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SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

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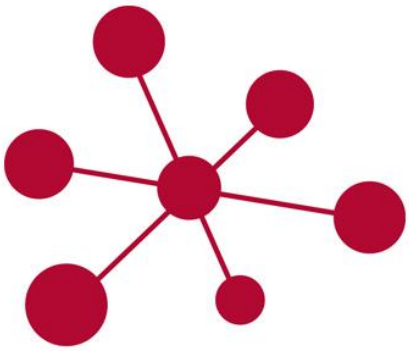

Inquiry into sustainability of energy supply and resources in NSW

13 September 2019

About the Public Interest Advocacy Centre

The Public Interest Advocacy Centre (PIAC) is an independent, non-profit legal centre based in Sydney.

Established in 1982, PIAC tackles barriers to justice and fairness experienced by people who are vulnerable or facing disadvantage. We ensure basic rights are enjoyed across the community through legal assistance and strategic litigation, public policy development, communication and training.

Energy and Water Consumers' Advocacy Program

The Energy and Water Consumers' Advocacy Program (EWCAP) represents the interests of low-income and other residential consumers of electricity, gas and water in New South Wales. The program develops policy and advocates in the interests of low-income and other residential consumers in the NSW energy and water markets. PIAC receives input from a community-based reference group whose members include:

- NSW Council of Social Service;
- Combined Pensioners and Superannuants Association of NSW;
- Ethnic Communities Council NSW;
- Salvation Army;
- Physical Disability Council NSW;
- Anglicare;
- Good Shepherd Microfinance;
- Financial Rights Legal Centre;
- Affiliated Residential Park Residents Association NSW;
- Tenants Union;
- The Sydney Alliance; and
- Mission Australia.

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The Public Interest Advocacy Centre office is located on the land of the Gadigal of the Eora Nation.

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Introduction

PIAC welcomes the NSW Legislative Assembly Committee on Environment and Planning's inquiry into the sustainability of energy supply and resources in NSW.

To date there has been a damaging public discourse that frames sustainability and economic opportunity as in opposition. PIAC considers this inquiry to be an opportunity to broaden the discussion and recognise that while climate change and the rapid transition in energy and resources presents many serious challenges for NSW, it also opens up opportunities to create more sustainable and prosperous communities and industries.

Around the world, societies and economies are in a period of rapid transition as they deal with and plan for the effects of the climate crisis and rapid technological change. Long term prospects for thermal generation, and the resources that support it, are rapidly changing as the economics of renewable generation increasingly make it uncompetitive. Even without structural policy shifts to respond to the climate crisis, the current and future reality is one in which thermal generation plays a diminishing part. Failure to recognise this reality, and initiate a comprehensive and strategic response to it, will leave regional communities with the risk of economic collapse and undermine the potential for NSW to reap the potential benefits of new opportunities of a renewable economy.

The growing cost of the energy system over the past decade has led to real electricity price increases for all NSW households and has become a major cost of living pressure. Households have responded in different ways, such as installing solar panels or energy efficient appliances, or using less energy. Others have regularly navigated a complicated energy retail market to find the best deal. However, for many, these options are either not available or unaffordable. This has exacerbated energy poverty and left many without adequate access to an essential service. This impacts their health, wellbeing and options for improving their circumstances.

Against this backdrop, the National Energy Market (NEM) is in a transformation from an energy system relying primarily on large scale, centralised, firm, fossil-fuel generation and passive demand, to one with a small scale, decentralised, variable, low-emission generation fleet interacting with more sophisticated and active demand-side behaviour.

As a consequence of these changes, energy market institutions and other stakeholders are increasingly concluding that the current regulatory and policy framework is not fit for purpose, as evidenced by many of the recommendations in the Finkel Review and ACCC's Residential Electricity Pricing Inquiry and the consequent reform processes. These reforms represent a fundamental shift in the framework for planning and operating the energy system, and also the protections frameworks in place to ensure consumers continue to access essential energy services.

Energy sector emissions can be reduced while still providing NSW consumers with affordable energy into the future. It is essential for the interests of NSW consumers that these benefits are delivered quickly and efficiently and in a way that ensures workers and communities dependent on industries in decline are given a just transition.

Capacity and economic opportunities of renewable energy

Australia and many countries around the world are making the transition to a low-emission economy. New technologies and markets are emerging around the growing demand for clean power, presenting massive opportunities for Australia to benefit from its vast natural renewable energy resources.

Renewable generation provides the obvious benefit of reduced emissions; however, large scale projects can also provide a long-term foundation for revitalisation of regional communities. Projects can provide much needed economic stimulus through employment and investment, increase skills and education, and diversify regional economies often otherwise dependent on a single industry. Unlike the thermal resource extraction and generation industry, renewable energy projects can provide these benefits without significant health, environmental and amenity costs.

There are numerous examples of regional communities benefiting from large scale renewable energy projects, including Broken Hill in NSW[1], Numurkah near Shepparton in Victoria[2], and Barcaldine in Queensland[3]. In Barcaldine, the development of large-scale solar helped alleviate peak demand pressures and provide voltage control, as well as meet predicted growth in energy demand from resource development in the Galilee Basin region.

Australia has seen significant investment in renewable energy over the past few years and is predicted to meet its 2020 target for large-scale renewable generation ahead of schedule[4]. As at August 2019, the Clean Energy Council estimates there are over 31 large-scale renewable energy projects in construction or due to start soon in NSW representing over $5 billion of investment and 3,473 jobs.[5] This existing pipeline does not reflect the much larger scope for renewable energy investment and development, that could be realised with a more solid strategic policy approach to renewable energy industry development. Despite this opportunity, investment in renewable energy generation is now declining[6] as existing frameworks fail to deliver an energy system that supports the development more renewable energy from coming online.

1 https://www.theguardian.com/environment/2017/apr/13/renewables-roadshow-how-broken-hill-went-from-mining-to-drag-queens-and-solar-farms
2 https://www.abc.net.au/news/2019-09-05/solar-farms-helping-revitalise-rural-towns/11481510
3 https://arena.gov.au/projects/barcaldine-remote-community-solar-farm/
4 https://www.smh.com.au/business/the-economy/australia-to-hit-2020-large-scale-renewable-target-ahead-of-schedule-20190903-p52nj3.html
5 https://www.cleanenergycouncil.org.au/resources/project-tracker
6 https://www.bloomberg.com/news/articles/2019-08-01/creaking-grid-is-jamming-up-australia-s-switch-to-green-energy

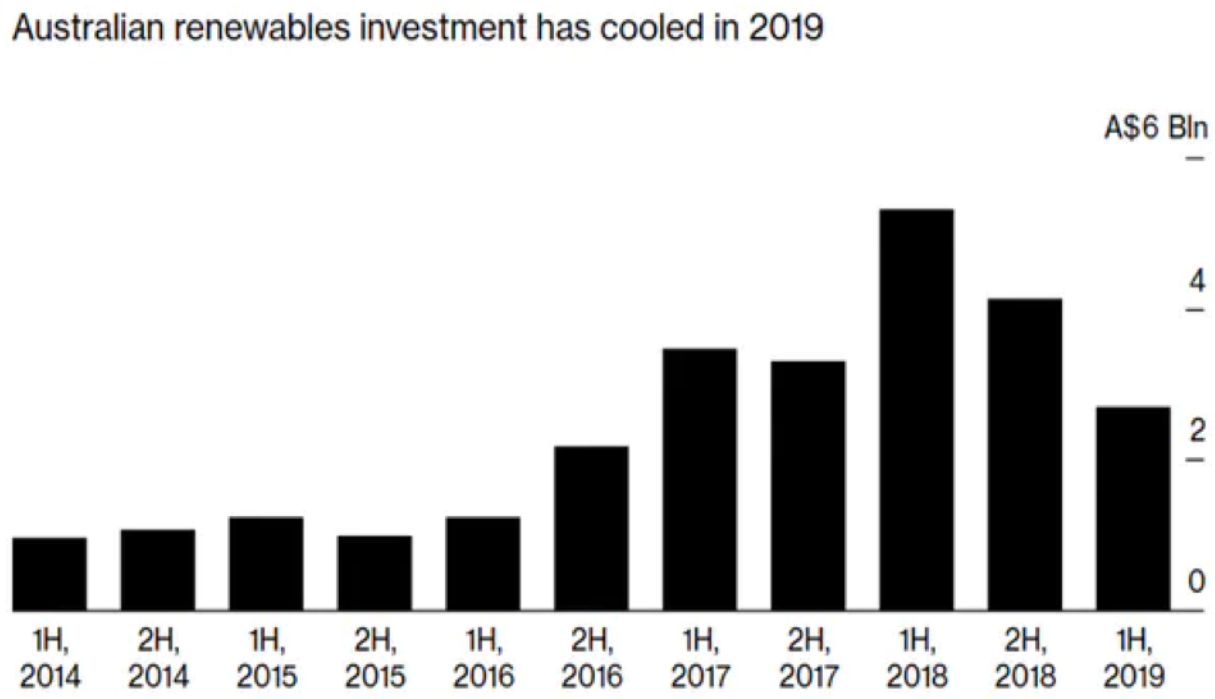

Figure 1: Australian renewables investment 2019-14

Addressing the policy and structural causes of the current downturn in investment, including the constraints on the existing system, will be key to ensuring the required infrastructure is delivered.

Barriers to renewable energy investment

One of the key constraints to developing large-scale renewable generation projects in the NEM is a lack of transmission infrastructure to deliver energy to the market at scale. Incremental and ad-hoc investment with each new generator is inefficient and expensive to the point of prohibitive, yet, under current regulatory arrangements, speculative investment in transmission infrastructure to service large-scale renewable generation is risky because it relies on uncertain future generation connections to recoup revenue; transmission investors have little certainty of number and capacity of new generation connections prior to investing. It is also unrealistic to expect generation investors to voluntarily co-ordinate and take on this risk themselves.

The result is optimal transmission infrastructure to support new energy projects may not get built. Consequently, generation projects which would have benefited the energy system and surrounding communities, either are at worst not developed and at best are built at a much higher cost than is optimal.[7]

[7] For further discussion of how current rules have not delivered scale-efficient investment, see TransGrid, *Integrated System Plan Submission*, February 2018, p 13: "SENE [Scale Efficient Network Extension] investments are considerably higher risk and potentially lower reward than investments by a TNSP in its prescribed business… No TNSP has ever successfully established a SENE, and under the current rules, TransGrid considers that this is unlikely to occur in future."

PIAC model for generation-leading transmission investments

PIAC has developed a framework to help address the barriers to investment in generation-leading transmission investment. It provides a model for how the cost of this investment could be shared between consumers, generators, Transmission Network Service Providers (TNSPs) and speculative transmission investors (who may or may not be TNSPs) in a way that helps drive timely, efficient system-wide outcomes. It also allows the option for governments to underwrite a portion of the investment cost to help reduce uncertainty.

PIAC's model is well suited to the context of Renewable Energy Zones (REZs) - shared transmission assets servicing renewable generation within a geographic area as prescribed by a regulatory process, such as the Integrated System Plan - but could be applied to any part of the energy system where new transmission infrastructure is built to support future access to multiple generators.

Cost-recovery for generation-leading transmission assets

Under the PIAC model:

- the costs of investment recovered from consumers via the incumbent TNSP are limited to a fixed portion, for example 50%, of the associated capital expenditure (capex) or increase to the regulated asset base (RAB).

- The remaining portion of the shared network capex or RAB is initially funded by contestable, speculative investment, with the investment risk compensated through a premium rate of return. The premium rate of return would be determined through the competitive process to select a speculative investor. This portion is ultimately recovered from connecting generators through connection charges.

- Revenue for the TNSP funded portion, and cap on connection charges for generators for the speculative portion, would be approved by the Australian Energy Regulator (AER). At this stage, government underwriting could be accommodated to limit risk to investors and/or consumers.

Value proposition for stakeholders

Under the PIAC model, generators are given certainty of access to market, and are protected from the risk of REZ underutilisation and timing misalignment between different generation projects. In lieu of bearing these risks, generators' connection charges include the rate of return premium to the speculative investor. Generators can choose to take on some of this risk by connecting early and are incentivised to do so through lower access charges.

Speculative investors receive a premium rate of return from generator access charges on regulated capacity, and can choose to overinvest at their own risk for non-regulated revenue on capacity above the prescribed amount.

Limiting costs and risk exposure for consumers are priorities. Consumers have little or no ability to manage the risk of underutilisation or asset stranding. Under the model, consumer exposure

to the risk of underutilisation is capped at a fixed, limited portion of the investment value. This limits their liability under all scenarios, including the 'worst case' where utilisation is low.

At the same time, consumers take some risk by funding a portion of the transmission investment, determine at the standard, binding rate of return to a portion of the prescribed capacity. Consumers effectively only pay for the speculative portion of the investment when it is proven efficient by being utilised and providing access to the market, protecting them from the impacts of any inefficient transmission investment or a less competitive wholesale market.

Government has the option of taking on some underutilisation risk by underwriting some portion of the capex for prescribed capacity.

International opportunities

Australia is well-placed to become a regional exporter of renewable energy. Developing a renewable energy export industry has huge potential benefits, however, care must be taken to ensure it doesn't come at the cost of local consumers' access to affordable and clean energy. Australia is currently facing a crisis in domestic gas prices, while at the same time being the world's largest exporter of natural gas. Many factors, including poor planning and policy, contributed to this outcome and it should serve as a lesson for the planning of any future energy export industry.

Indonesia's energy system is grappling with increasing demand, rising costs and carbon constraints. Official figures estimate demand in the Java-Bali system alone will rise by at least 6.8% per annum by 2030. Based on this trend, total demand will increase tenfold by 2050. If Indonesia wishes to achieve a carbon-neutral power system, it will be extremely difficult to meet the extraordinary growth in demand with domestic renewables alone.[8] Other countries in the region also present clean energy export potential for Australia.

Emerging trends in energy supply and exports, including investment and other financial arrangements

The energy transition holds myriad risks for consumers. New energy services and technologies are emerging that blur the line between consumer and producer, demanding new frameworks for providing consumers with the energy- specific protections they require, while the need for new infrastructure investment raises issues of who pays and who benefits.

As noted, the growing cost of the energy system over the past decade has led to real electricity price increases for all NSW households and has become a major cost of living pressure. One reason for this is historical excessive spending on network infrastructure or 'gold plating', the costs of which have been passed on to consumers in the form of regulated revenue for transmission businesses.

[8] Dargaville, R., Wang, C. & Hamilton, S. 2018. *Can we make Australia a renewable energy superpower*. https://theconversation.com/making-australia-a-renewable-energy-exporting-superpower-107285. Retrieved from The Conversation, 4 September 2019.

For regional communities the impact of inefficient investments and unregulated new technologies and businesses can be especially acute as they are often already particularly vulnerable.

In this environment, governments need to balance the risks of transition against the benefits to ensure consumers are appropriately protected from harm and unfair costs, while still enjoying sustainably affordable energy into the future.

To deliver timely and efficient network investment in a way that fairly balances risks between consumers and businesses, PIAC recommends a new framework, described in section one, be adopted for sharing costs, risks and benefits of new investment in transmission infrastructure.

More broadly, careful and decisive planning is required to ensure investment is directed where it is most needed and where it will produce optimal system-wide outcomes. Under the current market and regulatory structure this kind of planning is difficult. These system planning and investment frameworks are a legacy of the energy system of the past: they were designed to support incremental investment to an established, centralised generation and transmission system. Under this framework, the costs and benefits of individual investments are assessed without full regard for their impact on the rest of the energy system. Planning is largely left to the market and monopoly businesses, guided by a combination of profit-motivated responses to price signals and regulatory oversight.

A planning and investment framework that delivers efficiency for strategic, whole-of-system investments is required to ensure the transformation is delivered in a timely and cost-effective manner. PIAC considers developing this framework, in partnership with the relevant planning and rulemaking bodies, consumers and other stakeholders, should be a priority for the NSW government.

The status of and forecasts for energy and resource markets

In considering the trajectory of energy and resource markets it is crucial to ground the analysis by recognising the current reality. The case of coal is the most important, illustrative example.

Coal, for thermal generation and metallurgical uses, is NSWs largest export industry, at $13.2 billion in 2015-16[9]. This represents an amount larger than the next two export contributors combined, and is a level of single industry dependence that presents significant and material future risks to the NSW economy. However, it is important to recognise that a significant proportion of the coal exports originating in NSW are metallurgical grade coal, and so are unlikely to be impacted by many transitions in the global energy market. Specifically:

- Australian Coal production is comprised of 46% thermal coal for export, 14% thermal coal for domestic energy production, 39% metallurgical coal for export and 1% metallurgical coal for domestic manufacturing[10]. This indicates that 60% of coal production is subject to the

9 https://www.industry.nsw.gov.au/development/industry-opportunities/mining-and-resources/coal/coal-in-nsw .

10 https://minerals.org.au/sites/default/files/181012%20Commodity%20Insights%20Met%20Coal%20Report.pdf page 8

significant risks presented by the rapid transition of global energy markets and the need to de-carbonise.

- Current and forecast global thermal coal markets are likely to see low and declining prices as a result of static or declining global demand and consistent or increasing supply[11]. In this context increasing domestic thermal coal exports is likely to have a further smothering effect on price, with consequences for existing thermal coal mines, particularly older established mines with higher labour and production costs.

- Current and forecast metallurgical coal markets are likely to see sustained higher prices, with sustained demand related to ongoing development in China, India and stable demand in other Asian markets.

The current and future trajectory for thermal coal and thermal generation will also be significantly impacted, not only by domestic and international policies aimed at rapid de-carbonisation, but by ongoing declines in the cost of renewable energy. Even on conservative international assessments the cost of new solar and wind generation, even with the addition of storage technology which allows it to be 'dispatchable', is at or below the cost of new thermal coal generation[12]. Indeed, domestically many new renewable generation projects have an LCOE below existing, fully depreciated, thermal coal generators, indicating that even on existing market conditions thermal coal generation is increasingly uneconomic and uncompetitive.

Recognising market realities and international energy and resource trends in domestic policy is critical for the medium-term sustainability of regional communities dependent on coal mining. Failure to incorporate these trends will make the energy transition more costly, slower and more detrimental for impacted communities.

PIAC considers the following factors to be crucial in plotting a sustainable economic transition path for communities in light of the urgent reality of climate change and global trends in energy and resources:

- A sustainable strategy to transition and protect jobs and communities dependent on fossil fuel industries should be established. This strategy should recognise that there is an important difference between maintaining existing mining operations, and expanding and developing new ones. For instance, key to this will also be separating consideration of existing metallurgical mining from thermal mining, concentrating on opportunities to sustain employment opportunities in the short to medium term by preferencing metallurgical operations.

- Existing thermal coal mining operations and their associated jobs will be compromised by the expansion of new mines that will contribute to the ongoing lowering of the domestic and global price of thermal coal. New mines not only contribute further supply to a softening global market, but they do so with much lower production costs (by high rates of automation) that allow them to outcompete older established mines.

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11 https://www.exportfinance.gov.au/resources-news/news-events/export-monitor/2016/export-monitor-september-2016/thermal-coal-market-rally-defies-fundamentals/

12 https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf

The current restrictions on further gas extraction in NSW are often cited as a factor in sustained high domestic gas prices, and the flow-on high energy prices that we currently experience. It is true that gas prices have risen sharply over the last decade, and that high input costs often result in gas generators, as the marginal price setting generators, driving up wholesale electricity costs. However, this sustained gas price increase has occurred during a period of a massive increase in the gross supply of gas produced in Australia that has seen Australia become the world's largest producer. In analysing the current and forecast trends for gas extraction for export and thermal energy generation it is important to note:

- Current Australian Gas production substantially exceeds the long-term export contracts of the main suppliers
- The international market for uncontracted gas consistently sees prices that are 30% less than those in the domestic market (where gas is predominantly utilised by heavy industry and as input for peaking gas generators bidding into the wholesale market)
- The main gas producers continue to sell into the international market, sustaining high domestic prices that impact industry and households[13]
- New domestic gas production is often cited as a 'supply solution', even though ACCC investigations demonstrate that these potential sources are uneconomic and would only lock in higher prices for domestic gas, even if an economic case could be made for their commencement.[14]
- Gas reservation policies in WA have been effective in serving as a barrier to potential gas domestic market manipulation, and have helped to ensure cheaper and more sustainable access in the short to medium term.
- Current prospective gas resources in NSW are extremely likely to have dangerous impacts on local water resources, and do not present a strong economic case.

Accordingly, PIAC considers that the most effective way of guaranteeing the sustainability of existing communities in the coal and gas industry, is to restrict new thermal energy resource developments, and establish a strategic transition authority. This body could then facilitate the analysis of communities, risks, resources and opportunities, to develop and oversee the execution of a long-term plan that helps to protect the sustainability of communities dependent on existing extractive industries, and harness the medium to long term opportunities presented by renewable resource development.

Effects on regional communities, water security, the environment and public health

PIAC highlights the need to recognise the impact of energy and resource extraction operations on the long-term security of community access to water resources, as well as the impacts upon community health, and the sustainability of the environment and industries which depend on it.

Gas extraction, both conventional and 'fracked', and thermal coal mining and generation, are incredibly water resource intensive operations that are in direct competition, not only with

13 https://www.theguardian.com/australia-news/2017/sep/29/the-high-price-of-australian-gas-is-low-supply-really-to-blame
14 Ibid

agricultural uses, but with vulnerable regional communities and the environment at large, for increasingly insecure water resources. The impacts of this competition are not 'in the distant future', but are being felt now. For instance, in many regional NSW communities bushfire-fighters are having to make decisions regarding whether and how to fight fires based on access to water resources. These decisions are increasingly critical for the ongoing viability of communities.

PIAC considers it vital that a strategic and sustainable approach to energy into the future must recognise and account for the interaction of energy-related industry with water resources, and the long-term security of those resources.

Water is a finite resource and, notwithstanding the increasingly stark impact of climate change, must be managed on a basis that prioritises the community's ongoing access to secure water resources and a sustainable environment. At the very least, decisions regarding energy and resource extraction must be a part of a strategic approach to the long-term management of water resources.

Water access and pricing frameworks should recognise and support such a strategic approach. Recent evidence indicates that this is not currently the case. The recently released government report into the Broken Hill pipeline, is illustrative of a lack of consideration of the insecurity of the water resource, demonstrating the need for a strategic and holistic assessment of the value of the competing requirements on limited water resources, and a pricing and decision framework that ensures the most efficient and sustainable utilisation of resources in the long term.

More directly, the case of coal mining within the Sydney Basin is illustrative of the urgent need for a more holistic and strategic decision-making framework that links energy and resource decisions with the water, agriculture, environment and community issues that they impact. Long wall mining activities within the Sydney/Illawarra water basin, which sustains at least 6 million people, have been shown to have a severe impact upon the sustainability and security of water resources within the catchment[15]. The extension of leases on and expansion of these operations demonstrates a concerning lack of consideration of their wider impact. An effective, strategic approach to transition of energy and resources would:

- Consider the medium to long term prospects of the extractive operations
- Consider the medium to long term prospects of growth within the Sydney basin and the range of water resource requirements
- Consider the impact of extractive operations on short-term water availability, and long-term water resource security
- Consider the long-term impact of extractive operations on the local environment and opportunities for alternative industry and land-uses
- Ensure that water pricing and usage frameworks recognise the relative impact and importance of water resource usage, with community use prioritised and other uses prioritised on the basis of sustainability and overall economic benefit. Without such

[15] https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2004-2007/alteration-of-habitat-following-subsidence-due-to-longwall-mining-key-threatening-process-listing
https://ewater.org.au/uploads/files/McNally_Evans-2007-Longwall_mining.pdf

frameworks, the community will bear the mounting risks associated with energy and resource industry uses on limited water resources.
- Implement pricing that supports an expedited transition from water resource uses that impose costs greater than the assessed benefits

Similarly, gas extraction can deplete limited water resources and have an impact on the remaining water through chemical pollution[16]. These impacts are not reflected in the water prices charged to the companies responsible for the mining and extraction. Given the increasing scarcity of water, this approach is unsustainable in the long-term. Rather, a sustainable energy supply and transition must recognise and support the long-term security of water resources by pricing thermal resource extraction in a way that reflects its impact on communities' ongoing access to water resources.

The creation of a strategic transition framework and authority presents a crucial opportunity to create genuinely long-term solutions for communities across NSW that are both profitable, and sustainable.

Opportunities to support sustainable economic development in regional and other

As discussed in section 3, the industries supporting thermal energy generation and resource extraction are increasingly unsustainable. A strategy that plans for a swift transition to low-emission generation and away from fossil fuel extraction is necessary for the long-term welfare of NSW communities.

These kinds of adjustment are not easy, but targeted policy, planning and public investment, can provide a pathway that can deliver positive outcomes for the most affected communities. PIAC considers it not only possible, but necessary to make strategic choices about energy and new industry that creates new jobs and does not compromise water security, environmental, health and social fabric of NSW regions.

As such, PIAC recommends the NSW government establish, as soon as possible, a comprehensive strategy for transitioning to zero emissions that supports affected communities and workers, and delivers sustainable economic development

This strategy should:

- Establish a transition authority to assess the economic, environmental and social factors facing NSW and plot a strategic path to long term sustainability.
- Identify communities centred around existing thermal coal and gas extraction operations and work with them to plan an expedited transition path.
- Identify a range of staged closure timeframes for coal and gas operations based on potential market conditions, including assessment of existing operations' impact on water resources, health, the environment and the potential for the development of other industries.

16 NSW Department of Primary Industries, 2013. Water and Coal Seam Gas Frequently Asked Questions. http://www.water.nsw.gov.au/__data/assets/pdf_file/0007/547477/groundwater_coal_seam_gas_faq.pdf

- Identify opportunities for new industries in affected areas and set out a strategic approach to a transition that makes use of those opportunities. This should include a short-term preference for metallurgical coal as a source of transition employment where its impacts on water resource security and other long term industry opportunities is not significant.

Continued engagement

PIAC looks forward to continued constructive engagement to further explore the sustainability of energy supply and resources in NSW. We view this as a valuable opportunity to ensure that all NSW communities benefit from decarbonisation and the transition of the energy system.

Yours sincerely,

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