



Electricity markets in flux: The importance of a just transition^{*}

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ABSTRACT

Electricity prices in Australia have increased at an annual growth rate of 8% over the past decade, nearly four times higher than inflation (2.3 %). Low-income households spend a greater proportion of weekly income on energy costs. This article explores the nature of a ‘just transition’ toward lower emissions within electricity markets, with a particular focus on end user pricing outcomes and significantly impacted communities (e.g., coal mining regions, etc).

1. Introduction

Australia’s position in terms of electricity prices deteriorated from the fourth cheapest in the OECD in 2004 to the tenth cheapest in 2016, to now having the fourth highest prices amongst OECD countries (Australian Competition and Consumer Commission [ACCC], 2018). Over the last decade, the price of electricity in Australia has increased at an annual growth rate of 8%, more than twice that of wage growth (3.1 %) and nearly four times higher than inflation (2.3 %). Further, the economic divide in Australia means low-income households (i.e. with an annual income of \$22,761 or less) spend up to 8% of their income on electricity each year, compared to around 3.5 % for average-income households (Australian Energy Regulator AER, 2019). Moreover, as the majority of low-income households are tenants, they face barriers to various energy efficiency measures, such as increasing acoustic and thermal insulation as well as installing solar photovoltaic (PV) systems, due to the split-incentives problem (Nelson et al., 2019a).

In parallel, equity issues related to employment and regional development have emerged in Australia as the market transitions to the

availability of new technologies, which now make renewable, rather than coal based, sources of electricity more viable. Unless policy makers and industry work together, this transition poses short term challenges for communities that have been historically reliant upon centralised, fossil-fuel-based electricity production for jobs and economic activity¹.

2. What would a “just transition” look like?

To meet international commitments, Australia needs to reduce its carbon emissions to 26–28% by 2030 and reduce 2000 levels by 5 % by 2020 (Nelson et al., 2019a,b; Savaresi, 2016). There is strong agreement that the electricity transition should be driven primarily by the need to decarbonise and take advantage of technologic advances, while also protecting vulnerable citizens (Finkel, 2017). Transitioning away from high emissions-intensive coal and gas to zero-carbon energy sources is necessary in order to have a chance of restricting global warming to well below 2 °C in order to avoid more dangerous climate change in line with the Paris Agreement (Figueres et al., 2017; Spencer et al., 2018). In the Australian context, this principally implies switching from coal to

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¹ See Ratnam et al., 2020 for analysis of challenges facing the electricity market caused by climate change and associated emerging risks.

renewables (Denis et al., 2014). The transition to renewables offers numerous opportunities, as Australia can be an exporter of clean energy like green hydrogen (Hosseini and Wahid, 2016) and is richly endowed in emission-free energy sources such as solar and wind. However, the shift to renewable energy also presents challenges. Much of the debate around the energy transition has focused on an energy trilemma of the challenge of achieving secure and reliable energy supply while reducing carbon emissions and ensuring affordability for consumers (Finkel, 2017). While these issues are important, the failure to also consider the distributional and equity considerations of people, workers and communities in the transition, combined with an overwhelming focus on technical and market driven solutions, is leading to negative social outcomes and resistance to more rapid decarbonisation.

A failure to adequately address equity and fairness can render even the most economically-efficient design unsustainable (Rai and Nelson, 2019). Which party is responsible for delivering social or equity outcomes is often debated, with many believing it is 100 % the purview of Government. This paper, however, suggests that government, regulators, and energy companies all have a role to play in developing and implementing regulation, policies, products and services that lead to better social outcomes for all.

3. Australia's imperative to protect vulnerable consumers

Access to reliable and affordable electricity is a basic and essential human right (Tully, 2006). It is critical to the health, wellbeing, economic participation and social inclusion of Australians (Australian Council of Social Services [ACOSS], 2017). Recently, the essential nature of energy has been broadened under the Sustainable Development Goals², to ensure access to affordable, reliable, sustainable and modern energy for all (United Nations, 2019).

Despite the essential nature of energy, over the past decade electricity prices have significantly increased (ACCC, 2018), low income households are paying significantly more for the energy with a larger proportion of their income (ACOSS and Brotherhood of St Laurence, 2018) and the number of households experiencing energy hardship has risen (ACOSS, 2017).

Low income households on average spend 6.4 % of their income (up from 5.9 % in 2008) on energy, compared to 1.5 % (up from 1.4 % in 2008) for the highest-income households (Phillips, 2018). One in four pay over 8.8 % of their income on energy (Phillips, 2018). They are also more likely to live in inefficient homes and not own rooftop solar or batteries. Data show that low income households appear to use less energy and spend less in dollar terms per year, yet pay disproportionately more, even after energy concessions are considered (Phillips, 2018). Further, people on Newstart and Youth Allowance, sole parents, lone pensioners and renters are most vulnerable (Phillips, 2018). Many people on low income either deprive themselves of energy to afford to pay bills and/or end up in debt (Middlemiss and Gillard, 2015). The impacts of this include poor health, less spending on other essentials, social isolation, and increased risk of homelessness (Middlemiss and Gillard, 2015).

Rai and Nelson (2019) argue that while the Hilmer reforms of the early 1990's serviced electricity consumers well, three key issues emerged from the mid-2000's that resulted in the doubling of electricity retail prices: (1) Significant and largely unnecessary rise in networks; (2) Emissions policy discontinuity; and (3) Large increase in wholesale prices due to rising fuel prices and sudden exit of coal-power generators. Combined with deficiencies in cost recovery mechanisms (Rai and Nelson, 2019), underinvestment in household energy efficiency (Phillips, 2018), and deregulation of retail electricity (ACCC, 2018), amongst other things, have contributed to the increasing amount low income households spend on energy. Also see MacGil and Eplin (2020) for

detailed discussion on end-to-end electricity market design considerations that impact electricity pricing.

While the Australian Energy Market Commission (AEMC) (2019) predicted there will be a modest decrease in electricity prices in 2020 due to increasing investment and advancement in solar and wind power generation (Graham et al., 2018), the issues identified still remain and new issues are emerging. Further, technology change and the growth in distributed energy resources and services are contributing to the emergence of new distributional and equity issues. For instance, the Commonwealth Scientific and Industrial Research Organisation and Energy Networks Association (CSIRO-ENA) (2017) predicts up to 45 % of Australia's electricity needs will be provided by customer-owned generators by 2050. The shift is modelled to provide greater efficiency in the system, reduce the need for significant investment in traditional poles and wires, improve reliability and security, pay customers for grid support, and save the average household \$414 annually compared with a future based on business as usual (CSIRO-ENA, 2017). The study also found those who could access solar and batteries were substantially better off than those without.

Ultimately people on low incomes (especially renters) do not have the financial means or choice to invest in measures to help reduce their electricity bills like energy efficient appliances or distributed energy such as rooftop solar (Ugarte et al., 2016).

Current network access and pricing rules result in non-solar households paying more for network costs and distributed energy integration (AEMC, 2019). Many federal and jurisdictional energy efficiency, rooftop solar subsidies or rebates are poorly targeted and do not assist people in low income and wealth quintiles access energy efficiency and distributed energy (Commonwealth of Australia, 2017). Current policies are exacerbating the problem³. Some policies that encourage the uptake of renewable energy and energy efficiency are funded through electricity bills creating poor distributional outcomes. The Australian Competition and Consumer Commission (ACCC) (2018) calculated that environmental schemes contributed on average 6% of the electricity bill. While these subsidies are beneficial to all by reducing emissions, people on low incomes benefit the least (for example, they are less likely to purchase rooftop solar) and pay disproportionately more of their income (Best et al., 2019; Rai and Nelson, 2019). Low income households are generally locked out of the benefits of solar PV due to their housing tenure, which creates two barriers broadly considered as the split incentive problem where: (1) landlords incur the capital cost of installation with no direct benefit (e.g., the tenant rather than the landlord receives lower electricity bills); and (2) relatively short tenures of rental agreements, which are not conducive to expensive tenant capital investments.

4. Coal transition challenges for affect workers and communities

At the turn of this century, coal-fired power stations supplied more than four-fifths of Australia's electricity but this has fallen steadily, reducing to 61 % in 2017 (Burke et al., 2019). Around one-third of Australia's coal-fired power stations closed between 2012 and 2017, with most of the remaining stations expected to close over the next two decades, if not sooner (Burke et al., 2019). An ageing coal-fired power fleet, increased use of natural gas, coal's high emissions profile, policies to bring renewables onto the grid and relatively slow progress in reducing the cost of carbon capture and storage (Arranz, 2016) have each contributed to coal's decline. Technical progress is continuing to reduce the cost of new solar and wind installations (Blakers et al.,

³ We acknowledge that ineffective energy pricing strategies, as discussed by Brear et al., 2020 and Gordon et al., 2020, also impact energy affordability and equity. Also see Blackhall et al. (2020) for possible strategies to improve pricing equity in the electricity market through Distributed Energy Resources.

² Australia is a signatory to the sustainable development goals.

2019), making it increasingly unlikely that new coal-fired power stations will be built in response to private incentives alone.

The changing costs and need for faster decarbonisation could cause future coal closures to be sudden and sooner than expected. The unexpected closure of Northern Power Station in South Australia and Hazelwood Power Station in Victoria had significant repercussions for the energy system security and prices (Mountain and Percy, 2019). The closure also had significant implications for workers and communities. Looking at the international experience, coal-mining regions have undergone structural declines that have led to social disadvantage in some key coal-mining countries, including the United Kingdom (Johnstone and Hielscher, 2017) and the United States (Carley et al., 2018). Spencer et al. (2018, p. 13) conclude that coal-sector transitions have often been “poorly anticipated and poorly managed”. In Germany, unions were able to negotiate significant adjustment packages (Abraham, 2017), although financial compensation for workers does not necessarily solve the issue of regional structural adjustment.

From a national perspective, in the short term a transition from coal-fired electricity generation does not necessarily involve fewer jobs in electricity generation, since the installation of solar and wind generation capacity is a relatively labour-intensive process (Diesendorf, 2004; Fankhauser et al., 2008; Wei et al., 2010). At present, more people are employed installing and maintaining solar panels than in coal-fired power stations (Grudnoff and Denniss, 2014). However, Australia’s coal-fired power stations are all located in regional areas and according to the Productivity Commission (2017) adaptive capacities tend to be more limited in these areas than in capital cities.

In Australia, regions where coal mining and coal use in power generation are concentrated are particularly exposed, especially the Latrobe Valley in Victoria, the Hunter Valley in NSW, and the Mackay and Fitzroy regions of Queensland. For instance, Burke et al. (2019) found that regions with one or more recently closed coal-fired power stations have seen an increase in their unemployment rate of around 0.7 % on average, while other factors held constant. The research found that the increase in unemployment persisted beyond the initial six months, however some key regions have gone on to achieve reductions in their unemployment rate within a year or two. Sheldon et al. (2018) argue the lack of pre-planning, coordination, preparations and short notice have left many retrenched workers and their communities in Australia with very difficult transition problems. A lack of subsequent support has caused numerous problems such as intergenerational unemployment, poverty and poor physical and psychological health to continue and worsen with time, becoming entrenched and systemic.

The Paris Agreement⁴ affirms “the imperatives of a just transition of the workforce and the creation of decent work and quality jobs” (United Nations, 2015). The International Labour Organization (ILO) (2015, p. 12) notes that transition policy:

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

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

To date, there has been little to no transition planning for affected workers and communities in Australia. While there has been an attempt for planned closure and transition, for example the case of AGL giving formal notification to close the Liddell power station in 2022, there has been a mismatch with business strategy and political strategy (see Dodd and Nelson, 2019). Further, research conducted by Beyond Zero Emission BZE (2019) in collaboration with unions, social sector, traditional

owners and local community members of coal town in Collie Western Australia, has found that with foresight, co-design, planning and the right policy settings, there is opportunity to create 1750 jobs, more than offsetting the 1250 positions in the Collie coal industry.

5. The overarching policy challenge

The discussion of the social implications of the energy transition for people on low incomes or experiencing disadvantage, industry workers and affected communities, brought a number of critical issues to the fore. There is overwhelming support for decarbonisation of the energy sector which can play a key role in Australia’s contribution to limit global warming and minimise the impact climate change is already having on people, communities, the economy and our environment. However, there is frustration at the failure to deliver long-term stable integrated climate and energy policy. The perception is that the instability is being driven by ideology and self-interest, and not what is in the best short and long-term interest of the health and wellbeing of people, community, economy and environment. Additionally, there is a lack of trust in the energy sector as a result of the failure to put all people and community at the centre of product and service delivery. There is concern that the focus of policy makers on ideology, market and technical aspects of the energy transition, with little consideration of the social, distributional and equity considerations of people, workers and communities, is leading to negative outcomes and resistance to more rapid decarbonisation. Ongoing questions remain about who pays for the transition, are the costs being allocated equitably, are all people able to access benefits of modern energy system equitably? Rai and Nelson (2019) argue that equity and fairness impact the sustainability of electricity market designs and policy initiatives far more than what is typically anticipated, and failure to adequately address equity considerations can render even the most economically-efficient design unsustainable (Rai and Nelson, 2019). Equity needs to be a central part of policy design, even if from an economic efficiency perspective such policies are not initially ideal.

Prioritising the needs of people most vulnerable in a poorly managed transition is paramount. Planning for a just transition, for and in collaboration with workers and communities, was also seen as essential to build support, reduce stress, and maximise. The Australian Council of Trade Unions (ACTU) believe that governments should support workers and communities affected by the closure of coal-fired power stations by promoting the development of new employment opportunities, developing effective transition programs and helping them find decent and secure jobs (ACTU, 2016). Greater opportunities for engagement between governments, unions and communities are essential for job creation and community renewal, to ensure no one is left behind, while Australia transitions to zero emissions is essential (Smith, 2017).

6. Recommendations for future action, policy reform, and research

There is clear value in addressing the social, distributional and equity considerations of people, workers and communities to eliminate negative outcomes, increase support for more rapid decarbonisation, and improve the lives for people, communities and the environment. The following recommendations are proposed as a start.

6.1. Vision and principles

Consumer advocates have raised concerns that the National Energy Objective is no longer fit to guide the energy transition, for example it makes no reference to decarbonisation or social equity (ACOSS, 2017; Vorrath, 2016). In addition, the reform processes tend to focus on technical and market issues, rather than the values that should drive how we provide energy to people. Advocates have proposed the development of a new vision and principles for the Australian energy system that reflects the values of people, is future focussed and can be used by

⁴ See Nelson (2020) for further analysis of the implications of the Paris Agreement on the energy transition.

decision makers to guide policy and reform. The draft New Energy Compact (NEC) sets a vision for an inclusive, sustainable energy system that actively improves outcomes for people, the community and the environment (ACOSS, 2020). NEC's guiding value is that energy is an essential service, and everyone has the right to access clean, affordable, dependable energy. The vision and guiding principles are implemented through applying the following principles: put people at the centre; think long term and be flexible, just and fair; ensure it works; and deliver clean and healthy energy. Importantly, engagement and co-design with a broad range of stakeholders is critical.

6.2. Integrated climate and energy policy

6.2.1. Carbon pricing

There is a need for a predictable policy treatment of carbon dioxide emissions that can link to a possible future economy-wide emissions price signal. An emissions price signal would enhance investment conditions in the electricity sector and put downward pressure on price by reducing carbon policy uncertainty. It will also ensure the energy sector decarbonises in line with Australia's fair share of reducing global emissions, noting the energy sector should decarbonise faster than other sectors given the access to cleaner more affordable resources and technologies.

6.2.2. Mechanisms and incentives for coal exits

There currently are no provisions to encourage or mandate a specific timetable for the closure of coal plants. This has led to relatively sudden closures. As a result, replacement investments tend to come on stream well after the closure of power plants, leading to higher prices and risking disruptions in electricity supply. Local communities and State governments have little time to put in place economic and social adjustment programmes. There is now a requirement for a three-year notice period ahead of closure, however compliance is not strongly incentivized and this may not preclude future sudden exit. Thus, mechanism and incentives should be introduced to encourage predictable and orderly closure of coal-fired power stations, and possibly allowing to tailor the timing of coal plant exit to system requirements.

6.3. Planned transition for workers and communities

There is a need for planned transition for energy workers that includes adequate safety net to remain available. Further it requires access to high-quality re-training opportunities and labour market adjustments that would benefit from reduced barriers to mobility. A phase-out of stamp duty on homes is also commonly recommended as a key method of improving geographical mobility in Australia (Henry et al., 2009; Productivity Commission, 2017). In addition, worker transfer schemes, as used for workers at the former Hazelwood Power Station, offer a potential approach to ameliorate unemployment concerns associated with the energy transition. Where suitable, new energy-sector projects might be able to directly negotiate worker transfer arrangements with coal-fired power stations, without government subsidies.

Part of coal exit policies should be provisions to help with regional economic transformation and diversification, and measures to achieve socially acceptable transition outcomes for local communities. The creation of a Justice Transition Authority to plan and support the transition for workers and communities could be implemented in Australia (ACTU, 2016). A Justice Transition Authority has been supported by unions, social sector, environment groups and a number of political parties (Maritime Union of Australia Division, 2019)

6.4. Making electricity pricing and reform more equitable

Cost recovery mechanisms for government subsidies require reform and should come from more progressive cost sharing such as government budgets instead of energy bills where people on low incomes pay

disproportionately more of their income. Reforms are needed in the recovery of transmission and distribution network costs, as a higher percentage of these costs are recovered via volumetric charges than fixed charges. This allocates more of the costs of networks to consumers who are unable to reduce their grid-sourced electricity. Financially vulnerable households are less able to afford measures such as rooftop photovoltaic systems and batteries that reduce grid-sourced electricity consumption, meaning they are paying an increasing share of network costs

6.5. Targeted subsidies and rebates

Renewable energy and energy efficiency subsidies, rebates and programs should be targeted at people who would otherwise be locked out, for example:

- Governments invest in solar and energy efficiency upgrades for public, Aboriginal and community housing;
- Governments establish an Aboriginal and Torres Strait Islander Clean Energy Fund to invest in solar energy and battery storage (and potentially energy efficiency improvements) for regional and remote Aboriginal and Torres Strait Islander communities; and
- The Federal Government develop a funding mechanism (like the Solar Cities program) in conjunction with State governments, local councils and energy retailers, to install solar photovoltaic technology and batteries (and energy efficiency measures) for households with low incomes or who are otherwise disadvantaged.

6.6. Retailers put all customers at the centre

Retailers build greater trust through delivering more equitable and customer-centred products and services including fairer pricing and better hardship policies. Initiatives here include:

- Ensuring price discrimination is based on customers' capacity to pay. ACCC (2018) noted price competition (and competition more generally) in the retail market is based predominantly on offering varying conditional discounts off varying bases. This can make these offers difficult to understand and to compare, leaving many consumers on plans that do not match their capacity to pay. For instance, 27 % of residential customers on conditional-discount offers did not achieve their discounts. The situation is worse for customers in financial hardship and on payment plans, two key groups of vulnerable customers, of which around half did not achieve their discounts (ACCC, 2018).
- Better-designed and targeted hardship policies. Retailers' hardship policies could be improved, especially for vulnerable customers, by retailers identifying vulnerable consumers earlier and reducing some of the entry requirements into hardship programs (such as onerous 'commitment to pay' requirements that need to be met before a consumer can enter the hardship program) (ACCC, 2018).

In relation to the first issue, the AEMC made a rule in February 2020 that forces retailers to limit the size of their conditional discounts to levels consistent with the reasonable costs avoided by those discounts (namely, the avoided debt costs to retailers from customers paying on time). This should serve to reduce the extent of discounting, and therefore the *de facto* penalties incurred from not paying on time (an issue especially relevant for vulnerable customers who, by definition, have a low willingness to pay) (AEMC, 2020).

Similarly, the AEMC made a rule in November 2018 requiring the AER to develop enforceable hardship guidelines that include consistent and specific statements that retailers must include in their hardship policies. The statements aim to provide guidance to customers on their rights under the hardship guideline, whilst allowing retailers flexibility

in how they develop their hardship programs to meet their customers' needs (AEMC, 2018).

6.7. Improve capacity to pay

Analysis shows that for many people on low income, the capacity to pay their energy bills will remain an ongoing issue even if energy prices fall and the above recommendations are implemented. In addition to the retailer-focussed initiatives noted above, concession schemes should be better targeted and more consistently applied across retailers (ACCC, 2018). These reforms require government, as opposed to retailer action. Furthermore, the size of concessions should be increased to the greatest extent possible. This is especially pertinent given the significant deterioration in electricity affordability amongst low-income households. Further, the size of general concession schemes such as Newstart could also be increased⁵.

7. Conclusion

The goal of achieving a just transition from coal to zero-carbon energy sources of electricity presents social implications for people on low incomes or experiencing disadvantage, workers and affected communities. In recent years predictable and unpredicted social implications from the transition have emerged, which shed light on areas of improvement within policy that need to be examined to enable an effective people-focussed transition. Firstly, low incomes individuals are often not adequately considered during policy reform. As a result, some policies have funded the uptake of renewable energy and energy efficiency by increasing electricity bills which has created poor distributional outcomes. Therefore, new policies need to be applied that are fairer and equitable. Secondly, the closure of coal-fired power stations has resulted in social implications for workers and affected communities. A lack of management, planning and short notice has left many workers and communities in Australia with a very difficult transition. Thus, there needs to be consideration of how to reduce the strain of these closures. The social implications of the energy transition for people on low incomes or experiencing disadvantage, industry workers and affected communities do not have a singular solution. However, the recommendations for future action, policy reform and research suggestions provided may help reduce negative outcomes of this transition, allowing Australia to effectively transition to zero carbon emissions and meet its Paris commitment.

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⁵ Over the past 25 years, Newstart has not increased in real terms, while living costs have increased significantly. ACOSS and its partners call for an increase of \$95 a week to the Newstart allowance, as well as indexing Newstart payments to wages.

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