

New England Renewable Energy Zone Local Supply Chain Study

Final Report

June 2025



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		Name	██████████ ██████████ ██████████	██████████ ██████████	██████████
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Glossary and Abbreviations

Key Terms

Term / Abbreviation	Definition
ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
BESS	Battery Energy Storage Systems
Core businesses/sectors	Core businesses and sectors are those that provide a direct input into the renewable energy supply chain
FTE	Full time equivalent
GDP	Generation Design Partner
GSP	Gross State Product
ICN	Industry Capability Network
Local supply chain	The collection of businesses that will provide the goods and services required to deliver the renewable energy projects, rather than a whole-of-life analysis of each component that feeds into a supply chain
NE	New England (region of New South Wales)
NE REZ	The renewable energy zone centred around Armidale which has an intended network capacity of 8GW.
NE REZ network infrastructure project	The transmission lines and energy hubs required to support the renewable energy projects identified as part of the NE REZ.
Productivity	Output per worker
REMPPLAN	Online analytical tools and information resources for economic development and planning practitioners in local, state and federal government agencies
Renewable energy projects	The up to 8GW of renewable energy generation projects, including solar, wind, hydro and storage identified for the NE REZ.
Study Area	The 11 LGAs that incorporate the New England region and surrounding regions, including: Inverell, Uralla, Tamworth, Liverpool Plains, Muswellbrook, Tenterfield, Glenn Innes Severn, Armidale, Walcha, Upper Hunter and Singleton.
Supporting businesses/sectors	Supporting businesses and sectors are additional services that are not directly required to develop the REZ projects but will feed into the overall supply chain
Transferable businesses/sectors	Transferable businesses and sectors currently serve non-renewable energy supply chains but have a workforce, plant and equipment which could in future be part of the renewable energy supply chain

Executive Summary

Introduction

This study identifies opportunities for the local supply chain to support and benefit from the development of the New England Renewable Energy Zone (NE REZ). The study is split into three sections: a supply and demand assessment for key renewable energy supply chain components; findings; and opportunities.

Supply chains were mapped for each renewable energy technology type to identify sectors and sub-sectors that could be delivered by the local supply chain. Eight local supply chain sectors were confirmed to form the basis of this analysis:

- Materials
- Warehousing and storage
- Transportation
- Plant and equipment hire
- Security and surveillance services
- End of life (waste management)
- Construction services
- Catering, cleaning and hospitality

Approach

The relative strengths of the Study Area in each of the eight sectors was assessed by comparing the area's output per capita to that of NSW. Demand was assessed for five renewable energy technology types commencing across three

stages. Unit metrics were applied across sub-sectors, accounting for individual project size, delivery timeline and technology type to quantify demand. Projects were categorised by technology type, scale, indicative construction timings to quantitatively assess the demand over time. Estimated demand was compared to the baseline output to identify an indicative size of the gap and growth required to meet demand from the NE REZ.

The Study Area

The Study Area includes eleven Local Government Areas that surround the NE REZ declared area and the NE REZ network infrastructure project. There is existing capacity within the Study Area in each of the eight sectors assessed. In absence of the New England REZ projects, there is not expected to be significant growth across the relevant supply chain sectors. Some sectors will need to scale significantly to meet the anticipated demand from NE REZ projects. The impacts and opportunities across the Study Area will not be uniform. LGAs in the south will be transitioning from a predominantly mining driven economy, while some in the north will build on more agricultural economies.

Supply and Demand assessment

There is a strong base of quarrying, iron and steel manufacturing which presents an opportunity to capture economic benefits in the region based on the materials required. Demand

for **cement and concrete** is driven by the need for structural foundations across all project types. The demand for **structural steel** is driven largely by demand for wind turbine components. Demand for **road aggregates** is driven by the need for access roads to be constructed for projects to establish site access. Overall, materials output will need to more than double to meet peak demand.

Non-residential property services is a comparatively strong sector in the Study Area, however, there is more limited capacity to build non-residential buildings. Demand for **warehousing** will likely be driven by storage required for ancillary services rather than project components. There is substantial undeveloped industrially zoned land available in the Study Area that may be used for this purpose.

Road **transport** is a comparative strength for the Study Area, suggesting that existing businesses may be well-placed to expand to meet demand. The peaks in demand for transport is driven by the volume of aggregates and steel required during the construction of renewable energy projects. Steady growth in transport services is required to meet peak stage two demand.

There is some capacity in renting and hiring of **plant and equipment** within the Study Area, however, there is greater comparative strength in supporting industries such as equipment repair and maintenance. Demand for concrete agitators

is largely driven by wind projects, while mobile cranes are needed simultaneously across transmission and solar projects. A rapid expansion in the number of mobile cranes is required to meet peak demand in all stages. A rapid expansion in the number of excavators is required to meet peak demand in all stages.

The Study Area does not have a comparative strength in **security and surveillance** industry which could support the construction and operation of renewable energy projects. Security and surveillance services are required across both the construction and operations phases of the projects. Steady growth in security and surveillance services is required to meet peak stage two demand.

The **waste management** sector will need to build capability in reusing, recycling and processing waste streams related to renewable energy projects. Decommissioning or repowering of renewable energy projects generate various waste streams including structural steel, solar panels, wind turbine blades and batteries. Steady growth in waste management services is required to meet demands for waste streams from renewable energy projects.

Executive Summary

Certain businesses exist that can provide specific Construction Services where there are advantages to Head Contractors from sourcing them locally

The gap analysis demonstrates the increase in output required to meet demand varies significantly across sectors. Opportunities for local suppliers will be greatest in sectors that require significant growth to meet this demand.

Constraints and potential impacts

The scalability of each sector was assessed across six criteria:

- Existing capacity
- Workforce skills required
- Planning and approvals required
- Regulatory and licensing requirements
- Upfront costs
- Water intensity

Cement and concrete materials were identified as a critical sector to develop and support within the Study Area, however they are constrained by planning approvals and water usage. Growing the industry for cement and concrete could support the development of other infrastructure in the region and deliver.

Road aggregates were identified as having potential to scale with constraints relating to planning approvals and water usage. Their

expansion could deliver ongoing benefits by supporting construction and maintenance of transport infrastructure in the region.

Steel fabrication has the ability to scale, noting there are high up front costs and regulatory requirements. The local steel fabrication industry would need to leverage support from Australian Steel Institute and consider where the region could have a competitive advantage in the steel supply chain.

Warehousing and storage can be scaled to respond to the NE REZ if demand exists for these facilities, however expansion will need to be planned carefully to deliver ongoing community benefits.

Transportation has several advantages relating to output, workforce and regulation that would help with scaling this industry. It presents an opportunity to provide jobs, supporting the delivery of the NE REZ and responding to the ongoing increase in freight demand.

Scaling **Plant & Equipment** will require an understanding of actual availability across NSW compared to upfront costs and procurement timeframes. Local businesses can provide standard civil plant and equipment with more jobs created through training people to operate this machinery, but there may be better alternatives across the State.

Security & Surveillance has minimal barriers to scaling provided the capability of the industry can

be improved. It can be scaled to respond to demand but is not seen as key industry in delivering sizeable community benefits.

End-of-life presents an ongoing operational need that logically would take place in NE if facilities can be delivered in time and to scale. A circular economy approach can deliver ongoing benefits to the region and create a local industry that supports the decommissioning and repowering of generator projects.

Opportunities for **construction services** exist for specific technical disciplines that can provide benefits and efficiency from being based locally. Specific construction services can be scaled provided they form industry contacts and capabilities to respond to developer or major contractor tender packages

Catering, Cleaning and Hospitality services can capitalise on the additional demand relating to the NE REZ workforce.

Opportunities

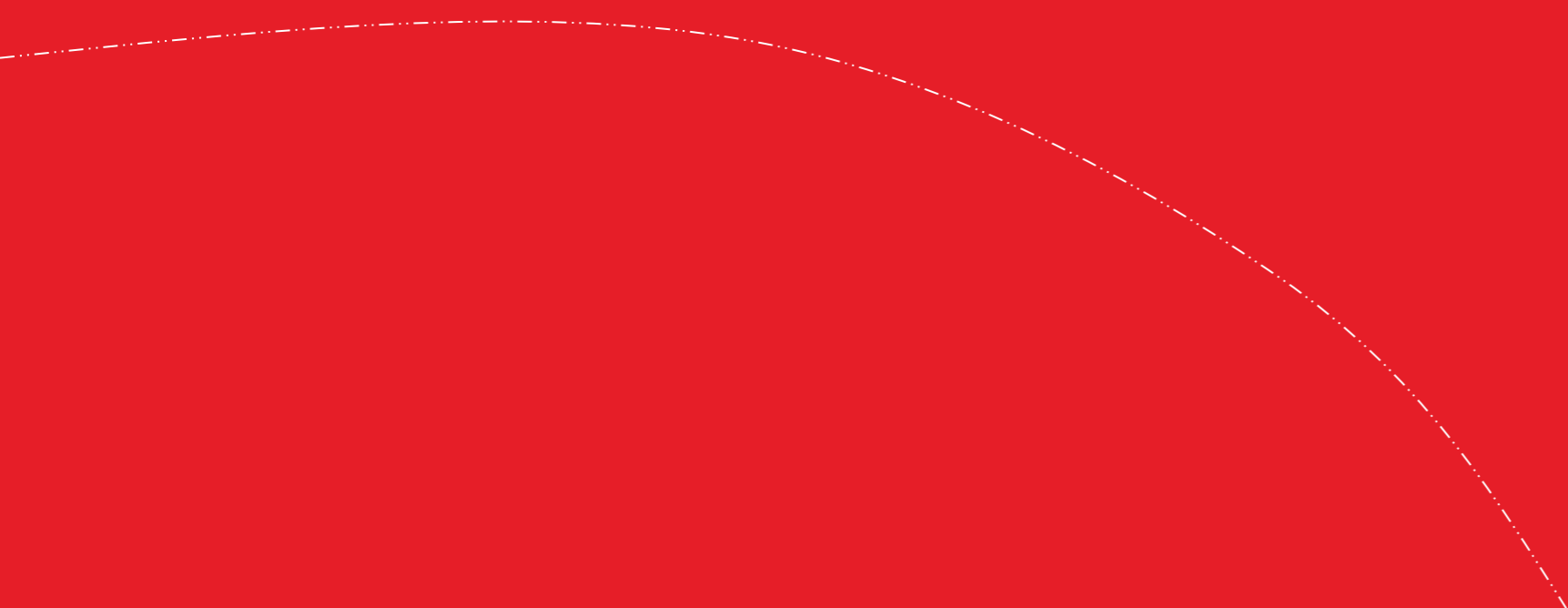
The local business survey highlighted that the local businesses would like to capitalize on the opportunities presented by the NE REZ, but need some support to do so. Based on these survey results and the work undertaken to date, we have identified potential supports for local businesses:

- Local business forums and business planning support should be commenced as soon as possible to prepare for project delivery.

- A local supplier database and opportunities register could be set up ahead of procurement processes commencing.
- Grants and loans can be used to support businesses grow through the purchase of new plant and equipment or investing in staff training.
- The simplification of procurement processes and inclusion of local content requirements can help to maximise participation of local businesses in the NE REZ projects.
- Simplification of planning and approvals will be highly beneficial for establishing new facilities to meet the NE REZ demand, particularly for quarries.

The Study Area has well-established industries and businesses that can contribute to the supply chain for NE REZ projects, ensuring local benefits. Local councils, GDPs, and businesses show a strong desire to procure goods and services locally and participate in renewable energy projects. This provides a good starting point to meet the increased demand. To capture economic and social benefits locally, industries need significant scaling, supported by various measures from information provision to cash grants. These supports should target industries with strong existing bases and ongoing community benefits, as not all can scale simultaneously within the required timeframes.

Introduction



Introduction

This study identifies opportunities for the local supply chain to support and benefit from the development of the New England Renewable Energy Zone (NE REZ).

Study scope and objectives

The purpose of this study is to establish a baseline understanding of local supply chain prospects and risks within and around the New England Renewable Energy Zone (NE REZ), focusing on the capacity needed to support renewable energy projects. The study provides:

- A baseline assessment of the current capacity of the local supply chain within the Study Area to provide the goods, services and raw materials needed to serve the delivery, operation and decommissioning of the NE REZ.
- A preliminary assessment of the demand for these goods, services and raw materials which will be created through the development of the NE REZ.
- Analysis of the gaps between the baseline supply and prospective demand to deliver the NE REZ, and scale of growth needed for supply chain components to be met locally.
- Opportunities to enable the local supply chain to prepare, adapt and increase capacity so that the New England region can benefit from the NE REZ development.

The study focusses on the supply chains within the Study Area which includes the Local Government Areas within the NE REZ declared boundary and those along the alignment of the proposed New England network infrastructure project. Note that most of the componentry required to build renewable energy projects (e.g. solar panels, wind turbines) is sourced from overseas this aspect of the supply chain has not been addressed as part of this study.

The core objectives guiding the analysis and findings of the study are shown in figure 1.

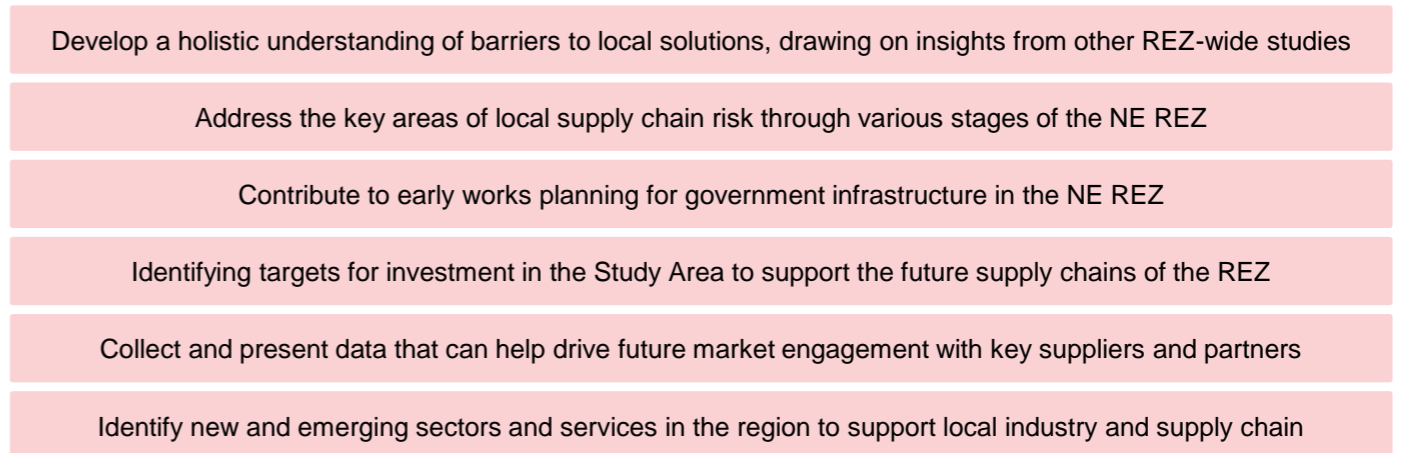


Figure 1: Local Supply Chain study objectives

Introduction

The study is split into three sections: a supply and demand assessment for key renewable energy supply chain components; findings; and opportunities.

Project process

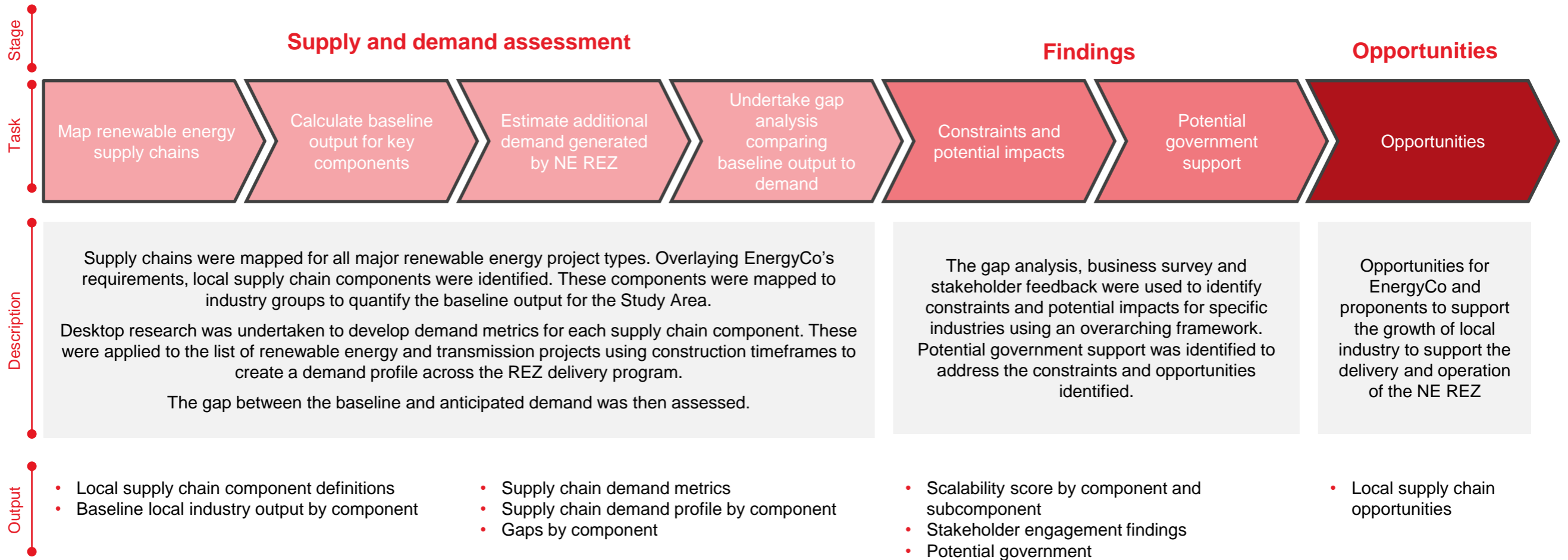


Figure 2: Project Process

Introduction

Supply chains were mapped for each renewable energy technology type to identify sectors and sub-sectors that could be delivered by the local supply chain.

Renewable energy supply chain

For this study, supply chains refer to the businesses providing goods and services for renewable energy projects, rather than a full life-cycle analysis of each component. Definitions for each component group are on the following pages.

Figure 3 shows a consolidated supply chain for all renewable energy projects, covering pre-construction, construction, and operations stages. Project renewals (i.e. replacement of turbines, panels and equipment) have not been included in the study. Detailed supply chains for each project type are in Appendix B.

This maps key businesses with local opportunities identified through research and consultation. Many components essential to renewable energy projects, such as solar panels, wind turbine blades, and battery storage systems, are not currently manufactured in Australia at scale, and therefore have been excluded from this study.

The supply of these components locally face challenges including high costs of local production, limited domestic manufacturing capability and competition with well-established global supply chains, which means that importing these components is the most cost-effective and efficient option for renewable energy projects within the Study Area.

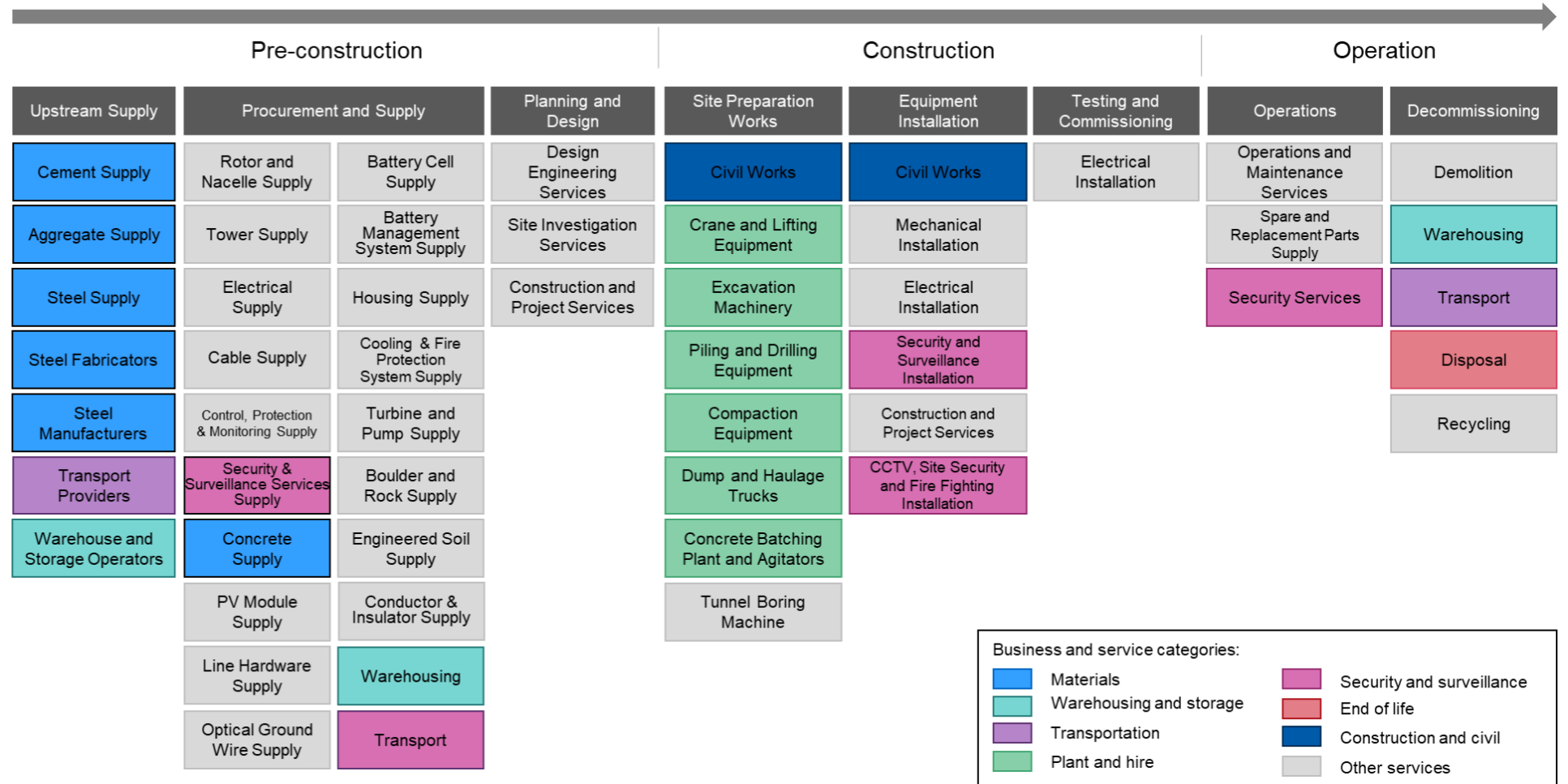


Figure 3: Indicative supply chain for all types of renewable energy projects

Introduction

Eight local supply chain sectors were confirmed to form the basis of this analysis.

Supply chain component definitions

Component	Materials	Warehousing and storage	Transportation	Plant and equipment hire
Description	Key construction inputs required to prepare, fabricate and maintain projects and supporting infrastructure	Space and facilities required to gather, stage, assemble and quality assure project components	Movement of project inputs, components and human resources in, within and out of the local area	Rent/lease of machinery, tools and equipment for a specific period to meet project needs. Plant is generally more substantive and for construction or major repair, while equipment is smaller and often needed for specific tasks
Inclusions	Includes minerals, aggregates, cement, concrete, steel and welding	Includes commercial property operations and services	Includes road, rail and air transport and supporting transport services	Includes rental of various motor vehicles, on-site transport equipment, heavy machinery, electrical and specialised equipment
Quantified sub-sectors	<ul style="list-style-type: none"> Road aggregates Concrete & cement Reinforcing steel 	<ul style="list-style-type: none"> Develop and undeveloped industrial zoned land 	<ul style="list-style-type: none"> Registered prime movers 	<ul style="list-style-type: none"> Includes: Tower cranes, mobile cranes, dump & haulage equipment, excavators, concrete agitators, concrete batching plants

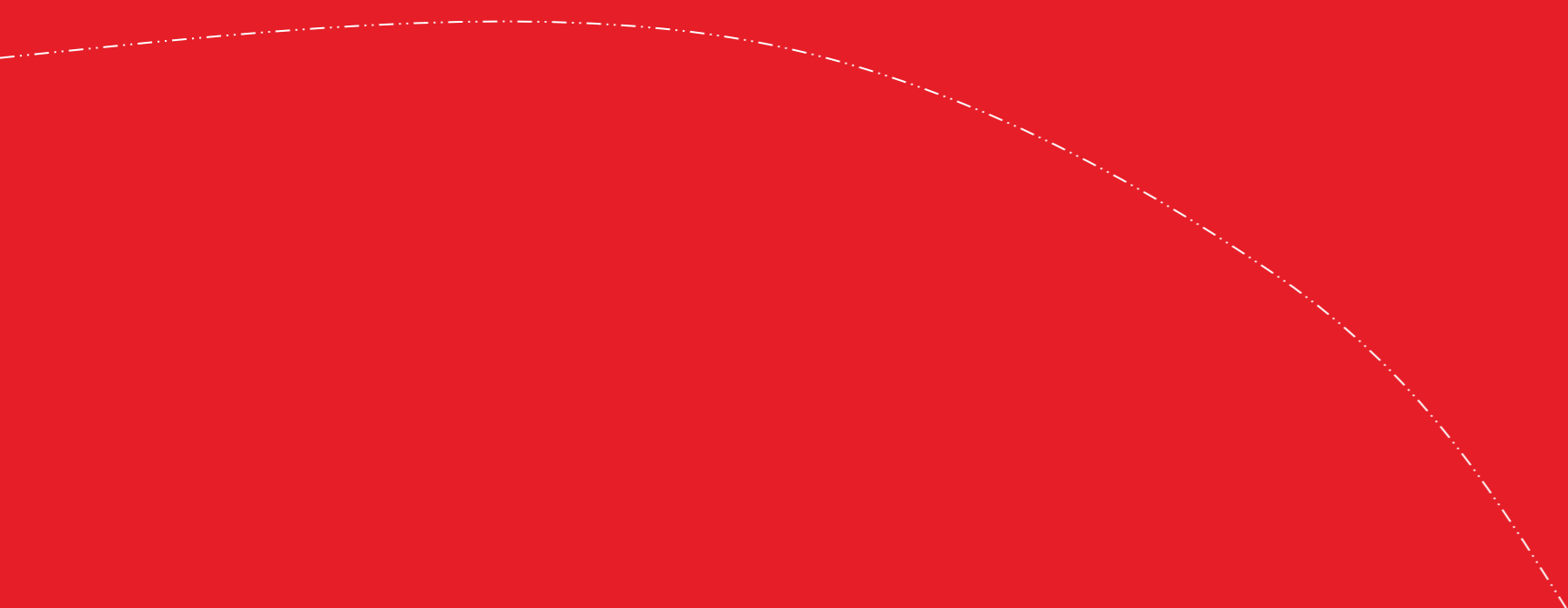
Introduction

Eight local supply chain sectors were confirmed to form the basis of this analysis.

Supply chain component definitions

Component	Security and surveillance services	End of life	Construction services	Catering, cleaning and hospitality
Description	Systematic monitoring and protection of infrastructure, property and people related to projects	Activities required to manage the final phase in the lifecycle of assets when they are no longer functional or economically viable to maintain	Wide range of planning, execution and management activities required to develop and implement projects	Provision of food, beverages and services as a supporting function of delivering projects
Inclusions	Includes security and telecommunications services, fencing and technological systems	Activities include decommissioning, disposal and recycling, and rehabilitation	Includes project management, engineering design, planning, legal, financial, environmental, cultural heritage and design and quantity surveying	Includes food and beverage services, laundry, cleaning and other ancillary services
Quantified sub-sectors	<ul style="list-style-type: none"> Security personnel 	N/A	N/A	N/A

Approach



Approach

The relative strengths of the Study Area in each of the eight sectors was assessed by comparing output per capita to that of NSW.

Baseline assessment

Each of the eight sectors were mapped to ANZSIC categories to form a baseline assessment of the comparative strength of the sector within the Study Area.

There is no specific industry within ANZSIC for renewable energy, such that renewable energy businesses are spread across a range of divisions and groups that classify businesses based on their primary activities. The eight sectors were therefore mapped to the most appropriate ANZSIC category at the group level (shown in Table 1). The ANZSIC groups were also split into Core and Supporting sectors to split sectors that directly input into the renewable energy supply chain, and those that provide ancillary services.

Detailed definitions of the ANZSIC categories are included in Appendix A.

Baseline output

Baseline outputs for each relevant ANZSIC category were estimated on an output per capita basis for both the NSW and Study Area populations. This enables the relative strength of the industry in the Study Area to be compared to the NSW region.

Baseline metrics for specific sub-sectors are also identified, which were used to provide an estimate of the existing output, which was then compared to the demand estimates for the gap analysis.

Given the availability of data, it was not possible to use a single baseline metric across all sectors. The specific metrics used for each sub-sector are included in the Supply and Demand Assessment section.

1. Assessed qualitatively

Supply chain sector	ANZSIC groups	
	Core	Supporting
Materials	<ul style="list-style-type: none"> Non Metallic Mineral Mining Cement, Lime & Ready-Mixed Concrete Manufacturing Plaster & Concrete Product Manufacturing Iron & Steel Manufacturing Structural Metal Product Manufacturing 	<ul style="list-style-type: none"> Other Non-Metallic Mineral Product Manufacturing Basic Non-Ferrous Metal Manufacturing Metal Containers & Other Sheet Metal Product Manufacturing Other Fabricated Metal Product Manufacturing
Warehousing and storage	<ul style="list-style-type: none"> Non-Residential Property Operators & Real Estate Services 	<ul style="list-style-type: none"> Other Wood Product Manufacturing Non-Residential Building Construction
Transportation	<ul style="list-style-type: none"> Road Transport Rail Transport Transport Support Services & Storage 	<ul style="list-style-type: none"> Petroleum & Coal Product Manufacturing Motor Vehicles & Parts; Other Transport Equipment Manufacturing Air & Space Transport
Plant and equipment hire	<ul style="list-style-type: none"> Wholesale Trade Rental & Hiring Services (except real estate) 	<ul style="list-style-type: none"> Electrical Equipment Manufacturing Specialised & Other Machinery & Equipment Manufacturing Automotive Repair & Maintenance
Security and surveillance services	<ul style="list-style-type: none"> Public Order & Safety 	<ul style="list-style-type: none"> Telecommunication Services Computer Systems Design & Related Services
End of life	<ul style="list-style-type: none"> Waste Collection, Treatment & Disposal Services 	n/a
Construction services	<ul style="list-style-type: none"> Construction services Heavy & Civil Engineering Construction 	n/a
Catering, cleaning and hospitality	n/a	<ul style="list-style-type: none"> Food & Beverage Services¹

Table 1: ANZSIC categories

Approach

Demand was assessed for five renewable energy technology types commencing across three stages.

The demand assessment seeks to quantify the demand facing the local supply chain to deliver the renewable energy projects planned within the Study Area.

Relevant renewable and transmission network projects are identified in Figure 4 and provide an overview of the project locations based on the coordinates provided in the *EnergyCo Data & Assumptions Book v2.1*.

A total of 58 projects, consisting of five project types, are outlined in Table 3. This includes all relevant projects across the technology types in the table. Projects are categorised by the stage project construction commences.

Table 2: NE REZ projects by project type

Project type	Stage 0 (up to 2027)	Stage 1 (2027-2031)	Stage 2 (2031-2033)	Total number of projects
Solar	14	-	6	20
Wind	4	5	9	18
Battery	7	2	2	11
Hydro	2	3	-	5
Transmission	2	1	1	4
Total	29	11	18	58

There are at least 14 projects located outside the NE REZ declared area which could significantly impact the supply chain in the region.

There are also a small number of non-renewable projects within the Study Area that are in the planning or pre-planning phase that may also impact on local supply chains. This includes the construction of major roads, such as the Singleton and Muswellbrook bypass as well as gas pipelines and quarry extensions. These non-renewable projects have not been quantified in the demand analysis, however, it is noted that these will likely add to the cumulative impacts of supply chain constraints in the region.

Only dedicated transmission line projects have been included in supply chain demand assessment. This excludes generator connections from the project sites to EnergyCo hubs.

* Hunter Central Coast REZ Transmission (indicative only)

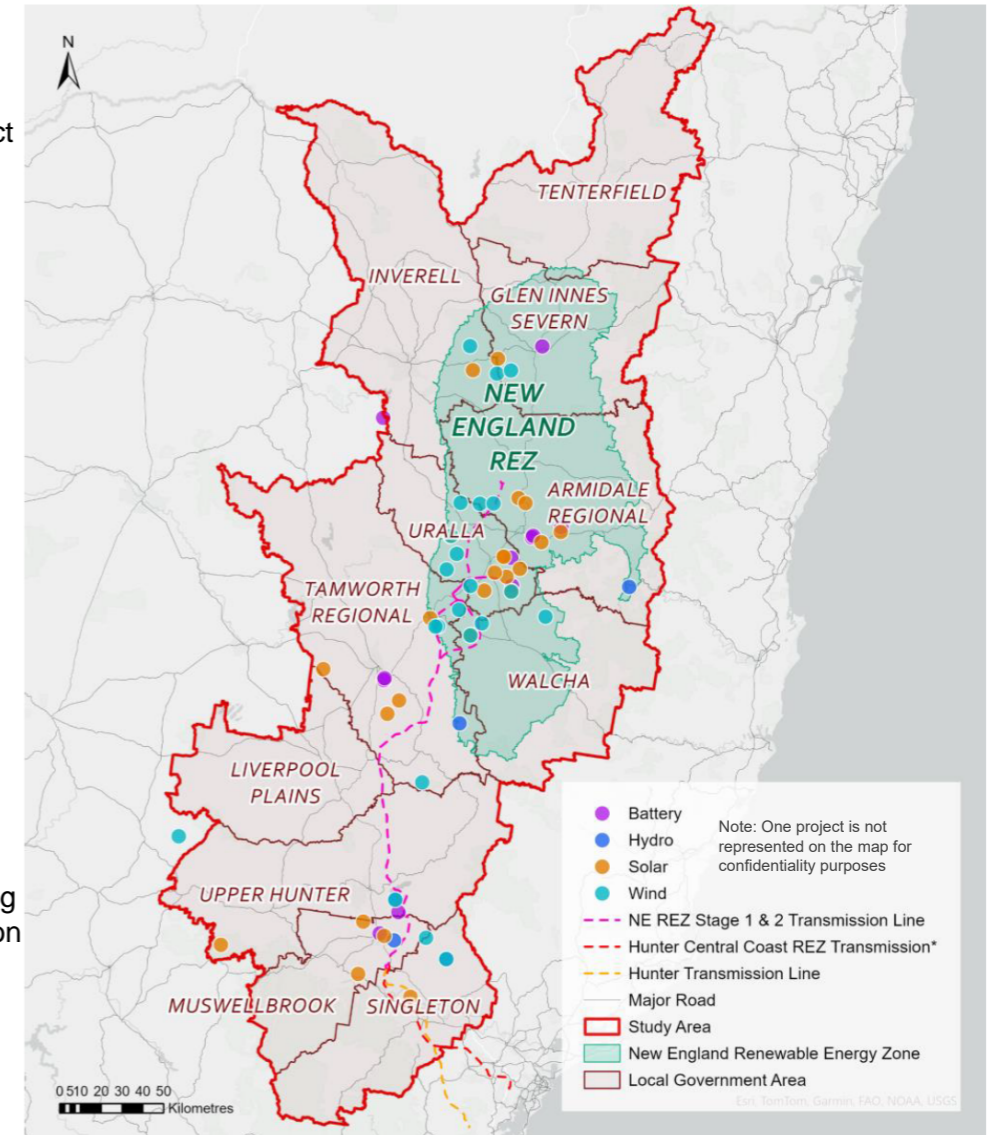


Figure 4: Renewable energy and transmission network projects

Approach

Unit metrics were applied across sub-sectors, accounting for individual project size, delivery timeline and technology type to quantify demand.

Demand metrics

To assess the demand on the local supply chain from projects in the NE REZ, a bottom-up assessment of the demand for relevant sub-sector businesses was undertaken. This assessment used individual demand metrics for different goods and services across technology types to build a profile of demand across the construction and operation stages of a project. Individual demand was then aggregated across sub-sectors and project stages to give an overarching profile of demand for each overarching sector.

The metrics were developed based on desktop research and benchmarks. These metrics were based on different measurements depending on the sector:

- Construction materials – quantity (kg or m3)
- Equipment hire – quantities of plant or equipment
- Warehousing – area (m2)
- Transportation – quantities of trucks / vehicles
- Security – FTE.

Metrics were identified for each of the sub-sectors shown in Figure 5.

A technology-specific metric for each of these categories was developed to account for different requirements for each technology type.

A quantitative demand assessment was not undertaken for End of Life; construction services; or catering, cleaning and hospitality. Detailed assessment of End of life is being undertaken as part of the separate Waste Management and Circular Economy, while analysis of construction services and catering was limited by data availability. The demand and gap analysis for each of these is assessed qualitatively in the Supply and Demand Assessment section.

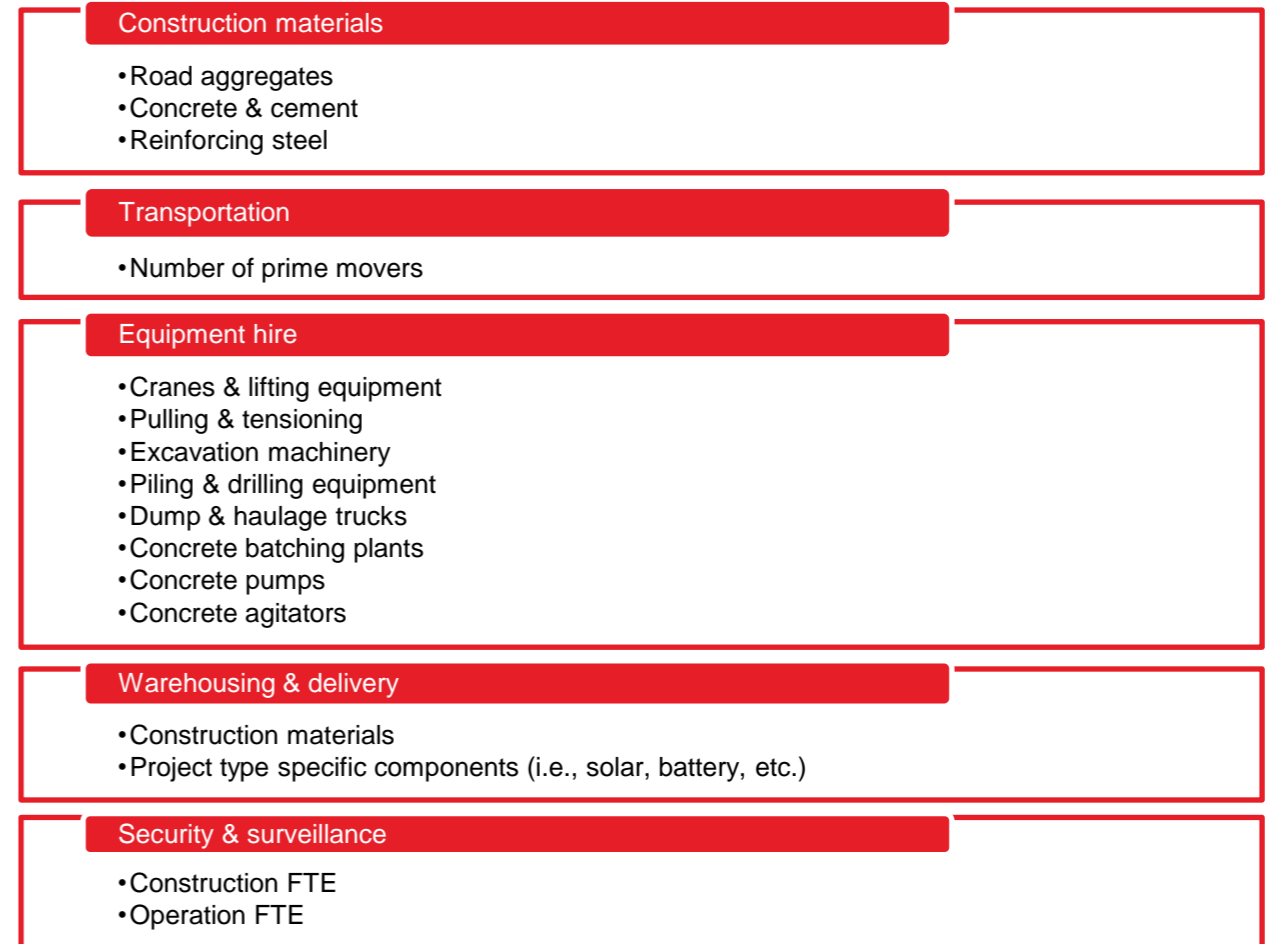


Figure 5: Subcategories

Approach

Projects were categorised by technology type, scale, indicative construction timings to quantitatively assess the demand over time.

Application of demand metrics

Demand metrics were applied to the size and construction timeframe for each project.

Project size

For materials and warehousing, metrics are applied based on the actual size of the project (i.e. name plate generation capacity, storage capacity, transmission length etc). For example, concrete demand is applied to solar projects on a volume per MW generation capacity basis.

For plant, equipment and transport, a project category-based metric has been applied based on the project type and scale. For example, all small solar projects are assumed to require two mobile cranes, while large projects will require ten. The categorisation of projects for these discrete metrics are shown in Figure 6

Timeframes

To assess the demand over time, profiles were developed based on timeframes relating to construction, indicative materials delivery, or operations and applied to each sector on the following basis:

- Materials, Warehousing and Transportation – metrics were applied for each project based on materials delivery timeframes
- Equipment hire - metrics were applied for each project at a constant rate across specific construction timeframes
- Security and surveillance – metrics applied to each project with different rates for construction and operations. For operations demand, the metric was applied for each project from the beginning of operations (6 months after construction completion) onwards.

For the five identified pumped hydro projects, metrics were developed on a project specific basis due to project complexity.

Detailed assumptions and the methodology applied for each supply chain sector and sub-sector are included in **Appendix A**.

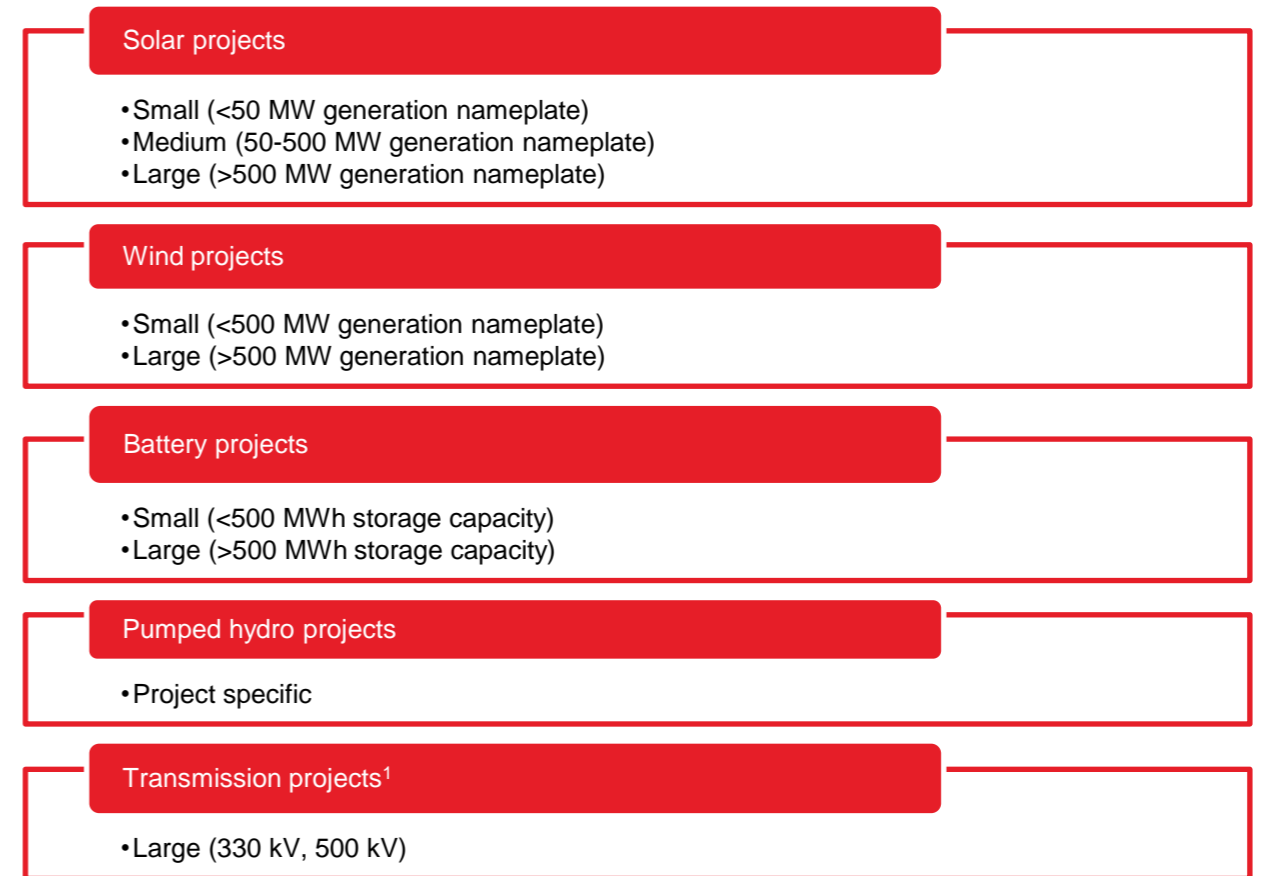


Figure 6: Project categorisation

1. Only dedicated transmission line projects have been included in supply chain demand assessment. This excludes generator connections from the project sites to EnergyCo hubs

Approach

Estimated demand was compared to the baseline output to identify an indicative size of the gap and growth required to meet demand from the NE REZ.

Gap analysis

To assess the gap between baseline supply chain capacity and the requirements to deliver the NE REZ projects, comparisons have been drawn between the estimated baseline output and demand assessment.

A quantitative assessment of the gap was undertaken for five of the eight sectors, with a qualitative assessment undertaken for the remaining three.

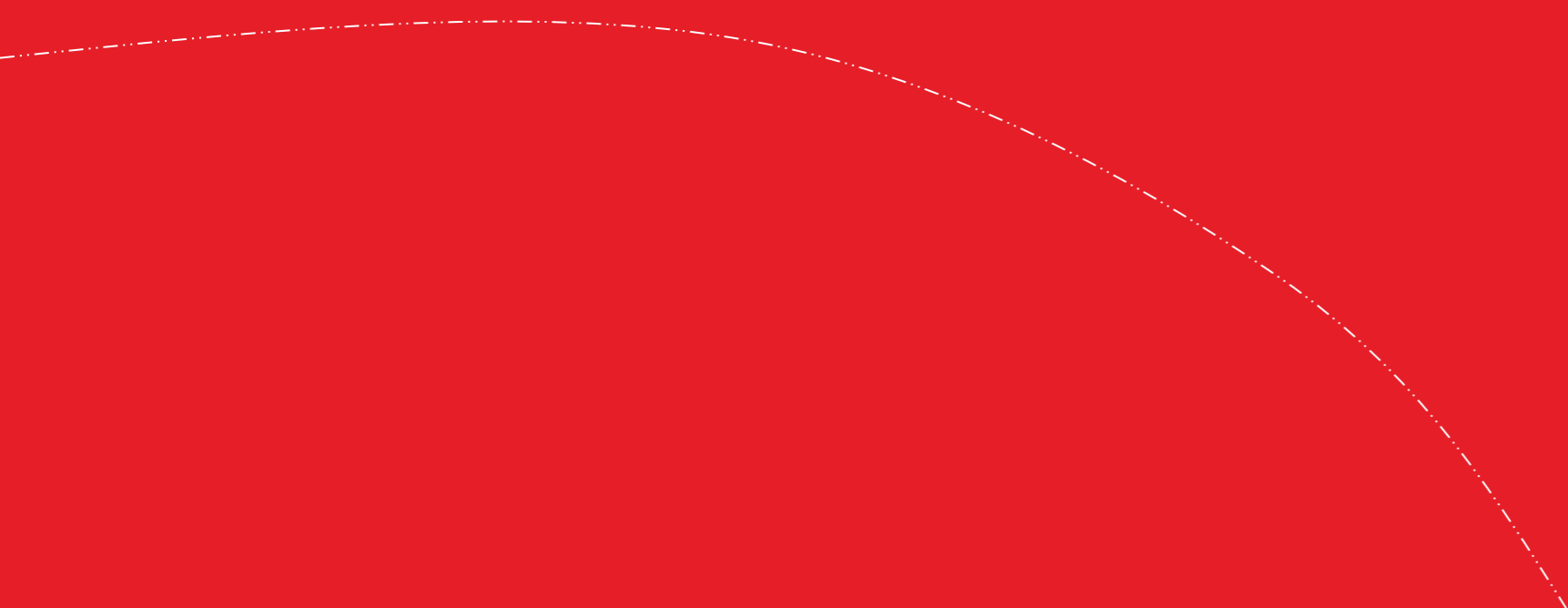
The general approach to the gap analysis for each of the eight sectors is shown in Figure 7.

The findings of the analysis show an indicative gap between the existing baseline output and demand generated by the NE REZ. This provide context for the remaining sections of the study that consider the barriers, opportunities and strategies to support the local supply chain and businesses in the Study Area to benefit from the development of the REZ.

Material and Security and surveillance services	Warehousing, Transportation and Plant and Equipment	End of life, Construction services and Catering, cleaning and hospitality
<p>Estimated demand figures in the demand assessment were converted to monetary terms using unit prices for materials from publicly available sources.</p> <p>Monetary values were then compared to the economic baseline at the sector level for materials and security and surveillance.</p>	<p>Baseline output was estimated using reported data sets for the following:</p> <ul style="list-style-type: none"> • Warehousing – developed and undeveloped industrial land • Transportation – Registered prime movers • Plant and equipment - Tower cranes, mobile cranes, dump & haulage equipment, excavators, concrete agitators, concrete batching plants <p>Baseline outputs were then compared to the demand assessment which was developed using comparable units.</p>	<p>A qualitative assessment was used to compare the baseline capacity and demand where comparable demand metrics were not available. This was completed using industry reports and contextual information for the End of life, Construction services and Catering and hospitality sectors.</p> <p>A qualitative approach was also used to supplement the gap analysis for the remaining Plant and equipment sub-sectors that were not able to be quantified.</p>

Figure 7: Approach to gap analysis by sector

The Study Area



The Study Area

The Study Area includes eleven Local Government Areas that surround the NE REZ declared area and the NE REZ network infrastructure project

NE REZ and Study Area

The NE REZ has an intended network capacity of 8 gigawatts and is expected to deliver \$24 billion in private sector investment. The scale of investment is expected to support around 6,000 construction jobs and 2,000 operational jobs¹. The key components of the NE REZ assessed as part of this study are:

- NE REZ Network Infrastructure Project (transmission lines and energy hubs)
- NE REZ generator and energy storage projects

The NE REZ is planned to be constructed in two stages: Stage 1 (2027-2031), Stage 2 (2031-2033). The network infrastructure project to be delivered in Stages 1 and 2 is presented in Table 3.

Table 3: Planned Infrastructure

	Infrastructure	
	Energy Hubs	Transmission Lines
Stage 1	<ul style="list-style-type: none"> • Central Hub: 500/300 kV substation • Central-South and North Hubs: 330kV switchyard • East Hub: 330 kV switchyard 	<ul style="list-style-type: none"> • 340km of transmission lines connecting the Bayswater substation Central Hub, Central-South, North Hub and East Hub
Stage 2	<ul style="list-style-type: none"> • Expand the Central-South Hub to 500 kV • Expand the North Hub to 500 kV 	<ul style="list-style-type: none"> • 220km of transmission line upgrades Bayswater substation, Central-South Hub, Centra Hub and North Hub

For the purposes of this study the ‘local’ supply chain has been defined as all Local Government Areas listed in the *EnergyCo Data & Assumptions Book v2.1*. This includes Armidale, Glen Innes Seve, Inverell, Liverpool Plains, Singleton, Muswellbrook, Tenterfield, Tamworth, Upper Hunter, Uralla and Walcha.

This covers LGAs that are within the NE REZ declared area and expected to host renewable energy projects, and LGAs through which the new transmission line will run.

This analysis has focused on the supply chain goods, services and raw materials that may be delivered within these LGAs, taking account of surrounding LGAs where relevant.

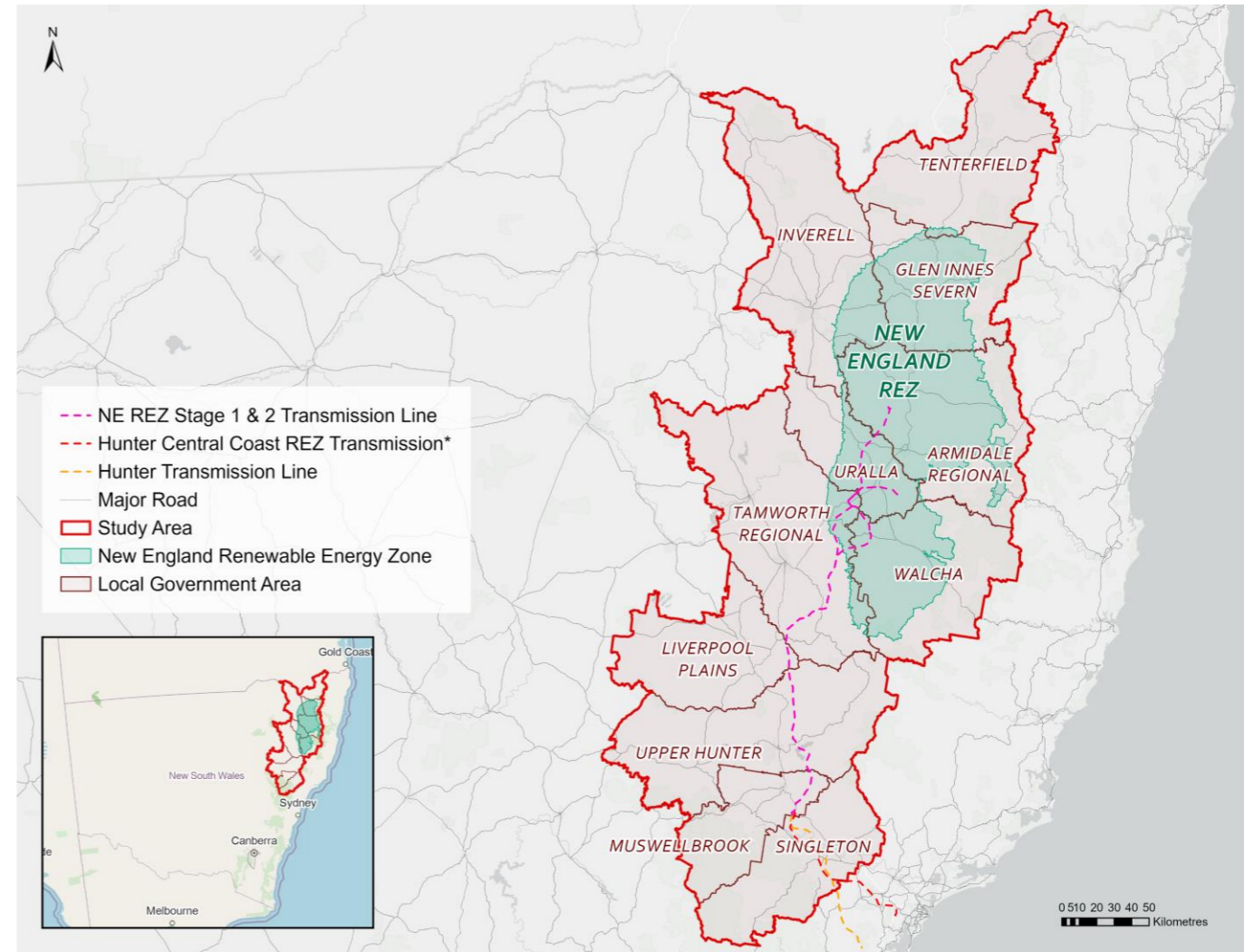


Figure 8: Local supply chain Study Area

1. <https://www.energyco.nsw.gov.au/ne-rez>

The Study Area

The Study Area is a significant contributor to the NSW economy.

Regional context

The Study Area is comprised of 11 different LGAs, each with their own unique characteristics. Collectively, they represent 2.4% of the NSW population and account for around 97,000 jobs.

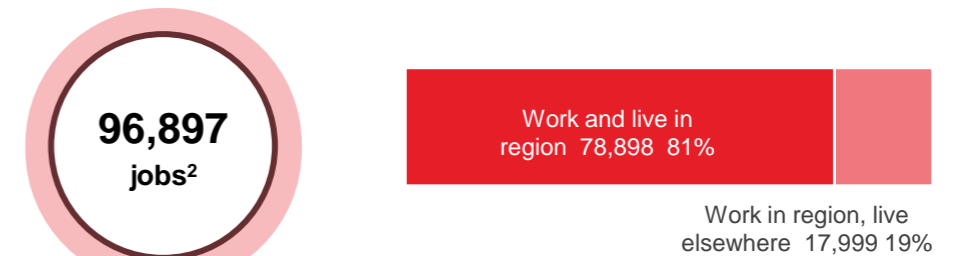
The region produces around \$34 billion of Gross Regional Product (GRP), which accounts for over 4% of NSW's Gross State Product (GSP). The region has a higher GRP per capita than the NSW average (\$173k versus \$98k) and is a highly productive area of the state.

At present, the sector with the largest contribution to economic output is mining (43%), which is concentrated primarily in the southern Study Area. This is followed by manufacturing (9%) and agriculture (8%). Construction represents 7% of total economic output and will be a key sector required to support the development of the NE REZ.

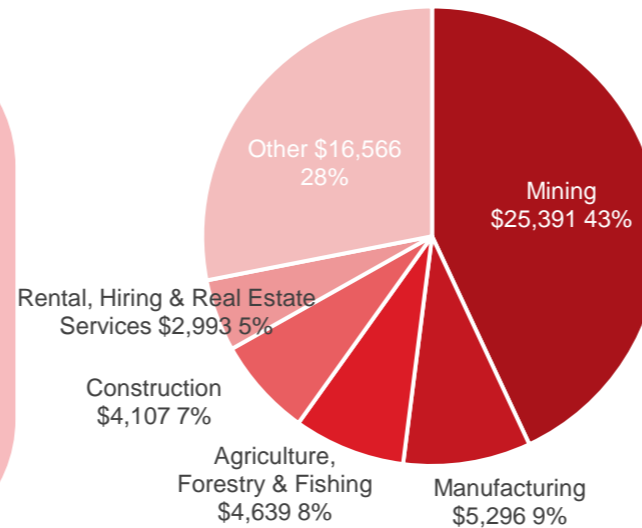
Population



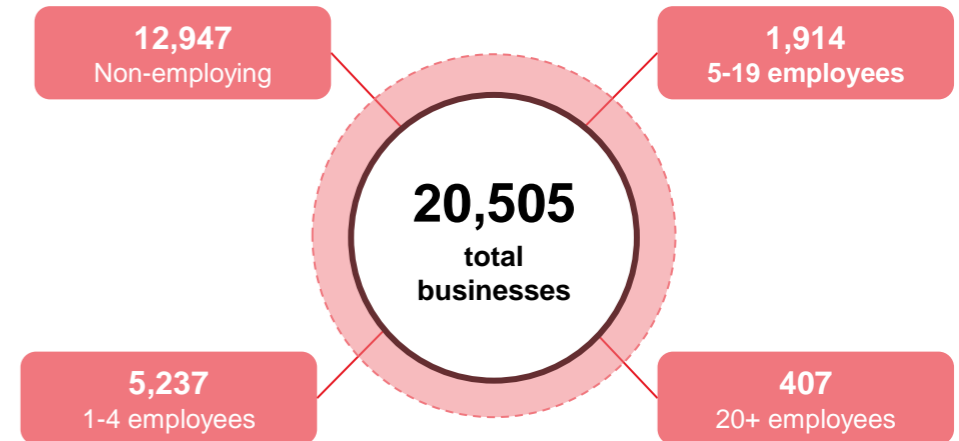
Employment



Economy



Key industries by economic output (\$m)¹



Businesses by headcount³

1. Source: REMPLAN 2023 R2
 2. Source: ABS 2023
 3. Source: ABS Data By Region 2023

The Study Area

There is existing capacity within the Study Area in each of the eight sectors assessed.

The existing economic output by industry type in the Study Area supply chain comprises:

- \$6.0 billion from **core** industries
- \$2.8 billion from **supporting** industries

At an aggregated level, **construction services, plant and equipment hire** and **Transportation** are currently the greatest contributors to the economy within the Study Area.

Productivity (measured as value-added per worker) varies between industries and supply chain components/sectors. Materials is the most productive sector (at \$282k), followed by warehousing and storage (\$272k).

There are opportunities across each sector for contribution and integration into the NE REZ local supply chain.

Output (\$m) by supply chain component and service for the Study Area, including subcomponents is provided in Figure 9 (source: ABS 2021)

The following pages explore the relevance and opportunity in each sector.

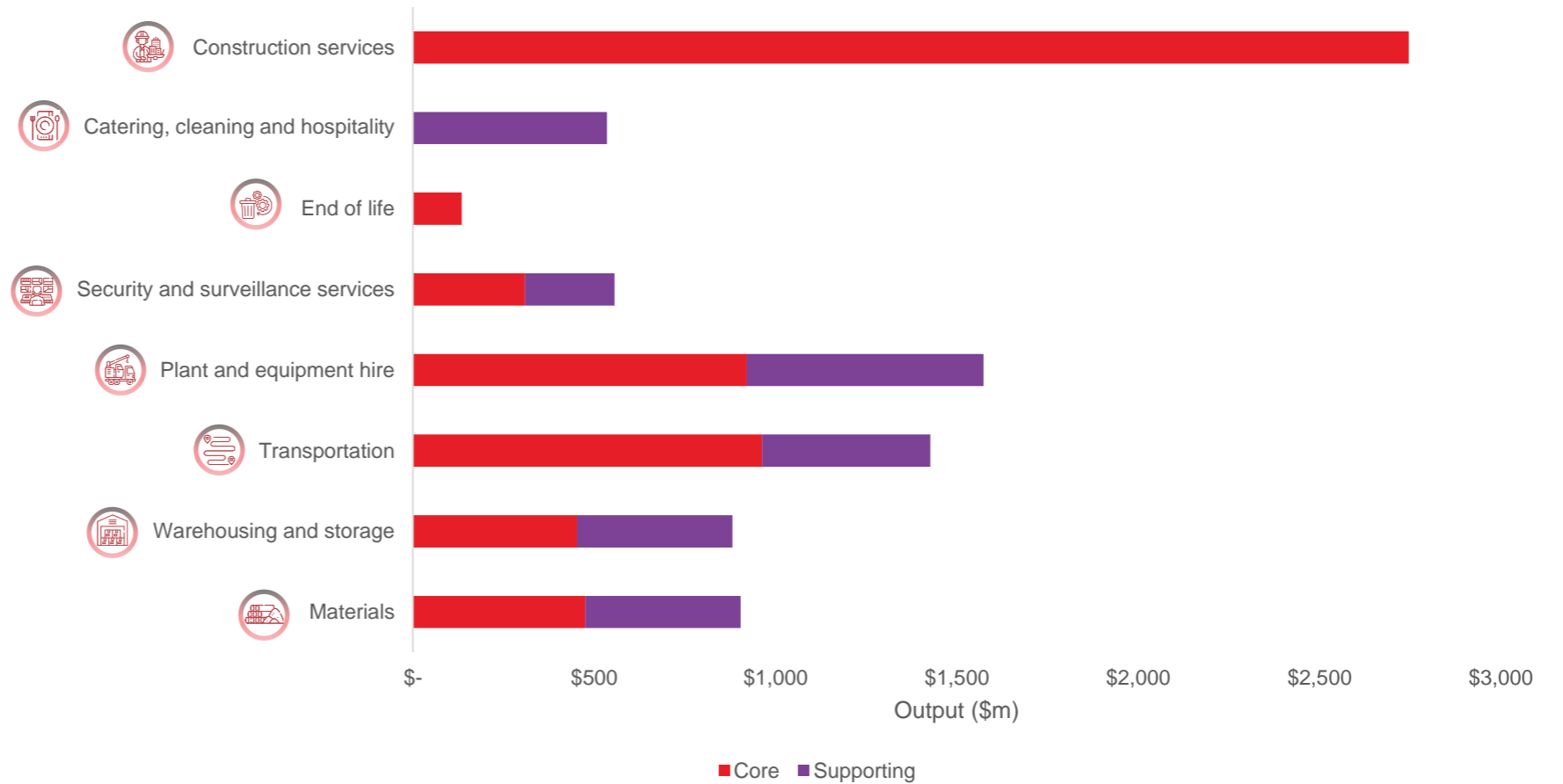


Figure 9: Output (\$m) by supply chain component and service in the Study Area, including subcomponents (source: ABS)

The Study Area

In absence of the NE REZ projects, there is not expected to be significant growth across the relevant supply chain sectors.

The baseline analysis predominantly focuses on the current capacity of the relevant businesses within the Study Area based on ABS census, national output, gross state product, and tourism data.

This capacity is expected to change over time in line with business-as-usual activities within the region, as shown in Figure 10. The baseline projections show the anticipated growth in these industries since of the NE REZ projects. It provides a baseline from which to compare additional demand generated by the RE projects across the EnergyCo project stages.

Growth rates across the relevant industries were estimated primarily using projected industry growth rates for Australia. Projected population growth rates were then factored in the Study Area to account for differences in the growth rates of industries across Australia.

The key takeaways from the baseline for core industries include:

- No industry demonstrates significant predicted growth over the forecast period
- Security and surveillance services have the highest average growth rate at 1.3 per cent per year
- Plant and equipment hire is the second largest industry by value but has one of the lowest growth rates at 0.2 per cent per year
- In absence of the RE projects, warehousing and storage output is expected to moderately decrease over the forecast period.

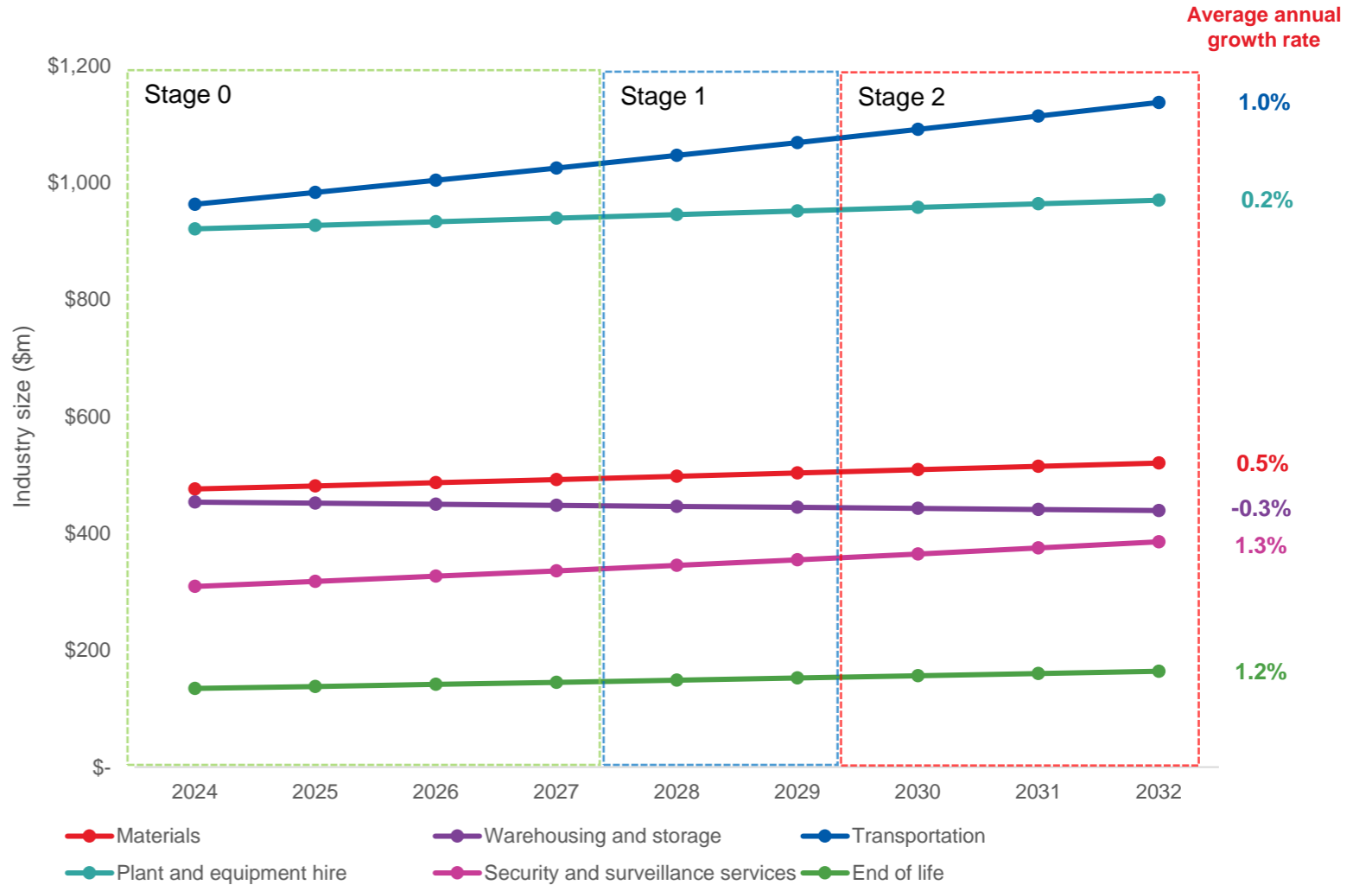


Figure 10: Industry size projections by supply chain component and service between 2024 and 2032 (source: Arup analysis)

The Study Area

Materials and plant and equipment hire will need to scale significantly to meet the anticipated demand from NE REZ projects.

Overview

It is evident that all industries will need to grow significantly to respond to the supply chain demand relating to the NE REZ. Particularly as there are already many other businesses and projects utilising the current industry capacity within the region.

Industries where demand outweighs current capacity most significantly are Materials and Plant and Equipment. Rapid expansion in the number of mobile cranes, excavators and concrete agitators is required to meet demand across all stages. There is already reasonable supply of tower cranes and dump & haulage equipment.

The magnitude of growth required in Warehousing and Transportation is less significant and there are contributing factors to increase output in these industries (abundance of industrial land and a drop in demand for transportation in the mining sector).

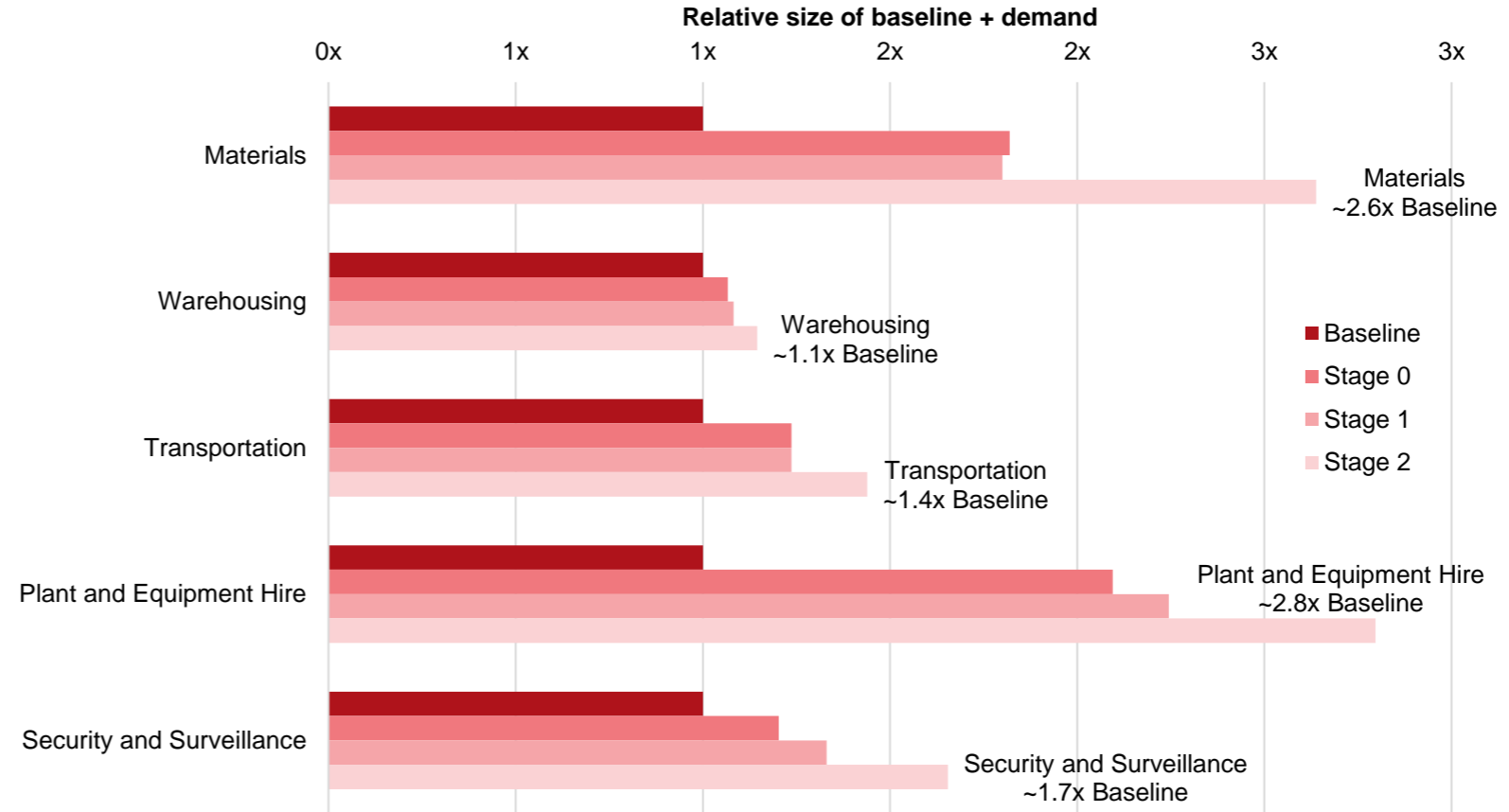
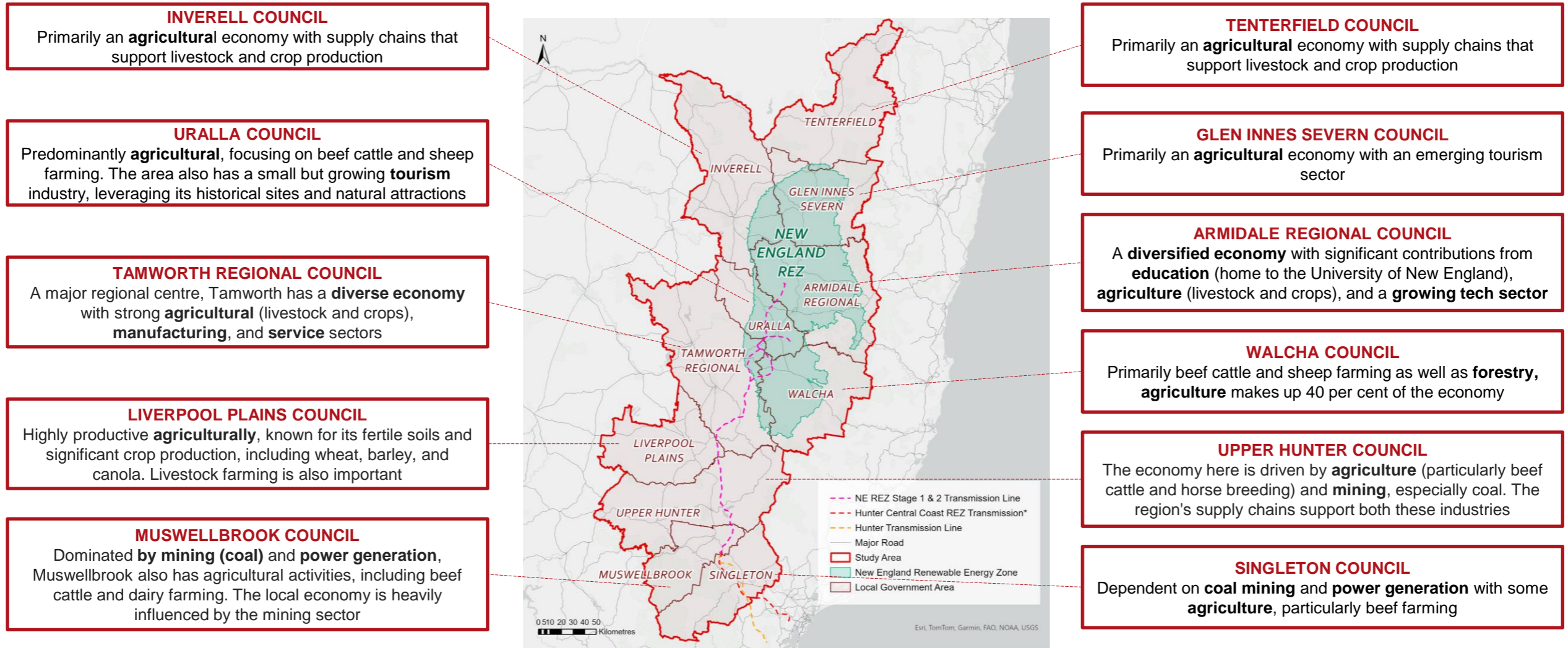


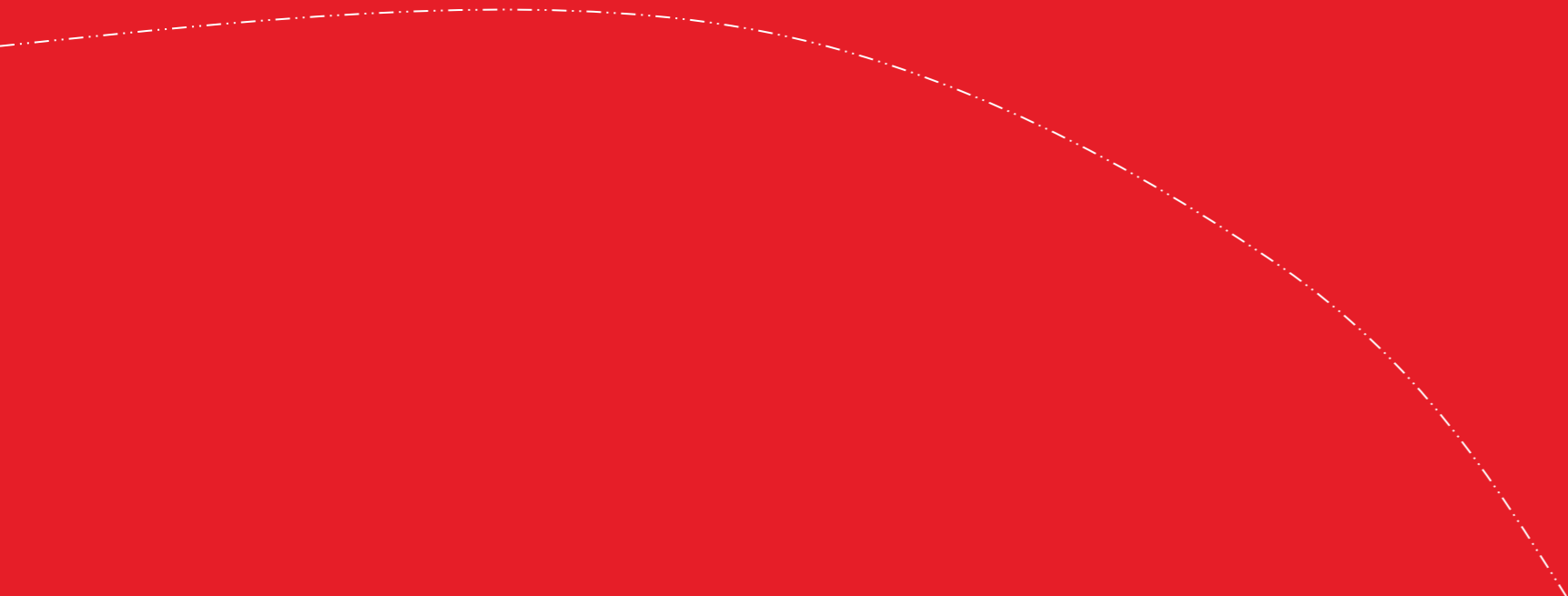
Figure 11: Proportional growth for assessed subcategories

The Study Area

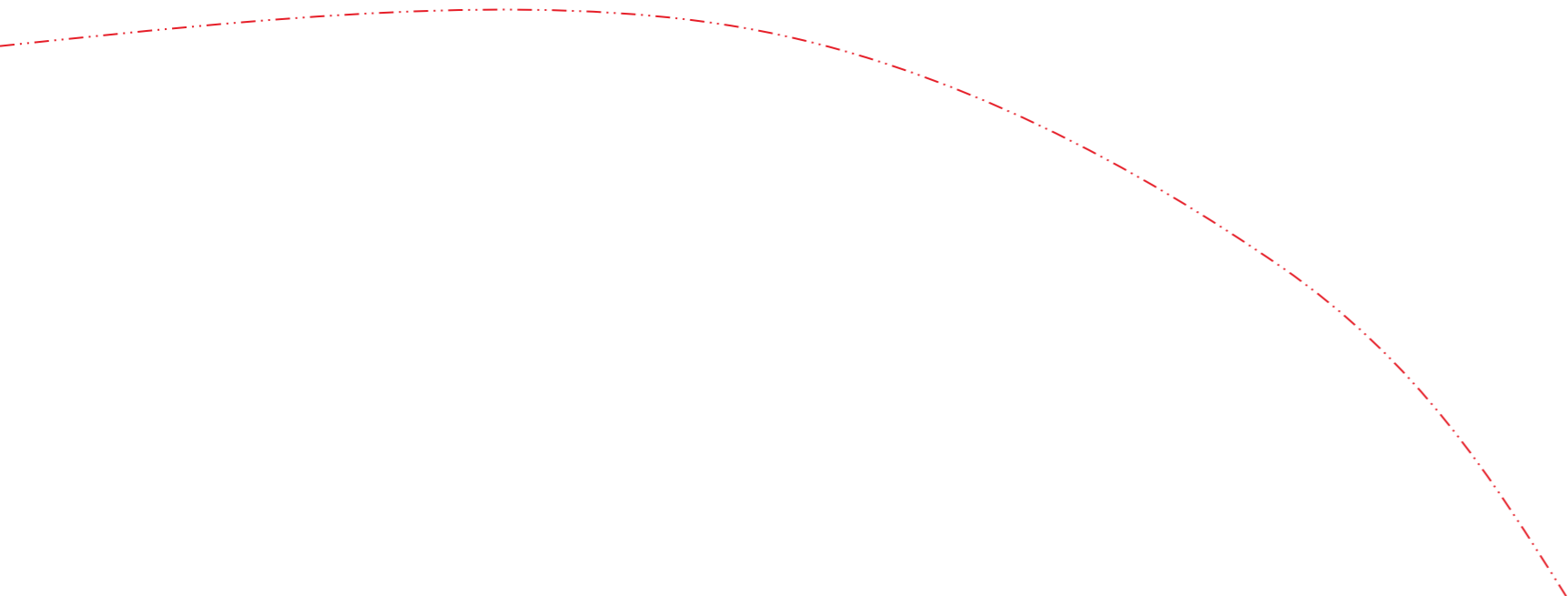
The impacts and opportunities across the Study Area will not be uniform. LGAs in the south will be transitioning from a predominantly mining driven economy, while some in the north will build on more agricultural IRFXHC economies.



Supply and demand assessment



Materials



Materials

There is a strong base of quarrying, iron and steel manufacturing which presents an opportunity to capture economic benefits in the region.



Baseline assessment

Various materials are key to delivering renewable energy projects. These are key construction inputs required to prepare, fabricate and maintain projects and supporting infrastructure.

Within this supply chain component, the mining of non-metallic minerals (such as gravel, sand, aggregates and road fill) and manufacture of cement and concrete as well as iron and steel are considered core.

Supporting these are various other types of manufacturing.

The Study Area has a higher output per capita in many materials subcomponents compared with the rest of NSW. Of the core subcomponents, the strongest comparative advantages are in **non-metallic mineral mining** and **iron & steel manufacturing**. This indicates potential capability to deliver these services locally, noting that these industries are primarily concentrated in the southern regions of the Study Area.

Conversely, the Study Area is underrepresented in **cement, lime and ready-mixed concrete manufacturing** and **plaster & concrete product manufacturing** compared to the rest of NSW.

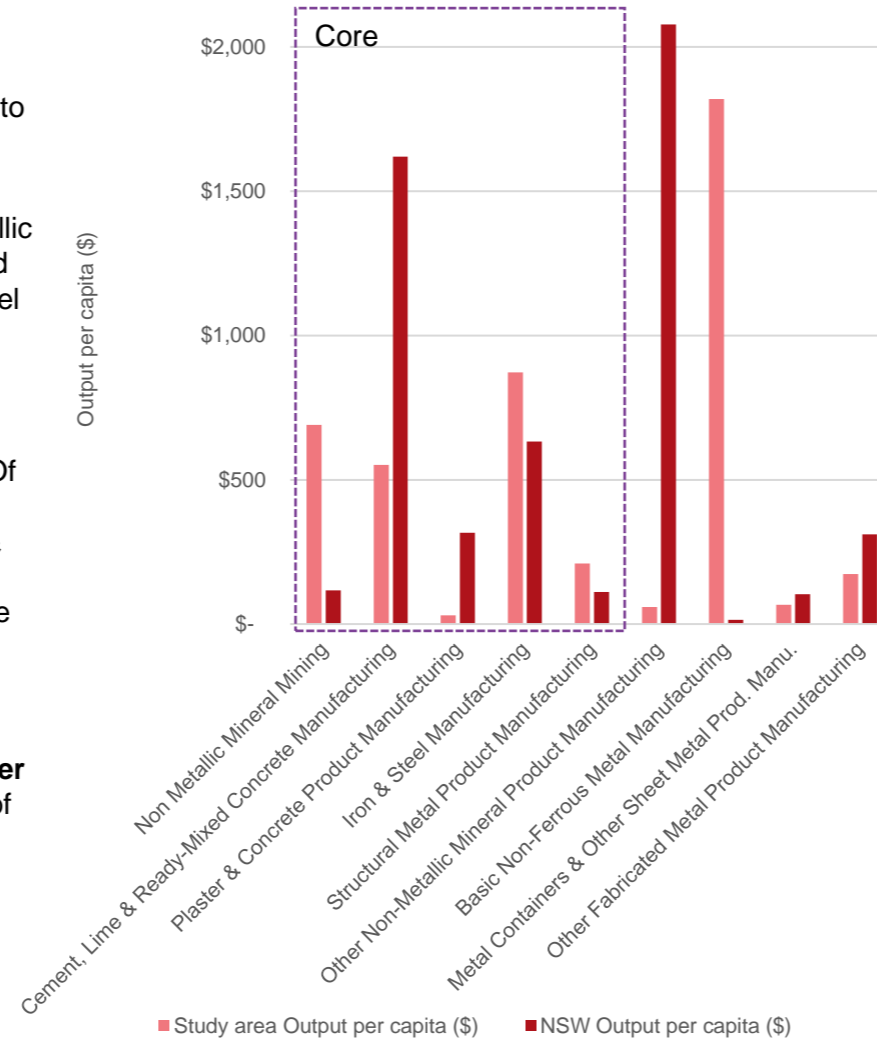


Figure 12: Output by materials subcomponent

Baseline metrics

Core ANZSIC groups used to assess baseline capacity of the materials supply chain:

ANZSIC Group	Economic output (\$m, 2023)
Non Metallic Mineral Mining	\$139
Cement, Lime & Ready-Mixed Concrete Manufacturing	\$111
Plaster & Concrete Product Manufacturing	\$6
Iron & Steel Manufacturing	\$176
Structural Metal Product Manufacturing	\$42
Total	\$476

The total economic output of these groups was used as an estimate of the baseline economic output of the materials sector in the Study Area. The unit prices for each construction material were used to convert volume/weight-based demands to economic figures, and then compared against this baseline.

Materials

Demand for cement and concrete is driven by the need for structural foundations across all project types.



Demand assessment – cement and concrete

Domestically sourced materials comprise three key elements:

- Cement and concrete
- Steel
- Road aggregates

Materials - cement and concrete

Cement and concrete can be separated into three main subcomponents:

- Concrete aggregates (geological materials such as gravel, sand and crushed rock)
- Raw cement (blend of silica, alumina and iron oxide rich materials)
- Cementitious materials (supplementary to cement)

Each of these subcomponents are required for the delivery of various project types. These materials are expected to arrive early at the project site to build the structural foundations.

Demand analysis

The demand for cement and concrete aligns with peaks in project delivery across the REZ stages. This reflects their complementary nature in delivering projects. By volume, concrete aggregates are in highest demand and cementitious materials are the lowest, reflecting its role as a supplement to concrete aggregates and raw cement in project delivery.

There is an initial relative peak in demand for cement and concrete between mid-2025 and mid-2027, during the delivery phase of the Stage 0 REZ projects. The largest demand peak for cement and concrete occurs between mid-2028 and late-2030. This aligns with the peak delivery period of the renewable energy projects, with the start of the construction for the transmission network plus wind projects in Stage 1, and mostly wind projects in Stage 2 as they require significant volumes of construction materials per MW.

Table 5: Concrete constituents demand across construction stages

Material	Unit	Stage 0	Stage 1	Stage 2
Cementitious Materials	Average (m3/day)	102	173	169
	Peak (m3/day)	221	247	390
Raw Cement	Average (m3/day)	179	303	296
	Peak (m3/day)	387	432	683
Concrete Aggregates	Average (m3/day)	230	389	381
	Peak (m3/day)	497	556	878
	Peak project count	13	14	18

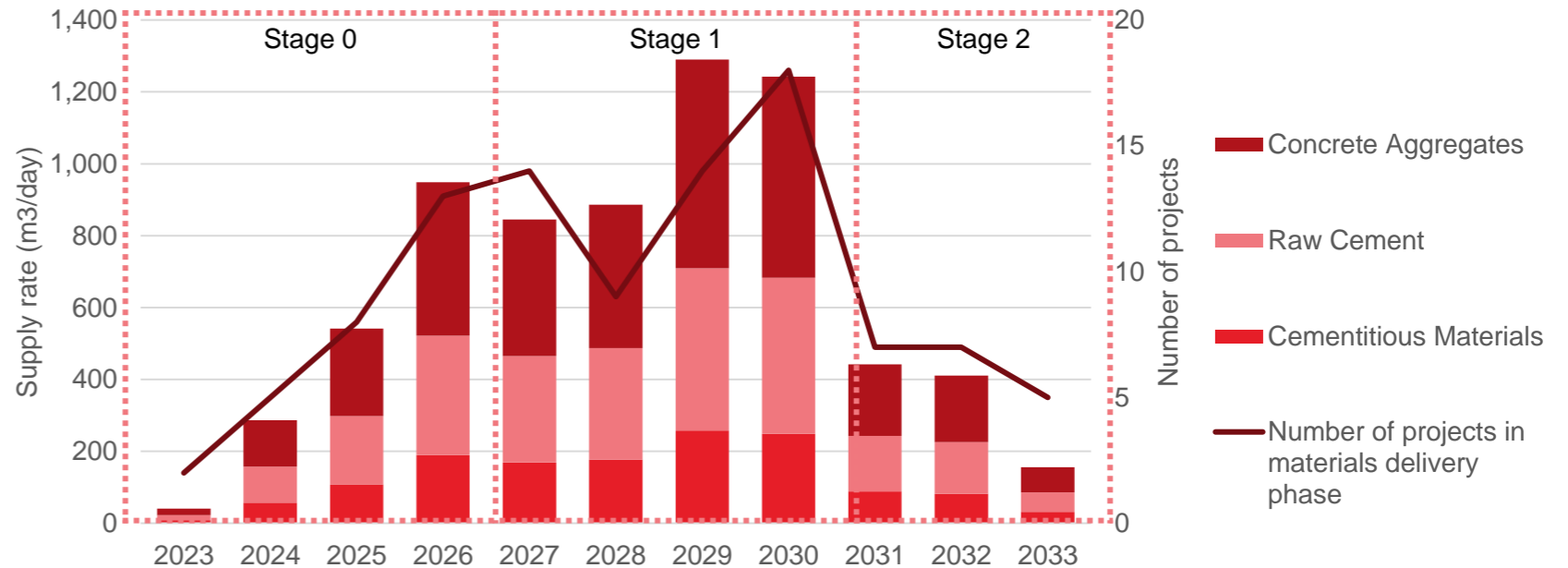


Figure 16: Concrete materials demand assessment

Materials

The demand for structural steel is driven largely by demand for wind turbine components.



Demand assessment - Steel

Steel can be separated into **structural** and **reinforcement**.

The structural steel refers to the steel materials that are required to manufacture the product components in wind turbines such as tower, hub, nacelle, and blade, solar PV racking system, and transmission towers. It is expected that most of these components will be imported to the NE REZ.

Steel reinforcement or rebars are mainly used to strengthen the concrete foundation.

Demand analysis

Volatility in demand for steel is driven by the demand profile for structural steel. This demand is variable across the stages as it reflects the project delivery cycle of planned projects. Demand for structural steel peaks between mid-2029 and late-2030 but generally remains high between late-2025 and late 2032.

Structural steel demand is heavily influenced by the number of wind projects in development, where bulk deliveries of steel products are expected. Although significant demand is expected relating to wind turbine components it is expected most of these would be procured as finished products from outside the Study Area.

The same scenario is observed for steel reinforcements, where the demand is high during the development of wind projects for tower foundation construction.

Table 6 Indicative steel demand across construction stages

Material	Unit	Stage 0	Stage 1	Stage 2
Steel (reinforcing)	Average (tonne/day)	54	110	132
	Peak (tonne/day)	132	152	272
	Peak project count	13	14	18

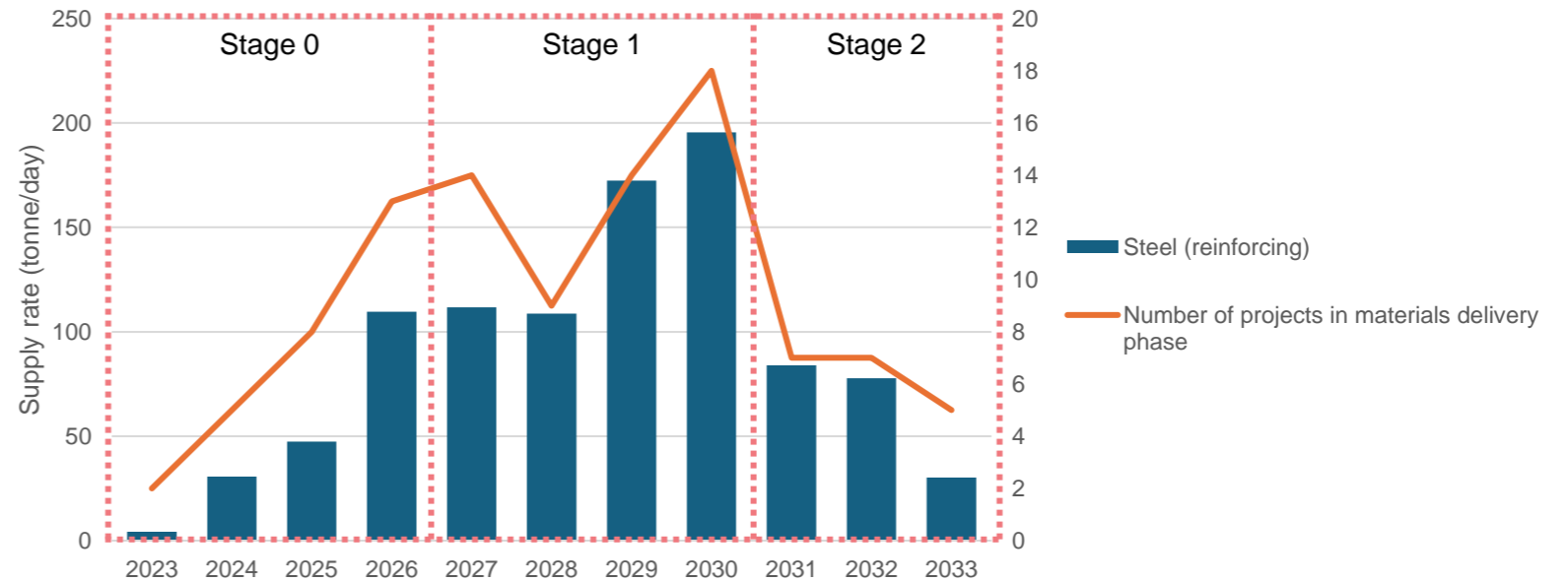


Figure 13: Steel demand assessment

Materials

Demand for road aggregates is driven by the need for access roads to be constructed for projects to establish site access.



Demand assessment – road aggregates

Site access roads across renewable energy projects are typically made from aggregates comprising a variety of materials such as gravel, sand, and crushed stone.

Demand analysis

Road aggregates are required to establish road access at the commencement of a project and will continue to be supplied until major construction works are finished.

There is an initially consistent demand for road aggregates (between mid-2024 to mid-2027), required to deliver enabling transport infrastructure to the project sites. Demand for road aggregates then increases considerably, for a shorter period, between late-2029 to late-2030 to construct enabling infrastructure for projects in Stage 2.

Given the need for repair and maintenance of access roads, there will be a consistent base level of demand required for road aggregates throughout the operation of NE REZ projects.

Table 7: Indicative road aggregates demand across construction stages

Material	Unit	Stage 0	Stage 1	Stage 2
Road aggregates	Average (m3/day)	1,214	746	1,319
	Peak (m3/day)	2,265	1,189	3,844
	Peak project count	13	14	18

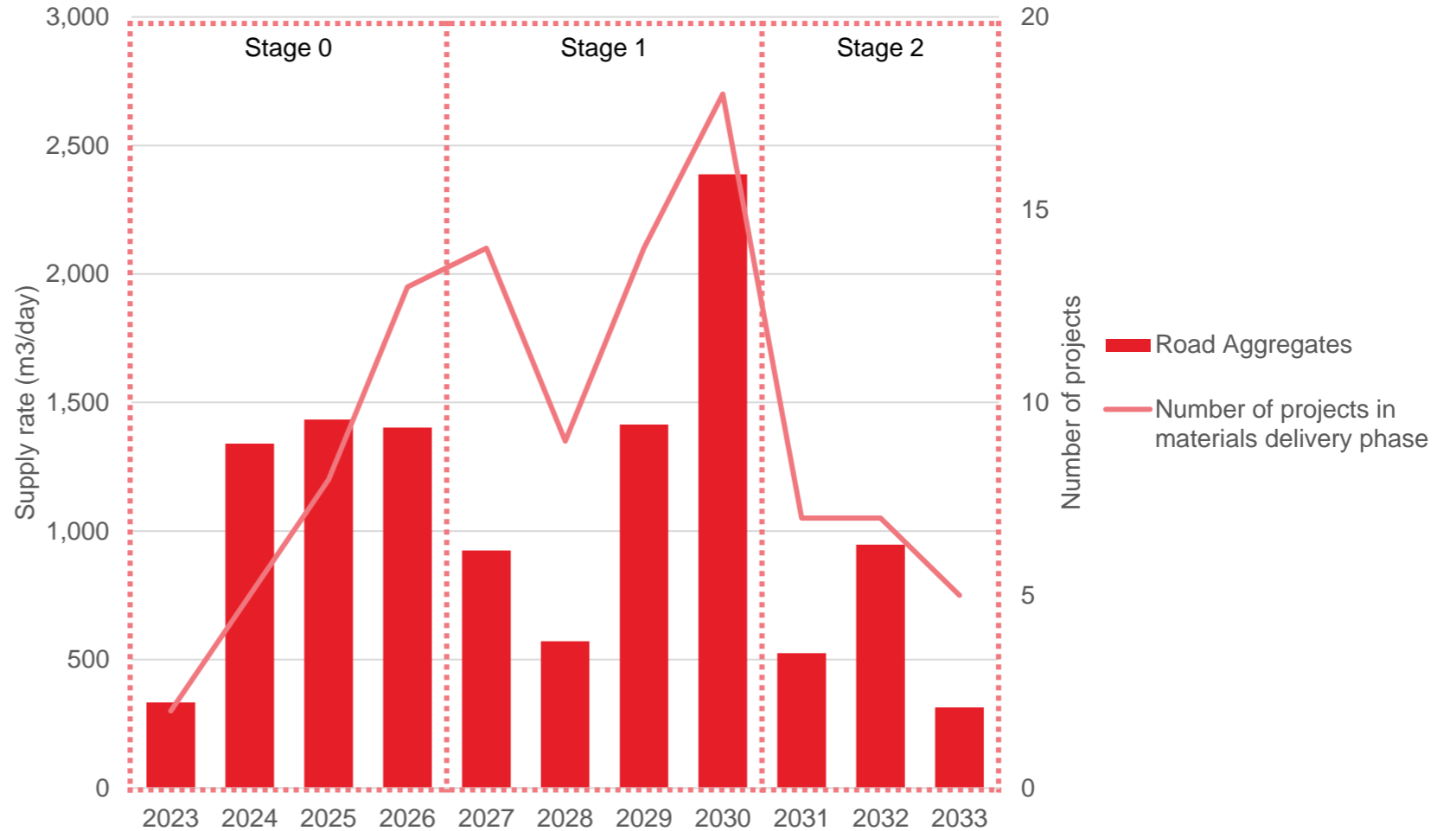


Figure 16: Indicative road aggregates demand assessment

Materials

Material output will need to more than double to meet peak demand.

Gap analysis

Unit prices for each of the main locally sourced construction materials have been used to estimate the gap between current production volumes and prospective future demand. This method has been adopted in the absence of sufficient data regarding the size and number of facilities manufacturing construction materials within the Study Area.

In absence of region-specific data unit rates were sourced from government data and supplier information. These rates could be updated as the development of the REZ progresses and more data becomes available.

The following unit prices have been used for this analysis:¹

- Road aggregates: \$93 / m³
- Cementitious materials: \$300 / m³
- Cement: \$300 / m³
- Concrete aggregates: \$300 / m³
- Reinforced steel: \$700 / tonne

The peak materials demand in each delivery stage has been converted based on the indicative unit price of each construction material aggregated into three categories: Aggregates, Concrete and Cement and Steel.

The aggregated monetary value for each category has been compared to the baseline output in terms of monetary value of the core services within the materials industry.

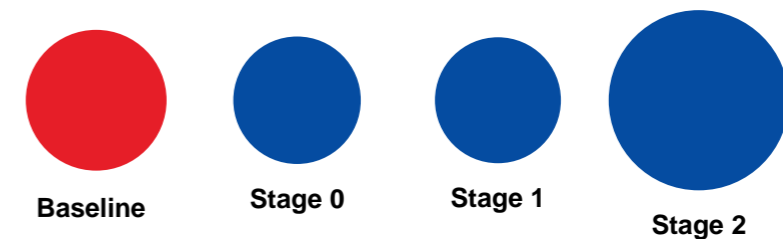
Table 8: Baseline and demand peaks for construction materials

Scenario	Stage	Aggregates (\$m)	Concrete and cement (\$m)	Steel (\$m)	Total (\$m)
Baseline	New England LGAs	139.5	117.5	218.7	475.7
Additional Demand	Stage 0 peak	131.5	66.5	192.0	390.0
	Stage 1 peak	101.3	74.4	205.1	380.8
	Stage 2 peak	214.4	110.2	454.7	779.3

The relative scale of this is of the same order of magnitude as the size of the current baseline output, suggesting that the demand generated by the NE REZ projects would require the materials sector to grow by around 2 to 3 times its current size.

The growth in industry varies by material type with road aggregates and steel requiring a greater magnitude of growth than cement production. Noting that structural steel makes up over 80% of the steel demands and this is not expected to be produced locally.

Figure 14: Materials demand – relative growth



1. Unit prices taken from landscaping services providers, construction material suppliers and commodity spot prices.

Warehousing and storage



Warehousing and storage

Non-residential property services is a comparatively strong sector in the Study Area, however, there is more limited capacity to build non-residential buildings.

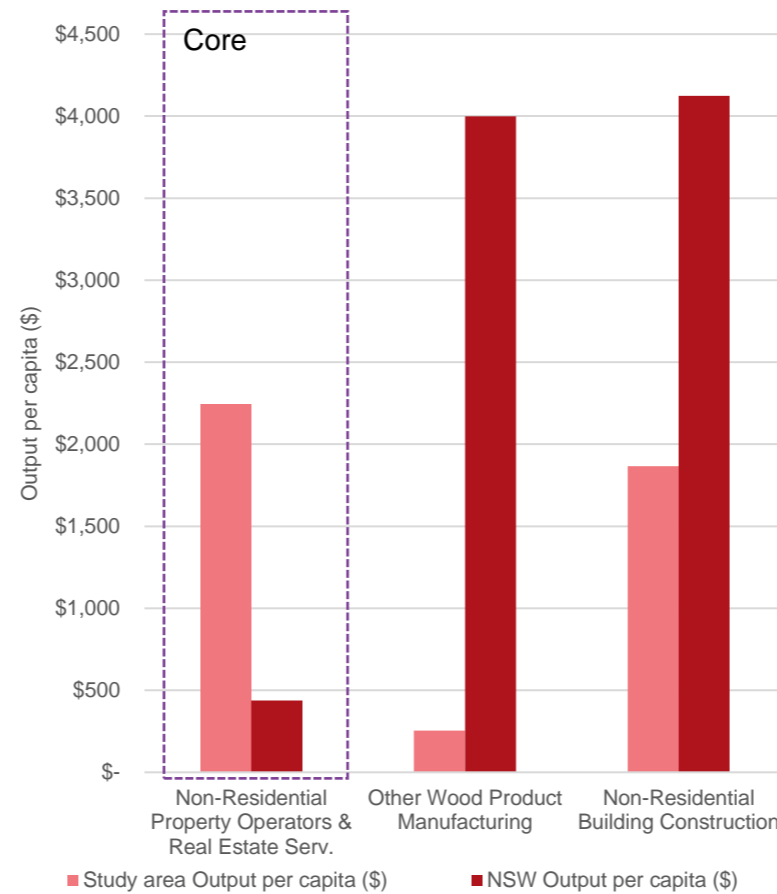


Baseline assessment

Warehousing and storage may be required for various components of the NE REZ local supply chain. Acknowledging the complexity and number of components which will need to be procured, gathered, staged, assembled and quality assured for the various projects. Furthermore, the long lead-times for many project components will mean a just-in-time approach will likely not be possible, and spare componentry will be required to be on-hand.

Due to the nature and location of the renewable energy projects (i.e. large components being transferred to largely remote locations using specialised transport equipment), it has been assumed that most renewable energy project components will be temporarily stored directly at the project site to reduce projects costs. Feedback from GDPs suggested that if major staging areas are required they would likely be located adjacent to a port of entry rather than in the region.

Of the core subcategories, the output per capita of **non-residential property operators & real estate services** in the Study Area exceeds that of NSW. This may indicate that the region has an established industry in delivering services to industrial users. However, output in relation to non-residential building construction is lower than the NSW output per capita suggesting the ability to construct warehousing or storage may be more constrained.



Baseline metrics

The volume of total and undeveloped industrial land informs the baseline. The process for determining this involved:

- Estimating the proportion of employment land utilised for industrial purposes (79%) in the Study Area
- Estimating the availability of undeveloped land available for industrial uses (62%) in the Study Area

The methodology for developing this metric is outlined in the gap analysis section.

This metric is utilised to inform the gap analysis.

Figure 7: Output by warehousing and storage subcategory

Warehousing and storage

Demand for warehousing will likely be driven by storage required for ancillary services rather than project components. There is substantial undeveloped industrially zoned land available in the Study Area that may be used for this purpose.



Demand assessment

Each construction component has different warehousing and storage requirements. It has been assumed based on consultation with renewable energy project proponents that the majority of mechanical components will be transferred directly from ports to the project site, with no requirement for intermittent off-site warehousing. This is primarily driven by the need to use specialist transportation equipment and costs associated with double handling.

As a result, warehousing may be required for the following:

- Solar and battery componentry
- PPE and hand tools
- Electrical componentry
- Transmission jewelry
- Construction materials (formwork, curing compounds etc.)

Additional warehousing may also be generated by supplier businesses expanding to meet the demands of the NE REZ.

As many of these components are ancillary specific demands by project could not be generated.

Gap Analysis

To identify whether the Study Area can accommodate growth in warehousing and storage. DPHI data on the proportion of total employment land utilised for industrial purposes was analysed.

Table 9: Industrial land in Study Area

LGA	Industrial land (Ha)	Total (Ha)	Industrial %
Armidale	398	411	97%
Glen Innes Severn	69	152	45%
Liverpool Plains	138	138	100%
Tamworth	511	770	66%
Tenterfield	Not reported		
Uralla	46	51	90%
Walcha	29	29	100%
Muswellbrook	Not reported		
Upper Hunter	Not reported		
Singleton	Not reported		
Inverell	145	150	97%
Subtotal	1,336	1,701	79%

From the data in Table 9, it is estimated that around 79% of the total employment land within the Study Area is currently utilised for industrial purposes. This indicates an ability to provide for additional industrial uses in the Study Area.

Data was also obtained for several LGAs to analyse the availability of undeveloped land for growth in industrial uses. This data is presented for Armidale and Tamworth in Table 10.

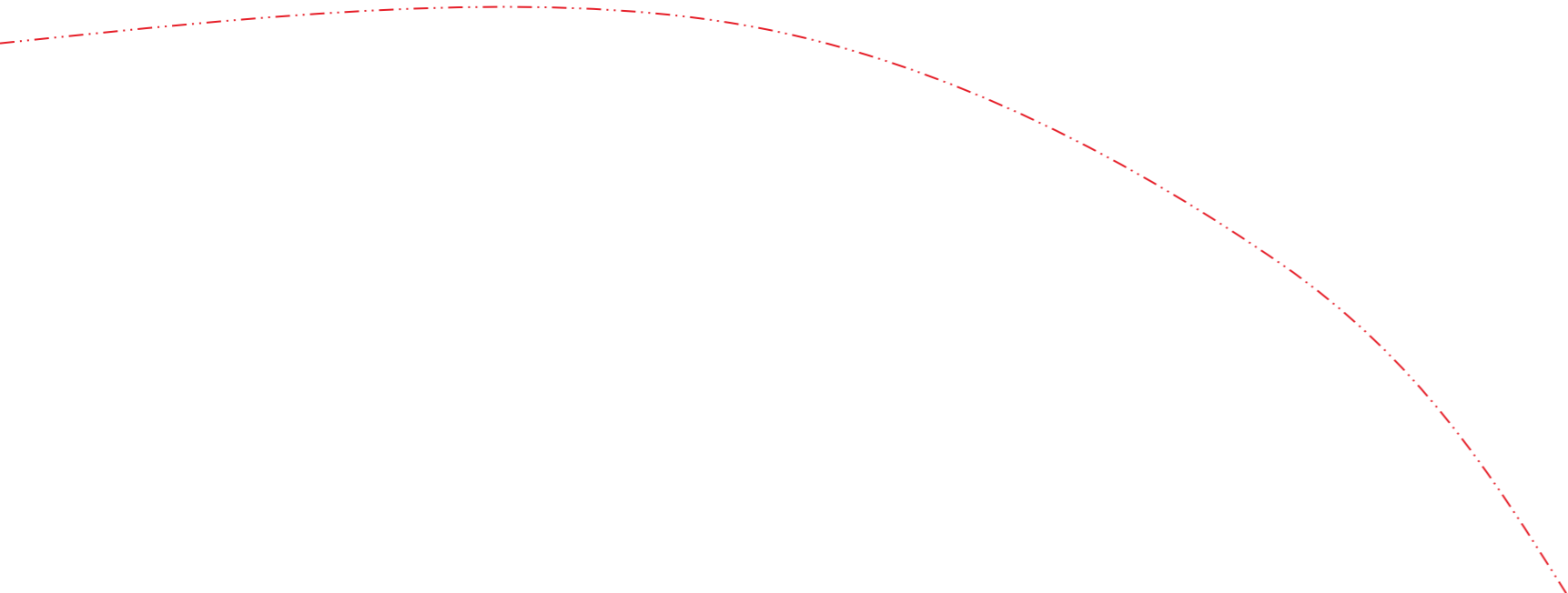
Table 10: Undeveloped land in Armidale and Tamworth LGAs

LGA	Undeveloped land (Ha)	Total (Ha)	Undeveloped %
Armidale	287	409	70%
Tamworth	439	758	58%
Subtotal	726	1,167	62%

This analysis suggests that additional land is available for development noting this may vary by LGA. It is expected that existing warehousing and storage uses within the Study Area will be able to provide support to meet a portion of the demand related to the NE REZ.

The suitability of the location of warehousing will vary by project and be reliant on business needs and transport connections. Therefore, it is likely a proportion of available warehousing, storage or land may not be suitable to support certain projects. In all cases new warehousing and storage will be subject to approvals.

Transportation



Transportation

Road transport is a comparative strength for the Study Area, suggesting that existing businesses may be well-placed to expand to meet demand.



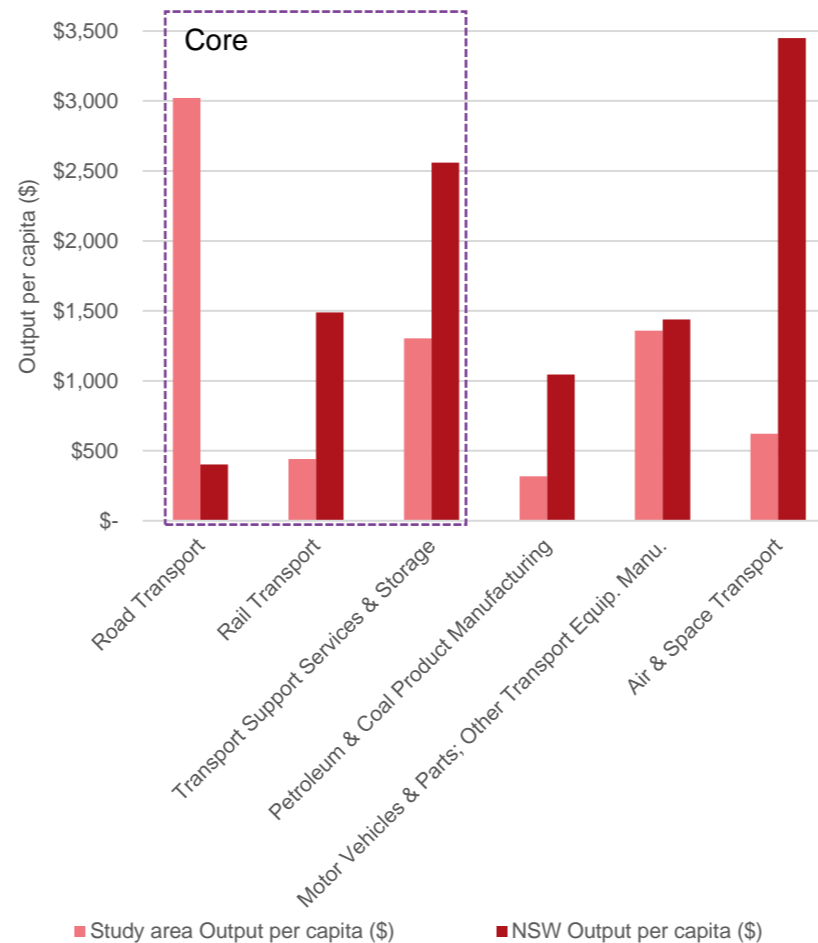
Baseline assessment

Transport of renewable energy project inputs, components and human resources is crucial for the NE REZ supply chain, given its inland location and distance to other potential supply chain linkages. Appropriately meeting local transportation demand will support cost efficiency, supply chain resilience and timely delivery of planned projects.

Core subcategories include **road transport**, **rail transport** and **transport support services & storage**.

The Study Area has a higher output per capita compared to NSW in the core subcomponent of **road transport**. This may indicate that it is well-placed to expand this sector to meet the road transport needs of the NE REZ's projects.

Rail transport and **transport support services & storage**, however, have a low output per capita in the Study Area relative to NSW.



Baseline metrics

The number of registered prime movers (defined as a heavy motor vehicle designed to tow a semi-trailer) informs the baseline. There are 1,169 prime movers in the local area¹. This represents 5% of the total count of prime movers in NSW (23,887) in the baseline.

This metric is utilised to inform the gap analysis.

Figure 15: Output by transportation subcategories

1. Transport for NSW (TfNSW) Registration Statistics

Transportation

The peaks in demand for transport is driven by the volume of aggregates and steel required during the construction of wind projects.



Demand assessment

Transportation refers to the demand for delivery trucks to transport construction materials, technology products, and structural components. Figure 10 shows the total demand for trucks in the Study Area at each point in time. Metrics for transport demand are detailed in Appendix A. These demands do not constitute hourly or daily trips. F

Demand analysis

The peak in the demand for trucks in the Study Area is driven by the volume of aggregates and steel reinforcements required during the construction of wind projects between 2029 and 2030.

As projects require delivery of materials towards the beginning of the construction timeframe, there is significant demand for transport services across Stages 0 and 1, as well as a peak in Stage 2 which aligns with a significant number of concurrent projects.

Table 11: Indicative transportation demand across construction stages

Material	Unit	Stage 0	Stage 1	Stage 2
Transportation – Road Transport	Average (number of trucks)	139	198	237
	Peak (number of trucks)	277	277	513
	Peak project count	13	14	18

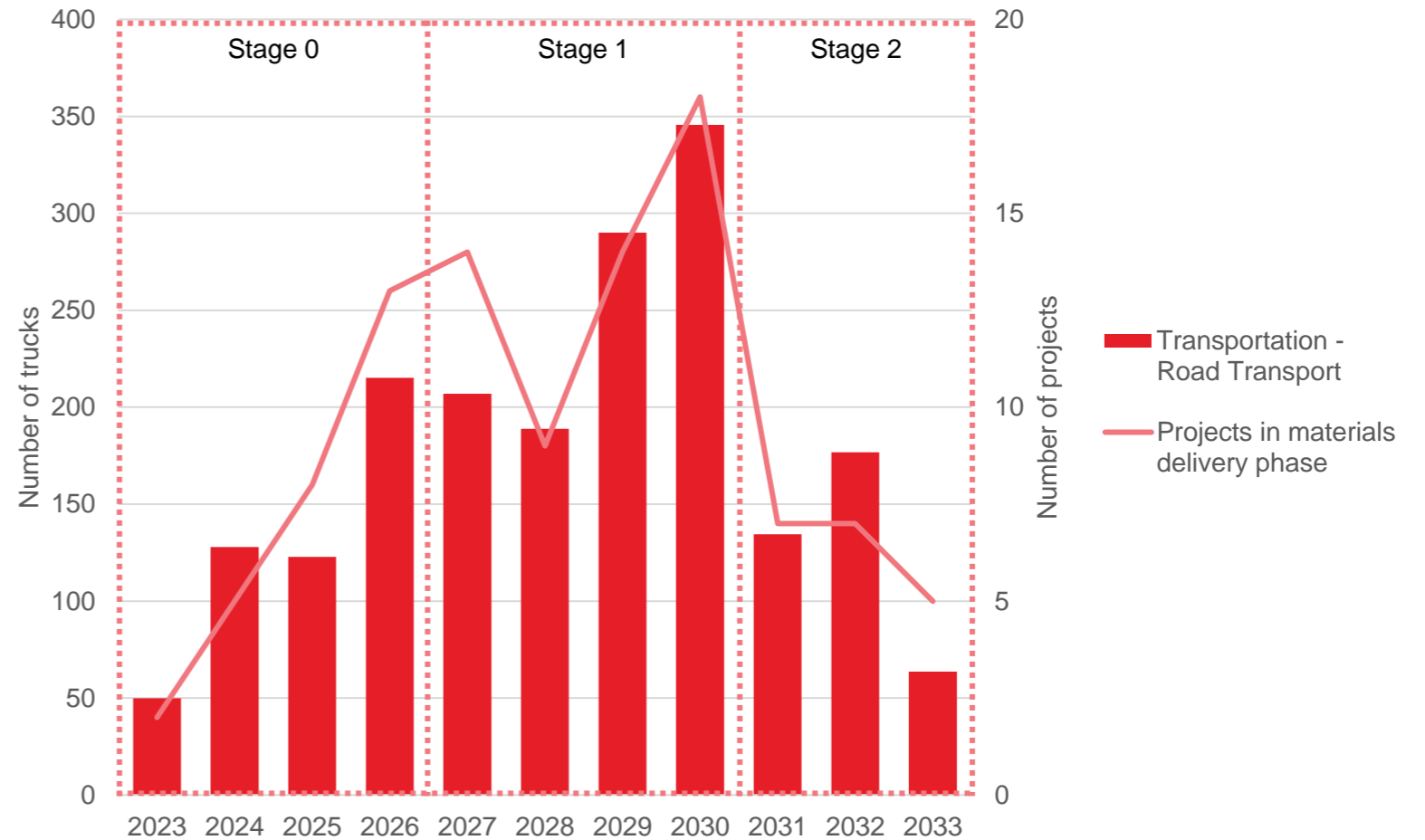


Figure 16: Transportation demand assessment

Transportation

Steady growth in transport services is required to meet peak stage two demand.

Gap analysis

Large volumes of construction materials and renewable energy components will need to be transported to support the delivery of the New England REZ. Although road and rail freight services will be used to transport goods to the REZ. Trucks will inevitably be used for the last leg trips and for goods not suitable for rail services or due to capacity constraints.

To form a robust assessment, the supply chain demand assessment assumes that the transportation of construction materials is via road trucking. The trucking requirements of the NE REZ projects are estimated in terms of prime movers (a heavy motor vehicle designed to tow a semi-trailer). This is expected to be the vehicle used for moving most materials. Specialist vehicles for transporting increasingly large components, particularly wind turbines are not considered in this analysis. However, it is noted that there is limited supply of these vehicles within Australia and project-specific procurements are likely required.

Road freight activities in NSW are carried out by a of large and small providers with many only working for specific markets or regions. As such, coordination of road freight resources between suppliers will be required and may also help manage the demand put on this industry.

The baseline of road transportation capacity within the Study Area has been estimated based on the TfNSW Registration Statistics, which contains a count of Registered Vehicles within NSW. Table 12 details figures for registered prime movers within this database (including heavy and medium goods vehicles).

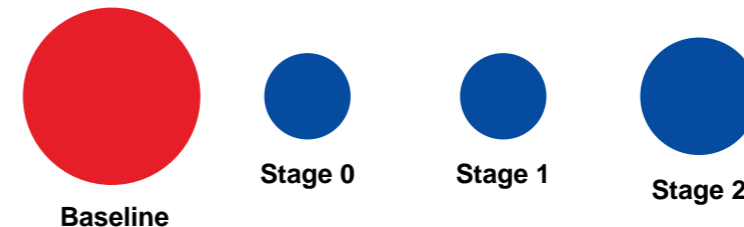
Scenario	Stage	Number of prime movers
Baseline	Study Area	1,169 (5% of total)
	NSW total	23,887
Demand	Stage 0 peak	277
	Stage 1 peak	277
	Stage 2 peak	513

Table 12: Baseline and demand peaks for transportation

The TfNSW data suggests that there is sufficient trucking capacity within the Study Area to meet the needs of the NE REZ projects. It is expected that transportation resources from nearby regions would support infrastructure development of this scale. Noting there will be transportation businesses currently serving the fossil fuels industries that are expected to decline over the next 10-15 years, representing an opportunity for transition

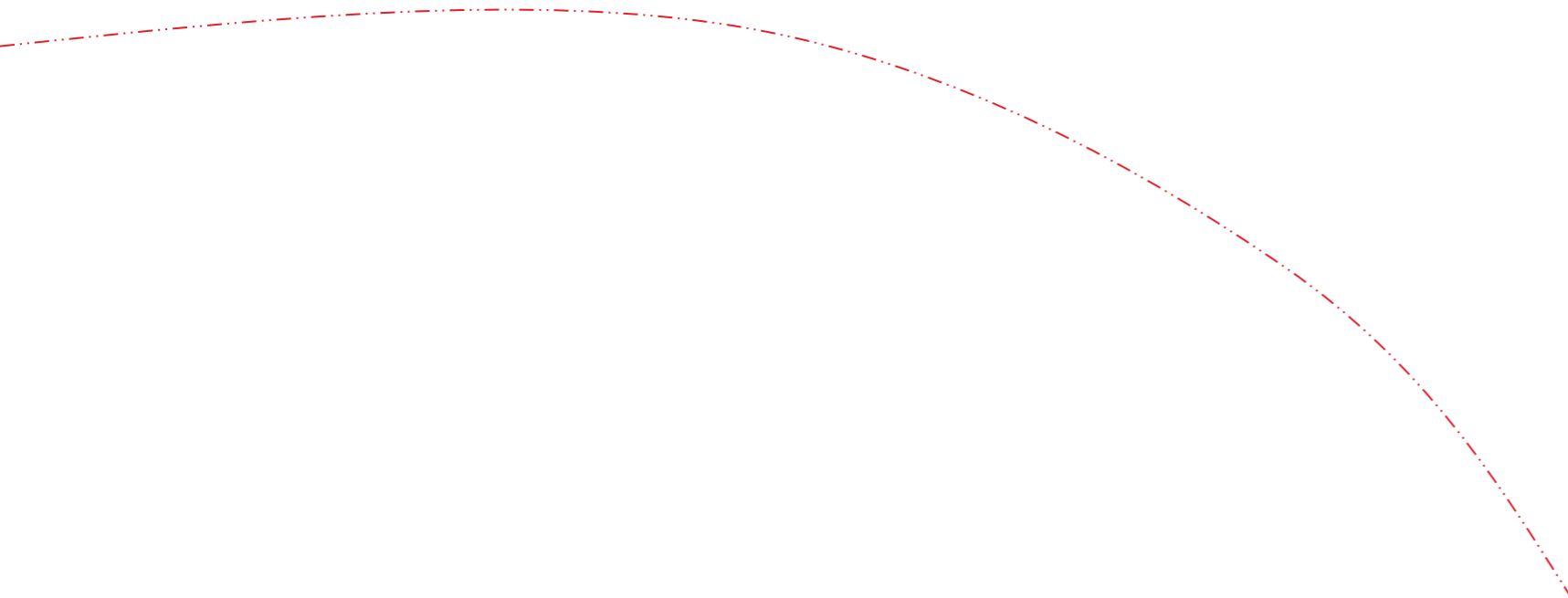
There is potential to achieve efficiencies in transportation by making use of the existing rail freight network, should it be available. Rail freight offers a more fuel-efficient option to road transport, although it is more constrained by the capacity of the network.¹

Figure 17: Transportation demand – relative growth



1. IBISWorld Industry Report - Road Freight Transport in Australia Sep 2024

Plant and equipment hire



Plant and equipment hire

There is some capacity in renting and hiring of equipment within the Study Area, however, there is greater comparative strength in supporting industries such as equipment repair and maintenance.



Baseline assessment

Plant and equipment hire enables the planned renewable energy projects and enabling infrastructure of the NE REZ to be delivered. Hiring provides flexibility and the ability for renewable energy project proponents to scale their operations based on project needs and can accommodate for efficiencies between projects where plant and equipment is transferred. Hire may include maintenance and support services, which reduces the burden on project teams to manage these elements, as well as risks associated with equipment obsolescence and depreciation.

Wholesale trade and rental & hiring services (except real estate) are factored as core subcategories of the plant and equipment hire supply chain component.

The Study Area's output per capita in both core subcomponents – **wholesale trade and rental & hiring services (except real estate)** – exceeds that of NSW. This indicates that these supply chain components and services are more represented in the local region relative to the rest of NSW and so may be well-placed to scale up for these services to be delivered locally for NE REZ projects.



Baseline metrics

The number of units in the Study Area baseline differs by plant/equipment technology, as outlined below:

- 16 tower cranes¹
- 49 mobile cranes²
- 1,772 dump and haulage resources²
- 44 excavators²
- 44 concrete agitators²

Certain specialised equipment is reasonably assumed to not be available in the local area in the baseline. In these instances, the daily or unit hire cost³ is taken (as these units are sourced outside the local area). These baseline rates are:

- \$1,050 per day for piling rigs
- \$1,100 per day for concrete batching plants
- \$9 per m² of concrete for concrete pumps

These metrics are utilised to inform the gap analysis.

Figure 18: Output by plant and equipment hire subcategories

1. Rider Levett Bucknall Crane Index
 2. TfNSW Registration Statistics
 3. Various industry sources

Plant and equipment hire

Demand for concrete agitators is largely driven by wind projects, while mobile cranes are needed simultaneously across transmission and solar projects.



Demand assessment

Only the key equipment required to support the major construction activities were accounted for in the plant and equipment hire assessment. These are also categorised differently across the technologies, as wind projects, for example will require larger or more specialised equipment than solar construction.

Demand analysis

Demand for plant and equipment hire is largely responsive to the project construction cycle. This reflects one of the key advantages of hire – supply is able to adjust in line with demand.

The peak demand is driven by the development of wind projects between 2029 and 2031, when bulk foundation works are undertaken. The quantity of agitators and concrete pumps is crucial to ensure continuous concreting of turbine foundations. Accordingly, this plant/equipment type makes up the largest share of all project requirements.

The peak in the quantity of mobile cranes between 2026/27 and 2030/31 is due to the start of construction of the transmission network, simultaneously with solar projects.

Table 13: Indicative plant and equipment demand across construction stages

Equipment	Units	Stage 0		Stage 1		Stage 2	
		Average	Peak	Average	Peak	Average	Peak
Tower Cranes	Number of units	0.8	2	3.5	5	2.8	5
Mobile Cranes	Number of units	45.5	77	39.9	58	51.8	80
Cable Pulling & Tensioning Equipment	Number of units	0.2	1	0.7	1	0.7	1
Excavators	Number of units	32.5	57	45.1	55	64.0	95
Piling & Drilling Equipment	Number of units	43.9	71	24.1	37	46.5	72
Dump & Haulage Equipment	Number of units	48.3	85	72.5	91	91.9	129
Concrete Batching Plants	Number of units	10.5	23	21.3	25	25.6	39
Concrete Pumps	Number of units	52.6	115	106.6	125	128.1	195
Concrete Agitators	Number of units	68.8	152	160.1	202	190.3	285
Number of projects in construction phase	Number of projects	9.7	19	14.2	19	16.2	25

Plant and equipment hire

Demand for concrete agitators is largely driven by wind projects, while mobile cranes are needed simultaneously across transmission and solar projects.



Demand assessment

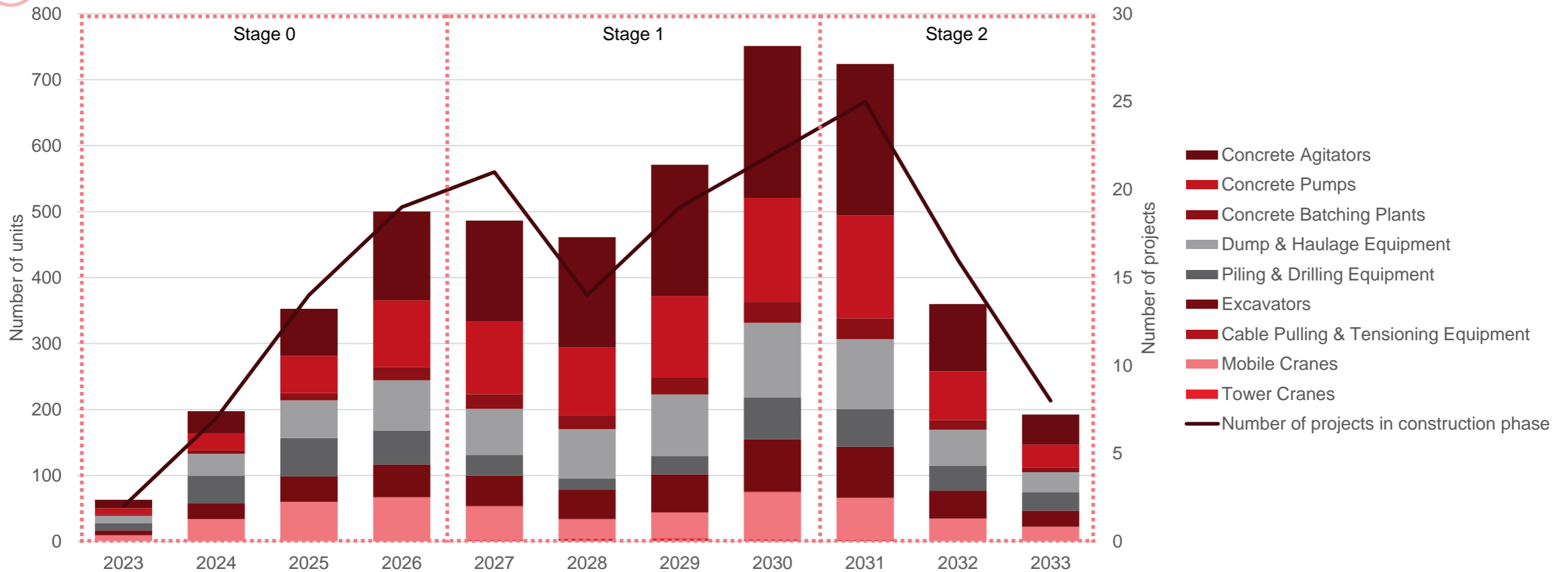


Figure 19: Plant and equipment hire demand assessment

Plant and equipment hire

A rapid expansion in the number of mobile cranes is required to meet peak demand in all stages.

Gap analysis (1/3)

Tower cranes

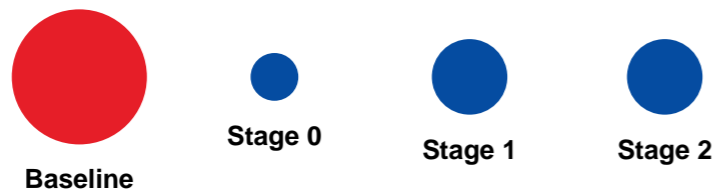
Tower cranes are required for the construction of pumped hydro projects. From the demand assessment, there is a peak demand of 5 tower cranes across the construction phases of all NE REZ projects. It is assumed that each pumped hydro project requires one dedicated tower crane across its construction timeframe. The Rider Levett Bucknall Crane Index indicates the number of tower cranes being utilised in construction projects across Australia.

Table 14: Baseline and demand peaks for tower cranes

Scenario	Stage	Number of tower cranes
Baseline	Newcastle Region	16
Demand	Stage 0 peak	2
	Stage 1 peak	5
	Stage 2 peak	5

From this data, it can be observed that there are currently 16 cranes in use within the Newcastle region. This indicates that the regional capacity may be able to cater for the NE REZ should sufficient coordination and streamlining across major construction projects be implemented. It will be important for project proponents to liaise with other major projects early in the construction planning stages.

Figure 20: Tower cranes demand – relative growth



Mobile cranes

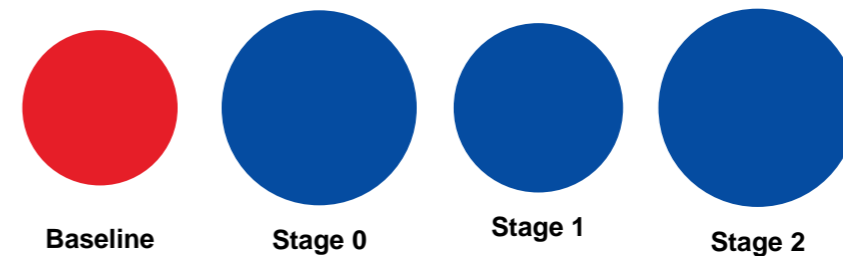
Mobile cranes are critical components for the construction of all NE REZ projects. The baseline number of mobile cranes within the Study Area has been estimated based on the TfNSW Registration Statistics. The table below indicates the demand for mobile cranes against the baseline figures.

Table 15: Baseline and demand peaks for mobile cranes

Scenario	Stage	Number of mobile cranes
Baseline	Study Area	49 (4% of total)
	NSW total	1,311
Demand	Stage 0 peak	77
	Stage 1 peak	58
	Stage 2 peak	80

This comparison suggests that the Study Area may not have sufficient mobile crane resources to fully support the NE REZ projects, although the demand can likely be met by using mobile crane resources from adjacent regions. Procurement timeframes for new equipment should be factored into overall construction planning.

Figure 21: Mobile cranes demand – relative growth



Plant and equipment hire

A rapid expansion in the number of excavators is required to meet peak demand in all stages.

Gap analysis (2/3)

Cable pulling & tensioning equipment

Specialised pulling and tensioning equipment is required for construction of overhead transmission lines. The equipment required to deliver the four major transmission line projects in NE will likely need to be sourced from outside of the Study Area, and potentially from overseas. The availability of this equipment is determined by the overall transmission line construction activity across Australia. The planned renewable energy zones in NSW (Central West-Orana, New England, Hunter-Central Coast, Illawarra, and South West) will all require high voltage transmission lines, and are hence likely to need the same specialised equipment. Considering this, it is likely that additional tensioning equipment will be required from outside the Study Area to meet these requirements fully.

Piling & drilling equipment

Piling equipment is required for the construction of solar and wind farms. Piling rigs are used more generally for establishing foundations for buildings and other large construction projects. Australia does not manufacture this equipment onshore, and should additional equipment be required to meet the full demand of the NE REZ projects, it will need to be sourced from overseas including factoring in procurement timeframes.

Dump & haulage equipment

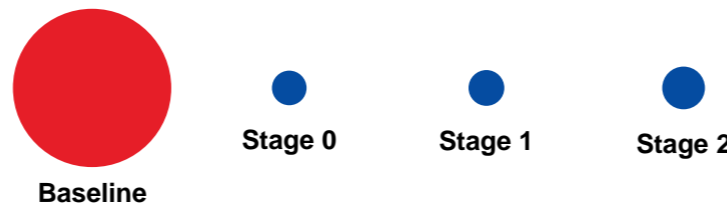
Dump & haulage equipment is required to transport waste construction materials and excavated volumes from project work sites. The baseline number for dump and haulage resources within the Study Area has been estimated based on the TfNSW Registration Statistics. The table below indicates the demand for dump and haulage against the baseline figures.

Table 16: Baseline and demand peaks for dump & haulage

Scenario	Stage	Number of dump & haulage resources
Baseline	Study Area	1,772 (5% of total)
	NSW total	36,240
Demand	Stage 0 peak	85
	Stage 1 peak	91
	Stage 2 peak	129

This comparison implies that there will be sufficient dump and haulage resources within the Study Area to fully support requirements.

Figure 22: Dump & haulage demand – relative growth



Excavators

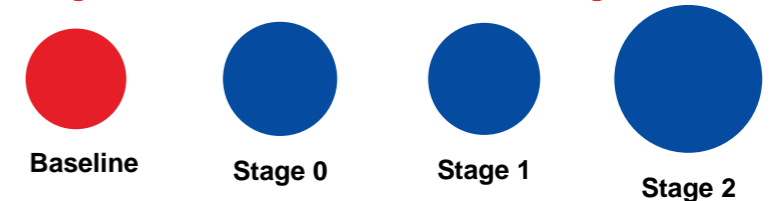
Excavators are required to prepare sites prior to construction. The baseline number of earthwork plant resources within the Study Area has been estimated based on the TfNSW Registration Statistics. The table below indicates the demand for excavation machinery against the baseline figures.

Table 17: Baseline and demand peaks for earthwork plant

Scenario	Stage	Number of earthwork plant resources
Baseline	Study Area	44 (7% of total)
	NSW total	610
Demand	Stage 0 peak	57
	Stage 1 peak	55
	Stage 2 peak	95

This comparison suggests that the Study Area may not have sufficient resources to meet the full demand for earthwork equipment, although it is likely that resources from adjacent regions will be able to provide support. This highlights the need for collaboration across NSW in order to limit delays to construction related to plant and equipment shortages.

Figure 23: Excavators demand – relative growth



Plant and equipment hire

A rapid expansion in the number of concrete agitators is required to meet peak demand in all three stages.

Gap analysis (3/3)

Concrete agitators

Agitators are used to transport concrete from batching plants to construction sites. The baseline number of concrete agitators within the study area has been estimated based on the TfNSW Registration Statistics. The table below indicates the demand for concrete agitators against the baseline figures.

Table 18: Baseline and demand peaks for concrete agitators

Scenario	Stage	Number of concrete agitators
Baseline	Study Area	44 (2% of NSW total)
	NSW total	2,233
Demand	Stage 0 peak	152
	Stage 1 peak	202
	Stage 2 peak	285

This data suggests that concrete agitator resources from surrounding areas in NSW will likely be required to fully support the demand brought by the NE REZ projects.

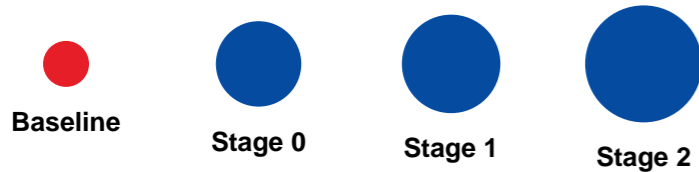


Figure 24: Concrete agitators demand – relative growth

Concrete batching plants

Concrete is an essential component in most construction projects. As per the relevant concrete delivery standard (AS 1379), there should be no more than 90 minutes between the start of mixing and pouring of a batch. Due to this time constraint, it is anticipated that the concrete required for the NE REZ projects will be primarily supplied by mobile concrete batching plants, which can be established closer to construction sites.

NSW has approximately 300 concrete batching plants currently operational.

Table 19: Baseline and demand peaks for concrete batching plants

Scenario	Stage	Number of concrete batching plants
Baseline	Study Area	300
Demand	Stage 0 peak	23
	Stage 1 peak	25
	Stage 2 peak	39

Concrete batching plants play a central role in delivering large scale infrastructure projects. With significant construction activity occurring across NSW, coordination is required to ensure adequate resources are available for delivering the NE projects noting sufficient plants do exist in NSW.

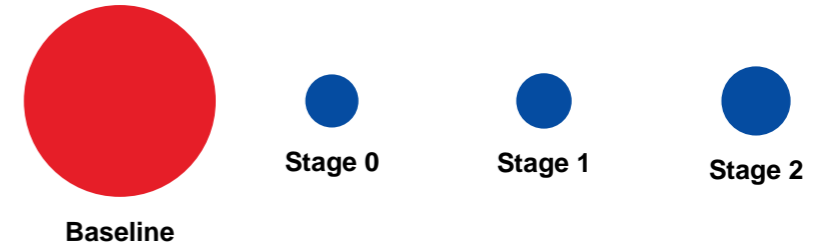


Figure 25: Concrete batching plants demand – relative growth

Concrete pumps

Concrete pumps are used to transfer mixed concrete from a concrete agitator to the concrete pouring location. Hire cost of a concrete boom pump is approximately \$9 per cubic metre of concrete. Based on the total concrete pump requirement developed in the demand assessment, this is equivalent to \$29 million in hiring costs for concrete pumps. It is assumed that the local concrete pump resources are equivalent in scale to concrete batching plants. As the concrete batching plant supply chain is adapted to meet the needs of the NE REZ projects, it is expected that the concrete pumping capacity will adapt in a similar fashion.

Security and surveillance services



Security and surveillance services

The Study Area does not have a comparative strength in security and surveillance industry which could support the construction and operation of renewable energy projects.

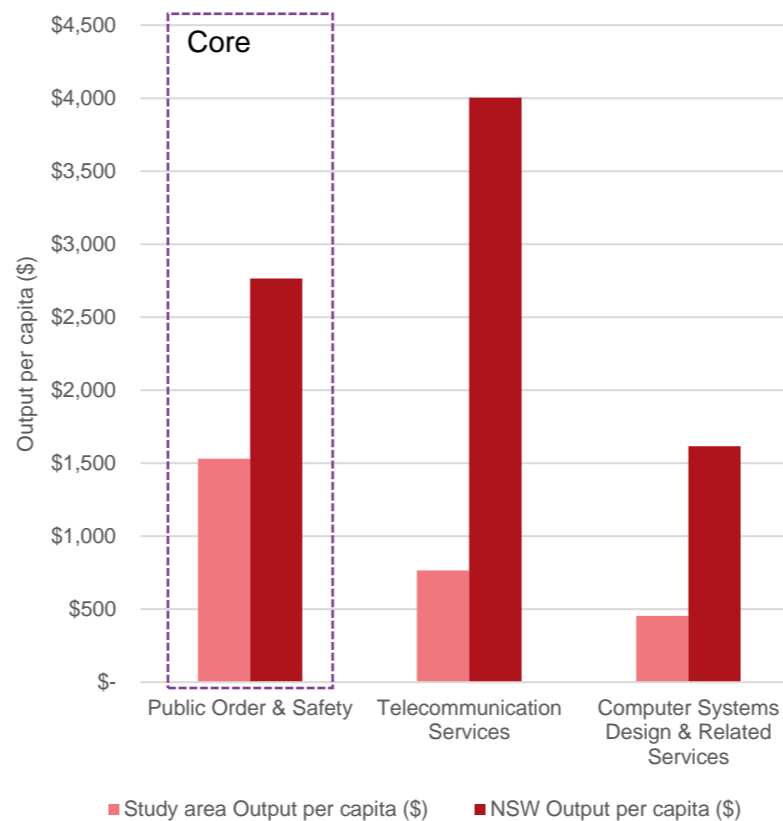


Baseline assessment

Security and surveillance services will be vital to secure the physical sites, personnel and assets of renewable energy projects and manage compliance and liability. This will support timely delivery, occupational health and safety and compliance with regulatory standards.

The **public order & safety** subcomponent is considered core to this supply chain component.

The Study Area is underrepresented on an output per capita basis in the core subcomponent of **public order and safety** compared to NSW. This means that these services are less concentrated in the local region compared to the whole state. The delivery and operations of NE REZ projects will increase localised demand for these services.



Baseline metrics

The baseline for security and surveillance services is measured on a full-time equivalent (FTE) basis. The baseline productivity rate of \$0.144m per FTE (reflecting the value-added per job) is applied to determine that in the baseline. This has been derived from the \$309m output in this category in the baseline.

This metric is utilised to inform the gap analysis.

Figure 26: Output by security and surveillance services subcomponent

Security and surveillance services

Security and surveillance services are required across both the construction and operations phases of the projects.



Demand assessment

Security and surveillance services estimated by FTE was used to assess the demand for the renewable energy projects. The estimates are based on benchmarks of the number of security personnel required per hectare, and the number of hectares required per MW (project nameplate capacity). These factors were combined to estimate a required security FTE across the projects.

Demand analysis

Demand for security and surveillance services is distinguished by project stage: construction and operation. These services are required during both, however as construction of projects culminates, demand for security and surveillance declines. However, there is still demand maintained after construction, in the operations phase. Demand for operation security and surveillance services is projected for another 15 years, but it could extend until the end of a project's life.

The peak demand occurs during the wind construction, with some solar projects also under construction. This occurs between 2030 and mid-2031. This is also driven by the security requirement for projects in operation.

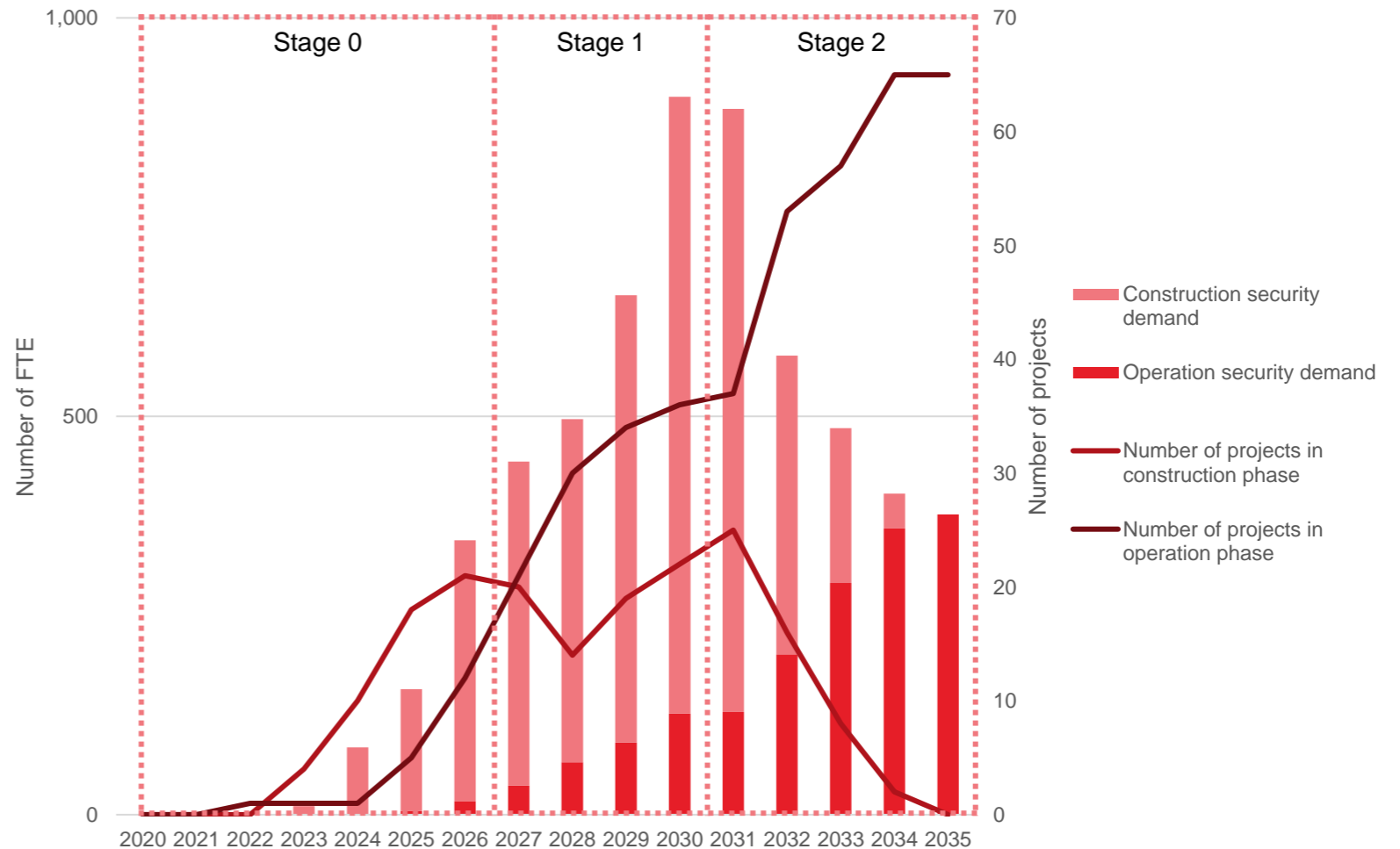


Figure 27: Security and surveillance services demand assessment

Security and surveillance services

Steady growth in security and surveillance services is required to meet peak stage two demand.

Gap analysis

The peak demand for security and surveillance services in each delivery stage is assessed on an FTE basis. Based on the baseline analysis, a productivity rate of \$0.144m per FTE (value-added per job) has been applied to evaluate the total value of the FTE demand. The total value of security and surveillance demand from the NE REZ projects is of the same order of magnitude as the size of the current baseline output, with a peak reached in Stage 2 due to multiple concurrent construction projects.

Table 20: Baseline and demand peaks for security and surveillance

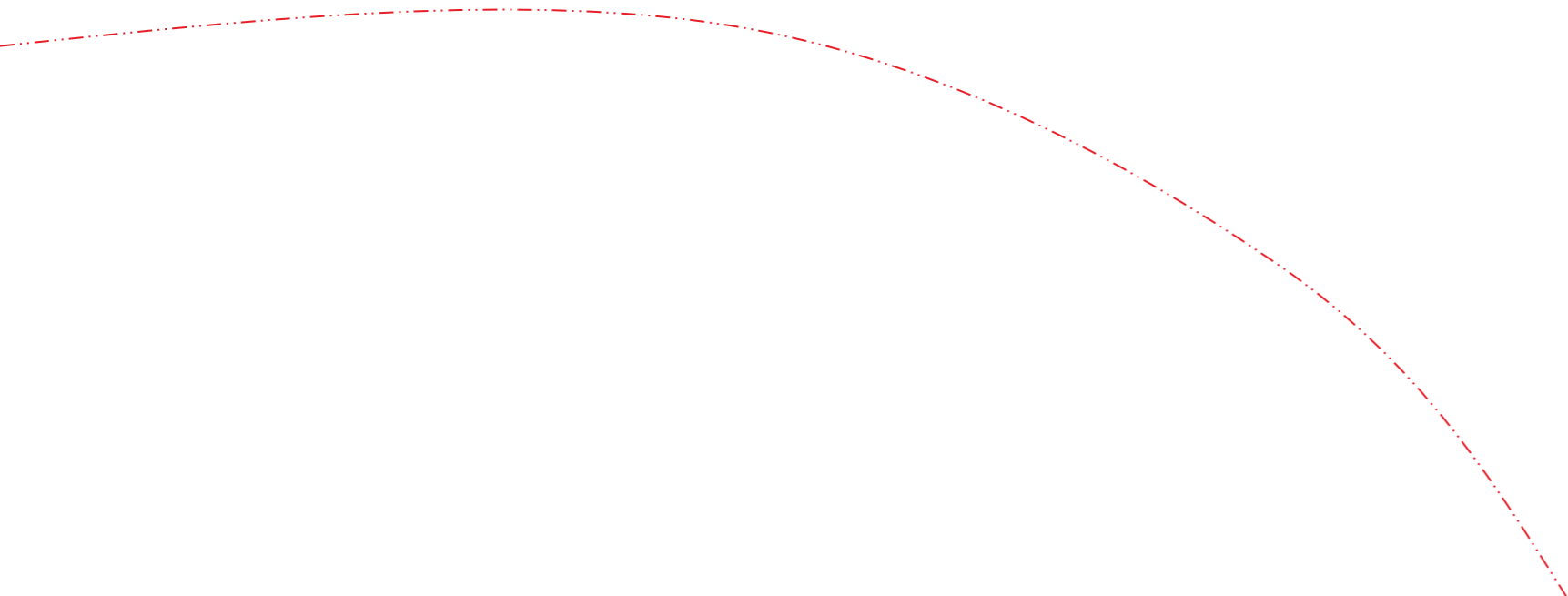
Scenario	Stage	Security and surveillance economic output (\$m)
Baseline	Study Area	309.0
Demand	Stage 0 peak	62.7
	Stage 1 peak	102.1
	Stage 2 peak	202.1

The demand for security and surveillance resources generated by the NE REZ projects would require the sector to grow by 1.5 to 2 times its current size.



Figure 28: Security and Surveillance Demand – relative growth

End of life



End of life

The waste management sector will need to build capability in reusing, recycling and processing waste streams related to renewable energy projects.



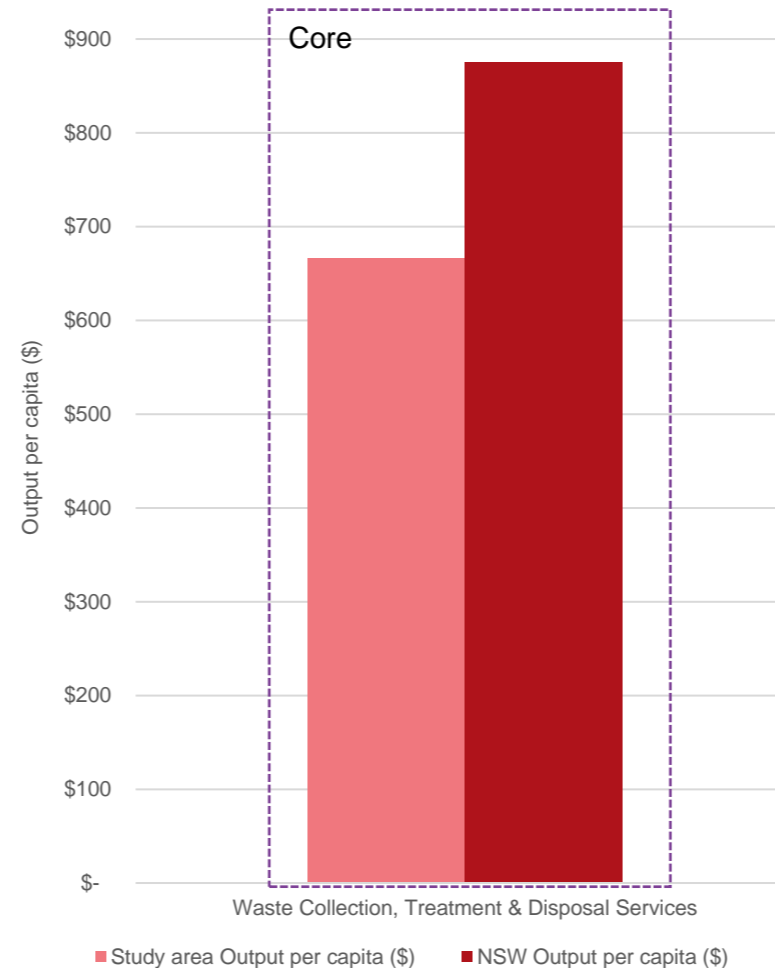
Baseline assessment

End of life considerations are important to consider for the NE REZ with most waste generated by renewable energy projects arising at the decommissioning or repowering stage. *The Waste and Circular Economy Study* should be referred to for more details on waste streams, generation volumes and opportunities.

Waste management for projects and ancillary streams will reduce detrimental impacts to the local environment. Renewable energy project components contain valuable materials which may be recovered and reused through effective end of life services.

The **waste collection, treatment & disposal services** subcomponent is the only one considered under end of life and is core to this supply chain component.

The local region is relatively underrepresented in **waste collection, treatment & disposal services** compared to NSW in the baseline assessment, before any REZ projects are considered. The lifespans of renewable energy projects mean that end of life services will be required constantly and in proximity to the projects. Efficient waste management in the local area can lower costs associated with disposal, develop circular practices to recapture material value and create employment opportunities in resource recovery and recycling.



Baseline metrics

The baseline for end of life comprises 178 facilities in the local area which are considered suitable to managing the end of life waste generated by the NE REZ projects¹. This value was validated against the Waste and Circular Economy Study which identified over 100 landfills, recycling facilities and transfer stations in the Study Area.

This metric is utilised to inform the gap analysis.

Figure 29: Output by end of life subcomponent

End of life

Decommissioning or repowering of renewable energy projects generate various waste streams including structural steel, solar panels, wind turbine blades and batteries.



Demand assessment

Following the end of operational life for NE REZ projects, there will be a significant volume of waste.

Solar

Solar panels will degrade over the life cycle of projects with most panels failing between 20-30 years into operation. Failure rates can be higher due to extreme weather conditions or early repowering of projects. Table 21 presents the key materials that solar panels are made of.

Table 21: Typical composition of a 22kg Solar Panel

Component	%	Kg per panel
Glass	70	15.40
Aluminium Frame	18	3.96
Polymer-based adhesive (EVA) encapsulation layer	5.1	1.12
Silicon metal solar cell	3.65	0.80
Back-sheet layer (based on polyvinyl fluoride)	1.5	0.33
Copper connector	1	0.22
Other conductors and metals	0.74	0.17

Wind

Wind turbine components such as blades, gearboxes and generators degrade over time. This also applies to structural steel components such brackets and joints. Weaker components can fail in the first 5 years of operation, with a more consistent failure for the remaining life of the project. Due to this, ongoing maintenance is required through the life of the project. Key materials that make up these components are presented in Table 22.

Table 22: Typical composition of wind turbines

Blades		Gearbox		Generator	
Component	%	Component	%	Component	%
Fibre glass, wood and carbon fibre	100	Steel	54.2	Steel	51.9
		Iron	44.2	Iron	42.3
		Aluminium	1.1	Aluminium	1.0
		Other	0.5	Copper	4.2
				Electrical components	0.6

BESS (Battery Energy Storage Systems)

Most BESS related waste is generated in the decommissioning phase given minimal waste is generated from daily activities. Decommissioning of BESS projects includes the following components:

- Batteries
- Components
- Supporting infrastructure (power conversion systems, cooling units)

BESS batteries are classed as dangerous goods, so require specific handling and can be reused for less critical secondary applications.

The key waste streams across all renewable energy projects are:

- Structural steel
- Solar panels
- Wind turbine blades
- Batteries

Local industry will need to grow and adapt to build capability to manage these waste streams and identify circular uses. Further details on waste quantities and demand are provided in the Waste and Circular Economy Study.

End of life

Steady growth in waste management services is required to meet demands for waste streams from renewable energy projects.

Gap analysis

The Waste Management Facilities Database reported by Geoscience Australia lists all currently operating waste management, recycled and reprocessing facilities within Australia.

It is estimated that there are a combined 178 facilities which can contribute to managing the end of life waste generated by the NE REZ projects. The Waste and Circular Economy Study suggests existing residents and commercial activities generate from 0.26-1.28 tonnes per capita across the various LGAs within the Study Area.

When reviewing the various future scenarios modelled in the Waste and Circular Economy Study it is evident operational waste volumes, which would include the ongoing decommissioning of assets are significant. In all scenarios by 2030 operational waste accounts for several 1000 tonnes of waste generation per annum and this will only increase further as projects reach decommissioning.

Looking at the current composition of available waste facilities it is evident that more facilities will be needed particularly for new wastes streams relating to decommissioned renewable energy components. Noting specific requirements will be dictated by recycling rates and targets for the REZ.

Table 23: Waste Management Facilities within New England

Type of facility	Facilities in local area	Materials
Construction & demolition waste recycling facility	1	Solar panels, Wind turbine blades
Electronic waste drop-off facility	6	Batteries, Transmission cables
Landfill - inert	1	Solar panels, Wind turbine blades, Batteries, Transmission cables, Structural steel
Landfill - putrescible	54	Solar panels, Wind turbine blades, Batteries, Transmission cables, Structural steel
Materials recovery facility (MRF)	13	Solar panels, Batteries
Metals recovery facility	3	Solar panels, Wind turbine blades, Batteries, Transmission cables, Structural steel
Reuse shop	12	Structural steel
Waste transfer station	88	Solar panels, Wind turbine blades, Batteries, Transmission cables, Structural steel
Total	178	

Construction services



Construction Services

Certain businesses exist that can provide specific Construction Services where there are advantages to Head Contractors from sourcing them locally



Baseline Assessment

Although construction services are not in the core scope of this local supply chain study, they are an important supporting element which will interact with the core local supply chain components.

The **heavy & civil engineering construction** and **construction services** subcomponents are considered core to this supply chain component.

Local advantage

Construction services, as a broad umbrella of services, are prevalent across both the Study Area and NSW. **Heavy & civil engineering construction** is overrepresented on a per capita basis in the Study Area. This means that these services are more concentrated, and the increased demand for these will enable local suppliers to be involved. Although major consultants and contractors will be the tenderers for major work packages certain services lend themselves to being delivered by local businesses (heritage, geotechnics, surveying etc.).

Baseline metrics

Construction services are a supporting component of the local supply chain, and therefore not quantified in the baseline assessment for further demand and gap analysis.

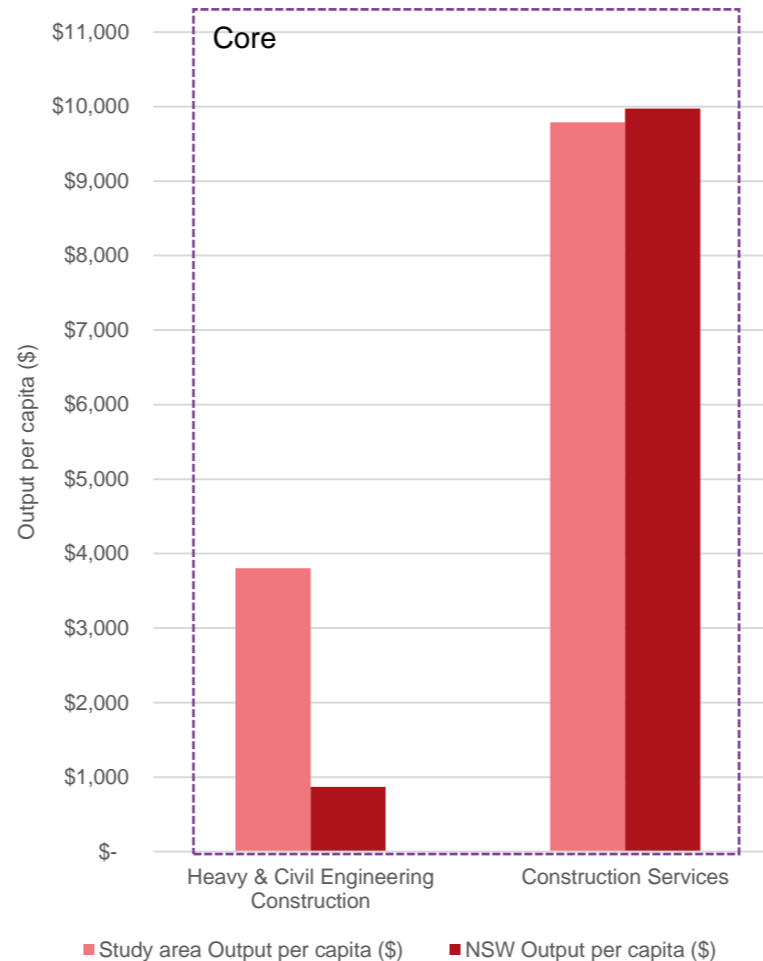


Figure 30: Output by construction services subcomponent

Demand Assessment

Construction services are a key component of all renewable energy projects. Certain services that can be serviced locally will be required at different phases in the construction life cycle.

Geotechnics and surveying

Ground conditions and foundations are key components of wind and solar farms generating demand for soil testing and assessments of ground conditions. Many projects will also be large in scale needing surveying work to help drive designs for projects.

On-site project management

Although overall project management responsibilities will sit with major contractors. On-site presence will be needed to manage site operations, deliveries, safety and security. These roles will be needed throughout the construction phase of renewable energy projects.

Local road upgrades

Most renewable energy projects will require minor road upgrades to create site access particularly in construction to enable construction materials and large components to be delivered to site. These works will be of a scale that they could be undertaken by smaller civil works companies.

Heritage

Understanding and assessment of heritage elements are generally more suited to businesses with local knowledge. Requirements for heritage studies will be on a project by project basis as identified through the planning process.

Catering, cleaning and hospitality



Catering, Cleaning and Hospitality

Ancillary services are present in the Study Area but will need to be scaled to meet the needs of the NE REZ workforce population.



Baseline Assessment

Although catering and hospitality – including food services, laundry, cleaning - are not in the core scope of this local supply chain study, they are an important supporting industry that presents a significant opportunity for local content.

Local opportunities

Catering and hospitality businesses currently exist in the Study Area serving the existing population and associated businesses. These businesses are currently configured to support the local population.

Ultimately the projects and workforce required to deliver the REZ will create a growing need for ancillary services whether these relate to construction or site operations, workforce accommodation or amenities workers may use outside of work hours. Local businesses would need to scale operations to meet these needs and in some cases form relationships with developers / operators of renewable energy projects to become selected providers of specific ancillary services.

Baseline metrics

Catering and hospitality services are a supporting component of the local supply chain, and therefore not quantified in the baseline assessment for further demand and gap analysis.

Demand Assessment

All renewable energy projects will generate demand for catering and hospitality services. These services can support site operations but will be more heavily linked to workforce accommodation centres.

Catering and hospitality

Food and drinks will need to be supplied to sites throughout construction and operation. These demands may be more significant depending on the arrangements for workers at their accommodation. Large workforce accommodation compounds may require large volumes of catering and hospitality services.

Laundry

This is a supporting service that will be heavily linked to the locations of workforce accommodation. Contracts will exist to provide these services for major accommodation sites. Though demand is also expected to increase in towns nearby major accommodation hubs for workers seeking to wash their own clothes.

Cleaning

Site offices and workforce accommodation will require regular cleaning due to usage. There will be contracts to provide these services for major sites and accommodation hubs. This demand is expected to be significant given the number of projects running concurrently and size of the workforce required to deliver the NE REZ.

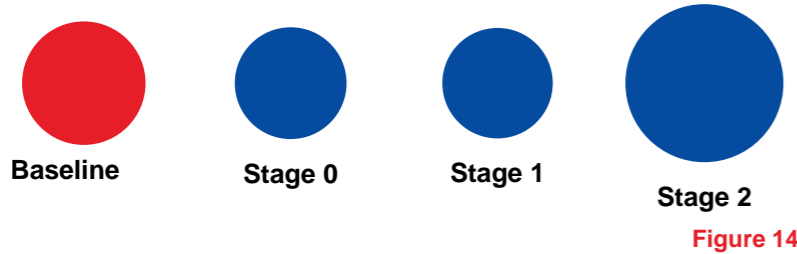
Summary



Summary

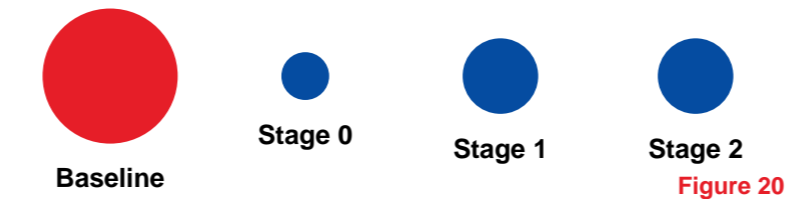
The gap analysis demonstrates the input in output required to meet demand varies significantly across sectors. Opportunities for local suppliers will be greatest in sectors that require significant growth to meet this demand.

Materials

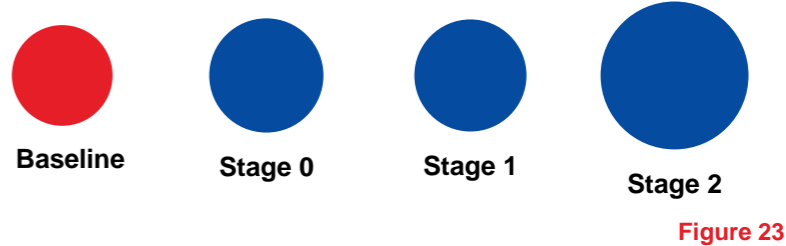


Plant and equipment

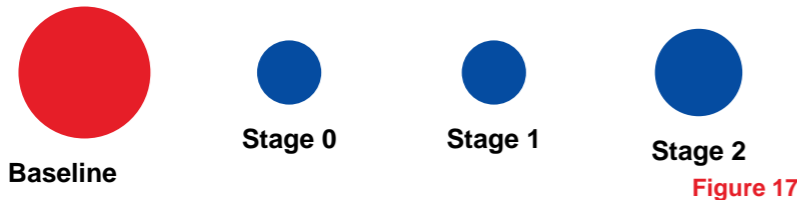
Tower cranes



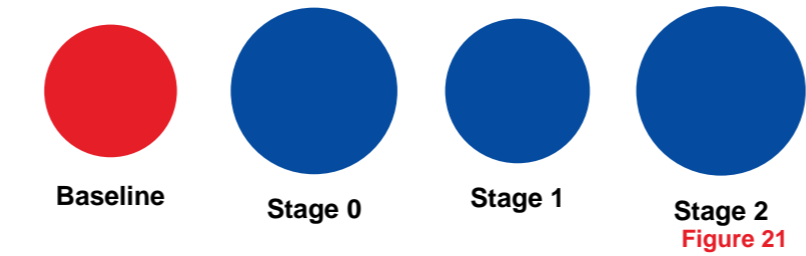
Excavators



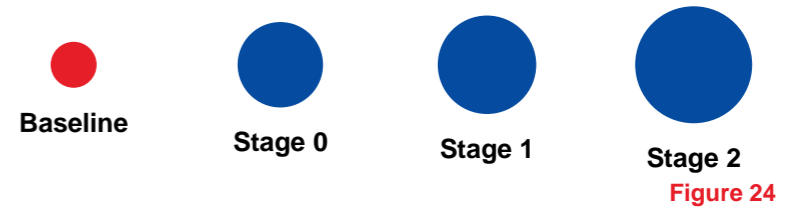
Transportation



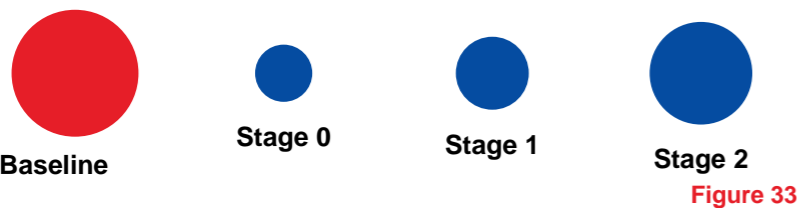
Mobile cranes



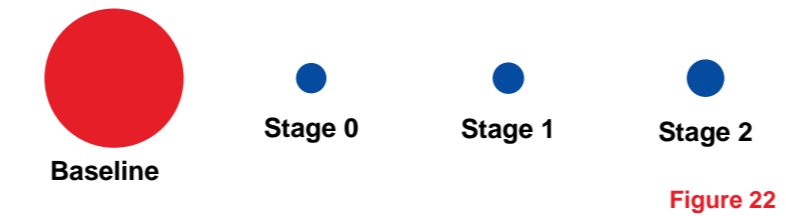
Concrete agitators



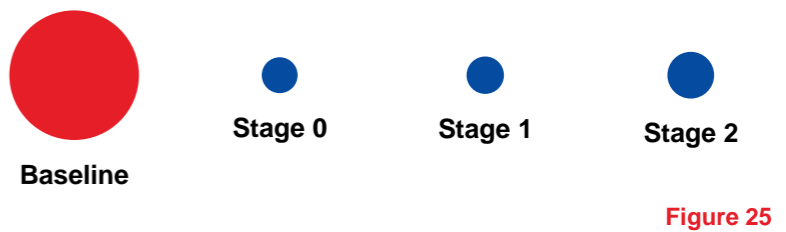
Security and surveillance



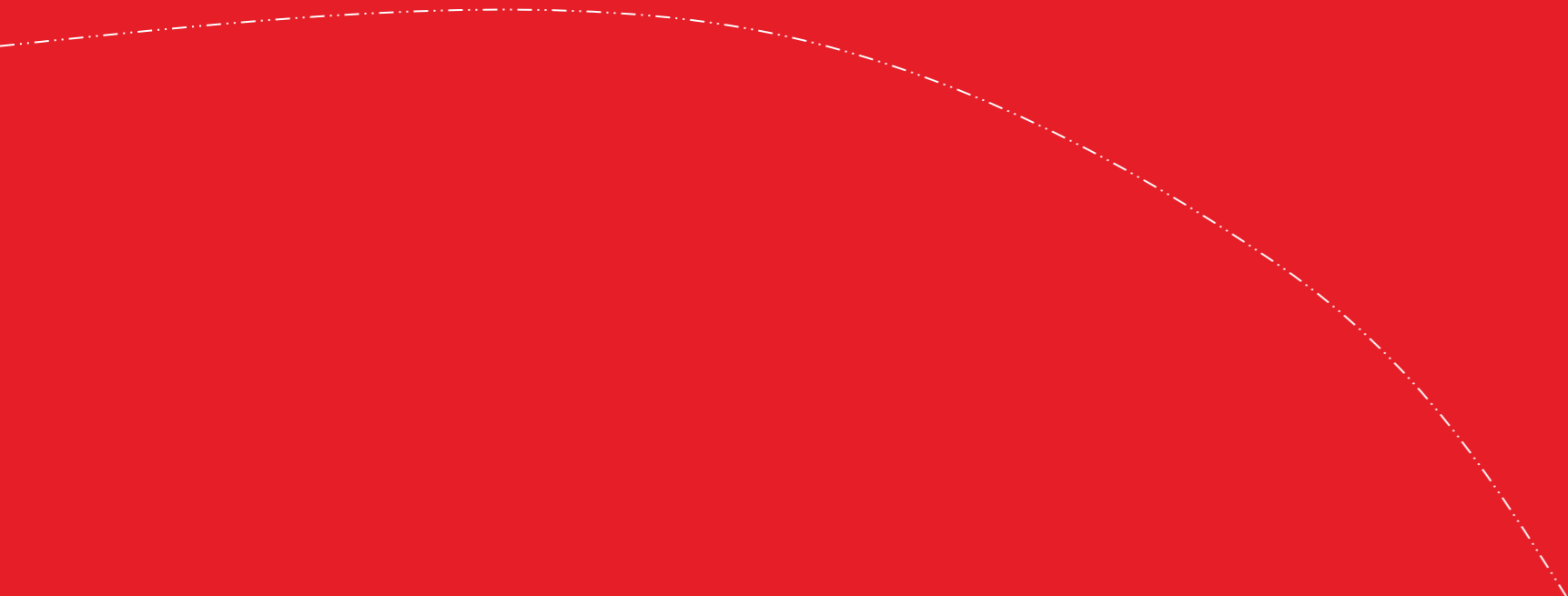
Dump & haulage



Concrete batching plants



Constraints and potential impacts



Constraints and potential impacts

The scalability of each sector was assessed across six criteria.

Approach

The gap analysis identified significant gaps in the existing baseline and demand for local industries that will need to be addressed to deliver the NE REZ projects.

To further consider which supply chain sectors should be targeted for growth, we evaluated the scalability of each sector, alongside other considerations such as community benefits, import costs and the existing support available.

Scalability assessment

The scalability of each local industry was assessed using a qualitative evaluation matrix that considered six different criteria (shown to the right).

Other considerations

- Community benefits – the social and economic benefits an industry brings to the region.
- Transport costs – the competitiveness of a local industry based on the transport costs of sourcing a supply chain component elsewhere
- Existing support available – existing funding, programmes and support that is already available to support the growth of the sector.

Criteria	Description	Scaleability scoring		
		Low	Medium	High
Existing capacity	The baseline capacity of the local industry assessed by comparing output per worker to the NSW average. A higher output per worker than average suggests there is a comparative advantage in the region compared to other sectors.	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average
Workforce skills required	The level of education and technical skills required by the majority of the workforce in the industry. Roles requiring a higher level of education are typically more difficult to scale.	Predominantly tertiary educated	Moderately skilled workforce (e.g. TAFE or higher)	Low skilled workforce (minimal further education required)
Planning and approvals required	The level of planning and approvals required to set up a new business or expand one within a particular industry sector. This includes zoning, planning and environmental approvals. The more complex the regulatory framework the more difficult an industry is to scale.	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements
Regulatory and licensing requirements	The costs to a business to comply with ongoing licencing and regulatory requirements for operating in a particular industry. The greater the complexity of the regulatory environment, the more difficult it is for businesses to scale.	Complex regulatory environment	Moderate level of regulatory requirements	Minimal regulatory requirements
Upfront costs	The upfront costs required to set up a new business or expand an existing one, including the cost of land, development or equipment required. The higher the initial costs, the more difficult it will be for businesses to scale.	High upfront costs	Moderate upfront costs	Low upfront costs
Water intensity	The volume of water required to operate within a particular industry. Industries that place higher demands on water may be more difficult to scale due to water availability.	High demand for water	Moderate demand for water	Low demand for water

Constraints and potential impacts

Cement and concrete materials were identified as having potential to scale but constrained by planning approvals and water usage.



Materials – cement and concrete

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that within the Study Area, Cement, Lime & Ready-Mixed Concrete Manufacturing has a much lower output per capita than the NSW average, suggesting that this is not a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. While some roles may require vocational training or an apprenticeship, the majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are extensive planning and approval requirements for extractive industries including quarries. Any new, expansion or re-opening of quarries must comply with the EPA Act (NSW) and have a site rehabilitation plan. Larger quarries may need to go through a State Significant Development process and smaller quarries will still require environmental assessments
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are moderate ongoing regulatory requirements for quarries that contribute to scaling costs. For example, ongoing obligations identified through the planning approvals process and specified Health & Safety requirements which businesses must comply with.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are medium upfront capital costs associated with cement and concrete businesses. For example, upfront investment is required for land acquisition, infrastructure and operating equipment which can make supply more difficult to scale.
Water intensity	High demand	Some demand	No demand	There is high demand for water to extract materials for cement and concrete from quarries. For example, water is required for dewatering, dust suppression and other processes.

Constraints and potential impacts

Growing the industry for cement and concrete could be used to support the development of other infrastructure in the region.



Other considerations

Community benefits

The cement and concrete industry plays a key role in the supply chain for renewable energy projects particularly in relation to foundations for renewable energy components. Wider economic benefits can be achieved through the use of local materials and quarries. Use of local materials is also preferable from a project delivery perspective to reduce costs and wider transport network impacts.

Beyond renewable energy projects, the industry can play an ongoing role in supporting infrastructure development and other industries such as housing, construction, transportation and utilities. A strong cement and concrete industry will contribute long term economic activity through providing the foundational materials required for development and growth and creating opportunities for upstream suppliers and the transport and construction sectors.

Quarries are relatively labour intensive so will support ongoing jobs in the region and can provide opportunities for unskilled workers in the region.

Transport costs

If cement and concrete aggregates are not able to be sourced from the local supply chain, this can add significant expense to the overall cost of projects. Aggregates are heavy, bulky materials and transportation cost can escalate as they are typically based on a cost per kilometre per tonne. Use of local suppliers can therefore reduce the financial impacts on projects, making them more cost effective.

The total demand for concrete aggregates across Stages 1 and 2 of the REZ projects has been estimated as approximately 1.2 million cubic metres. Assuming this is sourced from local quarries¹, road freight could cost approximately \$40 million². If this volume was unable to be sourced from the region, road freight costs could increase to over \$120 million.

Existing support

No specific support was identified for quarries through this study. Infrastructure Australia has highlighted the need for improved quarry supply to meet the demands of the construction industry. Their Infrastructure Market Capacity report outlined a number of opportunities for the federal government to address quarry supply shortages, particularly in regions experiencing high construction growth, such as New England.

Although approvals for large quarries are complex. Smaller quarries on adjacent land parcels may present simpler ways of utilising local materials to support project delivery by connecting GDPs and local stakeholders.

1. Local quarry assumed located approx. 200km from construction sites, out of region source quarry assumed to be approx. 650 km from construction sites (Marulan).

2. Based on 2030 forecast road freight cost (cents per tonne per km), https://www.bitre.gov.au/sites/default/files/is_090.pdf

Constraints and potential impacts

All feedback suggested that this is a critical sector to develop and support within the Study Area.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Skills shortages
- Unclear how to get involved

Support required:

- Grants
- Loans
- Business planning support



Local councils

- There was mixed feedback regarding the existing capacity of local quarries to meet demand generated from the REZ.
- All councils agreed there was increased discussion around quarry capacity in the region.
- Some councils identified new quarries already in the pipeline that could support the NE REZ projects. E.g. Wattle Vale quarry in Glen Innes
- There was general acknowledgement that planning requirements was the largest barrier to scaling the local supply.



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- There was a general view that it is preferable to source materials on site, and if not as close to the site as possible to reduce transport costs and traffic congestion
- Similarly, there is a strong preference for concrete batching on site given the complexity around concrete pours and timing
- There is some uncertainty around the process of council approvals for quarrying, particularly on site.

Summary

Materials for cement and concrete have potential to scale to meet demand from the NE REZ. Key constraints are low supply from existing quarries and extensive planning and approvals requirements that can mean new quarries take 5 to 10 years to open. Any quarrying undertaken by GDPs on site will reduce the impacts of the supply chain on the existing transport network but is unlikely to support ongoing employment opportunities.

The sector has potential to make a meaningful contribution to the local economy, and expansion will help to reduce supply chain risks associated with importing products from outside the Study Area. Support should be targeted at streamlining approvals processes and building local capability to meet the uplift in demand.

Constraints and potential impacts

Road aggregates were identified as having potential to scale with constraints relating to planning approvals and water usage

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that within the Study Area, Non-Metallic Mineral Mining has a much higher output per capita than the NSW average, suggesting that this is a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. While some roles may require vocational training or an apprenticeship, the majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are extensive planning and approval requirements for extractive industries including quarries. Any new, expansion or re-opening of quarries must comply with the EPA Act (NSW) and have a site rehabilitation plan. Larger quarries may need to go through an EIS process.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are moderate ongoing regulatory requirements for quarries that contribute to scaling costs. For example, ongoing obligations identified through the planning approvals and specified Health & Safety requirements which businesses must comply with.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are medium upfront capital costs associated with extracting road aggregates. For example, upfront investment is required for land acquisition, infrastructure and operating equipment which can make supply more difficult to scale.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is high demand for water to extract road aggregates from quarries. For example, water is required water for dewatering, dust suppression and other processes

Constraints and potential impacts

The road aggregates business could be expanded to support REZ delivery and ongoing maintenance of highways in the region



Other considerations

Community benefits

Similar to concrete and cement, the production of road aggregates locally can be used for site access roads and supporting infrastructure upgrades. Wider economic benefits can be achieved through the use of local materials and quarries. Use of local materials is also preferable from a project delivery perspective to reduce costs and wider transport network impacts.

Demand for road aggregates will peak during construction, before reducing significantly to support ongoing operations. Some of this additional capacity can be used to support other construction and infrastructure activities, providing ongoing low skilled jobs in the region.

However, the production from quarries will likely return to a baseline level in the longer term and may require ongoing environmental monitoring and site rehabilitation once production is no longer required. Due to this, smaller project specific quarries may be more appropriate that could support ongoing highway maintenance projects in the future.

Transport costs

If road aggregates are not able to be sourced from the local supply chain, this can add significant expense to the overall cost of projects. Aggregates are heavy, bulky materials and transportation cost can escalate as they are typically based on a cost per kilometre per tonne. Use of local suppliers can therefore reduce the financial impacts on projects, making them more cost effective.

The total demand for road aggregates across stages 1 and 2 of the REZ projects is approximately 4.1 million cubic metres. Assuming this is sourced from local quarries¹, road freight could cost approximately \$130 million². If this volume was unable to be sourced from the region, road freight costs could increase to over \$450 million.

Existing support

No specific support was identified for quarries through this study. Infrastructure Australia has highlighted the need for improved quarry supply to meet the demands of the construction industry. Their 'Infrastructure Market Capacity' report outlined a number of opportunities for the federal government to address quarry supply shortages, particularly in regions experiencing high construction growth, such as New England.

Although approvals for large quarries are complex. Smaller quarries on adjacent land parcels may present simpler ways of utilising local materials to support project delivery by connecting GDPs and local stakeholders.

1. Local quarry assumed located approx. 200km from construction sites, out of region source quarry assumed to be approx. 650 km from construction sites (Marulan).

2. Based on 2030 forecast road freight cost (cents per tonne per km), https://www.bitre.gov.au/sites/default/files/is_090.pdf

Constraints and potential impacts

GDPs identified that it is preferable to source road aggregates on site and therefore there may be limited scope for the local supply chain.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Skills shortages
- Unclear how to get involved

Support required:

- Grants
- Loans
- Business planning support



Local councils

- There was mixed feedback regarding the existing capacity of local quarries to meet demand generated from the REZ.
- All councils agreed there was increased discussion around quarry capacity in the region.
- Some councils identified new quarries already in the pipeline that could support the NE REZ projects. E.g. Wattle Vale quarry in Glen Innes
- There was general acknowledgement that planning requirements was the largest barrier to scaling the local supply.



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- There was a general view that it is preferable to source materials on site, and if not as close to the site as possible to reduce transport costs and traffic congestion
- There is some uncertainty around the process of council approvals for quarrying, particularly on site.

Summary

Road aggregates have potential to scale to meet demand from the NE REZ. Similar to cement and concrete, key constraints are low supply from existing quarries and extensive planning and approvals requirements that can mean new quarries take 5 to 10 years to open.

The sector has potential to make a meaningful contribution to the local economy in the longer term through ongoing input to construction projects, and expansion will help to reduce supply chain risks associated with importing products from overseas. Support should be targeted at streamlining approvals processes and building local capability to meet the uplift in demand.

Constraints and potential impacts

Steel fabrication has the ability to scale noting there are high up front costs and regulatory requirements

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that within the Study Area, Iron & Steel manufacturing has a higher output per capita than the NSW average, suggesting that this is a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. While some roles may require vocational training or an apprenticeship, the majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are a moderate level of planning and approval requirements for steel fabrication in the area. Although a significant amount of land is already zoned for industrial purposes, new businesses will still need to go through the relevant planning approval processes.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	Steel fabrication and reinforcement suppliers in must demonstrate their products meet relevant Australian standards for steel components and reinforcing. Steel reinforcement businesses must be accredited.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are high upfront capital costs associated with steel reinforcement businesses. For example, upfront investment is required for land acquisition, infrastructure and operating equipment which can make supply difficult to scale.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is relatively high demand for water in the steel fabrication process. For example water is used for cooling, heat dissipation and cleaning. However, depending on the facility the majority of this water may be recycled.

Constraints and potential impacts

The local steel fabrication industry would need to leverage support from Australian Steel Institute and consider where the region could have a competitive advantage in the steel supply chain



Other considerations

Community benefits

Increasing the supply of steel fabrication by local providers will be dependent on the supply chain for steel, and the ability of local businesses to secure the required volumes from steel producers and manufacturers from outside the region. Although most steel components will be imported, steel reinforcements for foundations can be sourced locally.

Scaling up the industry would deliver ongoing benefits to workers where businesses invest in training and development for employees to increase output and meet demand. Businesses may also invest in optimisation of workflows and new technology that increases productivity of these businesses.

Newly skilled workers and improved technology may increase capacity of the industry to shift to manufacturing other steel and metal products once the construction phases of NE REZ projects have ended. This will serve to strengthen domestic industrial capabilities and enhance local supply chains in line with the Australian Government's Future Made in Australia policy.

Transport costs

Similar to other materials, if steel products need to be sourced from outside the local region, there is potential for this to add significantly to renewable energy project costs due to the increased freight and transport charges. The steel fabrication output capacity in Australia is large, producing 1.6 million tonnes per annum, therefore it is anticipated that excess demand would be met from elsewhere in Australia.

Existing support

The Australian Steel Institute (ASI) provides information on various grants and funding opportunities available at both the federal and state level. This includes the Local Jobs Program that brings together expertise, resources at access to funding at the local level to support job seekers in regional areas.

The NSW government has also endorsed a number of ASI opportunities to protect local manufacturers through procurement initiatives. Fabricators supplying to the NSW Government are supported through tenders being required to be broken down into smaller parts to better enable small businesses to participate.

The ASI is holding roundtables to discuss local steel supply and key stakeholders from the NE REZ should aim to be part of this.

1. <https://www.steel.org.au/Membership/media/Australian-Steel-Institute/PDFs/Steel-Industry-Capability-document-140624.pdf>



Constraints and potential impacts

Local sourced steel will largely be in the form of steel reinforcements for foundations. The ASI is exploring additional avenues for local steel supply.

Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Skills shortages
- Unclear how to get involved

Support required:

- Grants
- Loans
- Business planning support



Local councils

- There was mixed feedback regarding the existing capacity of local quarries to meet demand generated from the REZ.
- All councils agreed there was increased discussion around quarry capacity in the region.
- Some councils identified new quarries already in the pipeline that could support the NE REZ projects. E.g. Wattle Vale quarry in Glen Innes
- Steel fabrication was noted to have a high upfront cost
- There was general acknowledgement that planning requirements was the largest barrier to scaling the local supply.



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- The bulk of steel within a wind farm is the tower. Keppel Prince is the only potentially operating local supplier and have recently announced their facility – which supplies two of the seven tower sections - may be mothballed. All remaining steel comes from overseas.
- Steel reinforcements for foundations can typically be sourced locally – All Threads is a key supplier.
- It was also noted that the Australian Steel institute is having a roundtable to explore local options for local steel supply.

Summary

Steel fabrication has potential to scale to meet demand from the NE REZ. Key constraints include high upfronts costs and moderate planning and approvals requirements.

The sector has strong potential to make a meaningful contribution to the local economy beyond the construction phases of the NE REZ. Leveraging support from ASI, and a strong baseline output capacity, local businesses are in a good position to be able to scale to meet demand. Investment in steel fabrication and will also strengthen domestic manufacturing capabilities in the region.

Constraints and potential impacts

Warehousing and storage can be scaled to respond to the NE REZ if demand exists for these facilities

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that within the Study Area, non-residential property operators have a higher output per capita than the NSW average, suggesting that this is a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. The majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are a moderate level of planning and approval requirements for new warehousing in the area. Although a significant amount of land is already zoned for industrial purposes, new warehouses will still need to go through the relevant planning approval process.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are no major ongoing regulatory requirements that would generate substantial costs that would restrict the ability of a local businesses to grow.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There is a moderate level of upfront cost required to establish or expand a warehousing business associated with purchase of or leasing of the land and obtaining development approval as required.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is low demand for water from the warehousing industry.

Constraints and potential impacts

Warehousing and storage delivery will need to be planned carefully to deliver ongoing community benefits



Other considerations

Community benefits

Most generation projects will use their project site for storage. Demand for warehousing would likely only be at key ports of entry to stage delivery of specialized components or relate to specific components that cannot be stored on site.

Legacy benefits to the region from increasing the supply of warehousing may be limited. Although supply of warehousing is relatively low cost and easily scalable, it may result in oversupply of warehouse space for which there are minimal ongoing uses. This may also result in environmental impacts such as habitat destruction and loss of biodiversity. To deliver community benefits warehousing should be planned with repurposing and flexibility in mind. Future uses could support the freight or agricultural industries.

The ongoing management of these facilities will only contribute a small number of jobs to the local market noting this is a strength of the region.

Transport costs

Warehousing can aid the delivery of projects in some cases noting double-handling generally adds to costs. Ensuring just-in-time provision of specialized project components to site will be key to project delivery programs. An increase in warehouse supply therefore may be necessary to support the NE REZ projects, particularly for components with long procurement processes, that require specialized transportation or cannot be stored on site. Lack of available warehousing may impact the cost of these components due to delivery delays, higher transport costs, inventory management issues and quality control problems.

Existing support

The NSW Government amended the State and Regional Development SEPP to temporarily allow more warehouses to be assessed as state significant development (SSD). This provides clearer, more streamlined and certain planning pathways for warehouse development to meet the growing demand in the state.

The Government has also prepared the Industrial Lands Action Plan outlining an approach to secure, manage and monitor the supply of industrial lands across NSW. It has established the Employment Land Development Program to help improve the supply of industrial lands across NSW, aiming to:

- Support a pipeline of zoned industrial land across NSW
- Provide increased certainty for industry
- Support access to jobs close to home, particularly in regional NSW

The revised planning pathways should help to accelerate the delivery warehousing where needed.

Constraints and potential impacts

Warehousing and storage on-site, followed by lay down areas at Ports, was preferred by GDPs.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Lack of local supply chain partners
- “Confidence that there will be sufficient and affordable electricity to operate”

Support required:

- Planning reform/approvals
- Early information
- Grants



Local councils

- Armidale is the only Northern Council to have a relatively high supply of zoned land for warehousing and storage while others could face a conflict with existing manufacturing demand.
- All Northern Councils struggle to create awareness for local business development and opportunities.
- There are standard regulatory and licensing requirements and upfront costs across councils.



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- Solar farms need lay down areas whereas wind farms can require storage at Ports.
- One GDP stated that for wind farms, there was a strong preference for on site warehousing and storage as storage at Ports was expensive and storing offsite required a high level of coordination and risk.

Summary

Warehousing and storage should be scaled if future uses can be planned beyond the delivery of the NE REZ, though individual sites must be cognisant of the future demand with repurposing in mind. Key strengths of the sector include a strong existing baseline, relatively low capital costs, and the availability of appropriately zoned land in the region.

In the longer term, this may be a lower value industry in terms of jobs and ongoing output, however, further consultation with developers to understand ongoing warehousing needs and the potential to for warehouses to be repurposed for agricultural or other freight needs may make it worthy of investment.

Constraints and potential impacts

Transportation has several factors relating to output, workforce and regulation that would help with scaling this industry

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that the Study Area has a comparatively high output per worker for road transport, suggesting that this is a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. While workers will need the appropriate licences to operate heavy vehicles, the majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are low planning approval requirements for transport businesses, as they do not require the development of significant infrastructure.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are moderate ongoing regulatory requirements for running heavy vehicle and freight businesses. These include compliance with National Heavy Vehicle Regulations which cover vehicle standards, driver accreditation and health and safety requirements.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are high upfront costs associated with the purchase of heavy freight and specialised vehicles required to transport materials to the NE REZ. Vehicles are often manufactured overseas and are therefore subject to import costs and potential delays if additional vehicles are required.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is a moderate demand for water across this industry. Although water is not a direct input to the supply of heavy vehicles, stakeholders raised concerns about the water requirements for washing and maintaining large fleets of vehicles.



Constraints and potential impacts

Transportation presents an opportunity to provide jobs, supporting the delivery of the NE REZ and responding to the ongoing increase in freight demand

Other considerations

Community benefits

Scaling of transport businesses to meet demand will deliver additional jobs in the region and can be used to support other infrastructure projects in future. The New England Highway is also a major freight route, serving as the primary inland route between Brisbane and Sydney. Investment in freight and transport businesses along this route will support the growing freight task, which is expected to grow approximately 26% between 2020 and 2050.

Transportation of oversized components such as wind turbine components is currently limited to a small number of specialized providers who have the capability to operate across the state. Given the higher entry costs and skills for this service local businesses may be more suited to moving bulk and construction materials. Unless grants can be provided to aid the procurement and training for more specialized vehicles.

There are currently a shortage of truck drivers across the industry so incentives may be needed to make these jobs attractive to the local workforce. Outcomes from the Training

and Skills Study may help to guide a training program for this industry.

Transport costs

It is expected that heavy vehicles will be sourced from both within the region and across the east coast more broadly depending on the origin of the goods to be moved. Transport costs are largely dependent on the number of kilometres travelled rather than the cost of the vehicle itself. Average rates for transporting general freight for both medium and long distances are shown below.

Although longer distances can be more efficient this is generally offset by the longer distance travelled.

	Medium trip	Long trip
Distance	c. 150-200km	c. 800km
Cost per tkm	\$0.125	\$0.08-0.10

If there is insufficient capacity among existing vehicles to move componentry and goods required for the NE REZ projects, this may

cause delays to construction and increase project costs.

Existing support

Existing policies and initiatives largely focus on developing the transport infrastructure rather than providing direct support to freight and haulage businesses. A new NSW freight plan is being developed by Transport NSW, with the previous plan covering 2018 to 2023.

Previous initiatives have involved the government subsidising the cost of Truck Licence training to reduce entry costs. Connections will need to be made with local education and training providers so these courses are accessible to people in the region.

1. <https://www.freightaustralia.gov.au/sites/default/files/documents/commodity-report--general-goods.pdf>

Constraints and potential impacts

Raw materials deliveries are expected to generate the most traffic around project sites and will likely be supplied locally.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Lack of local supply chain partners

Support required:

- Early information
- Grants
- Planning reform/approvals



Local councils

- Rail infrastructure in southern councils is adequate, however loading infrastructure is a current constraint for freight transport.
- Wind turbine transportation via rail is currently not feasible within southern councils.
- Shortage of trained drivers with the necessary licenses



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- Transportation is one of the biggest cumulative impact risks for any REZ.
- Over mass/size vehicles in particular have the biggest coordination and cumulative impact noting the associated transportation services are only undertaken by specialist providers
- It is critical that there is up front planning around routes is completed ahead of construction.
- Raw materials deliveries will generate the most vehicle movements – it is a fair assumption that these vehicles will be supplied locally

Summary

Transportation has potential to scale to meet demand from the NE REZ. Key strengths being that it has a strong baseline workforce, requires minimal training and is not subject to major planning approvals to scale.

The sector also has potential to make a meaningful contribution to the local economy in the longer term, being strategic located along the NE Highway.

Identifying ways to support transportation businesses to scale to meet growing demand to meet both project requirements and the growing freight task is required. The cost of inaction will be higher costs across the supply chain as transport is sourced from further afield.

Constraints and potential impacts

Scaling Plant & Equipment will require an understanding of availability across NSW compared to upfront costs and procurement timeframes

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that the Study Area has a similar output per worker for Rental & Hiring services for machinery and equipment, suggesting this is neither a strength nor weakness for the region.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. While workers will need the appropriate licences to operate heavy machinery, the majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There is a low level of planning and approval requirements for businesses that rent and hire plant and heavy equipment, as they do not require the development of significant infrastructure.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are low ongoing regulatory requirements for plant and equipment businesses. Some plant and equipment must be registered, and businesses are required to comply with health and safety regulations, but these do not act as a barrier to increasing the supply of equipment.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are high upfront costs associated with the purchase of plant and equipment. For example, the cost of cranes, excavators and piling & drilling equipment can range from \$100,000 to \$1,000,000 per piece of equipment.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is a moderate demand for water across this industry. Although water is not a direct input to the supply of equipment, stakeholders raised concerns about the water requirements for washing and maintaining this equipment.

Constraints and potential impacts

Local businesses can provide standard civil plant and equipment with more jobs created through training people to operate this machinery



Other considerations

Community benefits

Investment in plant and equipment to meet demand can support local content within the region. Although specialized plant like cranes and concrete batching plants will be sourced from the state and beyond. The use of civil plant for earthworks can be provided and operated by local suppliers. There may also be opportunities to repurpose plant and equipment that is currently being used for mining projects.

Similarly this creates opportunities for workers with skills operating heavy and advanced machinery to transition away from the mining sector.

For specialist equipment local workers could be trained to use this equipment. This may create further work opportunities on other major projects beyond the NE REZ. Outcomes from the Training and Skills Study may help to guide training program for this industry.

Transport costs

Sourcing plant and equipment from outside of the region should ideally only occur for specialized equipment to help reduce project costs.

Moving plant and equipment long distances will add transport costs and time to project delivery. If new equipment needs to be sourced from overseas there may be timing and supply chain impacts that could impact programing and costs. Imported machinery will also often require local configuration by specialist engineers that are currently in short supply.

Existing support

No specific support was identified to support local businesses meet the demand generated for plant & equipment. The latest Infrastructure Australia report on Infrastructure Market Capacity recommended that the Australian Government, in partnership with state and territory governments, should continue to expand construction non-labour supply through exploring opportunities to co-ordinate national demands for equipment facing strong global competition and long lead times in light of the energy transition.

EnergyCo and GDPs would assist in the coordination of the use of plant and equipment for the NE REZ and aim to utilise and grow local capabilities for less specialised plant. Connections will need to be made with local education and training providers so training is accessible to people in the region

Constraints and potential impacts

Tower cranes were identified by GDPs as a major supply chain constraint that will require coordination across the REZ.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- “Large out of town contractors taking all the work”

Support required:

- Grants
- Easier procurement processes
- Local contractor support



Local councils

- Southern councils have several small businesses that have the potential to scale, however the high cost of investing in land has stunted growth.
- Northern councils also have businesses available to scale, as well as the opportunity to lease equipment from councils.
- While there are low requirements for upskilling, local apprentices are in short supply.



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- General civil plant required for earthworks is ripe for local content as it is not particularly specialised.
- Cranes, particularly main tower cranes (LG1750) are a key supply constraint. The demand for these will need to be coordinated across the REZ.
- The number of cranes required is linked balancing availability and ensuring earthworks / pre-assembly are complete. Given hiring costs cranes cannot be sat idle

Summary

Plant and equipment has potential to scale to meet demand from the NE REZ. Key strengths included low requirements for upskilling, no planning and approval requirements and limited ongoing regulatory requirements that can add to business costs.

Scaling of the sector in the local region could help transition businesses from mining to renewables. However, co-ordination and planning of equipment requirements is needed now, to avoid delays and supply chain issues associated with sourcing additional equipment from overseas.

Constraints and potential impacts

Security & surveillance has minimal barriers to scaling provided capability of the industry can be improved

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that within the Study Area, workers in the Public Order & Safety sector have a lower output per capita than the NSW average, suggesting that this is not a strength of the area.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. The majority of security and surveillance positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are no planning and approval requirements for security and surveillance businesses.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are some ongoing requirements for businesses in the security industry that add to operational costs such as licensing requirements for individuals and businesses, accredited training, and background checks for workers.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are low upfront costs for establishing security and surveillance businesses as they do not require substantial investment in land or infrastructure.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	There is low demand for water from security and surveillance services

Constraints and potential impacts

Security & surveillance can be scaled to respond to demand but is not seen as key industry in delivering sizeable community benefits



Other considerations

Community benefits

Security throughout construction is mainly a focus when higher value components are on site (HV equipment, plant, large components). Security requirements can also be linked to workforce accommodation on site.

Security and surveillance roles can provide ongoing job opportunities for unskilled workers, but are not expected to provide significant ongoing community benefits. The need for this industry will mostly be throughout construction.

In operation security is more likely to be managed remotely using surveillance cameras.

Transport costs

Security and surveillance is predominantly a labour-based sector. If additional security personnel are required to be sourced from outside the region there may be additional costs associated with relocating workers. However, given the volume of projects in the region it is expected that jobs would be available throughout the construction phase of the REZ.

Existing support

No specific support was identified through this study to support security and surveillance businesses scale their operations for meet the demand of the NE REZ projects. However, the NSW Government provides fee-free training for Certificate II in Security Operations through approved training providers that is designed to support priority industries.

Constraints and potential impacts

While security presents an opportunity for local businesses, projects may rely on cameras and remote security services in the longer term.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- N/A

Support required:

- N/A



Local councils

- Opportunity to scale businesses due to the lack of a current contracted security presence in southern councils
- Opportunity to provide mines with security fencing, although this will involve high upfront costs



Generation Design Partners

- Security measures can vary depending on whether workforce accommodation is on site
- This is a lower priority in terms of planning, requires a relatively small number of people and has a low contract value.
- There was some preference expressed for using cameras and remote security services rather than security staff located on site.

Summary

Security and surveillance has potential to scale to meet demand from the NE REZ. Key strengths included low requirements for upskilling, no planning and approval requirements and low upfront costs. There are other emerging industries in the Study Area such as Controlled Environment Agriculture that will require similar security and surveillance services. This could support collaborative training programs and business growth.

Scaling of the sector in the local region could provide ongoing opportunities for low skilled workers, however, it is not expected to have significant ongoing benefits as the size of the supply chain task in operation is relatively small with most sites monitored remotely using technological solutions.

Businesses looking to scale should take advantage of the fee-free courses currently provided by the NSW Government.

Constraints and potential impacts

End-of-life presents an ongoing operational need that logically would take place in New England if facilities can be delivered in time and to scale

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that Waste collection, Treatment & Disposal services in the Study Area are similar, if slightly underrepresented, compared to the NSW.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Post secondary education is not typically required for most positions across this industry. The majority of positions do not require any formal training, such that roles will be easier to fill than those requiring significant qualifications
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are extensive planning requirements associated with new and expanding waste disposal sites. Most sites will require preparation of an Environmental Impact Assessment to evaluate air, water quality, noise and traffic impacts of new and expanded sites.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are moderate ongoing regulatory requirements that may impact the ability of the industry to scale. Waste disposal sites require an environmental protection licence from the NSW EPA. They must adhere to strict operational standards and undertake ongoing monitoring and reporting to demonstrate compliance with environmental standards.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	There are significant upfront costs associated with setting up new waste disposal facilities. These can include land acquisition, planning and environmental approvals and construction of the facility.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	Waste disposal facilities are considered moderately water intensive. Depending on the type of waste disposal, water may be required for cleaning and maintenance of vehicles and equipment, and in some cases an input into water processing.

Constraints and potential impacts

A circular economy approach can deliver ongoing benefits to the region and create a local industry that supports the decommissioning and repowering of generator projects



Other considerations

Community benefits

Given NSW is still in the early stages of the renewable energy transition most projects have not yet reached end of life. An industry will need to be established to manage the waste generated by the decommissioning or repowering of these projects.

Noting the waste management market is dominated by a small number of major suppliers. Local facilities will be required for the NE REZ that can provide jobs in the region.

These new waste streams presents opportunities to implement a circular economy within the region, which would focus on minimising waste disposal and landfill through re-using, recycling and repurposing waste materials from the projects. Circular economy opportunities are presented in the NE REZ Waste and Circular Economy Study.

Transport costs

The cost of sending waste to landfill and waste disposal sites varies depending on the distance, volume and local regulations. Transport costs typically account for the majority of waste disposal costs. If there is insufficient capacity at local sites to accommodate waste, projects will need to send their waste elsewhere, adding additional transport costs depending on the distance to the next available site and the type of waste.

Feeding waste streams back into the local supply chain for future uses may also reduce transportations needs.

Existing support

The 2024 National Waste Policy Action Plan identified a target to reduce total waste generated in Australia by 10% per person by 2030. The Action Plan identifies the construction and demolition waste stream as presenting the greatest opportunities to meet this target.

The NSW Waste and Sustainable Materials Strategy 2041 includes \$356 million in funding to deliver priority programs and policy reforms to supporting businesses reduce waste and increase recycling.

The NSW EPA has a number of grants available to support the waste industry. Business Rebates are available to assist businesses avoid, reduce and recycle waste, providing up to 50% to a maximum of \$50,000 for new equipment and technologies.

Although no longer running, previous grants programs include the Major Resource Recovery Infrastructure Program which was aimed at accelerating and stimulating investment in waste and recycling infrastructure. The program provided individual grants of \$1 million to \$10 million for councils, with a priority focus recovery of recyclables from businesses and households.

Constraints and potential impacts

Lack of a well-established recycling process for these projects present an opportunity to increase circular economy businesses within the region.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- N/A

Support required:

- N/A



Local councils

- Across all councils there is little to no local capacity for large scale industrial or commercial waste disposal.
- Local councils lack the fiscal capacity for high upfront costs to construct new landfill facilities without private or government support.
- Uralla has identified an opportunity to expand the landfill of construction waste and packaging cardboard to meet potential REZ demand.
- There is a potential opportunity to set-up recycling facilities in LGA's



Generation Design Partners

- There was a view that the industry is not well established for the recycling of these projects.
- Wind turbines have the greatest potential for recycling – ~90 per cent of a turbine is recyclable – but dismantling them requires the use of cranes.
- Cranes will also be required to dismantle projects when they are decommissioned

Summary

End-of-life services has potential to scale to meet demand from the NE REZ and enhance the local industry. This supply chain component has the benefit that major demands will not be for 20 years so there is time to grow this industry. Key constraints identified included extensive planning and regulatory requirements, high upfront costs and a lack of understanding of waste requirements as very few renewable energy projects have reached repowering or decommissioning.

Investment in the sector is required to meet the growth in demand and the changes in waste types that are expected to come from renewables projects. Investing in circular economy opportunities to reuse, recycle and repurpose resources will provide ongoing jobs and community benefits in the region.

Constraints and potential impacts

Opportunities for Construction services exist for specific technical disciplines that can provide benefit and efficiency from being based locally

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that the output per worker in Construction services within the Study Area are similar compared to the NSW, suggesting a reasonable baseline from which to scale.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Construction workers do not typically require tertiary qualifications; however, they will often undertake apprenticeships and complete additional training for specific trades and many firms will be led by workers with university degrees which can be a requirement for compliance and sign off.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are no planning and approval requirements associated with the provision of construction services.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are minimal regulatory requirements for construction services. Construction workers require a white card in NSW and certain services may need certification relating to their specific discipline.
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	The main component for construction services is labour costs and therefore considered to have relatively low upfront costs compared to other parts of the supply chain.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	Labour supply is considered the main component of construction services and therefore does not contribute significantly to water demand. However, there may be site maintenance and cleaning requirements that draw on the local water supply.



Constraints and potential impacts

Specific construction services can be scaled provided they form industry contacts and capabilities to respond to developer or major contractor tender packages

Other considerations

Community benefits

The ability for local businesses to provide construction services will vary. Given the complexity of approvals developers tend to use global engineering firms for these services. However, certain environmental services can be delivered more efficiently locally such heritage, geotechnics, surveying, on-site project management and local road upgrades.

The increased demand for these construction services presents opportunities to support the energy transition. Roles in the mining sector, such as heavy equipment operators, blasting technicians, surveyors, engineers and safety officers, could transition to renewables projects providing ongoing jobs that would otherwise be lost as coal mines close.

Many of these businesses exist in the region and could respond to increased demand through the REZ stages. Noting they will need to form connections with GDPs and major contractors to ensure they have access to the various tender packages.

Transport costs

Construction services is predominantly a labour-based sector. If additional workers are required to be sourced from outside the region there may be additional costs associated with relocating workers, such as offering higher salaries or providing housing support. On the other hand, given the volume of projects in the region it is expected that long term jobs would be available for workers that enable permanent moves through the construction phase of the REZ.

Existing support

Construction services have potential to scale to meet demand from the NE REZ. Key constraints are expected to be tied to the broader supply chain, with construction reliant on workforce, transport and equipment.

Ongoing community benefit will likely come from supporting growth of local businesses and providing ongoing, well-paid jobs to locals. Noting the demand for these jobs will decrease once the REZ is delivered

Incentives to invest in the workforce are presented in the NE REZ Workforce Study.



Most major developers and contractors use ICN to source to identify and source local services. Local businesses will need to be educated in ICN's processes / systems and prepared for more complex tendering processes and contracts than they would have been exposed to in the local market.

Constraints and potential impacts

Specific construction services, such as land surveying and site management, have the greatest opportunity to be sourced locally.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Regulation and planning
- Unclear how to get involved
- Skills shortages
- Lack of supply chain partners

Support required:

- Easier procurement processes
- Early information
- Business planning support



Local councils

- There is a workforce and skills shortage, with a high demand for apprentices and qualified trades people to provide on-going training.
- Uncertainty about future demand creates difficulty in small businesses to plan for growth



Generation Design Partners

- Planning and environment services are complex and require specialized expertise which is rarely available locally.
- Heritage, cultural heritage, soil testing and geotechnical are often less complex and could be sourced locally.
- Local/site road upgrades could be done by local design teams and contractors and/or by council teams
- Land surveying and site management should be procured locally.

Summary

Construction services have potential to scale to meet demand from the NE REZ. Key constraints are expected to be tied to the broader supply chain, with construction reliant on workforce, transport and equipment. It should be noted that only certain construction services will be attractive to larger consultancies and contractors.

Ongoing community benefit will likely come from supporting the growth of local businesses, and providing ongoing, well-paid jobs to locals. Noting the demand for these jobs will decrease once the REZ is delivered

Incentives to invest in the workforce are presented in the NE REZ Workforce Study.

Constraints and potential impacts

Catering, cleaning and hospitality services can capitalise on the additional demand relating to the NE REZ workforce

Criteria	Scaleability scoring			Rationale
	Low	Medium	High	
Existing capacity	Much lower output per worker than NSW average	Similar output per worker to NSW average	Much higher output per worker than NSW average	The baseline economic assessment identified that the output per worker in Catering and hospitality services within the Study Area are similar compared to the NSW, suggesting a reasonable baseline from which to scale.
Workforce skills required	Predominantly tertiary educated	Moderately skilled workforce	Low skilled workforce	Catering and hospitality services do not typically require tertiary qualifications and although additional training exists this is not usually a requirement to work in the industry.
Planning and approvals required	Extensive planning requirements	Moderate planning requirements	No/low additional approval requirements	There are no planning and approval requirements associated with the provision of catering and hospitality services.
Regulatory and licensing requirements	Complex regulatory environment	Moderate regulatory requirements	Minimal regulatory requirements	There are minimal regulatory requirements for catering and hospitality. Catering companies will be required to meet food hygiene standards and laundry services have some regulation on the products that can be used
Upfront costs	High upfront costs	Medium upfront costs	Low upfront costs	The main component for catering hospitality services is labour costs and therefore considered to have relatively low upfront costs compared to other parts of the supply chain.
Water intensity	High demand for water	Moderate demand for demand	Low demand for water	Although water is used in food production and laundry services the quantities used are low when compared to other industries.

Constraints and potential impacts

Catering, cleaning and hospitality represent a key supply chain sector where local business can be used. Certainty regarding the growth in workers in the area can support the planning of local businesses.



Stakeholder feedback



Local business feedback

Constraints to working in the energy sector:

- Unclear how to get involved
- Lack of supply chain partners

Support required:

- Easier procurement processes
- Early information
- Business planning support



Local councils

- Councils identified that there was opportunity for growth given the influx of workers to deliver the REZ
- Uncertainty about future demand creates difficulty in small businesses to plan for growth



Generation Design Partners

- A key supply chain component where local companies can be used.
- Partnerships have been formed with local businesses on others REZs

Summary

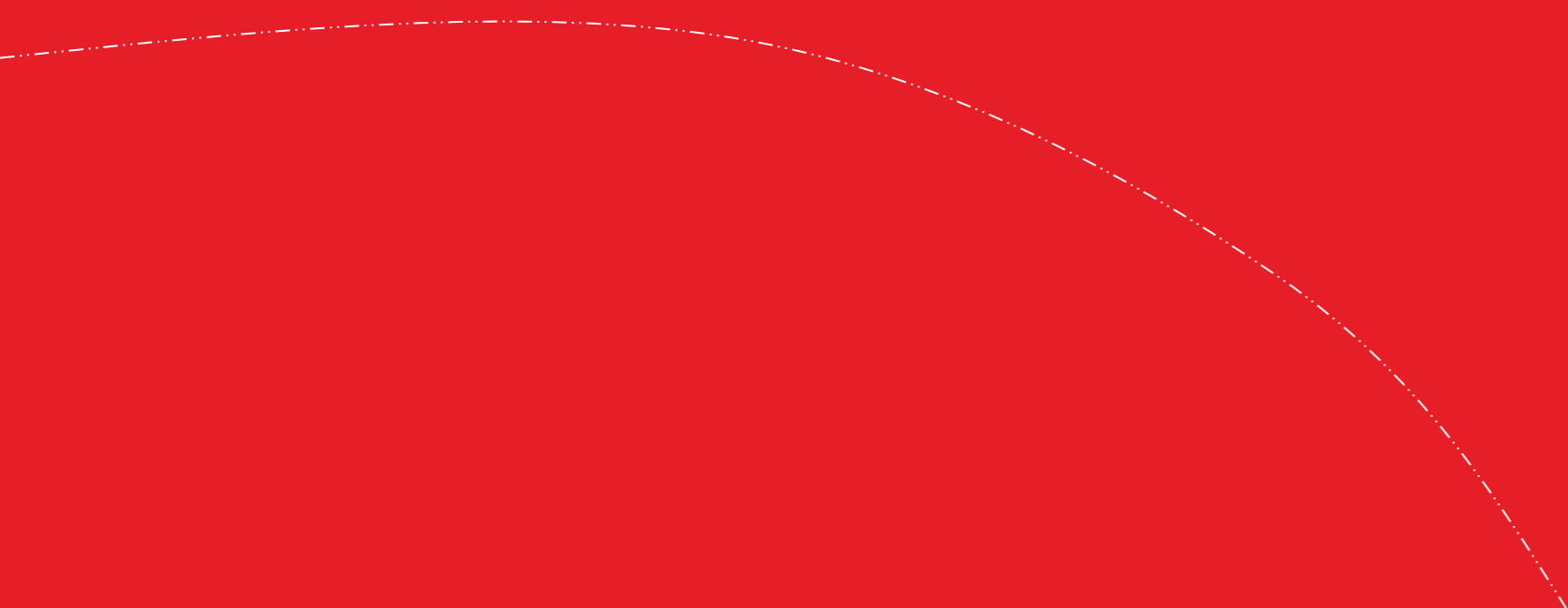
Catering and hospitality services have potential to scale to meet demand from the NE REZ. Key constraints are expected to be tied to demand as these services will only be in high demand where workforce accommodation is located. Given the temporary nature of this demand services may need to be setup flexibly (food trucks, temporary stalls) rather than setting up permanent infrastructure.

Ongoing community benefit will likely come from scaling local businesses than can then support more staff. Noting the demand for these jobs will decrease once the REZ is delivered.

Incentives to invest in the workforce are presented in the NE REZ Workforce Study.

Due to the significant nature of this topic, workforce accommodation requirements for the New England REZ and associated opportunities have been addressed as part of a separate detailed study (Workforce Accommodation Study, Urbis 2025).

Opportunities



Opportunities

The local business surveys highlighted that the local businesses would like to capitalize on the opportunities presented by NE REZ projects, but need some support to do so.

A total of 42 local businesses across core and supporting sectors responded to a survey which asked questions about their participation in renewable energy projects (see Appendix E for full methodology and results).

Of these 42 businesses, 88 per cent indicated that they were interested in working on and supporting renewable energy projects (the remaining 12 per cent stated that they were uncertain). Almost half of these businesses had already been involved in energy infrastructure projects.

Businesses surveyed did identify constraints in participating in renewable energy projects. These constraints included:

- Regulation and planning approvals (9 businesses)
- Unclear on how to get involved (17)
- Skills shortages (6)
- Lack of local supply chain partners (5).

Respondents to the survey were asked how they could be supported to capitalise on the opportunities presented. The results of these responses are in figure 31, and demonstrate that there are a range of opportunities to support local businesses be involved in the delivery of the NE REZ and deliver local community benefits.

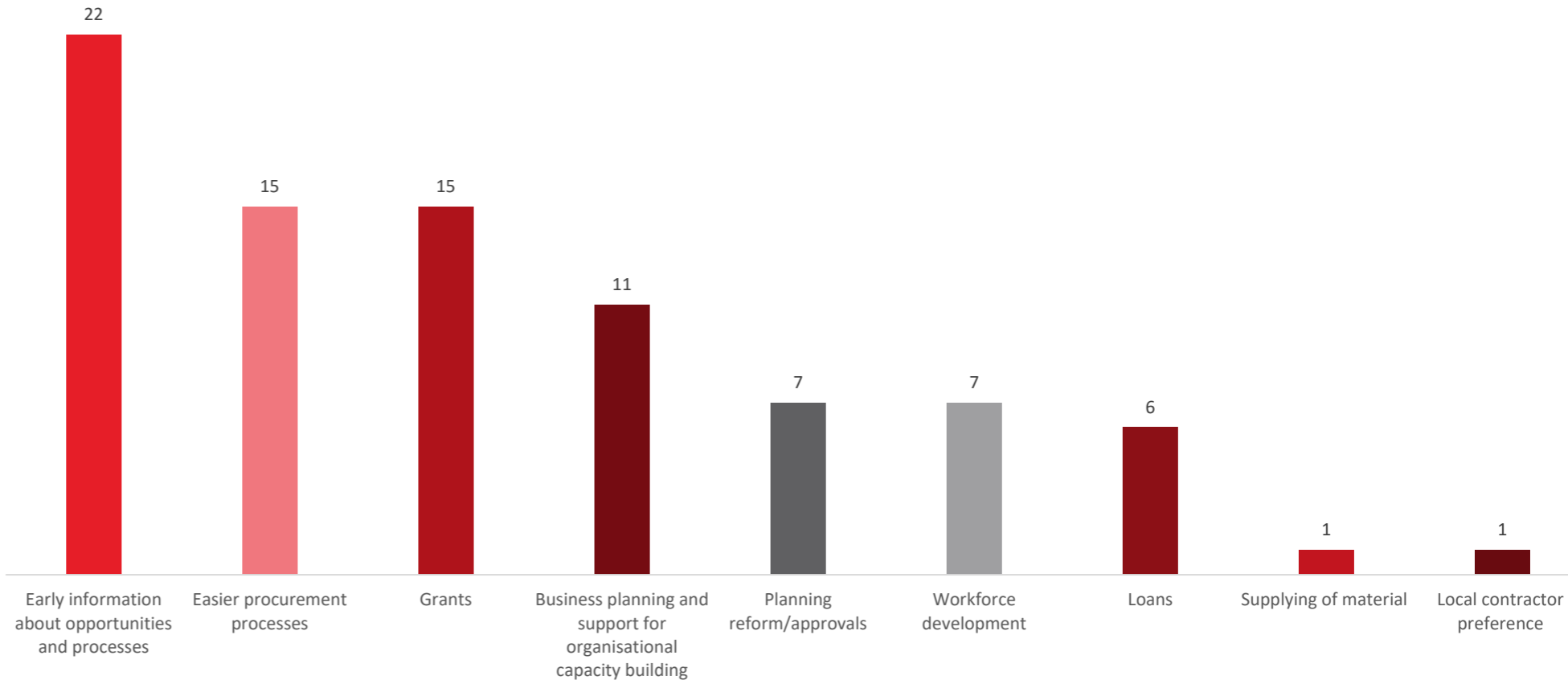


Figure 31: Local business survey results – supports required

Potential government actions



Potential Government Actions

Based on these survey results as well as the work undertaken to date, we have identified potential supports for local businesses

Based on the work completed to date, including surveys and feedback from local councils, we have identified ten potential support streams which are described in more detail on the slides 93 to 100:

- Local business forums
- Business planning support
- Local supplier database
- Opportunities register
- Small grants programs
- Low-cost loans
- Local content requirements
- Simpler procurement processes
- Simplification of planning and approvals
- Free training and skills development.

Ultimately a mix of these supports will be most effective, but action to establish these support mechanisms is required now to ensure that local businesses can meaningfully contribute to the local supply chain.

Potential Government Support

Local business forums and business planning support should be commenced as soon as possible to prepare for project delivery

Local Business Forums

Background

Public forums where local business owners and staff can come together to be briefed on opportunities to participate in the delivery of the NE REZ. This could include:

- Dissemination of information relating to timelines and specific NE REZ projects
- An outline of the opportunities for local businesses across the project lifecycle and the likely increase in capacity required across key industries
- A briefing on procurement processes and how to engage with different levels of government
- Assisting local businesses in receiving other government support (potentially including some of the supports outlined in this section).

A regular 'business newsletter' could form part of this initiative, which could be developed and distributed to businesses who register, covering the points outlined above.

Responsibility

This could be developed in conjunction with EnergyCo, other government agencies, ICN and Business NSW.

Timing

Our stakeholder consultation and the results of the business survey suggest that there is a lack of knowledge across the supply chain on the overall program of works, what will be required to deliver the NE REZ projects, what opportunities there may be for local business and how local businesses may position themselves to get involved.

This means that local business forums should be held across the next 12 months to prepare for project delivery, then periodically across the delivery of the NE REZ so that local businesses can be updated as well as share case studies and lessons learnt.

Business advice and support

Background

Ongoing business support may be useful to small and medium enterprises in the Study Area to directly assist them with capitalizing on the opportunities presented by the NE REZ. This would involve directly working with businesses to:

- Support them with the development of business plans
- Assist with procurement and tender processes
- Assist with meeting and achieving regulatory and approvals requirements
- Assist them with applications for Government support
- Coordinate and linking complementary businesses with one another

They may be particularly useful in assisting small scale businesses that currently exist in the region expand as well as move into the new workstreams that may be provided as part of NE REZ projects.

Responsibility

Business planning support is already provided by the Service NSW Business Bureau (see case study on the next slide). A specific program for the NE REZ could be provided by them or by EnergyCo, other government agencies and industry.

Timing

This service would start as soon as possible and be ongoing through the life of the NE REZ.

Potential Government Support

Service NSW Business Bureau Case Study

Summary

The NSW Government has launched the Service NSW Business Bureau to simplify business operations by reducing red tape, aiding navigation of government processes, and enhancing growth opportunities for small business owners. The bureau offers a range of services, including:

- Helping businesses prepare capability statements to showcase their strengths and capabilities.
- Guiding businesses through the procurement process to engage with government projects
- Providing one-on-one guidance through the Business Concierge service, which helps businesses navigate government processes, apply for licenses and permits, and access support to expand locally and overseas
- Receive independent business advice from Service NSW Business Connect during one-on-one session free of charge to seek suitable advisors, access resources on relevant topics such as business planning.

Objectives

- **Start Business:** Provide guidance and resources for starting a new business.
- **Opportunities to Grow:** Identify and leverage opportunities for business growth.
- **Adapt to New Challenges:** Offer tailored advice to help businesses adapt to changing environments.
- **Business Planning:** Assist with creating comprehensive business plans.
- **Marketing:** Provide marketing strategies and support.
- **Cashflow Advice:** Offer advice on managing and improving cashflow.
- **Redeem Vouchers:** Facilitate the redemption of business-related vouchers.
- **Online Access:** Provide services through the Service Business Bureau app for convenience and accessibility.

Service type

Type	Details
Service NSW Business Connect	<p>Assist you through every phase of the business journey.</p> <ul style="list-style-type: none"> • Services available across NSW • Businesses can access up to 8 hrs of support each financial year (across all industries) • Book webinars, online workshops etc. and connect with other businesses • Access online resources (podcasts, tools, webinars etc.) • Book an independent advisor to get free advice
Service NSW Business Concierge service	<p>Concierge service offers personalised, one-on-one guidance at every stage of the business journey, available via phone, online, or face-to-face.</p> <ul style="list-style-type: none"> • Help with navigating government regulations and processes • Assistance with applying for licenses/ permits • Support for selling to government • Access to resources for local and overseas expansion • Connection to mental health support • Disaster recovery assistance <p>Additional resources and support for:</p> <ul style="list-style-type: none"> • Women in business • Multicultural businesses • Aboriginal and Torres Strait Islander businesses

Potential Government Support

A local supplier database and opportunities register could be set up ahead of procurement processes commencing

Local Supplier Database

Background

A local supplier database or register of local businesses that are able to contribute to the supply chain could be established to assist GDPs procure locally. This could take the form of an online portal and may also present an opportunity to work with procurement agencies such as the Industry Capability Network (ICN) New South Wales and the Indigenous Chamber of Commerce.

Responsibility

These would be run by agencies such as ICN and the Indigenous Chamber of Commerce with assistance from EnergyCo and other government agencies.

Timing

Agencies such as ICN and the Indigenous Chamber of Commerce hold local supplier information. EnergyCo could commence conversations immediately with ICN and the Indigenous Chamber of Commerce as to how best to leverage existing resources in establishing a local supplier database.

Opportunities Register

Background

Complimenting a local supplier database, an opportunities register could be established in which Energy Co, GDPs and other major contractors can post procurement opportunities for local businesses to contribute to the delivery of NE REZ projects. This would have the dual benefit of simplifying procurement processes for both local suppliers and for Government and large companies operating in the study area.

Responsibility

The opportunities register could be developed by relevant agencies such as ICN with input from government agencies and GDPs.

Timing

Work on this register could begin work on establishing the register immediately and continue to build it out through project delivery phases.

Potential Government Support

Local Supplier Database Case Study

Australian Miners Directory

The Australian Miners Directory is a resource designed to connect various stakeholders within the mining industry. It serves as a central hub for miners, suppliers, investors, and industry professionals, providing a platform to list and discover businesses, products, and services related to mining.

The directory includes a wide range of listings, from junior miners and tier-one mining companies to suppliers of equipment, technology, and services. It aims to foster collaboration and innovation within the industry by making it easier for businesses to connect and share their stories.

In addition to business listings, the directory features information on upcoming mining events and conferences, such as IMARC, AIMEX, and Diggers and Dealers, which are crucial for networking and staying updated on industry trends¹. The platform also highlights news and articles on topics like ESG (Environmental, Social, and Governance) practices and team performance improvement, providing valuable insights for industry professionals.

Upper Hunter Mining Dialogue

The Upper Hunter Mining Dialogue is a collaborative initiative involving the community, mining industry, businesses, and government entities. Its primary goal is to address the impacts of mining in the Upper Hunter region and improve the quality of life for all residents.

The Dialogue operates through various working groups and committees that focus on key issues such as environmental management, economic development, and social well-being. These groups work together to explore and develop solutions for challenges like air quality, water stewardship, and land rehabilitation.

One of the Dialogue's significant activities is the annual Community Forum, which brings together over 120 community members, mining employees, and other stakeholders to discuss pressing issues and share updates on ongoing projects. The 2024 Forum, held in Singleton, featured discussions on the regional economic outlook, future of coal, and updates from the NSW Government on future jobs and investment. The Forum also included workshops where participants identified priority issues and collaborated on potential solutions.

The Dialogue also emphasizes youth engagement through its Youth Advisory Group, which invites young people aged 18 to 30 to participate in discussions and projects. Additionally, the School Mine Tours program educates primary and secondary students about the mining industry and its environmental impacts.

Regular updates on the Dialogue's activities and progress are shared through newsletters and social media platforms. Recent reports have highlighted achievements in water use management, air quality improvements, and rehabilitation efforts.



Potential Government Support

Grants and loans can be used to support businesses grow through the purchase of new plant and equipment or investing in staff training

Grants Programs

Background

Government grants may be paid to businesses as a lump sum(s) to businesses which meet specific criteria and are to use the grants to expand, purchase new plant, equipment and vehicles or train staff.

These businesses are usually subject to reporting requirements on what the money has been spent on, and the grants may be paid on the achievement of milestones or the provision of receipts.

Grants could be provided to existing businesses in core industries who could expand their operations to contribute to the local supply chain for NE REZ projects.

Responsibility

While the provision of funding for a grants program would be subject to whole-of-government decision making processes, depending on the scale of the program and the size of the grants involved, it could be administered by EnergyCo, Investment NSW, Department of Primary Industries and Regional Development or another government department or agency.

Timing

Grants could be provided ahead of peaks in demand for the various industries as outlined in the demand assessment. For example, if grants were provided to local businesses manufacturing and supplying steel reinforcements, these grants should be awarded ahead of the demand for these components (which are predominantly used in wind farms) ahead of demand escalating in 2026.

Low interest loans

Background

Like grants, low-interest loans can be provided to businesses looking to expand or invest in new plant and equipment but without the cash reserves to do so. Unlike Government grants, low interest loans would see the support provided paid back to the Government, but at a rate of interest lower than would be commercially available (for example, the rate of interest of government borrowing).

They therefore reduce the financial cost of borrowing and mean that businesses require a lower rate of return on the investment for it to stack up.

Responsibility

While the provision of funding for a grants program would be subject to whole-of-government decision making processes, depending on the scale of the program and the size of the grants involved, it could be administered by EnergyCo, Investment NSW, Department of Treasury, Department of Primary Industries and Regional Development or another government department or agency.

Timing

Like grants, low interest loans should be provided ahead of peaks in demand for the various industries outlined in the demand assessment.

Potential Government Support

The simplification of procurement processes and inclusion of local content requirements can help to maximise participation of local businesses in the NE REZ projects

Local content requirements

Background

Local content requirements require a certain percentage of goods, services or labour hours used in projects to be sourced locally. This provides additional certainty of demand for businesses looking to scale by increasing opportunities for local businesses to secure contracts. The NSW Renewable Energy Sector Board Plan and in some cases Long-Term Energy Service Agreements (LTESAs) for generators include baseline local content requirements and stretch goals as part of the merit criteria when awarding tenders, noting that Local refers to Australian and New Zealand suppliers.

Responsibility

As relevant, EnergyCo could develop more specific guidance that builds on the LTESAs which could be enforced through planning approvals processes.

Timing

The development of more specific local content requirements should be completed before final approval is given for the majority of projects which will make up the NE REZ.

Simpler procurement processes

Background

Simplifying procurement processes can minimise administrative costs, allowing small businesses to focus on core operations. Greater transparency and accessibility in the procurement process can also increase participation rates for local suppliers.

For the NE REZ, there may be broadly two potential 'procurers' – Generation Design Partners and their managing contractors; and government.

Responsibility

EnergyCo could work with Business NSW, ICN and successful proponents of REZ projects to simplify the procurement of local goods and services, through, for example a centralised procurement portal that is communicated locally.

This model could also be applied for any Government procurement in the region for NE REZ (or adjacent) projects.

Timing

To maximise the benefits of simplification, this portal should be set up prior to the major construction phase of NE REZ projects.

Potential Government Support

Local Jobs First Policy Case Study

Summary

The Local Jobs First Policy is a Victorian Government initiative aimed at maximising local content and job opportunities in major projects. It includes two key components:

- Victorian Industry Participation Policy (VIPP): Ensures local businesses (small and medium-sized enterprises) are given full, fair, and reasonable opportunity to compete for government contracts.
- Major Project Skills Guarantee (MPSG): Mandates that at least 10% of total labour hours on major projects are undertaken by apprentices, trainees, or cadets.

The Local Jobs First Act 2003 also includes a robust compliance framework to ensure optimal outcomes for local industries and workers. The Act is enforced by the Local Jobs First Commissioner.

The Local Jobs First Act 2003 is administered collaboratively by the Minister for Jobs and Industry and the Minister for Employment.

How VIPP Supports Local Businesses / Objectives

- Boosting employment and business growth by expanding market opportunities for local industries.

- Increasing contractors' access to and awareness of local industry capabilities.
- Introducing local industries to global best practices in innovation, e-commerce, and new technologies.
- Enhancing local industry's competitiveness and adaptability in global markets by ensuring fair competition with foreign suppliers.

The Local Jobs First Commissioner oversees compliance, ensuring that agencies and suppliers adhere to the policy, which has led to improved outcomes for local small-medium enterprises and workers.

Local Jobs First Projects are classified as Standard or Strategic based on their value or ministerial determination, with distinct processes for each type.

Success Factors

The Local Jobs First Policy has been instrumental in fostering local economic development and providing job opportunities, particularly for young and emerging workers in the construction industry.



Standard and Strategic Projects

Standard Project	Strategic Project
<p>Local Jobs First Standard Project is:</p> <ul style="list-style-type: none"> • Projects with a budget of \$1 million+ in rural/regional Victoria. • Projects with a budget of \$3 million+ statewide or in metropolitan Melbourne. • Projects declared as Standard by the responsible minister(s) 	<p>A Local Jobs First Strategic Project is:</p> <ul style="list-style-type: none"> • Projects with a budget of \$50 million+. • Projects declared as Strategic by the responsible minister(s)

Potential Government Support

Simplification of planning and approvals will be highly beneficial for establishing new facilities to meet the NE REZ demand, particularly for quarries

Simplification of planning and approvals

Background

There are a range of planning and approvals processes which will impact the ability of local businesses to expand, establish new facilities (including quarries) and enter the supply chain. These range from the approvals of new quarries to licensing requirements for security and surveillance firms.

These processes can often overlap and pathways or requirements can be unclear, particularly to smaller less sophisticated local businesses.

Simplifying these processes will make it easier for existing and new local businesses to expand and enter the market to participate in the NE REZ local supply chain. One such mechanism for simplifying these processes is to establish a single point of entry to Government approval agencies for businesses seeking planning or other approvals to participate in the NE REZ (see major projects facilitation agency case study on next slide).

Responsibility

There are numerous agencies responsible for the various approvals which may be required, and a coordinated whole of government approach is likely required.

Timing

The most complex approvals seem to relate to the expansion and establishment of quarries, so simplifying these processes prior to demand beginning to peak in 2026 should be a priority.

Free training and skills development

Background

To support priority industries, governments can providing free or subsidised TAFE or vocation training that supports businesses to upskill workers and increase workforce supply across priority sectors.

The NSW Fee-Free TAFE initiative is a joint effort by the Australian Commonwealth and New South Wales Governments to provide tuition-free training places for eligible students. It covers a range of industries, including: building and construction trades; civil construction and surveying; electrotechnology; information and communications technology.

Additional courses could be identified (particularly through the workforce study) as priorities for Fee-Free TAFE.

With the growing focus on controlled environment agriculture (CEA) in the region, there is an opportunity to align training organisations locally, and enable targeted security and surveillance training. This represents an additional avenue for meeting industry needs whilst generated regional employment opportunities.

Responsibility

TAFE NSW

Timing

Advocacy should begin following the completion of the *Training and Skills Study*

Potential Government Support

Major Projects Facilitation Agency Case Study

Summary

The Major Projects Facilitation Agency (MPFA) is an Australian Government initiative designed to assist developers of major projects (over \$20 million) with navigating the complex regulatory approval processes. It serves as a single-entry point for information and support regarding Australian Government regulations and approvals.

How It Supports Local Businesses

- **Information Provision:** MPFA provides detailed information on Australian Government regulations and necessary approvals, helping developers understand the requirements.
- **Approval Pathways:** It maps out critical approval pathways and processes, ensuring developers know the steps they need to take.
- **Regulator Communication:** MPFA facilitates communication with regulators, addressing any issues that arise during the approval process.
- **Confidentiality:** Developers can request that their information be treated in confidence, ensuring sensitive project details are protected.

Major Project Status

For projects over \$50 million that are of strategic significance to Australia, MPFA offers Major Project Status. This status provides additional support and coordinated approvals, recognising the project's national importance for economic growth, employment, or regional development.

Success Factors

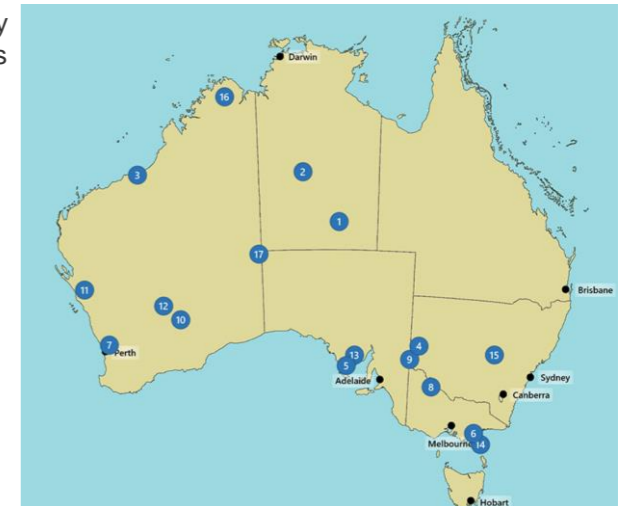
- **Streamlined Processes:** By offering a single-entry point and coordinated support, MPFA significantly reduces the complexity and time required for regulatory approvals.
- **Economic Impact:** Projects facilitated by MPFA contribute to economic growth, job creation, and regional development, demonstrating the agency's positive impact on the Australian economy.
- **Developer Support:** The comprehensive support provided by MPFA, from information provision to regulator communication, ensures that developers can focus on project execution rather than navigating bureaucratic hurdles.

Overall, MPFA's role in simplifying the regulatory approval process and providing robust support to developers makes it a successful initiative in fostering major project development in Australia.

Examples of current major project status projects

Current Major Project	Status Projects	Project proponent
Ammaroo Phosphate Project		Verdant Minerals Pty Ltd
Australia-Asia Power Link (AAPowerLink)		SunCable Holdings Pty Ltd
Australian Renewable Energy Hub (AREH)		Australian Renewable Energy Hub Pty Ltd – with bp Alternative Energy Australia Pty Ltd ('bp Australia') as Operator
Broken Hill Cobalt Project		Cobalt Blue Holdings Limited

Location projects currently holding Major Project Status



Opportunities

To capitalise on the opportunities presented by the NE REZ a range of supports should be progressed that target those sectors for which there is already a strong existing industry and for which there is ongoing community benefits.

The Study Area has well-established businesses across core and supporting sectors and sub-sectors that could both contribute to the supply chain required for NE REZ projects and ensure that benefits are captured locally. On the basis of our engagement with local councils, GDPs and local businesses, there is both a strong desire to procure goods and services locally, as well as desire from local businesses to get involved in the supply chain for renewable energy and transmission projects.

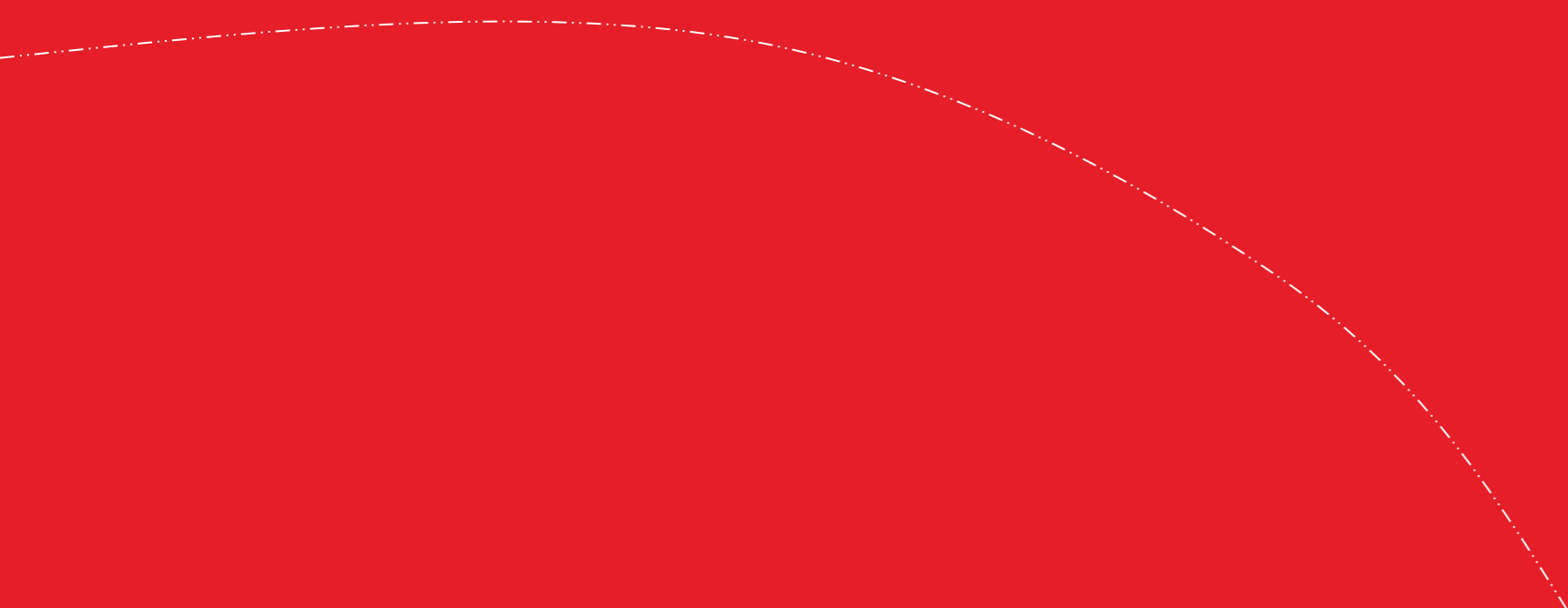
This provides a good starting point for meeting the significant increase in demand beyond what the Study Area is currently capable of producing across the supply chain.

To capture the economic and social benefits of NE REZ projects locally, a significant scaling of industries is required. In order to do this, a range of supports must be provided to local businesses to either transition into renewable energy components or grow their existing operations.

These supports, which are covered from slides 94 to 103 range in their level of investment and intervention – from information provision to cash grants. A package of these measures which complement one another should be developed.

It is unlikely that all industries across the supply chain could scale at the same time or within the timeframes that will be required to deliver the 58 projects in their currently identified timelines. Therefore, some supports – particularly those with a greater level of investment or intervention – should be targeted at those industries for which there is already a strong existing industry and for which there are ongoing community benefits.

Appendices



Appendix A – Industry classifications



Appendix A – Industry classifications

Subcategory definitions

Materials

Subcategory	Description
Core	
Non Metallic Mineral Mining	Mining and quarrying of construction material (including gravel, sand, aggregates, cement clay, road fill)
Cement, Lime & Ready-Mixed Concrete Manufacturing	Manufacture of cement from limestone and clay, and ready-mixed concrete or mortar
Plaster & Concrete Product Manufacturing	Manufacture of gypsum-based plaster and other plaster products and concrete products
Iron & Steel Manufacturing	Manufacture of finished and semi-finished iron and steel products (including fittings, forgings, valves)
Structural Metal Product Manufacturing	Manufacture of structural steel, prefabricated metal buildings, metal roof and guttering, architectural metal products
Supporting	
Other Non-Metallic Mineral Product Manufacturing	Manufacture of abrasives, lightweight aggregates, including brick, building board, flooring material, insulation
Basic Non-Ferrous Metal Manufacturing	Production of alumina, aluminium smelting, copper, silver, lead and zinc smelting and refining
Metal Containers & Other Sheet Metal Product Manufacturing	Manufacture of boiler, tank and other heavy gauge metal container and other sheet metal product
Other Fabricated Metal Product Manufacturing	Manufacture of nuts, bolt and screw, metal coating and finishing, spring and wire product

Warehousing and storage

Subcategory	Description
Core	
Non-Residential Property Operators & Real Estate Services	Renting and leasing of non-residential properties and valuing, purchasing, selling, managing and renting real estate
Supporting	
Other Wood Product Manufacturing	Manufacture of prefabricated wooden building, structural fitting and component
Non-Residential Building Construction	Includes construction, renovation and alteration of commercial, industrial, office buildings

Transportation

Subcategory	Description
Core	
Non-Residential Property Operators & Real Estate Services	Renting and leasing of non-residential properties and valuing, purchasing, selling, managing and renting real estate
Supporting	
Other Wood Product Manufacturing	Manufacture of prefabricated wooden building, structural fitting and component
Non-Residential Building Construction	Includes construction, renovation and alteration of commercial, industrial, office buildings

Appendix A – Industry classifications

Subcategory definitions

Plant and equipment hire

Subcategory	Description
Core	
Wholesale Trade	Purchasing and onselling of goods in high value or bulk volume transactions
Rental & Hiring Services (except real estate)	Rental and hiring of motor vehicles and transport equipment, heavy machinery, scaffolding
Supporting	
Electrical Equipment Manufacturing	Manufacturing of electrical cable and wire, electric lighting equipment, batteries, switchboards, transformers
Specialised & Other Machinery & Equipment Manufacturing	Manufacturing of mining and construction machinery, machine tool and parts, crushing machinery, lifting and material handling equipment and other machinery
Automotive Repair & Maintenance	Automotive electrical services, body, paint and interior repair, and repair and maintenance of particular components

Security and surveillance services

Subcategory	Description
Core	
Public Order & Safety	Police, investigation and security, fire protection and other emergency services
Supporting	
Telecommunication Services	Wired, mobile, satellite, wireless telecommunications network operation
Computer Systems Design & Related Services	Writing, modifying, testing or supporting software and communication technologies

End of life

Subcategory	Description
Core	
Waste Collection, Treatment & Disposal Services	Collection and haulage of solid and liquid waste, treatment/disposal of waste at landfills, combustors, incinerators, compost dumps and other treatment facilities, and remediation and clean up of contaminated buildings and mine sites, mine reclamation activities, removal of hazardous materials

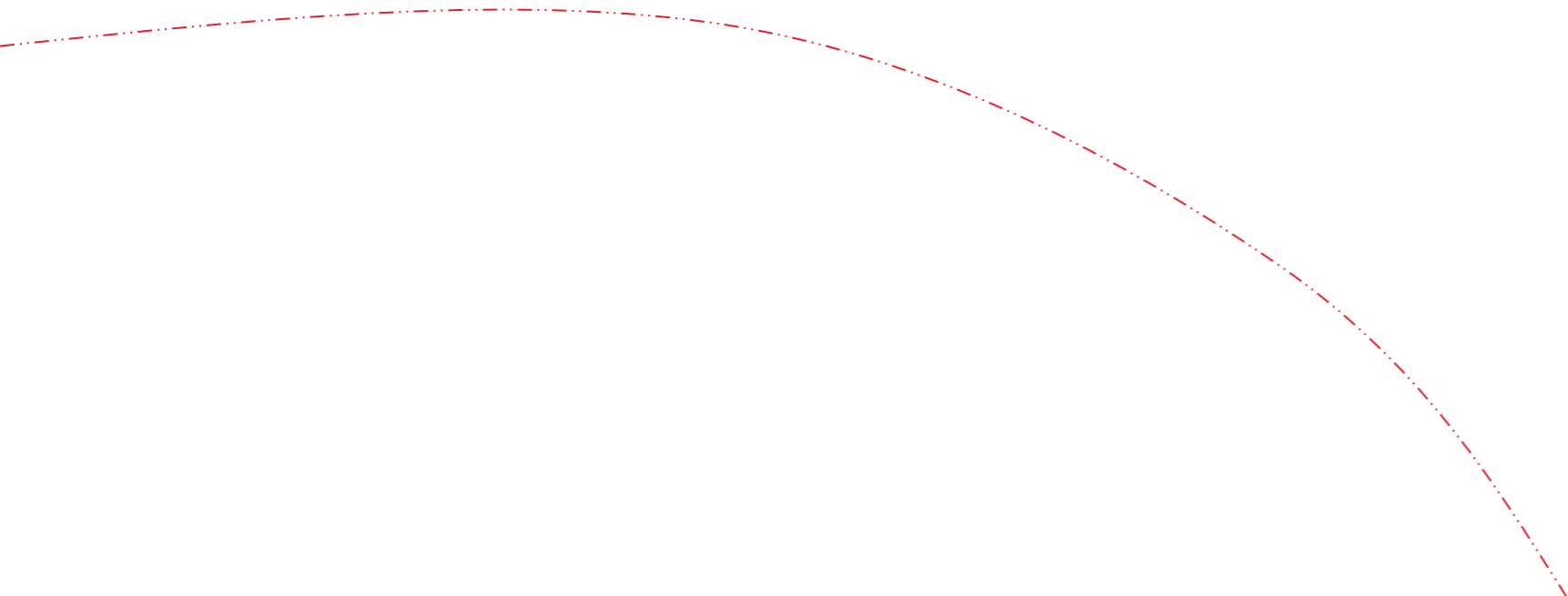
Construction services

Subcategory	Description
Core	
Heavy & Civil Engineering Construction	Construction of road, bridge, railway, dams, irrigation systems, water or gas supply systems, oil refineries, pipelines or other construction projects
Construction Services	Land development and site preparation services, building structure services, building installation services, building completion services, landscape construction services

Catering and hospitality

Subcategory	Description
Supporting	
Food & Beverage Services	Cafes, restaurants and takeaway food services, pubs, taverns and bars, clubs (hospitality)

Appendix B – Supply Chain Demand Metrics



Metric inputs

Materials, Plant and Equipment Hire

Metric	Solar, Small (<50MW)	Solar, Medium (50 - 500MW)	Solar, Large (500 - 1000MW)	Solar, Solar battery	Wind, Small (<500MW)	Wind, Large (>500MW)	Wind, Wind battery	Battery, Small (<500MWh)	Battery, Large (>500MWh)	Transmission, Large (>500kV)
Materials delivery timeframe (months)	3.00	6.00	12.00	3.00	18.00	24.00	3.00	6.00	12.00	24.00
Road Aggregates	174.00	174.00	174.00	73.00	236.00	236.00	73.00	73.00	73.00	-
Cementitious Materials	3.60	3.60	3.60	5.00	34.80	34.80	5.00	5.00	5.00	36.60
Cement	6.30	6.30	6.30	8.75	60.90	60.90	8.75	8.75	8.75	64.05
Concrete Aggregates	3.00	8.10	8.10	11.25	78.30	78.30	11.25	11.25	11.25	82.35
Steel (reinforcing)	1,800	1,800	1,800	2,750	35,000	35,000	2,750	2,750	2,750	20,154
Steel (structural)	71,300	71,300	71,300	-	179,000	179,000	-	-	-	140,000
Crane & Lifting Equipment - Tower Cranes	-	-	-	-	-	-	-	-	-	-
Crane & Lifting Equipment - Mobile Cranes	2.00	5.00	10.00	-	2.00	4.00	-	3.00	5.00	0.16
Transmission - pulling/tensioning	-	-	-	-	-	-	-	-	-	0.08
Small Scale Excavation Machinery	2.00	4.00	8.00	-	-	-	-	-	-	-
Large Scale Excavation Machinery	-	-	-	-	4.00	6.00	-	-	-	0.08
Small Scale Piling & Drilling Equipment	2.00	6.00	15.00	-	-	-	-	-	-	-
Large Scale Piling & Drilling Equipment	-	-	-	-	2.00	4.00	-	-	-	0.08
Dump & Haulage Trucks	3.00	6.00	10.00	-	4.00	8.00	-	-	-	0.08
Concrete Batching Plant	-	1.00	1.00	-	2.00	2.00	-	1.00	1.00	-
Concrete Pump	-	5.00	5.00	-	10.00	10.00	-	5.00	5.00	-
Agitators	1.00	3.00	3.00	4.00	15.00	15.00	4.00	2.00	3.00	0.02

Metric inputs

Warehousing and Storage

Metric	Solar, Small (<50MW)	Solar, Medium (50 - 500MW)	Solar, Large (500 - 1000MW)	Solar, Solar battery	Wind, Small (<500MW)	Wind, Large (>500MW)	Wind, Wind battery	Battery, Small (<500MWh)	Battery, Large (>500MWh)	Transmission, Large (>500kV)
Storage - road aggregates	-	-	-	-	-	-	-	-	-	-
Storage - cementitious materials	-	-	-	-	-	-	-	-	-	-
Storage - cement	-	-	-	-	-	-	-	-	-	-
Storage - concrete aggregates	-	-	-	-	-	-	-	-	-	-
Storage - steel (reinforcing)	8.51	8.51	8.51	12.99	165.38	165.38	12.99	12.99	12.99	-
Storage - solar components	9.62	9.62	9.62	-	-	-	-	-	-	-
Storage - steel (solar structural)	1.00	1.00	1.00	-	-	-	-	-	-	-
Storage - wind components	-	-	-	-	-	-	-	-	-	-
Storage - steel (wind structures)	-	-	-	-	-	-	-	-	-	-
Storage - battery components	-	-	-	0.40	-	-	0.40	0.40	0.40	-
Storage - steel (battery structural)	-	-	-	-	-	-	-	-	-	-
Storage - hydro components	-	-	-	-	-	-	-	-	-	-
Storage - steel (hydro structural)	-	-	-	-	-	-	-	-	-	-
Storage - cables (transmission)	-	-	-	-	-	-	-	-	-	-
Storage - steel (transmission structural)	-	-	-	-	-	-	-	-	-	-

Metric inputs

Transportation, Security and Surveillance

Metric	Solar, Small (<50MW)	Solar, Medium (50 - 500MW)	Solar, Large (500 - 1000MW)	Solar, Solar battery	Wind, Small (<500MW)	Wind, Large (>500MW)	Wind, Wind battery	Battery, Small (<500MWh)	Battery, Large (>500MWh)	Transmission, Large (>500kV)
Delivery - road aggregates	4.00	9.00	13.00	2.00	8.00	11.00	2.00	7.00	7.00	-
Delivery - cementitious materials	-	-	-	-	-	-	-	-	-	-
Delivery - cement	1.00	2.00	4.00	1.00	2.00	4.00	1.00	1.00	1.00	-
Delivery - concrete aggregates	1.00	2.00	6.00	3.00	6.00	13.00	3.00	1.00	1.00	-
Delivery - steel (reinforcing)	1.00	1.00	2.00	1.00	8.00	8.00	1.00	2.00	2.00	0.06
Delivery - solar components	3.00	6.00	8.00	-	-	-	-	-	-	-
Delivery - steel (solar structural)	1.00	2.00	4.00	-	-	-	-	-	-	-
Delivery - wind components	-	-	-	-	-	-	-	-	-	-
Delivery - steel (wind structures)	-	-	-	-	10.00	12.00	-	-	-	-
Delivery - battery components	-	-	-	-	-	-	-	1.00	1.00	-
Delivery - steel (battery structural)	-	-	-	-	-	-	-	-	-	-
Delivery - hydro components	-	-	-	-	-	-	-	-	-	-
Delivery - steel (hydro structural)	-	-	-	-	-	-	-	-	-	-
Delivery - cables (transmission)	-	-	-	-	-	-	-	-	-	0.02
Delivery - steel (transmission structural)	-	-	-	-	-	-	-	-	-	0.39
Sec+Surv - Construction	0.05	0.05	0.05	0.01	0.13	0.13	0.01	0.01	0.01	0.20
Sec+Surv - Operation	0.03	0.01	0.01	0.00	0.03	0.03	0.00	0.00	0.00	0.03

Metric inputs

Hydro projects

Metric	Units	Dungowan Pumped Hydro Stage 1, Hydro	Muswellbrook Pumped Hydro Energy Storage Project, Hydro	Oven Mountain Pumped Hydro, Hydro	Glenbawn Pumped Hydro, Hydro	Glennies Creek Pumped Hydro, Hydro
Cementitious Materials	m3	13,200	17,600	31,680	33,880	28,248
Cement	m3	23,100	30,800	55,440	59,290	49,434
Concrete Aggregates	m3	29,700	39,600	71,280	76,230	63,558
Steel (reinforcing)	kg	2,700,000	3,600,000	6,480,000	6,930,000	5,778,000
Crane & Lifting Equipment - Tower Cranes	#	1	1	1	1	1
Crane & Lifting Equipment - Mobile Cranes	#	2	2	2	2	2
Large Scale Excavation Machinery	#	4	4	4	4	4
Dump & Haulage Trucks	#	10	10	10	10	10
Concrete Batching Plant	#	2	2	2	2	2
Concrete Pump	#	10	10	10	10	10
Agitators	#	9	12	21	22	19
Storage - total	m2	12,758	17,010	30,618	32,744	27,301
Storage - steel (reinforcing)	m2	12,758	17,010	30,618	32,744	27,301
Delivery - total	#	9	10	17	19	15
Delivery - cementitious materials	#	2	2	3	4	3
Delivery - cement	#	3	3	6	6	5
Delivery - concrete aggregates	#	3	4	7	8	6
Delivery - steel (reinforcing)	#	1	1	1	1	1
Sec+Surv - Construction	# FTE	20	20	20	20	20
Sec+Surv - Operation	# FTE	5	5	5	5	5

Metric calculations

Materials, Plant and Equipment Hire

Parameter	Unit	Solar, generation	Solar, storage (battery)	Wind, generation	Wind, storage (battery)	Battery, storage	Hydro, generation and storage	Transmission, Large (>500kV)
Road Aggregates	m3	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by storage capacity.	Project specific.	Multiply by length.
Total Concrete	m3							
Cement	m3							
Concrete Aggregates	m3							
Steel (reinforcing)	kg							
Steel (structural)	kg							
Crane & Lifting Equipment - Tower Cranes	#	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Project specific.	Multiply by length.
Crane & Lifting Equipment - Mobile Cranes	#							
Transmission - pulling/tensioning	#							
Small Scale Excavation Machinery	#							
Large Scale Excavation Machinery	#							
Small Scale Piling & Drilling Equipment	#							
Large Scale Piling & Drilling Equipment	#							
Dump & Haulage Trucks	#							
Concrete Batching Plant	#							
Concrete Pump	#							
Agitators	#							

Metric calculations

Warehousing and Storage

Parameter	Unit	Solar, generation	Solar, storage (battery)	Wind, generation	Wind, storage (battery)	Battery, storage	Hydro, generation and storage	Transmission, Large (>500kV)
Storage - road aggregates	m2	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by storage capacity.	Project specific.	Multiply by length.
Storage - cementitious materials	m2							
Storage - cement	m2							
Storage - concrete aggregates	m2							
Storage - steel (reinforcing)	m2							
Storage - solar components	m2	Multiply by generation nameplate.	N/A	N/A	N/A	N/A	N/A	N/A
Storage - steel (solar structural)	m2							
Storage - wind components	m2	N/A	N/A	Multiply by generation nameplate.	N/A	N/A	N/A	N/A
Storage - steel (wind structures)	m2							
Storage - battery components	m2	N/A	Multiply by storage capacity.	N/A	Multiply by storage capacity.	Multiply by storage capacity.	N/A	N/A
Storage - steel (battery structural)	m2							
Storage - hydro components	m2	N/A	N/A	N/A	N/A	N/A	Project specific.	N/A
Storage - steel (hydro structural)	m2							
Storage - cables (transmission)	m2	N/A	N/A	N/A	N/A	N/A	N/A	Multiply by length.
Storage - steel (transmission structural)	m2							

Metric calculations

Transportation, Security and Surveillance

Parameter	Unit	Solar, generation	Solar, storage (battery)	Wind, generation	Wind, storage (battery)	Battery, storage	Hydro, generation and storage	Transmission, Large (>500kV)
Delivery - road aggregates	#	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	Project specific.	Multiply by length.
Delivery - cementitious materials	#							
Delivery - cement	#							
Delivery - concrete aggregates	#							
Delivery - steel (reinforcing)	#							
Delivery - solar components	#	Unit rate for equipment requirement based on category.	N/A	N/A	N/A	N/A	N/A	N/A
Delivery - steel (solar structural)	#							
Delivery - wind components	#	N/A	N/A	Unit rate for equipment requirement based on category.	N/A	N/A	N/A	N/A
Delivery - steel (wind structures)	#							
Delivery - battery components	#	N/A	Unit rate for equipment requirement based on category.	N/A	Unit rate for equipment requirement based on category.	Unit rate for equipment requirement based on category.	N/A	N/A
Delivery - steel (battery structural)	#							
Delivery - hydro components	#	N/A	N/A	N/A	N/A	N/A	Project specific.	N/A
Delivery - steel (hydro structural)	#							
Delivery - cables (transmission)	#	N/A	N/A	N/A	N/A	N/A	N/A	Multiply by length, divide by project grouping-specific materials delivery timeframe.
Delivery - steel (transmission structural)	#							
Sec+Surv - Construction	# FTE	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by generation nameplate.	Multiply by storage capacity.	Multiply by storage capacity.	Project specific.	Multiply by length.
Sec+Surv - Operation	# FTE							

Metrics Source

Materials, Plant and Equipment Hire

Metric	Assumptions	Source
Road Aggregates	Assume average road width of 6m, layer thickness of 500mm for solar. Assume road aggregates for pumped hydro can be sourced locally on site.	NREL was used as a reference, and previous projects were used as benchmarks
Cementitious Materials	Assume 20% of total concrete volume required for the structure and Balance of Plant (BOP) foundations	NREL was used as a reference, and previous projects were used as benchmarks
Cement	Assume 15% of the total concrete volume required for the structure and Balance of Plant (BOP) foundations	NREL was used as a reference, and previous projects were used as benchmarks
Concrete Aggregates	Assume 45% of the total concrete volume required for the structure and Balance of Plant (BOP) foundations	NREL was used as a reference, and previous projects were used as benchmarks
Steel (reinforcing)	Assume weight of steel reinforcement or rebar for concrete foundations.	NREL was used as a reference, and previous projects were used as benchmarks
Steel (structural)	Assume weight steel components such as the solar racking, steel piles, WTG tower, blade, and transmission steel tower.	NREL was used as a reference for solar and wind technology, and the transmission line was based on 500kV structures
Crane & Lifting Equipment - Tower Cranes	Assume number of tower cranes for pumped-hydro construction	Derived from a range of confidential projects across Australia for which Arup was engaged.
Crane & Lifting Equipment - Mobile Cranes	Assume number of smaller crane capacity for solar and battery, whereas wind assumes no. of support and specialized heavy cranes. Transmission utilizes small cranes for assembly and heavy all-terrain mobile cranes for tower erection.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Transmission - pulling/tensioning	Assume number for stringing works in transmission network.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Small Scale Excavation Machinery	Assume number of excavators for site development, foundation and road works	Derived from a range of confidential projects across Australia for which Arup was engaged.
Large Scale Excavation Machinery	Assume number of excavators for site development, foundation and road works	Derived from a range of confidential projects across Australia for which Arup was engaged.
Small Scale Piling & Drilling Equipment	Assume number of piling and drilling equipment for PV array foundation (steel, concrete or composite piles)	Derived from a range of confidential projects across Australia for which Arup was engaged.
Large Scale Piling & Drilling Equipment	Assume number of piling and drilling equipment for deep foundations.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Dump & Haulage Trucks	Assume number of trucks for haulage of spoil and other construction materials.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Concrete Batching Plant	Assume 1 batching plant can support up to 10 agitators. Assume no batching plant for transmission construction.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Concrete Pump	Assume 5 concrete pumps per concrete batching plant.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Agitators	Assume no. of agitators (7m3 capacity) for continuous concrete pouring.	Derived from a range of confidential projects across Australia for which Arup was engaged.

1. Source: IRENA Renewable Power Generation Costs in 2023
2. Source: NREL Renewable Energy Materials Properties Database Summary
3. Source: EnergyConnect Fact Sheet Transmission Towers 2024

Metrics Source

Warehousing and Storage

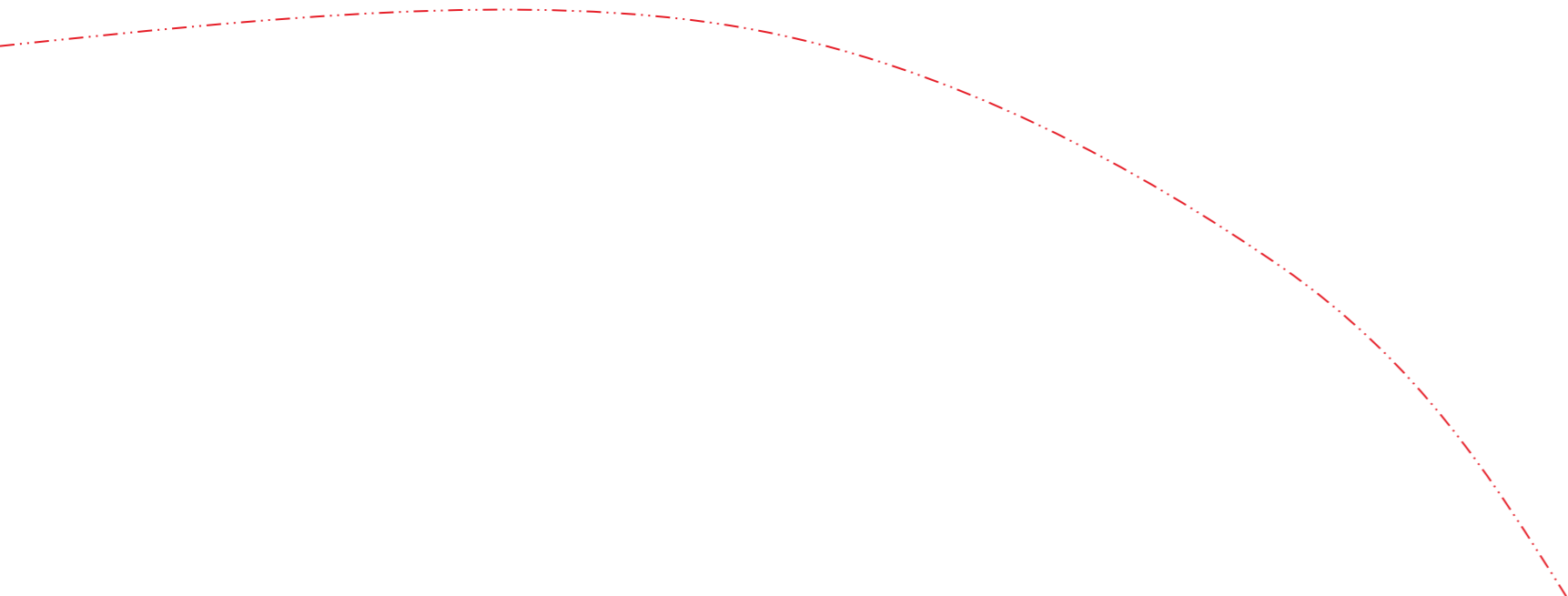
Metric	Assumptions	Source
Storage - road aggregates	Assume no warehousing required for road aggregates.	
Storage - cementitious materials	Assume no warehousing required for cementitious materials. Materials can be delivered directly to the site from cement plant.	
Storage - cement	Assume no warehousing required for cement. Materials can be delivered directly to the site from cement plant.	
Storage - concrete aggregates	Assume no warehousing required for concrete aggregates. Materials can be delivered directly to the site from aggregates facility/quarry.	
Storage - steel (reinforcing)	Assume a storage area for steel rebars. 350 rebars/ton, 9m long rebar, stacked in 10 layers, rebar thickness 10mm, allowing additional 5mm extra room per rebar for packing considerations. Assume reinforced steel required for transmission lines is stored at project sites, with no requirement for warehousing prior.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Storage - solar components	Area requirement was derived using a 650W module - 36pcs per pallet, approximately 1.5m ² per pallet and additional 50% to account for electrical equipment e.g. inverters, combiner box, cables. Assume 10% of total goes via warehouse, with 90% delivered directly to site (without warehousing requirement).	Derived from a range of confidential projects across Australia for which Arup was engaged.
Storage - steel (solar structural)	Assume 10% of total goes via warehouse, with 90% delivered directly to site (without warehousing requirement).	
Storage - wind components	Assume no warehousing required.	
Storage - steel (wind structures)	Assume no warehousing required. Turbine components are directly delivered to the site and placed on laydown areas.	
Storage - battery components	Assume 10% of total goes via warehouse, with 90% delivered directly to site (without warehousing requirement). Assume 11.9m ² footprint per battery, and 3 MWh storage per battery.	Tesla Megapack 2 Datasheet
Storage - steel (battery structural)	Assume 10% of total goes via warehouse, with 90% delivered directly to site (without warehousing requirement).	
Storage - hydro components	Assume no warehousing required. Turbine components are directly delivered to the site and placed on laydown areas.	
Storage - steel (hydro structural)	Assume no warehousing required. Steel components are directly delivered to the site and placed on laydown areas.	
Storage - cables (transmission)	Assume no warehousing required. Cable drums are directly delivered to the site and placed on laydown areas.	
Storage - steel (transmission structural)	Assume no warehousing required. Steel tower structures are directly delivered to the site and placed on laydown areas.	

Metrics Source

Transportation, Security and Surveillance

Metric	Assumptions	Source
Delivery - road aggregates	Total number of delivery trucks using 10-m ³ tipper trucks, 3trips each day, within the civil works timeframe	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - cementitious materials	Assume raw cement delivery trucks also transport cementitious materials.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - cement	Total number of trucks using large trucks, 21-m ³ size, within the civil works timeframe.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - concrete aggregates	Total number of delivery trucks using 10-m ³ tipper trucks, 3 trips each day, within the materials delivery timeframe.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - steel (reinforcing)	Total number of delivery trucks using 10-m ³ tipper trucks, 3 trips each day, within the materials delivery timeframe.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - solar components	Assume number of trucks for the delivery of solar panels and electrical components.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - steel (solar structural)	Assume number of trucks for the delivery of solar racking or mounting structure.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - wind components	Assume no transportation requirement as most of the turbine components are transported by specialised trucks.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - steel (wind structures)	Assume 10 trucks for the delivery of turbine components for each small wind project, and 12 trucks for each large wind project.	Previous projects were used as benchmarks Bodangora Wind Farm
Delivery - battery components	Assume standard truck carries 3 batteries, 0.33 batteries per MWh. 3 trips per day over materials delivery timeframe.	National heavy vehicle mass and dimension limits
Delivery - steel (battery structural)	Assume none as steel components are embedded in the battery packs.	
Delivery - hydro components	Assume number of trucks for the delivery of turbine components.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - steel (hydro structural)	Assume number of trucks for the delivery of steel pipes or penstocks.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - cables (transmission)	Assume number of trucks for the delivery of cable drums.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Delivery - steel (transmission structural)	Assume number of trucks for the delivery of steel tower structures.	Derived from a range of confidential projects across Australia for which Arup was engaged.
Sec+Surv - Construction	Assume total umber of security personnel based on project area derived from plant capacity (ha/MW).	Derived from a range of confidential projects across Australia for which Arup was engaged.
Sec+Surv - Operation	Assume 50% reduction from the no. of security personnel required during construction.	Derived from a range of confidential projects across Australia for which Arup was engaged.

Appendix C – Detailed supply chains by project type



Appendix B

Local supply chain mapping for renewables projects

Local supply chains scope

In line with the Statement of requirements for this study, the local supply chain analysis focuses on construction materials, warehousing and transportation, equipment hire, and security and surveillance services during construction and operation.

However, in the first instance, full supply chain mapping across each of the different renewable energy technologies to be delivered by the NE REZ was undertaken. This mapping provided an understanding of which components and services across each supply chain could be sourced locally within the Study Area, nationally with Australia and globally. The resulting mapping was then overlaid with the supply chain categories outlined in the Statement of Requirements to identify specific resources, services and business types in scope for the analysis.

This initial assessment identified that in addition to the categories identified in the Statement of Requirements, construction services, such as civil works, could also be sourced locally. Services during planning and design, as well as management services during procurement construction, and plant operation may be sourced from outside the Study Area. The majority of technology products and specialised equipment are likely to be procured overseas.

The remainder this Appendix outlines each of the supply chain maps including the supply packages (inputs), services and equipment expected to be sourced locally, and remaining services that were identified as being out of scope. Services and

sub-services were categorised into the following categories:

- Local Supply Chain
 - Supply Package in scope
 - Supply Sub-Package in scope
 - Service Package in scope
 - Service Package not in scope
 - Service Sub-Package in scope
 - Project Equipment in scope
 - Service Sub-Package not in scope
- National / Global Supply Chain
 - Supply Package not in scope
 - Service Package not in scope
 - Service Sub-Package not in scope

Supply Packages (inputs) and services were identified as out of scope where:

- The supply chain input, service or equipment did not fall under the categories identified in the Statement of Requirements.
- The supply chain input, service or equipment was considered unavailable with the Study Area or expected to be supplied from elsewhere in Australia or overseas

- The service was expected to be delivered by specialised consultants and contractors from outside the Study Area.

Appendix B

Supply chain for onshore wind

Scope of local supply chain

Figure 33 shows the supply chain components necessary for onshore wind development. This assumes that the local supply chain may have the capacity to provide the following:

- Construction materials such as cement, aggregates, concrete, and steel reinforcement
- Specialised mobile cranes for turbine blade, nacelle, hub, and tower assembly
- Excavation and compaction machinery for site development, access roads, foundation and underground cabling works
- Piling and drilling equipment for deep tower foundations
- Dump and haulage trucks for transferring spoil and other construction materials
- Mobile concrete batching plants and agitators
- Transportation services such as specialised trucks for transporting turbine main parts from port to the project site
- Security services to provide support during construction and operation
- Predevelopment services such as surveying, environmental sampling and monitoring, permitting, and approvals
- Civil works such as site formation, staging, earthworks, road construction, and foundations
- Mechanical installation such as turbine assembly and installation
- Electrical installation such as nacelle, transformer, and substation assembly, and cabling works

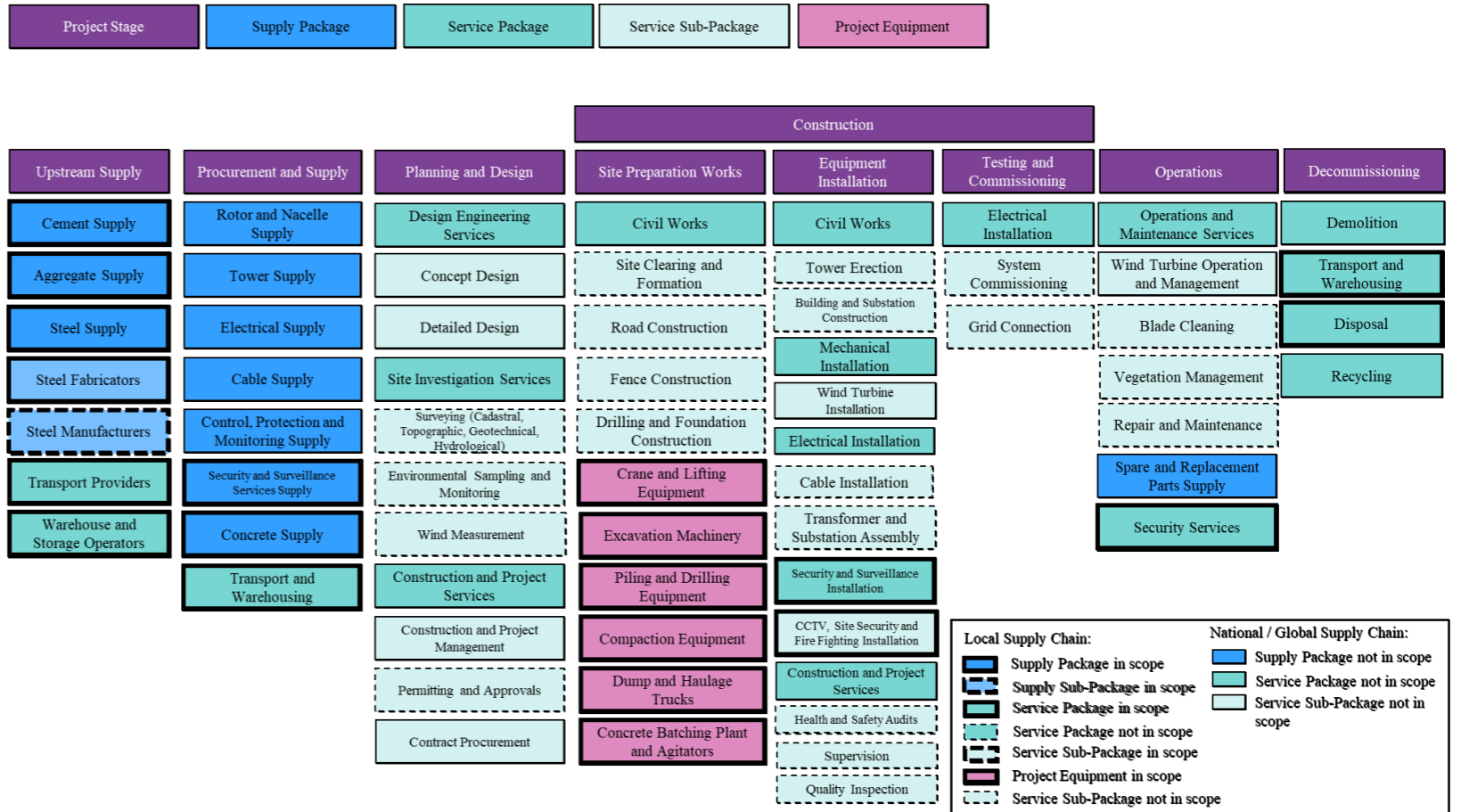


Figure 33: Supply chain for onshore wind

Appendix B

Supply chain for utility-scale battery storage

Scope of local supply chain

It should be noted that since specialised cranes and trucks are required, they may not be fully available in the local area and could potentially need to be sourced from outside the region.

Figure 34 shows the supply chain components necessary for utility-scale battery storage development. This assumes that the local supply chain may have the capacity to provide the following:

- Construction materials such as cement, aggregates, concrete, and steel reinforcement
- Small to medium mobile cranes for lifting battery packs and other electrical equipment
- Excavation and compaction machinery for site development, access roads, foundation, and underground cabling works
- Dump and haulage trucks for transferring spoil and other construction materials
- Warehousing for temporarily storing battery packs, cables, and ancillary equipment
- Transportation services such as delivery trucks for transporting equipment and materials from port/warehouse to the project site
- Security services to provide support during construction and operation
- Predevelopment services such as surveying, environmental sampling and monitoring, permitting, and approvals
- Civil works such as site formation, earthworks, road and fence construction, and pile driving
- Mechanical installation such as battery, cooling system, and fire protection system installation
- Electrical installation such as inverter, management systems, and substation assembly, and cabling works

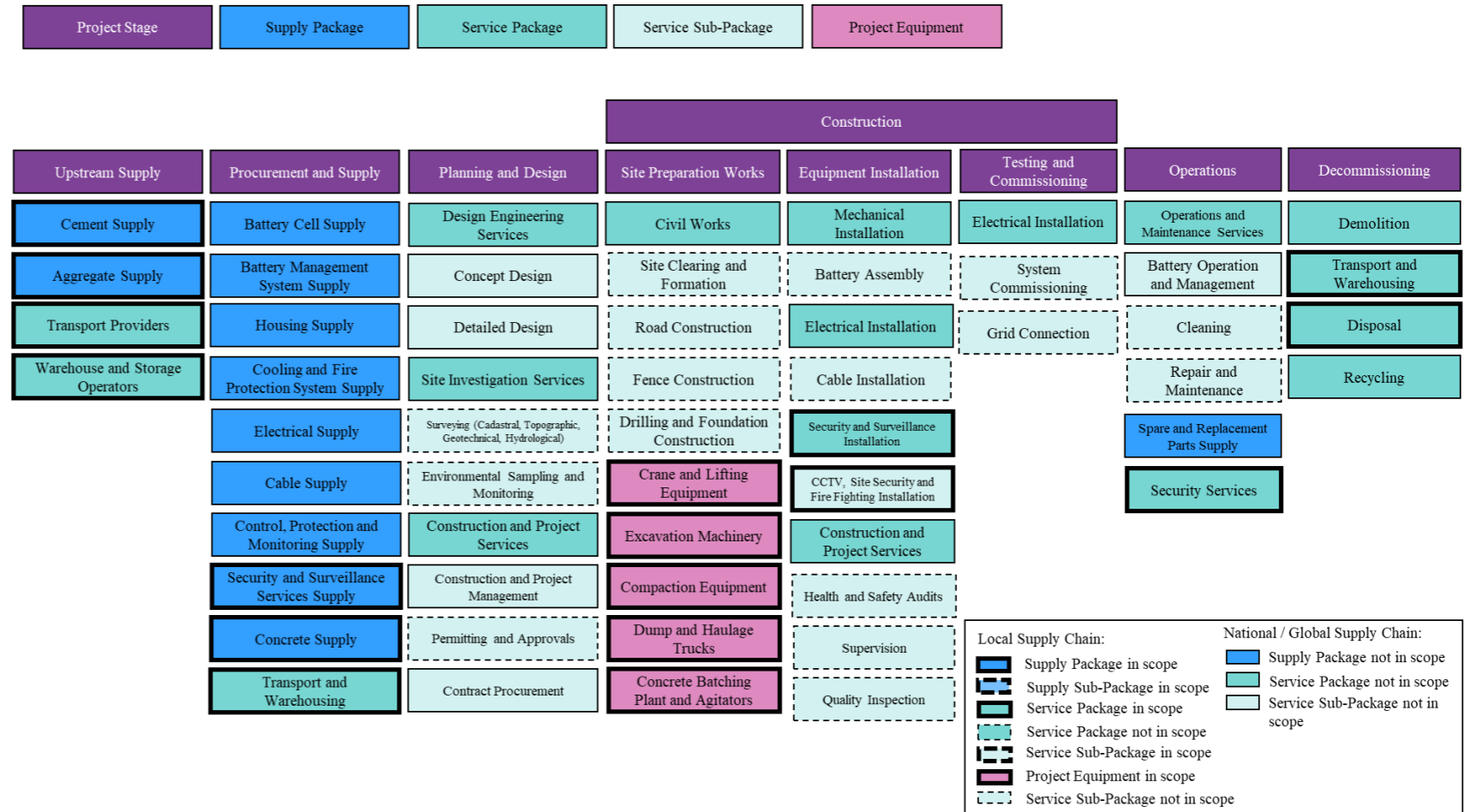


Figure 34: Supply chain for utility-scale battery storage

Appendix B

Supply chain for pumped hydropower storage

Scope of local supply chain

Figure 35 shows the supply chain components necessary for pumped hydropower storage development. This assumes that the local supply chain may have the capacity to provide the following:

- Construction materials such as cement, aggregates, concrete, and steel reinforcement
- Small to large mobile cranes for lifting steel pipes, hydro turbine, and other electrical equipment
- Excavation and compaction machinery for site development, access roads, foundation, reservoir, and dam construction
- Piling and drilling equipment for dam, cavern and tunnel construction
- Dump and haulage trucks for transferring spoil and other construction materials
- Transportation services such as delivery trucks for transporting equipment and materials from port to the project site
- Security services to provide support during construction and operation
- Predevelopment services such as surveying, environmental sampling and monitoring, permitting, and approvals
- Civil works such as site formation, earthworks, roads, dam and reservoir, and slope protection
- Mechanical installation such as pump/turbine and powerhouse installation
- Electrical installation such as transformer and substation assembly, and cabling works

Heavy equipment and machinery for pumped hydro, especially for the drilling works, are highly specialised. Equipment such as robo-drills and tunnel boring machines need to be sourced from other parts of the country or from overseas.

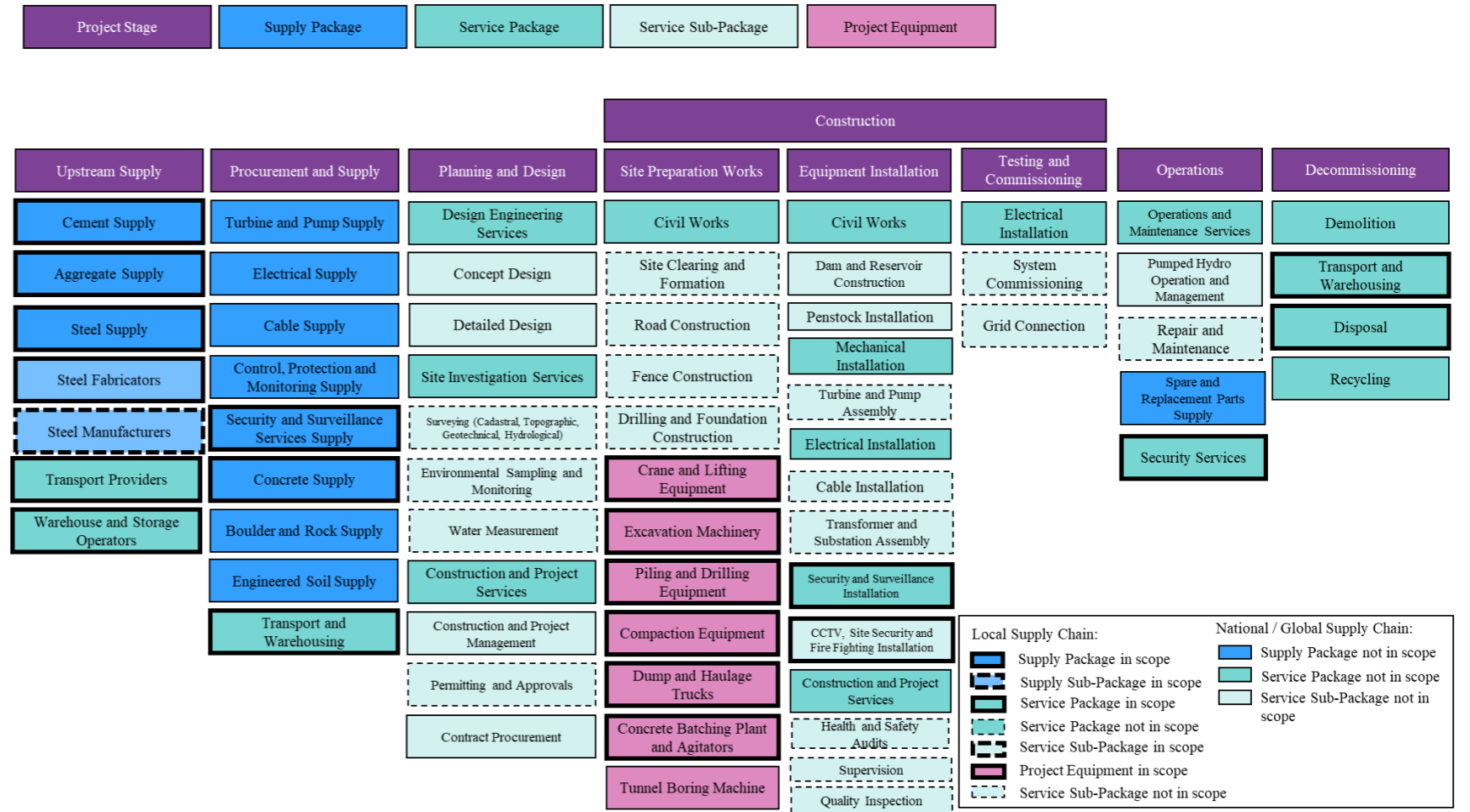


Figure 35: Supply chain for pumped hydropower storage

Appendix D – Regional Profiles



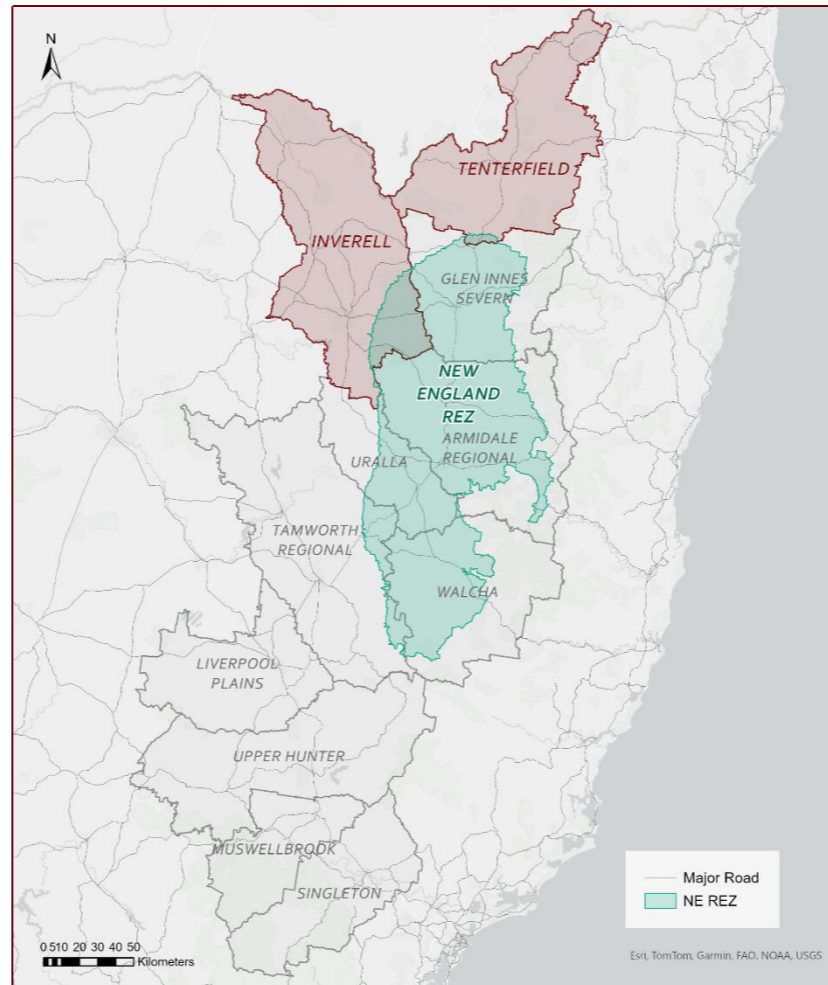
Regional context

Inverell is an agricultural economy with both food production and processing predominant. Tenterfield is an older community that is heavily dependent on agriculture but has one of the lowest working age populations in New South Wales.

Inverell

Population	18,059 (0.22% of NSW population)
Working age population	57.3% (NSW 64.6% Aus 64.9%)
Number of jobs per business	7.1
Key industries	<ul style="list-style-type: none"> Healthcare & social assistance (15%) Agriculture, forestry & fishing (13%) Manufacturing (11%)

- 56% of total land area in Inverell is utilised for agriculture. The principal agricultural outputs are beef cattle and cropping. A beef processing firm (Bindaree Food Group) is the largest employer.
- Inverell has ample water supply, housing one of NSW's largest inland dams (Copeton Dam).



Tenterfield

Population	6,973 (0.08% of NSW population)
Working age population	51.8% (NSW 64.6% Aus 64.9%)
Number of jobs per business	4.7
Key industries	<ul style="list-style-type: none"> Agriculture, forestry & fishing (21%) Healthcare & social assistance (11%)

- Tenterfield has the lowest working age population (51.8%), with 33% of its population aged over 65.
- The region's major infrastructure project is the planned Tenterfield Heavy Vehicle Bypass, which would improve transport efficiency but also draw on some of the resources required for renewable energy projects.

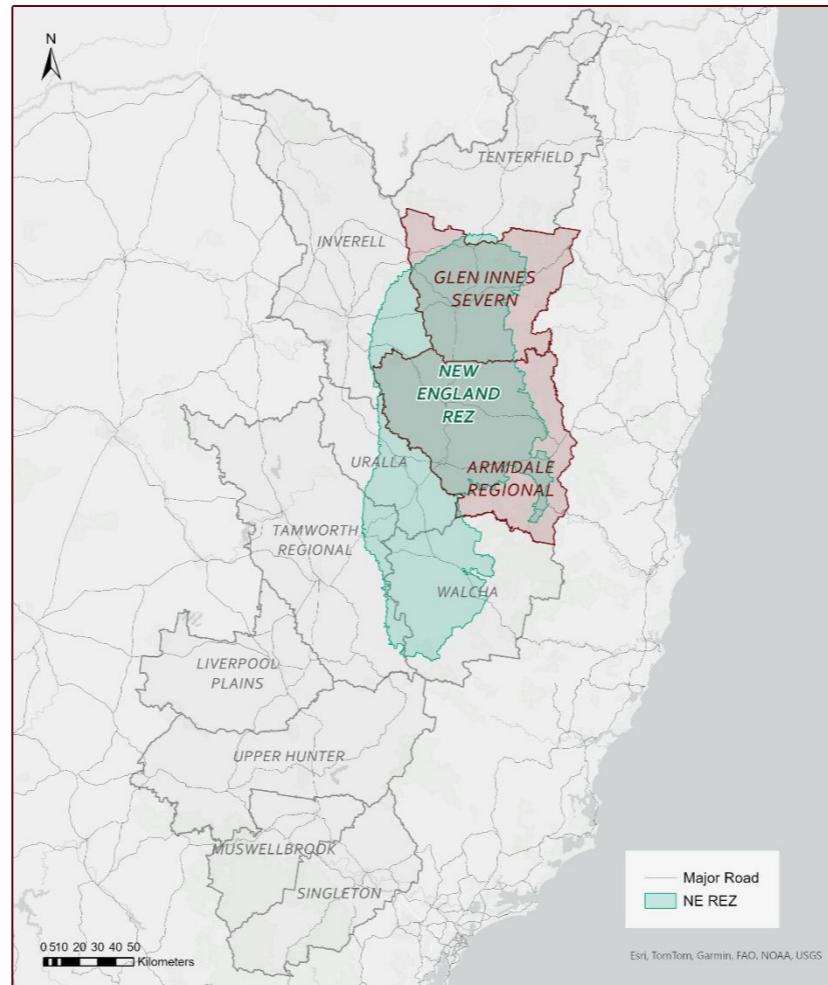
Regional context

Glenn Innes Severn is another agricultural economy but also has several key quarries. Armidale is a regional centre with a relatively diverse economy including several service businesses.

Glen Innes Severn

Population	8,989 (0.11% of NSW population)
Working age population	55.1% (NSW 64.6% Aus 64.9%)
Number of jobs per business	5.5
Key industries	Agriculture, forestry & fishing (18%) Healthcare & social assistance (13%)

- 22% of total land area is protected, largely comprising national parks and reserves.
- Glenn Innes Severn houses key quarries (such as Water Hill quarry).
- Stakeholders advise that there is little spare human capital capacity and a shortage of skilled trades.



Armidale

Population	29,594 (0.35% of NSW population)
Working age population	63.8% (NSW 64.6% Aus 64.9%)
Number of jobs per business	8
Key industries	Education & training (20%) Healthcare & social assistance (15%) Agriculture, forestry & fishing (11%)

- Armidale is one of the main sources of medium-to-large scale business and industrial services in the Study Area.
- Armidale’s education industry is driven by the University of New England and the NSW TAFE Digital Hub.
- Stakeholder feedback indicates that Armidale’s key strengths are in end of life and recycling, particularly for solar.

Regional context

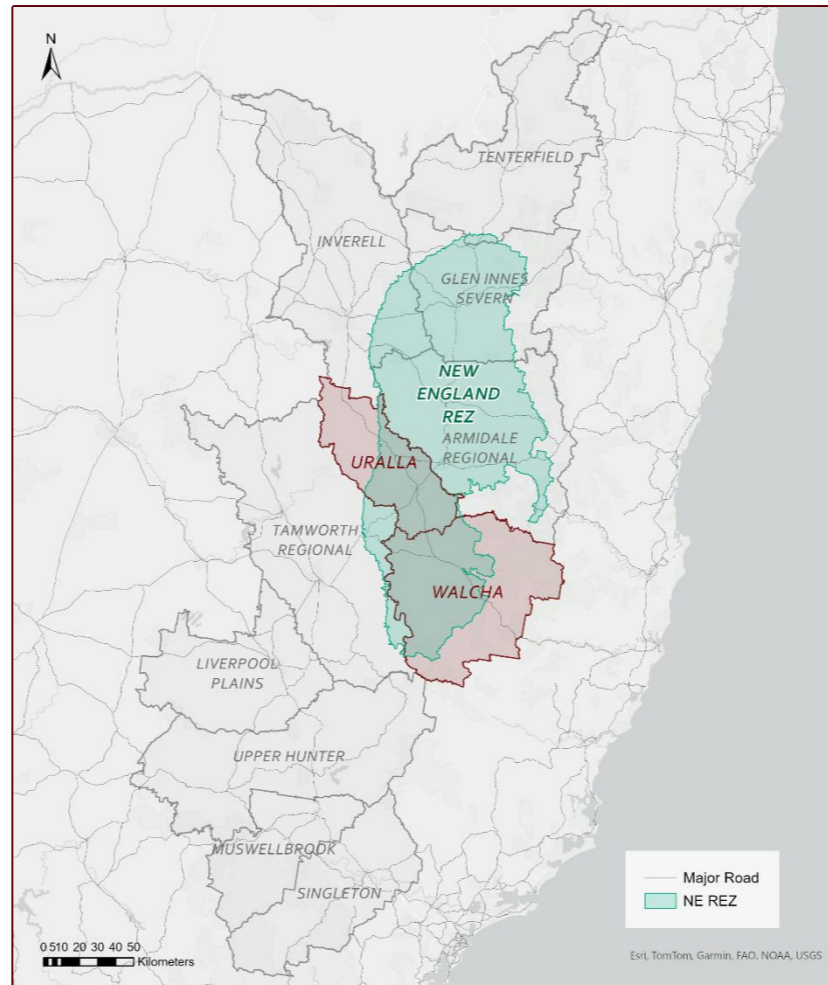
While still agricultural, Uralla is home to several key quarries in the region. Walcha is the least populous LGA in the region and has an economy that is most dependent on agriculture.

Local snapshot by LGA (3/6)

Uralla

Population	6,047 (0.07% of NSW population)
Working age population	58.6% (NSW 64.6% Aus 64.9%)
Number of jobs per business	7.2
Key industries	<ul style="list-style-type: none"> Agriculture, forestry & fishing (15%) Education & training (14%) Healthcare & social assistance (14%)

- Stakeholder feedback suggests that Uralla’s key strength is in workforce accommodation.
- Uralla houses key aggregate quarries (including Kingstown and Arding quarries), however has little spare water and housing capacity.



Walcha

Population	2,968 (0.04% of NSW population)
Working age population	53.1% (NSW 64.6% Aus 64.9%)
Number of jobs per business	4.3
Key industries	<ul style="list-style-type: none"> Agriculture, forestry & fishing (40%) Healthcare & social assistance (9%)

- Walcha is the least populous LGA, accounting for 1.5% of the Study Area’s population.
- 52% of the total land area in Walcha is agricultural land. Stakeholders consider there to be a shortage in land zoned for industrial uses.

Regional context

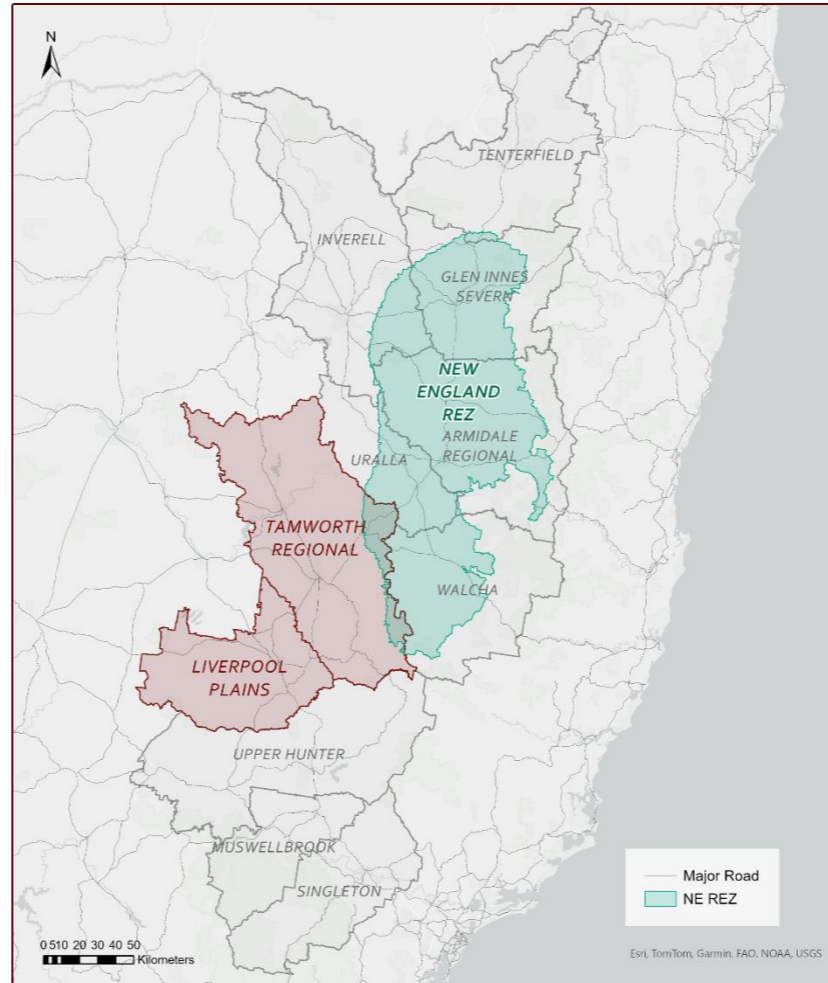
Tamworth is the most populated LGA with a range of medium-to-large scale businesses and industrial services. Liverpool plains is more rural and more heavily dependent on agriculture.

Local snapshot by LGA (4/6)

Tamworth

Population	65,246 (0.78% of NSW population)
Working age population	59.9% (NSW 64.6% Aus 64.9%)
Number of jobs per business	8.5
Key industries	Healthcare & social assistance (17%) Retail trade (10%)

- Tamworth is the most populous LGA. It is one of the main sources of medium-to-large scale business and industrial services.
- Stakeholders consider Tamworth's key strengths to be logistics, intermodal transport and warehousing.
- Stakeholders consider Tamworth to have a broad baseline capacity, however low unemployment constrains ability to meet the current delivery pipeline.



Liverpool Plains

Population	7,667 (0.09% of NSW population)
Working age population	58% (NSW 64.6% Aus 64.9%)
Number of jobs per business	5.9
Key industries	Agriculture, forestry & fishing (23%) Healthcare & social assistance (12%)

- Liverpool Plains contains some of the most productive agricultural land in NSW and extensive groundwater resources.
- Werris Creek Intermodal Hub is located in the LGA.

Regional context

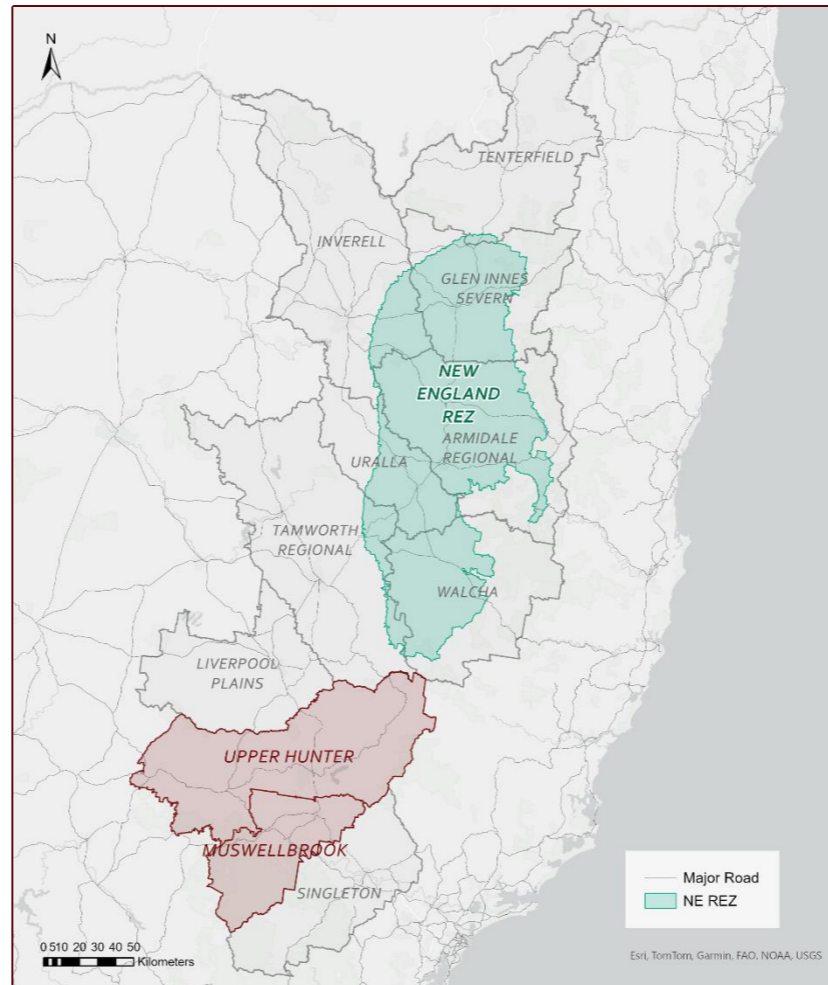
Upper Hunter and Muswellbrook are both mining communities whose supply chains are predominantly set up to support the mining industry, with some contribution to each from agriculture.

Local snapshot by LGA (5/6)

Upper Hunter

Population	14,338 (0.17% of NSW population)
Working age population	60.3% (NSW 64.6% Aus 64.9%)
Number of jobs per business	6.7
Key industries	Agriculture, forestry & fishing (17%) Mining (12%)

- Stakeholders consider Upper Hunter to have plentiful water and land supply, particularly in mine buffer areas.
- Waste capacity is constrained in Upper Hunter, with only 2-5 years of capacity remaining. Investment in a new site (in Aberdeen) is under consideration.



Muswellbrook

Population	16,778 (0.2% of NSW population)
Working age population	63.7% (NSW 64.6% Aus 64.9%)
Number of jobs per business	11.5
Key industries	Mining (22%) Healthcare & social assistance (9%)

- Muswellbrook has the highest number of jobs per business (11.5), indicating a high concentration of businesses.
- The Muswellbrook Bypass (major infrastructure project) is due to be completed in 2028, freeing up workforce capacity.
- Stakeholders consider Muswellbrook's ability to support the REZ to be constrained by mine buffer areas.

Regional context

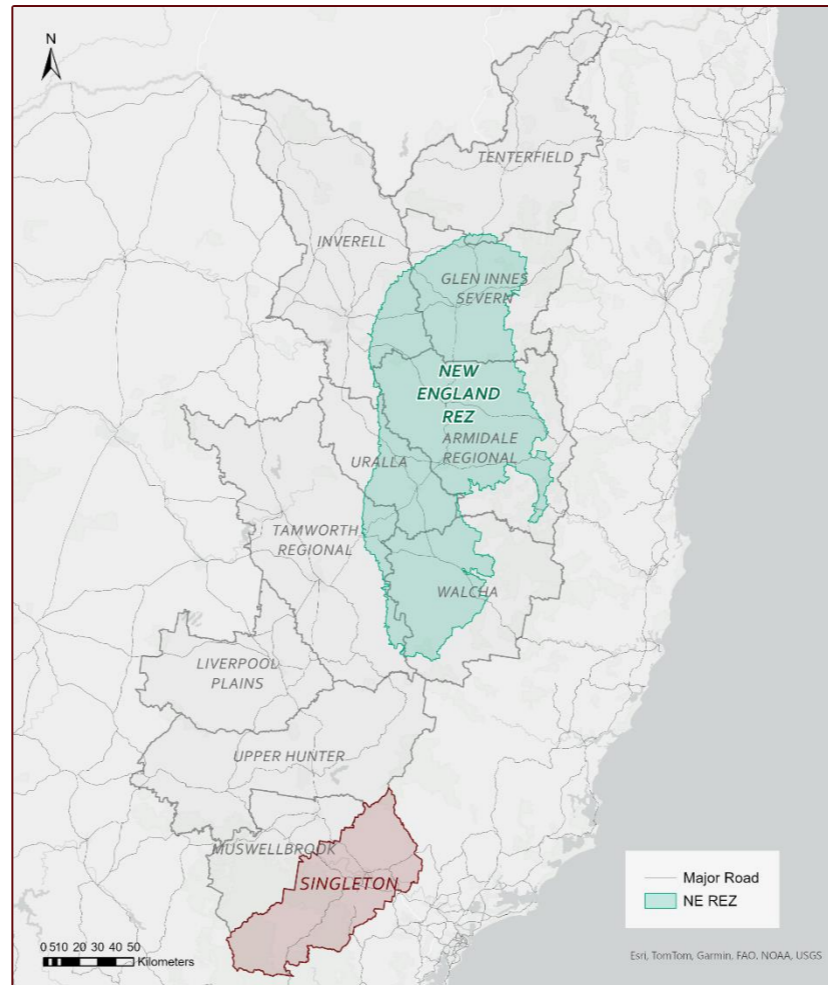
Singleton is another mining community, with coal mining representing 75 per cent of the LGA's economic output.

Local snapshot by LGA (6/6)

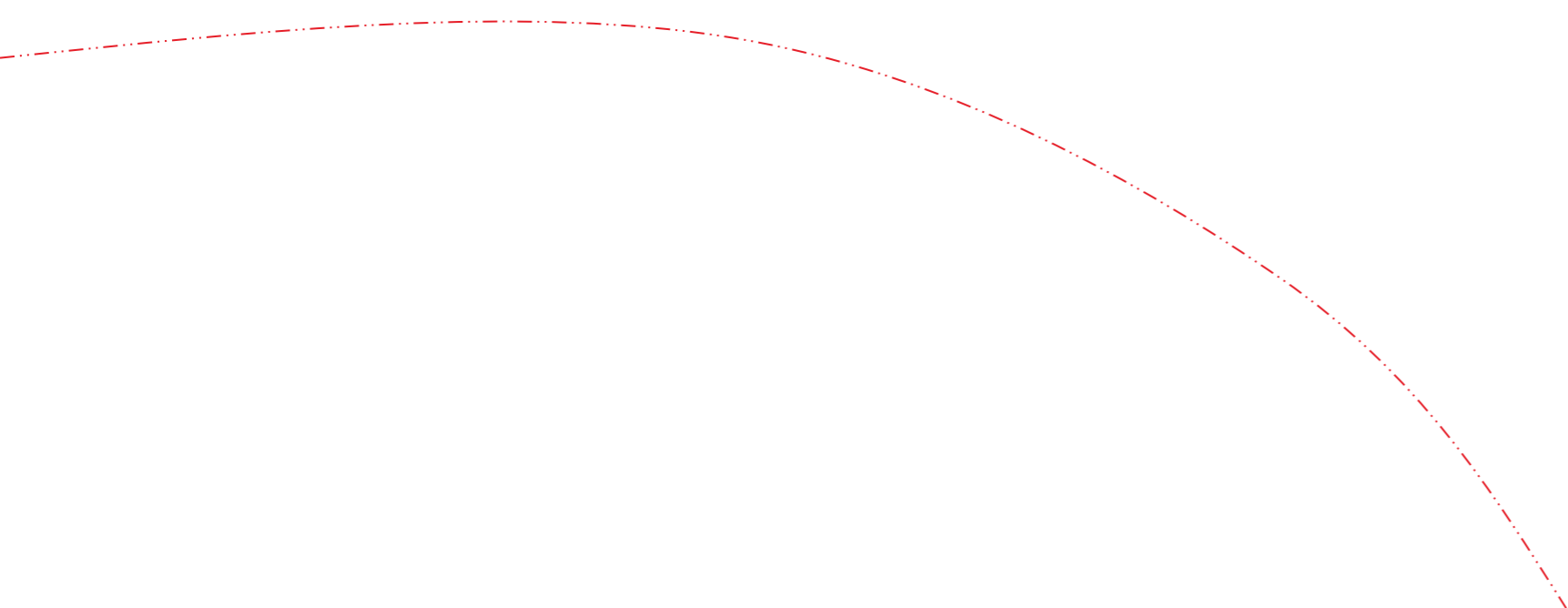
Singleton

	Population	25,332 (0.3% of NSW population)
	Working age population	64.5% (NSW 64.6% Aus 64.9%)
	Number of jobs per business	8.8
	Key industries	Mining (22%) Healthcare & social assistance (9%)

- Coal mining comprises the overwhelming majority (75%) of the LGA's economic output. Hunter Valley Operations is responsible for the production of export-grade thermal coal.



Appendix E – Business Survey Results



Business Survey Results

Survey Questions

A survey was sent and made available to businesses across the study area. A total of 42 responses were received. The survey included xx questions as follows:

Section One – Industry Information

What industry does your business in the NE REZ most closely align to?

1. Minerals, aggregates and concrete supply and batching
2. Steel and metal supply and fabrication
3. Warehousing, logistics, transport and distribution
4. Crane, plant, equipment and heavy vehicle hire
5. Construction and electrical services
6. Electrical component supply
7. Security and surveillance services
8. Waste and disposal
9. Other services (including project management, engineering design, planning, legal, financial, environmental, cultural heritage and design and quantity surveying)

Describe the main activities of your business. If applicable, indicate the scale of your business.

Which (if any) of the following types of infrastructure projects has your business been

involved in delivering?

1. Solar
2. Wind
3. Pumped hydro
4. Battery storage
5. Transmission (132 kV, 220 kV, 330 kV, 500kV network)
6. Transport (roads, rail)
7. Mining
8. Fossil fuel (coal and gas) electricity generation
9. Hospitals, industrial/commercial, schools and other community infrastructure
10. My business has not been involved with any of these projects

Is your business interested in working on/supporting energy infrastructure?

1. Yes
2. No
3. Uncertain

Why/Why not?

What constraints does your business face to working in the energy sector?

1. Unclear on how to get involved

2. Skills shortages
3. Lack of local supply chain partners
4. Lack of specialist infrastructure
5. Lack of available land
6. Lack of access to training
7. Regulation and planning constraints
8. Water access/security issues
9. Other

What support would assist your business in becoming involved in the development of energy infrastructure?

1. Grants
2. Loans
3. Workforce development
4. Business planning and support for organisational capacity building
5. Easier procurement processes
6. Early information about opportunities and processes
7. Planning reform/approvals

Section Two – Business Information

What is the size of your business in Australia?

1. Sole trader/partnership (1-2 employees)
2. 3-10 employees
3. 10-19 employees
4. 20-199 employees
5. 200+ employees

What is the size of your business in the NE REZ?

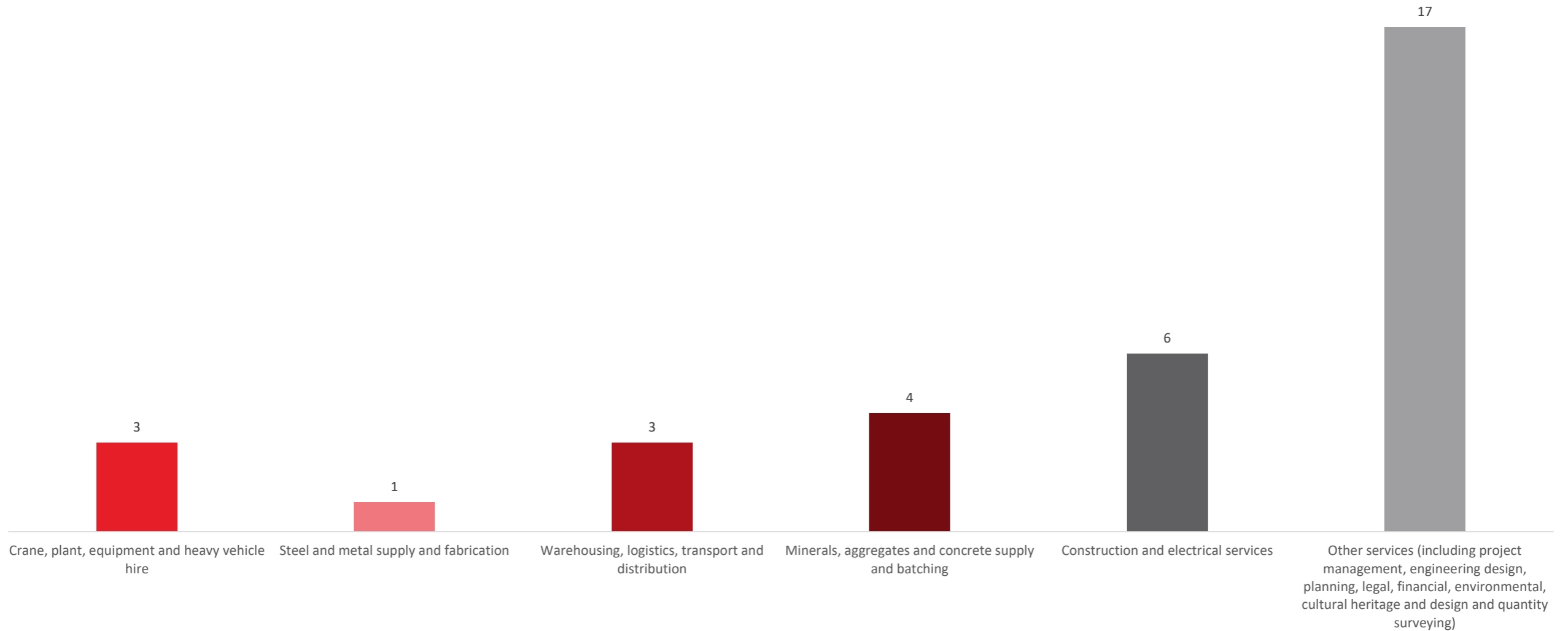
1. Sole trader/partnership (1-2 employees)
2. 3-10 employees
3. 10-19 employees
4. 20-199 employees
5. 200+ employees

Is your business a social enterprise, Aboriginal business or an Australian Disability Enterprise?

1. Yes
2. No
3. Uncertain

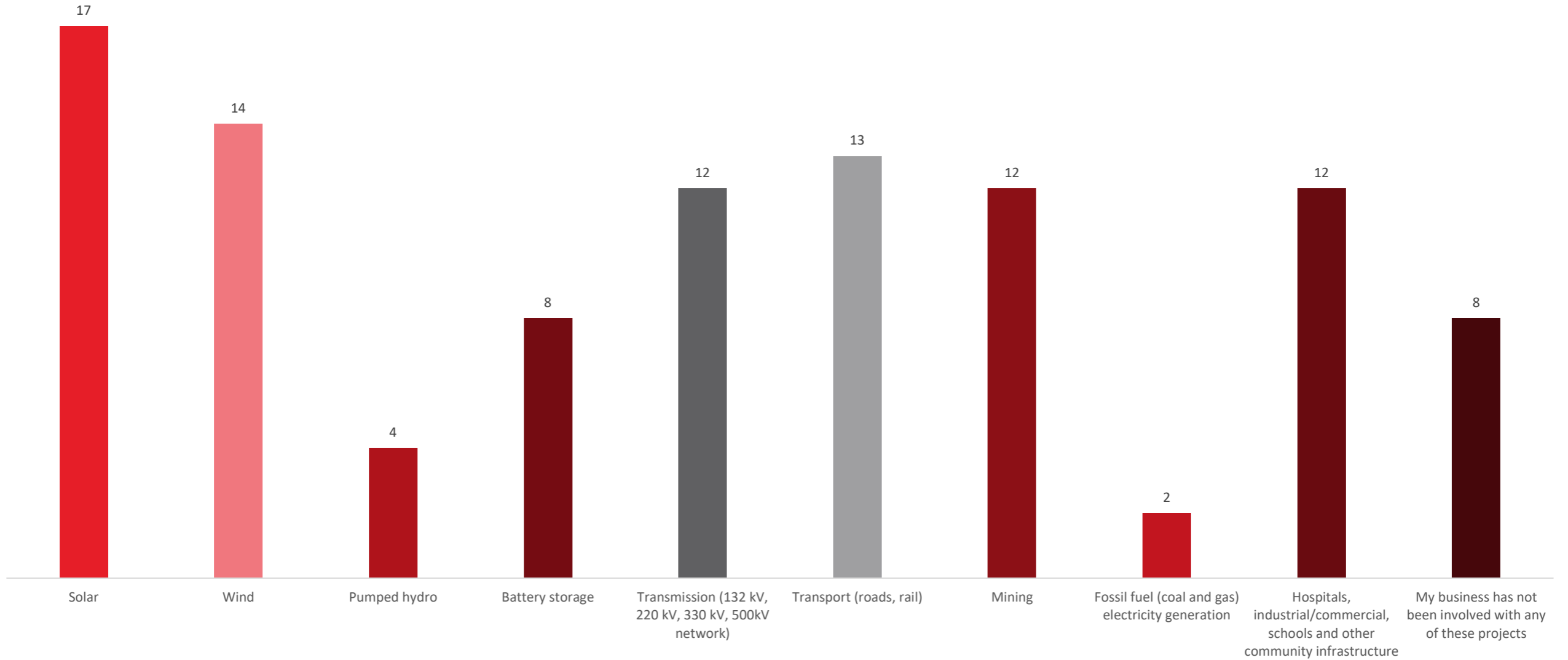
Preliminary Business Survey Results

What industry does your business in the New England Renewable Energy Zone closest align to?



Preliminary Business Survey Results

Which of the following types of infrastructure projects has your business been involved in delivering?



Preliminary Business Survey Results

What is the size of your business in Australia and the New England Renewable Energy Zone?

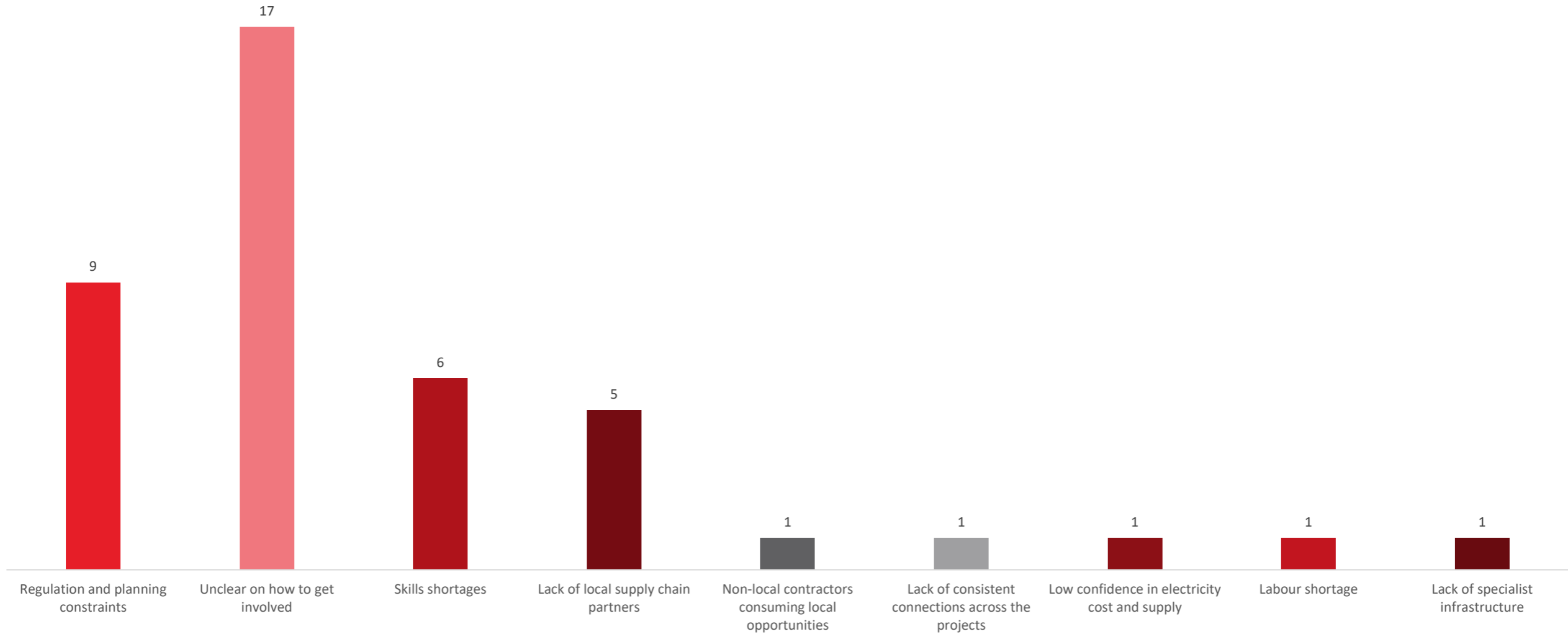
Smaller businesses (1-19 employees) in the warehousing, logistics, transport and distribution, minerals, aggregates and concrete supply and batching, and construction and electrical services sectors are the most represented in the NE REZ area, relative to their footprint in the rest of Australia.

Industry	Sole trader/partnership		3-10 employees		10-19 employees		20-199 employees		200+ employees	
	NE REZ	Australia	NE REZ	Australia	NE REZ	Australia	NE REZ	Australia	NE REZ	Australia
Crane, plant, equipment and heavy vehicle hire	-	-	2	2	1	1	-	-	-	-
Steel and metal supply and fabrication	-	-	-	-	-	-	1	1	-	-
Warehousing, logistics, transport and distribution	-	-	2	1	-	-	1	1	-	1
Minerals, aggregates and concrete supply and batching	2	1	-	2	1	-	-	1	-	-
Construction and electrical services	-	-	1	1	4	1	1	3	-	1
Other services	3	3	6	7	3	3	3	3	1	1

: more represented business type in the local area relative to the rest of Australia

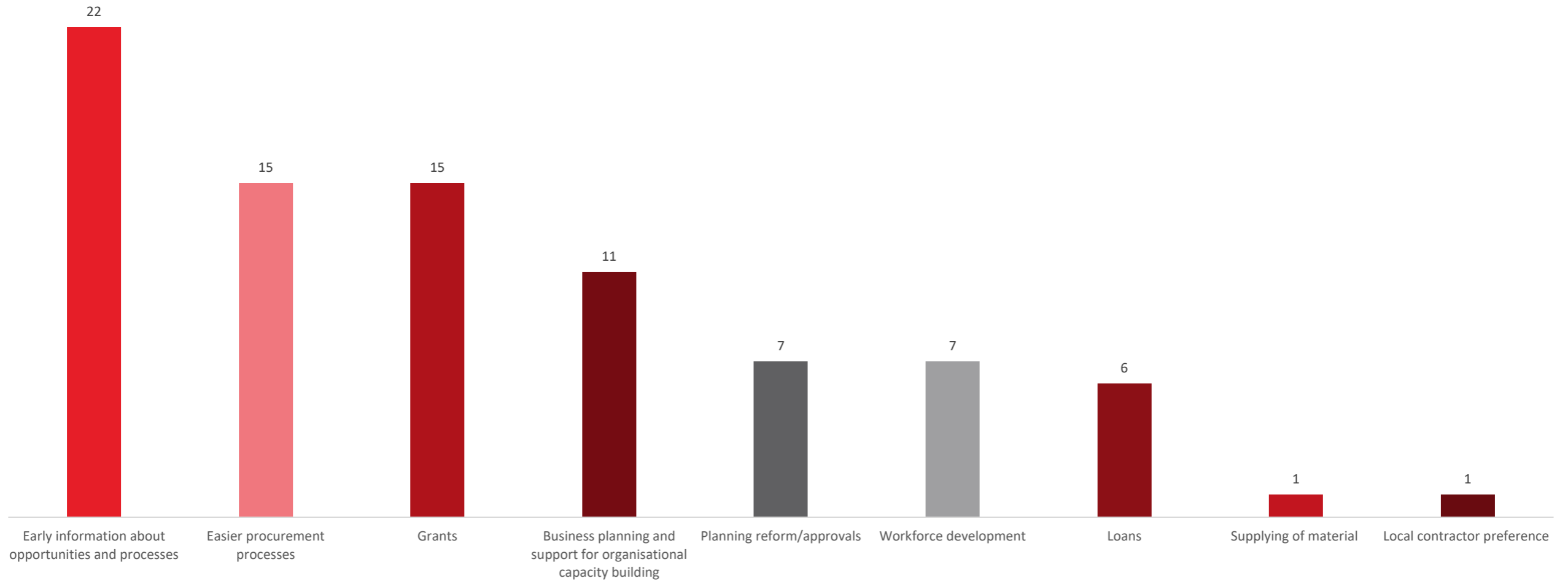
Preliminary Business Survey Results

What constraints does your business face to working in the energy sector?



Preliminary Business Survey Results

What support would assist your business in becoming involved in the development of energy infrastructure?



Arup
Level 5 / 151 Clarence Street
Sydney NSW 2000
Australia
www.arup.com

Contact
[Redacted]
[Redacted]
[Redacted]
[Redacted]