interests rather than with other sectors of the community or the environment movement. Moreover, unless the whole community is engaged, conversations about environmental and economic change risks replacing one form of hazardous industry with another, and one social elite with another. The following sections discuss progress and complexities of working with these tensions at the regional level, within the Hunter community.

## 3. Challenges to coal's hegemony in the Hunter

### *3.1. Stop T4 campaign: protecting air quality*

The Stop T4 Coal terminal campaign, coordinated through the

Hunter Community Environment Centre (HCEC) in Newcastle, has focused on community organising around concerns about air quality, from coal mines to port facilities. The campaign, endorsed by over 20 community groups extending throughout the Hunter and adjacent coalfields, includes farmers, resident action groups, climate action groups, public health advocates, bird watchers and nature conservation groups united through concern about the cumulative impact of coal mines on the health of landscapes and people. The campaign initiated an assortment of health-related community surveys, including a 'Sick of Coal' survey of over 500 households which identified over 69% of all respondents voicing concern about the impact of coal trains passing through Newcastle suburbs, with dust, noise and traffic the key issues (HCEC, 2012, 2013a). A 'Coal Train Pollution Signature Study', a citizens' science project monitoring atmospheric particle pollution, found that more than 30,000 people reside and 25,000 children attend school within 500 metres of the coal corridor between Rutherford and the Newcastle Port; as coal trains pass through those areas, particle pollution concentrations increase up to 13 times above pre-coal train movement levels (HCEC, 2013b).

In response to community pressure, including the Stop T4 campaign, the NSW Environmental Protection Authority (EPA) agreed to implement an action plan to improve air quality in the Upper Hunter region (NSW EPA, 2013). Since April 2013 this has included installing an air quality monitoring network and measures to prevent and/or minimise emissions of particulate matter from coal mining. A Parliamentary Inquiry into the EPA, released in February 2015, called for an evidence-based review of pollution management and proposed a number of readily available and easily implemented solutions to reducing pollution. The HCEC welcomed the recommendations, which included managing moisture content of coal in wagons, changing the profiles of coal loads in wagons, washing of wagons, use of chemical suppressants and hard covers on loaded wagons and regular and frequent cleaning of accumulated rail ballast (HCEC, 2015a), but continues to campaign against the construction of T4 and coal industry expansion and for a National Air Pollution Prevention Act (HCEC, 2015b).

### 3.2. Groundswell: defending rural lifestyles and economies

Gloucester, where the Groundswell campaign is based, is a rural town with a population of 4800 people. Over the last 15 years the town's culture and economy have changed from predominantly rural production (dairying, pig farming, beef and forestry) to tourism and service industries. This has happened as 'tree changers', predominantly retired tradespeople and professionals on fixed incomes have been attracted from metropolitan areas to Gloucester in search of rural lifestyles and comfortable retirement on the fringes of the town (Campbell and Gedye, 2013). Gloucester already hosts two major export coalmines (Duralie and Stratford, some 35 and 15 kilometres respectively from town). Groundswell and earlier local campaign groups mobilised against a third coal mine (Rocky Hill), proposed within two kilometres of the town. They extended their concerns to also include the impacts of coal seam gas mining when energy company AGL proposed to drill more than 300 CSG wells within five kilometres of the town, utilising fracking techniques. Groundswell asserts that proposed new mines in the Gloucester Valley offer very little to the local economy, with just 11 jobs for locals likely to be created while damaging existing industries and the land and water resources that sustain the region (Groundswell Gloucester, 2015a). Over the last five years, a vocal social movement has emerged in a socially and politically conservative rural community that, like the Stop T4 campaign, has drawn on a pool of local residents with science and legal skills to produce 'citizen science' reports. Groundswell's 'Exposing the risks: Fundamental flaws in AGL's application to frack CSG wells in Gloucester' highlighted the risks of industrialisation and linked health impacts, and the failure of failure of government and fossil fuel corporations to protect the region's ecosystems (Groundswell Gloucester, 2014).

At first sight, the Groundswell Gloucester campaigners might be considered to be a wealthy, rural 'elite' minority motivated by NIMBYism, but in fact the majority of Gloucester's residents are opposed to the project and many, including local campaigners, are low-income with many on fixed incomes. Coal and gas mining health threats have stalled investment on many local farms and many residents believe they suffered significant decline in the value of their properties which has destroyed lifetime savings, increased their economic insecurity, and degraded the legacy many elderly residents had anticipated leaving their children (Groundswell Gloucester, 2015b).

The Stop T4 and Groundswell campaigns are regional and local responses to long-standing and entrenched mining identities, and have built counter hegemonic power by developing individual and collective capabilities (as described by Nussbaum (2001) and Rauschmayer et al. (2015)) through strategic partnerships in the wider community, including with health practitioners, social scientists, local government leaders, and national and global anti-coal/gas and climate justice networks. However, like many environmental campaigns the immediate focus and consumer of campaigners' energies has been on fending off an immediate threat rather than organising around issues of job security and longer-term economic restructuring and equity. The lack of T4 and Groundswell campaigns capacity to engage with some key sectors of the local community, particularly coal industry workers and their unions, impedes the social movement's capabilities to unsettle the pervasive hegemony of the fossil fuel bloc.

### 3.3. Workers and trade unions: jobs and the environment

Australian trade unions maintain a critical but constrained and conflicted relationship with the fossil fuel historical bloc. Contemporary trade unionism in Australia operates in a context of declining membership and density in key regional industries (Australian Bureau of Statistics, 2014) and a restrictive industrial relations framework which favours market forces over regulation and limits scope for industrial action (Macdonald and Burgess, 1998; Peetz, 2015).

We have used Hyman's (2001) classification of union typologies and Goods' (2013) discussion of how these typologies align with the principles and practices of a just transition to provide some insights into the challenges the T4 and Groundswell community campaigns face in drawing unions into a just transitions dialogue. Hyman (2001) identified three types of unionism: (i) business unionism, which seeks mutual gains between business, workers and union interests; (ii) social democratic or social movement unionism, which seeks to socialise the capitalist economy to moderate market forces in order to achieve social justice and equity, and (iii) radical unionism, which seeks to mobilise social political forces to promote working-class interests and an alternative non-capitalist society. Goods (2013) links each of Hyman's unionism typologies to their approach to environmental issues and the transition to a green economy, defined as "improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities" (United Nations Environment Program, 2011: 16).

According to Goods (2013), business unionism tends to follow business agendas and market forces to shift industry towards 'green' practices without fundamentally disrupting capitalist power and accumulation. He describes this as a "passive" transition. In contrast, Goods suggests that social democratic unionism advocates for public interventions to facilitate a green economy and green

jobs, for example, the introduction of environmental regulations and taxes and subsidies for renewable energy, but does not challenge the fundamental dynamic and power relationships of capitalist societies and economies. He refers to this as a "minimalist" transition. In further contrast, radical unionism challenges capitalist power relationships through a militant anti-capitalist agenda and seeks to put in place institutions and collaborations at local, regional and global scales that can drive transformation, from below, towards an alternative set of ecological, social and economic relationships: a "transformative" transition (Goods, 2013).

The three key unions that cover workers in coal mining and energy intensive industries, the Australian Workers Union (AWU), the Construction Forestry Mining and Energy Union's Mining and Energy Division (CFMEU M&E), and the Australian Manufacturing Workers Union (AMWU), exemplify different unionism types. The AWU, which covers workers in the Hunter's aluminium smelters exemplifies Goods' first type, a passive transition primarily focused on the maintenance of members' jobs through advocating generous government subsides to the employing enterprise and thereby indirectly benefiting union members and helping secure their jobs. The CFMEU M&E which covers the Hunter's mine workers, and power station operators, advocates strategies consistent with Goods' (2013) minimalist transition. At the regional level, when mineworkers' jobs are under threat, the union is focused on protecting existing jobs in coal mining even where it comes at the possible loss of jobs for potentially displaced workers in other industries. This occurred in the case of the Drayton South mine expansion. Where the horse breeders argued mine expansion would jeopardise their viability the CFMEU M&E argued that:

> "A strong and vibrant mining industry, where new projects come online to make up for those winding down, is critical to the prosperity of the Hunter Valley… After all, mining is the industry that generates the most wealth for the Hunter, providing the secure, skilled, well-paid jobs that sustain our communities" (Construction Forestry Mining and Energy Union M&E Division, 2014: 1).

The AMWU, which covers workers in mine equipment manufacturing and maintenance and power station maintenance in the region, like the CFMEU M&E falls into the minimalist transition category. The union tries to protect existing jobs while advocating just transition strategies at the national level through a mix of industry subsides and direct public investment. In its report 'Making our future – Just transitions for climate change mitigation' the union stated:

> "With the right government support and investment, tens of thousands of jobs could be created in renewable energy and sustainable industries. There is an opportunity to refresh our manufacturing sector and create the means for a cleaner energy future" (Australian Manufacturing Workers Union, 2008: 3)

Advocates of the third response, a transformative transition, explicitly advocate just transition processes as a "challenge [to] the conventional understanding of economic growth, and to mobilise for an alternative development path" (Cock, 2012: 12). There is currently no Australian trade union advancing this approach, even though there is a strong tradition of radical labour movement environmentalism in Australia, including the Hunter region, as exemplified by the Green Bans led by the New South Wales Builders Labourers Federation (NSW BLF) during the 1970s in which organised workers refused to work on socially and environmentally harmful projects. However, the NSW BLF was deregistered through government intervention in the late 1970s, largely because of its militant and disruptive environmentalism (Burgmann and Burgmann, 1998; Burgmann, 2012; Cox and Pezzullo, 2015; Räthzel and Uzzell, 2012; Snell and Fairbrother, 2012).

At the national level, current ACTU policy reflects Goods' (2013) minimalist transition strategy, calling on government to develop active industry policy complemented by regulation of carbon emissions and renewable energy targets and to provide significant direct funding for research and development of renewable energy technologies and markets. It calls for accelerated investment in communities affected by economic structural adjustment away from fossil fuels, including economic diversification plans and a comprehensive 'workforce development plan' including significantly increased up-skilling opportunities for existing workers (Australian Council of Trade Unions, 2015). These policies provide scope for Australian trade unions to actively campaign at both national and local levels for 'green jobs' but in themselves are unlikely to "sow the seeds of alternative forms of working and living in practice" (Uzzell and Räthzel, 2012: 9). In reality, active campaigning by the organised labour movement for 'green jobs' has tended to be at the national, rather than at the local level in the Hunter.

## 4. Discussion: hegemony shaken by a changing reality

### 4.1. Lessons from the past

Coal miners' well-paid jobs are becoming increasingly precarious in a deregulated market facing structural decline. Sudden, unannounced retrenchments of workers by mining companies, usually without consultation, are now a regular event in the region. In September 2015, 16.2% of Australian mining professionals were unemployed while the unemployment rate in the coal sector had risen from 8.8% to 11% in the previous 12 months (Hannan, 2014; Kirkwood, 2013). Jobs in coal-fired power stations are also under threat as Origin and AGL, the owners of coal-fired power stations in the Hunter, recently announced plans to shut them down by 2030 and 2050 respectively (Hannam, 2015b; Williams, 2015).

There are important lessons from earlier major economic restructuring process in the Hunter that can be applied to the current challenges. The closure of the BHP Steelworks in Newcastle in the late 1990s was a local example of a managed transition with many just transition policy features (Evans, 2008). The steelworks was the major employer in the region for eighty years and at its peak in 1964 there were 11,448 people working there. BHP steadily laid off workers or outsourced the workforce to private contractors between the 1960s and final closure (Murphy, 2014), contributing to Newcastle and the Hunter experiencing high levels of unemployment. At the time of final closure, in 1999, some 2300 direct employees and 1400 contract employees lost their jobs. At this time, in contrast to earlier, many policies consistent with a just transition approach were applied that served to minimise trauma for directly affected workers and their families and major disturbance and flow-on impacts in the Newcastle economy. Early notice was a critical element in ensuring warning and preparedness for closure. The final cohort of BHP steelworkers was given two and a half years of prior notice of the proposed changes, and packages were put in place to ensure that workers received benefits during the transition from steelmaking. A major planning and adjustment program for affected individuals, known as 'Pathways', was established involving employees, unions and management in designing and implementing programs that would assist displaced workers (BHP, 1999). Ensuring training for alternative employment tailored to individual needs and local opportunities was done through a 'Workforce Transition Committee' through which the employer, unions and the workforce worked together towards

"orderly closure". Attention was paid to the vulnerability of older workers as, at the time of closure, the average BHP worker had spent 21 years at the plant and was around 44 years old. A company, 'Pathways Employment Services', initially set up by BHP to smooth the transition, claimed that 15 months after the closure, about 90% of the closure workforce had jobs or were getting educational qualifications.

Direct funding for new industries and jobs was arguably the most critical element to creating new opportunities. BHP and the federal and NSW Government contributed equally to a $30 million 'Hunter Advantage Fund'. This fund was credited with generating about 1280 full-time and 194 part-time jobs. An eco-industrial park was established for advanced industrial and high-technology production with an innovative, streamlined approvals process (New South Wales Legislative Assembly various speakers, 1999). One significant success of this park was the relocation of the national headquarters of the Energy Transformed Flagship of the federal government's leading scientific research organisation, the CSIRO, to the site, creating new jobs and bringing into the region a world-class hub in solar thermal energy, distributed energy generation, solar-fossil hybrid technology research. However, reflecting the ongoing hegemonic influence of the fossil fuel industry, the centre's research also includes carbon sequestration and low emissions coal-fired power generation.

### 4.2. Learning in the present

There are many places throughout the world experiencing economic restructuring that provide potentially useful lessons about alternative transition pathways, in both the minimalist and radical models. Some carbon-intensive industry regions of Australia, such as the Illawarra in NSW and Geelong and the Latrobe Valley in Victoria, have ongoing and broad collaborative projects in the minimalist model, that involve state and local governments, academic institutions, unions, and local businesses, community organisations and residents seeking to create employment into the new sectors and support communities affected by change (Fairbrother et al., 2012; Green Jobs Illawarra Project Steering Committee, 2009; Latrobe City Council, 2010; G21 Geelong Regional Alliance, 2016).

In Geelong, which has experienced closures in car manufacturing, aluminium smelting and oil refining industries, direct investment by governments and industry in transition support and in job creation has been critical. The local Trades and Labour Council has been actively involved in transition campaigns with other community organisations and local government. Together they successfully lobbied for $64 million, allocated by Ford and the State and Federal Governments, for local jobs and transition support. They also convinced the Gillard Labor Government to establish the headquarters of DisabilityCare Australia in Geelong, securing more than 300 permanent new jobs. The decision provides an opportunity for the region to build from local skills to become a manufacturing hub for new technologies, vehicles, equipment and aids for disabled and ageing Australians and for global markets (Electrical Trades Union, 2012).

However, as the revolution that is sweeping global energy markets is much faster than anyone could have anticipated even a few years ago, union, business and political leaders are recognizing that 'business-as-usual' is no longer an option. The CFMEU M&E leader, Tony Maher, recognises that government support is needed to transition thousands of workers in traditional coal-fired generators and mines who might lose their jobs into other jobs. At the Labor Party's National Conference in July 2015, Maher called for maintenance of mine workers' existing annual wage rate, which is often $100,000 or more, until new jobs or early retirement is possible (Peacock, 2015).

In March 2016, two key political leaders in the Hunter coal community also publicly called for transition strategies to a more diverse Hunter economy. The Federal Member for Hunter Joel Fitzgibbon, who in 2006 declared "extreme environmentalists are launching a jihad against the industry in an attempt to close it down" (The Australian Opinion, 2006), called for government support for the development of a regional strategy to promote economic diversity in mining areas, while Muswellbrook Shire mayor, Martin Rush, called on the NSW Government to commit $30 million to an Upper Hunter Economic Development Corporation to help affected communities transition to new industries and create job opportunities (de Lore, 2016).

Rather than relying on government or industry to drive change community activists are initiating bottom-up approaches to enable new and different regional futures to emerge based on a community strengths and community economies approach (Gibson-Graham, 2006; Gibson-Graham et al., 2013). The Renew Newcastle urban renewal project that linked up artisans with the owners of empty mainstreet shops was a pioneer in this approach (Westbury, 2015). The Transition Town movement (Hopkins, 2011) and worker-owned cooperatives such as the Evergreen Cooperative movement in Cleveland, Ohio in the US (Wang and Filión, 2011) and the Earthworker Cooperative in Victoria, Australia (Earthworker Cooperative, 2014; Phelan et al., 2012) also offer inspiration. In late 2015, Groundswell Gloucester initiated a Sustainable Future Convention which brought community members together to discuss community health and wellbeing, local economic development and community inclusion. The Convention committed to supported initiatives such as community-owned renewable energy, sustainable food production, food and nature-based tourism (Sustainable Futures Committee, 2015) that are consistent with Schlosberg and Collins' (2014) analysis of transformative change that links environmental justice into transition strategies. In March 2016, the campaign organisation, Lock The Gate Alliance, initiated a separate process to engage the local community, unions, businesses and local government in mapping out how to initiate a community conversation on economic restructuring.

Local governments are also becoming involved. The threat of job insecurity from the structural decline of the region's coal industry prompted Newcastle City Council to adopt a resolution in August 2015 to shift its investments away from fossil fuels towards 'environmentally and socially responsible investment' (Newcastle City Council, 2015a) and in September 2015 Council passed another resolution calling for the establishment of a 'Newcastle/Hunter Future Jobs Taskforce' whose role is to:

> "work with the community, industry, unions, the University of Newcastle and key stakeholders in the region to identify and promote job creation opportunities… [and]… help regions to broaden their traditional economic base through new partnerships, skills and technologies" (Newcastle City Council, 2015b).

## 5. Conclusion and policy implications

Hunter transition initiatives to a post carbon society that challenge the hegemony of the fossil fuel interests are being driven by multiple forces operating across ecological, social and economic domains, and across multiple scales from local to global. Local initiatives are beginning to reflect Farrell's (2012) analysis that proposes that a successful synergy of just transition and environmental justice must be built on the engagement and participation of all sectors of the community. Successful collaboration draws from local knowledge and skills to create a compelling vision that addresses local aspirations and deals with structural inequality and disadvantage.

In the Hunter actual dialogue about potential partnerships and strategies have only recently emerged from multiple sources: the environment movement, the labour movement, local government, political leaders and community organisations. In the post-industrial context of the city of Newcastle, the T4 campaign focus on the health impacts of coal on communities opens up the potential of building a broad community alliance around a vision for an alternative climate-friendly economy with secure, quality jobs that draws from the city's engineering, research, education, skilled manufacturing, service sector and health research strengths. In the rural region of Gloucester with a vastly different social base, local campaigners are seeking to promote transition and new jobs around the region's World Heritage natural environment, food-growing, and positive lifestyle qualities.

In what was identified as “a major win for its opponents”, AGL announced in February 2016 that it will exit from the coal seam gas industry in Gloucester. AGL claims its decision to withdraw from Gloucester is because the project is not longer economically feasible, but local campaigners are asserting the decision was made in response to their campaigning on environmental justice issues (Hannam, 2016). Meanwhile in Newcastle, the PAC approved the T4 project on September 30, 2015, demonstrating the ongoing local resilience of the ‘jobs versus environment’ frame as it justified its decision on the basis that the project would generate jobs, as well as stimulate the local and regional economy (Australian Broadcasting Commission, 2015).

Climate change and structural decline of coal markets will become increasingly powerful global drivers of restructuring in the Hunter economy and the counter hegemonic force to the fossil fuel bloc. A successful regional and national synergy around environmental justice and just transition campaigns in which the labour movement and community campaigners collaborate can be a powerful counter hegemonic force that reinforces other global forces. Currently, the various models of unionism and transition strategies these models support, suggests that the labour movement is likely to rely heavily on government-led initiatives focused on influencing energy markets and subsidies, with significant public investment in new job creation. A stronger synergy could enable a more powerful counter hegemonic force and embolden labour unions and communities to embrace , advocate and organise for the more radical and speedy ecological, social and economic transition that the climate and structural decline crises warrant. While at the local level collaboration is currently limited and conflicted, there is an emergent synergy that may assist labour movement and community campaigners to collaborate together and with other institutions to achieve a post-carbon society in the Hunter.

## References


Agyeman, J., Bullard, R., Evans, B., 2003. Joined-up thinking: bringing together sustainability, environmental justice and equity. In: Agyeman, J., Bullard, R., Evans, B. (Eds.), Just Sustainabilities: Development in an Unequal World. Earthscan, London, UK, pp. 1–18.

Albrecht, G., 2005. 'Solastagia': a new concept in health and identity. Philos. Act. Nat., 41–55.

Angus, I. (Ed.), 2009. The Global Fight for Climate Justice. Resistance Books, London, UK.

Australian Broadcasting Corporation (ABC), 2015. Newcastle's Controversial T4 Coal Loader Project Approved. ABC, Sydney, Australia.

Australian Bureau of Statistics (ABS), 2014. 6310.0 – Employee Earnings, Benefits and Trade Union Membership, Australia, August 2013. ABS, Canberra, Australia.

Australian Council of Trade Unions (ACTU), 2012. Environment and Climate Change Policy, ACTU Congress 2012. ACTU, Melbourne, Australia.

Australian Council of Trade Unions (ACTU), 2015. Environment and Climate Change – Final Policy. ACTU, Melbourne, Australia.

Australian Manufacturing Workers Union, 2008. Making our future: just transitions for climate change mitigation. AMWU, Melbourne, Australia.

Baer, H., Burgmann, V., 2012. Climate Politics and the Climate Movement in Australia. Melbourne University Press, Melbourne, Australia.

BHP, 1999. Submission to the Australian House of Representatives Inquiry Into Issues Specific to Workers Over 45 Years of Age Seeking Employment, or Establishing a Business, Following Unemployment.

Bridge, G., Bouzarovski, S., Bradshaw, M., Eyre, N., 2013. Geographies of energy transition: Space, place and the low-carbon economy. Energy Policy 53, 331–340.

Buckley, T., 2015. Newcastle Coal Port: T4 – A Stranded Asset? Planning Assessment Commission Submission, Sydney, Australia.

Bullard, R., 1983. Confronting Environmental Racism: Voices From the Grassroots. South End Press, Boston, MA.

Bullard, R., 1994. Unequal Protection: Environmental Justice and Communities of Color. Sierra Club Books, San Francisco, CA.

Bullard, R., 2005. Environmental justice in the twenty first century. In: Bullard, R. (Ed.), The Quest for Environmental Justice: Human Rights and the Politics of Pollution. San Francisco, CA, Sierra Club Books, pp. 19–42.

Burgmann, V., 2012. 'Jobs versus environment' to 'Green-collar jobs': Australian trade unions and the climate change debate. In: Räthzel, N., Uzzell, D. (Eds.), Trade Unions in the Green Economy: Working for the Environment. Earthscan/Routledge, Oxford, UK and New York, NY, pp. 131–145.

Burgmann, M., Burgmann, V., 1998. Green Bans, Red Union: Environmental Activism and the New South Wales Builders Labourers' Federation. UNSW Press, Sydney, Australia.

Cahill, D., 2005. Neo-liberalism and neo-liberal hegemony in Australia, Hegemony: Explorations into consensus, coercion and culture. A workshop at the University of Wollongong. Wollongong, Australia, University of Wollongong.

Caldecott, B., Tilbury, J., Ma, Y., 2013. Stranded Down Under? Environment-Related Factors Changing China's Demand for Coal and What This Means for Australian Coal Assets. Smith School of Enterprise and the Environment. Oxford, UK, Oxford University.

Camacho, D., 1998. Environmental Injustices, Political Struggles: Race, Class and the Environment. Duke University Press., Durham & London, UK.

Campbell, R., 2014b. Seeing Through the Dust: Coal in the Hunter Valley Economy. The Australia Institute, Canberra, Australia.

Campbell, R., Gedye, N., 2013. Gloucester Socio-economic Profile: A Report for Gloucester Shire Council, October 2013. Economists at Large, Melbourne, Australia.

Canadian Labour Congress (CLC), 2000. Just Transition for Workers During Environmental Change. CLC, Ottawa, ON, Canada.

Center for International Environmental Law (CIEL), 2011. Climate Change & Human Rights: A Primer. CIEL, Washington, DC.

Cock, J., 2012. Contested notions of the transition to a ‘green economy’: an alternative development path or a ‘wolf in sheep’s clothing’. International Sociological Association Forum, Buenos Aires, Argentina.

Comerford, J., 1997. Coal and Colonials: the Founding of the Australian Coal Mining Industry. United Mineworkers of Australia (NSW Northern District Branch of the CFMEU Mining & Energy Division), Aberdare, NSW, Australia.

Connor, L., Albrecht, G., Higginbotham, N., Freeman, S., Smith, W., 2004. Environmental change and human health in upper hunter communities of New South Wales, Australia. EcoHealth 1, 47–58.

Construction Forestry Mining and Energy Union M&E Division (CFMEU M&E), 2014. Jobs and Prosperity for the Hunter: the Case for Drayton South. CFMEU M&E, Sydney, Australia.

Corkery, M., 2016. As Coal's Future Grows Murkier, Banks Pull Financing. New York Times, New York, NY.

Cox, R., Pezzullo, P.C., 2015. Environmental Communication and the Public Sphere. SAGE, London, UK.

della Porta, D., 2015. Democracy in social movements. In: della Porta, D., Diani, M. (Eds.), The Oxford Handbook of Social Movements. Oxford University Press, Oxford, UK, pp. 767–780.

de Lore, A., 2016. Call for Transition Strategy to Assist Hunter Coalmining Communities in Wake of Job Losses. Newcastle Herald, Newcastle, Australia.

Earthworker Cooperative, 2014. Earthworkjer Cooperative: Working Our Way Out of Climate Emergency. Earthworker Cooperative, Melbourne, Australia.

Electrical Trades Union Victoria, 2012. ETU Fighting for Geelong & Manufacturing. Electrical Trades Union, Geelong, Australia.

Evans, G., 2008. Transformation from “Carbon Valley” to a “Post-Carbon Society” in a climate change hot spot: The coalfields of the Hunter Valley, New South Wales, Australia. Ecol. Soc. 13.

Evans, G., 2010a. A Just Transition to Sustainability in a Climate Change Hot Spot: From 'Carbon Valley' to a Future ‘Beyond Coal’ in the Hunter Valley, Australia. VDM, Sarrbrucken, Germany.

Evans, G., 2010b. A Rising Tide: Linking local and global climate justice. J. Aust. Political Econ. 66, 199–221.

Fairbrother, P., Snell, D., Bamberry, L., Condon, L., McKenry, S., Winfree, T., Stroud, D., Blake, J., 2012. Jobs and Skills Transition for the Latrobe Valley. RMIT University, Melbourne, Australia.

Farrell, C., 2012. A just transition: Lessons learned from the environmental justice movement. Duke. Forum Law Soc. Change 4, 45–63.

G21 Geelong Regional Alliance, 2016. About G21. Geelong Regional Alliance, Geelong, Australia.

Gibson-Graham, A.K., 2006. A Postcapitalist Politics. University of Minnesota Press, Minneapolis, MN.

Gibson-Graham, J.K., Cameron, J., Healy, S., 2013. Take Back the Economy: An Ethical Guide for Transforming our Communities. University Of Minnesota Press, Minneapolis, MN.

Goldman Sachs, 2013. The Window for Thermal Coal Investment is Closing: Rocks & Ores Commodities Research, 24/7/2013. Goldman Sachs, New York, NY.
Gollan, R., 1963. Coalminers of New South Wales: a History of the Union. Melbourne University Press, Melbourne, Australia, pp. 1860–1960.
Goodell, J., 2006. Big Coal: The Dirty Secret Behind America's Energy Future. Houghton Mifflin, Boston, MA.
Goodman, J., Salleh, A., 2013. The 'Green Economy': Class Hegemony and Counter-Hegemony. Globalizations 10 (3), 411–424.
Goods, C., 2013. A just transition to a green economy: evaluating the response of Australian unions. Aust. Bull. Labour, 13–33.
Gramsci, A., 1971. Selections from the Prison Notebooks. International Publishers, New York, NY.
Jobs Green Illawarra Project Steering Committee, 2009. Green Jobs Illawarra Action Plan. South Coast Labour Council & University of Wollongong,.
Groundswell Gloucester, 2013. The Beautiful Gloucester Valley is Threatened by Destructive Coal and Gas Mining. Groundswell Gloucester, Gloucester, Australia.
Groundswell Gloucester, 2014. Exposing the Risks: Fundamental Flaws in AGL's Application to Frack CSG Wells in Gloucester. Groundswell Gloucester, Gloucester, Australia.
Groundswell Gloucester, 2015a. Our Future. Groundswell Gloucester, Gloucester, Australia.
Groundswell Gloucester, 2015b. AGL's Coal Seam Gasfield in Gloucester: A Case Study in Poor Environmental, Social and Corporate Governance (ESG) November 2015. Groundswell Gloucester, Gloucester, Australia.
Hannam, P., 2015a. Rio Tinto Wins Planning nod for Controversial Warkworth Coal Mine. Sydney Morning Herald, Sydney, Australia.
Hannam, P., 2015b. AGL Vows to Exit Coal-fired Power Plants as Sun Shines on Solar. Sydney Morning Herald, Sydney, Australia.
Hannam, P., 2016. AGL Exits NSW, Queensland Coal Seam Gas in Major Win for Opponents. Sydney Morning Herald, Sydney, Australia.
Hannan, E., 2014. Thousands of Mining Jobs to Go. The Australian, Sydney, Australia.
Heinberg, R., 2004. Powerdown: Options and Actions for a Post-carbon World. New Society Publishers, Gabriola Island, BC, Canada.
Heuskel, D., Gerbert, P., Lotjunker, S., Herhold, P., Burchardt, J., 2013. Towards a New Balance of Power: Is Germany Pioneering a Global Transformation of the Energy Sector?. Boston Consulting Group, Boston, MA.
Higginbotham, N., Connor, L., Albrecht, G., Freeman, S., Agho, K., 2006. Validation of an environmental distress scale. EcoHealth 4, 245–254.
Higginbotham, N., Freeman, S., Connor, L., Albrecht, G., 2010. Environmental injustice and air pollution in coal affected communities, Hunter Valley, Australia. Health Place 16, 259–266.
Hopkins, R., 2011. The Transition Companion: Making Your Community More Resilient in Uncertain Times. Chelsea Green, White River Junction, VT.
Hunter Community Environment Centre (HCEC), 2012. Sick of Coal: Community Attitudes Towards a Fourth Coal Terminal in Newcastle. HCEC, Newcastle Australia.
Hunter Community Environment Centre (HCEC), 2013a. Coal Dust Free Streets. HCEC, Newcastle Australia.
Hunter Community Environment Centre (HCEC), 2013b. Coal Train Pollution 'Signature' Study. HCEC, Newcastle Australia.
Hunter Community Environment Centre (HCEC), 2015a. Inquiry Calls for Science and Transparency in Reducing Coal Dust Pollution. HCEC, Newcastle Australia.
Hunter Community Environment Centre (HCEC), 2015b. Health and Environment Groups Call for National Air Pollution Prevention Act. HCEC, Newcastle Australia.
Hyman, R., 2001. Understanding European Trade Unionism: Between Market, Class and Society. SAGE, London, UK.
Intergovernmental Panel on Climate Change (IPCC), 2013. Climate Change 2013: The Physical Science Casis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Cambridge, United Kingdom and New York, NY.
Intergovernmental Panel on Climate Change (IPCC), 2014a. Climate Change 2014 Fifth Assessment Synthesis Report: Summary for Policymakers. IPCC, Potsdam, Germany.
Intergovernmental Panel on Climate Change (IPCC), 2014b. Climate Change 2014: Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. In: Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A. N., MacCracken, S., Mastrandrea, P.R., White, L.L., (Eds.), Cambridge, United Kingdom and New York, NY, USA.
International Trade Union Confederation (ITUC), 2009a. Copenhagen Climate Summit: "Just transition" on the Agenda. ITUC, Brussells, Belgium.
International Trade Union Confederation (ITUC), 2009b. A Just Transition: A Fair Pathway to protect the Climate. ITUC, Brussells, Belgium.
Kirkwood, I., 2013. Yancoal Sheds Coal Jobs at Gloucester. Newcastle Herald, Newcastle, Australia.
Kirkwood, I., Ray, G., 2005. Resource Giants Have the Power; 'Big Four' Dominate for Better and Worse: King Coal Counting the Cost – Special Inestigation. Newcastle Herald, Newcastle, Australia.
Lannin, S., 2015. Around 30,000 Mining Jobs Threatened as Industry Looks Into 'Painful' Future: Survey. Australian Broadcasting Commission, Sydney, Australia.
Latimer, C., 2014. Carbon Tax Repealed. Australian Mining, Sydney, Australia.
Latrobe City Council, 2010. Positioning Latrobe City for a Low Carbon Emission Future. Latrobe City Council, Morwell, Australia.
Leaton, J., Ranger, N., Ward, B., Sussams, L., Brown, M., 2013. Unburnable Carbon: Wasted Capital and Stranded Assets. Carbon Tracker & The Grantham Research Institute, LSE, London, UK.
Leggett, J., 2015. The Winning of The Carbon War. Jeremy Leggett, London, UK.
Levy, D., 2012. Private actors and strategies in global environmental governance: The role of information disclosure. In: Dauvergne, P. (Ed.), Handbook of Global Environmental Politics, 2nd ed. Edward Elgar, Cheltenham, UK, pp. 308–318.
Levy, D., Newell, P., 2005. A Neo-Gramscian Approach to business in international environmental politics: an interdisciplinary, multilevel framework. In: Levy, D., Newell, P. (Eds.), The Business of Global Environmental Governance. The MIT Press, Cambridge, MA, pp. 47–69.
Macdonald, D., Burgess, J., 1998. Globalisation and Industrial Relations in the Hunter Region. J. Ind. Relat. 40, 3–24.
Marsden, S., 2002. Coals to Newcastle: a History of Coal Loading at the Port of Newcastle, New South Wales [HYPHEN]1797[HYPHEN] 1997. Bobby Graham Publishers, Wagga Wagga, Australia.
McCarthy, J., 2015. Drayton South and Mt Thorley Warkworth Decisions: Planning Assessment Commission Recommends Against Drayton But Backs Mount Thorley Expansion. Newcastle Herald, Newcastle, Australia.
Metcalfe, A., 1988. For Freedom and Dignity: Historical Agency and Class Structures in the Coalfields of NSW. Allen & Unwin, North Sydney, Australia.
Minerals Council of Australia (MCA), 2012. The Carbon and Mining Taxes. MCA, Canberra, Australia.
Mitchell, C., 2016. Momentum is increasing towards a flexible electricity system based on renewables. Nature. Nature Energy (Article number: 15030).
Mitchell, T., 2009. Carbon democracy. Econ. Soc. 38, 399–432.
Moore, F., Gorman, P., Harrison, R., 1998. At the Coalface: the Human Face of Coal Miners and their Communities: an Oral History of the Early Days. CFMEU Mining & Energy Division, Sydney, Australia.
Moyer, B., McAllister, A., Finley, M.L., Soifer, S., 2001. Doing Democracy: The MAP Model for Organising Social Movements. New Society Publishers, Gabriola Island, BC, Canada.
Munro, S., 2012. Rich Land, Waste Land. Macmillan, Sydney, Australia.
Murphy, D., 2014. Newcastle's Steely Resolve Masks Painful Scars From BHP Shutdown. Sydney Morning Herald, Sydney, Australia.
New South Wales Legislative Assembly various speakers, 1999. BHP Newcastle Steelworks Closure. NSW Parliamentary Hansard, Sydney, Australia.
Newcastle City Council, 2015a. Council resolution of 25 August 2015 - Item 64 - Adoption of Revised Investment Policy. Newcastle City Council, Newcastle, Australia.
Newcastle City Council, 2015b. Regional Investment and Jobs: Lord Mayoral Minute – 8/9/2015. Newcastle City Council, Newcastle, Australia.
Newcastle Port Corporation, 2015. The Port of Newcastle Marine Services.
NSW Environment Protection Authority, 2013. Upper Hunter Air Particles Action Plan. Sydney, Australia.
NSW Trade and Investment, 2014. NSW Coal Industry Profile 2013. NSW Trade & Investment, Division of Resources & Energy, Maitland, Australia.
Nussbaum, M.C., 2001. Women and Human Development: The Capabilities Approach vol. 3. Cambridge University Press, Cambridge, UK.
Peacock, M., 2015. CFMEU Backs Labor RET on Condition of Unprecedented Assistance for Vulnerable Workers. Australian Broadcasting Commission, Sydney, Australia.
Pearse, G., 2007. High and Dry: John Howard, Climate Change and the Selling of Australia's Future. Viking, Camberwell, Australia.
Pearse, G., 2009. Quarry Vision: Coal, Climate Change and the End of the Resources Boom, Quarterly Essay. Black Inc., Melbourne, Australia.
Pearse, G., McKnight, D., Burton, B., 2013. Big Coal: Australia's Dirtiest Habit. New South Publishing, Sydney, Australia.
Peetz, D., 2015. Are Australian Trade Unions Part of the Solution, or Part of the Problem? Australian Review of Public Affairs. University of Sydney, Sydney, Australia.
Pettit, J., 2004. Climate justice: a new social movement for atmospheric rights. IDS Bull. 35, 102–106.
Phelan, L., Henderson-Sellers, A., Taplin, R., 2013. The political economy of addressing the climate crisis in the Earth system: Undermining perverse resilience. New Political Econ. 18, 198–226.
Phelan, L., McGee, J., Gordon, R., 2012. Cooperative governance: one pathway to a stable-state economy. Environ. Polit. 21 (3), 412–431.
Phillips, B., Ross, D., 1980. Who Asked Us? Coal, Power, Aluminium – The Hunter Region's Only Future?. Newcastle Ecology Centre, Newcastle, Australia.
Polletta, F., Gardner, B.G., 2015. Narrative and social movements. In: della Porta, D., Diani, M. (Eds.), The Oxford Handbook of Social Movements. Oxford University Press, Oxford, UK, pp. 534–548.
Räthzel, N., Uzzell, D., 2012. Mending the breach between labour and nature: environmental engagements of trade unions and the North-South divide. Interface: J. Soc. Mov. 4, 81–100.
Rauschmayer, F., Bauler, T., Schäpke, N., 2015. Towards a thick understanding of sustainability transitions — linking transition management, capabilities and social practices. Ecol. Econ. 109, 211–221.
Ray, G., 2005a. Carbon Valley: How the Hunter has Become a Greenhouse Capital of Australia. Newcastle Herald, Newcastle, Australia,.
Ray, G., 2005b. From Historic Homes to Old Slab Huts, the Voracious March of Mines Threatens Our Heritage. Newcastle Herald, Newcastle, Australia.
Ray, G., 2005c. Valley's 'Lunar Landscape' Prompts Demand for…Mine Free Zone. Newcastle Herald, Newcastle, Australia.
Ray, G., 2011. All the Rivers Run Into King Coal's Coffers. Newcastle Herald,

Newcastle, Australia.
Ray, G., 2012. It's Open Slather in the Empire of King Coal. Newcastle Herald, Newcastle, Australia.
Ray, G., 2013a. Justice, But Will it Last?. Newcastle Herald, Newcastle, Australia.
Ray, G., 2013b. King Coal a Merry Soul. Newcastle Herald, Newcastle, Australia.
Ray, G., 2013c. King Coal up to Old Tricks. Newcastle Herald, Newcastle, Australia.
Ray, G., 2013d. King Coal's Legal Stick. Newcastle Herald, Newcastle, Australia.
Ray, G., 2014. Hunter Valley no Better Off After Digging for King Coal: Return of the King. Newcastle Herald, Newcastle, Australia.
Rey-Lescure, O., 2009. Mining Areas in and Near the Hunter River Catchment. University of Newcastle, Newcastle, Australia.
Richardson, D., Denniss, R., 2011. Mining the Truth: The Rhetoric and Reality of the Commodities Boom. The Australia Institute, Canberra, Australia.
Ross, E., 1970. A History of the Miners Federation of Australia. Australian Coal & Shale Employees Federation, Sydney, Australia.
Scanlon, M., 2005. Coal baron Forged Empire with Iron Fist. Newcastle Herald. Newcastle, Australia, 32.
Schrader-Frechette, K., 2002. Environmental Justice: Creating Equality, Reclaiming Democracy. Oxford University Press, New York, NY.
Schlosberg, D., 2004. Reconceiving environmental justice: global movements and political theories. Environ. Polit. 13, 517–540.
Schlosberg, D., 2007. Defining Environmental Justice: Theories, Movements and Nature. Oxford University Press., Oxford, UK.
Schlosberg, D., 2013. Theorising environmental justice: The expanding sphere of a discourse. Environ. Polit. 22, 37–55.
Schlosberg, D., Collins, L.B., 2014. From environmental to climate justice: Climate change and the discourse of environmental justice. Wiley Interdiscip. Rev.: Clim. Change 5, 359–374.
Snell, D., Fairbrother, P., 2012. Just transition and labour environmentalism in Australia. In: Räthzel, N., Uzzell, D. (Eds.), Trade Unions in the Green Economy: Working for the Environment. Earthscan, Oxford, UK and New York, NY, pp. 146–161.
Sustainable Futures Committee, 2015. Gloucester Sustainable Future. Groundswell Gloucester, Gloucester, NSW, Australia.
Sze, J., London, J.K., 2008. Environmental justice at the crossroads. Soc. Compass 2, 1331–1354.
Tan, A., Snow, D., 2015. Cuultural conflicts and social movements. In: della Porta, D., Diani, M. (Eds.), The Oxford Handbook of Social Movements. Oxford University Press, Oxford, UK, pp. 513–533.
The Australian Opinion, 2006. Green Jihad a Disastrous Idea. The Australian, Sydney, Australia.
Thomas, P., 1983. Miners in the 1970s: a Narrative History of the Miners Federation. Miners Federation, Sydney, Australia.
Thompson, G., Richards, D., 2015. The End of Coal?. In: Thompson, G., Richards, D. (Eds.), End of Coal? Sydney, Australia, Australian Broadcasting Commission.
Turner, W., 1979. Brown, John (1850–1930), Australian Dictionary of Biography. Melbourne, Australia, Melbourne University Press.
United Nations Environment Program (UNEP), 2007. Labour and the Environment: A Natural Synergy. UNEP, Nairobi, Kenya.
United Nations Environment Program, 2011. Towards a green economy: Pathways to Sustainable development and Poverty Eradication. UNEP, Nairobi, Kenya.
Unruh, G., 2000. Understanding carbon lock-in. Energy Policy 29, 817–830.
Uzzell, D., Räthzel, N., 2012. Mending the breach between labour and nature: A case for environmental labour studies. In: Räthzel, N., Uzzell, D. (Eds.), Trade unions in the green economy: Working for the environment. Earthscan, Oxford, UK and New York, NY, pp. 1–12.
Walker, A., 1945. Coaltown: a social survey of Cessnock. Melbourne University Press, Melbourne, Australia.
Walker, G., 2012. Environmental Justice: Concepts, Evidence and Politics. Rouutledge, London, UK.
Wang, E., Filión, N.A., 2011. Sustainable Economic Development: A Resource Guide for Local Leaders. Institute for Sustainable Communities, Denver, CO.
Westbury, M., 2015. Creating Cities. Niche Press, West Brunswick, Australia.
Williams, P., 2015. Lack of Customers Bad News for Coal-fired Power Stations. Australian Financial Review, Sydney, Australia.
Williams, R., 1977. Marxism and Literature. Oxford University Press., Oxford, UK.
Winchester, H., McGuirk, P., Dunn, K., 2000. Material and symbolic identities of Newcastle: continuity and change. In: McManus, P., O'Neill, P., Loughran, R. (Eds.), Journey: The making of the Hunter. Allen & Unwin, St Leonards, Australia, pp. 207–226.
World Coal Association (WCA), 2013. Coal Market and Transportation. WCA, London, UK.