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The coal story: Generational coal mining communities and strategies of energy transition in Australia

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ABSTRACT

The implications of place attachment and loss in generational coal mining communities are currently underexamined in energy transition discourse in Australia. By examining public submissions regarding a coal mining development in Lithgow, New South Wales, this paper identifies a relationship between coal mining and generational identity in this community. Acknowledging this relationship adds a useful perspective to energy transition discourse by highlighting the way in which hidden dimensions of loss can act to reinforce local support of extractive industry. We combine recent scholarship on the emotionality of the minescape (Ey & Sherval, 2016; Ey et al., 2017) with work on the ways in which place attachment can translate to feelings of loss in response to material change (Adger et al., 2013; Barnett et al., 2016; Tschakert et al., 2017) to suggest that factors of time and place can make community-level actors within the energy landscape either receptive, or resistant, to change. Applying this understanding to decarbonisation strategies can inform a more effective, and more just, energy transition in Australia.

1. Introduction

The takeaway message from the International Energy Agency's (2016) report on energy sector trends is that global coal consumption is decreasing for a range of reasons, including deliberate phase-out policies across Europe, decreased importation by former coal consumption leaders India and China, and the increased use of solar, wind and gas energy production (IEA, 2016). As society grapples with this shift towards a radically redefined and reconfigured energy sector on the global scale, we want to examine the implications of this shift at the community level, with a particular focus on generational coal mining communities (GCMCs). GCMCs here refer to communities in which coal mining has played a central role in the economic, cultural, social and physical development of a township or region over many generations. GCMCs provide a unique vantage point from which to examine the implications of the changing meaning of coal as Australia shifts, over time, from fossil-fuel production and consumption to new, renewable sources of energy. Coal exports have defined Australia's international trade relations for decades (Bayari, 2016), with Baer (2016) suggesting that it is this embedded association between coal and stability that has led to Australia's comparatively listless investment – both political and economic – in shifting away from coal production and use. This paper argues that the same inertia driving macro-political coal-dependency manifests at the local scale through social and cultural norms, which introduce a distinct set of considerations with respect to energy transitions in Australia. This paper will explore the implications of this localised coal legacy for GCMCs in the current stage of Australia's energy transition.

In doing so, we address a particular paradigm in current energy transition discourse in which analysis is clustered around either the urban, developed context of production and consumption (for examples see Droege, 2011; McGuirk, Bulkeley and Dowling, 2014; McGuirk et al., 2015; Frantzeskaki et al., 2017), or the vulnerable, often Global South, context of communities experiencing the inequitable distribution of climate change impacts (for examples see Barnett and Campbell, 2010; Schlosberg and Collins, 2014; Adger et al., 2013; Barnett et al., 2016; Tschakert et al., 2017). We do not suggest that engaging with GCMCs in Australia, who are on a global level socially, economically and politically privileged, either competes or detracts from existing scholarship on climate change and its attendant transitions. Rather, we wish to add another dimension to our understanding of the current energy landscape. This is helpful because, as Miller et al. (2013, p.135) note, the narrow focus of much of the energy transition literature on technological and economic issues has resulted in a "stunted energy debate" that excludes primary socio-cultural questions of why and how we produce and consume energy. Addressing such questions requires engaging with the material processes of fossil fuel production and use, as well as the social, political and economic institutions that influence

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these processes. For Miller and Richter (2014), such social and technological factors are so entwined that reconfiguring one necessarily requires significant change in the other, even impacting core values and identity. Thus disputes relating to energy futures are rooted in issues that extend beyond technical specificities. As Adger et al. (2013, p.112) note, a central driver of energy transitions is the global threat of climate change, the impacts of which are "only deemed negative within a given cultural frame of reference". In other words, global processes can only be given meaning through localised experience, experience that is shaped by where, and to whom, it happens.

We explore the importance of such context in the energyscape by drawing on public submissions to the New South Wales (NSW) Planning Assessment Commission (PAC) regarding the Springvale Extension Development Proposal (SEDP), a development application to extend an existing coal mine near Lithgow, NSW. The SEDP was submitted to the NSW Department of Planning and Environment in 2014, when public opposition to the project on environmental grounds triggered an extended process of community engagement which included written public submissions to the PAC on the development. An examination of these submissions suggests that place attachment and an emotional connection between coal and local identity actively influenced how regional residents framed and understood the SEDP and its opposition. Such aspects of extractive industry are currently unacknowledged in the energy landscape. This is problematic because a more nuanced and diverse consideration of the community-level impacts of the changing meaning of coal offers a twofold benefit for the broader energy transition discourse in Australia.

First, it can be used to inform more effective and efficient strategies of transition. Framings of energy justice are innately political, constructed, and contested (Eames and Hunt, 2016), with many energy transition initiatives attributing blame in the process of identifying solutions (Fuller and McCauley, 2016; Ayling and Gunningham, 2017). The effectiveness of such an approach is increasingly questioned compared to strategies that represent the energy landscape, and the actors within it, as existing within a complex system (Jenkins et al., 2016; Sovacool et al., 2017). This whole systems approach encourages nuanced understanding of the spatial and temporal implications of all motivating factors of production and consumption (Bickerstaff et al., 2016; Fuller and McCauley, 2016). The effectiveness of such a strategy lies in the ability to address not only the threats associated with coal's continuation, but also those associated with its cessation. Previous research on fossil-fuel industrial transitions suggest that policies that acknowledge the "embodied, emotional and experiential" (Hall et al., 2013, p.416) impacts of transition reach a wider audience, gain more traction and tend to be more effective than those that do not (see Evans and Phelan, 2016; Johnstone and Hielscher, 2017).

Second, actively acknowledging the lived experience of GCMCs, and the central role of coal in their connection to place and identity can minimise place-specific threats associated with processes of transition, contributing to more just decarbonisation strategies and policies. The existing energy justice literature has tended to focus on the distributional (un)fairness of generation and waste technologies, limiting a more integrated understanding of how and why such injustices are perpetuated and exacerbated across time and space (McLaren et al., 2016). As a concept, justice is both pluralistic and simultaneous, with any claim for justice understood only in its own empirical and normative context (Walker, 2014). Examining "the social, political-economic and material processes driving the experience of energy injustice and vulnerability" (Bickerstaff et al., 2016, p.2) associated with GCMCs enables distinct and valuable insights. Through this lens, we can identify the ways in which place attachment enables 'big picture' injustice in that it entrenches fossil fuel production and thus exacerbates the inequitable distribution of climate change impacts. However, this lens also allows an understanding that this entrenchment is a product, in its own way, of a specific community vulnerability. Attending to this vulnerability in transition strategies can thus contribute to more just outcomes at both the community and the global scale.

In order to understand how the effectiveness and justice of energy transition discourse can be informed by GCMC analysis, we must first examine the tensions and issues surrounding shifting meanings of and associations with coal in Australia.

2. Changing meaning of coal

The cyclical nature of coal extraction on 'host' communities is currently evident in NSW, with falling market prices, over four thousand layoffs since 2013, and many mines closing or going into care-and-maintenance mode (Connor, 2016). Politically, successful decarbonisation means increasing job losses for those in the coal mining sector, and this relationship between positive climate change action and decreased employment security for some requires, Rosemburg (2010) argues, increased recognition in just transition discourse. This is supported more recently by Evans and Phelan's (2016) argument that the 'jobs versus environment' narrative which tends to characterise decarbonisation discourse simultaneously undermines energy transition initiatives, exacerbates community-level concerns over stability, and reinforces the hegemony of the fossil fuel industry. In this context, coal mining employees - particularly unskilled labourers - equate decarbonisation not only with job loss but also eventual industry loss.

As the material role of coal in energy production is shifting, so too are its associated socio-cultural meanings. Coal mining has a long and central history in Australia's development, particularly in NSW where it enabled the development of many regions and communities during the twentieth century. In outlining the historical context of coal in Australia, Baer (2016) highlights that coal was, until very recently, normalised as positive in popular social, cultural and economic discourse. The anti-coal movement is a recent development, and we are only just now seeing the first waver of political support from the close nexus existing between the coal industry and Australian governments (Baer, 2016). The Australian government continues to characterise itself in global economic terms as a dominant natural resource exporter, while NSW is experiencing a proliferation of new mining developments (Connor, 2016). However, the increasingly contested nature of these developments on social and environmental grounds demonstrates an increasing destabilisation of coal's dominance.

The ecological impacts of coal production and consumption are increasingly salient in both the public consciousness and the political sphere, due to both the high profile environmental impacts of coal mines and the contribution of coal burning to climate change. This change is propelled by scientific consensus on the need for fossil-fuel reduction and eventual cessation, a cause championed by a spectrum of environmental advocacy groups on ethical grounds (Mittler, 2014). Ayling and Gunningham (2017:140) examine the 'deep green' strategy "to stigmatize [the fossil fuel industry] and treat it as a moral pariah" that comprises a small, yet high profile, fraction of energy transition approaches. While coal production is increasingly contested in coal rich production zones in NSW (Connor, 2016), the success of such decarbonisation initiatives has been impeded by entrenched socio-political regimes that perpetuate the influence of the coal industry (Bacon and Nash, 2012; McKnight and Hobbs, 2013; Rosewarne, 2016; Marshall, 2016). For example, the increasingly contested meaning of coal has seen "psycho-social defence mechanisms" emerge from industry lobby groups, particularly in the form of 'clean coal' discourse (Marshall, 2016, p.289). In shifting away from the macro-level political and economic discourse, we wish to examine how such tensions manifest at the community level in places where coal has socio-cultural value. This is particularly salient in light of Adger et al.'s (2013, p.112) critique that the failure of contemporary policy approaches to acknowledge, and value, community-specific"material and lived aspects of culture, identity, community cohesion and sense of place" impedes productive climate change action. It is this aspect of the energy landscape that we explore here, to suggest that the emotional and cultural coal legacies in

GCMCs remain unnamed and unacknowledged barriers to a just transition away from coal in Australia.

While the practises of the industry have shifted in many regions towards fly in-fly out arrangements (Eklund, 2015), in NSW in particular, coal mining continues to interact with notions of community and place-based identity. This can be observed in regional land-use contestations in the Hunter Valley, where coal is seen to devalue and threaten existing regional identity (McManus and Connor, 2013; Connor, 2016). This understanding of extractive industry as undesirable and unwanted by host communities fits within a dominant environmental paradigm based on morality and disgust (Mittler, 2014; Jia et al., 2017) and the integrity of local identity (Grubert and Algee-Hewitt, 2017). We seek to challenge and extend this understanding by considering communities that perceive coal, not as a threat to a communal identity and sense of place, but rather as integral to it.

3. Place attachment

The nexus between coal, identity, and meaning in local communities is enabled and reinforced by place attachment, or the "ecological, built, social, and symbolic" (Hummon, 1992, p.253) bond between individuals and the place they live. Such a bond allows the associations of a particular place to be incorporated into the personal identity and behaviours of an individual (Hernández et al., 2010) or a community (Bartel and Graham, 2015). This has led to conceptions of "parochial" place identities in which the local is presented as either a "moral starting point and a locus of ecological concern" (Tomaney, 2013, p.1), or a conservative approach that may, when "local interests and identities" are seen to be affected, lead to conflict (Bartel and Graham, 2015, p.278). The politics of place-based identity are important in conditions of environmental change, precisely because challenges in place are understood as a challenge to personal identity, authority and control (Bennett and Layard, 2015). This has been historically overlooked in procedural planning and regulation (Manzo and Perkins, 2006), yet there is increasing recognition that the place-people connection is key in understanding how and why communities respond to change. This is critical, as place attachment has been shown to drive maladaptive behaviours that impede positive environmental outcomes in some contexts (Bartel, McFarland, and Hearfield, 2014), while enabling them in others (Bartel and Graham, 2015; Manzo and Perkins, 2006; Masterson et al., 2017). Such variability in outcomes suggests that effective public planning should "enhance rather than threaten place-related continuity, distinctiveness, self-efficacy and self-esteem" (Devine-Wright, 2009, p.437).

Recent work on the cultural dimensions of climate change again highlights the importance of place attachment in how and why communities react to change, particularly when changes to the social, environmental or economic fabric of that place are viewed as a threat to communal identity (Adger et al., 2013). This work has been developed to explore the role of culture in localised climate change adaption, primarily drawing on examples of community vulnerability in Burkina Faso, South Pacific atoll islands, the Polynesian island Niue, and the Inuit of Nunavut, Canada (Barnett et al., 2016). This idea that localised responses to change are "shaped and often constrained" (Barnett et al., 2016, p.976) by particular forms of place attachment provides a helpful common ground between communities experiencing the impact of climate change, and the comparatively stable extractive communities that play a role in exacerbating these impacts. It is within this context that we wish to draw on Shriani et al.'s (2013) work on the ways in which everyday practice is embedded in and influenced by the past, present and expectations of the future, and that the immediate demands of family life – stability and wellbeing – tend to eclipse future concerns. Norgaard's (2011) work questioning how and why citizens of wealthy industrialised nations are responding (or not responding) to climate change suggests that we need to recognise that just as the impacts of climate change are experienced in complex and subtle ways, so too are its enabling factors. Fundamentally, as Catney et al. (2013) highlights, we need to understand and accommodate existing contexts, meanings and relationships to energy production at the local scale before we can attempt to change them.

4. Minescape communities

Mining communities, and particularly coal-mining communities, exhibit strong social ties and generational links to the industry, and thus to the places that enable it (Skeard, 2015; Strangleman, 2001). These ties are more than practical, and manifest through working class socio-cultural values shaped, in part, through the social, economic and often physical isolation associated with cultures of coal extraction (Ballesteros and Ramírez, 2007; Wicks, 2002). Critical in bridging the nature of such communities and the scholarship on place attachment is Ey and Sherval's (2016) concept of the 'minescape', which recognises that the processes and meaning associated with extractive industry emerge in complex and dynamic ways in the identity of supporting communities. The distinct character of minescapes are enabled, paradoxically, though associations of stigma and isolation in combination with an appreciation of coal as the foundation of regional development, and as such "cannot be understood superficially" (Ey and Sherval, 2016, p.179). In further work, the prime example of superficial engagement with the minescape is identified as the pervasive characterisation of the place-industry relationship in exclusively economic and rational terms, with narratives dominated by numbers of jobs, levels of productivity, and percentages of wealth creation (Ey, Sherval and Hodge, 2017). This work demonstrates the ways in which this relationship is also inherently emotional and irrational, and calls for a greater acknowledgement of this emotional dimension in productively addressing issues of conflict related to extractive industry.

The minescape concept emphasises the importance of invisible meanings and understandings in shaping physical places and the processes associated with them. This compliments Marshall's (2016) work on emerging energy technologies, which highlights that the social and political reactions of communities in response to change lies in their ability to imagine and embrace a different future. Whether this future will be, or is able to be, realised is somewhat moot, the point being that gaining collective support in energy discourse is as much a matter of engaging with imagined futures as with current realities. This can also be seen in Mayes et al.'s (2014) examination of the ways in which mining companies use strategies of targeted corporate community engagement for community groups and projects in such a way that "community history and identity, and also 'the' future, are perfectly aligned with mining capital" (2014, p.408). The strategic result, over time, is entwined social, cultural and economic bonds between mining companies and the communities in which they are based (Mayes et al., 2014), demonstrating again the importance of imagined futures, and the power of influencing or shaping such collective imaginings.

Engaging with this concept of imagined futures requires recognition of the ways in which factors of time and place interact to characterise processes of energy transition at the local scale. Extractive industry is, by its nature, 'boom and bust', embedding a need to plan for and manage transition stages in the mine lifecycle at the community level (Robertson and Argent, 2016). This can be seen in the Appalachian region of the United States, where coal, in the region's post-mining 'bust' phase, is "depicted as a nearly familial presence that has betrayed its communities and no longer represents security and prosperity" (Grubert and Algee-Hewitt, 2017, p.100). This demonstrates not only the shifting nature of the meaning of coal, but also the pervasiveness of its personal, emotive influence despite this change. Failing to account for the cumulative impact of time in mine lifecycles that span decades, or even centuries, enables the communities that develop around them to associate extraction with permanence, normality, and security. This is problematic, because, as Wheeler (2014) highlights, generational mining tends to form the basis of a regional identity that can last well

beyond the industry end which, as we see in the Appalachian example, can negatively impact the regional ethos well past the closure of the mines.

The last point we seek to emphasise here is that in such generational communities, the contribution of mining to local identity and heritage is highly valued, even to the point that it is understood as both natural and enduring (Wheeler, 2014). Here we can draw upon the work of Tschakert et al. (2017), who proposes a values-based approach to climate change adaption that accounts for the loss of intangible assets such as knowledge, sense of place, social cohesion, and identity. Current transition discourse suggests that mining heritage is largely not valued by wider society; as we can see from environmental activism that links morality to decarbonisation (Mittler, 2014; Ayling and Gunningham, 2017), demonising coal and all its attendant enablers is an intentional strategy. However, acknowledging the complexity of the minescape as central to local heritage and to communal place-meaning provides insight into the ways in which material change in extractive industry can trigger feelings of loss and vulnerability in GCMCs.

Miller et al., (2013, p.143) suggests that a key aspect of energy justice is ensuring that communities are empowered to choose whether and how energy systems, and their daily lives by extension, will change. Considering this, and the fact that "continuity of place can be an important component in maintaining or reinforcing identity" (Adger et al., 2013, p.113, on Hernández et al., 2010), a new justice question for the energy landscape becomes: How can we promote energy transition in a way that supports, rather than threatens, the social and cultural continuity of communities historically tied to coal?

5. Lithgow as a GCMC

In order to illustrate the salience of the minescape in processes of transition, we now turn to an examination of a traditional mining community in the current period of energy transition. Lithgow is a semi-rural township in NSW with a local population of just over 21,000, of which 8.1% are employed in coal mining, the dominant regional industry (ABS, 2016). Lithgow's economic and social growth has historically been supported and sustained by regional industrial activities, with commercial coal mining playing a central role in its growth since 1868 (Christison and Parry, 2014). Throughout Lithgow's history, mining companies have been associated with community welfare initiatives, such as the Lithgow Industrial Co-operative Society, which connected pharmacies, grocers, and other retail operations with smaller mining communities throughout the region (Christison, 2003). Housing was also often provided for workers in the early mining days of Lithgow, resulting in spatial clusters of families with historical mining ties (Christison, 2003). This association between community and industry can be seen to be actively sustained through current outreach initiatives by local mines involving local sporting organisations and charitable causes.

Industrial identity is celebrated in many local initiatives, including 'Ironfest', a popular tourist event celebrating the industrial past, and the large scale traditional coal miner's lamp that adjoins the Lithgow Information Centre. While mining continues to be the dominant regional industry, employment in coal mines has decreased by over 34% since 2011 (ABS, 2014; ABS, 2016). Since 2014, industrial production in the region has slowed, with the closure of two major mines – Angus Place and Baal Bone Collieries – as well as the Wallerawang Power Station. In addition, the major collieries currently operating around Lithgow, namely Clarence and Springvale, have viability outlooks for 20–25 years at most (Centennial Coal, 2012). While coalmining is likely to play a central role in the Lithgow economy for the foreseeable future, local production rates combined with wider market forecasts suggest that Lithgow is entering the last phase of mining viability. As a township, Lithgow features a range of food and retail activity typical of similarly sized populations, and is primarily characterised by 'blue collar' commercial activity. The regional workforce has a much higher percentage of trades workers, machinery operators, and labourers than state and national percentages, and a much lower percentage of professionals, managers and sales workers (ABS, 2016). Lithgow's proximity to Sydney, healthcare services, and semi-rural location have made it an increasingly popular retirement destination, with aged care residential services trailing (though distantly) mining as the main regional employment.

In this research, we examine the ways in which residents of the Lithgow region engaged in deliberative processes regarding the outcome of the Springvale Extension Development Proposal (SEDP), a regional coal mining proposal that received significant environmental opposition. The proponent of the SEDP was Centennial Coal's Springvale Colliery, a coal mine located in Wallerawang, a small township 10 km north west of Lithgow. The SEDP outlined a plan to extend the existing operation area of the Springvale Colliery by 5810 ha, allowing 4.5 million metric tonnes of coal to be extracted annually over the next 13 years, generating 310 jobs and up to $368 million in operation incomes, state royalties and taxes (PAC, 2015). The SEDP was strongly opposed on environmental grounds, prompting extended processes of community consultation and, eventually, litigation.

The deliberative body for the SEDP decision was the Planning Assessment Commission (PAC).[1] The PAC is an independent panel of experts who impartially advise or, as in this case, decide the outcome of development proposals submitted to the NSW Department of Planning and Environment that have a state significant environmental and/or economic impact. The PAC is used only when there is significant community opposition to a development, and its key role is to examine the planning documents and to gather public sentiment on the proposal through oral submissions in-person at public meetings or through written submissions made electronically via the PAC website, in order to evaluate the original proposal and arrive at a decision.

The following analysis is based upon an examination of 1893 publically available written submissions made to the Planning Assessment Commission, the decision-maker associated with the SEDP. These submissions were coded using NVIVO, and the themes and illustrative extracts from local residents in this data set are presented below. Interviews with various local and non-local stakeholders involved in the PAC process were also undertaken, and are used to support adjacent work by the authors' (Della Bosca and Gillespie, 2018).

6. Generational identity

PAC submissions demonstrated a strong association between current coalmine employment and the familial history and identity represented and embedded in that landscape. Coalmining is integral as a connecting factor over time between generations, and also provides a shared history that binds the current generation. Responses to this effect include:

My family are fourth generation coal miners in Lithgow

Both my wife and I grew up in the area her grandfather, father, and her step father all have worked in the mines previously and I also have worked at the mine for 7 years now.

I'm a 3rd generation coalminer.

I am also from family that have been in the district for 8 generations and have had much involvement in the mines of the district over this long period of time.

This generational sentiment came not only from current and past mine employees, but also their families, demonstrating that coalmining is embedded in Lithgow as a community identity.

[1] As of 1 March 2018, the Planning Assessment Commission has been renamed the Independent Planning Commission of NSW, a standalone agency under Part 2, Division 2.3 of the *Environmental Planning and Assessment Act 1979*

Great granddaughter, granddaughter, daughter, wife, sister, niece, cousin & friend of many miners.

I have seen my pop, dad and now my husband and father in law all work in the mines, which has supported all our families.

While these submissions refer to coal mining employment, it is clear that the meaning of coal here is more-than-economic, reinforcing the emotionality of the minescape's people-place connection. Coal here is a link through time, and can be seen to provide a sense of continuity, as well as serving as a reference point for both personal and familiar identity.

7. Time

Time as a legitimating factor was used extensively throughout submissions, serving as a complimentary theme to the generational identity outlined above. This temporal consistency can be seen to associate continuity, security and familiarity with coal extraction in this region and for the township of Lithgow.

Lithgow has always been a Coal Mining Town.

Coal has been mined in Lithgow for over 100 years LET IT CONTINUE

Our region is known for its coal mining and why should it change now?

The mining industry has been an integral part of our community for over one hundred and fifty years.

Here again we see that coal enables a linkage between past, present, and future; a continuity based on generational stability and an entrenched meaning of coal as the foundation of both the township and the community within it. Here we see the unique opportunity afforded by GCMCs to examine the nexus of place attachment and energy transitions, as GCMCs feature a relatively unilateral identity, established over decades through colliery-sponsored housing and welfare initiatives that tied the everyday life of generations of local families to processes of coal extraction.

8. Meaning

The submissions from Lithgow residents demonstrate the influence of the minescape on their understanding of both the present and the future of Lithgow. The following excerpts demonstrate the way in which the materiality of coal, and the dirtiness of the process, are relate directly into particular emotional, psychological meaning for Lithgow residents.

Pride, work ethic, salt of the earth, "getting hands dirty" is not a figure of speech, but a reality in a mining town.

We have grown up living in a mining community where getting your hands dirty has been handed down from previous generations.

We can also see that it is understood to be an essential, and even visceral, factor of regional connection, community and belonging.

The community of Lithgow and surrounding districts have for generations been involved in the mining industry. It is the lifeblood of our area.

The loss of a sense of community and the good the mine does in the community - This is immeasurable. Like many small towns, Wallerawang has a strong sense of community spirit, and a level of connectedness and co-operation that makes the residents feel they belong.

We see here the full implications of the emotional dimension of the minescape, and the community utility associated with the coal sector in the region. This sense of community can be understood as a 'cultural asset', a paradigm increasingly drawn on to understand how global processes translate to loss at the local level (Adger et al., 2013; Walker, 2014; Tschakert et al., 2017). Marshall's (2016) observation of industry defence mechanisms at the local scale can be observed here, where defence of self and group identity translate to a defence of coal.

9. Change as a threat

Acknowledging the importance of coal in the heritage and identity of Lithgow and its community allows an understanding of how changes to that industry may represent a threat not only to the local way of life, but to the continuity and existence of the town itself.

Lithgow has always been a[n] Industry driven town, without industries like mining and power generation there is not a lot of opportunity within the local area for families to exist…

Lithgow is changing, unrelated to the SEDP. Many mines have closed or been put into care and maintenance due to lack of feasibility – both physical and financial - and the employment and residential demographics of the Lithgow are arguably shifting away from the traditional coal mining base. We can contextualise responses to the SEDP by understanding that local fear of change is as much a result of cumulative factors compounding the threat to Lithgow's identity and continuity as it is a result of the SEDP itself.

It is no secret that the closure of both Baal Bone and Angus Place Collieries along with Wallerawang Power Station has negatively affected the local economy, dampened community morale, impacted on local businesses and schools and left all concerned worried about the future of our town.

…and we have already lost so many pits, and of course the people working in the mines want work, so they move.

There has already been massive job losses outside of the mining industry in our area and is centennial is one of the largest employers left in the town

I believe the area is struggling with recent down turns and job losses and I want to offer my complete support to the project…

…the domino affect [sic] that the closure of this mine will have would be disastrous for the local community. Schools will be forced to lay off staff, shops will close and people will move away. The loss of Angus Place and Wallerawang power station have left the town hanging by a thread as it is.

These statements clearly convey fear for the future, for loss of community, and for the instability of a regional future in the absence of coal mining. They also provide insight as to why opposition to the SEDP was understood as a threat to the coalmining industry and, due to the integral role coalmining plays to both the identity and economy of Lithgow, to Lithgow itself. They also reveal underlying motivations for participating in the SEDP process which arise due to cumulative impacts, as opposed to direct engagement with the development, primarily in addressing the question: if not coal mining, what? This insight is crucial in considering how mechanisms of place and time interact with the changing meaning of coal in order to contribute to the vulnerability of GCMCs in Australia's current phase of energy transition.

These excerpts from public submissions regarding the SEDP demonstrate the ways in which cultural dimensions of climate change adaption "mak[e] it difficult to predict which of the changes arising from climate change will lead to losses of cultural assets that communities value." (Adger et al., 2013). It is important to note here that we are applying Adger et al.'s insight to the site of coal production and continuation i.e. a contributing source of global CC, as opposed to communities suffering its impacts. However, it is this framing of intangible value that allows us to recognise that GCMCs are losing something valuable to them –identity, community stability, imagined futures. This is critical in understanding the Australian context of energy transitions because just as cultural dimensions of loss in vulnerable

communities suffering the impacts of CC a motivate decarbonisation, the cultural dimensions of loss in GCMCs can impede them.

In the following section, we will explore how these themes of place attachment within the minescape are useful in understanding micro and macro processes of energy transition. We wish to develop the work of Ey and Sherval (2016) and Ey et al. (2017) on the importance of acknowledging the unique identity profile of communities based around extractive industry, and the role of this identity in the emotional connections to place that position change as a social threat. The implications of this people-place connect in wider energy transition discourse in Australia shall then be explored.

10. The meaning of time and place in GCMCs

Characterising Lithgow as a minescape, and distinct from other mining-related research, provides insights into a local community which is uniquely reactive to planning developments that impact local extraction. This idea of GCMCs as vulnerable communities in the transitioning energy landscape sits somewhat uncomfortably with Barnett et al.'s (2016, p.977) suggestion that "climate change needs to be recast as a problem beyond blame and responsibility, to one of moral rightness". We argue that in the context of GCMCs, this approach provides yet another framework of constructed polarisation in which moral rightness is enabled only if divergent understandings (and those actors perpetuating them) are necessarily morally wrong. It also dehumanises processes of decarbonisation by failing to acknowledge lived experiences of loss that may be associated with this transition at the local level. Strategies of assigning morality to actors within the energy field, particularly those which "stigmatize [the fossil fuel industry] and treat it as a moral pariah" (Ayling and Gunningham, 2017, p.140) problematically disconnects discourse objectives from the influential actors that they seek to influence, and at the community level reinforce connection to the coal sector. Place attachment can trigger feelings of loss when people face the prospect of having to move, and it is increasingly evident that providing communities with a sense that they control how the change happens is important (Adger et al., 2013). Acknowledging that contestations can be a threat to more than one community identity, and that different types of community identities are valid and important, future decisions made in a physical and political climate of increasing uncertainty are going to be impeded. In NSW, we suggest that it is important to consider the importance of place attachment in a changing world, and how particular development processes impact or exacerbate the existing levels of uncertainty experienced by different communities

We suggest that in discussing energy futures in GCMCS there are two critical aspects related to time that need to be drawn out. First, time links both an understanding of the past with understandings of the future, and that both the understandings guide current decisions on the local scale. In the submissions, words like *family* and *generation* are associated not only with coalmine but with numerical and often cumulative accounting of time. The relationship between these factors is complex and embedded as a result of time, and it is this heritage, we argue, that is impeding the shift away from coal in this area. Considering this, we can see how demonising coal, and GCMCs by association, in transition activism strategies may be seen as a personal attack, and not only inhibit the message of transition, but reinforce the attachment to coal. Second, coal in GCMCs has a plethora of attendant meanings. We can see in the submissions that not only is coal enacted in connecting individuals to their familial lineage, and in connecting that familial lineage in turn to the Lithgow region, but that it is also active in contemporary meaning. Submissions referring to *getting your hands dirty* overtly connect the materiality of mining with community values relating to a particular enactment of practicality, physicality, mentality. The resistance to change is also seen in submissions that overly identify a shift away from coal as a threat to the continuation of the township as a result of lost employment, and a threat to the cohesion of the community and belonging. The moral imperative, ethics-based strategy employed by some renewable advocates (Mittler, 2014; Ayling and Gunningham, 2017) misses a critical point that, as emphasised by Shriani et al. (2013), the lived reality of such a legacy is likely to be more valuable and more relevant to people in GCMCs than "big picture" climate change imperatives. Understanding this, in relation to the importance of imagined futures (Mayes et al., 2014; Marshall, 2016), we argue that transition strategies and activism can be made more effective and more just by considering and presenting alternate futures for specific GCMCs.

Our changing climate is catalysing corresponding social, environmental and political shifts that threaten different communities in different ways. By focusing on threats to cultures that we find valuable, such as the "morally right" victims of climate change, we ignore critical barriers to energy landscape change originating from within privileged, fossil-fuel producing communities. In traditional energy discourse, these communities may be understood through a particular lens in which they are the locus of the problem, but this, we argue, inhibits deeper and more productive engagement. In line with Adger et al.'s (2013, p.116) focus on "the potential threats to cultural assets and the role of culture in [climate change] adaptation", we wish to contribute a new consideration of communities such as GCMCs, based on the argument made above relating to time, and to coal as a linkage between a valued past and a stable future. It is relevant to the overall energy discourse that the value of GCMC heritage is not recognised or socially supported by the wider community, and is in fact often demonised either directly or by association with extractive companies. Efforts to attack extractive industry, and fossil fuel producers in particular, as described by Ayling and Gunningham (2017) research on the deep-green divestment strategy of isolation, arguably 'trickle down' to GCMCs. Considering the above examples of the role of coalmining in the generational identity and attachment to place in Lithgow, the significance of having this local culture largely unvalued by anyone outside that community prompts the question of whether it useful to marginalise these communities whilst simultaneously condemning them.

11. Conclusion

It is not our intention to provide a "how to" discussion on transitioning between coal and renewable energy. Rather, we have investigated the implications of such a transition under the assumption that processes of transition are already occurring, and while this is being enabled in many ways, there are multiscalar factors of resistance that require considered and strategic attention. We have used the minescape concept developed by Ey and Sherval (2016), as well as their further research with Hodge (2017) on the emotional foundations of the minescape, to examine the role of these emotions as social and, importantly, political drivers in GCMCs. Further research on this topic could build upon our work to consider and compare enabling processes of natural resource transitions that have occurred in Australia and elsewhere, as well as how other factors impacting the coal futures of GCMCs, for example increasing autonomisation, interact with the socio-political discourse on energy transitions.

Much energy transition literature is focused on urban space, carbon emissions and climate change impacts, and to this we want to contribute a greater acknowledgement of the social and personal experience of processes of energy transition in areas with a generational mining history. We suggest that in order to enable a particular transition, activists, regulators and communities alike need to understand and address existing barriers to that transition. This response argues that during the transition away from the carbon industry, enabling strategies need to be more mindful not only to not exacerbate resistance to this transition, but to actively manage and enable it through a heightened contextual awareness. Walker's (2014) insight that simplistic and embedded understandings of justice (and the world) need to be

constantly challenged in order to better represent the lived realities of the systems we seek to understand is a particularly useful frame of reference in this endeavour. Considering that historical mining towns in NSW are facing a series of environmental, economic and existential changes, this aspect of justice could improve energy transitions and environmental outcomes in NSW and, by extension, improve the response to global level climate change impacts. The minescape concept allows us to alter perspective slightly to understand ways in which identity isolation and wider community condemnation may act to solidify local cohesion while entrenching reluctance to change. As Tschakert et al. (2017) find, while not all that is valuable can be preserved, transition strategies may be better served by exploring ways in which the intangible associations with place – identity, attachment – can be maintained at the community level in the face of material changes in the physical environment.

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