Submission No 245

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Organisation: Maritime Union of Australia

Date Received: 10 October 2019

MUA Submission:

Sustainability of energy supply and resources in NSW

8 October 2019

Committee on Environment and Planning

Submitted by email: environmentplanning@parliament.nsw.gov.au

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Introduction

This submission has been prepared by Maritime Union of Australia (MUA). The MUA is a Division of the 120,000-member Construction, Forestry, Maritime, Mining and Energy Union and an affiliate of the 20-million-member International Transport Workers' Federation (ITF).

The MUA represents approximately 14,000 workers in the shipping, offshore oil and gas, stevedoring, port services (tugs, mooring services, pilot vessels), port operations and maintenance and commercial diving sectors of the Australian maritime industry. Many of our members rely on emissions-intensive industries for their work, such as the Newcastle coal export terminals, port services for coal and gas exports and for liquid fuel imports, as well as construction and operational support for offshore oil and gas projects.

In NSW, the MUA has three branches: Sydney, Newcastle and Southern NSW. This submission is made on behalf of all three branches.

Summary

The MUA supports science-based emissions reduction efforts to address the current climate crisis, including the need to limit global heating to 1.5°C.

A just transition to support workers and communities through the process of reducing emissions is critical. It must include significant government investment and ownership, and ensure that workers in fossil fuel industries can transition to good union jobs in low emissions industries.

Opportunities for the development of low-emissions industries in NSW include:

- The development of floating offshore wind turbines off the coast of NSW, with the development of an offshore wind port terminal and manufacturing in Newcastle, using steel manufactured in Port Kembla. Projects could be built on a large scale and connect to the Hunter Valley transmission infrastructure.
- If a hydrogen industry is developed in NSW, there are critical safety issues which must be considered.

The fragmentated and privatised nature of much of the current electricity system makes the planning and implementation of a transition more difficult, both in terms of the speed and scale of the transition required, the stability of the system in this process, and the social consequences of a transition. For these reasons, the NSW and Commonwealth government must take a direct role in building the new low-emissions energy systems we need, through the Commonwealth-owned energy company Snowy Hydro, or through the establishment of a NSW publicly owned renewable energy company similar to CleanCo in Queensland.

Please note that the MUA are in the process of commissioning further expert research into the viability of offshore wind in NSW, and will seek to submit this to the Inquiry when it is complete.

TOR: Opportunities to support sustainable economic development in regional and other communities likely to be affected by changing energy and resource markets, including the role of government policies.

Putting the 'Justice' in 'Just Transition'

There is now widespread acceptance that a transition to a low carbon economy should be a 'just transition'. The need for a just transition, the need to avoid the failures of past structural adjustments for working people, and specific proposals for the creation of an Energy Transition Authority (or Just Transition Authority) are supported by the ACTU, the ALP and other political parties, the CFMMEU, and other unions. Good secure union jobs are the cornerstone of combating inequality and ensuring that there is justice in the transition to a new low-emissions economy.[1]

Unfortunately, we are already in the midst of a largely unplanned and unjust energy transition. This is a result of the failure of the current Australian government to develop a transition plan, the unjust industrial relations system, the rapid decrease in the price of renewable energy, the aging of Australia's coal-fired power stations, the fragmented and privatised nature of our current electricity system and the rigid adherence to market-based approaches. The following problems are already developing:

- Fear and angst amongst workers and coal-mining communities. There is widespread unemployment following the closure of the Northern coal fired station (in South Australia) with no transition plan, and significant unemployment in the Latrobe Valley following the privatisation and restructuring of the electricity generation industry over the last twenty-five years, culminating in the closure of the large Hazelwood power station in March 2017. The 2019 federal election showed that right-wing political parties including the Liberals, Nationals, United Australia and One Nation were effective in using the fear of action on climate change to win working class votes.[2] One Nation has developed a strongly climate denialist platform[3] and ran two coal miners as candidates: in Hunter NSW Stuart Bonds received a 21.6% swing (with the ALP losing 14% of its votes) and in Capricornia, Qld Wade Rothery won a 16.7% swing with the ALP losing 14% of its votes.
- Renewable energy projects are being constructed in regional areas on poor wages and conditions, and without consideration for, and training of, workers from high-emissions sectors as part of a transition plan.[4]

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[1] Dr. John Falzon, *Goodbye Neoliberalism: Restoring democracy, supporting trade unions, protecting workers' rights*, December 2018,.
[2] The Nationals, *Labor's Just Transition Plan*.
[3] One Nation, *Climate change*.
[4] Josh Bavas, *Queensland solar farms actively hiring backpackers, insider claims*, ABC, 26 Sept 2018; Marco Balsamo, Worker dies on Bungala solar farm site, *The Transcontinental Port Augusta*, 19 Feb 2018; ETU Victoria, *Solar Scandal: Unsafe UGL pocketed state subsidies by exploiting French Backpackers*, Sept 2018; ETU National, A Tale of Two Solar Cities, October 2018; *ETU Submission to Senate Standing Committee on Legal and*

- Rights to build renewable energy projects being awarded to private companies by states through programs that prioritise cost-minimisation over the broader economy or community. These rights and associated subsidies are being awarded with no minimum labour standards or procurement standards, encouraging a race to the bottom for workers and wages in these areas.[5]
- Failure of important renewable projects, and instability and loss of employment for thousands of workers due to competitive underbidding and bankruptcy, such as occurred with RCR Tomlinson.[6]
- Lack of financing for important projects, such as for the Port Augusta solar thermal plant.[7]
- Loss of ability to plan the development of the electricity grid in the public interest and to plan for and provide connections for new renewable systems.[8]
- Difficulty in planning and implementing transition plans due to the fact that most existing coal-fired power plants in Australia are privately operated and focused on profit maximising and cost minimisation, rather than providing a just transition for their workforce.[9]

The impact of an unjust transition will be felt most strongly in regional areas, where a great deal of high-emissions industries are concentrated. Our aim in the rest of this submission is to outline the measures that should take place to ensure that we can secure a sustainable decarbonised energy supply, and achieve a just transition in Australia.

Constitutional Affairs Inquiry into the effectiveness of the current temporary skilled visa system in targeting genuine skills shortages, December 2018.

[5] John Falzon argues that government procurement and industry assistance, including for clean energy finance, should require a union agreement. See reference above, Dr. John Falzon, p. 21-22. Some very minimal standards have been introduced in Victoria. Problems with current global funding models for renewable energy are explored in detail in Trade Unions for Energy Democracy, *TUED Working Paper #10: Preparing a Public Pathway Confronting the Investment Crisis in Renewable Energy*, November 2017,

[6] Stephen Letts, *Renewable energy investment looks to be going from boom to bust as prices collapse*, ABC, 26 April 2019; ETU Victoria, *The Titanic RCR disaster that we all saw coming: ETU Victoria is still standing by hundreds of displaced workers left high and dry by the collapse of RCR Tomlinson, Whilst top executives have walked away with multi-million dollar payouts* March 2019; ETU Queensland and NT, *RCR administration announcement a timely reminder of privatisation's failures, union calls on developers to ensure workers' entitlements are paid in full*, 22 November 2018.

[7] ABC, Port Augusta solar thermal power plant scrapped after failing to secure finance, 5 April 2019.

[8] John Quiggin, *Electricity Privatisation in Australia: A record of failure*, February 2014. John Quiggin, 'Electricity reform', In *Wrong Way: How privatisation and economic reform backfired,* LaTrobe University Press, p.149-165.

[9] Darryn Snell, 'Just transition solutions and challenges in a neo-liberal and carbon-intensive economy' in 'Morena, E., Krause, D. and Stevis, D. (eds), 2019 forthcoming, *Just Transitions in the Shift Towards a Low-Carbon Economy*. London: Pluto Press.

Measures to guide an energy transiton

There is a significant body of policy work that has been done about what a just transition might mean. Some key documents include:

> Peter Sheldon, Raja Junankar, Anthony De Rosa Ponello. *The Ruhr or Appalachia? Deciding the future of Australia's coal power workers and communities*, October 2018. IRRC Report for CFMMEU Mining and Energy Division.
>
> ACTU, Climate, Energy and Just Transition Policy 2018.
>
> ACTU, 2016, *Sharing the challenges and opportunities of a clean energy economy: A Just Transition for coal-fired electricity sector workers and communities*.
>
> Dr. John Falzon, *Goodbye Neoliberalism: Restoring democracy, supporting trade unions, protecting workers' rights*, December 2018.
>
> IndustriALL, Just Transition – An idea whose time has come, 16 May 2019.
>
> Trade Unions for Energy Democracy, *TUED Working Paper #11 - Trade Unions and Just Transition: The Search for a Transformative Politics*, January 2018.

There is widespread agreement that a Just Transition involves 'mitigating the adverse impacts of coal power station closures on regional workforces and communities'.[10]

Even more important is the task of ensuring that these workers and others in emissions-intensive industries have good unionised jobs to go to in low-emissions industries.[11] Ensuring that every affected worker and community can make such a transition is a significant task that will require union and community campaigning, the establishment of Transition Authorities (such as the LaTrobe Valley Authority, but also at a state and national level), and very significant government investment. Such a transition needs to be developed in close consultation with unions in both high and low emissions industries in order to gain the trust of workers and communities and avoid divisive backlash.

Unfortunately, the history in Australia is that industrial transitions have increased inequality, with only one half to one third of displaced workers finding equivalent employment.[12]

The MUA is in the process of developing a campaign and report titled *Putting the 'Justice' in 'Just Transition': Tackling inequality in the new renewable economy*, which focusses on how

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[10] Labor, *A Fair Go for Australia: Labor National Platform*, point 37.

[11] Australia is a signatory to the Paris Agreement, which describes "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities." UNFCC, Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, p.21.

[12] ACTU, 2016, *Sharing the challenges and opportunities of a clean energy economy: A Just Transition for coal-fired electricity sector workers and communities*.

the Star of the South offshore wind project planned for construction off the coast of Gippsland, Victoria could provide a model for a just transition.

A just transition requires a forward-looking plan to ensure good jobs in new low-emissions industries. Transition Authorities should play a key role in ensuring these measures are implemented, but the actions listed below will need to be taken across many other government departments and sections of the economy. New renewable energy projects must involve:

1. **Maximising local jobs.** Detailed procurement plans must be developed for the sourcing of materials and equipment that maximise Australian production capacity and potential production capacity.
2. **Ensuring good union jobs.** The government should ensure that procurement rules with good employment conditions, union agreements and responsible contracting policies are in place across the industry.
3. **Maximise the number of jobs available** by ensuring good rosters, reasonable hours of work, and good leave ratios. We need to ensure that there are as many jobs as possible for people to go to.
4. **A job guarantee and no forced redundancies** for workers from fossil fuel industries, allowing for direct transition into employment in low emission industries. An examination of how the German job guarantee model could be implemented in Australia should be carried out.[13]
5. **Detailed skills and training assessments** should be carried out and local training providers must be put in place and appropriate training funded to ensure the workforce is prepared. Training should be provided through local TAFEs rather than privately.
6. **Reducing inequality.** Ensure that low-emissions industries have apprenticeship programs in place with minimum ratios, and include recruitment of workers from disadvantaged backgrounds, including women and Aboriginal workers.
7. **Ensuring community engagement and development**, to ensure that local communities benefit in the broadest possible sense.
8. **Safety and Training.** Work with Safe Work Australia and relevant training agencies to develop safety codes of practice and qualifications for low emission industries at a national level. Establish industry training centres in TAFEs to ensure they are publicly accessible and accountable.
9. **Public energy system ownership**. Public ownership of energy generation and transmission systems should be developed to allow for rapid and planned development of new systems, at an affordable price. Superannuation investment in

[13] Commission on Growth, Structural Change and Employment, *Final Report*, January 2019, see p.97-98 for details of the job guarantee scheme.

democratically controlled renewable projects should be facilitated through government-issued bonds intended specifically to fund these projects.[14]

10. **Energy system management** to ensure the planned development of renewable energy generation and the integration of new generation and storage capacity with the existing grid, and appropriate timing of retirement of older generation assets. Wherever possible, low-emissions projects should be located in emissions intensive communities. There should be direct government investment and ownership to prioritise these projects and ensure they are built to the highest standards.

Examples to look to: Just transition and renewable energy

There are a number of useful international and domestic transition examples of efforts being made to ensure that an energy transition is a just transition.

The German government appointed a multidisciplinary Commission on Growth, Structural Change and Employment in June 2018, including trade union representation from the union IG BCE. The Commission considered expert evidence, visited affected areas and completed its final meeting and report with recommendations in January 2019.[15] The report recommends:

- Phasing out coal-fired power and brown coal mines by 2038, but conditional on the creation of quality jobs and clear transition pathways for workers.

- Includes a job guarantee with no forced redundancy for any worker. The goal is to ensure that for each direct job loss, a good new job is created and that this process is covered by a collective agreement. There will be a plan and a pathway for every single directly employed worker in coal-fired power plants and lignite/brown coal mines, including employment in new jobs with training, income bridging, and bridging to pensions for older workers.

- If a job disappears, the affected worker will be placed in a new, decent job, and will be compensated in a lump sum payment for any difference in salary between the old and the new job.

- Allocates €40 billion over 20 years for regional development, including infrastructure and rehabilitation of mining areas and plants.

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[14] Trade Unions for Energy Democracy, *TUED Working Paper #10: Preparing a Public Pathway Confronting the Investment Crisis in Renewable Energy*, November 2017, p.61-63.

[15] Commission on Growth, Structural Change and Employment, *Final Report*, January 2019, see p.97-98 for details of the job guarantee scheme; IndustriALL, Just Transition – An idea whose time has come, 16 May 2019, http://www.industriall-union.org/just-transition-an-idea-whose-time-has-come.

New York State has set emissions reduction targets, and also taken the following important actions:

- Developed a comprehensive Offshore Wind Master Plan, including studies on workforce planning and training, port infrastructure, vessel availability, and environmental baseline studies.[16]

- Set a target to build 9,000 MW of offshore wind projects by 2035.

- Made a requirement for union agreements on prevailing wages on all offshore wind projects, as well as local procurement.[17] The state is also building an offshore wind training centre and will invest $200 million in port upgrades.[18]

The New York Government has been able to take these actions despite a Federal Government hostile to climate action, and with offshore wind farms being sited in Federal waters.

The Queensland government has also taken some important actions, including:

- establishing a new public renewable energy generator called CleanCo.[19] Any employees transferring to CleanCo from generators CS Energy or Stanwell will maintain their existing conditions, including no-forced redundancies or relocations, and any new CleanCo employees will also be on the same terms and conditions as any transferring employees. The Queensland Government will initially invest $250 million in the construction of new, public renewable energy generation assets like solar, wind and hydro.[20]
- The Queensland Government has also established a Just Transition Group, which will be developing a transition plan for the state.[21]

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[16] New York State Energy Research and Development Authority, 2018, *New York State Offshore Wind Master Plan*, see https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-State-Overview/NYS-Offshore-Wind-Master-Plan.
[17] The Worker Institute, *State Commitment to Wind Industry Workers is Historic, Skinner Says*, 12 November 2018, Industrial and Labor Relations School, Cornell University, https://www.ilr.cornell.edu/worker-institute/news/state-commitment-wind-industry-workers-historic-skinner-says.
[18] New York State*, FY 2020 Executive Budget Briefing Book*, pg. 312-14, pg. 326-7, https://www.budget.ny.gov/pubs/archive/fy20/exec/book/briefingbook.pdf. New York State, 2019 Justice Agenda, 2019 State of the State Budget Address, https://www.ny.gov/programs/2019-state-state-budget-address.
[19] The Honourable Dr Anthony Lynham, *CleanCo: Queensland's newest electricity generator*, February 26 2019, http://statements.qld.gov.au/Statement/2019/2/26/cleanco-queenslands-newest-electricity-generator. Cleanco website, https://cleancoqueensland.com.au/
[20] Queensland Treasury, *Queensland's new Cleanco*, https://www.treasury.qld.gov.au/growing-queensland/queenslands-new-cleanco/
[21] Queensland Department of Employment, Small Business and Training, *Just Transition*, https://desbt.qld.gov.au/employment/transition-programs/just-transition

The Socialist-led Spanish Government increased its votes by 6%, and won up to 50% of the vote in mining regions, after running on a Green New Deal in April 2019 elections and signing a Just Transition plan in October 2018. The plan commits €250 million in investment to cover the closure of 10 privately-owned mines, and was negotiated with mining unions and employers. It includes substantial redundancy payments for younger workers, and workers from age 44 being entitled to a pension of 2- 3 times the minimum wage for the rest of their life. An action plan will be made for each mining community, including plans for developing renewable energy and improving energy efficiency, and investing in and developing new industries and the regeneration of former mining sites. Money will be set upside to upgrade facilities in the mining communities, including waste management, recycling facilities and water treatment plants, utilities infrastructure and distribution for gas and lighting, forest recovery, atmospheric cleansing and reducing noise pollution.[22]

The Canadian government *Final Report by the Task Force on Just Transition for Canadian Coal Power Workers and Communities* has been issued. $35 million was spent visiting 15 affected communities and holding extensive consultations, and the Task force estimates "hundreds of millions of dollars" may be required. Those made forcibly redundant get a top of up to 75% of their former wage, but this is limited to 2 years. Principles include:

- respect for workers, unions, communities, and families
- worker participation at every stage of transition
- transitioning to good jobs
- sustainable and healthy communities
- planning for the future, grounded in today's reality
- nationally coherent, regionally driven, locally delivered actions
- immediate yet durable support[23]

A future hydrogen industry?

There has been significant discussion around the development of a hydrogen industry in Australia, and for the potential for hydrogen exports to Asia, lead by the current National Hydrogen Strategy Taskforce. Hydrogen made from renewable energy has significant potential to reduce greenhouse gas emissions and establish a new industry and significant jobs in Australia.

Hydrogen is a dangerous, experimental and high-value cargo. We urge the committee to require that hydrogen exports from Australia take place on Australian flagged and crewed ships, governed by Australian WHS and fatigue standards. The costs of this are minimal in comparison to the value of the cargo, and the importance of safely establishing the industry.

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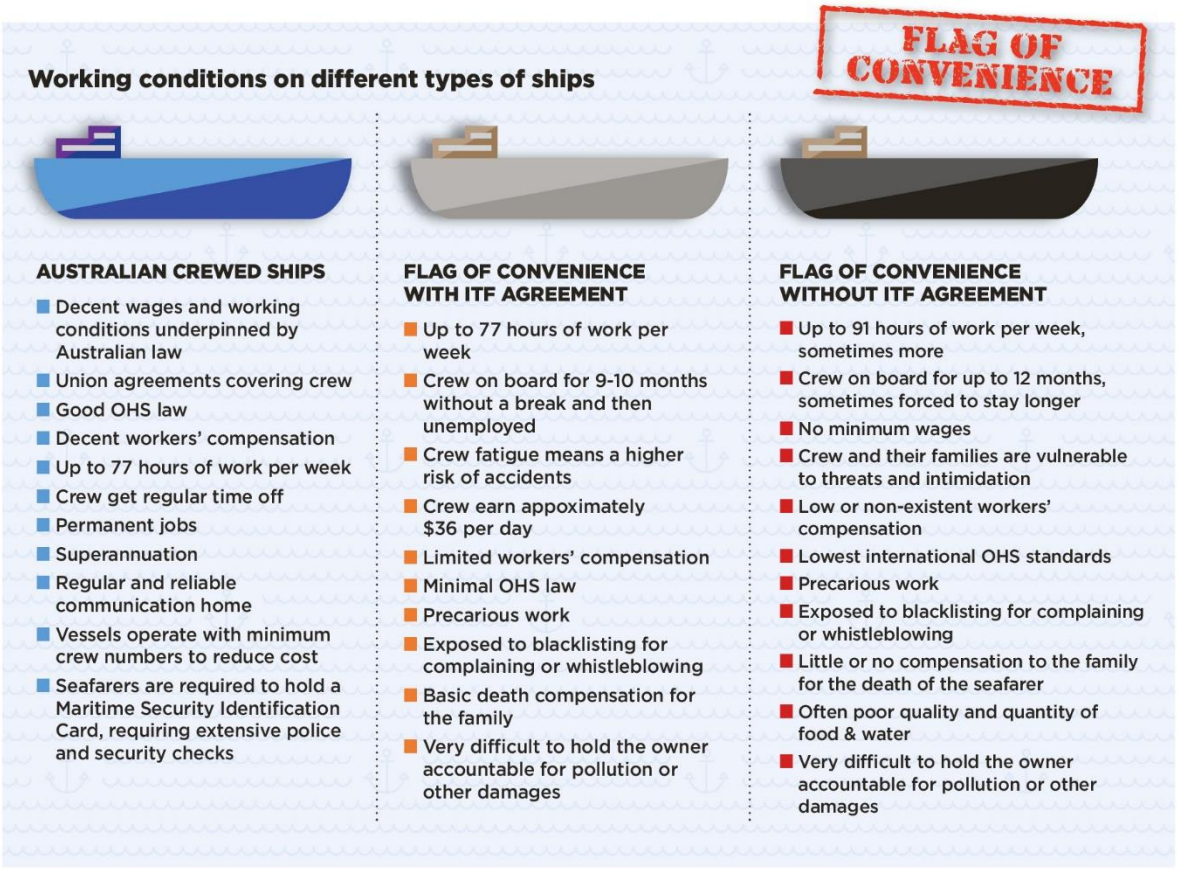
[22] IndustriALL, Spanish coal unions win landmark Just Transition deal, 2 November 2018; Spain's socialists win election with Green New Deal platform, 1 May 2019; Spain's Socialists Make Gains in 3 Elections, *New York Times*, 26 May 2019.

[23] Task Force on Just Transition for Canadian Coal Power Workers and Communities, Final Report.

There is too much at stake to leave the safe regulation and rapid development of the industry to other flag state authorities, or to flag of convenience shipping and crews. Figure 1 gives a comparison of working conditions on various types of ships.

Figure 1: A comparison of working conditions on Australian and international ships.



Source: Maritime Union of Australia and International Transport Workers Federation

Ensuring that hydrogen export vessels are Australian flagged and crewed will also ensure that the economic value of the transport directly contributes back to the Australian economy. This happens both through the vessel's management in Australia, but also the income taxes crew pay in Australia back to the Australian government, and the wages they spend in their (often regional) communities.

In the LNG export industry, four Australian-flagged and crewed vessels have been operating for 30 years to transport LNG from the North West Shelf (NWS) LNG Joint Venture project, with no industrial issues during that time.

Safety in the hydrogen industry

Working with hydrogen will be hazardous, and somewhat experimental as new processes and technologies develop. Measures to ensure good secure jobs in the hydrogen industry will also significantly increase the safety of the industry. Australia's process-based safety laws rely on the participation of Health and Safety Representatives and full consultation with the workforce. Workers can only participate in these processes properly and with confidence if they are in secure work, are not fatigued, and have the support and protection of a union. Good secure permanent jobs with decent wages are imperative to ensure the safety of the hydrogen industry.

Casualisation of work significantly undermines safety, and this should not be allowed to develop in the hydrogen industry or it will significantly undermine the community confidence needed for the speedy development of the industry.

A new hydrogen industry must aim for best practice employment and WHS processes.

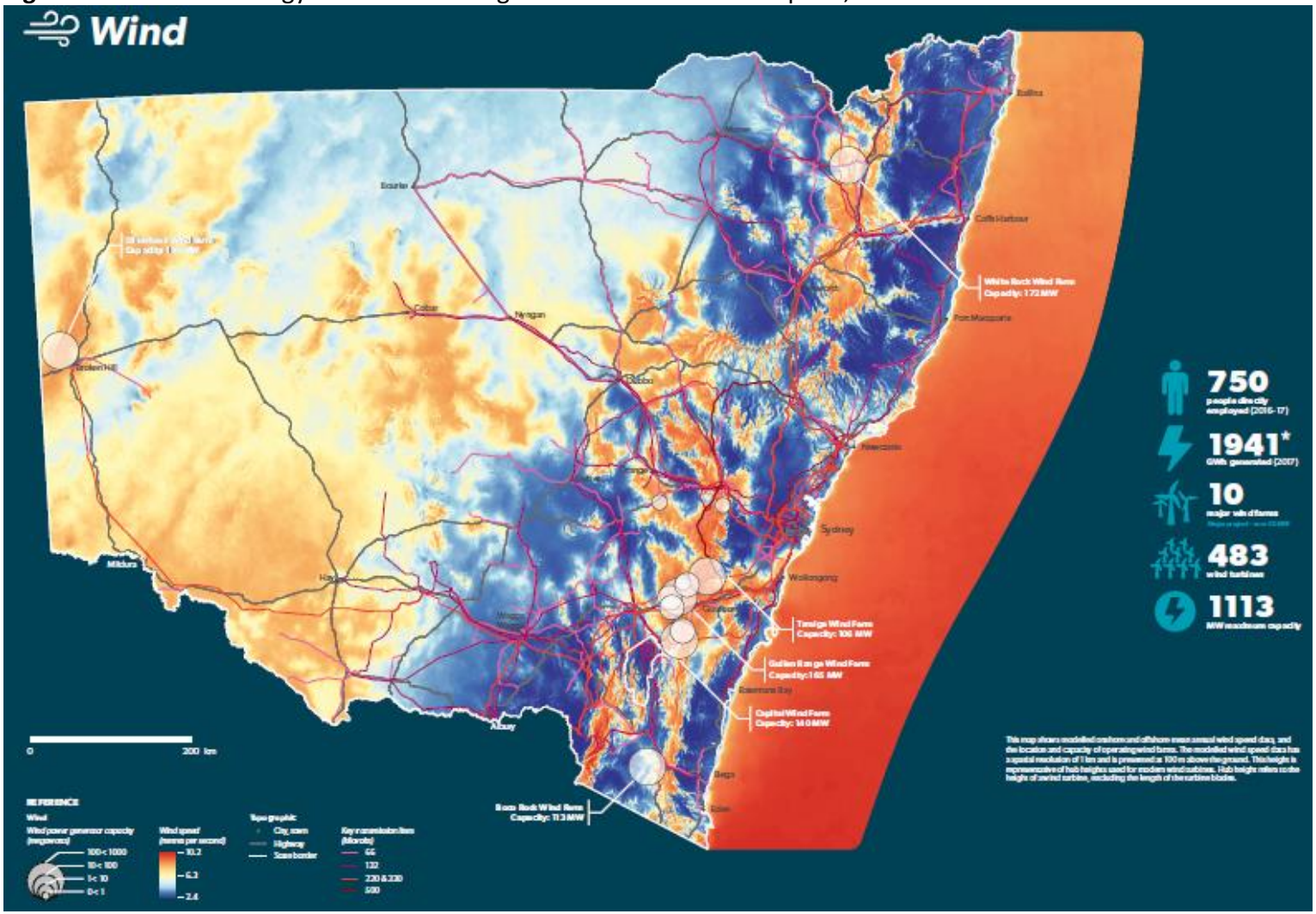
A hydrogen safety working group should be established through Safe Work Australia, and include the Australian Council of Trade Unions, unions from relevant industries including maritime unions, and the Australian Maritime Safety Authority. The Australian Maritime Safety Authority will need to be involved in the development of maritime regulation, and can play a role in the development of regulation at the International Maritime Organisation. This will be needed to support the development of international hydrogen shipping.

TOR: The capacity and economic opportunities of renewable energy

Developing offshore wind in NSW

We believe there is significant potential for the development of a floating offshore wind industry to make a significant contribution to the NSW energy supply. Wind resource maps produce by the NSW Department of Industry and the Geological Survey of NSW show strong wind resources off the NSW coast, close to major population centres and grid connections (Figure 2).

Figure 2: NSW wind energy. Red indicates highest mean annual wind speed, and blue is lowest.



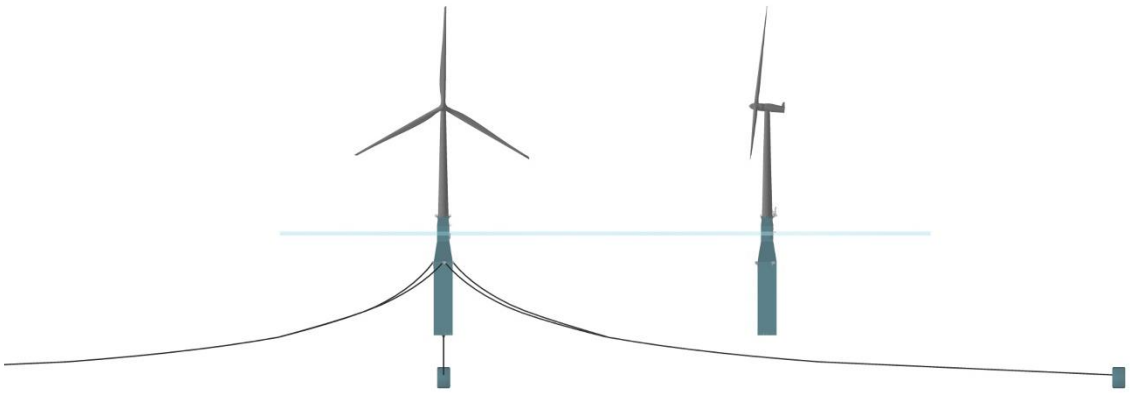
Source: Carter P.J & Gammidge L.C. (compilers) 2019. Renewable energy map of new South Wales (3rd Edition). Geological Survey of New South Wales, Maitland. ©State of New South Wales through NSW Department of Planning and Environment 2018.

Wind projects offshore can be built to a larger scale than onshore. With proper design and integrated storage, they could be built to minimise the need for augmentation of the grid and connect to the existing high-energy grid connections in the Hunter area. For example, the Star of the South offshore wind project in Victoria will have a 2,000 MW capacity, and plug into the grid at the LaTrobe Valley. Newcastle could be a future site for an offshore wind port terminal and manufacturing hub for New South Wales, using steel produced in Port Kembla.[24] The Port of Newcastle has access to significant portside land area required to manufacture and stage the massive wind turbine masts, blades and generators before they are loaded onto vessels.

The challenge for developing offshore wind in NSW is the water depth off the coast. However floating offshore wind turbines could be used to overcome this challenge. The first commercially operating floating offshore windfarm (Hywind Scotland) has been built off Scotland by Equinor, at depths of 95-120m (Figure 3). It had an extraordinary 65% capacity factor during the winter months.[25] Approximately 50 more floating offshore wind projects are planned worldwide.[26] Offshore wind projects are often built 10-20km offshore to reduce or eliminate their visibility from the coast. The depths off the NSW at these distances are within the range of feasibility for offshore wind projects.

There is a need for more research into the potential for offshore wind in NSW and around Australia. The MUA is in the process of commissioning research into this, which we will submit to the Inquiry as soon as it is available.

Figure 3: One design of a floating offshore wind turbine.



Source: Illustration ©Equinor

[24] South Coast Labour Council, Illawarra Unions Demand Climate Jobs Action Plan - Morrison's Policy Paralysis May Cost Regional Jobs, 30 September 2019.
[25] Mark Klippenstein, *World's First Floating Offshore Wind Farm Achieves 65% Capacity Factor After 3 Months*, Greentech Media, March 01, 2018
[26] Wind Europe, *Floating Offshore Wind Energy: A policy blueprint for Europe*. 2018, p.2

Given the urgency of emissions reduction, the complexity of developing an offshore wind industry in Commonwealth waters, and the challenges caused for the electricity grid with the closure of power stations, we believe the NSW and the Commonwealth government should play a direct role in developing offshore wind. This could be done:

- Through Snowy Hydro, which has expanded to become 'an integrated energy business' wholly owned by the Commonwealth, and operating power stations across NSW, Victoria and South Australia. In NSW, Snowy Hydro owns the Colongra Power Station on the Central Coast, which is the largest gas-fired generation plant in New South Wales (in addition to its hydroelectric dams which are located in both NSW and Victoria).
- Through a renewable energy company established by the government of NSW, similar to the CleanCo renewable energy company that has been established by the Queensland government.

Energy NSW, the Department of Energy, the Australian Renewable Energy Agency, the Australian Energy Market Operator, and the COAG Energy Council need to do a proper assessment of the potential for offshore wind in Australia, and work together to develop a Master Plan for how it can be developed and integrated into Australia's electricity system and marine areas.

Seafarers and workers from coal terminals, coal fired power stations and other parts of the thermal coal industry could transition to those jobs.

Offshore wind in Victoria

The Star of the South offshore wind project off Gippsland, Victoria is the first offshore wind project to be built in Australia. It is an important opportunity to implement a just transition focussed on the creation of good secure union jobs, and to provide direct transition opportunities for regional workers in high-emissions industries, including the LaTrobe Valley.

The Star of the South project was given exploration approval in March 2019, and still needs to gain separate construction approval. It includes:

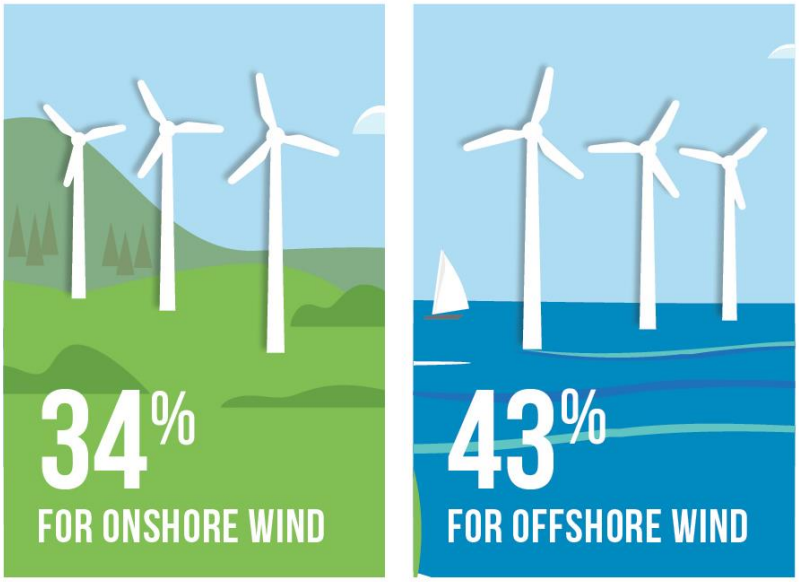
- A 2,000 megawatt increase in Victoria's renewable energy generation capacity, with 250 wind turbines built 10-25km off the east coast of Gippsland. This could supply up to 18% of Victoria's current electricity demand.
- A large reduction in greenhouse gas emissions from electricity generation.
- The company projects 2,000 direct construction jobs, with construction spread over a number of years, and 300 ongoing jobs. Offshore wind turbines also need to be replaced about every 25 years.
- An injection of infrastructure and resources into the Gippsland region, with substantial community benefits. The project is estimated to cost $8 billion.
- A renewed future for the Latrobe Valley's energy transmission assets.

Why offshore wind?

A significant advantage of offshore wind projects is that they can be built at a bigger scale than onshore projects. In Australia 38 onshore renewable energy projects were completed in 2018. The largest was 270 MW, nine were 100-200 MW, and the remaining 28 projects were less than 100 MW.[27] In contrast, the Star of the South offshore wind project in Victoria is proposed to be 2,000 MW. Offshore wind turbines can be built with taller masts reaching stronger winds and supporting larger and more powerful turbines: in 2018 individual turbine sizes of up to 8.8kW were used. This means that each individual turbine can produce more power.

Offshore wind projects can be built in areas of greater and more consistent wind strength than are available onshore, which leads to a higher capacity factor (Figure 4). Daily wind patterns can provide overall stability for the grid and reduce the need for storage. For example on the US east coast, wind offshore is strongest in the evening, when power demand peaks and solar power is not usually effective. This also means that production is greatest at the time of highest energy prices.

Figure 4: Average capacity factor for onshore wind compared to offshore wind.



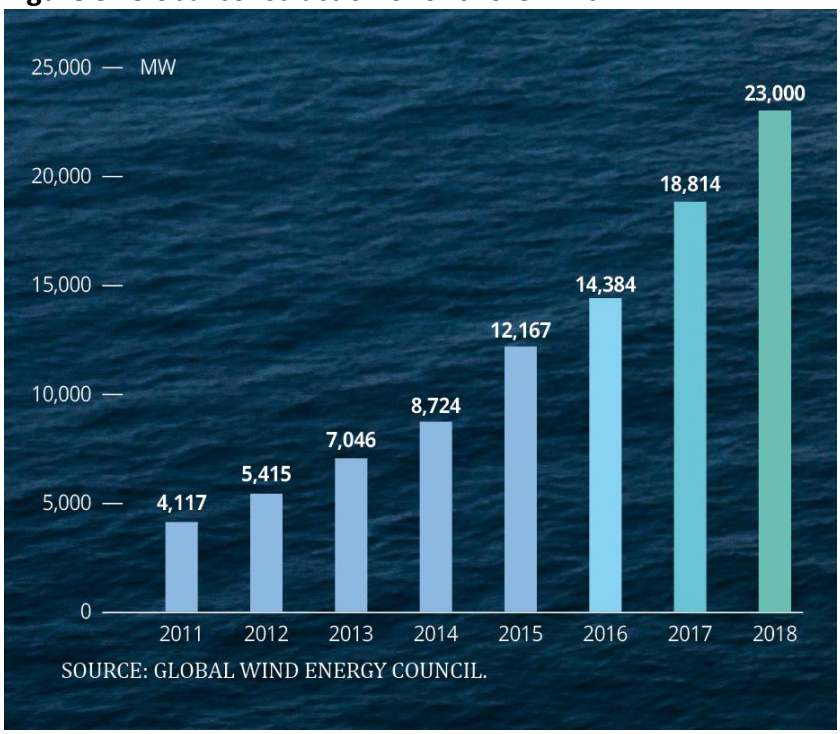
SOURCE: INTERNATIONAL RENEWABLE ENERGY AGENCY, RENEWABLE POWER GENERATION COSTS IN 2018, P.19 AND 24.

[27] Clean Energy Council, *Clean Energy Australia Report 2019*, p.15.

With the bulk of Australia's population located near the coast, offshore wind farms can also be sited close to sources of energy demand, reducing transmission costs.

By the end of 2018, 23 GW of offshore wind had been installed globally, and 4,543 grid connected offshore wind turbines were built in Europe (Figure 5).[28] In 2017 the average size of a grid-connected European wind farm was 493 MW, built at an average depth of 27.5m, with an average distance to shore of 41km.[29] Projects are increasingly being built at greater water depths and distances offshore, allowing them to access stronger wind resources and to operate more efficiently. In 2018 a number of European offshore wind projects were built at depths of 30-55m and 40-90km offshore. This has lifted capacity factors for European offshore wind to an average of 50%.[30]

Figure 5: Global construction of offshore wind.



Offshore wind construction is growing in many other countries (Figure 6):

- Japan has recently amended its laws to facilitate offshore wind and has a target to build 10GW of offshore wind by 2030.
- Taiwan has a target of 10-17 GW of offshore wind by 2030.[31]

[28] Global Wind Energy Council, Global Offshore Wind Report: sector has potential to grow to 200GW of capacity by 2030, 26 June 2019; Wind Europe, Offshore Wind in Europe: Key trends and statistics 2018.
[29] Global Wind Energy Council, *Global Wind 2017 Report*, p.56-7.
[30] IRENA, *Renewable Power Generation Costs in 2018,* p.49, p. 52.
[31] Global Wind Energy Council, *Global Wind 2017 Report*, p.59.

- South Korea's government is building transmission infrastructure to facilitate offshore and onshore wind, and looks likely to build about 13 GW of offshore wind by 2030.
- The first US offshore wind project has been built in Rhode Island. New York State has developed an *Offshore Wind Master Plan*, and aims to build 9,000 MW of offshore wind by 2035. Massachusetts utilities are required by law to procure 1.6 GW of offshore wind by 2027. New Jersey and North Carolina are also making plans for offshore wind.
- In India, large offshore wind developments may be built in coastal Gujarat and Tamil Nadu.

Figure 6: Sites where offshore wind has been built or is under development.

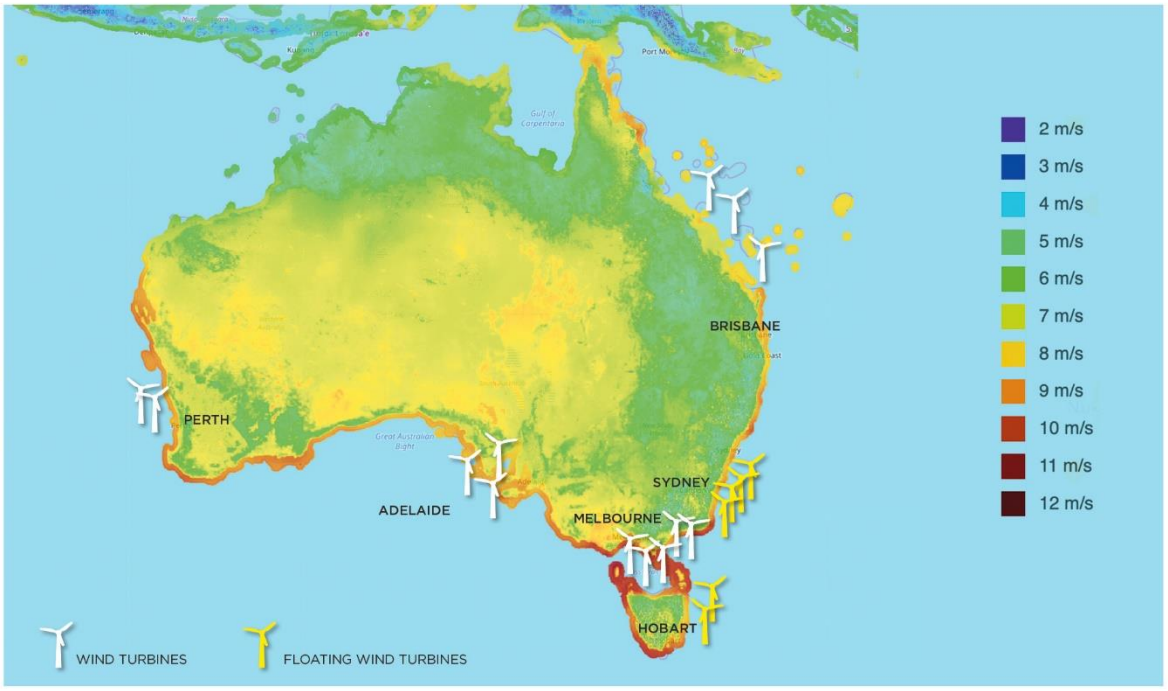
In Australia, offshore wind has so far been dismissed as too expensive. However, we believe these cost assessments rely on outdated assumptions,[32] and the real problem is a lack of research, planning and any regulatory pathways for the development of offshore wind. There is also a lack of long-term vision. Australia is in an enviable position to take advantage of our abundant energy resources to create competitive industries that will deliver substantial economic benefit, both in terms of jobs and technological development. However, it needs investment to support these infant industries to allow them to grow. The

[32] For example, we believe there are a number of flawed assumptions in the GHD report *AEMO Costs and Technical Parameter Review*, produced in 2018. Details available on request.

development of a low carbon energy industry would place Australia as the ideal location for low carbon energy-intensive manufacturing.

The only published study we are aware of to examine offshore wind potential in Australia was published in 2009. It identified a number of potential locations for offshore wind, but this research needs to be updated in light of the development of offshore wind technology (Figure 7).[33]

Figure 7: Sites where offshore wind could be built in Australia, based on a 2009 study plus possible sites for floating offshore wind.



SOURCE: POTENTIAL LOCATIONS FOR WIND TURBINES FIXED TO SEAFLOOR. WIND MAP FROM IRENA GLOBAL ATLAS FOR RENEWABLE ENERGY.; ELEONORA MESSALI AND MARK DIESENDORF, 2009, 'POTENTIAL SITES FOR OFFSHORE WIND POWER IN AUSTRALIA', WIND ENGINEERING 33(4): 335-348. WIND MAP FROM IRENA GLOBAL ATLAS FOR RENEWABLE ENERGY.

More recently, CSIRO scientist Dr. Mark Hemer has carried out assessments of the potential for offshore wind and other ocean energy sources such as tidal, wave, and floating solar. He finds that wind turbines in much of Australia's coastal waters can be expected to have a capacity of 0.4 to 0.5, with some areas having a capacity factor up to 0.6.[34] Hemer estimates that 3600 TWh/yr could be generated from offshore wind in places within 50km of the

[33] Eleonora Messali and Mark Diesendorf, 2009, 'Potential Sites for Offshore Wind Power in Australia', *Wind Engineering* 33(4): 335-348.

[34] Calculated using the minimum wind strength recorded over a recent 10-year period. Assumes one wind turbine per square kilometre and uses the published power curves for an 8MW Leanwind turbine, similar to a Vestas V164. See Mark Hemer, 2018, *Australia's offshore renewables: Where do the opportunities lie?* Presentation to Australian Ocean Renewable Energy Symposium, November 2018, p.13. Unpublished powerpoint presentation.

current electricity grid, and in water depths of less than 50m (which reduces the cost and technical challenges).[35] Expanding to locations with depths up to 200m, which would mostly require floating offshore wind installations, there is 5611 TWh/yr of potential power available from offshore wind in locations less than 50km from the current electricity grid. Electricity generation in Australia in 2014-15 was 252 TWh/yr.

Good jobs in offshore wind

A just transition requires good jobs in new industries. One major advantage of offshore wind is that it provides more skilled, long term jobs than onshore wind – estimates are 2.5 to 3 times more jobs.[36]

Although more labour is required to run offshore wind turbines, they are more efficient at producing electricity and other costs are reduced. Offshore wind projects are sited on areas of the seabed that are publicly owned, which avoids the need to make significant payments to individual private landowners to buy or lease land required for onshore projects. Turbines and masts can be constructed in port precincts and loaded directly onto purpose-built vessels, avoiding the civil works to build new roads on-site, and costs of road transport of wind turbine parts over long distances to remote sites, including high load escorts, main road approvals, live line lifts (driving under powerlines), and the costs of specialised cranes and trucks.

A significant number of jobs in offshore wind are ongoing maintenance jobs. Detailed jobs estimates for 2.4GW of offshore wind to be built in New York state (and assuming some support is provided for a further 5.6 GW built in the NE US region) provide for 1,830 ongoing NY jobs in operation and maintenance, mainly in service and maintenance of turbines. However the total number of jobs created in offshore wind projects will depend significantly on the effort put into maximising local manufacturing of offshore wind components. In scenarios where local content is maximised, a further 470 installation and commissioning jobs and 2,250 manufacturing jobs are created in New York. Where such efforts are not made, only 200 installation and commissioning jobs and 90 manufacturing jobs are created (Figure 8).[37]

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[35] Mark Hemer, 2018, *Australia's offshore renewables: Where do the opportunities lie?* Presentation to Australian Ocean Renewable Energy Symposium, November 2018, p. 18.

[36] European Wind Energy Association, Green Growth: The impact of wind energy on jobs and the economy, April 2012, p.34.

[37] BVG Associates, *New York State Offshore Wind Master Plan: The Workforce Opportunity of Offshore Wind in New York*, December 2017, p.62, Prepared for New York State Energy Research and Development Authority.

Figure 8: Comparison of jobs in offshore wind in New York, depending on whether local manufacturing takes place or not.

Source: BVG Associates, New York State Offshore Wind Master Plan: The Workforce Opportunity of Offshore Wind in New York, December 2017, p.62, Prepared for New York State Energy Research and Development Authority. P.19: INFOGRAPHIC BY LX9 DESIGN

Australia's remote location, the availability of raw materials, the necessity of transitioning our skilled workforce and the very large and delicate nature of wind turbine components mean that there is good reason to ensure that wind turbine manufacture is further expanded in Australia.[38] However, this will require an ongoing pipeline of local projects. This will require planning and firm expectations from all levels of government. Experience in the UK shows that without strong transition plans involving requirements for local procurement and good jobs, workers do not transition, and fewer jobs are created.[39]

Another important measure to maximise jobs and provide a just transition is to ensure that jobs are permanent, stable jobs with good rosters, reasonable hours of work, good leave ratios, and union agreements. The Maritime Union of Australia is committed to achieving this outcome.

Australia is home to many seafarers currently working in the offshore oil and gas industry, who have highly developed skills in the construction and maintenance of large maritime oil and gas projects. There is a significant overlap of skills between the offshore oil and gas industry and offshore renewables industries.

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[38] Keppel Prince manufacture wind towers in Portland, Victoria, and global wind company Vestas announced in February 2019 that they will be establishing a wind turbine manufacturing and maintenance facility in the former Ford plant in Geelong.

[39] Scottish Trade Union Congress, Trade unions back radical action on climate and jobs, 17 April 2019, Scottish Trade Union Congress, Fife 'Ready for Renewal' campaign swings into action, 22 May 2019.

Offshore wind projects also have their own electrical substation that needs to be installed, operated and maintained, much like the electricity substations ashore in the Hunter Valley coal fired power stations.

Transitioning fossil fuel workers to the renewable energy industry must be a part of a just transition in the Australian economy as a whole.

Regulation of offshore wind in Australia

Developing the offshore wind industry will require fixing some significant regulatory issues. Offshore wind projects are most likely to be built in Commonwealth waters, beyond the jurisdiction of state planning agencies. The Star of the South project has been dealt with as a one-off special case by the Commonwealth Department of Energy, and there is still no broader regulatory framework for offshore wind in place. We would like to see the Commonwealth Government develop an Offshore Wind Master Plan for Australia to map the best locations for offshore renewable energy, including floating offshore wind, and establish a plan to facilitate the speedy development of the industry. Energy NSW should do the same for NSW. New York State has recently completed such a planning process.[40]

Any consideration of the future of offshore wind needs to be planned as part of the development of the electricity grid, so the responsible authorities should include Energy NSW, the Commonwealth Department of Energy, the Australian Renewable Energy Agency, the COAG Energy Council, and the work of the Australian Energy Market Operator in developing an Integrated System Plan.

It is our view that the development of offshore wind should be kept separate from the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), which is responsible for offshore oil and gas developments in Australia. The regulation of the energy grid is already extraordinarily complex and fragmented. We do not need to bring in another agency which does not have experience in the electricity grid, and whose experience is in the very different oil and gas industry. Instead, the necessary maritime and environmental expertise should be brought into an agency that is already involved in the electricity grid. Moreover, the cash bid auction process used for offshore oil and gas is not a good model to follow for offshore wind. In the last round of cash bids companies paid between $2 million and $5 million for rights to undertake exploration in a specific area.[41] One of the advantages of offshore wind is that land is not privately owned, so this aspect of costs can be reduced, compared with onshore wind.

It is also important to us that workers in new offshore renewable industries have the same Work Health and Safety rights as other seafarers and shoreside workers, and not be subject to the poorer provisions of the OPGGS Act. The recent Inquiry into the Work health and

[40] New York State Energy Research and Development Authority, *NYS Offshore Wind Master Plan*, 2018.
[41] Department of Industry, Innovation and Science, 2018 Offshore Petroleum Acreage Release cash bidding results, 22 February 2019.

safety of workers in the offshore petroleum industry documented the significant problems that exist with the OPGGS Act.[42]

We cannot wait for the private sector to solve the challenges we face in the development of a low-emissions electricity system. As previously outlined, the government of NSW and Australia needs to play a direct role in building offshore wind in Australia.

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

Problems with market-based electricity systems

Australia's electricity sector is our country's single largest contributor to greenhouse gas emissions at 33 per cent of total emissions. It is also the sector that can provide the greatest opportunity for rapid reductions in emissions, by reducing overall demand and through the deployment of new technologies.

The disruption to the earth's climate caused by greenhouse gas emissions has been well known for decades, yet has been ignored in the rush for corporatisation and then privatisation of most of our electricity system. In this process, the government threw away one of our most significant opportunities to reduce emissions. The National Electricity Market (NEM) was established 10 years after the Intergovernmental Panel on Climate Change was established, 6 years after the Australian government signed up to the UN Climate Change Convention, and in the same year the government signed the Kyoto Protocol. Yet the NEM's 'objectives' and 'rules' do not include any consideration of greenhouse gas emissions.

Electricity networks in Australia were first built, owned and controlled by a few rich families for the private use of their households and businesses. Public systems of street lighting, and later, electric tramways, were first established in Sydney and Melbourne. Between WWI and WWII, Australian state governments systematically nationalised and expanded electricity supply. By the 1960s Australia had an almost universally publicly owned and controlled electricity system which provided some of the cheapest and most reliable electricity in the world. This all changed in the 1990s when state-based Electricity Commissions or Trusts were broken up, corporatized, and incorporated into the NEM, which was established in 1998. Energy retailers across the country and grid operators in South Australia and Victoria were then fully privatised, and in NSW privatisation began in 2010.

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42 https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Education_and_Employment/WHSinoffshorepetroleum/Report

The grid and the National Electricity Market (NEM) are currently run to facilitate market competition and private investment. Australia's electricity prices in this privatised system have become among the world's highest, increasing 56% in the past ten years. In 2018 the COAG Energy Council rated the affordability, security and governance of the NEM as 'critical' and forecast that its ability to deliver reliable low emissions electricity will soon also deteriorate to 'critical'.[43]

Privatisation and marketisation meant that the technical oversight and planning of the national electricity network was split into multiple grid operator, generator, and retailing companies – each operating to maximise their own profits. This created an explosion of marketing and sales staff in the NEM adding completely unnecessary overhead costs, such as retailers charging customers hundreds of dollars a year in sales and marketing strategies to convince them to purchase the electricity they are already buying.[44] Generators pretend to compete against each other to sell electricity, within an artificial electricity 'market', where the price paid to supply power changes constantly, allowing private investors to speculate and make money. Meanwhile every player in the game is guaranteed a profit by the market regulator.

Corporatisation and privatisation, along with the market structure of the National Electricity Market, have added very significant obstacles to the transition of our energy systems. [45] The system is fragmented, with whole sections privately owned and controlled, or publicly owned but entirely corporatized and run on market principles. There are no requirements placed on electricity companies to ensure that high-emissions generation is systematically replaced with renewable energy, or that upgrades keep the electricity grid fit for purpose, or that workers and communities are fully supported through this process. These challenges must be addressed to ensure good electricity supply at low prices, and to avoid increasing inequality and leaving whole communities and regions without jobs and economic infrastructure.

To achieve a just transition to renewable energy at the speed and scale required, the electricity system must be completely overhauled to be run in the public interest, which now includes reducing greenhouse gas emissions. Our electricity network was built around large scale centralised generation sources which then transmit that energy long distances to electricity consumers. A renewable energy system has to function very differently, requiring decentralised and interconnected grids with significant flexibility to manage constantly changing flows of energy. This will require a massive transformation of Australia's electricity network, a task that a fragmented private or corporatised sector will not deliver.

Relying on the market to run the electricity system also means workers in the industry lose out. In all parts of the system, thousands of skilled maintenance workers have been laid off,

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[43] Energy Security Board, The Health of the National Electricity Market 2018, COAG Energy Council, p.6.
[44]David Richardson, The Costs of Market Experiments: Electricity Consumers Pay the Price for Competition, Privatisation, Corporatisation and Marketization. The Australia Institute, January 2019.
[45] John Quiggin, *Electricity Privatisation in Australia: A record of failure,* February 2014. John Quiggin, 'Electricity reform', In *Wrong Way: How privatisation and economic reform backfired,* LaTrobe University Press, p.149-165.

and apprenticeship programs reduced or eliminated. Instead, layers of management, and marketing and sales departments have been added to chase customers with confusing electricity offers, adding up to $200 to annual electricity bills.[46] Higher electricity prices have a disproportionate on people with low incomes. Meanwhile, three of the largest companies in the electricity system made a combined $2.6 billion in profit in 2018.

The development of renewable energy

Globally, renewable energy development took off in Europe following the privatisation and liberalisation of those electricity markets. The European model of renewable energy development was based on sending signals to the market to invest in renewables through, on one hand, setting a carbon price, and on the other hand, spending billions on public subsidies to create investment incentives and reduce risk for private renewable energy developers (such as feed-in tariffs, power purchase agreements and contracts-for-difference awarded through reverse auctions). Variations of this model have been exported to North America, Australia, and even China. While these measures have achieved significantly increased investment in renewable energy, they are failing to achieve emissions reduction at the speed and scale required, or with the social conditions needed to avoid a political backlash that could threaten the transition process.[47] Trade Unions for Energy Democracy have carried out an important analysis of what they call the 'green growth' model, identifying that emissions reduction targets are not being met, and by 2015 $150 billion of public money had been spent subsidising a system not under public control.[48]

In Australia, a key policy has been the Renewable Energy Target (RET), which created tradeable Certificates sold by renewable energy companies, up to a targeted amount of renewable generation by 2020 (a target that was reduced by Abbott). Energy retailers and large users were required to buy these Certificates. This additional subsidy for renewable energy developers was ultimately subsidised by consumers, who paid an estimated $40 annually to support the RET through energy bills. It has already been announced that enough Certificates will be issued to meet the reduced 2020 target, but Minister Angus Taylor has announced that the RET will not be extended. With the RET winding up, state policies have become more important. There are similar RETs in Queensland and Victoria, as well as reverse auctions run by the Queensland, ACT and Victorian governments which effectively guarantee a minimum price for developers.

RETs and reverse auctions have encouraged construction of renewable energy projects, but this has taken place chaotically, without planning of where these projects should be located, how they fit into existing energy supply, and what transmission is needed to support them –

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[46] David Richardson, The Costs of Market Experiments: Electricity Consumers Pay the Price for Competition, Privatisation, Corporatisation and Marketization. The Australia Institute, January 2019.
[47] Vera Weghmann, *Going Public: A decarbonised, affordable and democratic energy system for Europe*. Public Services International Research Unit, July 2019.
[48] Trade Unions for Energy Democracy, *TUED Working Paper #10: Preparing a Public Pathway Confronting the Investment Crisis in Renewable Energy*, November 2017.

far less any just transition policies for coal fired power workers. 38 renewable energy projects completed in 2018 were owned by 32 different companies,[49] mainly specialised private renewable energy companies, which are often subsidiaries of global companies established in Europe and China. In addition, two million homes now use rooftop solar panels, most installed by companies with only a few employees.

Renewable energy companies 'prospect' for potential project locations using wind or solar resource maps, and by knocking on the doors of private landowners to see if they will lease land, and at what price. They then arrange to bring in their own contractors for construction, and poor conditions on the worksites are rife. The Electrical Trades Union report that in many cases, licenced electricians are not used and installations do not meet electrical safety standards. Companies must then negotiate the crucial grid connection they need to sell electricity with the company operating the grid locally. Sometimes this can take years of contractual battles, as the grid company seeks to make the renewable energy developer shoulder the cost, and the renewable energy company seeks to reduce their costs as much as possible.

This disorganised system can function at low levels of renewable energy, but as the percentage of renewable energy increases, significant problems are developing. Renewable energy supply is variable, and solar energy is concentrated in the middle of the day when the sun is shining. A renewable energy system requires planning to balance out this variability by using different types of generation, connecting different geographical areas, and by using systems of energy storage such as batteries and pumped hydro to ensure grid stability and that sufficient power is available when needed, especially in peak evenings or hot days. The discussions around the cost of renewables that focuses on a single project (Levelised Cost of Electricity or LCOE) do not incorporate these system-level costs – which AEMO is now attempting to calculate and use for future planning.[50]

The need for better planning of the electricity system was recognised in the Finkel review of the electricity market in 2017. AEMO developed its first Integrated System Plan (ISP) in 2018, which is now being reviewed and updated. But the ISP is filled with contradictions. It recommends all sorts of new grid interconnectors – but has no power to build them or to require they are built. It has no control over when coal fired power stations will be shut down. AEMO is caught in the contradiction that generators will (hopefully) give three years notice of closure, but they need approximately a 10-year lead time to build significant new grid interconnectors. NSW Minister for Energy and Utilities Don Harwin said that in 2018, only one in 20 proposed new renewable energy projects in the planning pipeline actually have a grid connection available to them.[51]

AEMO says four new projects to upgrade and build transmission lines between NSW, Victoria, SA and Qld are critical to maintaining reliability as more coal fired power stations

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[49] Clean Energy Council, *Clean Energy Australia Report 2019*, p.15.
[50] Within the Gencost project jointly run by AEMO and the CSIRO.
[51] NSW Government, NSW Transmission Infrastructure Strategy: Supporting a modern energy system, November 2018, p.3

shut and renewables are brought online.[52] It appears that they are mainly relying on Transgrid to do this work. But Transgrid was fully privatised by the NSW Liberal government in 2015, for $10 billion. A public company could just be directed to make this investment, and could access the lowest cost financing available. But in order to encourage a privatised Transgrid to do this work, the NSW government is offering them a 'funding guarantee',[53] the South Australian government has offered to put in over $200 million, and the COAG Energy Council and the Energy Security board are exploring setting up a Fund that could be used to 'underwrite' investments recommended by the ISP.[54] It could end up being a complex and expensive way to take action that could have been done much more quickly and easily under public ownership.

As a start, new investment in renewable energy generation, storage, and the new transmission and distribution infrastructure needed to support it should be done under public ownership and financing. Governments can build at lower cost due to their ability to access cheaper financing. Planning and investment is needed to ensure that the required grid interconnectors and transmission is available for an electricity system based on renewable energy, as well as appropriate timing of retirement of older generation assets. Wherever possible, low-emissions projects should be located in emissions-intensive communities. There should be direct government investment and ownership to prioritise these projects and ensure they are built to the highest standards and maximise good employment. Superannuation investment in democratically controlled renewable projects should be facilitated through government-issued bonds intended specifically to fund these projects.[55]

The transformation of the energy network could and should provide the investment that regional Australia desperately needs.

Conclusion

A focus on lowest-cost and market-led emissions reduction cannot achieve the speed and scale of emissions reduction we need, and will not do it without increasing inequality and generating significant political backlash, particularly in regional Australia.

We urgently need a step-change in government actions to address the climate crisis, to include strong government planning, action and very significant investment to ensure that every step taken to reduce emissions also includes measures to reduce inequality, and to

[52] AEMO, *Statement of Opportunities 2019.*
[53] NSW Government, NSW Transmission Infrastructure Strategy: Supporting a modern energy system, November 2018.
[54] COAG Energy Council, Energy Security Board: Converting the Integrated System Plan into Action, May 2019, p.19
[55] Trade Unions for Energy Democracy, *TUED Working Paper #10: Preparing a Public Pathway Confronting the Investment Crisis in Renewable Energy*, November 2017, p.61-63.

ensure that workers have good union jobs to go to in the new low-emissions economy. Building an offshore wind industry should be part of our actions to address these challenges.