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NSW GOVERNMENT

NSW Renewable Energy Sector Board's Plan

September 2022

Acknowledgement of Country

The NSW Renewable Energy Sector Board and the NSW Office of Energy and Climate Change (OECC) acknowledge the First Nations people of NSW and their continuing social, spiritual and cultural connection to Country, and we pay our respects to Elders past, present and emerging.

The Board and the OECC believe in thoughtful, placed-based approaches to our work and maintaining strong partnerships with First Nations communities to ensure local priorities and values inform and influence decision-making, and that those communities benefit from the economic empowerment and jobs generated from the work of the Board and the OECC.

The Board's plan is consistent with, and will contribute to achieving, the outcomes of *Our Place on Country: First Nations Outcomes Strategy 2023*.

The Board's plan aims to align with the guidelines for consultation and negotiation with First Nations people issued under section 4 of the *Electricity Infrastructure Investment Act 2020* (NSW) (the Act). Where there is any divergence on matters relating to First Nations participation, the First Nations Guidelines take precedence.

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NSW Renewable Energy Sector Board's Plan

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Cover image: Maintenance worker seen from the back fixing a solar panel. Photo by Capuski/Getty Images

Foreword from the Board's joint chairpersons

NSW has a once-in-a-generation opportunity

The NSW Electricity Infrastructure Roadmap (the Roadmap) will deliver globally competitive prices and low emissions electricity. This can help our industries revitalise and take advantage of emerging opportunities for growth as the world economy reduces its carbon emissions.

By declaring its commitment to new clean energy generation, NSW has the first mover advantage in the National Electricity Market (NEM). This provides an opportunity to attract investment in local manufacturing to NSW and create jobs for NSW workers in the construction and operation of electricity infrastructure.

It is important that we manage the energy transition well to maximise the opportunities and minimise the adverse impacts for regions, communities and workers. While some regions will see growth, others are already experiencing disruption and dislocation. This ultimately can result in loss of social licence for the transition.

Through its advice to the Minister for Energy (the Minister), the NSW Consumer Trustee and Energy Corporation of NSW (EnergyCo), the NSW Renewable Energy Sector Board (the Board) can help establish Australia's renewable energy industry on solid foundations in a way that:

- supports the growth and competitiveness of the industry
- ensures the benefits of renewable energy projects are shared with workers, their families and communities through guaranteed quality local jobs and stronger employment conditions.

Board's vision for the NSW renewable energy sector

Our vision is to make sure our local workers, communities and industries reap the economic benefits of the transition to cheap, reliable and clean electricity.

Our plan sets out how to do this in ways that are cost-effective for all electricity consumers, drive sustainable growth and competitiveness of our industry, and provide quality jobs for new and existing workers in NSW.

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Summary

About the Renewable Energy Sector Board

The NSW Electricity Infrastructure Roadmap (the Roadmap) is the NSW Government's plan to transform our electricity system into one that is cheap, clean and reliable.

The Minister for Energy (the Minister) appointed the NSW Renewable Energy Sector Board (the Board) in February 2021, as required under the *Electricity Infrastructure Investment Act 2020* (NSW) (the Act). The Board has representatives from unions, the steel, electricity and manufacturing sectors, the renewable energy industry, and electricity customers.

The Act requires the Board to prepare and provide to the Minister a plan for the NSW renewable energy sector, in particular in relation to the operation of the sector and the manufacture and construction of infrastructure in the sector.

The Act requires the Minister and the NSW Consumer Trustee to take this plan into account when exercising their functions under the Act.

The section on Local content requirements for generation, storage and network projects sets out the Board's advice to the Minister and Consumer Trustee relating to their functions under the Act. The Board has also directed these recommendations to the Energy Corporation of NSW (EnergyCo) as the infrastructure planner for the 5 renewable energy zones (REZs) required to be declared under the Act.

The section on Continuous improvement of the Board's plan sets out priorities for the review of the plan, required under the Electricity Infrastructure Investment Regulation 2021 (the Regulation) at least every 2 years. This includes consideration around refining and modifying the minimum requirements and stretch goals for local content.

In addition to the recommendations made under the Act, the section on Building up the capacity and capability of the NSW renewable energy sector provides the Board's advice to the NSW Government.

The Board's plan aims to align with the guidelines for consultation and negotiation with First Nations people issued under the Act. Where there is any divergence on matters relating to First Nations participation, the First Nations Guidelines take precedence.

Trade obligations and consumer cost

The Regulation specifies that an objective of the Board's plan is that it protects the financial interests of NSW electricity customers and is consistent with Australia's international trade obligations.

Protecting the financial interests of NSW electricity customers

To ensure this plan protects the financial interests of electricity customers, the Board's recommended local content requirements set out below are informed by:

- analysis and modelling of consumer costs, economic benefits, and the capacity of small and medium enterprises (SMEs)
- a survey of consumer willingness to pay.

Table 1 sets out the net economic benefit, jobs creation and impact on retail electricity bills associated with the Board's recommended local content minimum requirements.

Table 1. Impact of Board's recommended local content minimum requirements

Benefit for NSW	
Net economic benefits (net present value in 2021 dollars)	$520 million
Jobs created (full-time equivalent (FTE) 2020–2041)	13,400
Impact on retail electricity bills in NSW (weighted average, FY23–41)	
Residential	0.3%
Small business	0.3%
Medium commercial and industrial	0.4%
Large commercial and industrial	0.4%

The survey of consumer willingness to pay indicated households and businesses were willing to pay, on average, 9.7% for maximising the use of locally produced material, contribution by apprentices and trainees, and participation by First Nations people.

Australia's international trade obligations

Throughout the development of this plan, the Board consulted with international trade law experts. The Board is satisfied this plan is consistent with Australia's international trade obligations because:

- the recommended minimum requirements for generation, storage and network infrastructure projects at merit assessment relate to:
  - supply chain inputs that can only be competitively supplied by local suppliers
  - exemptions from Australia's international trade obligations, including for SMEs and First Nations suppliers
  - matters such as fair and ethical practice and environmentally sustainable procurement that are non-discriminatory or permitted under exemptions to Australia's international trade obligations

- the recommended value for money (VFM) assessment holistically considers the overall economic benefit a bid brings to NSW, and the Board recommends the Consumer Trustee incorporate the VFM assessment into its evaluation process in a manner that is consistent with Australia's international trade obligation.

Opportunities and barriers in the NSW renewable energy sector

Over the next 20 years, the Roadmap will support significant investment into the NSW electricity system across generation, storage, firming and network infrastructure. The scale of the build-out, longer timeframe and coordinated approach will create long-term demand throughout the renewable energy supply chain, presenting significant opportunities for NSW workers and businesses.

Opportunities

Key opportunities for investors in the NSW renewable energy sector include:

- **Solar farm infrastructure:** Opportunities to supply racking, piling and mounting infrastructure locally.
- **Wind tower manufacturing:** The state's steel manufacturing capacity provides an opportunity for the co-location of new wind tower factories.
- **Wind farm manufacturing (non-tower):** There are opportunities to supply wind blades and foundations locally.
- **Battery energy storage supply chain:** NSW has many of the minerals necessary to support this industry.
- **Offshore wind:** Co-location of offshore wind facilities with existing ports and steel production facilities in the Hunter and Illawarra REZs, providing alternative employment for workers transitioning from traditional energy sectors.
- **Electrical balance of plant:** Existing local supply of electrical balance of plant such as cabling and inverters could expand to meet increasing demand.
- **Transmission tower manufacturing:** Potential for local manufacturing of transmission towers, which are currently imported.
- **End-of-life:** NSW could build on its existing local capacity such as in lead-acid battery recycling to foster a robust reuse and recycling sector.

Barriers

Although NSW has significant opportunities in several parts of the renewable energy supply chain, both statewide and regional barriers need to be overcome for these opportunities to be realised, and could present challenges for the successful and timely delivery of electricity infrastructure under the Roadmap:

- **Barriers faced by SMEs:** SMEs find it challenging to participate in procurements for large projects due to lack of scale, lack of specialised procurement expertise and inability to access project information.
- **Skills and labour shortages:** Driven by issues such as competition from other projects, low levels of unemployment within REZs and shortages in occupations such as electricians.
- **Skills and training:** The provision of training to address skills shortages is constrained, due to a lack of market capacity for training in renewable energy.
- **International competition for manufactured goods:** Labour and electricity costs are relatively high in Australia, which makes local manufacturing less internationally competitive.
- **Supporting infrastructure:** Infrastructure to attract and retain workers and support increased economic development, such as housing supply being constrained in some regional areas.

Local content requirements for generation, storage and network projects

The Board's recommendations provide guidance to the Consumer Trustee and EnergyCo on how to maximise the use of local content and workers in generation, storage and network projects under the Roadmap, as well as in the allocation of REZ access rights.

The Board supports the Consumer Trustee's proposed long-term energy service agreement (LTESA) and REZ access right eligibility criteria for employee entitlements, relevant legislations, industrial relations and modern slavery.

The Board further recommends that the Consumer Trustee include in eligibility or merit criteria or incorporate into its due diligence process evidence requirements for the following:

- industrial agreements, work health and safety (WHS), employee entitlements and other related requirements
- timely payment of small business subcontractors
- compliance with modern slavery legislation.

The Board recommends imposing an eligibility criterion on generation and storage project proponents to prepare an Industry Participation Plan (IPP), including a First Nations Participation Plan, when they seek an LTESA and/or to participate in a REZ access scheme. Network operators for network infrastructure projects should also be required to prepare an IPP.

Some of the projects under the Roadmap may be required to prepare an Australian Industry Participation Plan (AIPP) as prescribed under the *Australian Jobs Act 2013* (Cth).[1] The contents of an AIPP will likely duplicate components of the suggested IPP.

[1] Major public or private projects with an estimated capital expenditure of $500 million or more must prepare an AIPP.

To fulfill the requirements of an IPP and First Nations Participation Plan, the Board suggests that all Roadmap projects submit an AIPP with supplementary details addressing the topics not covered in a standard AIPP.

Merit and VFM assessments

The Board recommends minimum local content requirements be set in a way that ensures consistency with Australia's international trade obligations while providing local suppliers, including SMEs and First Nations suppliers, with full, fair and reasonable opportunities.

This includes setting minimum requirements and stretch goals for local content considered in merit assessment. Bids committing to the minimum requirement should receive the base score, and bids making commitments above the minimum for SME and First Nations content would receive a higher score in the merit assessment.

Bids not meeting the minimum requirement for a particular technology should be scored zero on that criterion, but should not be excluded from consideration as local content is one of several criteria in the merit assessment. However, proponents should provide a justification for why they cannot meet the minimum requirements.

Stretch goals will apply at the merit assessment if the minimum requirement for local content is set at a moderate level.

To set clear expectations for proponents, the weighting or priority for each criterion that will be used in evaluation should be identified.

The Board recommends that the Consumer Trustee incorporate a VFM assessment into its evaluation, assessing the overall economic benefit a bid brings to NSW considered holistically.

The Board recommends that the Consumer Trustee select how best to incorporate the VFM assessment into its evaluation process, in a manner consistent with Australia's international trade obligations. The Board's recommendations for ensuring the VFM assessment is consistent with international trade law are set out below at Recommendation 3: Merit and value for money assessments.

Table 2 sets out the Board's recommendations on minimum requirements and stretch goals for the first LTESA tenders, REZ access rights allocations and network infrastructure projects for merit assessment.

If adopted by the Consumer Trustee and EnergyCo, these would apply to local content from Australia and New Zealand, except for First Nations participation. The First Nations requirements apply to Australia, with emphasis on opportunities for local communities.

Table 3 sets out the Board's recommendations on stretch goals that could be considered by the Consumer Trustee in a VFM assessment, applying to NSW or the REZ.

The Board recommends the minimum requirements should evolve over time based on proponent performance and feedback and as the capacity of the local supply chain changes.

Monitoring, reporting and compliance

The Board recommends the development of a framework for monitoring, reporting and compliance that ensures commitments are implemented.

The Board recommends monitoring should include:

- information and guidance to proponents on how to comply
- ongoing monitoring of IPP implementation
- strong systems for data collection and reporting.

The Board recommends the Minister report at least annually to the NSW Parliament on local content, local jobs and the development of NSW supply chains in the Roadmap.

The Board also recommends the Minister report annually on:

- the status of workers in traditional energy sectors transitioning to renewable energy jobs and any adverse impacts on workers from this transition
- opportunities for trainees and apprentices in the sector
- use of the employment purpose component of REZ access fees.

The Board recommends the approach to compliance should be collaborative and use a risk-based graduated regulatory response, with enforcement actions as appropriate.

Continuous improvement of the Board's plan

As required under the Act and the Regulation, the Board will review its plan at least every 2 years, and report on its activities and make recommendations to the Minister each year. When reviewing its plan, the Board will:

- analyse and build on the outcomes of generation, storage and network infrastructure projects under the Roadmap
- refine and modify its recommended minimum requirements and stretch goals for local content
- take into account relevant updates to the First Nations Guidelines
- update baseline and opportunities studies for the NSW renewable energy sector
- consider implementation of relevant NSW Government plans, such as the Net Zero Plan Stage 1: 2020–2030 and the Hydrogen Strategy.

Table 2. Minimum requirements and stretch goals in merit assessment

Theme: Supply chain inputs	Criteria	Minimum requirements				
		Wind	Solar	Pumped hydro	Battery storage	Network projects
	Development phase	40%	49%	66%	23%	68%
	Operation and maintenance phase	51%	71%	61%	35%	78%
	Steel products and components using locally milled steel	10%	95%	30%	95%	Maximise to the extent possible
	Criteria	**Stretch goals**				
		Wind	**Solar**	**Pumped hydro**	**Battery storage**	**Network projects**
	Development phase	72%	81%	86%	78%	93%
	Operation and maintenance phase	76%	81%	82%	79%	89%
	Steel products and components using locally milled steel	95%				
Theme: Employment, skills and knowledge transfer	**Criteria**	**Minimum requirement**			**Stretch goal**	
	Learning workers (% of total project workforce)	20%			40%	
	Apprentices (% of all trades positions on a project)	20%			30%	
Theme: First Nations participation	**Criterion**	**Minimum requirement**			**Stretch goal**	
	First Nations participation	1.5%			10%, or the goal in the region-specific protocol under the First Nations Guidelines, where stated	
Theme: Fair and ethical practice	**Criterion**	**Minimum requirement**			**Stretch goal**	
	Employment of underrepresented groups	15%			25%	
Theme: Environmentally sustainable procurement	Numerical minimum requirements do not apply. Proponents are required to respond to evidence requirements to demonstrate environmentally sustainable procurement.					

Table 3. Stretch goals in VFM assessment

Theme: Supply chain inputs	Criteria	Stretch goals				
		Wind	Solar	Pumped hydro	Battery storage	Network projects
	Development phase	65%	67%	67%	47%	71%
	Operation and maintenance phase	70%	78%	77%	75%	85%
	Steel products and components using locally milled steel	90%				
Theme: Investment and innovation in the supply chain	**Criterion**	**Stretch goal**				
	Contribution to investment and innovation	10%				
Theme: Employment, skills and knowledge transfer	**Criteria**	**Stretch goal**				
	NSW jobs (% FTE jobs)	90%				
	Jobs for people from the local region – defined as the REZ and adjacent local government areas	60%				
	Learning workers (% of total project workforce) – applies to NSW	40%				
	Apprentices (% of all trades positions on a project) – applies to NSW	30%				
Theme: First Nations participation	**Criterion**	**Stretch goal**				
	First Nations participation	10%, or the goal in the region-specific protocol under the First Nations Guidelines, where stated				
Theme: Fair and ethical practice	**Criterion**	**Stretch goal**				
	Employment of underrepresented groups	25%				
Theme: Environmentally sustainable procurement	Stretch goal not applicable. Proponents are required to respond to evidence requirements to demonstrate environmentally sustainable procurement.					

Building up the capacity and capability of the NSW renewable energy sector

The Board has also developed recommendations for the NSW Government on actions needed to drive sustainable growth and competitiveness of local industries and realise the benefits for local workers and communities presented by the Roadmap. These recommendations represent the Board's advice to the NSW Government.

The Board notes the private sector, government and the community sector each have a role to play in delivering these recommendations. The Board recommends the NSW Government consult with the Board, industry, unions, councils and professional associations early and regularly in the implementation of this plan to ensure initiatives are relevant to the needs of the renewable energy sector and NSW community.

The recommendations are categorised under the following themes.

1. **Long-term planning for local content, jobs and skills**

   NSW has a significant pipeline of major infrastructure projects planned over the coming decades, including the $32 billion private sector investment under the Roadmap and other major initiatives in areas such as transport and community infrastructure (NSW Government 2022).

   While this pipeline of projects will deliver long-term benefits to communities, in the short term, renewable energy projects may compete with other infrastructure projects for resources. Managing this investment effectively will require long-term planning and a collaborative approach to create visibility of the statewide requirements for skills, infrastructure and resources.

   The Board recommends the NSW Government work with the private and community sectors to:

   1.1 Establish a NSW Government policy for local content, jobs and skills in the renewable energy sector

   1.2 Ensure a comprehensive approach to WHS in the renewable energy sector

   1.3 Minimise waste during construction and establish an end-of-life industry for the renewable energy sector

   1.4 Ensure a coordinated inter-regional approach to infrastructure delivery.

2. **Supply chain development**

   The significant investment expected under the Roadmap creates opportunities to develop local industries in areas where NSW has a competitive advantage.

   Increasing local content in the construction, manufacture and operation of electricity infrastructure will support jobs, growth and diversification for regional communities. This will strengthen and reduce risks in the NSW supply chain while potentially creating new export opportunities.

The Board recommends the NSW Government work with the private and community sectors to:

2.1 Attract investment to the NSW renewable energy sector

2.2 Reduce barriers for SMEs and First Nations businesses, particularly in regional areas

2.3 Build the capacity of the local manufacturing sector

2.4 Coordinate battery energy storage system industry development

2.5 Support development of an offshore wind industry in NSW.

3. Skills and training

The Roadmap is a once-in-a-generation opportunity to create quality jobs for NSW workers in the renewable energy sector; however, over 50% of industry stakeholders cite skills shortages as a major barrier in the renewable energy sector.

Coordinated, sector-wide action is needed to ensure the education, training and apprenticeship offerings in NSW can supply qualified workers in the numbers required, and with the skills required to support the delivery of the Roadmap.

The Board recommends the NSW Government work with the private and community sectors to:

3.1 Coordinate skills and workforce development in the REZs for energy, resources and infrastructure

3.2 Facilitate workforce redeployment, including opportunities for workers affected by the energy transition

3.3 Develop a Renewable Energy Sector Skills and Training Strategy that addresses key short-term and long-term skills and labour gaps in the market

3.4 Establish a nationally recognised training program for the transmission construction workforce

3.5 Improve employment and economic participation opportunities for underrepresented groups.

About the Board and this plan

The Act requires the NSW Minister for Energy to establish a board for the NSW renewable energy sector, in particular in relation to the operation of the sector and the manufacture and construction of infrastructure in the sector.

The Minister appointed the Board in February 2021. It has representatives from unions, the steel, electricity and manufacturing sectors, the renewable energy industry, and electricity customers.

The Act requires the Board to:

- prepare and provide to the Minister a plan for the NSW renewable energy sector
- monitor and review the plan and make recommendations to the Minister about the implementation of the plan
- report to the Minister on another matter if requested by Parliament by resolution of both Houses of Parliament.

Consistent with the Act, this plan sets out how to achieve the following objectives in the manufacture, construction and operation of electricity infrastructure under the Roadmap:

- maximise the use of locally produced and supplied goods and services
- maximise the employment of suitable qualified local workers
- foster opportunities for NSW apprentices and trainees.

A plan approved by the Minister must be published on the website of the Office of Energy and Climate Change (OECC) and takes effect on the day it is published.

About the Board's plan

The Board's plan, as approved by the Minister, comprises:

- The Foreword from the Board's joint chairpersons sets out the Board's vision for the renewable energy sector in NSW.
- The Acknowledgement of Country acknowledges the First Nations people of NSW.
- The Summary provides an overview of the key points in this plan.
- This section About the Board and this plan sets out the requirements relating to the plan under the Act. The section also sets out the process for developing the plan, including steps the Board took to ensure the plan protects electricity customers' financial interests and is consistent with Australia's international trade obligations.
- The section NSW renewable energy sector: opportunities and barriers summarises findings from a baseline and opportunity study of the NSW renewable energy sector, and provides contextual information for the Board's recommendations.

- The section on Local content requirements for generation, storage and network projects sets out the Board's advice to the Minister and Consumer Trustee relating to their functions under the Act. The Board has also directed these recommendations to EnergyCo as the infrastructure planner for the 5 REZs required to be declared under the Act. This is because EnergyCo will be responsible for recommending and procuring a network operator for the REZ network infrastructure projects.
- The section on Continuous improvement of the Board's plan sets out priorities for the review of the plan that is required at least every 2 years under the Regulation. This includes consideration for refining and modifying the minimum requirements and stretch goals for local content.
- The Definitions and Shortened forms sections provide clarity on terms used in this plan.
- Appendix A: Guidance for detailed requirements provides guidance for detailed local content requirements.

Effect of the plan

The Act requires the Minister and the Consumer Trustee to take the Board's plan into account when exercising their functions under the Act.

The Consumer Trustee's functions include:

- running the competitive tender processes for LTESAs
- preparing an infrastructure investment objectives report
- assessing REZ network infrastructure projects.

The Consumer Trustee may impose a condition that is consistent with the plan when:

- recommending the Minister give a direction for a REZ network infrastructure project
- authorising a network operator to carry out a REZ network infrastructure project.

The Minister may impose a condition that is consistent with the plan in:

- a direction for a REZ network infrastructure project
- an authorisation for a priority transmission infrastructure project.

The Board's advice to the NSW Government

The section on Building up the capacity and capability of the NSW renewable energy sector sets out the Board's advice to the NSW Government.

Appendix B: Vocational education and training sector provides an overview of the vocational education and training (VET) sector.

Development of this plan

In developing this plan, the Board adopted the following 7 key principles. These set out the Board's ambition and priorities, and the outcomes sought for the people of NSW.

1. Give full, fair and reasonable opportunity to NSW SMEs to participate in the construction and operation of infrastructure under the Roadmap
2. Encourage the growth and expansion of competitive, productive and efficient supply chains, including through modernising plant, equipment and technologies, for electricity infrastructure planning, construction, operation and maintenance activities
3. Maximise quality employment opportunities for local workers, including the provision of transition opportunities for workers and communities impacted by the energy transition
4. Support the development of a skilled workforce with sustainable career paths in the renewable energy sector and beyond
5. Ensure the renewable energy industry reflects society as a whole and operates ethically and safely
6. Give NSW businesses a competitive advantage in emerging 'green' industries including by complementing actions under the NSW Net Zero Plan
7. Encourage participation of local businesses with innovative products, processes, technologies and services that have potential to address challenges or create high value jobs in the sector.

The recommendations in this plan are informed by the following professional services projects:

- renewable energy sector baseline and opportunity study to identify opportunities, actions and strategies to maximise local content, including from SMEs, employment and skills for each REZ region (ISF and SGS 2022)
- WHS study to identify best practice and strategies to enhance WHS standards for the sector (MBB Group 2021b)
- supply chain analysis of the renewable energy sector to identify supply chain constraints and opportunities to develop current capacity for local content delivery (MBB Group 2021a).

A reference group consisting of Board members, staff from their organisations and representatives from relevant NSW Government agencies also supported the development of the plan.

The Board's plan aims to align with the guidelines for consultation and negotiation with First Nations people issued under section 4 of the Act. Where there is any divergence on matters relating to First Nations participation, the First Nations Guidelines take precedence.

Electricity customers' financial interests and Australia's international trade obligations

The Regulation specifies that an objective of the Board's plan is that it protects the financial interests of NSW electricity customers and is consistent with Australia's international trade obligations.

The Independent Pricing and Regulatory Tribunal (IPART), the Regulator for Part 2 of the Act, may recommend a Board's plan to the Minister only if satisfied the plan meets these 2 conditions. The Minister may approve the plan only on the recommendation of IPART.

Analysis of consumer costs, economic benefits, SME capacity and willingness to pay

To ensure this plan protects the financial interests of electricity customers, the recommended requirements set out in the section about Local content requirements are informed by (ACIL Allen 2022):

- analysis and modelling of consumer costs, economic benefits and SME capacity
- a survey of consumer willingness to pay.

A base case assumed there are no local content requirements. The modelling considered several possible scenarios for local content minimum requirements. The Board's recommendations are based on:

- a **'minimum requirements'** scenario, where components that can already be locally assembled or manufactured are assumed to be sourced from local SMEs, rather than imported
- a **'stretch goals'** scenario, where imports are replaced with locally manufactured or assembled content where the level of demand under the Roadmap may justify establishing a local capacity for SMEs.[2]

As Table 4 sets out, an increase in the use of local goods, services and employment in the construction, manufacture and operation of infrastructure under the Roadmap leads to an increase in economic activity. The minimum requirements scenario would create 13,400 new full-time equivalent (FTE) jobs in NSW in the period 2020–2041. The stretch goals scenario would add 32,000 new jobs.

Table 4. Net economic benefit for NSW and Australia (in 2021 dollars)

Jurisdiction	Minimum requirements	Stretch goals
NSW	$520 million	$1,324 million
Australia	$178 million	$675 million

Source: ACIL Allen 2022

[2] The stretch goals scenario is called the 'ambitious scenario' in ACIL Allen (2022).

Increasing local content requires additional investment in new facilities, and also results in higher costs during the development, operating and maintenance phases. The total additional cost for the minimum requirements scenario is estimated at $1.8 billion, and $4.7 billion for the stretch goals scenario.

These costs are passed through to consumers in their electricity bills. Table 5 sets out the increase in retail electricity bills for different customer groups in NSW.

Table 5. Impact of local content scenarios on retail electricity bills in NSW (weighted average, FY23–41)

Customer group	Minimum requirements	Stretch goals
Residential	0.3%	1.3%
Small business	0.3%	1.4%
Medium commercial and industrial	0.4%	1.8%
Large commercial and industrial	0.4%	1.9%

Source: ACIL Allen 2022

A survey of NSW households and businesses assessed the willingness of NSW electricity customers to pay for increased local content in the delivery of the Roadmap. The amount survey participants indicated they are willing to pay is significantly higher than the estimated increases in electricity bills.

Participants indicated they are willing to pay, on average:

- 5.2% for 'somewhat more locally produced materials', which broadly corresponds with the minimum requirements scenario
- 9.7% for 'as much locally produced material as possible, more local workers, contribution by apprentices and trainees and participation by First Nations people', which broadly corresponds with the stretch goal scenario.

Australia's international trade obligations

Throughout the process of developing this plan, including recommendations in the section on Local content requirements, the Board has consulted with international trade law experts.

The Board is satisfied that this plan and its recommendations are consistent with Australia's international trade obligations, in particular because:

- the recommended minimum requirements for generation, storage and network infrastructure projects at merit assessment relate to:
  - supply chain inputs that can only be competitively supplied by local suppliers
  - exemptions from Australia's international trade obligations
  - matters such as fair and ethical practice and environmentally sustainable procurement that are non-discriminatory or permitted under exemptions to Australia's international trade obligations

- the recommended VFM assessment holistically considers the overall economic benefit a bid brings to NSW rather than the origin of the proponent
- the recommended VFM assessment does not incorporate a weighted element, and has the purpose of differentiating between bids that are approximately evenly-matched.

The Board also recommends that the Consumer Trustee seek advice to confirm that the manner in which it has incorporated the VFM assessment into its evaluation process is consistent with Australia's international trade obligations.

NSW renewable energy sector: opportunities and barriers

Over the next 20 years, the Roadmap will support significant investment into the NSW electricity system across generation, storage, firming and network infrastructure. The scale of the build-out, longer timeframe and coordinated approach to development in the Roadmap's design is a first for Australia. This will create long-term demand throughout the renewable energy supply chain, presenting significant opportunities for NSW workers and businesses.

This section summarises findings from a baseline and opportunity study of the NSW renewable energy sector, completed by Institute of Sustainable Futures (ISF) at the University of Technology, Sydney in partnership with SGS Economics and Planning (ISF and SGS 2022).

The study considered the projected uptake in renewable energy and storage technologies under the Roadmap. If the 'energy superpower' scenarios involving large-scale electrification and hydrogen are realised in NSW, employment in renewable energy will be significantly larger, as will market scale and pay-offs for local manufacturing (ISF and SGS 2022).

Employment opportunities in the electricity sector

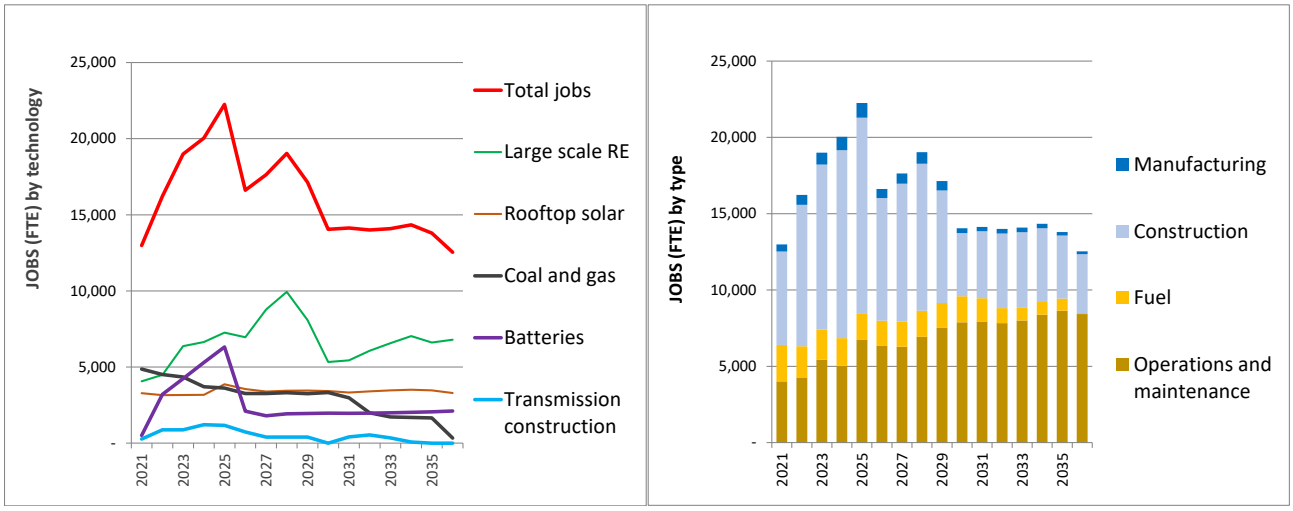
Figure 1 shows that total employment in the electricity sector fluctuates between 14,000 and 22,000 over the next 15 years, peaking in 2025 as a result of projected construction activity (ISF and SGS 2022).

Investments under the Roadmap present 2 primary types of opportunities for increasing local employment:

- **onsite employment in REZs and on transmission network projects**, including in project development, construction, operations and onsite maintenance
- **local industry involvement in the supply chain**, including mineral processing, manufacturing and off-site maintenance. The end-of-life industry with recycling and reuse is also an emergent opportunity.

The majority of employment will initially be in the construction of large-scale renewable energy projects. Over time, however, employment in operations and maintenance will take over as the major source of jobs as the fleet of generation expands.

Figure 1. Employment by technology and type, electricity generation and transmission construction (NSW REZ), 2021–2036[3]



Demand for materials and opportunities for NSW supply chains

The build-out of infrastructure under the Roadmap will drive materials demand across a range of areas. Substantial demand is foreseen for:

- concrete, overwhelmingly driven by pumped hydro energy storage with significant contributions from wind farms
- steel, driven by wind towers, pumped hydro and solar farms
- copper, driven by solar farms and pumped hydro
- aluminium, driven by solar farms, batteries and transmission towers.

Currently, with the exception of concrete, much of the material inputs are embodied in imported components. By increasing local production of components such as wind towers, NSW has the potential to increase the demand for local raw materials.

Table 6 lists opportunities to develop NSW industry supply chains, reflecting advantages such as existing industry specialisation, reduced time to market and increased supply chain resilience.

[3] The graphs show employment that can be influenced under the Roadmap and do not include ongoing employment in electricity transmission networks, distribution networks and electricity retailing. Manufacturing employment reflects the share of local industry based on a 2019–20 survey and does not incorporate jobs that could result from new policies.

Table 6. Major opportunities for the NSW renewable energy supply chain

Opportunity	Description
Solar farm infrastructure	Currently, solar panels are imported and installed on supporting mounting and racking equipment that is predominantly imported. Local supply of supporting infrastructure would be quicker to market, more responsive to changes in project schedules and would reduce exposure to disruptions in global supply chains. Piling used in solar panel foundations is one immediate opportunity due to smaller lead times for local supply. Racking and mounting accounts for approximately 9% of total project value, representing a relatively high value opportunity for NSW. There could also be opportunities for ongoing employment in manufacturing frames and local steel products such as posts.
Wind tower manufacturing	NSW's steel manufacturing capacity provides an opportunity for the co-location of new wind tower factories. The projected demand for wind under the Roadmap meets the minimum viable scale for investment in a new manufacturing capacity. There are also opportunities to supply neighbouring states and to produce pipes for pumped hydro. If realised, this opportunity could lead to long-term jobs most likely sourced from local workers and a major boost to the local steel supply chain.
Wind farm manufacturing (non-tower)	**Wind blade manufacturing:** Blade manufacturing is a high value opportunity, accounting for 15% of total wind farm project costs. Pooling demand across states would be required to reach the minimum viable scale for investment. **Wind turbine assembly:** While nacelle manufacturing is unlikely to be viable in Australia or NSW, local assembly could be co-located with ports and existing manufacturing capability. Around two-thirds of the value in nacelle manufacturing is in assembly functions (NREL 2019). **Foundations:** Wind turbines are large and heavy structures that require significant reinforced concrete and steel foundations. These foundations require specialised equipment for rolling, drilling and welding, as well as for their transport.
Battery energy storage supply chain	The development of an integrated battery supply chain is an estimated $7.4 billion market opportunity for Australia, with the potential to generate 34,000 jobs (Future Batteries Industries CRC 2021). NSW has significant mineral deposits of some of the raw materials required in battery production. From this foundation, the state could develop its materials refining and manufacturing capacity. Labour costs are a lower proportion of production costs (10%) than traditional manufacturing, leading to NSW potentially being competitive in battery pack assembly and cell manufacturing. The development of low-cost, reliable renewable energy within the REZs could also lead to more cost competitive battery manufacturing.

Opportunity	Description
Offshore wind	Global development of offshore wind has decreased costs and led to innovations in turbine design, increasing the viability of offshore wind in NSW. Co-location with ports and steel production would significantly reduce transport costs and damage, while leveraging onshore wind supply chains could increase the local content of future offshore wind projects. The Illawarra and Hunter REZs present ideal locations for offshore wind development due to the presence of port infrastructure, steel manufacturing capability and transmission capacity. Offshore wind could create employment building on existing industry in the Hunter and Illawarra REZs, and also provide alternative sources of employment for workers transitioning from traditional energy sectors, in the coal industry. Floating offshore wind is in early commercial development and presents an opportunity for NSW to be an early adopter.
Electrical balance of plant	Existing local supply of electrical balance of plant in areas such as cabling and inverters could expand to meet increasing demand. Balance of plant usually accounts for 5–10% of the value of renewable energy projects, some of which could be produced by smaller businesses in the supply chain.
Transmission tower manufacturing	The large-scale transmission build-out required in NSW creates the potential for local manufacturing of transmission towers, which have to date been imported. A modern, automated manufacturing facility with integrated fabrication and galvanisation would remove additional handling and transport costs. This facility would create direct employment and also support employment in the steel manufacturing industry, which provides the input material.
End-of-life	Reuse and recycling are better supported where local renewable energy manufacturing supply chains exist, as these skills are often directly transferrable to end-of-life. Co-location of recycling facilities with materials processing and manufacturing will aid in the circulation of materials throughout the supply chain. NSW has significant local capacity to leverage, such as lead-acid battery recycling for other battery chemistry recycling. A mature steel, aluminium and copper recycling supply chain also exists. Opportunity exists for the transfer of skills from the construction of renewable technology to decommissioning, disassembly and refurbishment. Recycling and repair skills in themselves are likely to be a source of long-term employment, further enhancing the longevity of end-of-life employment.

Source: ISF and SGS 2022

Barriers faced by the renewable energy sector

Although NSW has significant opportunities in several parts of the renewable energy supply chain, both statewide and regional barriers need to be overcome for these opportunities to be realised.

Statewide barriers include:

- skills and labour shortages, largely due to labour force dynamics, such as:
  - competition from a large general infrastructure pipeline
  - low levels of unemployment within REZs
  - shortages in occupations such as electricians.

  Specific drivers within the renewable energy sector also play a role, such as short construction phase timeframes and uncertainty around project timing
- the provision of training to address skills shortages is constrained by a lack of market capacity for training in renewable energy
- developer decisions to use offshore suppliers are mostly based on price, as many projects are marginal investment decisions. Labour and electricity costs are relatively high in Australia, which makes local manufacturing less internationally competitive (MBB Group 2021a)
- the adequacy of infrastructure in some regional areas to attract and retain workers and support increased economic development may be constrained. Infrastructure such as housing supply are important long-term enablers of employment and industry development.

Table 7 sets out opportunities and barriers specific to each REZ region.

Table 7. Opportunities and barriers for the NSW renewable energy sector within each REZ region

REZ	Description
Central-West Orana Employment statistics (ABS 2016): • full-time employed: 37.9% • part-time employed: 17.9% • unemployed: 3.9% • labour force participation: 63%	• Population growth in the area is projected to be relatively strong, which can contribute to growing the size of the local workforce. • The nearby Parkes Special Activation Precinct (SAP) will have a sustainability focus, including in resource recovery and recycling, renewable energy and critical minerals (NSW Government 2021g). • Infrastructure such as housing, schools, hospitals and internet connectivity may be lacking to support increased economic activity. Addressing these shortcomings will be crucial to ensure workers remain in the region. • Courses offered by local educational facilities currently do not align with the opportunities presented by the REZ in terms of direct skills.

REZ	Description
New England Employment statistics: • full-time employed: 32.3% • part-time employed: 19.6% • unemployed: 4.2% • labour force participation: 59.3%	• New England contains both the largest hard rock tin deposit in Australia and rare earth metals used in renewable energy manufacturing. There is opportunity to begin local mineral processing of these resources for renewable energy and battery storage components. • Transport, freight and logistics are key strengths, given the region's Walcha road freight services and the Armidale airport, and proximity to agricultural processing infrastructure in south-east Queensland. • Skills and labour shortages are a barrier within the region, compounded by a lack of relevant training availability. However, local educational facilities such as the University of New England and local TAFEs could be adapted to match the skills required within the REZ. • Attracting a skilled workforce to address skills shortages will require local infrastructure upgrades to road, rail and housing supply.
South-West Employment statistics: • full-time employed: 41.8% • part-time employed: 18.6% • unemployed: 2.9% • labour force participation: 68.2%	• Project EnergyConnect, the new high-voltage interconnector between NSW and South Australia will help transport energy from the South-West REZ to energy consumers across NSW. • The nearby Wagga Wagga SAP provides opportunities for large-scale manufacturing or assembly, and is bolstered by strong freight connectivity in road and rail, which may support imports and exports of products. • Workers in the South-West have fewer qualifications than in broader NSW, as the agricultural industry is less likely to require formal qualifications. • Realising REZ job opportunities locally will require significant upskilling of agricultural workers. There is no major university in the South-West to assist with skills development, though this may be mitigated by the number of TAFEs in the region.
Illawarra Employment statistics: • full-time employed: 36.8% • part-time employed: 18.8% • unemployed: 3.3% • labour force participation: 62.3%	• Engineering is the most common qualification held in the Illawarra due to local manufacturing and construction. • Over 40% of manufacturing employees work in primary metal product manufacturing. • Land and port access and existing steel production capabilities could support co-located wind tower and anchor cage fabrication facilities. • The most significant barrier to skills development in the Illawarra is the lack of funding and resources with TAFEs to develop and deliver tailored courses for future clean energy opportunities.

REZ	Description
Hunter-Central Coast Employment statistics: • full-time employed: 33.5% • part-time employed: 19.4% • unemployed: 4.2% • labour force participation: 60.2%	• The region hosts manufacturing and processing facilities for steel and aluminium, as well as heavy engineering. Industry is realising some clean technology opportunities such as heavy vehicle battery manufacturing and steel recycling. • The region has a higher share of residents with engineering qualifications than the state average, likely due to its mining focus. • TAFEs in the region provide a wide range of courses such as in manufacturing, engineering, business and information technology. • Land, port and grid access provided by existing coal and gas plants could be used for future renewable energy, storage and hydrogen projects.

Source: ISF and SGS 2022

Local content requirements for generation, storage and network projects

In line with the Act, the Board's recommendations in this section provide guidance to the Consumer Trustee and EnergyCo on how to maximise the use of local content and workers in generation, storage and network infrastructure projects under the Roadmap, as well as in the allocation of REZ access rights.

Recommendation 1: Eligibility criteria

The Board supports the proposed LTESA and REZ access right eligibility criteria for employee entitlements, relevant legislations, industrial relations and modern slavery. These criteria are:

- The project must provide a binding First Nations Participation Plan in accordance with the Aboriginal Procurement Policy January 2021 (NSW Government 2021h).
- The proponent and/or the contracted entity must not have had a judicial decision relating to employee entitlements made against it (not including decisions under appeal) and not have paid the claim.
- The proponent and/or the contracted entity must not have been named as an organisation that has not complied with the *Workplace Gender Equality Act 2012* (Cth).
- The proponent must materially comply with:
  - obligations under employment contracts, industrial agreements, and awards
  - codes of conduct and practice relevant to conditions of service and to the relations between the proponent and the employees employed by the proponent
  - applicable WHS legislation.
- The proponent has registered a modern slavery statement with the Australian Border Force.

Recommended additions to the eligibility criteria

The Board recommends that the Consumer Trustee include in eligibility or merit criteria or incorporate into its due diligence process the following requirements for project proponents to:

- have a current certified industrial agreement registered with the Fair Work Commission
- provide evidence of the last 5 years' performance relating to WHS, workers compensation, industrial relations, superannuation and portable entitlements contributions compliance.

Where a joint venture cannot provide evidence of the last 5 years' performance, the requirements extend to the parent companies of the joint venture

- demonstrate how they will pay small business subcontractors for the provision of goods or services relevant to the project within 20 business days following receipt of a correctly rendered invoice.

The Board recommends ensuring the proponent's registered modern slavery statement is compliant with the *Modern Slavery Act 2018* (Cth).

The Board also recommends requiring project proponents to prepare and submit an IPP (see Recommendation 2: Industry Participation Plans). IPPs are evaluated as part of the next stages of assessment.

The Board recommends these additions to the eligibility criteria as they:

- reduce uncertainty for proponents
- enable identification early in the assessment of projects more likely to have social licence and be in the long-term interests of consumers.

If the proposed eligibility criteria and the Board's additional requirements are not adopted, they should be set as minimum requirements in the merit criteria.

The eligibility criteria should apply to LTESAs, REZ access rights and network infrastructure projects.

Considerations for new entrants

Eligibility criteria should not eliminate bids where the proponent is not able to meet the requirement because it is relatively new and has not been operating long enough to provide the evidence required or meet the criteria.

For example, this could be the case if the proponent has been operating for only 2 years, but information for the last 5 years' performance relating to WHS and industrial relations is requested.

Recommendation 2: Industry Participation Plans

The Board recommends that the submission of an IPP is an eligibility criterion for:

- generation and storage project proponents seeking an LTESA and/or participating in a REZ access scheme
- network operators for network infrastructure projects.

The Board recommends the IPPs cover the following:

- **Supply chain inputs:** Providing local suppliers, including SMEs, with full, fair and reasonable opportunities to provide goods and services for the construction and operation of electricity infrastructure in NSW.

- **Investment and innovation in the supply chain:** Supporting investment, local innovation and commercialisation opportunities in the NSW renewable energy sector.
- **Employment, skills and knowledge transfer:** Maximising local employment, skills development and knowledge transfer to local businesses and workers.
- **First Nations participation plan:** Providing First Nations people with opportunities to increase skills and economic participation (to avoid duplication, the Board recommends the First Nations Participation Plan, required under the First Nations Guidelines, is included in the IPP).
- **Fair and ethical practice:** Ensuring fair and ethical practice in the workforce and supply chain.
- **Environmentally sustainable procurement:** Promoting environmentally sustainable procurement throughout the supply chain.

Consideration of an Australian Industry Participation Plan

Some of the projects under the Roadmap may be required to prepare an AIPP as prescribed under the *Australian Jobs Act 2013* (Cth).[4] Projects required to submit a state or territory IPP may be eligible for an AIPP exception.

The contents of an AIPP will likely duplicate components of the suggested IPP. To fulfill the requirements of the IPP and First Nations Participation Plan, the Board suggests that the form of the IPP be an AIPP with supplementary details. The supplemented information will address the topics not covered in a standard AIPP.

The Board encourages the OECC to discuss this topic with the Commonwealth Government to recognise where process efficiencies can be gained.

Subject to the approach undertaken, the Board recommends:

- developing guidance material for project proponents on evidence requirements for IPPs to demonstrate how they will meet their commitments
- the scope of IPPs and First Nations Participation Plans be evaluated as part of the assessment process
- for successful projects, the requirements under IPPs and First Nations Participation Plans become a contractually binding commitment.

[4] Major public or private projects with an estimated capital expenditure of $500 million or more must prepare an AIPP.

Recommendation 3: Merit and value for money assessments

The Board recommends minimum local content requirements be set in a way that ensures consistency with Australia's international trade obligations while providing local suppliers, including SMEs and First Nations suppliers, with full, fair and reasonable opportunities. This includes:

- setting minimum requirements for local content considered in merit assessment
- an assessment of the VFM for NSW from the overall economic and social benefits a bid will bring, including from local content.

Framework for minimum requirements and stretch goals in merit assessment

The Board recommends the framework for minimum requirements and stretch goals in Table 8 be applied to LTESA tenders, REZ access rights allocations and network infrastructure projects.

The framework identifies criteria against each of the 6 themes in the IPP, with some themes having more than one criterion. The theme 'environmentally sustainable procurement' requires demonstrated evidence on actions taken to promote sustainability and responsible sourcing, but does not set a numerical minimum requirement or stretch goal.

Supply chain inputs (goods and services) should have separate minimum requirements set for each technology type: solar, wind, batteries, pumped hydro and network projects. A bid should meet the minimum requirement for the technology or technologies used in the project. For example, a solar and battery storage project would need to meet the minimum requirement for both solar and batteries but not for wind or pumped hydro.

Bids committing to the minimum requirement should receive the base score, and bids proposing commitments above the minimum requirement should receive a higher score in the merit assessment.

Bids not meeting the minimum requirement for a particular technology should be scored zero on that criterion but should not be excluded from consideration, as local content is one of several criteria in the merit assessment. However, proponents should provide a justification for why they cannot meet the minimum requirements.

To set clear expectations for proponents, the weighting or priority for each criterion that will be used in evaluation should be identified.

Stretch goals will apply at the merit assessment if the minimum requirement for local content is set at a moderate level.

Where the minimum requirement is set at the upper limit of local content that can be supplied in a way that is consistent with Australia's international trade obligations, a stretch goal would not apply. The minimum requirement could still increase over time, as the capacity of local SMEs and First Nations people and companies increases.

Table 8. Framework for minimum requirements and stretch goals in merit assessments

Theme	Description of criteria	Type
Supply chain inputs	Local content for: • the development phase • steel products and components • operations and maintenance phase. Local content means: • goods produced by local industry • services supplied by local industry • construction activities carried out by local industry. Minimum requirements and stretch goals expressed as percentage (%) of total project contract value. Commitments and reporting as value ($) and percentage (%) of total project contract value. The development phase includes all costs from project inception to completion of project commissioning. The operations and maintenance phase commences once the project is fully commissioned. The minimum requirement for steel products and components is determined by reference to steel that the SMEs and First Nations businesses in the local industry have the capacity to produce. The Consumer Trustee and EnergyCo should give guidance to proponents on items/products included in the minimum requirement. The Board recommends the requirement should focus on the most steel intensive components where the most economic benefit and supply chain benefit will be derived, including but not limited to: • wind tower sections and foundations such as anchor cages • racking, mounting and foundations for solar, including torque tubes, frames and piling solutions • the civil and structural works for substations. The minimum requirement for steel products and components is not intended to cover steel components integral to a component or product not available locally at the time of bidding.	Minimum requirements and stretch goals

Theme	Description of criteria	Type
Investment and innovation in the supply chain	Contribution to investment and innovation may be met using one or a combination of the following: • % of project value invested in new, local facilities in the supply chain for the clean energy sector • % of project value invested in supporting innovation in the 'local' supply chain • contributions to or participation in a developer pooled investment.	Minimum requirements and stretch goals
Employment, skills and knowledge transfer	Number of FTE jobs locally Percentage (%) of FTE jobs Total value of local labour ($) including direct and indirect sources	Considered in the VFM assessment
	Percentage (%) of the total project workforce (FTE) made up of 'learning workers' (trainees, apprentices and workers who need to update their qualifications to meet the needs of the infrastructure project – for more detail see Definitions) Percentage (%) of all trades positions on a project made up of apprentices (FTE)	Minimum requirements and stretch goals
First Nations participation	All projects to achieve a minimum % of the project contract value or project workforce that may be met using one or a combination of the following: • minimum % of the contract value to be subcontracted to First Nations businesses • minimum % of the contract's Australian based workforce (FTE) that directly contribute to the contract to be Aboriginal or Torres Strait Islander peoples • minimum % of the contract value to be applied to the cost of education, training, or capacity building for First Nations staff or businesses directly contributing to the contract.	Minimum requirements and stretch goals
Fair and ethical practice	Employment of underrepresented groups, expressed as numbers (FTE) and % of the total project workforce. These can include but are not limited to people with characteristics defined in the *NSW Antidiscrimination Act 1977* and people who are long-term unemployed.	Minimum requirements and stretch goals

Theme	Description of criteria	Type
Environmentally sustainable procurement	Numerical criteria not applicable All projects to: • have a net zero plan to reduce carbon emissions from construction and operation activities • promote low carbon and circular economy solutions in line with the NSW Circular Economy Policy Statement • ensure responsible sourcing of materials and equipment including sourcing products and materials that align with EN15804, and/or recognised by the Green Building Council of Australia's Responsible Products Framework.	Non-numerical minimum requirement

Application of requirements

The Board recommends requirements related to people (learning workers, apprentices, First Nations people and underrepresented groups) be based on FTE.

The Board recommends that a worker can be counted towards multiple minimum requirements if they meet the eligibility criteria for each of those requirements. For example, a First Nations woman aged under 25, living locally and undertaking a plumbing apprenticeship can be recorded against the minimum requirements and stretch goals for:

- employment, skills and knowledge transfer
- First Nations participation
- employment of underrepresented groups.

Apprentices (as they are undertaking a nationally recognised qualification) can also count towards the learning workers requirement.

Minimum requirements and stretch goals in merit assessment

This section recommends minimum requirements and stretch goals for the first LTESA tenders, REZ access rights allocations and network infrastructure projects.

The recommendations are based on credible evidence, including financial interests of electricity customers (ACIL Allen 2022).

The minimum requirements apply to local content from Australia and New Zealand, except for First Nations participation. The First Nations requirements apply to Australia, with emphasis on opportunities for local communities.

The Board recommends the minimum requirements should evolve over time based on proponent performance and feedback, and as the capacity of the local supply chain changes (see section on Continuous improvement. The Board will also refine and modify its recommended minimum requirements and stretch goals for local content when reviewing its plan at least every 2 years (see section on Continuous improvement of the Board's plan).

By identifying the stretch goals in this plan, the Board aims to send a clear signal to the market on the opportunities presented by the Roadmap and provide industry with both time and certainty to invest. The stretch goals are intentionally set to represent ambition and future direction over time, and it is recognised they may not be delivered in full in the near term.

Theme: Supply chain inputs

Table 9 sets out the Board's recommended minimum requirements and stretch goals for the theme supply chain inputs. These are based on analysis and modelling of consumer costs, economic benefits and SME capacity, and a survey of consumer willingness to pay (ACIL Allen 2022).

The Board considered several local content scenarios modelled by ACIL Allen (2022), including:

- a **'base case' scenario**, which represents the amount of content that can only be competitively supplied locally
- a **'minimum requirements' scenario**, which includes the base case and, in addition, assumes that components that can already be assembled or manufactured by local SMEs and First Nations businesses are sourced locally, rather than imported
- a **'stretch goals' scenario**, which assumes that imports are replaced with locally manufactured or assembled content where the level of demand under the Roadmap may justify establishing local capacity for SMEs and First Nations businesses.

The minimum requirements scenario is achievable in the short term, as the facilities already exist locally or there has been previous local manufacturing (ACIL Allen 2022).

The assessment of Australian and New Zealand SMEs' capacity to deliver materials above the base case took into account (ACIL Allen 2022):

- a survey of more than 200 businesses in the NSW renewable energy sector (ISF and SGS 2022)
- information from the Australian Bureau of Statistics (ABS) on the number of SMEs operating in industries that may be relevant to modernising the NSW electricity system.

Commitments under this theme should be awarded the base score at merit assessment, if both:

- the overall commitment meets or exceeds the minimum requirement
- the commitment includes a proportion of SME and First Nations content that is equal to the difference between the minimum requirement and the base case.

Commitments should be awarded a higher score at merit assessment, if both:

- the overall commitment meets or exceeds the minimum requirement
- the proportion of SME and First Nations content exceeds the difference between the minimum requirement and the base case.

This approach is consistent with Australia's international trade obligations.

The stretch goals scenario requires investment in new facilities in new parts of the supply chain. The lead-time to build new facilities is around 2 years. Engineering, procurement and construction (EPC) contractors also require their suppliers to have a track record of:

- capacity to meet the quantities required
- ability to meet quality, performance and technical requirements
- ability to support operation and maintenance in the long term.

Table 9. Supply chain inputs – minimum requirements for Australian and New Zealand content in merit assessment

Supply chain input criteria	Minimum requirements				
	Wind	Solar	Pumped hydro	Battery storage	Network projects
Development phase	40%	49%	66%	23%	68%
Operation and maintenance phase	51%	71%	61%	35%	78%
Steel products and components using locally milled steel	10%	95%	30%	95%	Maximise to the extent possible
Supply chain input criteria	**Stretch goals**				
	Wind	**Solar**	**Pumped hydro**	**Battery storage**	**Network projects**
Development phase	72%	81%	86%	78%	93%
Operation and maintenance phase	76%	81%	82%	79%	89%
Steel products and components using locally milled steel	95%				

Theme: Investment and innovation in the supply chain

This theme aims to support investment, local innovation and commercialisation opportunities in the NSW renewable energy sector. Contribution to investment and innovation may be met using one or a combination of the following:

- % of project value invested in new, local facilities in the supply chain for the clean energy sector
- % of project value invested in supporting innovation in the 'local' supply chain
- contributions to or participation in a developer pooled investment.

For the first LTESA tenders, access right allocations and network infrastructure projects, the Board recommends a requirement for project proponents to make a voluntary but contractually binding commitment to investment and innovation. These commitments should form the basis for minimum requirements and stretch goals in future years.

Commitments under this theme should be evaluated with reference to investment in Australian and New Zealand SMEs, and Australian First Nations suppliers. This approach is consistent with Australia's international trade obligations.

Theme: Employment, skills and knowledge transfer

Table 10 sets out the Board's recommended minimum requirements and stretch goals for the theme employment, skills and knowledge transfer. These adopt the targets for learning workers and apprentices under the NSW Infrastructure Skills Legacy Program (ISLP).

The ISLP is a NSW Government partnership with the construction industry to address current and emerging skills shortages to ensure NSW has a skilled workforce that is highly trained and diverse. The stretch goals are based on the top performing ISLP projects (NSW Government 2021a, 2021d and 2021e).

Table 10. Employment, skills and knowledge transfer – minimum requirements and stretch goals for merit assessment

Criteria	Minimum requirement	Stretch goal
Learning workers (% of total project workforce)	20%	40%
Apprentices (% of all trades positions on a project)	20%	30%

Theme: First Nations participation

Table 11 sets out the Board's recommended minimum requirement and stretch goal for the theme First Nations participation.

These are based on the NSW Government's Aboriginal Procurement Policy, which supports employment opportunities for First Nations people and the sustainable growth of Aboriginal owned businesses.

Table 11. First Nations participation – minimum requirement and stretch goal for merit assessment

Criterion	Minimum requirement	Stretch goal
First Nations participation	1.5%	10%, or the goal in the region-specific protocol under the First Nations Guidelines, where stated

The policy requires suppliers to NSW Government for contracts valued at $7.5 million or above to demonstrate how they will contribute at least 1.5% of the contract value to First Nations participation. The stretch goal is based on top performing projects, which have achieved up to 10% First Nations participation (NSW Government 2018).

The Board's plan aims to align with the guidelines for consultation and negotiation with First Nations people issued under section 4 of the Act. Where there is any divergence on matters relating to First Nations participation, the First Nations Guidelines take precedence.

This includes the situation where a region-specific goal under the First Nations Guidelines is in place, in which case that goal should be adopted in place of the general stretch goal.

Theme: Fair and ethical practice

Table 12 sets out the Board's recommended minimum requirements and stretch goals for the theme fair and ethical practice, based on the ISLP and the South Australian Government's procurement policy for construction projects.

The ISLP has targets for increasing diversity in the construction workforce. These include doubling the number of women in trade related work and 8% of the project workforce being younger than 25 years old.

The South Australian Government requires all construction projects greater than $50 million to achieve at least 15% of the labour hours performed by nominated groups where these can include people with barriers to employment, long term unemployed, and graduates (South Australian Government 2018, p3).

The stretch goal is informed by:

- top performing ISLP projects, which have achieved an average of 17% young people under 25 years and 4% women in non-traditional roles across key projects (NSW Government 2018)
- the definition of underrepresented groups in this plan, which in addition to young people and women include people with characteristics defined in the *Antidiscrimination Act 1977* (NSW) and people who are long-term unemployed.

Table 12. Fair and ethical practice – minimum requirement and stretch goal for merit assessment

Criteria	Minimum requirement	Stretch goal
Employment of underrepresented groups	15%	25%

Theme: Environmentally sustainable procurement

Numerical minimum requirements do not apply. Refer to Table 18 and Appendix A for evidence requirements.

Maximising outcomes and impact

The Board recommends tender design should allow proponents to pool their efforts and/or funds to achieve greater efficiencies, impact and outcomes. This should be designed in a way that is consistent with anti-collusion provisions in the tender process. The Consumer Trustee, EnergyCo or another appropriate body could play a role in facilitating this approach.

As an example, under the Victorian Renewable Energy Target, a consortium of wind farms in partnership with Federation TAFE established the first blade apprenticeship in Australia, including a purpose-built tower training facility. While in Victoria this emerged from an informal partnership, this type of collaboration could be encouraged through the tender design.

The Board recommends allowing a proponent's investments, where appropriate, to contribute towards more than one criterion. For example, an investment in a First Nations business providing an innovative product or service could count towards the themes:

- investment and innovation in the supply chain
- First Nations participation.

Value for money assessment

The Board recommends that the Consumer Trustee incorporate a VFM assessment into its evaluation, assessing the overall economic benefit a bid brings to NSW considered holistically, to differentiate between bids that are approximately evenly-matched. The Consumer Trustee should determine the appropriate nature and extent of the VFM assessment.

The Board recommends that the Consumer Trustee select how best to incorporate the VFM assessment into its evaluation process, in a manner consistent with Australia's international trade obligations. This could include considering bidders' voluntary commitments for creating opportunities for NSW suppliers, employment and trainees/apprentices.

The Board recommends that the Consumer Trustee publish clear guidance on any non-price criteria used in assessing VFM. This guidance could:

- indicate priorities for the assessment, such as commitments against the supply chain theme being higher priority than those for the innovation theme
- have stretch goals for each IPP theme appropriate for NSW or REZ zones to guide proponents on the level considered ambitious and to strive for over time.

The Board recommends the themes and stretch goals listed below be considered holistically to form an overall view as to the advantageousness of the bid. There should be no weighted component to the VFM assessment.

The Board recommends the country of origin of a proponent not be considered in the VFM assessment; rather, consideration should be given to the benefits that a tender can bring to a local community.

The Board recommends that the Consumer Trustee seek advice to confirm that the manner in which it has incorporated the VFM assessment into its evaluation process is consistent with Australia's international trade obligations.

Theme: Supply chain inputs

Table 13 sets out the Board's recommended stretch goals for VFM assessment for the theme supply chain inputs.

The stretch goals are based on a mapping of the renewable energy supply chains from cradle to grave for the 5 technologies. The analysis identified the raw material and component inputs

into each technology and assessed existing NSW capacity to supply these. A survey of more than 200 businesses in the renewable energy supply chain identified opportunities for NSW to expand existing capacity and develop new capacity (ISF and SGS 2022).

Table 13. Supply chain inputs – stretch goals for NSW content in VFM assessment

Supply chain input criteria	Stretch goals				
	Wind	Solar	Pumped hydro	Battery storage	Network projects
Development phase	65%	67%	67%	47%	71%
Operation and maintenance phase	70%	78%	77%	75%	85%
Steel products and components using locally milled steel	90%				

Theme: Investment and innovation in the supply chain

Table 14 sets out the Board's recommended stretch goal for VFM assessment for the theme investment and innovation in the supply chain.

The stretch goal reflects the Board's priorities as defined in its principles, in particular to:

- encourage the growth and expansion of competitive, productive, and efficient supply chains, including through modernising plant, equipment and technologies, for electricity infrastructure planning, construction, operation and maintenance activities
- encourage participation of local businesses with innovative products, processes, technologies and services that have potential to address challenges or create high value jobs in the sector.

Table 14. Investment and innovation in the supply chain – stretch goal for NSW content in VFM assessment

Criterion	Stretch goal
Contribution to investment and innovation	10%

Theme: Employment, skills and knowledge transfer

Table 15 sets out the Board's recommended stretch goals for the theme employment, skills and knowledge transfer, based on achievements for employment of local workers under the ISLP and other infrastructure projects.

ISLP projects have averaged 55%, with Lismore Hospital achieving 58% local employment (NSW Government 2021a). The Canberra and Gold Coast light rail projects have achieved 70% and 96% respectively (Canberra Metro 2021; ACAA 2015). The stretch goals for learning workers and apprentices are the same as in the merit assessment but apply to NSW rather than Australia and New Zealand.

Table 15. Employment, skills and knowledge transfer – stretch goals for VFM assessment

Criteria	Stretch goals
NSW jobs (% FTE jobs)	90%
Jobs for people from the local region*	60%
Learning workers (% of total project workforce)	40%
Apprentices (% of all trades positions on a project)	30%

* Local region is defined as the REZ and adjacent local government areas

Theme: First Nations participation

Table 16 sets out the Board's recommended stretch goal for VFM assessment for the theme First Nations participation. The stretch goal is the same as in the merit assessment but applies to First Nations participation from the REZ and adjacent local government areas.

For projects not located in a REZ, the stretch goal applies to the local area as defined in the project contract and agreed in consultation with First Nations communities.

Table 16. First Nations participation – stretch goal for VFM assessment

Criterion	Stretch goal
First Nations participation	10%, or the goal in the region-specific protocol under the First Nations Guidelines, where stated

Theme: Fair and ethical practice

Table 17 sets out the Board's recommended stretch goal for VFM assessment for the theme fair and ethical practice. The stretch goal is the same as in the merit assessment but applies to employment of underrepresented groups from NSW rather than Australia and New Zealand.

Table 17. Fair and ethical practice – stretch goal for VFM assessment

Criterion	Stretch goal
Employment of underrepresented groups	25%

Theme: Environmentally sustainable procurement

Numerical minimum requirements do not apply. Refer to Table 18 and Appendix A for evidence requirements.

Continuous improvement

The Board's recommended minimum requirements in this section are based on credible evidence, and are initially set to be realistic and achievable.

The proposed schedule of tenders over the next 10 years creates the opportunity to have a continuous cycle of improvement as the minimum requirements and stretch goals are refined and modified in each tender round.

The Board recommends the minimum requirements should evolve over time based on proponent performance and feedback, and as the capacity of the local supply chain changes.

The Consumer Trustee and EnergyCo should also review the criteria to reflect any changes to legislation, policies and guidelines referenced in the criteria; for example, the *Modern Slavery Act 2018* is due for review in 2022.

Recommendation 4: Evidence requirements in IPPs

The Board recommends each IPP theme include detailed requirements to ensure commitments made by proponents are supported with evidence of impactful actions. These should apply to the tenders or application processes for LTESAs, REZ access rights and network infrastructure projects.

Evaluation of bids should include an assessment of the quality of evidence provided against the detailed requirements, which are designed to help proponents prepare and submit bids that address the priorities for each tender. The tender documentation should, where possible, indicate the relative importance of each theme.

Table 18 summarises the detailed requirements recommended by the Board with more in-depth guidance set out in Appendix A. This guidance is based on extensive stakeholder engagement and analysis commissioned for the Board.

Table 18. Summary of recommended detailed requirements for evidence to support bid evaluation

IPP theme	Evidence requirements in IPPs
Supply chain inputs	Demonstrate the use of local content, including from SMEs, and contribution to local economies in design, construction and manufacturing decisions. Activities to address barriers to entry for SMEs and provide ongoing support during the life of the project or engagement period. Application of performance-based design specifications to the extent possible and where not in conflict with relevant performance standards for generators and the network. Performance-based design means specifying the outcome to achieve rather than how to achieve it. Use Australian standards as the primary reference for project design. Where other standards are used, proponents must provide a justification and demonstrate equivalence to Australian standards in a way that supports certification for compliance. Due diligence in market research and tender specifications to provide equal opportunity to local suppliers, including unbundling large work packages.

IPP theme	Evidence requirements in IPPs
Investment and innovation in the supply chain	Demonstrate contribution to the long-term capability and competitiveness of local supply chains and regional development, including through investment in new facilities, plant and equipment. Activities to support local innovation and commercialisation of products, processes, technologies and services related to the renewable energy supply chain. Investment and innovation in the supply chain means impactful activities proponents or their supply chain partners have undertaken or plan to undertake to support local innovation and opportunities for SMEs and First Nations businesses in the following categories: • research and development related to challenges faced by the project and its associated technology • start-ups and social enterprises related to renewable energy and First Nations communities • innovative products, processes, technologies, and services across the development, construction and operations phases of the project that have wider applicability in the sector.
Employment, skills and knowledge transfer	Direct contributions to or participation in one or more of the following: • employment opportunities for workers transitioning from traditional energy sectors, including coal-fired power generation or coal mining • capability development of NSW employees, suppliers, subcontractors in the supply chain • learning and development opportunities for workers and suppliers to develop accredited transferrable skills that are recognised across industry and jurisdictions • development of future looking skills in the workforce, including inspiring young talent to have greater engagement in science, technology, engineering and mathematics (STEM) • participation in a pooled investment scheme addressing one or more of the above employment, skills and knowledge transfer actions.
First Nations participation	Strategies to promote local First Nations people's participation in the project including: • inclusion of First Nations in project design and planning • an engagement strategy with Traditional Owner groups and organisations supporting First Nations communities such as the Aboriginal Employment Strategy or the NSW Indigenous Chamber of Commerce • community benefit and ownership sharing models for Traditional Owner groups • creating a safe and inclusive workplace for First Nations people. Strategies should align with the First Nations Guidelines and the region-specific protocols.

IPP theme	Evidence requirements in IPPs
Fair and ethical practice	Activities to increase diversity and create opportunities for underrepresented groups. This includes but is not limited to people with characteristics defined in the *NSW Antidiscrimination Act 1977* and people who are long-term unemployed. Policies and plans to comply with relevant WHS legislation and regulation. Stakeholder engagement activities to support fair and ethical practice in the workforce and supply chain.
Environmentally sustainable procurement	Demonstrate environmental, social and governance principles are applied throughout the project to promote sustainability. Activities to reduce construction and operational carbon footprints and promote low carbon solutions including through procurement. Demonstrate how project activities align with the NSW Circular Economy Policy Statement. Demonstrate how project sourcing of products and materials aligns with EN15804, and/or recognised by the Green Building Council of Australia's Responsible Products Framework. Limiting the use of harmful pollutants and chemicals.

Recommendation 5: National security requirements

The Consumer Trustee and EnergyCo should seek expert advice as to national security risks associated with energy infrastructure and include in tender documents requirements to limit suppliers to Australian only, where essential to security.

Energy generation and transmission is an essential security interest and may be vulnerable to a range of threats including cyberattacks. For example, the Ukrainian power grid experienced blackouts attributed to cyberattacks in 2015 and 2016 (BBC News 2017).

Recommendation 6: Australian standards

Local SMEs may be 'designed out' of projects where these are designed with reference to international standards only.

The Board therefore recommends requiring proponents to work with their suppliers to:

- apply performance-based design specifications to the extent possible and where not in conflict with relevant performance standards for generators and the network
- use Australian Standards as the primary reference for project design and implementation. Where other standards are used, provide evidence to justify their use and demonstrate equivalence to the performance intent of Australian Standards using a performance solution approach similar to that adopted in the National Construction Code (NCC). The outcome should support certification for compliance.

Evidence of the above should be included in the proponents' IPPs and will help ensure SMEs have full, fair and reasonable opportunity to participate in the construction and operation of infrastructure under the Roadmap. In addition, proponents should work with their suppliers to assure and demonstrate compliance with relevant local standards as explained below, including third-party independent certification where relevant.

The Board also recommends requiring proponents to report on the standards used in their project and using this data for monitoring and review. This can help strengthen the requirement for use of standards over time, if necessary.

Relevant local standards and certifications

Relevant local standards include:

- applicable design and performance standards in the NCC except where more specialised design and performance standards are demonstrated as appropriate. In this case, these standards should be treated as a performance solution under the NCC and verification demonstrated
- applicable standards for building products, construction materials and construction or manufacturing processes, including, where relevant, the standards specified in the attachment to NSW Procurement Board Direction PBD-2016-03 (DFSI 2016).

PBD-2016-03 identifies the following standards:

AS/NZS 1163:2006 Cold formed structural steel hollow sections

AS/NZS 1594:2002 Hot rolled steel flat products

AS/NZS 3678: Structural steel – Hot rolled plates, floor plates and slabs

AS/NZS 3679.1: Structural steel – Hot rolled bars and sections

AS/NZS 3679.2: Structural steel – Welded I sections

AS/NZS 4671: Steel reinforcing materials

AS/NZS 4672: Steel prestressing materials

AS/NZS 5131 Structural steelwork – fabrication and erection.

For all standards in PBD-2016-03, the Australasian Certification Authority for Reinforcing and Structural Steel (ACRS) is a recognised third-party independent certifier, except for AS/NZS 5131, for which the certifier is Steelwork Compliance Australia (SCA) under the National Structural Steelwork Compliance Scheme.

Where a supplier's steel product described in the standards in PBD-2016-03 is not certified by ACRS or SCA (as appropriate), the proponent should work with that supplier to demonstrate that the steel material and steelwork meets or exceeds these standards.

The Australian Steel Institute's *Technical Note TN015 Ascertaining compliance of structural steel* (Australian Steel Institute 2021) provides a risk-based approach to ascertaining the compliance of structural steel to meet the performance intent mandated by the NCC and Australian standards.

Recommendation 7: Monitoring, reporting and compliance

The Board understands the Consumer Trustee, EnergyCo and Scheme Financial Vehicle (SFV) are likely to have joint responsibility for monitoring, reporting and compliance, with specific responsibilities to be determined. The Board also recommends the Minister report at least annually to the NSW Parliament on matters set out in the section Reports to Parliament.

The Board recommends the development of a framework for monitoring, reporting and compliance that ensures commitments are implemented. Monitoring, reporting and compliance are critical to ensuring commitments to local content by project developers are kept.

The Board's recommendations set out an overall vision for monitoring, reporting and compliance, which the Consumer Trustee, EnergyCo, SFV and OECC should work together to implement.

Monitoring and reporting

Monitoring provisions

The Board recommends monitoring should include:

- information and guidance to proponents on how to comply
- ongoing monitoring of IPP implementation including mechanisms such as:
  - an IPP implementation statement (see Box 1)
  - a post-build report to require compliance in a defined timeframe
  - information requests to obtain better quality information from proponents
- strong systems for data collection and reporting including standardisation to allow comparison and aggregation of the data and an appropriate database to store the large amount of data.

The body responsible for monitoring implementation should meet with successful proponents regularly, at least quarterly until the project is fully commissioned, to assess progress against local content commitments. This body should receive oversight from a subcommittee of Board members. This subcommittee should:

- have access to reporting on progress towards local content commitments including risks to compliance and mitigation actions, in a way that protects commercial interests
- provide advice on monitoring and implementation of local content commitments.

Reporting and compliance provisions

Project contracts should include reporting and compliance assurance provisions, where necessary. These should include:

- an obligation to report in a format and frequency defined by the Consumer Trustee or EnergyCo
- providing information of sufficient quality to enable monitoring and compliance

- keeping records for a defined period to enable auditing
- reporting the number of employees that have previously worked in traditional energy sectors in the last 5 years, including coal-fired power generation or coal mining.

The Board supports the proposed reporting on outcomes of each tender round, which includes:

- total capacity of LTESAs and REZ access agreements proposed and executed
- names of all projects, lead proponents, location, and capacity
- summary of LTESA fixed price ranges, key commercial terms (e.g. term, escalation) and repayment thresholds (generation LTESAs)
- summary of annuity amount ranges, key commercial terms, and net revenue thresholds (long duration storage LTESAs)
- lowest and highest LTESA fixed price and repayment threshold levels.

In addition, the Board recommends the Consumer Trustee or body responsible:

- report information on the local content commitments made by successful proponents for each tender round
- publish information regularly on progress of local content outcomes to build social licence for projects and the REZ, including communicating these to local First Nations communities.

This should be in a form that protects commercial interests while allowing stakeholders such as the Board and Jobs Advocate to use the information; for example:

- the Act requires the Board to monitor the implementation of its plan
- unions may be interested in information relating to how workers in traditional energy sectors, including coal-fired power generation or coal mining, are able to transition to new jobs in renewable energy.

Reports to Parliament

Consistent with section 50(4) of the Act and recommendation 7c of the Legislative Assembly Committee on Environment and Planning report *Sustainability of Energy Supply and Resources in New South Wales*, the Board recommends the Minister report at least annually to the NSW Parliament on:

- local content used in delivery of the Roadmap
- the development of NSW supply chains for the provision of generation, storage and network infrastructure
- the number of local jobs created through Roadmap activities.

The Board also recommends the Minister report annually on:

- information relating to:
  - how workers in traditional energy sectors, including coal-fired power generation and coal mining, have been able to transition to new jobs in renewable energy
  - any adverse impacts experienced by these workers (e.g. decreased income compared to former coal industry employment)

- opportunities created for trainees and apprentices in the NSW renewable energy sector
- use of the employment purpose component of REZ access fees.

Box 1: The United Kingdom's Contracts for Difference scheme

The UK's Contracts for Difference (CfD) scheme for supporting low-carbon electricity generation has a well-defined and transparent process for ongoing monitoring and review of commitments made under supply chain plans.

The plan forms part of the project deed for successful projects and becomes a contractually binding commitment.

The Department for Business, Energy & Industrial Strategy (BEIS), the agency responsible for the scheme, undertakes ongoing monitoring and reporting. The Department also reviews and consults on local content and associated documents such as industry guidance between tender rounds or auctions to ensure continuous improvement.

In the fourth CfD auction round, the UK Government introduced additional requirements whereby proponents must demonstrate progress towards their commitments by providing a Supply Chain Plan Implementation Assessment and by attending meetings with BEIS every 2 months. Proponents unable to meet their commitments are given several warnings, after which the Government may terminate the contract.

In previous CfD auction rounds, BEIS met with developers to assess their progress, with no termination of contract for non-compliance.

A key strength of the UK's scheme is its flexibility. Proponents are awarded points for implementing certain components of their Supply Chain Plan, with the Government requiring a certain number of points to be achieved to pass the implementation assessment. This allows proponents to overperform in some areas where they may have been unable to in others, fostering supply chain flexibility and innovation while ensuring the goals of the scheme are met.

Compliance framework

The Board recommends the approach to compliance should be collaborative and use a risk-based graduated regulatory response, with enforcement actions as appropriate. This means:

- early and continuous engagement with proponents throughout the project lifecycle
- providing information and advice on how to fulfil commitments made in IPPs
- standardising reporting requirements
- identifying risks to compliance and supporting their mitigation
- positive financial incentives for exceeding local content commitments made
- duty of self-reporting by proponents

- providing opportunities to rectify any instance of non-compliance, including setting the expectation that the proponent should justify any variation and voluntarily rectify any issues raised by the Consumer Trustee or EnergyCo as soon as possible
- a complaints process and mediation services to resolve disputes such as the NSW Small Business Commission's commercial mediation service
- a range of enforcement actions that are proportionate to the seriousness of the issue, including:
  - requests for information
  - adverse publicity notices
  - injunctions to suspend activity until non-compliance is remedied
  - financial penalties for not meeting commitments
  - termination of contract in cases of severe underperformance and where this is in the public interest.

The compliance framework should include an independent audit regime.

The Board recommends creating a shared understanding with proponents, early in the project lifecycle, of the long-term benefits from delivering on the local content requirements. For example, proponents are more likely to comply if they understand that by delivering on their commitments to skills and training, they are addressing the future skills needs of the sector and any new projects the proponent may undertake.

The body with primary responsibility for ensuring compliance should publish a compliance strategy outlining its approach to compliance and enforcement activities and update the strategy regularly. For example, the Victorian Local Jobs First Commissioner published a Compliance Strategy in 2019.

Proponents, contractors and subcontractors should have a single point of contact for complaints. In Victoria there is a Local Jobs First Commissioner and in South Australia an Industry Advocate.

To the extent that the Consumer Trustee has responsibility for managing the compliance process, it should put in place governance arrangements to manage the potential conflict that may arise from its obligation to act in the long-term financial interests of NSW electricity customers.

The Consumer Trustee, EnergyCo and SFV should ensure adequate resourcing for a collaborative approach to compliance. For example, Transport for NSW has dedicated resources to support social procurement during implementation of projects.

Continuous improvement of the Board's plan

The Act requires the Board to:

- monitor and review its plan and make recommendations to the Minister about the implementation of the plan
- report on its activities to the Minister each year, with the next report due 30 June 2022.

As required under the Regulation, the Board will review its plan at least every 2 years. When reviewing its plan, the Board will:

- analyse and build on the outcomes of generation, storage and network infrastructure projects
- refine and modify its recommended minimum requirements and stretch goals for local content
- take into account relevant updates to the First Nations Guidelines
- update baseline and opportunities studies for the NSW renewable energy sector
- consider implementation of relevant NSW Government plans, such as the Net Zero Plan Stage 1: 2020–2030 and the Hydrogen Strategy.

When refining and modifying the minimum requirements and stretch goals for local content, the Board will consider new evidence as it becomes available, including on:

- investment and capacity in the local supply chain
- change in renewable energy technologies
- the outcomes of local content commitments in previous generation, storage and network projects under the Roadmap
- changes to the policy or regulatory frameworks applying to the renewable energy sector
- costs to electricity customers
- changes to Australia's international trade obligations.

Building up the capacity and capability of the NSW renewable energy sector

This section sets out the Board's advice to the NSW Government on actions needed to drive sustainable growth and competitiveness of our local industries and realise the benefits for local workers and communities presented by the Roadmap. The recommendations are categorised under the following themes:

1. Long-term planning for local content, jobs and skills
2. Supply chain development
3. Skills and training.

Successful implementation of these recommendations will require ongoing collaboration with industry and communities. The private sector, government and the community sector each have a role to play in realising the opportunities for the NSW renewable energy sector, including in delivering potential actions described below.

For those actions where government leads work, inter-agency coordination and collaboration will be required to deliver these recommendations and harness the work already underway in NSW to boost local industries and support communities.

Agencies such as the Department of Education, Investment NSW and the Department of Regional NSW are designing and implementing programs that target and develop skills and opportunities for local workers and businesses. Leveraging existing initiatives and expertise will ensure efficient and effective workforce and industry development and can accelerate delivery of the plan, creating a world-leading renewable energy sector in NSW.

The Board recommends the NSW Government consult with the Board, industry, unions, councils and professional associations early and regularly in the implementation of this plan to ensure initiatives are relevant to the needs of the renewable energy sector and the NSW community.

Theme 1: Long-term planning for local content, jobs and skills

NSW has a significant pipeline of major infrastructure projects planned over the coming decades to support thriving, connected communities and a strong economy across the state. This includes the $32 billion private sector investment under the Roadmap and other major initiatives in areas such as transport and community infrastructure (NSW Government 2022).

While this pipeline of projects will deliver long-term benefits to communities, in the short term, renewable energy projects may compete for resources with other infrastructure projects. Managing these resources effectively will require a cohesive strategy for the development of the renewable energy sector and for the economy more broadly across NSW.

Long-term planning and a collaborative, economy-wide approach involving government, industry, unions and other stakeholders will help to create visibility of the statewide requirements for skills, infrastructure and resources. This will help identify and address gaps as they emerge, and increase opportunities for local content, jobs and skills development.

1.1 Establish a NSW Government policy for local content, jobs and skills in the renewable energy sector

Related NSW Government portfolios	Department of Education, Department of Regional NSW, EnergyCo, Infrastructure NSW, Investment NSW, NSW Treasury

Rationale for recommendation

The NSW Government supports local content, jobs and skills through the Small to Medium Enterprise and Regional Procurement Policy, the Aboriginal Procurement Policy and the Infrastructure Skills Legacy Program.

The *Australian Jobs Act 2013* (Cth) requires major public or private projects with an estimated capital expenditure of $500 million or more to prepare an AIPP. Projects required to submit a state or territory IPP may be eligible for an AIPP exception.

States such as Victoria, South Australia, Queensland and Western Australia have implemented comprehensive local content legislation and supporting policies.

NSW has the opportunity to build on its current approach to develop a more comprehensive policy for the state's renewable energy sector to create greater opportunities for local businesses and jobs, and encourage greater investment in local skills, while ensuring consistency with Australia's international trade obligations.

Such a policy can support economic development in the state, including regional areas, while mitigating supply chain risks such as those that have resulted from the COVID-19 pandemic. A standardised cross-industry policy will provide consistency and direction across the state.

The section on Local content requirements sets out recommendations to the Consumer Trustee and EnergyCo on how to maximise the use of local content in investments under the Roadmap.

Potential actions

- Develop and implement legislation for local content, jobs and skills in the renewable energy sector, including:
  - a local content procurement strategy
  - local industry participation plans
  - a Local Jobs First Commissioner to coordinate, monitor and implement activities to maximise opportunities for local workforces and industries.

- Develop statewide local content targets and policies in collaboration with industry and unions, consistent with the principles and research set out in the Local content requirements section of this plan.
- Distinguish between:
  - 'standard projects' as those worth (for example) at least $1 million in regional NSW and (for example) at least $3 million in metropolitan areas
  - 'strategic projects' as those worth (for example) at least $50 million, to which higher local content requirements will apply.

1.2 Ensure a comprehensive approach to WHS in the renewable energy sector

Related NSW Government portfolios	Department of Customer Service, Office of Energy and Climate Change, Fair Work Commission, NSW Fair Trading, SafeWork NSW

Rationale for recommendation

Construction under the Roadmap will attract thousands of workers to build, operate and maintain electricity infrastructure projects, many in regional or remote locations. The sector is relatively new and not yet classified as a separate industry for the purposes of WHS and many workers do not consider themselves as part of an industry (MBB Group 2021b).

Modern best practice WHS has moved beyond the traditional focus on just physical health and safety, and today includes responsibility for the psychological wellbeing of the workforce and ensuring the supply chain is not knowingly involved in modern slavery (MBB Group 2021b).

The Board recommends establishing a comprehensive approach to WHS for the sector in partnership with unions and industry. The goals of this approach should be to improve flexibility for workers, support the psychological safety of workers, and to keep injuries and fatalities as close to zero as possible.

It should address gaps in existing WHS approaches (MBB Group 2021b), such as:

- clarity on roles and responsibilities of safety regulators
- safety inspector capacity and capability to carry out safety inspections, particularly in remote areas
- safety licensing for renewable energy projects.

This will also support the sector being recognised as a standalone, cohesive industry, making it more appealing to workers and leading to greater attraction and retention rates.

Potential actions

- Bring together industry, unions and safety experts to improve job quality and working conditions in the renewable energy sector and to report on modern slavery risks and incidents.
- Work with SafeWork NSW to establish safety forums for employers, contractors, workers and safety professionals to share knowledge, innovation and lessons learnt on safety issues in the renewable energy sector.

- Include the renewable energy sector as a key focus area for development in the next NSW Government safety strategy.
- Work with the Department of Customer Service to better define the roles and responsibilities of SafeWork NSW as the safety regulator for the renewable energy sector and NSW Fair Trading as the regulator of electrical licensing.
- Develop a renewable energy sector safety licence to cover existing gaps specific to the industry, such as energised direct current systems, underground cables, high voltage, overhead wiring and remote working.
- Develop a proactive inspection regime at critical hold points during construction and not just at completion to address identified gaps in current remote worksite practices (MBB Group 2021b).
- Ensure safety inspectors have adequate resources to carry out inspections, including immediate investigation of significant incidents, as well as the required skills to perform inspections on renewable energy worksites.
- Enforce construction and manufacturing standards on renewable energy worksites in line with Recommendation 6 in the Local content requirements section of this plan to minimise safety risks.
- Advocate for the Fair Work Commission to establish a national industry framework for wages and conditions for the sector agreed between relevant unions and employers.
- Advocate for Safe Work Australia to develop national safety Codes of Practice covering new renewable energy sectors not adequately covered by existing codes.

Case study: Work health and safety training courses for current and aspiring residential solar and battery installers

The OECC has worked with the Office of the Building Commissioner, TAFE NSW and Safework NSW, together with the Clean Energy Council and Smart Energy Council to develop training for the residential solar and battery installation sector.

The training will help ensure residential solar and battery installers have the skills and knowledge to stay safe when working at heights and around hazardous materials, as well as ensuring installs meet Australian standards.

This training will contribute to a safer work environment for tradespeople, those working around them and consumers in this dynamic and growing industry.

The training, launched in November 2021, includes:

- online training modules available for free on the Clean Energy Council learning management system on working safely at heights in the solar industry, compliance with standards, and installing home batteries
- face-to-face training on working safely at heights to be hosted by the Smart Energy Council in regional and rural areas
- online training on awareness of working around potentially asbestos containing materials hosted on the Construct NSW learning platform.

1.3 Minimise waste during construction and establish an end-of-life industry for the renewable energy sector

Related NSW Government portfolios	Department of Planning and Environment, Office of Energy and Climate Change, Department of Regional NSW, NSW Environment Protection Authority, Office of Local Government NSW

Rationale for the recommendation

The adoption of circular economy principles and end-of-life processing are at a very early stage in the renewable energy sector both internationally and in Australia. Large-scale investment in renewable energy technologies under the Roadmap creates an opportunity to support the NSW Government's Circular Economy Policy Statement (NSW Government 2021b) and develop a local end-of-life industry before generation and storage are decommissioned.

Reducing waste to landfill through recycling:

- aligns with the NSW Government's vision for making the transition to a circular economy over the next 20 years (NSW Government 2021b)
- reduces emissions, supporting the NSW Government's ambitions for net zero by 2050 (NSW Government 2020).

End-of-life processing can also provide local employment opportunities, including in advanced manufacturing and traditional sorting facilities. These facilities could be located within the NSW Government's clean manufacturing precincts and offer job opportunities for local workers. For example, recycling creates more than 3 times as many jobs as landfill disposal (Access Economics 2009).

The section about Local content requirements provides guidance to the Consumer Trustee and EnergyCo on how to ensure developers incorporate circular economy principles in the design and construction of a project. The actions below set out further steps needed to minimise waste during construction and develop the local end-of-life industry.

Potential actions

- Strengthen planning regulations to create and expand end markets for recycled materials from renewable energy technologies, such as:
  - revising technical specifications to increase recycled content
  - prioritising the use of recycled materials in government procurement and projects.
- Work with industry to minimise waste during construction activities and recycle 100% of non-contaminated waste generated on site.
- Ensure suppliers and operators of all high value renewable energy components are members of relevant product stewardship schemes, such as the National Battery Stewardship Scheme.
- Seek to impose mandatory responsibilities on renewable energy manufacturers to ensure their products are recyclable and contain recycled content where possible.

- Build on the Australian Energy Market Operator's (AEMO 2021a) *Generation information* portal of energy facilities to include location, type and age of technology to better enable efficient repairs and end-of-life collection for processing.
- Attract investment in waste management processing infrastructure for renewable technologies.
- Integrate recycling facilities into related hubs and precincts including for hydrogen, clean manufacturing, regional jobs and special activation precincts.
- Collaborate with other jurisdictions to complement rather than duplicate investments.
- Identify and promote grants to support industry compliance with regulations and participation in recycle and reuse schemes.
- Ensure early engagement with recycling and reuse businesses to identify workforce and skills requirements, including opportunities to transition renewable energy workers to the end-of-life industry over time.

1.4 Ensure a coordinated inter-regional approach to infrastructure delivery

Related NSW Government portfolios	Office of Energy and Climate Change, Department of Planning and Environment, Department of Regional NSW, EnergyCo, Infrastructure NSW, Regional Growth NSW Development Corporation

Rationale for the recommendation

Across regional NSW, the government and private sector are making significant investments in transport and community infrastructure, economic development and supports for workers and businesses in transitioning from traditional energy sectors (Infrastructure NSW 2021, NSW Government 2021c).

While delivering long-term benefits for communities, large-scale investments may in the short term put pressure on local infrastructure and services, such as accommodation, childcare, health and roads (ISF and SGS 2022).

Ensuring that major investments complement each other will also ensure better outcomes for local skills and supply chains. For example, industry and local stakeholders noted the provision of road infrastructure, education facilities and affordable housing are essential enablers for developing, attracting and retaining local workforces (ISF and SGS 2022).

Potential actions

- Develop a statewide schedule of state significant projects as defined under the *State Environmental Planning Policy (State and Regional Development) 2011* and supporting infrastructure to improve coordination between infrastructure initiatives.
- Use the infrastructure schedule to:
  - identify gaps and where projects are competing locally for material and human resources

- update government employment projections, distribution and timeframe forecasts
- identify housing supply challenges created by the arrival of temporary workers on construction projects
- plan for and design temporary accommodation to meet community needs and deliver longer-term benefits
- align infrastructure and services planning to match seasonal and resident population growth in and around the REZs.

- Engage early with local councils to understand the capability and capacity to deliver infrastructure within each region as a whole and within each council.

Theme 2: Supply chain development

The Act sets a minimum target of 12 GW of new generation and 2 GW of long duration storage to be constructed by 2030. This significant demand throughout the renewable energy supply chain, including mineral processing, manufacturing and maintenance creates opportunities to develop local industries in areas of the supply chain where NSW has a competitive advantage.

Increasing local content in the construction, manufacture and operation of electricity infrastructure under the Roadmap will support jobs, growth and diversification for regional communities. This will also help reduce supply chain risks, safeguarding the delivery of the Roadmap from potential disruptions.

Ultimately, NSW could harness its competitive advantages to become a global leader in renewable energy technologies, creating new export industries.

2.1 Attract investment to the NSW renewable energy sector

Related NSW Government portfolios	Consumer Trustee, Office of Energy and Climate Change, EnergyCo, Investment NSW

Rationale for the recommendation

The Roadmap together with related NSW Government policies such as the NSW Hydrogen Strategy present significant opportunities to attract new investment into the NSW renewable energy sector, both from international companies and Australian businesses.

Investors will require details of the Roadmap to understand the nature of demand, make informed strategic decisions, and create connections with potential buyers of their goods and services. Lead times to establish new facilities and train workers can be significant, meaning industry also needs information as early as possible to make sound investment decisions (ACIL Allen 2022).

The actions below set out a pathway for communicating the pipeline of opportunities under the Roadmap and related policies to international and Australian investors.

Potential actions

- Launch an international campaign to communicate the opportunities under the Roadmap and related NSW Government policies to attract foreign companies to set up operations in NSW.
- Establish an international manufacturing exchange to attract foreign investment and create international partnerships with local manufacturers.
- Build on and communicate information in the Consumer Trustee's Infrastructure Investment Objectives Report and EnergyCo's upcoming Network Strategy Report to provide more certainty and clarity on when regions are likely to see investment. This will help the business community plan appropriately.
- Prioritise funding for pilot programs, grants and loans with a focus on facilitating international partnerships.
- Create a register of businesses that have expressed interest in participating in renewable energy supply chains and want continued communication on Roadmap opportunities and supports available.

2.2 Reduce barriers for SMEs and First Nations businesses, particularly in regional areas

Related NSW Government portfolios	Department of Education, Office of Energy and Climate Change, Department of Regional NSW, EnergyCo, Investment NSW

Rationale for the recommendation

Many regional economies are undergoing economic transition and are in need of new industry development and economic opportunities (ISF and SGS 2022). SMEs usually support local employment, the retention of wealth locally and are engaged with local communities (SGS Economics and Planning 2020).

However, SMEs find it challenging to participate in procurement processes for large projects due to lack of scale, lack of specialised expertise in large-scale procurement processes and inability to access project information. Without early action, the economic, business, employment, training and wealth benefits will not be captured locally, but instead flow to major cities or internationally (ISF and SGS 2022).

The section about Local content requirements provides guidance to the Consumer Trustee on how to ensure developers engage with local supply chains to address barriers to entry for SMEs and First Nations businesses. The actions below identify supports and strategies needed to enable local business to take advantage of opportunities presented by the Roadmap.

Potential actions

- Undertake a business and skills mapping project to understand where the opportunities for SME participation align with local capability in each REZ.

- Develop a renewable energy supply chain business directory to increase knowledge of local and regional capacity among developers, original equipment manufacturers (OEMs) and EPC contractors.
- Leverage and educate local businesses about existing grant programs and other assistance, including supports to:
  - upgrade technology and processes
  - get workers into regions
  - pre-employment training and how to engage apprentices.
- Prioritise funding where gaps in existing grants programs and assistance exist, including tailored financial support to develop scale and capability to take advantage of the opportunities under the Roadmap.

2.3 Build the capacity of the local manufacturing sector

Related NSW Government portfolios	Office of Energy and Climate Change, Department of Regional NSW, EnergyCo, Investment NSW, Jobs Advocate

Rationale for the recommendation

Increasing locally manufactured content for the renewable energy sector will reduce supply chain risks and increase the economic benefits for NSW from investments under the Roadmap.

Using local manufacturers increases quality assurance and WHS standards, lowers maintenance costs, and reduces the impacts and risk of a mistake occurring in the supply chain (MBB Group 2021a). Supply chain disruptions resulting from the COVID-19 pandemic further highlight the value of local supply chains in reducing project delays (MBB Group 2021a).

The section about Local content requirements provides guidance to the Consumer Trustee and EnergyCo on how to maximise the use of local content in the manufacture, construction and operation of infrastructure under the Roadmap.

Notably, local content requirements under the Victorian Renewable Energy Target led to the expansion of existing capacity, but not investment in new manufacturing capacity (ISF and SGS 2022). The Roadmap offers a larger project pipeline, creating greater long-term opportunities for local manufacturing; however, additional engagement, support and capacity-building may be required to realise investment in new manufacturing capacity.

Potential actions

- Carry out market sounding with OEMs and investors on major opportunities, including:
  - wind tower and transmission tower manufacturing
  - nacelle and hub assembly
  - electrical balance of plant manufacturing.
- Leverage existing state and federal business attraction schemes for manufacturing investment.

- Collaborate with other jurisdictions to realise advantages of specialisation and avoid duplication of effort.
- Undertake detailed analysis and work with key stakeholders to understand, from a whole-of-NSW perspective:
  - the optimal location(s) for new and repurposed manufacturing facilities
  - the timing and scale of manufacturing capacity needed to meet the project pipeline of demand
  - identify any additional facilitation measures needed to attract investment.
- Prioritise funding for local manufacturing pilot programs, grants and loans with a focus on building capacity and scaling local businesses.
- In regions where traditional energy and heavy industry are prevalent, such as the Hunter and Illawarra, access fees could be directed towards supporting businesses' transition to new opportunities in renewable energy.
- Undertake a feasibility study of transport, telecommunications and other supporting infrastructure to identify any upgrades that are required, such as for transporting wind turbine blades along road networks.
- Investigate scope for a national testing facility for transmission and wind towers to support local manufacturing.
- Engage with councils early to align land-use and strategic planning with investments in renewable energy supply chains, such as ensuring availability of serviced land for manufacturing.

Case study: UK Wind Expert Support Toolkit (WEST) Pilot Program

The UK WEST Pilot Program supported the growth of new and existing offshore wind supply chain companies by providing business support, market intelligence, and insight into the sector. A key focus of the program was to transfer knowledge, skills and technologies from other sectors, identified as a requirement to meet the ambitions set out in the UK Offshore Wind Sector Deal.

One barrier identified in attracting entrants from other industries was a lack of specific renewable energy sector knowledge. The WEST program provided participants with access to world-leading experts who delivered specialist advice to companies of different sizes and levels of maturity within the offshore wind sector.

The pilot was taken up by 32 companies looking to increase their capability in offshore wind supply chains from industries including oil and gas, aerospace and defence. The pilot was a success, leading to 60 companies registering for the expanded 2021 WEST program (Offshore Wind Growth Partnership 2020).

2.4 Coordinate battery energy storage system industry development

Related NSW Government portfolios	Office of Energy and Climate Change, Department of Regional NSW, EnergyCo, Office of the Chief Scientist NSW

Rationale for the recommendation

The global demand for batteries and their material inputs exceeds current supply capacity (ISF and SGS 2022). This demand is expected to grow as energy and transport sectors continue to electrify, leading to long-term sustainable employment opportunities. The Australian battery workforce has the potential to increase from 6,000 in 2020 to 30,000 in 2030 through the development of integrated battery supply chains (Future Batteries Industries CRC 2021).

NSW could be internationally competitive in several parts of the battery supply chain, including mineral processing, battery pack assembly, system services and end-of-life management. For example, NSW could participate in the downstream processing of nickel and cobalt leading to significant value-add and employment opportunities (ISF and SGS 2022).

Developing local supply chain capacity at the speed and scale required to harness the opportunity in NSW requires innovative coordination between government, industry, research, and training organisations.

Potential actions

- Attract and facilitate investment to bridge the gap between local and international knowledge and support local projects to secure finance.
- Build the local workforce and its skills, including by:
  - identifying, promoting and supporting university and VET courses that produce graduates suitable for advanced manufacturing and battery supply chains
  - addressing any gaps in the scope and specialisation of engineering degrees for the battery supply chain, particularly in mechanical, chemical and industrial engineering
  - linking industry, universities, and registered training organisations (RTOs) through battery innovation hubs
  - engaging with and supporting career pathways for graduates with identified critical skills (refer to recommendation 3.4).
- Investigate opportunities and barriers to supply chain development, including:
  - co-location of processing, manufacturing and end-of-life facilities where feasible
  - research into opportunities for better circular integration of battery supply chain stages for more effective end-of-life treatment
  - supporting battery material mines to achieve best practice sustainability certification to maximise export opportunities and ensure readiness for future supply chain certification.
- Broker renewable energy power purchase agreements to improve access to competitively priced renewable energy for energy intensive supply chain stages such as mineral processing.

2.5 Support development of an offshore wind industry in NSW

Related NSW Government portfolios	Department of Education, Office of Energy and Climate Change, Department of Regional NSW, EnergyCo, Investment NSW

Rationale for the recommendation

The International Energy Agency views offshore wind as one of the 'big three' clean energy generation sources (Blue Economy CRC 2021). Offshore wind technology has reduced in costs rapidly, while increasing in scale. New floating turbine designs are emerging that can access more locations off the coast of NSW (ISF and SGS 2022).

Several offshore wind farms have been earmarked for development in NSW, some of which would reside within the Illawarra and Hunter REZs (Blue Economy CRC 2021). Offshore wind is a nascent industry that may offer significant opportunities in manufacturing, construction and operations to these regions. The sector also has the potential to provide high-paid ongoing and skilled employment.

Offshore wind could play an important role in the state's energy transition with the ability to install large projects that connect into parts of the electricity network with significant existing capacity and very low cost of expansion (AEMO 2021b). Offshore wind can also (ISF and SGS 2022):

- complement onshore wind and solar generation
- supply power to heavy industry, including green hydrogen
- boost employment in the Hunter and Illawarra, including opportunities for workers transitioning from traditional energy sectors in these regions, such as coal-fired power generation, coal mining and coal ports
- building on existing, more developed onshore wind supply chains.

Potential actions

- Create a statement of intent for the offshore wind sector in NSW, setting out:
  - the long-term goals for the sector, including investment, anticipated megawatt capacity and job creation
  - how development of the sector will meet community expectations and address environmental sensitivities
  - actions to provide certainty and demonstrate commercial opportunities for offshore wind projects.
- Advocate for local content requirements in the licensing of offshore wind projects by the Commonwealth Government.
- Collaborate with other state and federal jurisdictions on offshore wind industry development to support a sustainable and mobile workforce and avoid labour shortages.
- Incorporate offshore wind into planning for NSW REZs, including identifying opportunities for offshore wind to complement onshore renewable energy and offset storage requirements.

- Identify supply chain and workforce development opportunities and constraints, such as:
  - ensuring any new wind tower and steel manufacturing facilities are 'future-proofed' for larger-scale offshore wind components
  - incorporate assessment of transition pathways into offshore wind for workers in traditional energy sectors (refer to recommendation 3.2)
  - specific requirements, including specialised skills and equipment, which need to be in place to realise the opportunities for offshore wind in NSW.
- Advocate for funding through the Australian Renewable Energy Agency and the Clean Energy Finance Corporation for offshore wind, such as demonstration of floating wind technologies that could accelerate the development of offshore wind in NSW.
- Support investigation and feasibility assessments of the most efficient offshore wind grid connection solutions, including identifying the need for further government coordination akin to the REZ model.

Theme 3: Skills and training

The Roadmap is a once-in-a-generation opportunity to create quality jobs for NSW workers in the construction, manufacture and operation of renewable energy infrastructure; however, skills shortages are a major barrier to realising these opportunities.

Over 50% of industry stakeholders cite skills shortages as a major barrier in the renewable energy sector (ISF and SGS 2022). Labour and skills shortages pose a significant risk for the build-out of renewable generation and transmission infrastructure, especially in regions with tight labour markets (Infrastructure Australia 2021a).

Action is needed to ensure the education, training and apprenticeship offerings in NSW can supply qualified workers in the numbers required, and with the skills required to support the delivery of the Roadmap.

This section provides recommendations for coordinated, sector-wide action to address current and emerging skills shortages and to support workers from traditional energy sectors and underrepresented groups to find employment in the renewable energy sector.

3.1 Coordinate skills and workforce development in the REZs for energy, resources and infrastructure

Related NSW Government portfolios	Department of Education, Department of Regional NSW, EnergyCo, Jobs Advocate, Office of Local Government NSW

Rationale for the recommendation

The lack of effective mechanisms for coordination, communication and planning between industry, government and training organisations is one of the key barriers to skills development and increased local employment (ISF and SGS 2022).

To enable coordinated and holistic regional action and partnerships a Skills and Workforce Development Working Group should be established in each REZ, covering energy resources and infrastructure.

Each working group should contain representatives from government, industry, regional development organisations, unions as well as public and private training organisations, and have First Nations representatives with links to the local community. These working groups should build on existing groups, such as:

- Renewable Energy Zone Regional Reference Groups run by EnergyCo
- Regional Leadership Executive – workforce development subcommittees run by the Department of Regional NSW
- Special Activation Precinct reference groups run by the Department of Regional NSW.

The scope of the working groups should extend beyond renewable energy to include other related sectors because:

- renewable energy is part of an 'ecosystem', with mining, manufacturing and infrastructure each having overlapping workforce requirements
- labour supply and demand need to be managed across the regional ecosystem to reduce skills shortages and counter-productive competition for labour
- renewable energy construction is a short-term employment opportunity and establishing career paths and attracting and retaining labour into regions requires movement between renewable energy and other sectors
- renewable energy is a 'thin market', with investment in training capacity and workforce development more effective across a group of sectors.

Potential actions

- Share information through the working groups on project pipelines and future labour demand to assist with planning and smoothing of demand from overlapping industries.
- Identify local training needs for each of the REZs including skills mapping of available skills and audit of local training capacity.
- Develop and implement mechanisms for workforce redeployment between renewable energy and other sectors and within renewable energy (see recommendation 3.2 for detail).
- Monitor and evaluate implementation of skills and training strategies within the REZs, including overseeing suitability and availability of training at the local level (see recommendation 3.3 for detail).

Implementation considerations

The focus of the working groups will vary between the REZs; for example, REZs in traditional energy and heavy industry regions of the Hunter and Illawarra will need a greater focus on skills mapping and workforce transition (refer to recommendation 3.2 for detail).

Implementation of the working groups will need to create processes for effective decision-making by, for example, limiting participation to decision-makers and establishing sub-groups to develop and implement actions.

The working groups should be industry-driven, but organised by an agency with overall responsibility for delivering outcomes. This will provide coordination at a statewide level to facilitate effective intelligence gathering and prioritise funding.

Case study: Sydney Metro Skills and Employment Advisory Group

To support the delivery of the Infrastructure Skills Legacy Program requirements Sydney Metro established a strategic stakeholder forum called the Skills and Employment Advisory Group (SEAG). Sydney Metro coordinates this forum, bringing together the NSW Government, Australian Government, industry bodies, employers and training bodies.

The group meets on a bi-monthly basis to collaborate, inform, advise and support the delivery of jobs, skills, diversity and inclusion on Sydney Metro projects. The group has developed and implemented a number of programs and models contributing to the advancement of the construction industry. These include:

- the Sydney Metro Industry Curriculum, aimed at increasing workforce capability and capacity by developing transferrable skills and competency of individuals across industry
- a pre-employment program, providing accredited entry level technical skills and employability training for the long-term unemployed and other underrepresented groups in the workforce
- the Sydney Metro apprenticeship program, designed to improve completion rates and build industry capacity. The program provides short-term and long-term placement options for contractors based on length of their package and apprentices with rotation options to continue their apprenticeship while gaining experience on other packages within Sydney Metro projects.

3.2 Facilitate workforce redeployment, including opportunities for workers affected by the energy transition

Related NSW Government portfolios	Department of Customer Service, Department of Education, Department of Regional NSW, Investment NSW, Jobs Advocate

Rationale for the recommendation

The Roadmap will transform the NSW electricity system into one that is cheap, clean and reliable as ageing coal-fired power stations retire. However, without coordinated action, workers, communities and related supply chains in coal-reliant regions will experience disruption and dislocation. This can ultimately result in loss of social licence for the transition.

Workers in the traditional energy sector and related industries have skills that are likely to be transferable to the manufacture, construction and operation of renewable energy. Successful policy responses involve (ACTU 2016):

- early planning and engagement with the workforce and local community
- measures to create new jobs
- supports to help people connect to new jobs.

Helping workers in traditional energy sectors transition to quality careers in renewable energy will also help address skills shortages in the sector and improve local labour supply.

More broadly, workforce redeployment within the renewable energy sector and between renewable energy and related sectors such as mining and manufacturing helps address the risk of labour shortages in the context of tight labour markets.

The Skills and Workforce Development Working Groups proposed in recommendation 3.1 will play a role in sharing information about the project pipeline, and forecast labour demand and help coordinate workforce redeployment.

Potential actions

- Develop a detailed understanding of workforces and communities that will be affected by the scheduled retirement of coal-fired power stations and mine closures, including a breakdown of the workforce into sub-groups such as:
  - those who prefer staying in the region
  - those who prefer remaining in the traditional energy sector
  - those who prefer a move to the renewable energy sector.
- Undertake skills mapping between overlapping sectors, including those affected by changes in electricity generation in the state.
- Create transition pathways from traditional energy industries by:
  - prioritising funding, including from the REZ access fees, to develop and pilot training for skillsets and micro-credentials
  - working with employers, unions and training providers to deliver training prior to power station closures.
- Engage with local workforces and communities to promote available reskilling and employment assistance such as Training Services NSW Skills Broker programs, training opportunities and future employment opportunities.
- Engage with employers to promote opportunities for diversification, expansion or relocation through programs such as the Department of Regional NSW's Regional Job Creation Fund or the Royalties for Rejuvenation program.
- Identify and address challenges and barriers faced by traditional energy companies, including:
  - tax or other financial settings such as fringe benefits tax payable on training courses
  - the need to manage the departure of workers in a safe and coordinated way so critical roles remain filled.

- Establish centralised online platforms for REZ regions with candidate profiles, jobs and apprenticeship listings to help workers find new opportunities.
- Expand the NSW digital education passport program to create an efficient and verified record of skills and qualifications for the renewable energy sector workforce.
- Engage with regulatory bodies to establish mandatory portability of entitlements for workers moving from one project to another.

3.3 Develop a Renewable Energy Sector Skills and Training Strategy that addresses key short-term and long-term skills and labour gaps in the market

Related NSW Government portfolios	Department of Education, Office of Energy and Climate Change, Department of Regional NSW, EnergyCo, Investment NSW, Jobs Advocate, TAFE NSW

Rationale for the recommendation

Skills shortages already exist or are forecast to emerge for many occupations across the renewable energy sector (Clean Energy Council 2020). The length of time it takes to complete formal training, such as apprenticeships, coupled with overlapping demand for skills from other industries such as mining or infrastructure, increases the pressure.

Regional skills shortages present an additional challenge for delivery of the REZs, while establishment of the REZs creates an opportunity for a more collaborative approach. This approach enables coordination and collaboration between industry, government and training authorities to improve local skill formation and employment (Infrastructure Australia 2021b).

Through a series of VET system reviews including the Gonski and Shergold review (2021), NSW Productivity Commission (2021) and Federal Productivity Commission (2020), the capacity of the training system has been identified as a major barrier.

Developing a sector-wide skills and training strategy aimed at meeting skills and labour gaps, and increasing the pool of available talent, will also be essential for meeting future employment and skills needs. Recommendation 3.2 identifies actions to facilitate workforce redeployment, including opportunities for workers affected by the energy transition. Recommendation 3.4 focuses on skills needs in the transmission sector. Recommendation 3.5 sets out strategies to attract workers in underrepresented groups to the renewables sector.

Potential actions

- Ensure the strategy addresses critical skills shortages for the industry such as electricians, grid connection workers, wind farm maintenance technicians and engineers, including:
  - identifying and promoting relevant training packages and advocating for development of new qualifications where necessary
  - innovative delivery methods, such as mobile training units
  - creating new training capacity by leveraging existing industry training initiatives.

- Establish alternative pathways to trades qualifications for mid-career entrants and part-time employees and support for adult apprenticeships.
- Promote apprenticeships and higher apprenticeships as an attractive alternative to university through marketing campaigns and enhanced VET programs such as school-based apprenticeships and traineeships.
- Develop renewable energy programs in schools targeting STEM skills.
- Facilitate partnerships between universities and renewable energy, transmission and related projects for internships and graduate programs for engineers.
- Create incentives to establish partnerships for learning workers between renewable energy projects and tertiary educational institutions.
- Prioritise funding for RTOs and TAFE NSW to expand subsidised training offerings.
- Develop strategies to increase the capacity of group training organisations (GTOs) including to support apprentice employment where direct employment is not appropriate, such as on short projects.
- Develop strategies to address the shortage of trade teachers, including by funding for 'train the trainer' incentives and grants and removing regulatory barriers that limit involvement of industry in training.
- Investigate with TAFE NSW and other RTOs the potential for training and innovation hubs in regional NSW, like those established elsewhere in Australia.
- Work with TAFE NSW to integrate the Renewable Energy Sector Skills and Training Strategy into its strategic planning and funding proposals.

Case study: Government and industry collaboration to address skills and training gaps

In Western Victoria, a consortium of renewable energy companies (Vestas, Acciona, Tilt Renewables and Global Power Group) is partnering with Federation TAFE and Federation University to establish the Asia Pacific Renewable Energy Training Centre (APRETC). The companies have contributed $1.8 million to establish the first blade technician apprenticeship in Australia (ISF and SGS 2022).

The Queensland Government recently announced new renewable energy and hydrogen training facilities, including some delivered in collaboration with the private sector. This includes the Renewable Energy Training Facility in Brisbane, operated by Electro Group Training, offering a Certificate IV – Electrical in Renewable Energy (Queensland Government 2021a). The government is also supporting 3 new training facilities for hydrogen sector skills, including a Hydrogen Training Centre of Excellence at the industry-led Queensland Apprenticeships Centre (Queensland Government 2021b).

The Queensland Government and the not-for-profit Energy Skills Queensland also established the coal seam gas/liquified natural gas Industry Training Program, a $10 million initiative jointly funded by government and industry. The initial $5 million investment from the government is matched by companies in the industry when they access the training. The program focuses on up-skilling existing workers and training new entrants to address significant skills shortages.

3.4 Establish a nationally recognised training program for the transmission construction workforce

Related NSW Government portfolios	Department of Education, Office of Energy and Climate Change, EnergyCo, Investment NSW

Rationale for the recommendation

NSW is experiencing a current and growing shortage of transmission construction workers. Coordinated action is needed as:

- transmission construction is a 'thin market' for training, with few training suppliers
- market uncertainty limits forward training investment by industry
- transmission projects face competition for line workers from rail and electricity distribution projects, as these can often offer more ongoing employment in urban or major town settings
- there is a lack of experienced staff to pass on skills and knowledge on the job.

If not addressed, skills shortages in the sector could have a negative impact on the delivery and cost of transmission construction for the Roadmap (ISF and SGS 2022).

As part of a training strategy for the sector (see recommendation 3.3), the NSW and Australian governments should provide co-funding to a national training program for transmission construction. The program should address shortages for key occupations such as engineers, line workers and electrical commissioning specialists across the National Electricity Market (NEM). It should also consider the skills needed to support microgrid projects in communities.

A NSW-based organisation is well-placed to train the workforce in other states as NSW is projected to have the largest share of transmission construction jobs (43% overall) across the NEM by 2024 (ISF and SGS 2022).

Potential actions

- Advocate for federal–state co-funding to establish a nationally recognised training program.
- Identify established training facilities that could become a centre or centres of excellence for transmission construction training.
- Develop initiatives to increase the redeployment of workers between transmission and distribution network projects.
- Encourage shared engagement of apprentices providing workers with qualifications in both transmission and distribution sectors.
- Include consideration of skills and knowledge needed for microgrid projects in communities.
- Develop partnerships delivering internship opportunities for engineers between universities, transmission companies and EPC contractors.

- Engage with other jurisdictions to ensure interstate mobility of workers trained through the program.
- Develop courses for on-the-job training of trades workers such as site supervisor courses.

Case study: Federal and state funding to address identified skills shortages

The Australian Government has committed $16 million to Energising Tasmania, partnering with Skills Tasmania to deliver the skills and training needed for the Battery of the Nation initiative and for the renewable energy and related sectors more broadly. This includes the:

- Energising Tasmania Training Fund, which will offer fully subsidised training to up to 2,500 learners
- Energy and Infrastructure Training Market Development Fund, supporting capacity building of training providers
- Energy and Infrastructure Workforce Development Fund, delivering an industry-led workforce development plan.

In Western Sydney, the NSW and Australian governments are jointly delivering the Multiversity, focused on skills and training for the jobs of the future. The Multiversity is part of the Aerotropolis development located next to the site of the future Western Sydney airport, with the intention of attracting new and emerging industries, such as advanced manufacturing, aerospace and high-tech freight and logistics. The Multiversity is designed to provide the skills needed for these industries, with 4 NSW universities and TAFE NSW partnering to deliver the courses (Multiversity 2021).

3.5 Improve employment and economic participation opportunities for underrepresented groups

Related NSW Government portfolios	Department of Education, Department of Regional NSW, EnergyCo, Investment NSW, Jobs Advocate

Rationale for the recommendation

Attracting groups traditionally underrepresented in the renewable energy sector can help alleviate projected labour and skills shortages. At the same time, the Roadmap presents an opportunity to increase employment and economic participation for groups experiencing unemployment or underemployment.

Women, First Nations people, youth and older workers are all underrepresented in renewable energy and related sectors such as infrastructure and mining, and present an untapped talent pool. For example, women account for less than 13% of the total construction workforce, and less than 2% of trade roles, with attitudinal bias and working conditions being significant barriers to entry (Infrastructure Australia 2021b).

Many regional areas have lower numbers of younger residents and an ageing workforce, while trades and VET have become less attractive relative to university education for school-leavers and young people (ISF and SGS 2022). First Nations people account for a significant portion of the unemployed across several REZ regions (ISF and SGS 2022).

The section about Local content requirements sets out how opportunities for underrepresented groups can be maximised in generation, storage and network project tenders. The actions below identify further coordinated strategies and priorities.

Case study: Improving the culture of the construction industry

The construction industry Culture Standard is an initiative of the Construction Industry Culture Taskforce and is focused on improving the culture of the construction industry. The Taskforce is a collaboration between the Australian Constructors Association, the NSW and Victorian governments and leaders from industry and academia.

The Taskforce has identified several issues in the construction industry which if addressed could substantially improve inclusivity and productivity, while helping to reduce labour shortages in the industry.

The Taskforce is developing a Culture Standard to lift the productivity and performance of the construction sector and address the major issues experienced within the industry including excessive and inflexible work hours and failure to attract a diverse workforce (Culture in Construction 2021a). The standard will also seek to address high levels of family conflict and divorce and high rates of mental health problems and suicide. Currently, construction workers are twice as likely to commit suicide than the national average.

The Culture Standard is particularly focused on increasing female participation in the construction workforce. Increasing female representation has demonstrated benefits such as decreasing aggressive behaviour and bullying, improved attention to detail and improved communication (Culture in Construction 2021b). Additionally, attracting and retaining female workers expands the talent pool and increases capacity to deliver projects at a time when the industry is facing skills shortages.

Once the Culture Standard is finalised, the Taskforce will call on governments to adopt the standard in their procurement procedures.

Potential actions

- Establish a network for information sharing, contacts and best practice on engagement and employment of underrepresented groups across the sector and within each REZ.
- Provide ongoing support for First Nations working groups for each REZ region, to provide connections between local First Nations communities and developers.
- Engage with the renewable energy sector to:
  - undertake First Nations cultural awareness training within their workforce
  - develop employment opportunities for local First Nations people, such as environmental assessments, cultural tours for workers, land management and rehabilitation, and fire management.

- Support best-practice recruitment practices, pre-employment training, work-placements, mentoring and qualifications that create bridges for underrepresented groups.
- Develop programs such as mentoring and blended learning to increase the uptake and completion of apprenticeships and training by underrepresented groups, including women.
- Engage with the sector to set targets and deliver programs to improve gender equity and diversity within the renewable energy and the transmission and distribution workforces, including a focus on flexible working hours with no mandatory overtime, and improving worksite conditions and workplace culture.

Implementation considerations

The Department of Regional NSW has established Regional Aboriginal Partnership Officers in each region who would be well placed to assist with some of the actions related to First Nations participation.

Additionally, the OECC will establish First Nations working groups for each REZ region that could also support some of the actions.

Case study: First Nations employment program, Wagga Wagga Base Hospital

During the redevelopment of Wagga Wagga Base Hospital, head contractors CPB Contractors sought to increase First Nations participation. CPB approached Training Services NSW to develop a pre-employment program to meet targets set out in the Infrastructure Skills Legacy Program. Participants were attracted to the scheme as it provided a pathway into secure work and allowed them to leave a legacy through contributing to the largest building in Wagga Wagga.

Training Services NSW developed a First Nations employment program in partnership with CPB, Multicultural NSW, TAFE NSW and the Australian Government.

Key components that contributed to the program's success were:

- culturally inclusive educational delivery, including onsite tours and fieldwork to reduce extended classroom time
- a collaborative approach across multiple agencies and levels of government
- providing transport, lunches, personal protective equipment, counselling, mentoring and accommodation support where necessary, to reduce barriers to work.

The cohort featured 13 workers aged from 18–24, some of whom had not worked prior to engaging in the program. Each of the 13 applicants successfully completed the program and all were subsequently able to secure employment on the Wagga Wagga Base Hospital project. Several participants also continued on to traineeships and apprenticeships in the construction industry.

Funding priorities for REZ access fees

Table 19 identifies actions from the recommendations in this section of the plan that could be funded from REZ access fees, including the employment purpose component. The Board recommends the Consumer Trustee and EnergyCo prioritise these actions in the allocation of funds from the access fees.

Table 19. Priority actions for REZ access fees

Recommendation	Action
2.3 Build the capacity of the local manufacturing sector	In regions where traditional energy and heavy industry are prevalent, such as the Hunter and Illawarra, access fees could be directed towards supporting businesses to transition to new opportunities in renewable energy.
3.2 Facilitate workforce redeployment, including opportunities for workers affected by the energy transition	Access fees could fund the creation of transition pathways from traditional energy industries, including development and piloting of training for skillsets and micro-credentials.

Definitions

Detailed requirements: are where proponents must provide actions, strategies and evidence to show how they will meet the criteria.

Development phase: for a project includes all costs from project inception to completion of project commissioning.

Industry participation plans (IPPs): are submitted by proponents as part of their tender bid and outline how the proponent will meet the relevant tender criteria for local industry and workforce participation.

Learning worker: a worker without qualifications or who needs to update their qualifications or skills to meet the needs of the infrastructure project. This includes trainees and apprentices. Once defined as a learning worker, the worker maintains this status for the duration of the project.

All workers on a project who undertake accredited training count towards the learning worker requirement, not just construction workers. The project workforce includes all people who contribute to the project. This includes people such as managers, engineers, finance team, environmental team, safety team, construction employees consisting of supervisors, those in leadership roles, tradespeople and operators.

People who undertake training organised by the contractor prior to employment are counted as learning workers only if they are employed on the project.

Training must be accredited vocational education and training (VET) or nationally recognised professional qualifications that meet the needs of the project and can be full or part qualifications (such as one or more units of competency). It may be subsidised by government funding or through a fee-for-service arrangement.

Participants in the NSW Government Trade Pathways Program are to be included as learning workers and count towards achievement of this outcome.

Minimum requirements: the lowest level of performance a proponent must commit to for eligibility and merit criteria.

Operations and maintenance phase: of a project commences once the project is fully commissioned.

Project proponent: the person(s) or an organisation who is legally responsible for carrying out the project and submits a tender bid to the Consumer Trustee or EnergyCo for a long-term energy service agreement (LTESA), REZ access right or network infrastructure project authorisation.

Stretch goals: higher levels of performance defined in the tender guidance documents, communicating the ambition for the renewable energy sector. Proponents receive higher scores in evaluation for exceeding the minimum requirement with the top score for meeting a stretch goal.

Value for money (VFM): the value of the overall net economic and social benefits during the lifetime of the project; for example, a project may deliver economic value through cost-saving innovations or downstream job creation.

Shortened forms

AIPP	Australian Industry Participation Plan
ACRS	Australasian Certification Authority for Reinforcing and Structural Steel
BEIS	United Kingdom Department for Business, Energy & Industrial Strategy
CfD	Contracts for difference
CRC	Cooperative research centre
Cth	Commonwealth
The Act	*Electricity Infrastructure Investment Act 2020* (NSW)
EnergyCo	Energy Corporation of NSW
EPC	Engineering, procurement and construction
FTE	Full-time equivalent
GTO	Group training organisation (see Appendix B)
GW	Gigawatts
IPART	Independent Pricing and Regulatory Tribunal
IPP	Industry participation plan
IRC	Industry Reference Committee
ISF	Institute for Sustainable Futures, University of Technology Sydney
ISLP	NSW Infrastructure Skills Legacy Program
ITAB	Industry Training Advisory Body
LTESA	Long-term energy service agreement
MBB	MBB Group
NEM	National Electricity Market
NSW	New South Wales

OECC	NSW Office of Energy and Climate Change
OEM	Original equipment manufacturer
REZ	Renewable energy zone
The Roadmap	The NSW Electricity Infrastructure Roadmap
RTO	Registered training organisation (see Appendix B)
SAP	Special activation precinct
SCA	Steelwork Compliance Australia
SFV	Scheme Financial Vehicle
SEAG	Skills and Employment Advisory Group
SGS	SGS Economics and Planning
SME	Small to medium enterprise
SSO	Skills Service Organisation
STEM	Science, technology, engineering and mathematics
TAFE	Technical and Further Education
UK	United Kingdom
VET	Vocational education and training
VFM	Value for money (see definition above)
WEST	Wind Energy Support Toolkit
WHS	Work health and safety

Appendix A: Guidance for detailed requirements

The following tables provide guidance for the detailed requirements for evidence on how a tenderer is planning to meet minimum requirements and stretch goals for each IPP theme.

Table 20. Supply chain inputs

Detailed requirement	Example specifications
Demonstrate credible strategies for providing NSW suppliers, including SMEs, with full, fair and reasonable opportunities to provide goods and services for the construction and operation of electricity infrastructure by: • describing and supporting with evidence the use of local content, including from SMEs, and the contribution to local economies in design, construction and manufacturing decisions • describing and supporting with evidence how your organisation plans to address barriers to entry for SMEs and provide ongoing support during the life of the project or engagement period • demonstrating the application of performance-based design specifications to the extent possible and where not in conflict with relevant performance standards for generators and the network • demonstrating use of Australian standards as the primary reference for project design; where other standards are used, evidence to justify their use and demonstrate equivalence to Australian standards in a way that supports certification for compliance • demonstrating due diligence in market research and tender specifications to provide equal opportunity to local suppliers, including unbundling large work packages to match market capability and enable greater flexibility for SMEs to respond.	• Design and specification of construction and manufacturing packages, including subcontractors, i.e. EPC contracts. • Prepare engagement strategies with local suppliers to support capacity and capability development, including early engagement. • Advertise opportunities on the NSW Industry Capability Network website for one month and obtain at least one quote from a local supplier with capability and capacity to deliver on required demand. • Support for SMEs to upskill in business development activities. • A bespoke strategy on unbundling of large work packages tailored to the local market the project is being delivered in.

Table 21. Investment and innovation in the supply chain

Detailed requirement	Example specifications
Demonstrate credible strategies for supporting investment, local innovation and commercialisation opportunities in the NSW renewable energy sector by: • describing and supporting with evidence the investments your organisation or its supply chain partners have undertaken or plan to undertake in new facilities, plant and equipment. These investments should contribute to the long-term capability and competitiveness of local supply chains and regional development • describing and supporting with evidence the most impactful activities your organisation or its supply chain partners have undertaken or plan to undertake to support local innovation and commercialisation of products, processes, technologies and services • describing and supporting with evidence contributions to or participation in a pooled investment for: — the long-term capability and competitiveness of local supply chains — local innovation and commercialisation of products, processes, technologies and services related to the renewable energy supply chain.	• Establish opportunities to trial and pilot high-end and innovative products during the construction and delivery phases to demonstrate proof of concept for commercialisation. • Identify an initial selection of innovative products, processes, technologies and services that will be investigated during the project lifecycle. • Invest in plant and equipment to increase the capacity and capability of the local supply chain for renewable energy.

Note: Investment and innovation in the supply chain means impactful activities proponents or their supply chain partners have undertaken or plan to undertake to support local innovation and opportunities in NSW in the following categories:

- research and development related to challenges faced by the project and its associated technology
- start-ups and social enterprises related to renewable energy and First Nations communities
- innovative products, processes, technologies, and services across the development, construction and operations phases of the project that have wider applicability in the sector.

Table 22. Employment, skills and knowledge transfer

Detailed requirement	Example specifications
Demonstrate credible strategies for maximising local employment, skills development and knowledge transfer to local businesses and workers by: • supporting capability development of NSW employees, suppliers, subcontractors in the supply chain, including upskilling and cross-skilling into renewable energy pathways via vocational training and courses on cutting-edge skillsets such as: — advanced manufacturing — mechatronics — artificial intelligence — cyber security • providing learning and development opportunities for workers and suppliers to develop accredited transferrable skills that are recognised across industry and jurisdictions • describing and supporting with evidence how your organisation will contribute to the development of future-looking skills in the workforce, including engaging local professionals and inspiring young talent to have greater engagement in STEM • describing how your organisation will help contribute to the long-term capability and competitiveness of local supply chains and regional development including through investment in training, plant and equipment.	The requirement is to demonstrate credible strategies for maximising skills and knowledge transfer to NSW businesses and workers by the following: • Demonstrate capability development of NSW employees, suppliers, sub-contractors in the supply chain, including upskilling and cross-skilling into renewable energy pathways via vocational training and courses on cutting-edge skillsets such as: — advanced manufacturing — mechatronics — artificial intelligence — cyber security. • Provide learning and development opportunities for workers and suppliers to develop accredited transferrable skills that are recognised across industry and jurisdictions including for workers transitioning from traditional energy sectors. • Describe and support with evidence how the proponent organisation will engage local professionals, for example engineering interns, and contribute to the development of future looking skills in the workforce. This could include programs encouraging high school students to have greater engagement in STEM. • Describe how the proponent organisation will help contribute to the long-term capability and competitiveness of local supply chains and regional development including through investment in training, plant and equipment.

Table 23. First Nations participation

Detailed requirement	Example specifications
Demonstrate credible strategies for providing First Nations people with opportunities to increase skills and economic participation by: • describing and supporting with evidence how your organisation plans to ensure consistency with the First Nations Guidelines, including but not limited to: — developing transferable skills — addressing current and future skills shortages locally and nationally by training and empowering First Nations people — increasing opportunities for small, medium and large local verified First Nations businesses to access the project supply chain — increasing and retaining the number of First Nations staff working in the pipeline of projects • demonstrating with supporting evidence how your organisation plans to create a safe and inclusive workplace for First Nations people.	The requirement is to demonstrate credible strategies for providing First Nations people with opportunity to increase skills and economic participation by the following: • Describe and support with evidence how the proponent organisation plans to ensure consistency with the First Nations Guidelines, including but not limited to: — developing transferable skills — addressing current and future skills shortages locally and nationally by training and empowering First Nations people — increasing opportunities for small, medium, and large local Recognised First Nations businesses to access the project supply chain — increasing and retaining the number of First Nations staff working in the pipeline of projects. • Demonstrate with supporting evidence how the proponent organisation plans to create a safe and inclusive workplace for First Nations people.

Table 24. Fair and ethical practice

Detailed requirement	Example specifications
Demonstrate credible strategies for ensuring fair and ethical practice in the workforce and supply chain by: • describing and supporting with evidence the most impactful activities your organisation plans to undertake to increase diversity and create opportunities for underrepresented groups, including supporting existing programs in the region • describing and supporting with evidence the policies and plans in place to assure WHS standards for workers are met, both within your workforce and your supply chain, including but not limited to: — a WHS management plan, including mental health and creation of a safe and supported workplace — an industrial relations management plan — a subcontract management plan • describing and supporting with evidence your organisation's recent performance relating to WHS, modern slavery and subcontractor payment processing • describing and supporting with evidence your stakeholder engagement plan to support fair and ethical practice in the workforce and supply chain including for: — local councils — First Nations people — unions and trade and labour councils.	• Develop targeted programs to create skills, jobs and mentoring pathways for women, young people and other underrepresented groups. • Ensure the project aligns with the NSW Government's and Australian Government's modern slavery legislation including providing a modern slavery statement compliant with the *Modern Slavery Act 2018* that is registered with Australian Border Force. • Implement modern slavery and labour exploitation policies, including having up to date supply chain audits and strategies to address non-conformances. • Ensure the project aligns with best practice employment standards including guaranteeing safe working environments and providing market salary rates and working conditions. • Implement stakeholder engagement activities including: — partnerships to maximise outcomes — gathering information on underrepresented or disadvantaged groups in the local community — mapping skills needs for the project with those in the community to enhance employment opportunities during and post construction; for example, local councils could help proponents identify the needs in the community and where investments will have greatest impact.

Table 25. Environmentally sustainable procurement

Detailed requirement	Example specifications
Demonstrate credible strategies for promoting environmentally sustainable procurement throughout the supply chain by: • describing how project sourcing of products and materials aligns with EN15804, and/or is recognised under the Green Building Council of Australia's Responsible Products Framework • describing and supporting with evidence the most impactful activities your organisation plans to undertake to reduce your construction and operational carbon footprints and promote low carbon solutions that align with the NSW Government's Net Zero by 2050 target, including: — materials, including embodied emissions — energy and fuel in project delivery and logistics — minimising use of water and increasing use of non-potable water • describing how project activities align with the NSW Circular Economy Policy Statement, including: — use of recycled content — reducing waste to landfill — maximising products that can be reused, repaired and recycled.	The requirement is to demonstrate credible strategies for promoting environmentally sustainable procurement throughout the supply chain by the following: • Demonstrate how project sourcing of products and materials aligns with EN15804, and/or is recognised by the Green Building Council of Australia's Responsible Products Framework. • Describe and support with evidence the most impactful activities your organisation plans to undertake to reduce your construction and operational carbon footprints and promote low carbon solutions that align with the NSW Government's Net Zero by 2050 target, including: — materials, including embodied emissions — energy and fuel in project delivery and logistics — minimising use of water and increasing use of non-potable water. • Demonstrate how project activities align with the NSW Circular Economy Policy Statement, including: — use of recycled content — reducing waste to landfill — maximising products that can be reused, repaired and recycled.

Appendix B: Vocational education and training sector

The vocational education and training (VET) sector provides education and training that focuses on providing skills for work, helping students upgrade skills, join the workforce for the first time or change careers. Nationally, more than 4 million VET students undertake training each year with around 4,000 training providers working together to provide nationally consistent training (ASQA 2021).

Training providers

VET providers include industry, public and private training organisations, along with schools and universities that also offering some VET training. Both government and private training providers are quality controlled by the Australian Government's Australian Skills Quality Authority. The majority of VET is provided by:

- Technical and Further Education (TAFE) is run by government and provides education after high school in vocational areas. TAFE focuses on specific skills for a particular workforce. TAFE is primarily taught at institutes although some courses are available online
- registered training organisations (RTOs) are private businesses that offer training, such as colleges. They deliver training according to the scope of their registration and issue nationally recognised qualifications.

Training offerings

Training packages define the skills and knowledge needed by learners to perform a job. A training package contains 3 components:

- units of competency define the skills and knowledge needed, and how to apply them in a workplace context
- a qualifications framework shows how units of competency combine to produce specific learning outcomes
- assessment guidelines describe the qualifications needed by assessors, the design of assessment processes and guidelines for assessment management.

Skill sets are a single unit of competency or combination of units of competency from one or more training package that link to a licence or regulatory requirement, or defined industry need.

Micro-credentials are short and targeted training modules that offer flexible ways of learning. They deliver training to meet emerging and urgent skills needs and support people to move between jobs and industries. Micro-credentials can be completed as stand-alone modules to address a specific need or used as building blocks towards full qualifications.

Training development

Training packages are developed when an industry identifies a need for training that is not covered by an existing training package. The key roles in developing training are:

- Industry Reference Committees (IRCs) are made up of representatives of industry, peak bodies and unions who understand the skills needs of the sector. IRCs develop and review training packages to ensure the training system provides the qualifications, knowledge and skill sets that industry needs
- Skills Service Organisations (SSOs) are independent, professional service organisations that support IRCs in their work developing and reviewing training packages. SSOs are funded by the Australian Government Department of Education, Skills and Employment. SSOs support industry engagement while remaining independent from both industry and the training sector.

Apprenticeships

Australian Apprenticeships

Australian apprenticeships include apprenticeships and traineeships that combine a program of structured on-the-job training with formal study at a VET training provider. Apprenticeships provide a VET qualification at the Australian Qualifications Framework level 2 (Certificate II) to level 4 (Certificate IV), including Certificate II in Sustainable Energy or Certificate III in Electrotechnology Electrician.

Higher Apprenticeships

Higher apprenticeships combine a program of structured on-the-job training with formal study, with the study component leading to the award of a VET qualification at the Australian Qualifications Framework level 5 (Diploma) or level 6 (Advanced Diploma). Higher apprenticeships can be a useful tool in reskilling people to adjust to disruptive industry changes.

Pre-apprenticeships

A pre-apprenticeship is a form of entry level training that can provide a pathway into an industry. Pre-apprenticeships can assist in improving literacy and numeracy skills while developing essential work-related skills and can be helpful for those who have been out of the workforce for extended periods.

Group training organisations

A GTO employs apprentices and trainees, and then places them with a host employer who they work for whilst receiving on-the-job training for their apprenticeship or traineeship. The apprentice or trainee might stay with one host employer for the duration of their training or they might move between host employers as project demands change, or to learn specialist skills.

Industry support

Industry Training Advisory Bodies (ITABs) are autonomous, industry-based bodies that represent their industries on training and related matters to support the vocational education and training system. ITABs are a key source of industry advice for the NSW Government and provide advice to the Department of Education on the training and skills needs of their NSW industry sectors to facilitate workforce development.

Industry Skills Councils are funded by the Australian Government and governed by independent industry-led boards. They provide industry intelligence and advice to government and enterprises on workforce development and skills needs. They support the development, implementation and continuous improvement of training and workforce development products and services including training packages.

References

ABS (Australian Bureau of Statistics) (2016) *ABS Census of Population and Housing 2016*, Australian Bureau of Statistics.

ACAA (Australian Construction Achievement Award) (2015) *Technical Paper: Gold Coast Light Rail*, ACAA, Sydney. acaa.net.au/wp-content/uploads/2020/02/Gold-Coast-Light-Rail.pdf [PDF 420KB]

Access Economics (2009) *Employment in waste management and recycling*, report by Access Economics Pty Limited for the Department of the Environment, Water, Heritage and the Arts. www.awe.gov.au/sites/default/files/documents/waste-and-recycling-employment.pdf [PDF 1.2MB]

ACIL Allen (2022) *Consumer costs and economic benefits for Renewable Energy Sector Board's Plan: Final report*, report to NSW Department of Planning and Environment, ACIL Allen, Melbourne.

ACTU (Australian Council of Trade Unions) (2016) *Sharing the challenges and opportunities of a clean energy economy: A Just Transition for coal-fired electricity sector workers and communities*, ACTU website. www.actu.org.au/media/1032953/actu-policy-discussion-paper-a-just-transition-for-coal-fired-electricity-sector-workers-and-communities.pdf [PDF 2.6MB]

ASQA (Australian Skills Quality Authority) (2021) *VET sector overview*, ASQA website. www.asqa.gov.au/about/vet-sector

AEMO (Australian Energy Market Operator) (2021a) *Generation information*, AEMO website. aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information

AEMO (Australian Energy Market Operator) (2021b) *2021 Inputs, Assumptions and Scenarios Report,* AEMO website. aemo.com.au/-/media/files/major-publications/isp/2021/2021-inputs-assumptions-and-scenarios-report.pdf?la=en [PDF 5.3MB]

Australian Steel Institute (2016) *The new AS/NZS 5131 Structural Steelwork – Fabrication and Erection*, Australian Steel Institute, Pymble NSW. www.steel.org.au/ASI/media/Australian-Steel-Institute/Banners/media_File_ASNZS_5131_Brochure.pdfwww.steel.org.au/ASI/media/Australian-Steel-Institute/Banners/media_File_ASNZS_5131_Brochure.pdf [PDF 200KB]

Australian Steel Institute (2021) *Technical Note TN015 Ascertaining compliance of structural steel*, Australian Steel Institute, Pymble NSW. www.steel.org.au/resources/elibrary/resource-items/tech-note-tn015-ascertaining-compliance-of-structu

BBC News (11 January 2017) 'Ukraine power cut "was cyber-attack"', BBC News website. www.bbc.com/news/technology-38573074

Blue Economy CRC (Cooperative Research Centre) (2021) *Offshore Wind Energy in Australia*, Blue Economy CRC, Newnham Tasmania. blueeconomycrc.com.au/projects/offshore-wind-potential-australia

Canberra Metro (2021) *The Canberra light rail project brings opportunity for local employment & local supply chains*, Canberra Metro website. www.canberra-metro.com.au/local-industry-participation

Clean Energy Council (2020) *Clean energy at work*, Clean Energy Council and Institute for Sustainable Futures, University of Technology Sydney. assets.cleanenergycouncil.org.au/documents/resources/reports/Clean-Energy-at-Work/Clean-Energy-at-Work-The-Clean-Energy-Council.pdf [PDF 6MB]

Culture in Construction (2021a) *A culture standard for the construction industry – Consultation paper*, Construction Industry Culture Taskforce, October 2021. cultureinconstruction.com.au/wp-content/uploads/2021/10/A-Culture-Standard-for-the-Construction-Industry_Consultation-Paper_October-2021.pdf [PDF 2.2MB]

Culture in Construction (2021b) *The cost of doing nothing report*, report prepared by BIS Oxford Economics for the Construction Industry Culture Taskforce, May 2021, cultureinconstruction.com.au/wp-content/uploads/2021/09/The-Cost-of-Doing-Nothing-Report.pdf [PDF 870KB]

DFSI (Department of Finance, Services and Innovation) (2016) *PBD-2016-03: Construction standards and conformance*, New South Wales Procurement Board, NSW Department of Finance, Services and Innovation, July 2016. arp.nsw.gov.au/pbd-2016-03-construction-standards-and-conformance

Future Battery Industries CRC (2021) *Future Charge: Building Australia's Battery Industries*, report prepared by Accenture for the Future Battery Industries CRC. fbicrc.com.au/wp-content/uploads/2021/06/Future-Charge-Report-Final.pdf [PDF 1.9MB]

Gonski D and Shergold P (2021) *In the same sentence: Bringing higher and vocational education together*, NSW Department of Premier and Cabinet, Sydney. education.nsw.gov.au/content/dam/main-education/about-us/strategies-and-reports/Final_VET_Sector_Report.pdf [PDF 1.2MB]

ISF and SGS (2022) *Employment, Skills and Supply-Chains: Renewable Energy in NSW*, Institute for Sustainable Futures and SGS Economics and Planning, Sydney.

Infrastructure Australia (2021a) *Market Capacity for electricity generation and transmission projects: A report from Infrastructure Australia's Market Capacity Program*, Infrastructure Australia. www.infrastructureaustralia.gov.au/sites/default/files/2021-10/Market%20Capacity%20for%20Electricity%20Infrastructure%20211013.pdf [PDF 4.6MB]

Infrastructure Australia (2021b) *Infrastructure Market Capacity*, Infrastructure Australia. www.infrastructureaustralia.gov.au/sites/default/files/2021-10/Infrastructure%20Market%20Capacity%20Report%20211013_0.pdf [PDF 58MB]

Infrastructure NSW (2021) *NSW major projects infrastructure pipeline*, Infrastructure NSW website. www.infrastructure.nsw.gov.au/industry/construction-industry/pipeline-of-projects

MBB Group (2021a) *Supply Chain Analysis Report*, MBB Group, Sydney.

MBB Group (2021b) *Work Health and Safety Baseline and Opportunities Study*, MBB Group, Sydney.

Multiversity (2021) *Multiversity*, Multiversity website. www.multiversity.edu.au

NREL (National Renewable Energy Laboratory) (2019) *2019 Cost of Wind Energy review*, National Renewable Energy Laboratory, Golden, CO, USA. www.nrel.gov/docs/fy21osti/78471.pdf [PDF 3.9MB]

NSW Government (2018) *Prison Project Delivers Jobs And Training Boost* [media release], Infrastructure NSW. www.infrastructure.nsw.gov.au/media/1689/prison-project-delivers-jobs-training-boost.pdf [PDF 79KB]

NSW Government (2020) *Net Zero Plan Stage 1: 2020–2030,* Department of Planning, Industry and Environment, Sydney. www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Climate-change/net-zero-plan-2020-2030-200057.pdf [6.6MB]

NSW Government (2021a) *Infrastructure Skills Legacy Program*, Training Services NSW website. www.training.nsw.gov.au/programs_services/islp/index.html

NSW Government (2021b) *NSW Waste & Sustainable Materials Strategy 2041,* Department of Planning, Industry and Environment, Sydney. www.dpie.nsw.gov.au/__data/assets/pdf_file/0006/385683/NSW-Waste-and-Sustainable-Materials-Strategy-2041.pdf [PDF 2.1MB]

NSW Government (2021c) *The NSW Budget 2021-2022: Budget Paper No. 1*, NSW Treasury. www.budget.nsw.gov.au/sites/default/files/2021-06/Budget%20Paper%20No.%201%20-%20Budget%20Statement%20-%20Budget%202021-22.pdf [PDF 1.3MB]

NSW Government (2021d) *Lismore Base Hospital*, Infrastructure NSW website. www.infrastructure.nsw.gov.au/industry/construction-industry/case-studies/lismore-base-hospital

NSW Government (2021e) *Sydney Metro and Southwest*, Infrastructure NSW website. www.infrastructure.nsw.gov.au/industry/construction-industry/case-studies/sydney-metro-city-and-southwest

NSW Government (2021f) *Training Management Guidelines: Skills, training and diversity in construction, Infrastructure Skills Legacy Program*, NSW Department of Education. www.training.nsw.gov.au/forms_documents/programs_services/islp/training_management_guidelines_october_2021.pdf [PDF 1.2MB]

NSW Government (2021g) *Parkes Special Activation Precinct*, NSW Government website. www.nsw.gov.au/snowy-hydro-legacy-fund/special-activation-precincts/parkes

NSW Government (2021h) *Aboriginal Procurement Policy*, NSW Treasury. buy.nsw.gov.au/__data/assets/pdf_file/0007/949174/app_policy_jan_2021.pdf [PDF 570KB]

NSW Government (2022) *Infrastructure – Invest NSW*, Invest NSW website. invest.nsw.gov.au/why-nsw/infrastructure

NSW Productivity Commission (2021) *Productivity Commission White Paper 2021: Rebooting the economy*, NSW Treasury, Sydney. www.productivity.nsw.gov.au/sites/default/files/2021-06/Productivity%20Commission%20White%20Paper%202021.pdf [PDF 27MB].

Offshore Wind Growth Partnership (2020) *Thirty-two UK companies to receive business transformation support through the Offshore Wind Growth Partnership*, Offshore Wind Growth Partnership website. owgp.org.uk/thirty-two-uk-companies-to-receive-business-transformation-support-through-the-offshore-wind-growth-partnership

Productivity Commission (2020) *National Agreement for Skills and Workforce Development Review*, *Study Report*, Productivity Commission, Canberra. www.pc.gov.au/inquiries/completed/skills-workforce-agreement/report/skills-workforce-agreement.pdf [PDF 4.3MB].

Queensland Government (2021a) *Sod turning for $23 million investment in Queensland's renewable future*, Queensland Cabinet media statement, 23 September 2021. statements.qld.gov.au/statements/93310

Queensland Government (2021b) *Training and skills development in hydrogen*, Department of Energy and Public Works website. www.epw.qld.gov.au/about/initiatives/hydrogen/training

SGS Economics and Planning (2020) *Community wealth building in Australia: A new focus for regional economic development*, SGS Economics and Planning Pty Ltd. cles.org.uk/wp-content/uploads/2020/05/SGS-Economics-and-Planning_community-wealth-building_Pat-Fensham.pdf [PDF 1.8MB]

South Australian Government (2018) *Skilling South Australia Procurement Guideline*, Department for Infrastructure and Transport website. www.dpti.sa.gov.au/wpgcp