



Melbourne Sustainable
Society Institute

Fay Gale Memorial Lecture: Rein-stating Power – Decarbonisation, Decentralisation and Digitalisation in Electricity

Edited transcript from the Fay Gale
Memorial Lecture, Institute of Australian
Geographers Incorporated Conference,
Hobart, Thursday 11th July

Speaker

Dr Sangeetha Chandrashekeran, Deputy Director, Melbourne Sustainable Society Institute and Lecturer, School of Geography

Acknowledgements

Thanks to the Institute of Australian Geographers Conference for the invitation to deliver the Fay Gayle lecture and their generous financial support for the conference visit.

I would like to thank Elaine Stratford for her warm welcome and generous introduction, and echo her acknowledgement of the traditional owners of this land on which we stand. Thank you to Uncle Rodney Dillon for welcoming us to the conference and it is nice to see the message stick on the table here – a wonderful symbol of Aboriginal knowledge and custodianship for our discipline.

I want to express my thanks for the opportunity to deliver the Fay Gale Memorial lecture. It is an honour to be asked, and I am excited to be able to celebrate the discipline of geography for which Fay Gale did so much.

I wanted to begin by telling you a bit about Fay Gale AO. After graduating from University of Adelaide with Honours in Geography she taught and then in 1957 commenced her PhD which was called A study of assimilation: Part Aborigines in South Australia. It was the first to explore the lives of part-Aboriginal women who had been taken from their mothers in infancy - the term then used for those who were of mixed descent. Published in 1960, the study was influential in the move towards citizenship and land rights for indigenous people, and the introduction in South Australia of the nation's first anti-discrimination act.

Throughout the 1960s and '70s, as she juggled life as a teacher and mother of two, Fay continued her research with Aboriginal people, especially the marginalisation of those who later came to be called the Stolen Generation. She returned to work in the mid '60s as a lecturer in the Department of Geography at the University of Adelaide, and was quickly recognised as a gifted teacher. In 1972, her book *Urban Aborigines* was published. Its argument for Aboriginal self-determination radically altered public perceptions at a time where Aboriginal land rights was increasingly high on the political agenda. The Land Rights Act in the Northern Territory addressed remote Aboriginal communities but not those in urban spaces. This focus on the urban spoke to the uneven geographies of land rights, and was ahead of its time. In 1978 she became the first woman to be appointed to a professorship at the University of Adelaide, and one of only a handful of women Australia-wide.

What struck me most in researching her contribution were the following defining features: her celebration of geography as a truly interdisciplinary undertaking that draws attention to the co-production of culture and environment. So, for example, some of her most well-known research focused on tourism and Aboriginal rock art as she interrogated the meaning of the term 'environment'. Her commitment to social justice and calling out of systemic practices of social exclusion. This is most obvious in the book 'Urban Aborigines' and another about Aboriginal people in the juvenile justice system. Fay Gale had a way of bringing to bear her geographic sensibility on the public sphere and social reform. For example, applying her research to develop regulatory frameworks for the protection of Aboriginal cultural property in an age of tourism, and then serving as an Australian Heritage Commissioner in the 1980s and 1990s. Finally, and not insignificantly, was her research and practice on gender, calling out discrimination and pioneering new strategies, particularly in her administrative roles as a senior academic and eventually as Vice Chancellor of the University of Western Australia. She also connected her personal struggles as a mother and woman in a male-dominated academy and society with her geography. We have much to thank Fay Gale and her peers for and still much to do.

In Fay Gale's spirit of wearing multiple hats at different times, what I really want to talk about today are three aspects of my life and how I bring my geographic sensibilities to bear on these. The first is the research that I do as a geographer in a School of Geography (SoG) where I have spent the last 10 years focusing on energy and state-market-society relations. My fieldwork has been in Australia and that is largely because of the other aspect of my life, which is as a parent to two young children.

In this caring role, I have found myself much more locally anchored than before and this has revealed the significance of relational connections through institutions like schools, libraries and child care centres, and streets and waterways. I have been working on a project at our local primary school that works with the Wurundjeri Elders, artists, and sustainability knowledge specialists to learn both at and through the local creek. Through the project we have commenced a process of decolonising the primary school curriculum and celebrating situated knowledges and relational connections. There are many aspects of the geographies of care that come together through this project; care for country near and far; care for kin, human and non-human; care for future generations.



Figure 1: School children engaging with the Merri Creekulum.
Read more at: <https://merri-creekulum.squarespace.com/>

This project also connects both relationally and conceptually with engagement work that we have done in the SoG at the University of Melbourne (UoM) through the Geography Artist in Residence project which is now in its third year. Figure 2 shows some images of the artists Fayen D’Evie and Katie West guiding a walk on a University campus in the Shepparton region over underground waterways with staff and students from the UoM and the Shepparton Art Museum.





Figure 2: Fayen D'Evie and Katie West, School of Geography Artists in Residence

The project is a collaboration across the University including the Potter Museum, Faculty of Veterinary and Agricultural Science, Melbourne Sustainable Society Institute and with the Shepparton Art Museum. It brings previously unconnected parts of the University into conversation.

Finally, I wanted to reflect on the work I have been doing as Deputy Director of the Melbourne Sustainable Society Institute (MSSI), which is one of the interdisciplinary research institutes at UoM. I have a 0.4 appointment in teaching and research in Geography and a 0.6 appointment at MSSI. The team consists of quite a few heterodox economic geographers: Brendan Gleeson, Director, MSSI and former student of Ruth Fincher; Lars Coenen who works on geographies of innovation; and Svenja Keele, who works on the geographies of knowledge (also Ruth's student). There are also other non-geographers in the team as well. Our key job is to convene researchers across disciplines, and external stakeholders to promote research and engagement on sustainability.

In Figures 3 and 4 are some images of a wonderful exhibition by Professor Gini Lee and Antonia Besa called Water Lore.



Figure 3: Image by Antonia Besa.



Figure 4: Kati Thanda-Lake Eyre by Antonia Besa; Map sources: Geoscience Australia, NASA and Google Earth.



Figure 5: UoM water researchers meeting at Water Lore.

As an example of the work that I do at MSSl, we brought together water researchers from all faculties (in Figure 5) using this exhibition as a catalyst for interdisciplinary conversations. There is a great strength of talent in water research at the University of Melbourne, but there have been some challenges in enabling interdisciplinary conversation. So, we have been trying to convene STEM and HASS researchers and create opportunities for collaborative thinking.

In this exhibition, Gini and Antonia mapped two major Australian river systems, the regulated Murray Darling and the unregulated Cooper Creek. Mapping at large scale conveyed the scale and beauty of our critical river systems. The artists combined traditional maps with contemporary and historic water values and installations revealing how places are shaped by the deeply held values we place on water. The multiple modalities and languages of this exhibition exemplified the interdisciplinary endeavor, and, along with the free drinks, helped conversations to flow between researchers. We have now formed a cross-university water grouping, the Water Futures Research Network, on the back of this event.

So, geography provides me with a language to understand and engage with the complex socio-environmental relations that I am enmeshed in both personally and professionally. And like Fay Gale, I find myself engaged as a geographer in multiple spheres, albeit at a lower level of influence!

Unfortunately, I do not have time to go into a lot of detail about that but I am happy to discuss more later. What I will spend the rest of my time talking about is my own geography research.

I did my PhD in geography focused on the marketisation and privatisation of the Australian electricity sector. I was trying to understand why the sector had remained so supply-side focused and therefore largely indifferent to the potential for demand to be shaped to meet the needs of households and businesses behind the meter. I found that under privatisation and aggressive marketisation and the situation of oversupply coupled with new state-designed modes of competition incentivised every entity along the supply chain to sell more electricity and build for growing demand, actions which provide little opportunity for demand-side to be valued. I analysed demand-side interventions from the 1970s and then stopped the analysis at about 2005, in order to make the thesis a bounded and manageable undertaking. I concluded that supply-side orientation in the electricity sector was not significantly reworked despite major industry restructuring.

An important aspect of my analysis was to show how states were actively involved in shaping the new market, and how they continued to manage the market as it evolved. This is contrary to a prevalent view that the state is hollowed out, diminished, and therefore less relevant to study as a result of privatisation and marketisation. Phil O'Neill, in his work on the qualitative state, has argued that the nature of the state transforms with the shift away from central planning and ownership of resources, but this can in fact intensify state involvement rather than signal a withdrawal of the state. The state that has emerged in the last few decades is qualitatively different from before as it actively works out how to manage the contradictions of a more globalized, interdependent economy. Bob Jessop's work on a strategic relational approach is also important here.

This stands in contrast to thinking that states have been completely neoliberalised and are now barely distinguishable from markets - they exist only in service of the market.

How do states matter at a time of socio-environmental and technological change?

I think this is a very important question to ask because the future energy imaginaries are dominated by a techno-utopianism that erases existing people and places. Yet the legacy of past investments and state practices will shape the future. Communities in places cannot simply be overwritten. There is a political process of contestation and negotiation that involves us thinking about the state.

Maps like that in Figure 6 tell us about the right climactic environmental conditions for new renewable technologies. It is the basis for calculations that Australia has huge energy production potential in terms of total land area, but more specifically in terms of ‘unutilised’ land area.

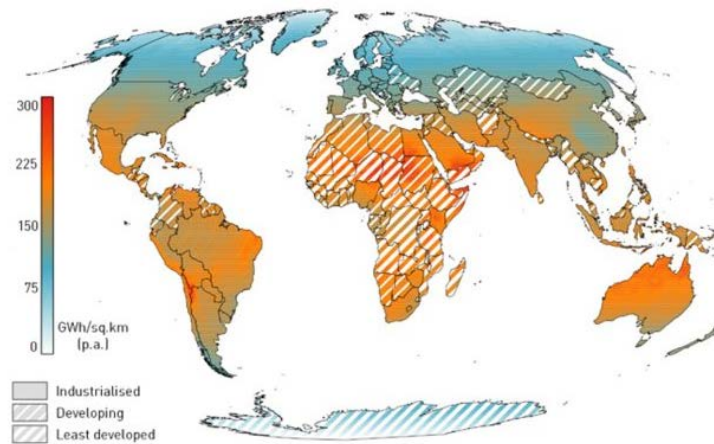


FIGURE 6
Global distribution of combined wind and solar generation potential. Derived from NASA global wind and solar data⁶⁷.

Figure 6: Image from Beyond Zero Emissions, 2015

They then layer a development indicator over this which marks out where the industrialised areas are, and before you know it this becomes a map of investable renewable energy areas vs high risk of uninvestable areas. This then fosters imaginaries of Australia as a Renewable Superpower. And this is a phrase that proliferates at energy industry events that I attend. You go from finding the right environmental conditions, to the right infrastructural conditions from which to build an export-oriented grid.

In Figure 7 we see glimpses of the old in the new. Dominant, residual and emergent forms all on display at any one time.

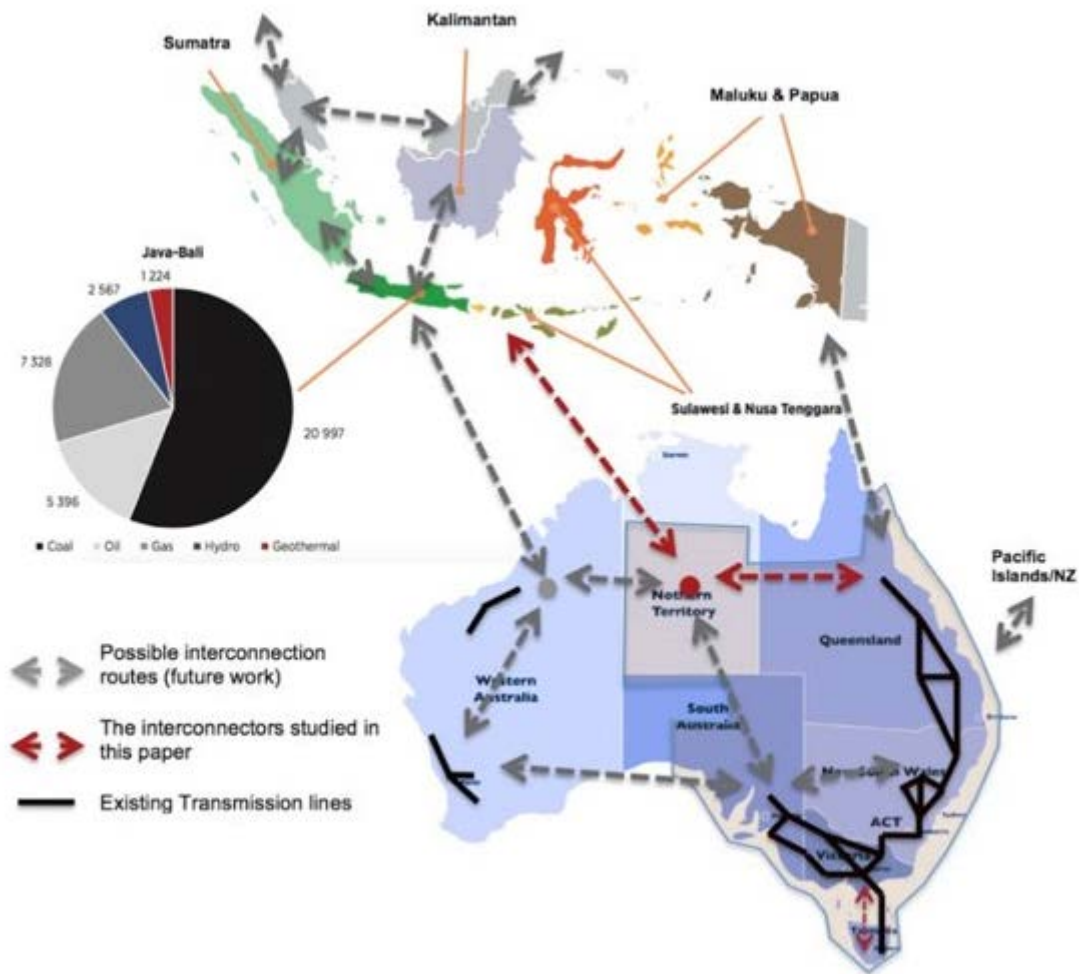


Figure 7: Garnaut 2018

The existing transmission lines are in black in Figure 7. These are the state investments that to date have organised the spatial economy of Australia. Australia has the longest sustained transmission grid in the world, stretching all the way from northern Queensland down to Tasmania via the underwater Bass Link cable. It is thin and long, and marked by poor connectivity between the States. Because, until fairly recently, energy was governed at the subnational scale and subnational states competed more than they cooperated.

But the future, the techno-utopians argue, is one of networked integration both across the country but also into Asia and this presented as great potential that Australia must plan for. We have the renewable energy sources, and they ‘over there’ have the energy-hungry growing middle class populations.

This is now being factored into planning by our energy market operator.

Figure 8 shows the market operator’s new maps of renewable energy zones: areas with high resource potential (wind or solar), where coordinated strategic transmission planning will enable connection of multiple projects at a lower cost. This is based just on the existing transmission capacity.

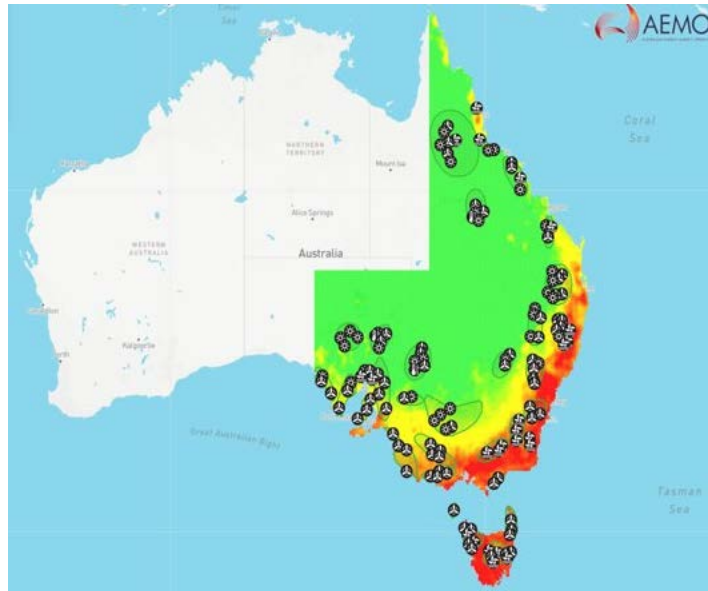


Figure 8: AEMO Integrated System Plan, 2019

The market operator has foreshadowed much more ambitious and extensive zoning over time, moving right into the areas of highest solar irradiation and lowest population density in the country - those 'unused' land areas I mentioned before.

But shouldn't those maps be overlaid with this map in Figure 9 of Indigenous land titling in Australia? These are maps showing different forms of Aboriginal ownership and control of land across Australia.

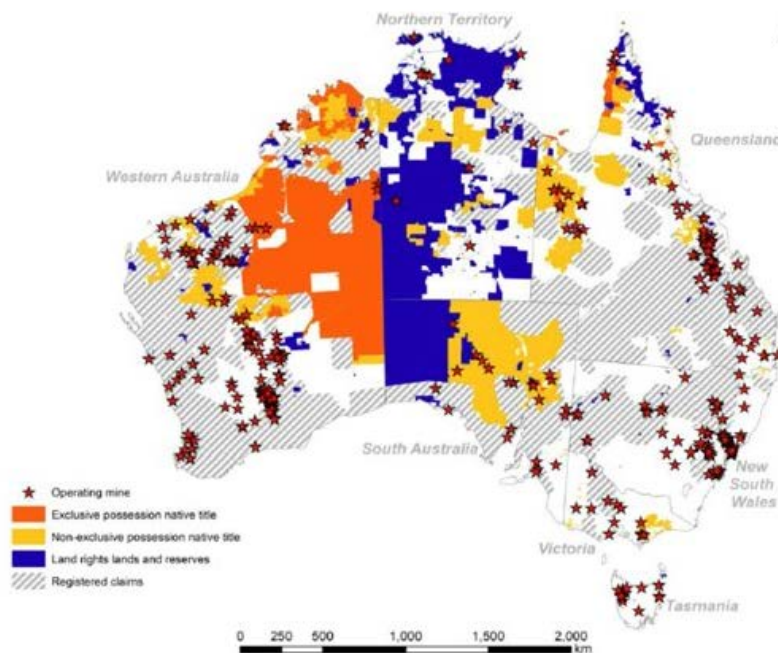


Figure 9: Markham and Altman, 2017

Note that the areas with the highest solar radiation have registered land claims across them, and the renewable energy zones of the future will creep into the areas of blue orange and yellow that are Aboriginal land legally recognised by the colonial settler state.

Below, in Figure 10, is another example of the historical amnesia and spatial blindness of energy imaginaries. Peer-to-Peer (P2P) trading using blockchain is already happening. As decentralised energy grows and storage options develop, P2P trading allows consumers to take advantage of other users who produce more energy than they need. Those consumers can sell their excess power for profit.

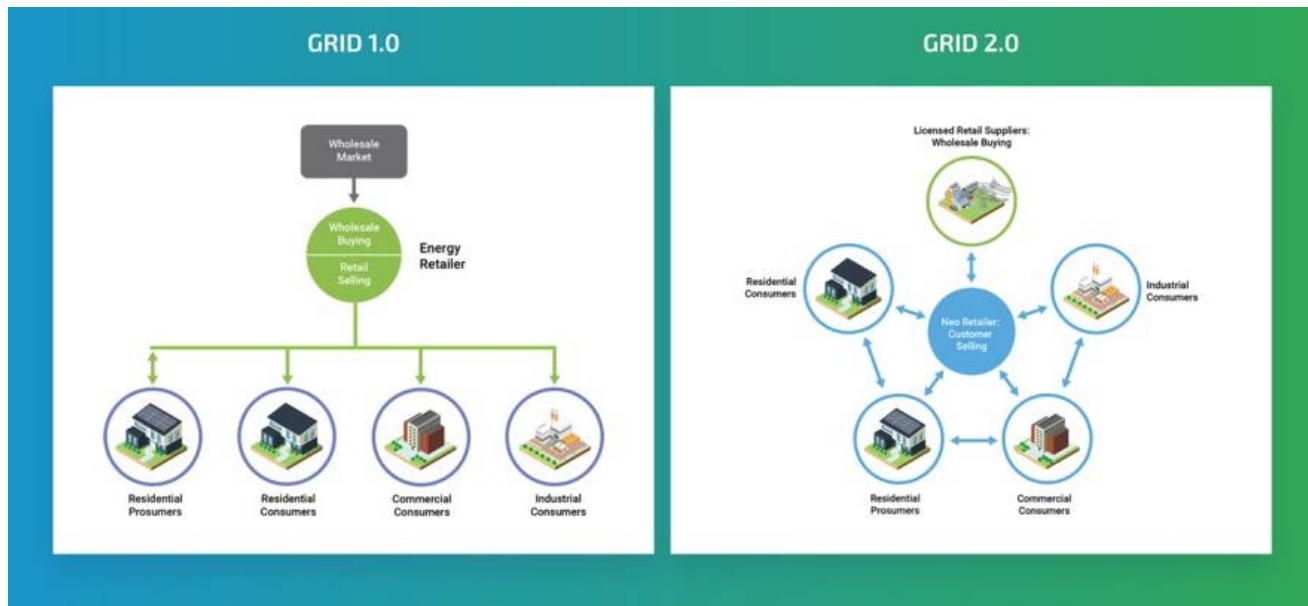


Figure 10: Sourced from <https://enosi.io/>

I was just at an interesting presentation by Andrew Glover from RMIT this week in which he was talking about his research with solar households, who expressed a desire to gift their excess power as an act of charity. They saw P2P gifting as a benevolent act. As fortunate people with solar PV they wanted to demonstrate their commitment to fairness and equity through a voluntary act of redistribution. But hang on a second.... wasn't there once a thing called the grid? And, wasn't it developed by the State based on principles of universal provision? Congealed within this grid technology is a redistributive politics. Even after privatisation, network pricing is based on principles of redistribution in the form of cross subsidies. Commercial businesses pay more so households and farms pay less for their electricity service.

Metro households pay more than the actual cost of supply so rural households can have the same service at about the same price.

I am not saying this is perfect. Arguably, we all cross subsidise power for aluminum smelters.

But my point is that the grid was established by the State to make decisions based on a set of principles, including fairness, equity and universal service provision.

What's more, those who installed solar panels have done so with state incentives and, due to the rules, currently they cannot be charged for using the grid for solar injections. So, the costs of installation and supply for solar PV have already been reallocated onto other customers who do not have solar.

Who does and does not have solar PV? Figure 11 is an image from a project we at the UoM are doing with the not-for-profit St Vincent de Paul looking at the uptake of solar PV in Victoria. We are mapping the installations relative to the annual mean, using a low to high measure. We are also mapping against a number of socio-demographic factors, one of which is the index of socio-economic disadvantage.

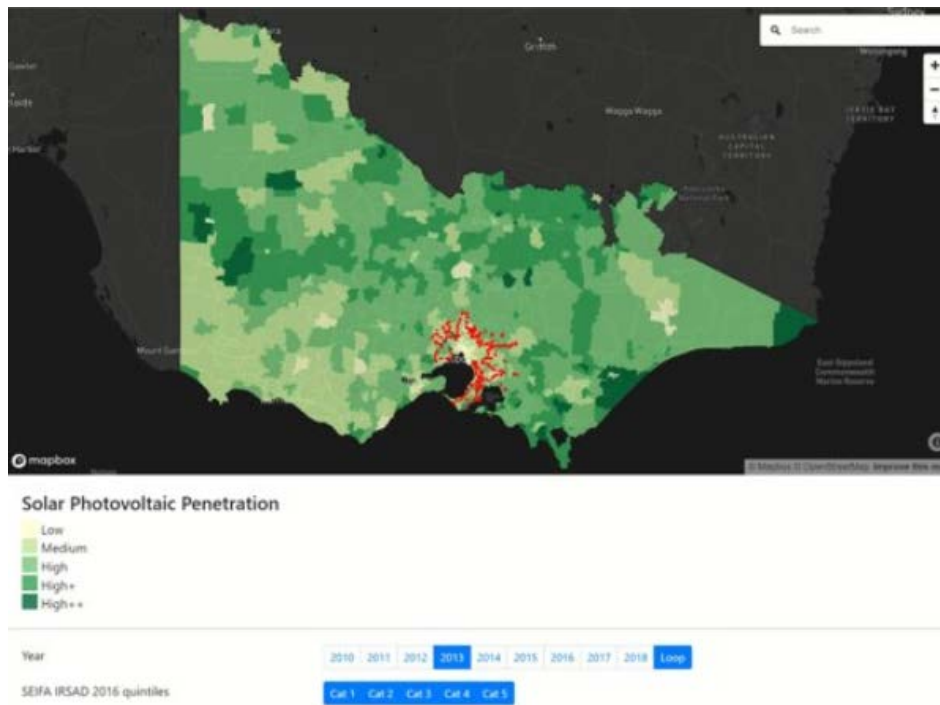


Figure 11: Chandrashekeran, 2019

Below, in Figure 12, is a clearer map created by Fanqi Li, a geography post-graduate student.

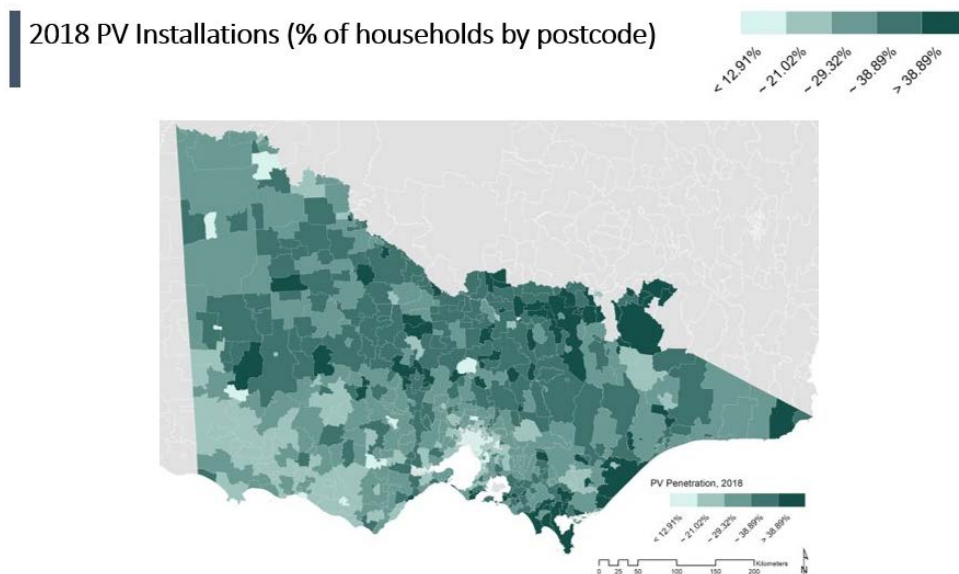


Figure 12: Chandrashekeran and Li, 2019

What we are finding is that solar PV uptake is not a simple function of wealth.

The highest uptake is not in the most advantaged quintile, but in the second and third quintiles. In fact, the most advantaged households have the lowest uptake. There is a higher uptake in rural areas.

Significant factors include owning a home, not renting, and not living in an apartment, and we are even finding that Family Tax Benefit B recipients – proxy for lower income families with young children – have a

positive association with PV installation. Beachside holiday home postcodes are outliers with very high uptake and need further investigation.

I digress though. The key point is that, those who have solar panels are actually being cross subsidised by those without as a result of state incentives, and strange rules around grid use. So, I would recast the act of privatised energy philanthropy as a repayment of debt back to the households that are cross subsidising your solar panels, but based on very socially selective criteria about who is in need and who is not.

I make these points because when I see these visions of energy futures, I think we really need to talk about the relationship between states and markets, and how we govern the energy transition in a fair and equitable manner.

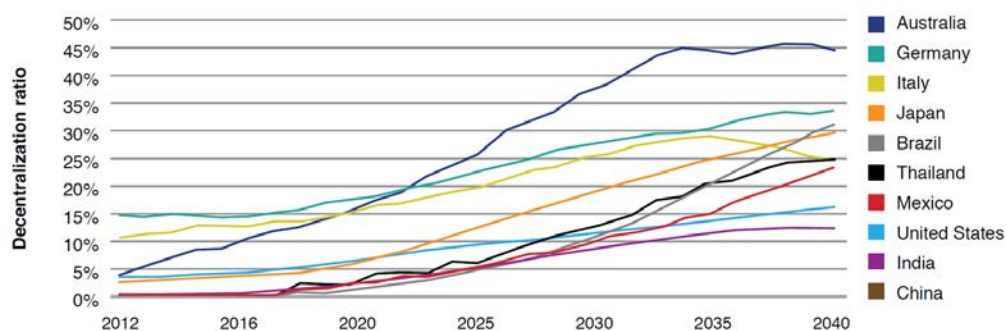
Geography has much to add here. Scholars like Tim Mitchell and Gavin Bridges have shown how infrastructures for energy are a key frontier in the evolution of economic and social space. This transcends the energy sector and is integral to the reproduction of economic power.

Simon Graham and Graham Marvin back in the 2000s argued that electricity markets reconstitute relations between providers and end users according to new logics of profit and customer value which are highly spatially differentiated: leading to “hot” (over-stretched) parts of the network and bypassing the “cold” (under-utilised) parts.

But the question we face now is, do political and regulatory institutions simply co-evolve to reflect the broader logic of marketisation?

Today I want to argue that the process of co-evolution is not straightforward. I want to show how states are actively involved in enabling, designing and managing markets, but also in disciplining them and, in some cases, unmaking them too. The ways in which this occurs are contradictory and uneven, so we need to work hard to develop a broader theory of the state under conditions of both marketisation and significant socio-environmental change. I will do this by looking at the changing Australian electricity system, which has within it some of the highest rates of renewable energy uptake in the world, putting us at the frontier of social and technological change. I want to just note that there are a number of energy geographers, like Sally Weller, who I have benefitted from discussing these ideas with.

Global Rate of Electricity Market Decentralisation



Source: AEMO and Energy Networks Australia, Open Energy Networks, Consultation Paper, July 2018

A quick word about how I am using the 'state'. I am using it to describe both a set of material capabilities, and a process. It is an institutional apparatus capable of mobilising vast resources to respond to contradictions as they emerge, including levying taxes to generate revenue and the application of force. The state then tangibly includes subnational and national governments, bureaucracies, and state-owned enterprises.

The state as a process works to manage resistance, and promote a balance of forces favourable to capital but not servile, and promotes a broader national interest. The state is the material condensation of that balance of forces between private capitalist interests and a universalising public interest. It is enmeshed in contradictions, and manages these to provide what David Harvey calls a structured coherence for growth and to maintain legitimacy.

Modern economic development was built on fossil fuel based electricity and it was state-led. In the early 20th century subnational states usurped municipalities who were then the main providers of decentralised energy.

State-owned monopolies completely redesigned the way electricity was generated, transmitted and distributed in the State. They did this through the exploitation of coal, large-scale generation and the establishment of a grid and a ring of high voltage lines that supplied a geographic region from a major load centre. Slightly different histories in different places. Where we stand today (Tasmania) is a hydro state.

The subnational state exercised almost complete control over electricity systems within their territorial boundaries and engaged in State to State cooperation on a needs basis only. Then, in the 1990s under the banner of national competition policy and marketisation, Australia undertook a radical experiment in rescaling electricity governance nationally. Well, nearly nationally. We created a national electricity market that does not include Western Australia and the Northern Territory.

This near national rescaling was fraught because the Commonwealth lacks constitutional powers to regulate electricity. All kinds of workaround emerged with varying degrees of clunkiness. The National Energy Market (NEM) was set up through the Council of Australian Governments (COAG), and a plethora of technoeconomic market governance institutions developed and operate under the oversight of COAG, including a market operator, rule maker and regulator. These managerial market-enabling institutions are highly responsive to the interests and concerns of industry stakeholders and technical energy experts, and operate by design at arms-length from the executive.

But the energy investment landscape is changing. Dispersing and decentralising production. I like this visualisation because it gives a sense of the spatial and temporal scale of investment in fixed generation assets. It shows how Victoria and NSW have shifted from a single concentrated centre of production in the Latrobe and Hunter Valleys from the 1970s and 80s to a geographically diversified fuel mix just in the last 15 years.

Note the significant growth not just of wind and solar, but gas and hydro which have an increasing role to play when the sun is not shining and the wind is not blowing.

The Australian National electricity market and its associated governance is struggling to keep up with the changing technologies, social practices, and political imperatives. Where it will lead is unclear but we know that the electricity system that we have today will be barely recognisable in 20 years' time.

Today's electricity market has been described as a "failed experiment" or failing the nation by both Prime Ministers, politicians, technocrats, community sector and industry representatives alike. Why? Here are 5 reasons.

1. The market hasn't done what it was supposed to do. It was created in the 1990s (excluding WA and NT) and designed to harness competition to drive investment in the least cost way. It has not done this.

From 2003 almost all investment in new generation has been supported by either capital subsidies or revenue support from government schemes. With the demise of the ETS in 2014, the Federal Government Renewable Energy Target has come to be the most significant driver of new investment. It creates a government guaranteed market share for renewable energy technologies. It is a form of industry policy. It is driving booms and busts in solar and wind investment.

2. The national market is not a truly national market. Despite the early intentions of market architects, there has been little investment in transmission capacity for transfers of electricity across state lines. Interstate connection remains weak. This is a problem of both governance and finance: the 'who pays' question.

3. The market is experiencing serious reliability issues with narrowly avoided blackouts in NSW and Victoria over the last few summers diminishing faith in existing forms of market governance. Below, in Figure 13, is an image from the SA blackout of 2016.

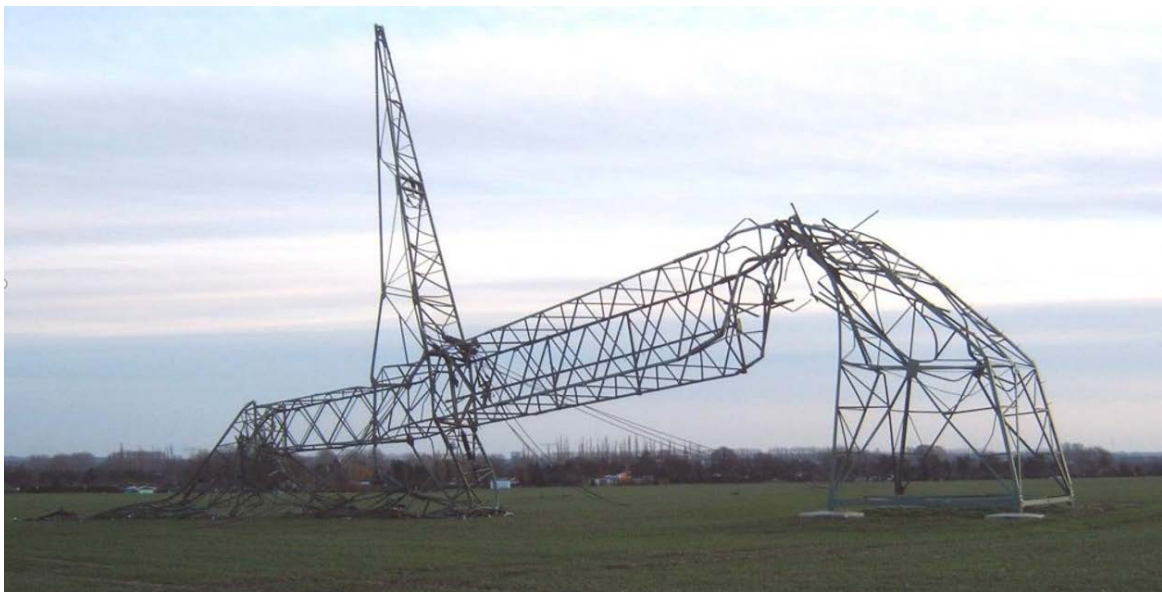


Figure 13: Renewable Energy Magazine, 2016

4. Electricity prices have risen beyond an acceptable threshold and now threaten profitability and social stability. Rising prices have deepened energy poverty and made electricity far less affordable for households and businesses and affected competitiveness for export-oriented sectors. In Figure 14 you can see that this occurred rapidly over a 10-year period, and we are now one of the least competitive electricity sectors amongst the OECD.

There is no simple explanation for this. Important factors include the exercise of market power in both retail and generation; gold plating investment in poles and wires, especially in Queensland and NSW; rising gas prices due to lucrative gas export prices; and, environmental schemes to a lesser extent.

Metropolitan Household movements in real energy prices since 1991

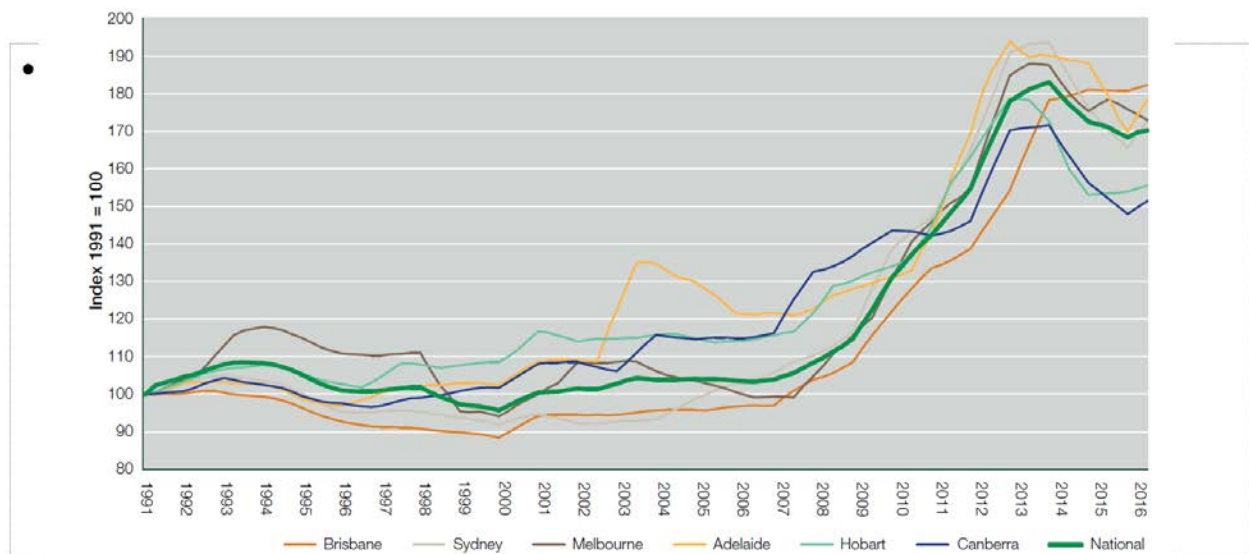


Figure 14: Australian Energy Regulator, 2017

5. There is no coherent Federal energy and climate change policy framework to decarbonise the sector. The political conflict within the current conservative national government and across parliament has led to the demise of whole of economy emissions trading schemes, and scuppered a clean energy target and the emission reduction element of the National Energy Guarantee. There is no national plan on how to decarbonise the electricity system in a fair and smooth manner.

In this context we have to ask, what is the state doing? I want to emphasise at this point that there is no single monolithic state. That it is spatially variegated, and that there are a range of counter-movements occurring that show that the state is always involved with the market, but often in complex and contradictory ways.

I will now outline four recent responses by the state to the challenges of the failing market, and then explain how the making and unmaking of electricity markets that is underway gives rise to new state-society and state-citizen divisions.

A holy grail of marketisation in the 1990s was the deregulation of electricity prices. It began in the late 1990s in Victoria, but was only completed for small businesses and households by 2016, and still with some exceptions. This took so long because electricity prices were always seen to be deeply socially embedded and politically sensitive.

Over time state's relinquished control and light-handed regulation shifted to the centralised Australian Energy Regulator.

Last year Victoria led a rearguard action to re-regulate the retail market in response to rising prices and a widespread concern that the market has not worked in the best interests of all consumers. The Federal government has followed suit for other States and as of last week they too have imposed a regulated default offer, which is a cap on the standing offer tariff that retailers charge customers who have not shopped around for a better deal.

In Victoria, this group of customers makes up less than 10% of all customers. The price cap will provide a benchmark in the market and help other customers compare their offer and their discounts. The Victorian government's framing of the default offer is around 'fairness'. It is part of the Energy fairness plan, and the Minister has instructed retailers to call it a regulated, fair price for electricity in conversations with consumers. The State is using its hierarchical powers to impose what it sees as a 'just' outcome on the retail market. This is a new development.

Previously governments encouraged and assisted consumers to navigate the complex retail market to get the best outcomes (see Victorian Energy Compare). On top of using its concessions framework or hardship programs to deliver fairness, it is directing the market on how to price for a certain group of customers. Interestingly, in Victoria there is no data to suggest that the group of customers who will be affected are vulnerable or low income, which makes me think that fairness is a secondary issue here. This is the government signaling that it can and will discipline the market if prices do not come down. It is a shot across the bow to retailers.

But this reassertion of authority may not lead to lower prices overall. If the regulated price is set too low it will make it harder for smaller retailers to recover the cost of supply. If there is consolidation in the market, prices could drift up for the majority of customers. With the convergence of tariffs towards that capped offer, mid-size retailers lose flexibility, whereas the large fossil fuel generator/retailers will be better placed to absorb the disruption, and the small new entrants who are competing aggressively on price could be pushed out of the market.

So, regulation on the retail side could counterintuitively translate into higher prices, reduce competition, and cause more uncertainty and caution in renewables investment. I wonder whether the government has another measure up their sleeve to address that - a government-owned retailer perhaps? Could this be the thin edge of the re-regulation wedge?

Last year, around the time of the bitter dispute within the Coalition about the National Energy Guarantee which culminated in the ousting of the sitting Prime Minister, the Federal government did something quite extraordinary that I don't think got the attention it deserved. It spent \$6 billion to purchase 5.5 GWs of generation capacity from the Victorian and NSW government to make it the sole owner of the Snowy Hydro Scheme. It has plans to expand the scheme's capacity to 2GW of hydro supply and storage capacity.

When wind and solar are producing excess power, Snowy 2.0 can pump water in Talbingo up through 26 kilometres of underground pipeline to Tantangara (see Figure 14). When wind and solar cannot meet demand, water would be drawn back down the tunnel through turbines to generate hydro-electricity.



Figure 14: ABC News, 2019

The purchase from the Victorian and NSW governments, makes the Federal government the owner of the fourth largest generator and retailer in the country now. This gives the government extraordinary power to control one part of rising wholesale electricity costs, because hydro and gas are consistently the fuel sources that set the marginal price for electricity in the wholesale market. As the price setting bidder, Snowy Hydro could help control volatility in the wholesale market, and act as a deterrent to other firms seeking to engage in uncompetitive market bidding.

The Snowy Hydro purchase harnesses the developmental and nation-building discourses of post WWII in service of the hegemonic project of macro-regulatory integration, and enhanced national influence in the electricity market. It also corrects a historically stupid decision by the Federal government to hand the scheme to Victoria and NSW in the 1990s in return for a commitment to corporatising their electricity assets. It is also worth noting that water from the hydroelectric scheme underwrites the production of around \$3 billion worth of agricultural products every year by releasing water into the Murray and Murrumbidgee Rivers.

There is a consolidation of the national interest through this purchase, and that national interest is based on a hegemonic vision of national identity, social protection, and environmental significance. It also allows the Federal government to become a major actor in the transforming and volatile electricity generation market. What the Federal government lacks in administrative sovereignty over electricity, they are making up for through territorialised fixed investments. The purchase during a period of economic stagnation and deficit reduction pressures gives you a sense of how concerned the government is about reliability and prices.

On 28 September 2016, South Australia's power supply shut down when tornados knocked out critical infrastructure, including giant transmission towers. The Federal government with no evidence blamed it on SA's higher than usual renewable generation penetration. The Labor government in South Australia used this as the impetus to effectively abandon its commitment to market-based planning and investment, and to step out alone with a subnational energy investment plan.

Premier Jay Weatherill declared that, “the national energy market is failing South Australia and the nation” and criticised a privatised energy sector that “put profits before people”, concentrated market

power in a handful of energy companies, an incoherent national energy policy, and “ideological attacks” on renewable energy leading to underinvestment (State Energy Plan 2017).

The Premier legislated to give the Energy Minister power over the NEM and initiated interventionist strategies that included building a state-owned gas generator for backup, and creating targets and incentives for local energy sources.

The Energy Plan continued to be implemented even after Weatherill’s Labor party lost power in 2018, and enjoys strong support in the South Australian electorate. Just after the blackout Australian software billionaire CEO of Atlassian, Mike Cannon-Brookes, and Elon Musk began conversing on Twitter. Musk claimed that his company could install a battery farm capable of ‘fixing’ the system within 100 days, or else do it for free. A \$50 million bet ensued. It was done within the timeframe so Cannon-Brookes paid up.

This reveals the celebrity circumstances under which entrepreneurial global capital can be attracted for decentralised renewable and storage projects, effectively bypassing the normal state-mediated procurement processes, at least initially.

The reserve battery is owned and operated by a French company and, as part of its package of intervention, the South Australia government created a Power Purchase Agreement with Neoen, so they have the right to call on the stored power under certain circumstances. That agreement costs taxpayers \$4 million per year.

Within six months it was estimated to have saved A\$40 million in costs by providing back up power. In other words, it avoided costs which would eventually be passed on to consumers, and it has also been hugely profitable for the company owner. Just shows that rich white men can do anything with the power of Twitter.

South Australia is not going it alone. All States and Territories in the NEM now have plans to be zero net emissions by 2050 and are developing decarbonisation pathways accordingly that will influence decision making on coal plant closures and the creation of renewable energy zones. Cities are going even further.

So, we have a curious situation where the Federal government cannot establish a coherent energy policy position but independently the states and territories have achieved just that national coherence, and subnational ambition is helping finance capital to flow into low carbon projects.

This decentralisation is driving inter-regional competition to attract low emissions generation and supporting infrastructure. Subnational states are competing with each other to attract global investment in renewables, and it is happening over twitter.

I will just mention this briefly. It is interesting to note that despite all of this turmoil and the crisis in the national market, the Federal government is pushing ahead to make energy data much more freely available. A Consumer Data Right will create third party data access models in the key sectors of energy, banking and telecommunications.

It provides consumers with a right to access and transfer certain types of data about themselves to accredited third parties. Currently this data is highly protected and restricted to just a handful of market participants.

Third party access will be enabled through a centralised data platform hosted or coordinated by the market operator; an accreditation process for third parties; and a consent regime so consumers can grant

access to third parties. There are a host of grey areas and unresolved questions related to who owns the data, how value is created in the data, and how the data is shared.

I won't go into the details of this. Suffice to say that there are real concerns about who will be made vulnerable and the adequacy of protections. What I want to stress is that this is a state-driven process to determine the form and nature of enclosure of the energy data commons. Through the Consumer Data Right the rhythms and patterns of your behaviour inside the home will be commodified through state-led initiatives to create a regulated market for data.

Conclusion

I have argued that the state plays an active role in reshaping the energy landscape in Australia. The state works in and through markets to promote particular accumulation strategies and to achieve social cohesion and legitimacy. I have drawn attention to the current challenges of the NEM, and used this as an opportunity to provide insights into the way the state operates to both stabilise and transform accumulation; to show how it operates across scales; and its distributive purpose. I argue that these are key elements that will influence how we move to a decarbonised, decentralised and digitalised energy future.

How does the state shape Australia's market society? I could facetiously answer that, when it comes to electricity, how does it not shape markets. From the micro to the macro, from the surface all the way down, the state is ubiquitous. I do not want to generalise this case study too far to every market in every place, nor do I want electricity to get typecast as an exception to the neoliberal rule. Instead, I would argue that our understanding of how states govern markets remains impoverished so long as we continue to ignore the actual realms of state intervention and focus attention on self-regulated markets. Questions of political authority, legitimacy and state-market-society relations are never far from the surface of state infrastructure projects. We can think of infrastructure broadly to include electricity, transport, and digital networks, but also water and clean air. Through the study of infrastructural markets, we can unpack the ways in which the state is constituted through social relations and governs through the social relations of markets. By doing so we demystify and challenge the seemingly mythical powers of markets over our everyday lives. We cease to see ourselves on an inclining gradient that inexorably drags us further down towards the commodification of everything.

If we re-socialise markets from the outset, rather than as an ex-post reactive counter movement, we can see how deeply intertwined markets are with the social fabric, and therefore subject to the norms, rules and logics that go beyond markets and market values. As the nature of the contradictions become bigger, denaturalising and resocialising markets is important work for geographers.

The four mini case studies of new energy governance developments that I presented paint an interesting picture of the range and nature of state involvements. I make the following observations. States use hierarchical power to limit the power of firms – this is now a real possibility, not a distant risk. Re-regulation is a repudiation of faith in markets to achieve the least cost outcomes, and signals a change of winds following a decade or more of deregulatory dynamics. State ownership of the means of electricity production is another counter movement, following two decades of privatisation. We should not overstate the likelihood of this occurring particularly in the current fiscal climate. What is more significant is the strategy of ownership as a means to gain and exercise power in the market. Market discipline can then occur from within the market itself.

Re-regionalisation of energy governance also takes us backwards in time when subnational states dominated electricity supply and provision within their borders. This is partly a response to the decentralisation of technologies, and a reassertion of deep path dependence. Or perhaps it just puts to bed the heroic claims of free market ideologues to be able to go beyond our Federalist spatial structure and govern electricity infrastructure for all Australians. The techno-utopian claims of Australia as a renewable energy super power will have to grapple with the plural multi-scalar states that we have - Federal/state/regional/local. It is worth pondering whether the subnational state presents the limit to the devolution of energy governance. There is a rich history of municipal governance of electricity in the 20th century, somewhat erased by the reform juggernaut. Could decentralised smart grids coevolve with an even more micro scale of governance? This raises complex questions of political geography in the Australian context.

Finally, I added the digitalisation example because I think it shows us quite clearly that the state continues to perform its core role of creating new regimes of accumulation and stabilising existing ones. The Consumer Data Right once applied to the electricity sector will take a barely touched data commons and make it ripe for enclosure and then commodification. The state plays a central role in making new markets for data, and will have to be pushed to preemptively protect citizen-consumers from the worst impacts of these, rather than wait for the inevitable Cambridge Analytica scandal to arise.

I have stopped short of making a grand claim about the nature of the state that we see. It is not simply a competition state enabling markets to develop largely unfettered. As the major owner of the means of production, and as the hierarchical re-regulator of markets we do see shades of the developmental state. However, this developmental state does not take a centralized form as it did a century ago in Australia. Rather it is working in and through markets to achieve a balance of forces between competing social and political interests. It is the hybridity of states (plural) that is most notable.

Finally, I would like to return to Fay Gale' legacy as an interdisciplinarian and as an advocate for justice. Political economic geography is a study of wealth, welfare and distribution as a fundamentally spatial phenomena. This is an important aspect of energy studies, but it is insufficient. We need the social, cultural and physical environmental insights of geographers as well. Both in Australia, but particularly overseas, I think the subdiscipline of economic geography needs to connect environmental change with heterodox economics more. Inequality is increasingly being driven by a changing environment. And the more we do this, the more we will find ourselves at the very intersection of questions of both social, economic and environmental justice. In the spirit of Fay Gale I look forward to talking and engaging with all of you to produce fairer, kinder and more caring energy futures.

References

Chandrashekeran, S (2019) The Social Context of the Energy Transition (password protected website)

Chandrashekeran S and Li, F (2019) “Exploring the Social-Spatial Context of the Energy Transition”, Conference paper *State of Australian Energy Research Conference*, Canberra, June 2019

Garnaut, R (2018) “Australia as an Energy Superpower in a Low-Carbon World” 2018 Annual AARES Conference, Adelaide Convention Centre on North Terrace, Adelaide, South Australia 7 February 2018