



Friday, 16 December 2022

## Submission – Inquiry into workforce development in Northern Australia

The Clean Energy Council (CEC) and the Australian Hydrogen Council (AHC) welcome the opportunity to make a submission in response to the Joint Select Committee on Northern Australia on workforce development.

The CEC is the peak body for the clean energy industry in Australia. We represent and work with more than 1,000 businesses operating in Australia across renewable energy, energy storage, and renewable hydrogen.

AHC is the peak body for the Australian hydrogen industry. AHC connects the hydrogen industry and its stakeholders in building a secure, clean and resilient energy future that sustainably produces and uses hydrogen within the energy mix. AHC's members are from a range of sectors, including energy, transport, consulting, banking and technology.

Recent research indicates that Northern Australia could play a major role in the energy transition in Australia. This has the potential to be a significant driver of population growth, as well as regional investment in social infrastructure. Alongside the opportunities presented to Northern Australia in a renewable energy future, there are also significant challenges. Some of these challenges are associated with the pace and scale of change required, the sequencing of projects, the availability of materials, labour and skills, and the associated impacts on capital costs.

Attracting, training, and retaining the workforce needed to support both the expansion of renewable generation projects and any associated social infrastructure faces key challenges, including in relation to the location of projects, the visibility of opportunities, availability of training, mobility for workers, and equity, inclusion, and diversity. These projects have the potential to deliver substantial benefits for local Indigenous communities.

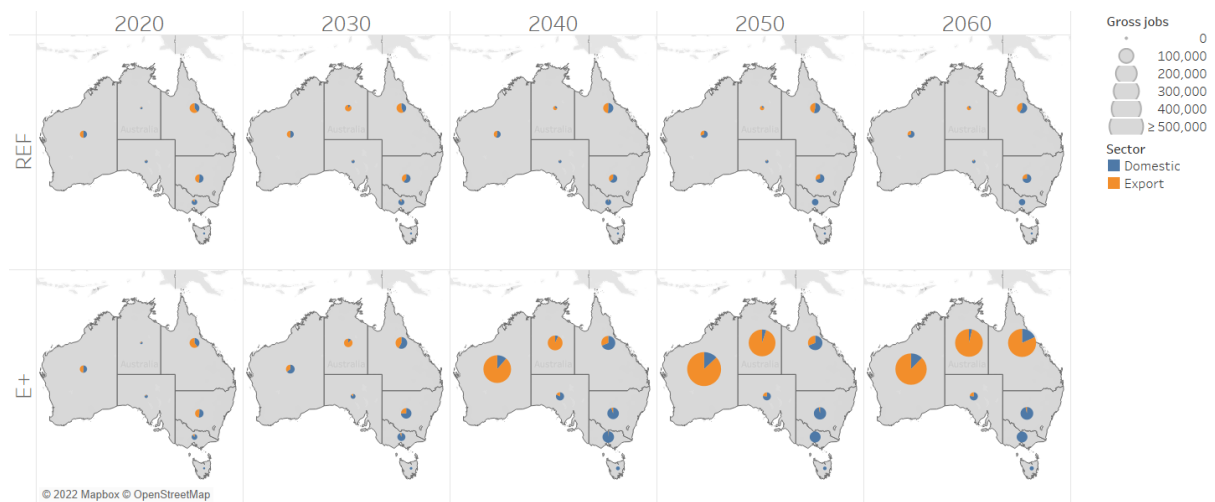
***a. trends in Northern Australia that influence economic development and industry investment including population growth, economic and business growth, workforce development, infrastructure development, and Indigenous economic participation;***

Recent research from the Net Zero Australia (NZA) project indicates the potential for significant growth in the energy sector workforce in Northern Australia over the coming decades. Net Zero Australia is a collaborative research project between the University of Melbourne, the University of Queensland, Princeton University, and the Nous Group. The study models changes to Australia's energy system for both domestic and export sector emissions across all technologies from 2020 to 2060, as well as the associated impacts on jobs, occupations, skills and education.

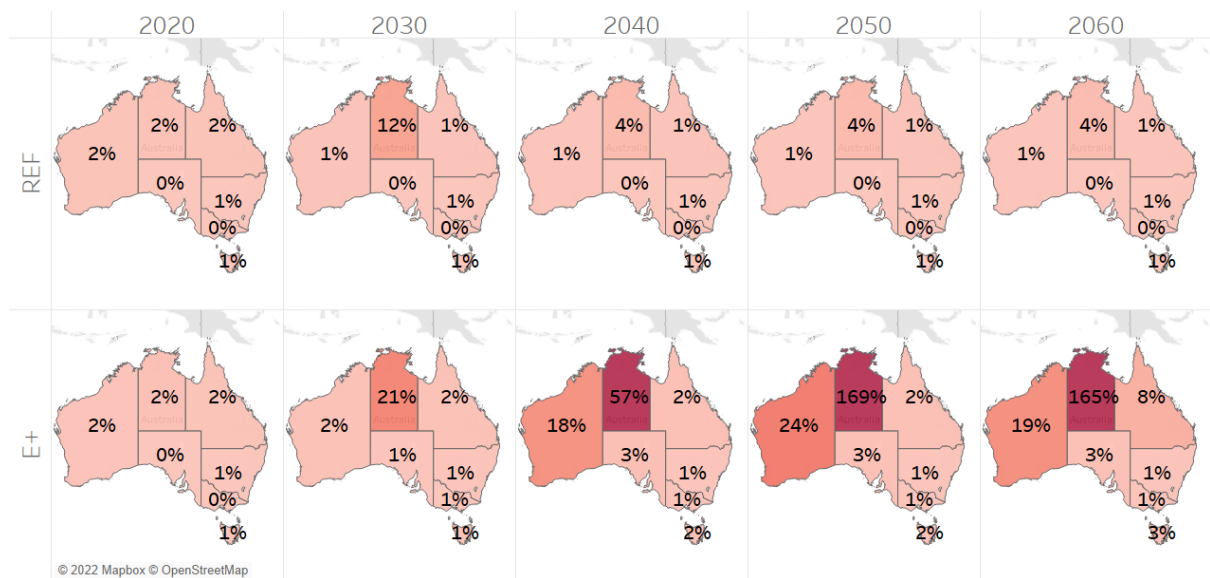
Preliminary findings indicate that the energy sector workforce over 2020 to 2060 will increase substantially by an average factor of 22 in Western Australia, 86 in the Northern Territory and 5 in Queensland (see Figure 1). Average gross energy sector jobs in 2060 are 470,000 for Western Australia (with a range of 412,000 to 544,000), 267,000 for the Northern Territory (range of 144,000 to 372,000) and 226,000 for Queensland (range of 80,000 to 357,000). It should be noted that these results are preliminary. As-yet unpublished revisions indicate total jobs will reduce by between 30-40%.

Most of these jobs support the export sector across the hydrogen supply chain, which includes utility solar, onshore wind, electrolysis, hydrogen storage and transmission, electricity transmission, battery storage, ammonia production. Around 75% of these jobs will be rurally located, in regions such as the Pilbara, Gascoyne, Big Rivers, Barkley, and Central Queensland. As noted in Figure 2, the energy sector could comprise a major proportion of the projected workforce in the Northern Territory from 2030 and exceeds the total projected workforce by 2050.

**Figure 1 | Jobs by state/territory and sector for each decade to 2060 from the Net Zero Australia project.** Results are shown for two scenarios; an unconstrained emissions scenario that reflects existing policies (REF) and a rapid electrification scenario with a net zero emissions constraint (E+). The size of the circles are relative to the number of jobs, with the largest circles representing just over 500,000 jobs.



**Figure 2 | Proportion of the projected workforce occupied by the energy sector by state and territory for each decade to 2060.**



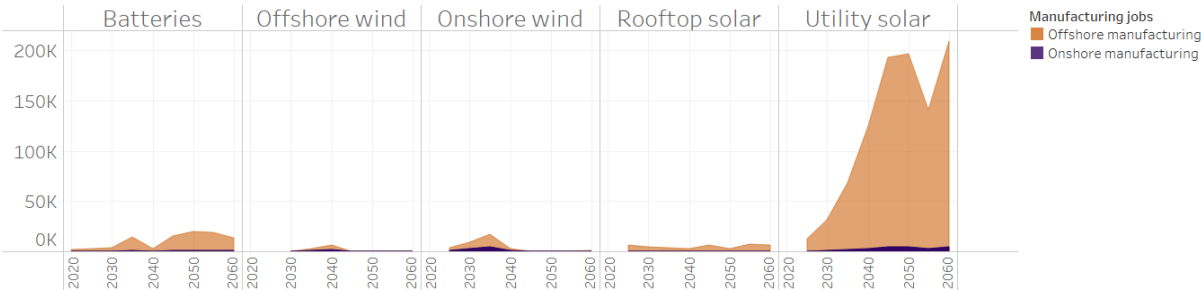
The workforce development impacts of this transition are substantial. Almost two thirds of jobs are blue-collar and require Vocational Education and Training, which includes electricians, electronics and telecommunications trades workers, construction workers and labourers. One third of jobs will require a tertiary degree and include professional occupations such as electrical and civil engineers, project managers and administrators.

A limitation of this research is that it does not account for increased capital and workforce costs associated with regional development. This will be examined in a sensitivity scenario in a future publication. However, the findings indicate the potential for labour availability to be a major consideration in the location of critical infrastructure, as well as the importance of long-term planning and project sequencing in managing labour shortages.

The study focusses on direct job creation in the energy supply. Direct jobs are those associated with primary activity such as extraction or electricity generation. It models some indirect jobs associated with the mid- or downstream activities within the value chain such as fuel conversion. However, other indirect jobs such as those involved in mining and mineral processing or upstream manufacturing including cement production and steelmaking are not counted here. The study assumes that onshore manufacturing capacity will remain at historically low levels throughout the transition, which is unlikely given the current policy and political focus on Australian manufacturing.

Figure 3 demonstrates onshore and offshore manufacturing jobs by renewable technology over time. The potential to create additional jobs by onshoring manufacturing is most significant for utility solar, with the possibility of an additional 200,000 domestic jobs across the manufacturing supply chain.

**Figure 3 | Onshore and offshore manufacturing jobs in renewable technologies for Net Zero rapid electrification (E+) scenario.**



Importantly, the NZA study does not include induced jobs created from the economic activity generated by the spending of direct or indirect incomes. It also excludes jobs associated with energy efficiency and electrification, including appliances, vehicles, transport. Furthermore, it ignores all jobs necessary to support major population growth, such as those involved in the construction and operation of social infrastructure and facilities including roads, hospitals and schools. As such, the job projections are likely to underestimate the real economic and business impacts of the energy transition.

***b. impediments to building the economic and social infrastructure required to support industry and business to expand and create regional jobs;***

The majority of energy sector jobs will be located in regional parts of the country. This will require investment in civil infrastructure. Access roads will be needed to facilitate the transport of materials and workforce. Population growth will require social infrastructure, including health and education services. It will also require appropriate accommodation. Insufficient housing supply risks a rapid increase in house prices, which can impact the social license of a project when residents are priced out of their communities.

The challenges to substantially expanding social infrastructure include the pace and scale of change, the sequencing of projects, the availability of materials, labour and skills, and the associated capital cost impacts:

- Pace and scale of change – the energy transition will require an unprecedented expansion of generation, storage and transmission infrastructure. Net Zero Australia research indicates electricity generation will increase by a factor of 40 to 2050. The energy system will comprise 1.9 terawatts of utility solar, 132 gigawatts of onshore wind and 42 gigawatts of offshore wind. The pace and scale of change will create challenges regarding social license, and the regional location of projects will have implications for engagement with First Nations peoples.
- Project sequencing – as energy capacity is built up, most new jobs will be in short-term construction and installation roles. Without proper sequencing, projects may experience workforce bottlenecks as projects compete for a constrained supply of workers. By around 2050, the operations and maintenance workforce will represent half the workforce, in most modelled scenarios. There is thus the opportunity to undertake the required workforce planning as that workforce grows.
- Materials – the COVID-19 pandemic and the Russian invasion of Ukraine have revealed the vulnerability of global supply chains to Australia. Increases in commodity prices and material shortages have exacerbated the costs of construction, which may delay or impede large-scale construction projects.

Proper supply chain analysis and discussions of onshoring or near-shoring manufacturing capacity are needed to ensure that the Northern Australian energy sector's supply chain is robust and resilient.

- Labour and skills – the Clean Energy Council has recently documented existing skill shortages facing the renewable industry across Australia in its *Skilling the Energy Transition* report. Key occupations are already in short supply, including electricians, engineers, and welders. These skill shortages will be experienced acutely in Northern Australia.
  - Northern Australia faces particular challenges due to its large and remote nature. Often, trades workers in remote areas are expected to have broad expertise and skillsets to be able to resolve the wide array of problems that may be experienced in remote field locations. This is unlike metropolitan regions with larger populations, where individuals can afford to specialise. This should be a consideration in the design of new qualifications.
  - There is a lack of research and data into the workforce requirements of the emergent hydrogen economy. As noted, this is a major source of jobs in the energy transition, and there is a role for government to provide further support in understanding the skills and education requirements needed to capitalise on this opportunity.
- Capital costs – all these factors increase the capital cost and contribute additional risk to the profitability of a project.

### ***c. challenges to attracting and retaining a skilled workforce across Northern Australia;***

Many of the challenges identified above apply to attracting and retaining a skilled workforce in Northern Australia. These include location, visibility, training, mobility of workers, equity, inclusion and diversity:

- Location – the remote location of Northern Australia is a major impediment to attracting qualified graduates, who are typically attracted to metropolitan areas. While some energy sector jobs, particularly those in project planning, administration and procurement, most will be located regionally.
- Visibility – jobs in clean energy jobs and pathways to work in the industry are poorly understood. The Clean Energy Council has published an online careers guide to demystify the industry prospective workers. However, as noted above, Northern Australia has unique needs due to its low population density and remote nature. An awareness campaign specific to Northern Australia highlighting the roles and pathways available would be a useful development. Visibility is a particular problem facing the emerging hydrogen economy, as the skills and occupations required are largely unknown.

- Training – the clean energy industry is already experiencing a critical lack of training capacity, notably in electrical trainers. These issues are amplified in Northern Australia, where Registered Training Organisations require additional support to expand their competence and offerings in relevant fields, which includes the availability and maintenance of key training equipment and environments. Where this cannot be provided locally, apprentices and trainees should be supported to complete training interstate through the provision of transport and accommodation.
- Mobility – workers currently face barriers to mobility between projects. There are opportunities to increase worker mobility, such as harmonising the required qualifications and training, and enabling the portability of long service leave and parental leave entitlements. As noted above, a coordinated sequencing of projects would provide construction workers with surety regarding future opportunities.
- Equity, inclusion and diversity – businesses with inclusive practices and high levels of diversity are more successful, boasting higher profits and performance and tending to have fewer safety incidents. Research by the Diversity Council of Australia shows that diverse and inclusive organisations are three times more likely to be effective, five times more likely to be innovative and three times more likely to provide excellent customer service. When employees feel valued and connected at work, they are five times more likely to be satisfied with their job and three times less likely to leave it. Employers that are known to be inclusive and have employees that are empowered to bring their own true self to work tend to attract a larger pool of highly skilled and capable talent. In the context of a growing industry with concerns around skills shortages, expanding the talent pool is critical. Female participation in trades is low, with more work required to attract and retain women in trades. There is also an opportunity to ensure the industry enshrines these practices from the outset and avoids replicating the biases present in the oil and gas industry. It is incumbent on government, industry, unions and workers to collaborate effectively in setting meaningful objectives regarding workplace equity and diversity.

Onshoring manufacturing, while important for regional economic development, could significantly increase local employment demands, thus exacerbating the issues already discussed. However, it affords additional opportunities in the form of allowing for preferential procurement for local contractors and Aboriginal businesses. It also affords greater control of quality and flexibility and can lead to more ethical supply chains. Co-location of complementary services in industry clusters can also increase productivity, responsiveness, and supply chain resilience, reducing risk and enhancing Australia's domestic energy security. While there is opportunity and

ambition for Australia to become a major global hydrogen player, there is an immediate need for planning to identify and address industry-specific supply chain challenges.

***d. empowering and upskilling the local Indigenous population.***

As most projects are located regionally, there are significant opportunities for empowering and upskilling local Indigenous populations. There is strong potential for communities to benefit from regional investment and the infrastructure development opportunities outlined above. There are economic opportunities from royalties and benefit sharing, as well as training and education opportunities for short-term and ongoing jobs.

It is essential for industry to engage with local communities early in the process and establish them as genuine partners in decision-making. Negotiations must be entered in good faith, ensuring communities are empowered to give free, prior and informed consent on all relevant matters, including siting, design and implementation. Projects need to prioritise the establishment of long-term relationships of mutual benefit with local communities as a key success criterion. Cultural awareness and safety training can help ensure that a project's workspace is a safe and welcoming place for local communities.

An honest communications strategy is needed on the employment opportunities in clean energy, particularly in relation to the transient nature of many roles in the construction phase. Where there is prior and informed consent for a project and it is co-located with local indigenous communities, preferential employment opportunities should be provided. In these instances, additional support should be also provided. This could include training on how the clean energy industry functions and what effective partnership might look like with clean energy industry projects to maximise the opportunities to self-determine outcomes. It should also include assistance in navigating administrative and employment tasks such as acquiring identification, opening a bank account, understanding a paycheck, assistance with transportation etc. Government support could be provided to assist industry in engaging on-site mentors and support assistants for indigenous employees.

The First Nations Clean Energy Network has recently published a negotiation guide to support First Nations peoples with this. The Clean Energy Council is working to develop industry guidelines on best practice for engaging with First Nations communities for its members.

We thank the Committee for taking on this important enquiry, and hope its work catalyses an important conversation about the important role Northern Australia will



play in the emerging green global economy, as well as the opportunities for workforce development and empowerment of local Indigenous populations.

Yours sincerely,

A handwritten signature in blue ink, appearing to be 'A. Talberg', with a long horizontal flourish extending to the left.

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