

# Australia and the New Geographies of Climate Change

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## Introduction

The Victorian Government's 'Black Balloon' television ad campaign (2006), designed to encourage the use of renewable energy in the home, depicts household CO<sub>2</sub> emissions through the 'release' of black balloons from a range of domestic sources—each equivalent to fifty grams of greenhouse gas. The balloons emerge one by one, with a slow squeeze out of the smaller appliances and more hurriedly from the larger, and begin to float outwards, joining up with balloons from other sources in other rooms. As one mass, the balloons resist the confines of the house, pushing open the door to the outside and finding release into the world. In the final scenes of the ad, a sea of black balloons rush up into the sky and in an aerial shot the entire screen is filled with balloons—still floating on—as far as the eye can see.

The strikingly visual metaphor of the balloons takes on a concern that has plagued climate change communication strategy—the invisibility of greenhouse gas. 'You can't see it,' a voice narrates, 'but you produce greenhouse gas every time you use energy'. And indeed, the Google Earth-esque vision of a vulnerable planet, only just discernable through a moving swarm of black blobs, certainly makes its point. As reported in *The Age* in March 2007, the number of Victorians who switched to renewable energy since the campaign launch had doubled (Rood 2007). But what is most notable in the ad, for us at least, is the seeming agency of the balloons in their break for freedom: the balloons strain against their source, and once released, surge forth. These are journeying balloons; they merge and mingle, and move on, well away from their very local point of emergence.

It is not just the fact of emissions that the advertisement materialises; more effectively, it is also the momentum and dispersal of greenhouse gas—its relationship with other places—that is depicted. The flying balloons filling the sky indicate a connection between here and elsewhere (although it has to be said that there is no definite sense of emissions from the outside entering an interior space). They call us, as the viewer, to consider our position in an open-ended network of relations, as much as to focus on energy consumption in the sphere of the home. And it is this network of materials, effects and place that forms the interest of this paper.

As the reality of climate change has been increasingly accepted around the world, new economies, policies and practices have correspondingly developed. So too have geographies: under conditions of climate change our places are altered, and in more-than-environmental ways. The new geographies of climate change that we will go on to discuss are constituted by multiple actors, processes and manifestations—and they are real as much as they are immaterial. Through an elaboration of two key examples of climate change's new economies—the bio-fuel industry and renewable energy—we will explore how this multi-faceted phenomenon provides the context for rethinking Australian geographies. This has implications not only for how we imagine ourselves in Australia, but also how we proceed in our efforts to mitigate the effects of environmental devastation—both at home and away.

## **Gases and climates**

Some sense of the new geographies of climate change is given in a recent report by the CSIRO that identifies greenhouse gas generated in the Northern Hemisphere as 'partly responsible' for the transformation of Southern Hemisphere climates (Clarke 8). According to the report's authors, who studied ocean currents for two years in the different hemispheres, warm water is being pushed further South by emissions in the North as atmospheric circulation changes. The resulting warmer waters around the continent are seeing rainfall and wind patterns alter in Australia. Whereas previously the study of Northern-generated pollution and climate change had identified other impacts situated in the Northern Hemisphere—'like more summer time floods and droughts in China, and the weakening of the South Asian monsoon'—this latest report now evidences an interrelation between North and South on these lines. The point we want to work from here is not that Australia is, once again, defined against its relationship to the North (although this is in some way true), but that, in the machinations of climate change, the country is always turned towards the outside. It is intimately connected to elsewhere in the very making of place. The fact that the influence of Northern pollution on Southern climates is understood to be partial suggests that this openness is always active—its connections are never fully determined.

Indicated here are the dynamic processes of climate change. As both a force and an effect, climate change is generated by elastic relations of proximity and distance: the mingling of pollutants in the world, the often non-linear, often inequitable dispersal of their impact, and the realignment of political, economic and cultural interests in response to ongoing environmental transformations.

Ecologies are shifting, and with this the arrangement of human relationships and the ground for imagining. Unlike other kinds of pollution, greenhouse gas has a global reach: with a lifespan of over one hundred years, it eventually disperses relatively evenly throughout the atmosphere of the Earth. 'When it

comes to the greenhouse effect,' writes Robert Henson, 'one nation's emissions are everyone's problem' (Henson 31). Yet this is not so straightforward. Poor (and small) countries are much more vulnerable to the effects of climate change, even while they are often low emitters of greenhouse gas. Populations across the globe are being realigned through their experiences of suffering, and others—in geographically distant places—via their culpability. And this does not necessarily follow old economic alliances: the low-lying coral atolls of the Maldives, with the second-highest GDP in South-East Asia, is facing the threat (along with poorer South Pacific countries such as Tuvalu) of sea level rise and increasing tropical cyclones, while the Ukraine, well-behind other European countries in terms of wealth, has the most carbon intensive economy, topping the list for CO<sub>2</sub> emissions per unit of GDP (40).

The new regional alignments brought about through conditions of climate change overlie other economic or physical proximities. The Kyoto Protocol's creation of 'Annex 1'—a grouping of developed countries who, having grown wealthy from carbon-fuelled economies, are charged with acting to address climate change before those countries whose gains are much more minimal—redrew the parameters of industrialised world without the United States of America and, until December 2007, Australia, both of whom initially signed but did not ratify the Protocol. Emissions trading markets established in the wake of Kyoto create carbon-based relationships within regions where the emissions from one country are absorbed by another. More insidiously, the so-called 'out-sourcing' of emissions, whereby the carbon-intensive production of goods is shifted off-shore, means that manufacturing countries such as China are emitting the greenhouse gases belonging to many millions of people in other places around the world.

Transforming environments notate geographic relationships oriented by patterns of effect, as well as by emissions. Drought periods in Indonesia, India, South-West Africa, Northern South America and Australia are shaped by the natural cycles of El Niño and La Niña, and it is possible that climate change will alter their oscillation—already the influence of El Niño (which increases the incidence of drought and raises temperatures) has been more pronounced over the last 30 years (Henson 112). There are connective threads that run between the forests of Kalimantan and Sumatra, subject to severe fires and drought, and the parched farmlands of South-Eastern Australia, where in the riverine areas healthy fruit trees are being cleared for lack of water to sustain them. We will go on to discuss in more detail two examples of new Australian geographies under conditions of climate change, and, in particular, explore the relation of these to the older geographies of a North/South divide. While in some respects, the North/South divide still makes sense when articulating Australia's position in the world, it is also an insufficient model for understanding the non-linear orders of ecologically-based relations between places. Before we do this, however, we will

briefly discuss the concept of place that informs our position, and enables a more nuanced perspective of the relations between 'here' and 'elsewhere'.

## Making Places

What we are arguing here is not that climate change instates an entirely new paradigm of place identity, but rather that it enables us to recognise, and think through the implications of, the unfixed nature of place at a time of significant environmental challenge. For places always begin elsewhere. According to Paul Carter, they are always doubled. The background to Carter's assertion is his study of the poetic colonisation of place through naming. His thesis is that places are the product of story-telling; place stories, in the form of founding legends, histories of exchange, and names for place, are initiated from the outside—that is, it is the arrival of the teller that marks the story's—and the place's—beginning (Carter 1988). Healthy places are multi-storied, constituted by many arrivals, and they exist both here and somewhere else. In the case of Australia, the dramatic transformations to place brought about by colonisation indicated a new arrival, but the doubled nature of place was largely denied. The indigenous stories already there, of human culture and community, and of the environment itself, were consciously forgotten, and a new culture of place—closed to the outside—was instated.

Australia was therefore founded on the desire to repress its complex relationship with other places. Only a single and chronological genealogy was allowed. As Carter writes of place-making in Australia:

The white myth of nation-making... symbolically excludes anyone who arrived too late to be part of the foundations... Despite the embrace of multiculturalism in the 1980s... the émigré is acceptable on condition his past life is annulled. The inability of our culture to imagine, let alone commemorate, the presence here of other landscapes, communities and cultures, is not due to a lack imagination, or the effect of a collective memory lapse: it is due to a discursive inadequacy, an incapacity to articulate the doubled identity by any (and perhaps all) of us who are conscious of coming from somewhere (Carter 2007).

Carter's concept of postcolonial geography sits within a substantial body of critical work that has illuminated the imaginative processes of Australia's colonisation by non-indigenous settlers. Ross Gibson's *South of the West* described the ways in which the Great South Land operated as a negative mirror to the countries of the North—representing degeneracy and deficiency in its indigenous state. The drive to remake the Australian landscape in an image of Northern Hemisphere environments, as writers such as Jay Arthur and Deborah Bird Rose have explained, has its origins in this dichotomous opposition (see Arthur; Rose). *Terra nullius* was a fantasy that supported a belief in the righteousness of colonial

endeavour in both environmental and human terms, and to sustain this non-indigenous Australians had to participate in a two-fold forgetting—of the places brought with them (beyond the approved myth of origins), and the histories that recalled the dispossession and repression upon which the nation was established.

This blindness to the nature of place is a self-induced unsettlement. The conditions for belonging set up by white Australians have undermined this ultimate goal, and at a high environmental cost. As a cast of names recalling European origins were laid out over the Australian landscape, a shadow ecology was imposed: stories of Northern Hemisphere environments—its rivers, soils, seasons and vegetation—that took material form in the active remaking of Australian landscapes, from the redirection and damming of rivers, to the clearing of land for agricultural industry. As it becomes more evident that the environment can no longer sustain this single ‘place story’, indicating the presence of other histories and rhythms in the land, non-indigenous Australians find their places shifting around them.

With climate change entering the mix of Australia’s dire environmental state, intensifying drought and flood periods, and altering ecologies as the planet warms, strategies to ameliorate the damage done by a dominant place story must take account of this denial of doubled place. However—and revealing the persistence of the desire to feel assured in the solidity of place, and thus of our relation to it—one reaction amongst some cultural and environmental writers, who recognise the ill-suited nature of prevailing Australian place stories, is the urge to re-establish dichotomy by asserting the distinct differences between Southern and Northern Hemispheres and appealing to a return of the land to its ‘original’ condition (see Tacey and Flannery for examples of this trend). This is the logic of a closed system—in ecological terms, a kind of ‘eco-fundamentalism’ (Carter 2007) that retrains a gaze to the ground at one’s feet as if the stories to be found were hermetically local. Once again, place is turned inward, away from the possibilities of a connection to elsewhere.

This logic can be discerned in the increasingly prevalent ‘ecological footprint’ model of human environmental impact which, as a circumscribed description of human/environment relations, reiterates a system in which happenings are discrete. Effects do not radiate in unpredictable ways. Suggesting Carter’s assertion that our dominant place stories lend themselves to ‘static objects’ rather than ‘mobile processes’ (Carter 2008), the ‘ecological footprint’ promotes a very particular form of response to environmental distress, one that directs responsibility and care—if only figuratively—towards a certain and quantifiable patch of ground. Furthermore, the agency to impact is solely attributed to humans. Places, as mobile composites, are excluded from this picture of the individual marking the world. The much more messy connections between

things indicated in the advertisement bearing the flying black balloons suggests that a different way of thinking about care and responsibility in the face of significant environmental change is needed. We will return to this concern at end of the paper, but will now turn to two examples of how climate change asks us to reconsider place relations.

## **Bio-fuels**

Biofuels are about geographies: their making stretches out over regions and is a movement through international supply chains. More importantly, many biofuels have a significant transformative impact on lands where they are grown: their making is place-making. In Australian geographies, biofuels are likely to start out as sugar stories, with their production caught up in the transformation of the landscapes and economies of sugar cane growing. In this sense, biofuels stories for Australia may well be minor remakings of sugar systems—systems that were early products of dichotomous North/South thinking and Australia's agricultural exporting history. But that is only the start, both in Australia and beyond, as many feedstocks are available for biofuel production.

A recent major study conducted by the Royal Society classifies several key types of biofuel feedstocks (Royal Society 2008). Conventional food crops that produce sugar, oil and starch, including sugarcane, wheat, corn/maize, canola and palm oil, are the current major feedstocks, but lignocellulose sources such as tree crops and perennial grasses are also significant. Further opportunities for biofuel exist beyond the agricultural economy, such as food production co-products, domestic vegetable waste, marine organisms and tank-bred biological systems. One important factor concerning food crop feedstocks is that they will have implications for food cycles, such as increasing maize and wheat prices due to competition between fuel and food end-uses. In turn, due to the extent of integration between grain and meat cycles (such as for beef production), the shift of grain product and grain lands to biofuels production, accompanied by higher grain prices, drives up other food prices.

This complex geography of interacting changes in land use, supply chains and the interactions between food and fuel cycles is also a story about climate change. Theoretically, some biofuels are able to achieve carbon-neutrality, in marked contrast to the rapid growth in the carbon footprint of conventional, fossil-fuelled transport. As well as energy security arguments, climate change responses are driving the development of biofuels research, manufacture, supply and use.

Looking at biofuels, untangling their geographies and implications (environmental, social and economic), it is necessary to acknowledge the doubled nature of places and the complexity of place-making. A decision to keep sugar cane land in production in Australia for ethanol not only may have implications for runoff water quality into the Great Barrier Reef lagoon, it also sends price

and other signals into Australian fuel markets and global energy supply chains. Similarly, biofuel demands in Europe have driven palm (oil) plantation growth in Indonesia, contributing both to species impacts, and, ironically, to additional greenhouse emissions when fire is used for landscape conversion.

These stories are starting to gain popular currency, including the more complicated tales of multi-place interactions between the fuel and food cycles. However, many recent popular accounts of these key global cycles, including Sonia Shah's *Crude: The Story of Oil* (2005) and Felicity Lawrence's *Not on the Label* (2004), approach supply chains and product cycles through discourses of travel, especially metaphors of journeying. While this can work as an initial strategy to engage popular opinion, it may well end up obscuring the multi-place simultaneous effects of our biofuels choices—especially where we are talking about complex interactions between multiple food and fuel cycles, across multiple places, all at once.

While there are dangers in falling into travel discourses and journey metaphors when thinking about biofuels, a degree of North/South thinking can be valuable here. The extent of public engagement in North America and the EU with debates about Indonesian land use and species impacts from palm oil plantation development (especially rainforest conversion and orang-utan conservation) is in part a product of prior debate about North/South developmental inequities, including previous debates about sourcing timbers from the South. In the context of biofuels debates, North/South thinking has set up some powerful shorthand, including an awareness of impacts throughout the South of the Americas (especially in Brazil) caused by North American demand for beef (and therefore for feedstock grains). This then provides a platform for arguing out the consequences in the global South of driving biofuels markets in the North. Brought back to the Australian context, Australian biofuels production asks pertinent questions about whether the country should identify with other sugar-based biofuels producers in the South (such as Brazil) or focus on other approaches to fuel security and the reinvention of transport.

## Renewables

While North/South binaries make sense for Australia when it comes to climate change issues such as biofuels and the interactions between food and fuel cycles, it is important not to take this thinking too far. Other aspects of the renewable energy response to climate change force us to conceptualise our position in the world outside a North/South framework.

Wind and solar are two of the renewable energy sources most commonly discussed in debates about energy policies and climate change responses. In Australia, recent debates about wind energy development have focused on contested project proposals—usually contested on aesthetic and/or heritage

grounds. For example, several wind energy developments in Victoria (including in Gippsland and near the Great Ocean Road) have been opposed by local residents and heritage groups for changing landscapes and landscape values, including heritage values and property values. Solar energy in Australia is often discussed in terms of Australia's abundant solar resources, its role as originating key technological innovations (especially in solar photovoltaics), and domestic solar panel or solar hot water use and rebating.

Renewable energy debates around wind and solar in Australia do sometimes reference overseas examples. In debates about coastal siting of wind farms in Victoria and South Australia, reference is often made to European approaches where offshore siting is an option. Looking beyond Australia, it is the Spanish experience that has most to offer Australian debates, whether on wind or solar, especially large scale developments.

It may seem strange to suggest Spain as an analogue of Australia, including the issue of renewables, but some aspects of the respective physical and human geography of both places bear further consideration. The Spanish population of around 45 million people is twice that of Australia (21 million), but the coastal distribution of both populations is quite similar. With the exception of the inland cluster around Madrid, both the Australian and Spanish current patterns of human settlement involve coastal population growth, both in large conurbations and linking corridors. This is significant in terms of the distance for transmission between the generation of renewables and centres of energy demand. While the Spanish topography includes significantly higher mountains, the energy challenge in both places is how to use less-settled lands and the coastal zone to generate renewable energy for dense, coastal uses. Both countries are hot and dry across many regions (around 1% of land area covered by water), which has implications both for hydro-electricity and also for being able to meet the water (steam) needs of coal fired electricity generation.

Recent figures put Spain at having achieved the second fastest rate of new wind energy capacity growth (3.5GW in 2007), behind the United States, and ahead of China.<sup>1</sup> New Australian targets for renewables capacity of 20% by 2020 are expected to drive significant growth in the Australian market. Spain achieved this 20% renewables benchmark in 2006, and is on track to meet its target of 30% of electricity generation coming from renewables by 2030. Significantly, Spain has managed a relatively smooth integration of intermittent renewable generation (mainly wind and solar) with their electricity grid, providing a powerful counter to arguments still current in Australia that renewable energy is not suitable for displacing significant percentages of fossil fuel generated power. Spain also mandates the integration of photovoltaic generation in new buildings and the installation of solar hot water systems.

The Spanish experience with renewable energy generation for electricity supply is a powerful example for the Australian context. Not only does it address issues of integrating renewables as a large share of grid supply, the Spanish experience addresses many of the challenges of renewables siting for supply to coastal development in a sunny, dry climate, and validates the business cases for investment in renewable energy. Australia and Spain are strange doubles, sharing climatic and resource opportunities. The challenge is to recognise the value of the Spanish experience for Australia, to see their complex relation, with Spain understood as part of Europe, as part of a global North, and not part of a cultural Commonwealth.

While this is still a struggle in the climate change context of renewable energy debates, Australians have conducted this kind of North/South, Australia/Spain bridging thinking already. A key example is the development of homoclimate analysis, mainly attributable to Australian viticultural research conducted by Dr Richard Smart.<sup>2</sup> A homoclimate is a localised climate sharing common properties (such as sunshine hours, mean daily temperatures, humidity) with another climate. Homoclimate analysis was developed in Australia for application in the wine industry, mainly as a tool to assess commonalities between key European wine regions and possible Australian analogues. The results of the application of homoclimate analysis to Australian and Spanish wine regions is an extensive series of commonalities, including those Australian regions sharing climatic characteristics with Spanish regions such as Ribera del Douro, Rioja and Toro.

It is possible to extend the basic principles of homoclimate analysis into the spaces of renewable energy, and acknowledge common resources and opportunities shared by Australia and Spain. Both for wind energy and solar power, the resources, the population distribution, the climate, the buildings and the patterns of energy consumption all support a comparative analysis. It is at this point we can see some of the risks in going too far into North/South modes of thinking regarding climate change issues such as renewables. Too firm a location of Australia in a global South and Spain in a global North, and the possibilities of homoclimates and of shared chances become remote.

While a North/South divide can help us to make sense of Australia's recent environmental history and the politics of climate change, we need to approach this particular place relation in nuanced ways. This means acknowledging North/South utility when considering biofuels and their complex implications for land use, social change, economic development and culture, without losing sight of discursive risks (such as the conventional uses of travel discourses and journey metaphors in understanding supply chains, when notions of folding, simultaneity, market signals or complementarity may be more useful). There is also a need to recognise that some powerful thinking can be done about climate

change by stepping outside North/South identification, such as in the case of Australia's and Spain's commonalities regarding wind and solar.

## Conclusion

One of the continuing challenges of climate change for Australia is that it asks for a reorientation of our relations to place. When Australian resources are consumed in China for steel production, the greenhouse emissions that result are Australian, Chinese, and global in their locations and subsequent impacts. This reorientation of place in Australia and beyond poses the prospect of post-national citizens, linked by climates, emissions and practices (not to mention international agreements). The mobility of forces and effects illuminated by climate change challenge us to reconsider what it means to take care of something that is simultaneously close and distant.

Citizenship under climate change, including in Australia, can operate in North/South terms, as biofuel geographies and debates reveal, with informed citizens understanding that their mobility choices in a global North may well play out simultaneously as land use change and species loss in a global South. But the point is that the relations between places, peoples, sources and effects in our world can never be fully explained in this way. Place identity, and subsequently the stories by which we know and narrate the world, always exceed a reduction to this *or* that. Places are never singular—the South is always also the North (and many other places too) and vice versa. Rather than the static image of the Southern Hemisphere culturally colonised by the North, or held as a distorted mirror image of the one true identity (the Global North), North/South relations are manifold, contradictory and dynamically situated. Moreover, as environmental transformations are clearly illuminating, places, and the species—human and non-human—within them, are constantly on the move. Ranges shift, refugia shrink, microclimates alter, patterns of touristic and hunting movements change—we expect climates and get weather—different weather. In a time of climate change it is vital to recognise this: to see ourselves in the world in terms *both* concrete and local, *and* as participants in networks that stretch beyond what is right here and now, into other places, other systems, other times and other lives.

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## Notes

<sup>1</sup> 'Europe remains the leading market for wind energy with over 57 GW of wind energy at the end of 2007, representing 61% of the global total. In 2007, the European wind capacity grew by 8.5 GW, over 17% compared to the previous year' (European Wind Energy Association).

<sup>2</sup> For more on homoclimate analysis and its application to viticulture, see [www.smartvit.com.au](http://www.smartvit.com.au).