Restart of Redbank Power Station and Use of Biomass (excluding native forestry residues from logging) as a Fuel – Economic Impact Assessment

Prepared for

VERDANT
EARTH TECHNOLOGIES

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AEAS
Australian Economic Advocacy Solutions

REPORT PREPARATION

This report has been prepared by AEAS for Verdant Earth Technologies Limited.

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Executive Summary

It is anticipated that the Redbank Power Station's commercial and community importance will be future proofed given the significant market changes arising from the Australian and NSW Government's commitment to net zero emissions by 2050 and resulting climate change adaption policies. It is anticipated the capital expenditure by Verdant Earth Technologies aligns with the policy directives currently underway.

The Singleton LGA has over the past decade experienced low population growth and is forecast to experience low population growth over the next two decades. It is only recently that Singleton LGA has experienced more promising population growth.

The implications of the economic overview indicate a considerable dependency of both the Singleton LGA and the Hunter Region on mining that highlights vulnerability for its community in terms of lost economic activity and employment as Australia inevitably transitions to a less carbon intensive economy.

A key priority for the Hunter Region will be the development and investment in renewable energy technology to enable substantial cuts in emissions but at the same time responding to increased energy demand. Of even a greater challenge will be the Hunter Region's concentration of coal fired power stations that are inevitably to be phased out and the impact this will have on the regional jobs, the economy and community. Projects like the Redbank Power Station's reopening will need to occur to help transition the Hunter to a lower carbon future.

The reopening of the Redbank Power Station is anticipated to be a significant economic project to both the Singleton LGA and the Hunter Region. The Redbank Power Station reopening will provide both direct and indirect opportunities for local businesses during construction and operation resulting in employment.

In total, the Redbank Power Station Restart are modelled to directly support 471.5 FTE jobs. In addition, another 538 FTE jobs will be supported from indirect flow-on impacts as a result of supply chain benefits and employee spend within NSW businesses.

Total Direct and Indirect Jobs Supported – (FTEs)

Impact	Total
Direct	471.5
Indirect	538
Total	1,009.5

Source: AEAS 2023

In total, the 25 Year NPV of the Redbank Power Station Restart is modelled to provide $901.1 million to the NSW economy.

Total Direct and Indirect Value Added (NPV $ millions)

Impact	Total
25 Years plus construction	$901.1

Source: AEAS 2023

The creation of economic activity from the reopening of the Redbank Power Station has the potential to support improved social and economic outcomes for residents through increased employment opportunities and resulting livelihoods. The Redbank Power Station offers the strong potential to increase the diversification of the employment and industry profile particularly in the Singleton LGA.

The negative socio-economic impacts from the construction and reopening of the Redbank Power Station are assessed to be low and will be managed responsibly by Verdant Earth Technologies. At the same time the socio-economic benefits such as employment creation, population growth, economic diversity and downward pressure on electricity prices and more reliable supply of renewable energy are assessed to have a high and positive consequence.

Redbank Power Station Operation Negative Social Impacts

Impact	Likelihood	Magnitude	Consequence
Potential impact on accommodation prices due to increased demand from power station workers	Possible	Minimal	Low
Potential impacts on social infrastructure and community facilities due to increased demand by power station workers	Unlikely	Minimal	Low
Impact on road safety due to increased traffic associated with haulage of waste wood residues feedstock	Possible	Minimal	Low
Amenity impacts on nearby residential uses	Unlikely	Minor	Low

Source: AEAS 2023.

Redbank Power Station Operation Positive Social Impacts

Impact	Likelihood	Magnitude	Consequence
Creation of direct employment opportunities for local and regional communities	Likely	Moderate	High
Population Growth	Likely	Moderate	High
Generation of Taxation and Revenue for Government	Likely	Minor	Medium
Improved Social and Economic Sustainability	Likely	Moderate	High
Downward pressure on electricity prices and more reliable electricity supply	Likely	Moderate	High

Source: AEAS 2023

In addition to economic and social impacts, the construction and reopening of the Redbank Power Station will create a number of strategic impacts for the Singleton LGA, the Hunter Region and NSW including:

- Both Singleton and the Hunter Region are vulnerable to the consequences of climate change abatement and adaptation policies based on the economic composition of their economies. For example 36.9 per cent of the Singleton LGA's workforce operate in mining. It is projects like the Redbank Power Station reopening that will be essential in helping transition the Singleton and Hunter Regions to a less carbon intensive economy and offering greater diversification of employment opportunities for its workforce.

- One of the most important strategic issues facing NSW is its future energy supply including the availability of reliable baseload and renewable electricity generation. Economic growth in NSW is expected to lead to sustained growth in electricity demand that if left unchecked will potentially lead to a capacity shortfall in the future. The Redbank Power Station reopening is anticipated to benefit NSW community, businesses and industry by improving the reliability of renewable supply in the NEM. The project will support overall downward pressure on NSW energy prices, supporting more affordable electricity costs for households, businesses and industry through NSW and participating NEM jurisdictions over the medium to long term whilst at the same time helping government meet their net zero emissions targets.

1.0 Introduction

AEAS was requested by Verdant Earth Technologies to prepare an economic impact assessment for the proposed reopening of the Redbank Power Station located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428).

Verdant Earth Technologies Limited was founded in 2018 and is working to achieve near-zero emissions by developing green hydrogen and renewable energy assets based on the key foundation of a net- zero economy underpinned by near-zero infrastructure.

The company's first facility, the Redbank Power Station, will be one of Australia's largest green baseload renewable energy providers outside of hydro. Verdant plans to convert the existing Redbank Power Station into a renewable energy hub and aims to use 100% to fuel its operations.

Upon restart, Verdant Power Station will be one of the largest green baseload renewable energy providers in NSW and the only existing facility capable of providing continuous green 24/7 power with near-zero CO2 emissions, adding to grid stability and reliability.

The merit of reopening the Redbank Power Station can in part be determined by highlighting the economic, social and environmental importance it has to both the Singleton community, the Hunter Region and NSW and the valuable role it plays for society and industry as an energy source that generates jobs from the economic activity it enables. Unique to this project is the achievement of these outcomes whilst at the same time achieving considerable environmental benefits.

The project will drive significant progress towards the NSW Government's Net Zero Plan Stage 1: 2020-2030, being the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. The conversion of Redbank Power Station to operate on fuel will result in the first major green baseload power station for Australia.

The Redbank Power Station raises the potential for social and economic impacts, both positive and negative, on the Singleton local government area, Hunter Region and NSW. The 'Scope of Works' for this report involves preparing an economic impact analysis of the potential economic impacts of the project.

2.0 The Redbank Power Station Reopening Project

The Redbank Power Station is an approved baseload power station located at 112 Long Point Road West, Warkworth (Lot 450 DP 1119428). Originally commissioned in July 2001, the Redbank Power Station was designed to use beneficiated dewatered coal tailings (BDT) left over from coal processing to create electricity. The power station uses FiCirc® fluidised bed combustion technology and a single 151MW steam turbine and associated equipment. The power station is designed to burn low value fuels such as coal tailings and is a preferred technology for energy generation from biomass. The technology has demonstrated excellent performance and a low emissions profile.

The power station was approved in 1994 (DA183/93) and the development consent was modified in 1997. Tailings were transferred by conveyor from the Warkworth mine to the power station as a source of fuel. The power station also relied on supplementary fuel in the form of Run of Mine (ROM) coal to assist in electricity generation. Due to the unavailability of coal tailings from Warkworth mine, the power station has been in care and maintenance since October 2014.

Verdant Earth Technologies Limited (the Applicant) has acquired the power station and is seeking approval to restart the plant using biomass (excluding native forestry residues from logging) ("Redbank Biomass") as a sustainable fuel to produce near net zero CO_2 emissions and enable the power station to continue to produce "green" electricity on an ongoing basis (the Proposal).

To address concerns expressed by the community in relation the use of native forestry residues as fuel, the Applicant has developed an alternative biomass fuel strategy which specifically excludes this fuel source. Verdant will also relinquish the current approval to use coal tailings as a fuel at Redbank.

It is proposed that Redbank will be fueled with ecologically sustainable biomass (in compliance with all relevant legislative requirements and excluding native forestry residues from logging) to deliver near net zero CO_2 power generation using standard fuels[1] and eligible waste fuels[2] from the following sources:

Standard Fuels:

- Purpose grown energy plantations;
- Perennial grasses; and
- Energy crops.

Eligible Waste Fuels:

- Biomass with no higher order uses arising from invasive native species control on agricultural land[3];
- Biomass with no higher order uses from approved land clearing activities such as major infrastructure developments for approved civil infrastructure, road clearing works, right of ways and related approved projects[4];
- Agricultural waste biomass products or residues with no higher order uses;
- End of life waste woody biomass manufactured and produced into a fuel to specification ("Domestic Biomass") (subject to EPA approval as an eligible waste fuel)[5]; and
- Other sources of eligible waste fuels with no higher order uses.

Note that at the initial start-up of the power station, and following boiler maintenance and restart of the boilers, a start-up supplementary fuel (diesel or a similar fuel) will be used to achieve the temperature required to use biomass as fuel. Once the boiler is operating at the design temperature, the Redbank Power Station will use only approved biomass as fuel.

The Proposal will use up to 700,000 tonnes of dry equivalent biomass per annum (approximately 850,000 tonne per annum at 25% moisture) as a fuel for conversion into electricity. Fuels for the Redbank Power station will be implemented in two stages.

The first stage will involve the start-up of operations using biomass (with no higher order uses) sourced primarily from approved land clearing operations (from existing civil and road works), biomass from invasive native species on agricultural land as approved by Local Land Services NSW and potentially a limited amount of purpose grown biomass.

The second stage will involve the introduction or increased use of purpose grown biomass which will be further increased over a period of two to four years from approval, and, if approved and declared an eligible waste fuel by the NSW EPA, the introduction and use of Domestic Biomass.

Verdant will, where appropriate, seek separate Specific Resource Recovery Orders and Exemptions (RROE) and notification by the NSW EPA in the New South Wales Government Gazette as required prior to the use of the biomass fuels.

Ash generated by the Proposal will be regularly tested and transported off-site for beneficial use as a soil amendment in agriculture in accordance with EPA requirements. Trucks used to deliver biomass to the site will be backloaded with the ash for removal to an approved site for reuse in accordance with the Ash from Burning Biomass Order and Exemption 2014. Once Domestic Biomass is approved, Verdant will apply for a separate RROE for the resulting ash derived from Domestic Biomass.

[1] *A standard fuel is defined in Part 1 of Schedule 2 of the Protection of the Environment Operations (Clean Air) Regulation 2022 as 'an unused and uncontaminated solid, liquid or gaseous fuel that is — (c) a wood or wood-derived fuel'.*

[2] *An eligible waste fuel is defined as a 'waste or waste-derived materials considered by the EPA to pose a low risk of harm to the environment and human health due to their origin, low levels of contaminants and consistency over time' as per NSW EPA (2022) Eligible Waste Fuel Guidelines.*

[3] *The Land Management (Native Vegetation) Code 2018 under the Local Land Services Act 2013 sets out permitted clearing and thinning of native vegetation on agricultural land, such as invasive native species where a compliance certificate has been issued by Local Land Services NSW.*

[4] *Requires notification by the NSW EPA in the New South Wales Government Gazette under Section 140 of the Protection of the Environment Operations (General) Regulation 2022.*

[5] *Domestic Biomass Fuel (DBF) is not currently prescribed as an 'eligible waste fuel' under current EPA guidelines, though the applicant will seek to demonstrate this prior to its use through a post-approval Specific Resource Recovery Order and Exemption application under Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014.*

To enable the power station to use biomass as a primary fuel source, some modifications to the plant and operations will be required. These changes are summarised below:

- Maintenance, repair and recommissioning works within the power station to permit recommencement of electricity generation;
- Delivery of biomass in B-doubles (42-44 tonnes per load) via Long Point Road on a 24/7 basis. Deliveries will be prioritised to 12-hour shifts on Monday through Sunday between 6am and 10pm;
- The existing conveyor from the Warkworth mine for transfer of coal tailings into the plant will remain in the first instance;
- Two 28m long weighbridges to be installed along the (western) inbound lane into the site and the (eastern) outbound lane out of the site;
- Conversion of the power station to enable the use of up to 700,000 tonnes dry equivalent per annum of biomass as feedstock fuel for electricity generation with near net zero CO_2 emissions equivalent;
- Construction of a 160m sealed road at the rear of the site to enable to delivery of biomass to the fuel storage area;
- Establishment of a new fuel delivery area adjacent to the existing stockpiling area directly south of the existing power plant. The system will incorporate two dual-lane drive over truck unloaders, two additional conveyors that supply two radial telescopic conveyors to unload the biomass. One telescopic conveyor will direct fuel to the existing fuel storage area (i.e. the area approved for storage of coal tailings), and the second to two moving floor bulk unloader bins, which directly feed existing Conveyor 76. Swales to be provided around biomass stockpile area to minimise movement of biomass fuel from the designated storage area;
- Use of the existing Conveyors 34 and 35 to supply Boilers 1 and 2 respectively with biomass fuel. An extension to Conveyor 76 and removal of the crusher house is required to enable the even transfer of fuel via Conveyors 34 and 35 to Boilers 1 and 2;
- Modifications to two reversing conveyors within the power station to transfer the biomass into each of six fuel silos that will store the biomass. These silos previously stored ROM coal for delivery into the plant's fluidised bed combustion chambers;
- Modifying of the 'trouser legs' of the six fuel silos within the power station to enable the more efficient flow of biomass into the plant's fluidized bed combustion chambers;
- Ash generated from the combustion process will be sampled, tested and potentially used as a fertiliser in accordance with the EPA's The Ash from Burning Biomass Order 2014. The existing ash slurry system previously used to transfer coal tailings ash back to Warkworth mine will remain in place, though it will not be used and may be removed at a later date. A Specific Resource Recovery Order and Exemption will be sought for ash from use of DBF as a fuel; and
- Other work, including landscaping, fire detection and suppression systems, and refurbishment of internal elements of the power station as required. This will also include the purchase of a water access licence, reconnection to the electricity grid, development of a spare parts inventory and purchase and storage of a fuel invention for the power station.

When fully operational the Proposal will supply the grid with approximately 1 million megawatt hours of 24/7 dispatchable or baseload electricity per year, equivalent to supplying around 200,000 homes. The Proposal will also drive significant progress towards the NSW Government's Net Zero Plan Stage 1: 2020-2030, the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050.

The facility is located on land zoned RU1 under the Singleton Local Environmental Plan 2013. The proposed development is permissible as a 'electricity generating works' with consent in RU1 zoning under Clause 2.36 of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

The Proposal is considered a State Significant Development (SSD) under Clause 20(a) of Schedule 1 of State Environmental Planning Policy (Planning Systems) 2021 as it involves a development for the purpose of electricity

generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that has a capital investment value of more than $30 million. The Secretary's Environmental Assessment Requirements for the Proposal were issued by the Department of Planning and Environment (SEARs 56284960) on 30th August 2023.

The Proposal requires assessment under Part 4 of the Environmental Planning and Assessment Act 1979 and the consent authority for the development will be the Minister for Planning. An Environmental Impact Statement (EIS) must accompany the development application. An amended licence from the NSW EPA under Schedule 1 of the Protection of the Environment Operations Act 1997 will also be required.

3.0 Scope of Report

The Redbank Power Station raises the potential for social and economic impacts, both positive and negative, on the Singleton local government area and Hunter Region. The 'Scope of Works' for this report involves preparing an economic impact analysis of the potential economic impacts of the development, including a discussion of any potential economic and social benefits to the local and broader community.

The methodology for this assessment has been informed by the Social Impact Assessment Guideline State Significant Projects (Department of Planning, Industry and Environment, 2020). Assessment based on these guidelines involved:

- Describing the existing socio-economic environment of the study area to provide a baseline from which impacts of the project can be assessed; and

- Assessing the potential socio-economic impacts of the project, including both negative and positive impacts. This included consideration of potential impacts on local amenity, access, connectivity, business and communities and potential cumulative impacts.

The study area for the economic impact assessment focusses on the Singleton LGA and the Hunter Region where potential impacts, both positive and negative, of the Project's construction and operation will be experienced. The report also describes social, environmental and energy related issues of the local and regional area and provide an assessment of their sensitivity/significance from an economic perspective.

Figure 1: Aerial View of Redbank Power Station

Source: Jackson Environment and Planning Pty Ltd

4.0 Socio Economic Overview

4.1 Overview

4.1.1 Singleton

The Singleton Local Government Area is located 200km north-west of Sydney and 80km inland from Newcastle in New South Wales. It is located in the heart of the Hunter Valley and has a land area of 4,893 sq km. As the gateway between the Upper and Lower Hunter, the Hunter Expressway makes Singleton easily accessible to the Port and coastal attractions of Newcastle, as well as 2.5 hours' drive to Sydney. Rail and air transport links allow convenient access to major cities on the eastern seaboard and beyond.

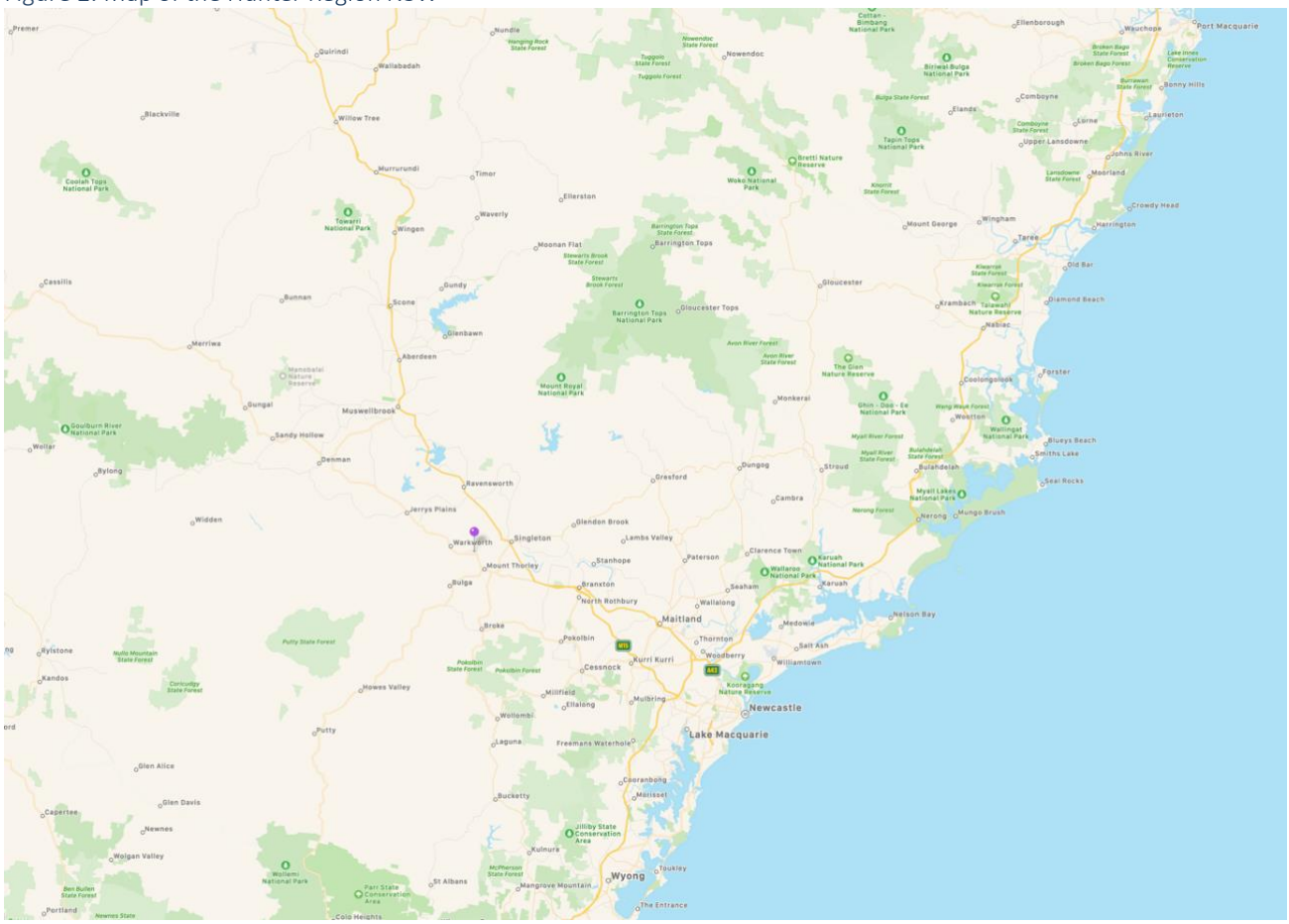
The Singleton LGA was founded on agriculture, coal and played an important role in the colonisation of NSW. Combined with an industry base, skilled labour force and location on a major transport route, Singleton is an attractive business and commercial location and is home of major industries including coal mining and construction, defence, agricultural production and viticulture.

Singleton also boasts natural attributes and historical significance, surrounded by Lake St Clair, Mount Royal, Yengo and Wollemi National Parks and is an important centre of Aboriginal and colonial heritage.

4.1.2 The Hunter Region

The Hunter region is comprised of ten local government areas including Cessnock, Dungog, Lake Macquarie, Maitland, MidCoast, Muswellbrook, Newcastle, Port Stephens Singleton, Upper Hunter. It includes Greater Newcastle - the seventh largest urban area in Australia.

Figure 2: Map of the Hunter Region NSW



The region is situated on Australia's main east coast transport corridor. It has sophisticated infrastructure, international gateways including an airport and deep sea port.

Covering an area of nearly 33,000 sq km it is the most populous regional area in Australia. With over 705,000 people the Hunter has significantly more people and greater economic output than Tasmania, the Australian Capital Territory or the Northern Territory.

The Hunter Region combines an innovative economic and business environment with a high standard of living, proximity to Australia's largest city, Sydney and easy connections to Australia's other capital cities. The Hunter Region is Australia's largest regional economy, with an economic output of around $59.5 billion per annum.

The Hunter Region is seeking to position itself strongly as a world-class regional centre. The Hunter's location on Australia's eastern seaboard, between Melbourne and Brisbane, and two hours' drive from Sydney together with significant transport infrastructure gives the region a competitive advantage in accessing Australian and international markets.

People relocating to the Hunter experience an excellent lifestyle, with a combination of natural assets, pleasant climate and a high level of social infrastructure and services. The Region offers very high levels of education and health services, as well as all the services expected from a major centre. Relatively low levels of traffic congestion and affordable real estate prices compared to most Australian capital cities are currently promoting net migration.

4.2 Population

As at the end of June 2022 the Singleton LGA had a resident population of 25,093 persons and the broader Hunter Region has a resident population of 734,523 persons. Whilst Singleton and the Hunter region offer considerable economic and lifestyle advantages their population growth has generally been below the NSW average over the past decade. However recently Singleton's population growth rate has been higher than NSW.

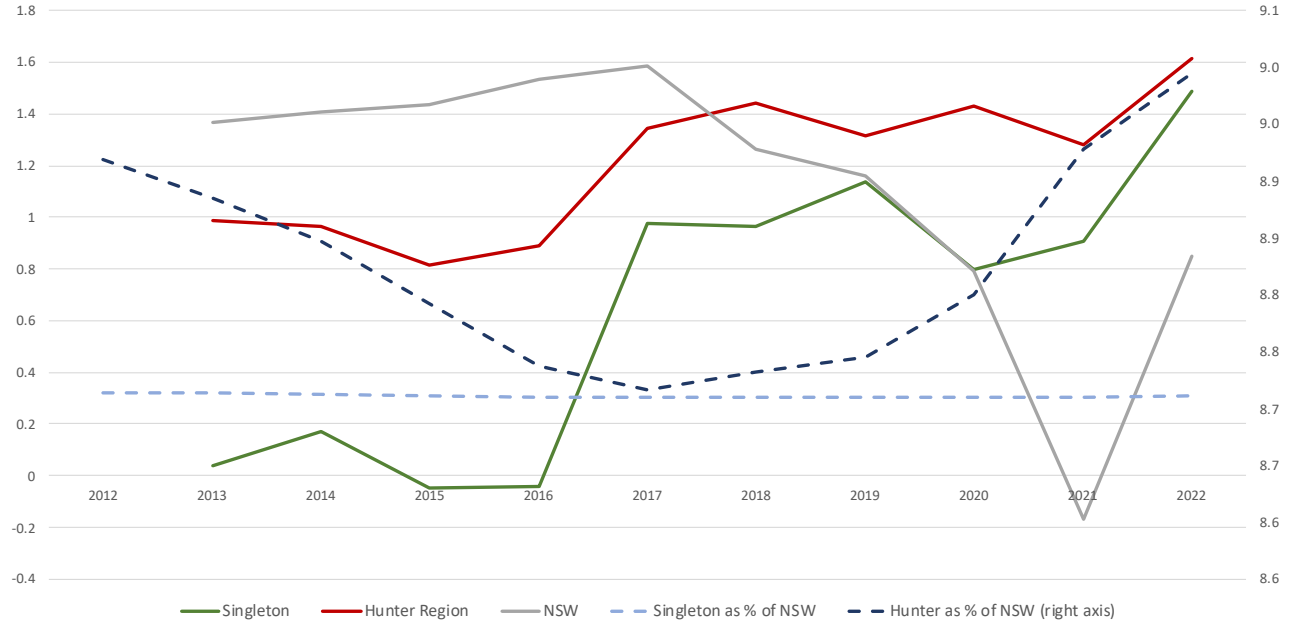
Table 1: Singleton LGA, Hunter Regional and NSW Population Estimates (persons)

	Singleton		Hunter Region		NSW			
Year (ending June 30)	Persons	Annual % Growth	Persons	Annual % Growth	Persons	Annual % Growth	Singleton as a % of NSW	Hunter as a % of NSW
2012	23,548		651,439		7,304,244		0.3	8.9
2013	23,557	0.0	657,874	1.0	7,404,032	1.4	0.3	8.9
2014	23,597	0.2	664,224	1.0	7,508,353	1.4	0.3	8.8
2015	23,586	0.0	669,656	0.8	7,616,168	1.4	0.3	8.8
2016	23,576	0.0	675,610	0.9	7,732,858	1.5	0.3	8.7
2017	23,806	1.0	684,676	1.3	7,855,316	1.6	0.3	8.7
2018	24,036	1.0	694,564	1.4	7,954,476	1.3	0.3	8.7
2019	24,309	1.1	703,683	1.3	8,046,748	1.2	0.3	8.7
2020	24,503	0.8	713,735	1.4	8,110,610	0.8	0.3	8.8
2021	24,725	0.9	722,862	1.3	8,097,062	-0.2	0.3	8.9
2022	25,093	1.5	734,523	1.6	8,165,731	0.8	0.3	9.0

Source: AEAS and Remplan 2023.

As a result Singleton's share of NSW's total population has remained relatively unchanged at just 0.3% and the Hunter region has increased from 8.9% in 2012 to 9.0%. Undoubtedly the strength of the Hunter economy (discussed next) will remain the key factor in determining future population, due to the strong link between economic performance and population growth as population flows towards employment opportunity.

Figure 3: Singleton LGA, Hunter Regional and NSW Annual Population Growth Rates (%)



Source: AEAS and Remplan 2023.

4.3 Population Projections

The trends referred to above according to NSW Government ASGS LGA population projections are not expected to change with the Singleton LGA's population not expected to grow over the next two decades and compares to the Hunter region's forecasted growth of 22.4% which are both less than NSW's forecasted population growth of 29.4%.

Table 2: Singleton LGA, Hunter Region and NSW Population Projections

	Singleton (persons)	Hunter Region (persons)	NSW (persons)
2021	23,380	705,055	8,167,532
2026	23,868	788,108	9,011,010
2031	23,829	818,286	9,560,567
2036	23,667	839,940	10,077,964
2041	23,383	863,131	10,572,696
Change	3	158,076	2,405,164
Percentage Change 2021 – 2041	0.0	22.4	29.4

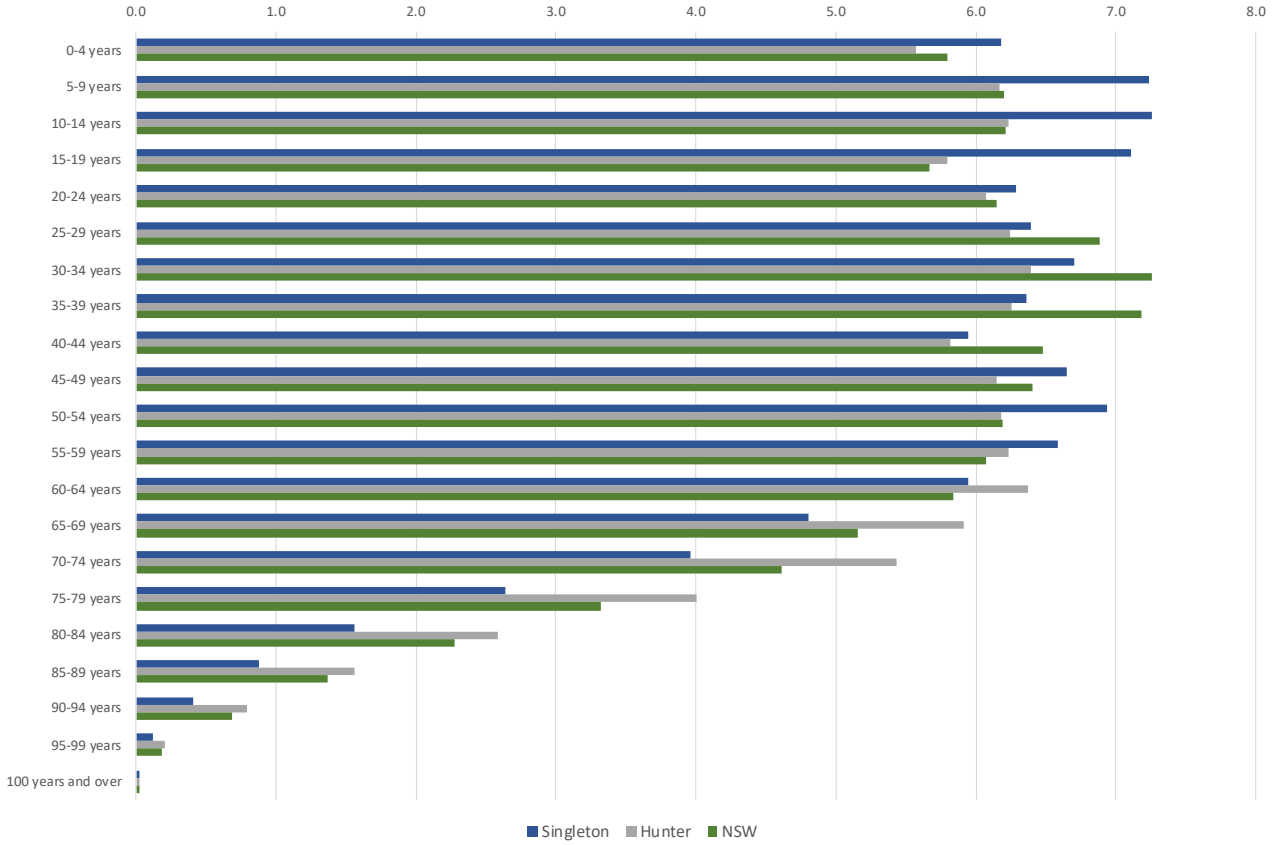
Source: NSW Government ASGS 2019 LGA projections

4.4 Demographics

Of the people who live in the Singleton LGA, 50.9% are male and 49.1% are female. The median age is 37. Data shows 5.4% of the population are Aboriginal and/or Torres Strait Islander people. The single largest age cohort for the Singleton LGA is 10 to 19 years with 3530 persons representing 14.4% of the population. This compares to the Hunter region where the largest cohort is aged between 50 – 59 years and NSW where the largest cohort is aged between 30 – 39 years.

Whilst population growth has generally worked against Singleton LGA in the past decade the LGA's age structure is now younger than both the Hunter Region and NSW which will positively influence the natural increase component of population growth in future years assuming this cohort remain located in the area.

Figure 4: Singleton LGA, Hunter Region and NSW Age Structure (% of total population)



Source: AEAS and Remplan 2023.

4.5 Education

In respect to level of educational attainment the Singleton LGA has a lower percentage of the population who have a certificate level of education or above. Only 39.2% of the population hold either a certificate, advanced diploma or diploma, bachelor degree, graduate diploma or certificate or postgraduate degree. This compares to 43.0% for the Hunter Region and 44.7% for NSW.

Table 3: Singleton LGA, Hunter Region and NSW Level of Qualification Held (Persons)

	Singleton		Hunter Region		NSW	
Industry Sector	persons	% of Total	persons	% of Total	persons	% of Total
Postgraduate Degree Level	365	1.5	22,441	3.1	485,845	5.9
Graduate Diploma and Graduate Certificate Level	229	0.9	10,855	1.5	135,609	1.7
Bachelor Degree Level	1,683	6.7	76,033	10.4	1,217,048	14.9
Advanced Diploma and Diploma Level	1,495	6.0	53,386	7.3	616,322	7.5
Certificate Level	6,063	24.2	153,470	20.9	1,197,119	14.7
Inadequately described	91	0.4	3,531	0.5	49,645	0.6
Level of education not stated	1,619	6.5	45,250	6.2	529,890	6.5
Not applicable	13,548	54.0	369,557	50.3	3,934,253	48.2
Total	25,093	100	734,523	100	8,165,731	100

Source: AEAS and Remplan 2023.

4.6 Incomes

Given the prominence of both mining and public administration, the Singleton LGA has a greater proportion of its employees earning higher incomes than both the Hunter Region and NSW. The largest income earning bracket for Singleton is annualised earnings greater than $104,000 - $156,000.

Table 4: Distribution of Incomes – Singleton LGA, Hunter Region and NSW ($ and Percentages)

	Singleton		Hunter Region		NSW	
Industry Sector	persons	% of Total	persons	% of Total	persons	% of Total
Negative income	12	0.1	329	0.1	4,517	0.1
Nil income	37	0.2	1,071	0.3	15,451	0.4
1-$149	353	1.9	9,557	2.9	80,314	2.2
150-$299	357	1.9	9,117	2.8	88,400	2.4
300-$399	382	2.1	9,887	3.0	99,194	2.7
400-$499	378	2.0	13,076	4.0	128,613	3.5
500-$649	803	4.3	23,585	7.2	224,012	6.1
650-$799	1,268	6.9	29,748	9.1	294,613	8.0
800-$999	1,637	8.9	39,295	12.1	396,350	10.8
1,000-$1,249	1,794	9.7	45,061	13.8	480,876	13.1
1,250-$1,499	1,457	7.9	33,751	10.4	383,218	10.4
1,500-$1,749	1,571	8.5	29,196	9.0	340,218	9.3
1,750-$1,999	1,684	9.1	22,579	6.9	267,564	7.3
2,000-$2,999	4,581	24.8	39,499	12.1	495,429	13.5
3,000-$3,499	1,139	6.2	7,557	2.3	118,572	3.2
3,500 or more	927	5.0	10,458	3.2	230,619	6.3
Not stated/Not applicable	100	0.5	1,881	0.6	24,282	0.7
Total	18,480	100.0	325,647	100.0	3,672,240	100.0

Source: AEAS and Remplan 2023.

Mining is the largest provider of remuneration to residents of Singleton accounting for 56.2% of all wages paid in the LGA. This contrasts against the broader Hunter Region where Health Care and Social Assistance is the largest provider of earnings (17.1%) and also for NSW (14.2%).

4.7 Implications for Redbank Power Station's Reopening

The Singleton LGA whilst experiencing lower population growth over the past decade has recently experienced an accelerated population growth. Despite this recent positive trend forecasts continue to indicate Singleton will experience lower population growth over the next two decades. As a result it is inevitable that it will be harder to support existing businesses and justify the provision of existing social infrastructure with the anticipated population base.

This has the potential to compound as population flows away from the area. Population flows toward economic and employment opportunity and the correlation between employment and population growth in Regional Australia has been very strong.

The Productivity Commission confirms the factors that will shape the Singleton LGA's adaptive capacity and economic transition include people-related factors such as educational achievement, employment rates, skill levels, personal incomes but also industry diversity. At the heart of the Singleton LGA's challenge will be a transition away from its reliance on mining that is illustrated in Section 5 and discussed in detail in section 10.1.

The socio outlook for the Hunter Region is more positive with significantly higher population growth both over the past decade and anticipated over the coming decades.

5.0 Economic Overview

5.1 Overview

The economy of the Hunter Region enjoys a number of strengths and makes a significant contribution to the Australian economy. The region is rich in resources and underpinned by the world's best quality coal, natural water resources, significant electricity generation capacity, an innovative manufacturing sector and a progressive business culture.

The Hunter regional economy has quite distinct industry bases with strong historical foundations in mining, manufacturing and agriculture with these continuing as major contributors. It has, however, undergone substantial structural changes over the past two decades, including considerable diversification in industry sectors and expansion in broad service sectors. However the same level of diversification has not yet occurred for the Singleton LGA and further diversification is required for the Hunter Region where its concentrated industry mix is still readily apparent.

5.2 Gross Regional Product

The Singleton LGA currently comprises 0.9% of economic activity in New South Wales, with estimated regional output of $5.8 billion. The Hunter currently comprises over 9.0% of economic activity in New South Wales, with estimated regional output of over $59.1 billion — making it Australia's largest regional economy.

Table 5: Singleton LGA, Hunter Region and NSW Gross Regional Product (Real Terms)

	Singleton		Hunter Region		NSW			
Year (ending June 30)	GRP $m	Annual % Growth	GRP $m	Annual % Growth	GSP $m	Annual % Growth	Singleton as a % of NSW	Hunter as a % of NSW
2012	$10,578	124.0	$56,845	24.5	$538,712	2.6	2.0	10.6
2013	$6,166	-41.7	$49,740	-12.5	$550,587	2.2	1.1	9.0
2014	$4,200	-31.9	$46,620	-6.3	$552,468	0.3	0.8	8.4
2015	$3,910	-6.9	$46,808	0.4	$567,266	2.7	0.7	8.3
2016	$4,523	15.7	$52,751	12.7	$589,092	3.8	0.8	9.0
2017	$4,492	-0.7	$51,488	-2.4	$618,915	5.1	0.7	8.3
2018	$7,336	63.3	$57,751	12.2	$635,437	2.7	1.2	9.1
2019	$7,913	7.9	$59,579	3.2	$647,196	1.9	1.2	9.2
2020	$8,689	9.8	$61,591	3.4	$653,493	1.0	1.3	9.4
2021	$8,237	-5.2	$62,754	1.9	$643,145	-1.6	1.3	9.8
2022	$5,791	-29.7	$59,141	-5.8	$656,993	2.2	0.9	9.0

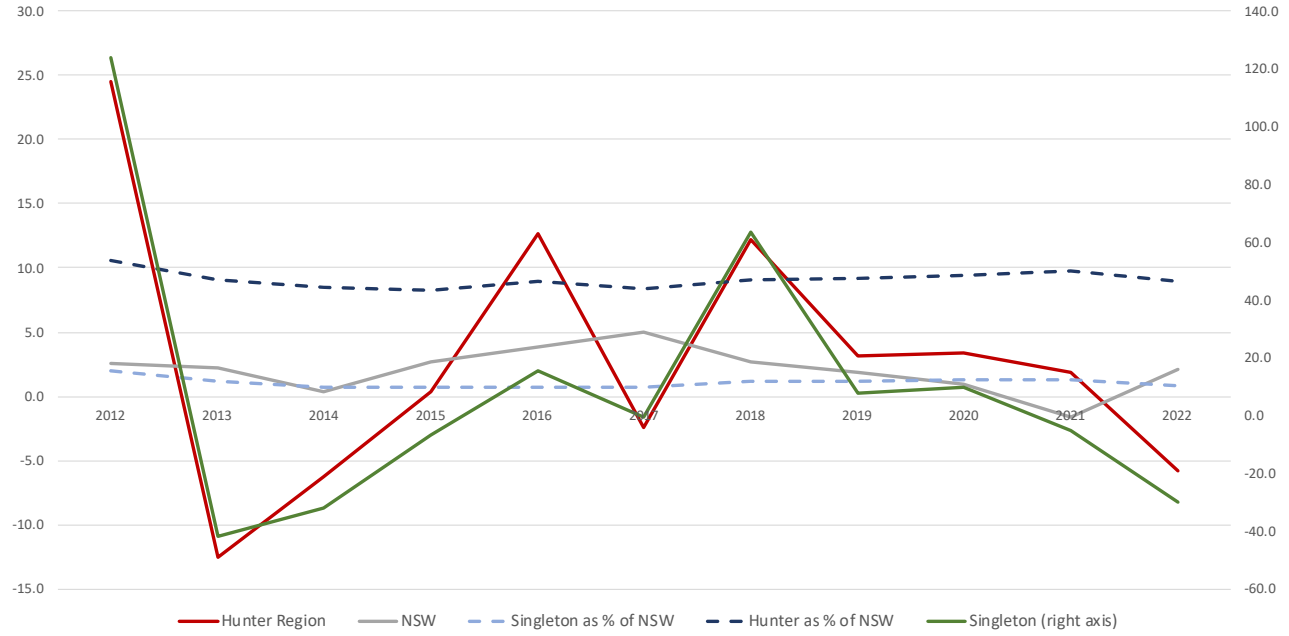
Source: AEAS and Remplan 2023.

Singleton LGA's economic growth has been inconsistent with economic growth ranging between -41.7% through to 124% and its economic importance ranging between 0.7% to 2.0% of NSW's economic output. The average economic growth over the past decade has been 9.5% and compares to NSW's 2.1%. This is a reflection of individual projects considerably influencing overall economic growth.

The Hunter Region has similarly experienced better economic conditions than the NSW. The Hunter Region's economic growth has ranged between -12.5% through to 24.5% and its economic importance has decreased from 10.6% of NSW economy in 2012 to 9.0% in 2022.

A range of macroeconomic issues are currently impacting on the Hunter Region's economy including softer global economic demand and volatility in commodity prices as well as perceptions relating to 'dirty' industries and a subsequent move of younger residents away from the region.

Figure 5: Gross Regional Product – Annual % Growth (CVM)



Source: AEAS and Remplan 2023.

5.3 Economic Contribution by Industry

Mining is by the far the largest economic contributor to the Singleton LGA comprising 66.1% of all industry value add. The three largest industries in the Hunter Region in 2021-22 were Mining ($3,983 million or 66.1%) but also Public Administration and Safety ($327 million or 5.4%); and Rental, Hiring and Real Estate ($304 million or 12.0%);. These three industries account for just over three in every four dollars of the total value added by industry in the Hunter Region.

Table 6: Singleton LGA, Hunter Region and NSW Industry Value Add by Industry Sector ($ million and %'s)

	Singleton		Hunter Region		NSW	
Industry Sector	IVA $m	% of Total	IVA $m	% of Total	IVA $m	% of Total
Mining	$3,983	66.1	$8,995	15.3	$20,681	3.2
Public Administration & Safety	$327	5.4	$4,055	6.9	$40,811	6.2
Rental, Hiring & Real Estate Services	$304	5.0	$7,351	12.5	$87,775	13.4
Construction	$223	3.7	$5,499	9.3	$55,070	8.4
Administrative & Support Services	$169	2.8	$1,313	2.2	$14,398	2.2
Manufacturing	$144	2.4	$3,130	5.3	$35,934	5.5
Wholesale Trade	$136	2.3	$1,442	2.4	$22,878	3.5
Health Care & Social Assistance	$106	1.8	$6,123	10.4	$57,264	8.8
Education & Training	$91	1.5	$2,609	4.4	$28,415	4.3
Retail Trade	$85	1.4	$1,003	1.7	$12,967	2.0
Electricity, Gas, Water & Waste Services	$81	1.4	$3,278	5.6	$38,137	5.8
Agriculture, Forestry & Fishing	$67	1.1	$2,854	4.8	$55,111	8.4
Financial & Insurance Services	$66	1.1	$2,226	3.8	$30,229	4.6
Other Services	$60	1.0	$2,177	3.7	$16,891	2.6
Accommodation & Food Services	$57	1.0	$1,495	2.5	$13,646	2.1
Professional, Scientific & Technical Services	$56	0.9	$1,073	1.8	$10,551	1.6
Transport, Postal & Warehousing	$53	0.9	$3,499	5.9	$87,219	13.3
Information Media & Telecommunications	$11	0.2	$572	1.0	$21,548	3.3
Arts & Recreation Services	$7	0.1	$268	0.5	$4,655	0.7
Total	$6,026	100.0	$58,962	100.0	$654,177	100.0

Source: AEAS and Remplan 2023.

5.4 Labour Market Status

As discussed above with sustained growth over the past decades, both the Singleton LGA and the Hunter region have experienced an upward trend in employment. Before this period, unemployment rates were significantly higher than NSW and national averages.

The Singleton LGA has 62.1% of its overall population in employment with 38.7% in full-time work and 18.4% in a part-time role. This is higher than the Hunter Region's 55.9% and the NSW average of 55.8%.

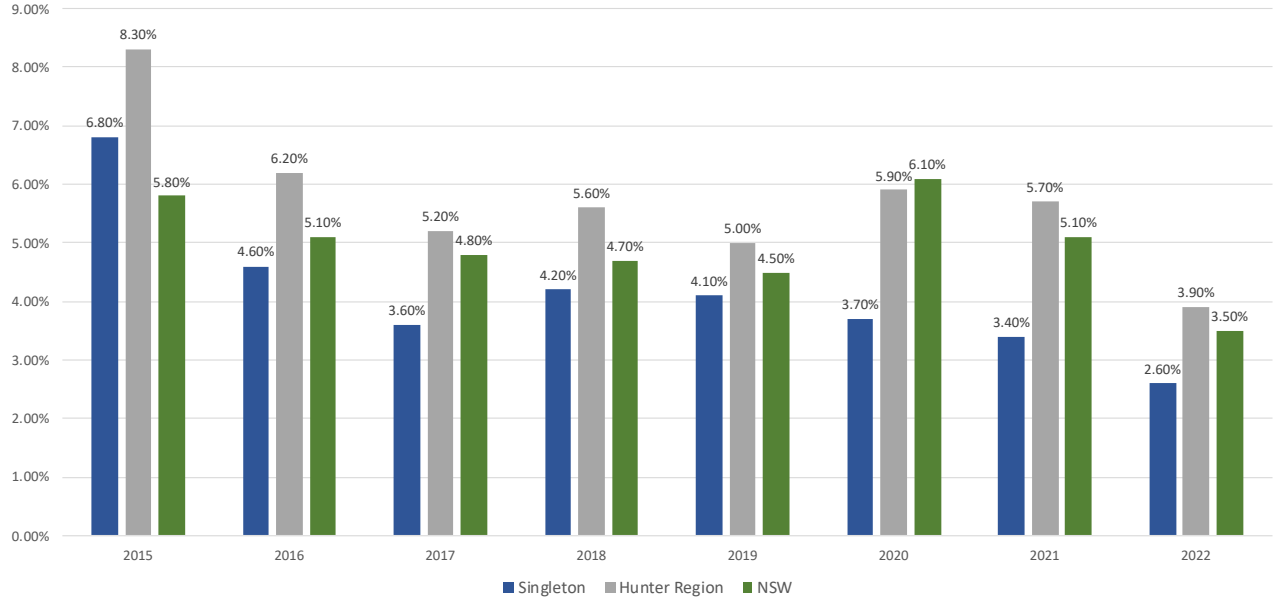
Table 7: Labour Market Status – Singleton LGA, Hunter Region and NSW ($ and Percentages)

	Singleton		Hunter Region		NSW	
Industry Sector	persons	% of Total	persons	% of Total	persons	% of Total
Employed, worked full-time	7,537	38.7	189,185	31.8	2,136,612	32.4
Employed, worked part-time	3,594	18.4	117,677	19.8	1,151,661	17.4
Employed, away from work	975	5.0	25,686	4.3	395,889	6.0
Unemployed, looking for full-time work	250	1.3	9,070	1.5	107,837	1.6
Unemployed, looking for part-time work	219	1.1	7,575	1.3	82,015	1.2
Not in the labour force	5,658	29.0	215,426	36.2	2,341,419	35.5
Not stated	1,266	6.5	30,184	5.1	386,728	5.9
Total	19,499	100.0	594,803	100.0	6,602,161	100.0

Source: AEAS and Remplan 2023.

Consistent with a higher portion of the population in employment the Singleton LGA's unemployment rate is just 2.6% in June 2022 and compares to the Hunter Region's unemployment rate of 3.9% and the NSW average of 3.5%. Singleton's unemployment rate has generally been trending down in recent years and is similar in trend in the Hunter region and NSW albeit at a much lower rate.

Figure 6: Unemployment Rate (% of labour market)



Source: AEAS and Remplan 2023.

5.5 Employment by Industry

The Singleton LGA supports an estimated 18,480 jobs, representing 0.5% of the 3,672,240 people working in NSW. The Hunter Region supports an estimated 325,647 jobs, representing 8.9% of the people working in NSW. The largest employing industry in the Singleton LGA is mining representing 36.9% of total employment. Other major industries include construction (6.8%), Administrative & Support Services (6.6%), public administration and safety (6.3%)

In combination these three industries accounted for over half of the LGA's's employees.

Table 8 : Singleton LGA, Hunter Region and NSW Employment by Industry Sector (persons)

	Singleton		Hunter Region		NSW	
Industry Sector	Persons	% of Total	Persons	% of Total	Persons	% of Total
Mining	6,817	36.9	15,618	4.8	36,317	1.0
Construction	1,250	6.8	32,657	10.0	329,271	9.0
Administrative & Support Services	1,226	6.6	11,430	3.5	123,616	3.4
Public Administration & Safety	1,161	6.3	20,109	6.2	223,533	6.1
Retail Trade	1,106	6.0	31,835	9.8	346,707	9.4
Health Care & Social Assistance	1,010	5.5	58,760	18.0	553,916	15.1
Accommodation & Food Services	945	5.1	26,211	8.0	238,771	6.5
Manufacturing	879	4.8	18,980	5.8	211,637	5.8
Education & Training	787	4.3	28,839	8.9	335,882	9.1
Other Services	695	3.8	13,745	4.2	130,758	3.6
Wholesale Trade	654	3.5	6,941	2.1	110,109	3.0
Agriculture, Forestry & Fishing	515	2.8	5,762	1.8	78,867	2.1
Transport, Postal & Warehousing	439	2.4	12,806	3.9	177,803	4.8
Professional, Scientific & Technical Services	439	2.4	18,263	5.6	342,263	9.3
Rental, Hiring & Real Estate Services	156	0.8	4,451	1.4	65,387	1.8
Electricity, Gas, Water & Waste Services	134	0.7	4,780	1.5	37,221	1.0
Financial & Insurance Services	129	0.7	8,587	2.6	204,529	5.6
Arts & Recreation Services	104	0.6	3,844	1.2	53,848	1.5
Information Media & Telecommunications	34	0.2	2,031	0.6	71,805	2.0
Total	18,480	100.0	325,647	100.0	3,672,240	100.0

Source: AEAS and Remplan 2023.

5.6 Implications for Redbank Power Station's Reopening

Both the Singleton LGA and the Hunter Region are vulnerable to the consequences of climate change abatement and adaptation policies based on the economic composition of their economies. For example 36.9 per cent of the Singleton LGA's workforce operate in mining and predominantly coal mining.

Much of the near to medium term policy 'flux' and the longer term direction are very much weighted in terms of concerted global action to reduce emissions. The Singleton LGA and Hunter Regional will inevitably be affected by climate change policies due to the presence of energy-intensive sectors of electricity generation and heavy industry. Coal mining, gas extraction, steel production and large scale manufacturing zones such as Tomago are anticipated to be impacted.

As such, the transition to a carbon-constrained economic environment including policies which may seek to price carbon and promote energy-efficient technologies will have considerable implications for the region's heavy industry base over the longer term. Heavy industries are inherently large scale, capital intensive and long lived. Accordingly, more incremental adjustments are less likely to occur. For the Hunter, there exist key vulnerabilities in terms of the closure or

downscaling of parts of the region's industrial base and a reduction in regional employment. Such structural change was seen in the closure of the BHP steelworks Newcastle in 1999.

It is projects like the Redbank Power Reopening that will be essential in helping transition the Singleton LHA and Hunter Region to a less carbon intensive economy and offering greater diversification of employment opportunities for its workforce.

6.0 Political Economic Overview

6.1 Changing Policy Landscape

The reopening of the Redbank Power Station is being considered amid a period of evolving Government energy and waste policy in response to community concerns around climate change. This changing policy landscape is positively influencing the need for projects like the reopening of the Redbank Power Station. Recent policy initiatives include:

6.2 Australian Government

6.2.1 Australian Government Commitment to Net Zero by 2050

The Australian energy sector is undergoing a major transformation. One of the major drivers for this transformation is the decarbonisation of the energy sector in line with the COP21 Paris agreement. The UN Paris Agreement, signed by 196 countries in 2016[i], committed the world to limit global warming to 1.5 to 2.0 degrees Celsius above pre-industrial levels. This agreement seeks to reach global peak emissions as soon as possible and achieve net-zero emissions in the second half of this century. The recently held climate conference in Glasgow (COP26) in late 2021 continues to show global support for rapid decarbonisation.

The Australian Government has just set a new 43% minimum reduction by 2030, and a commitment to net-zero emissions by 2050 – in line with the Agreement. All Australian states, territories have committed to achieving net zero targets within varying levels of ambition – from 2030 to 2050 including NSW.

6.2.2 Australian Energy Market Operator 2023 Integrated System Plan (ISP)

The latest Integrated System Plan (ISP) support Australia's complex and rapid energy transformation towards net zero emissions, enabling low-cost firmed renewable energy and essential transmission to provide consumers in the NEM with reliable, secure and affordable power.

The ISP's optimal development path recognises and guides the significant investment needed in the physical infrastructure and intellectual capital of the NEM. That investment is needed to:

- Meet significantly increased demand as homes, vehicles and industrial applications switch to electricity from existing energy sources. Without coal, this will require a nine-fold increase in utility-scale variable renewable energy (VRE) capacity, and a near five-fold increase in distributed solar photovoltaics (PV),
- Treble the firming capacity from alternative sources to coal that can respond to a dispatch signal, including utility-scale batteries, hydro storage, gas-fired generation, and smart behind-the-meter "virtual power plants" (VPPs),
- Adapt complex networks and markets for two-way electricity flow, while leveraging AEMO's Engineering Framework to prepare the power system for 100% instantaneous penetration of renewables, and
- Efficiently install more than 10,000 km of new transmission, to connect geographically and technologically diverse, low-cost generation and firming with the consumers who rely on it, on a pathway that is low cost and low regrets for consumers, with project work commencing on their earliest planned schedule.

The ISP calls for development opportunities in the Optimal Development Path (the ODP) that would assist the NEM in catering for:

- Almost double the electricity delivered to approximately 320 terawatt hours (TWh) per year. Today the NEM delivers just under 180 TWh of electricity to industry and homes per year. The NEM would need to nearly double that by 2050 to serve the electrification of our transport, industry, office and homes, replacing gas, petrol and other fuels. That growth is needed in addition to significant ongoing investment by consumers in distributed energy and energy efficiency. The needs of proposed hydrogen production to export our abundant renewable

energy potential, if supplied from the grid, would be additional to this growth and are explored further in AEMO's Hydrogen Superpower scenario.

- Coal-fired generation withdrawing faster than announced, with 60% of capacity withdrawn by 2030. Current announcements by thermal plant owners suggest that about 8 gigawatts (GW) of the current 23 GW of coal-fired generation capacity will withdraw by 2030. In the Step Change scenario, assessed by stakeholders as most likely, ISP modelling suggests that 14 GW would withdraw by 2030. Coal-fired generators are continuing to bring forward their withdrawal from the market – potentially by up to seven years to 2025 in the case of the Eraring Power Station. Competition, climate change and operational pressures will intensify with the ever-increasing penetration of firmed renewable generation.

6.3 NSW Government

6.3.1 NSW Net Zero Plan Stage 1: 2020-2030

The Net Zero Plan Stage 1: 2020-2030 is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's plan to protect NSW's future by growing the economy, creating jobs and reducing emissions over the next decade. The plan aims to strengthen the prosperity and quality of life of NSW while helping to achieve the State's objective to deliver a 50% cut in emissions by 2030 compared to 2005 levels. The plan will support a range of initiatives targeting energy, electric vehicles, hydrogen, primary industries, technology, built environment, carbon financing and organic waste.

6.3.2 NSW Electricity Infrastructure Roadmap

The Electricity Infrastructure Roadmap (Roadmap) is the NSW Government's plan to transform the State's electricity system into one that is cheap, clean and reliable. The Roadmap is enabled by the Electricity Infrastructure Investment Act 2020(Act). The Roadmap coordinates investment in transmission, generation, storage and firming infrastructure as ageing coal-fired generation plants retire. The Roadmap includes actions that will work together to deliver 'whole-of system' benefits.

6.3.3 NSW Waste and Sustainable Materials Strategy 2041

The NSW Waste and Sustainable Materials Strategy 2041: Stage 1 – 2021-2027 sets out the long-term vision for managing waste, planning for infrastructure, reducing carbon emissions, creating jobs, and refocusing the way NSW produces, consumes and recycles products and materials. The strategy will be used to track, review and measure NSW's progress toward meeting the targets set out in the National Waste Policy Action Plan. The targets include:

- Reduce total waste generated by 10% per person by 2030;
- Have an 80% average recovery rate from all waste streams by 2030; and
- Significantly increase the use of recycled content by governments and industry.

A major focus area of the strategy is to increase waste infrastructure and services to meet our future needs. The highest priority is to extend the life of existing landfills by reducing the volumes of waste being sent to landfill.

6.3.4 Energy from Waste Infrastructure Plan 2021

The Energy from Waste Infrastructure Plan guides strategic planning for future thermal energy from waste facilities to ensure infrastructure is located in areas that best address the state's waste management needs until 2041, and where it maximises efficiencies for waste innovation, management and energy recovery. The Energy from Waste Infrastructure Plan provides certainty and transparency to industry and the community on how the NSW Government will facilitate the establishment and operation of energy from waste infrastructure to manage genuine residual waste.

6.3.5 NSW Energy from Waste Policy Statement 2021

The NSW EPA Energy from Waste Policy Statement 2015 (revised in June 2021) identifies the relevant policy framework and principal criteria that apply to facilities in NSW that propose to thermally treat waste or waste-derived fuels for the recovery of energy. The NSW EPA recognises energy recovery has the potential to be part on an integrated waste management strategy. Energy from waste can be a valid pathway for residual waste where:

- Further material recovery through reuse, reprocessing or recycling is not financially sustainable or technically achievable; and
- Community acceptance to operate such a process has been obtained.

The EPA has applied the following overarching principles to waste avoidance and recovery:

- Higher value resource recovery outcomes are maximised;
- Air quality and human health are protected;
- 'Mass burn' disposal outcomes are avoided; and
- Scope is provided for industry innovation.

6.4 Implications for Redbank Power Station's Reopening

It is anticipated that the Redbank Power Station's commercial and community importance will be future proofed given the significant market changes arising from Australian and NSW Government's commitment to net zero emissions by 2050 and resulting climate change adaption policies. It is anticipated the capital expenditure by Verdant Earth Technologies and the processing of the feedstock fuels to a predetermined and approved specification will give it a social license in respect to the reopening and operations that aligns with the policy directives addressed in this section of the report.

7.0 Energy Overview

7.1 Overview

The Hunter Region's power generation industry produces over 60% of New South Wales' electricity grid supply and employs approximately 2,200 people. NSW's large coal-fired power stations produce some of the cheapest electricity in Australia. Within the Hunter and adjacent Central Coast Region, three generating companies operate four coal-fired power stations supplying power to the National Energy Market (NEM). These companies and their power generating are in the table below.

Table 9: Hunter Region Major Power Stations

Generator	Power Station	Type of Station	Location	Capacity
AGL Macquarie	Bayswater	Coal-fired	Muswellbrook/Singleton	2,640 MW
AGL Macquarie	Liddell	Coal-fired	Muswellbrook/Singleton	2,000 MW
Origin Energy	Eraring	Coal-fired	Lake Macquarie	2,880 MW
Sunset Power International	Vales Point	Coal-fired	Central Coast	1,320 MW
Snowy Hydro	Colongra	Gas-fired	Central Coast	667 MW

Source: 2023 Hunter Investment Prospectus

7.2 The Energy Transition Underway

Overall power generation in NSW is provided in table 10 and figures 7 and 8 below and adjacent. Two clear points are readily discernible from these. Firstly electricity generation in NSW is overwhelmingly at present sourced from black coal. Whilst its importance is diminishing it continues to be the largest generation source. Secondly the electricity sector in NSW is undergoing a significant transformation towards renewable generation. Renewables has grown considerably over the past decade however it currently only provides 29.8% of overall electricity generation. The growth in renewable generation reflects government climate change policies, the commitment to retire coal-fired plants and decreased costs for renewable generation.

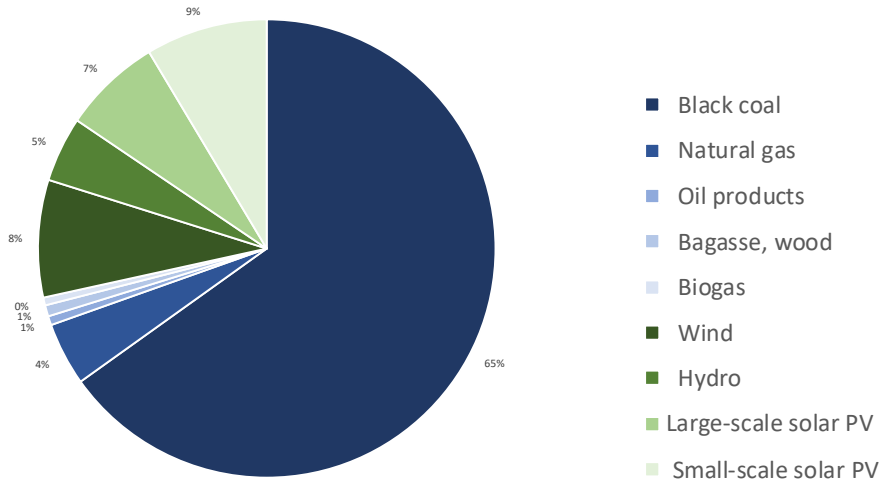
Table 10: NSW Electricity Generation by Source 2012-13 to 2021-22 (GWh)

	2012-13 GWh	2013-14 GWh	2014-15 GWh	2015-16 GWh	2016-17 GWh	2017-18 GWh	2018-19 GWh	2019-20 GWh	2020-21 GWh	2021-22 GWh
Non-renewable fuels										
Black coal	56,798.6	55,819.5	52,562.2	55,334.5	55,967.1	57,022.2	57,734.9	53,566.7	50,790.8	46,958.8
Natural gas	5,168.7	5,528.3	4,528.4	4,628.6	3,330.8	3,045.8	2,360.3	2,870.9	1,903.2	3,210.7
Oil products	190.9	170.7	284.3	289.5	321.6	324.4	322.6	337.3	340.6	458.1
Other										
Total non-renewable	62,158.2	61,518.5	57,374.9	60,252.6	59,619.5	60,392.4	60,417.8	56,774.9	53,034.6	50,627.6
Renewable fuels										

Bagasse, wood	425.4	461.7	551.1	601.7	696.5	765.0	758.8	716.2	686.1	568.3
Biogas	413.4	420.6	472.1	444.6	406.2	424.4	418.8	387.4	411.0	398.5
Wind	832.6	899.2	1,376.0	1,898.8	1,872.0	2,431.6	3,739.7	4,574.3	4,805.9	5,973.4
Hydro	3,298.1	2,721.1	1,771.0	3,170.2	3,290.6	2,915.5	2,160.3	2,110.1	2,964.2	3,315.5
Large-scale solar PV		10.6	60.2	399.5	567.6	700.0	1,348.2	2,084.6	3,368.0	5,014.4
Small-scale solar PV	857.6	964.9	1,211.2	1,461.9	1,706.8	2,095.8	2,717.1	3,417.3	4,892.9	6,201.3
Total renewable	5,827.1	5,478.1	5,441.6	7,976.8	8,539.8	9,332.3	11,143.0	13,289.8	17,128.2	21,471.6
Total	67,985.3	66,996.6	62,816.4	68,229.4	68,159.2	69,724.6	71,560.8	70,064.7	70,162.8	72,099.2

Source: Australian Energy Statistics 2021-22 Department of Industry, Science, Energy and Resources

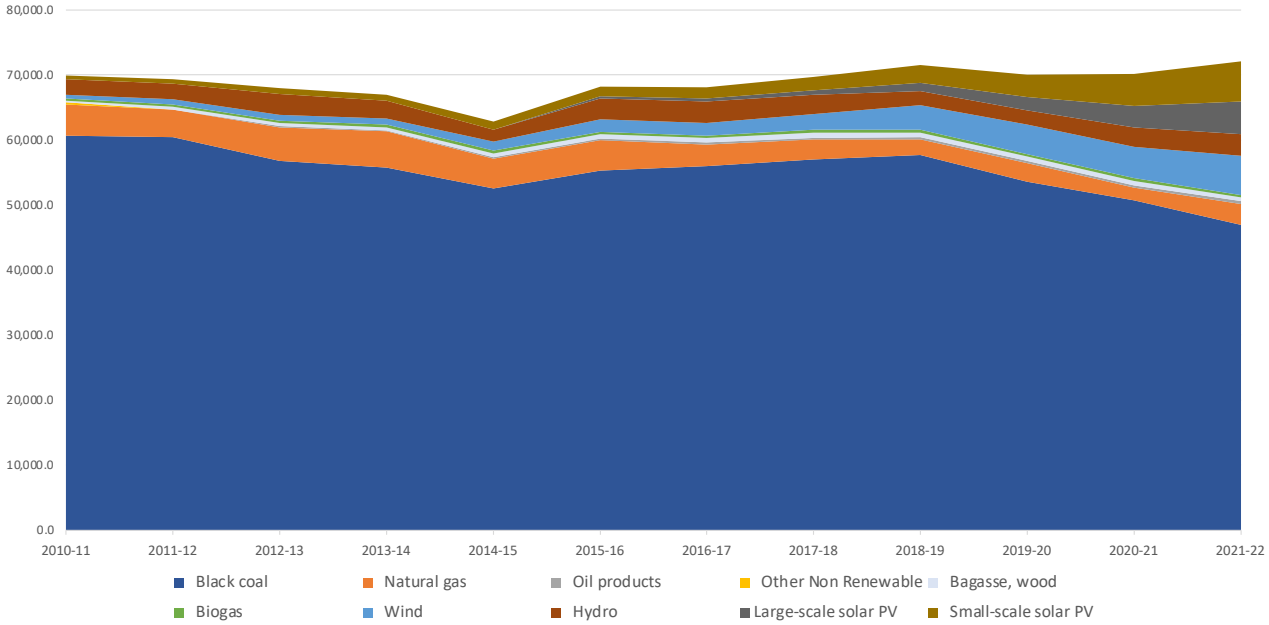
Figure 7: NSW Electricity Generation by Source 2021-22 (% of total)



Source Australian Energy Statistics 2019-20 Department of Industry, Science, Energy and Resources

A key priority for the Hunter Region will be development and investment in renewable energy technology to enable substantial cuts in emissions but at the same time as responding to increased demand. This will be a major challenge. Without adequate growth in renewable generation to offset the impacts of retiring coal-fired power plants, electricity prices will increase and supply will be less reliable. NSW will need to rapidly source additional energy supply or risk considerable energy cost increases and/or supply restrictions.

Figure 8: NSW Electricity Generation by Source 2010-11 to 2021-22 (GWh)



Source Australian Energy Statistics 2019-20 Department of Industry, Science, Energy and Resources

7.3 Implications for Redbank Power Station's Reopening

Of significant challenge will be Hunter Region's concentration of coal fired power stations that are also employers that are inevitably to be phased out and the impact his will have on the regional economy and community. Projects like the Redbank Power Station reopening will need to occur to help transition the Hunter to a lower carbon future and a region of employment opportunity.

One of the most important strategic issues facing NSW is its future energy supply including the availability of reliable baseload and renewable electricity generation. Economic growth in NSW is expected to lead to sustained growth in electricity demand that if left unchecked will potentially lead to a capacity shortfall in the future.

The reopening of the Redbank Power Station is forecast to generate 1 million megawatt hours of baseload electricity. The reopening of the Redbank Power Station utilising biomass will help to increase the renewable energy production in NSW, which is needed to meet NSW Government renewable energy targets and to replace the electricity that will be lost from the inevitable retirement of coal-fired power stations in NSW.

The Redbank Power Station will utilise the existing significant access to the transmission network and will help to replace jobs lost through the inevitable closure of coal fired power stations. It may also stimulate further renewable projects in the region through acting as a catalyst; for other renewable energy projects.

The reopening of the Redbank Power Station will contribute to NSW's energy sustainability through:

- Utilisation of a resource that can sustain electricity generation in NSW for decades;
- Helping to optimise the use of the NSW's energy and waste residuals endowment;
- Contributing to a balanced and secure energy supply through diversification of primary energy sources;
- Production of electricity at prices providing strong price competition to gas and enabling continued expansion of local industrial activity; and
- Replacing ageing electricity generation infrastructure

The Redbank Power Station will provide Baseload green power 24/7 to support the electricity grid and replaces the use of coal whilst complementing other renewable energy sources such as solar and wind power. It is believed the reopening of the Redbank Power Station will represent the largest renewable energy project outside of Hydro in Australia.

In summary, the Redbank Power Station reopening would benefit NSW communities, businesses and industry by increasing the reliability of renewable supply in the NEM. The project would support overall downward pressure on energy prices, supporting more affordable electricity costs for households, businesses and industry through NSW and participating NEM jurisdictions over the medium to long term whilst at the same time helping government meet their net zero emissions targets.

8.0 Evaluation of 'Restart' Economic Impacts

8.1 Methodology

This section outlines the process used to estimate the impacts on the Singleton LGA, Hunter Region and broader NSW economies. The key objective of an economic impact assessment is to identify the key positive and negative economic impacts of a project. The economic impact assessment for this project considers contributions to gross value added (GVA) and employment, assessed quantitatively using the Input-Output methodology.

This report was developed in consultation with Jackson Environment and Planning and Verdant Earth Technologies identifying the important economic, social, environmental and energy contribution the project makes as well as a range of other vital statistics that it contributes to the Singleton LGA, Hunter Region and NSW economies. The AEAS methodology is described below:

- AEAS identified the processes and expenditure involved in re-opening and operation of the Redbank Power Station through a comprehensive request for information to Jackson Environment and Planning and Verdant Earth Technologies for construction estimates, operational and supply chain expenditures both pre 2014 and forecast for reopening. This was coupled with a virtual workshop to discuss these materials.

- Desktop research was undertaken to establish information currently available for the Singleton LGA, Hunter region (environmental, social and economic), government policies, other Australian power station projects for use as benchmarks for AEAS calculated results.

- Estimates utilising AEAS Input-Output model of the direct and indirect contribution of the project to the Singleton LGA, Hunter Region and NSW economy in terms of gross value add and employment were prepared. Direct impacts were calculated as the first round of effects from direct operational expenditure on goods and services by the power station. The flow-on or indirect effects (i.e. the multiplier effects) were estimated in two parts: production-induced and consumption-induced effects. The production-induced effects arose from expenditure by the power station on goods and services supplied by other firms in Redbank's supply chain. The consumption-induced effects arose from expenditure of Redbank workers' income on goods and services supplied by NSW businesses.

The adopted methodology provides an estimate of the total economic impact and employment effect of the Redbank Power Station reopening. The two types of economic impacts that have been analysed using I-O modelling in this report are Gross Value Added and employment, outlined below in table 11.

Table 11 : AEAS IO model Metrics

Gross Value added	Employment
Gross value added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy. Value added for a project is comprised of wages and salaries, gross operating surplus of power station and its indirect taxes.	A measure of employment levels (full time equivalents) required to service the demand for economic output per annum.

Source: AEAS

8.2 Construction Stage

The restart of the Redbank Power Station involves an extensive process and capital expenditure. Over and above the council requirements for modification of the power plant the following actions need to be arranged before supply into the electricity grid commences.

Grid connection involves the modelling and study of the existing grid with the expected performance of the generator to ensure the generator complies to the Ausgrid and AEMO requirements. The duration for this work is about one year. Parallel to the grid connection the entire plant requires equipment assessment to determine condition and prepare for repairs. After repairs are undertaken and the plant is fully recommissioned in a systematic way to fully test all the safety and protection systems. The plant start up is with waste wood residues fuel which includes tuning of fuel and air ratios to achieve efficient combustion. The duration for this process is approximately 6 months.

Minor modifications will be included in the fuel handling equipment and storage silos to allow for the use of waste wood residues instead of coal.

The whole process is expected to take between 8 to 12 months as some activities are substantially well progressed. This process and expenditure will create a number of direct and indirect economic impacts which will benefit the Singleton LGA, the Hunter Region and NSW. These impacts are described in the following sections.

The total capital expenditure associated with the reopening of the Redbank Power Station is estimated at $70,718,379 excl GST and is provided in the table below.

Table 12: Restart - Summary of the Capital Investment Value (CIV)

Description	$/ Excl. GST
Refurbishment / recommissioning costs (excl. conversion) On costs	$15,790,434
On Costs	$6,104,207
Escalation to October 2023	$5,115,178
Weighbridge	$583,898
Infrastructure to New Fuel Delivery Area	$2,975,318

Modification to 2 Reversing Conveyors	$928,753
Silo Bottom incl. augers	$4,934,882
Additional Lighting	$676,500
Electrical Instrumentation and Control Equipment Total	$180,250
Truck Unloaders	$2,476,967
Radial Stackers	$,125,305
Civil Works	$463,470
Materials Handling (2 unloaders	$1,183,553
Storage and feeding bins	$1,033,052
Fire Services	$392,753
Freight	$200,000
Permits & Studies	Incl
Existing Basin	Excl
As-builts, Training and Manuals, Maintenance	Excl
Power Supply	Excl
Preliminaries, Overheads & Margin (12%)	$2,104,806
Professional fees (5%)	$3,547,331
Contingency	$3,018,923
Authority Fees	Excl
Client Costs (restart Costs)	$13,723,795
Escalation	$3,773,654
GST	Excl
TOTAL PROJECT COST [EXCL. GST]	$70,718,379

Source: Muller Partnership

8.2.1 Construction Stage Employment Creation

The Redbank Power Station will have positive impacts on employment through the creation of direct and indirect employment opportunities during the construction stage. Construction of the power station will support the employment of 331 workers across the period of construction.

Table 13: Restart - Direct and Indirect Jobs Supported During Construction Stage (FTEs)

Impact	Singleton LGA	Hunter Region (not including Singleton)	NSW (outside of Hunter Region)	Interstate & Overseas	Total
Direct Jobs Created	100	165	66		331
Indirect Jobs Created	151	252	101		504
Total Jobs Created	251	417	167		835

Source: AEAS 2021

The skills required to support construction will mainly be typical construction industry skills (e.g. labourers, plant and machine operators, tradespeople), with a small number of specialist workers required for specific activities. Where possible, the construction workforce will be sourced from within the project area or surrounding Hunter Region, helping to maximise employment benefits for local and regional communities.

The reopening is also likely to indirectly support employment in local and regional businesses providing goods and services to support construction activities and the expenditure of wages in surrounding businesses. 504 FTE jobs are estimated to be supported as a result of the indirect production and consumption induced effects.

8.2.2 Construction Stage Economic Activity

The Redbank Power Station reopening will provide opportunities for local businesses to provide goods and services to the construction of the project and as a result the Singleton LGA and Hunter Region economies. During construction, potential benefits for businesses will mainly be associated with provision of goods and services associated with reopening building activities as referenced in Section 2.0 and to support these activities (e.g. equipment hire, speciality trades, supplies, transportation, administrative services etc). The direct value add of construction is estimated at $28.64 million.

In addition, local businesses are likely to benefit from flow on spending by the workforce employed in the construction of the project. The reopening stage is likely to result in increased demand for services such as accommodation, supermarkets, restaurants and cafes, licensed hotels and outlets, and sporting/entertainment facilities within the Singleton LGA and the Hunter Region. The indirect value add of construction is estimated at $49.59 million.

The combined direct and indirect economic activity are expected to create an increase in value-added to the Singleton LGA, broader Hunter Region and NSW of $78.23 million.

Table 14: Restart - Direct and Indirect Value Added ($ millions) During Construction Stage

Impact	Singleton LGA	Hunter Region (not including Singleton)	NSW (outside of Hunter Region)	Interstate & Overseas	Total
Direct Value Added	$7.16	$14.32	$4.30	$2.86	$28.64
Indirect Value Added	$14.88	$24.80	$7.44	$2.48	$49.59
Total Value Added	$22.04	$39.12	$11.74	$5.34	$78.23

Source: AEAS 2021

8.3 Operational Stage

8.3.1 Operational Stage Employment Creation

When the Redbank Power Station is reopened it is expected to have an operational workforce of 58.5 FTE jobs at the actual power station and another 12 FTE jobs at the Head Office. A generalised breakdown of the profession of employees includes:

- 20 operators who have trade or engineering background
- 8 mechanical trades people
- 4 electrical trades people
- 2 apprentices
- 8 non trades personnel assisting the trades personnel and also provide other site support
- 4 admin personnel
- 1 GM, 1 HSE manager, 1 maintenance manager, 1 operations manager and 1 Financial manager, 1 HR/Payroll
- 1 Purchasing officer and
- 2 stores and workshop personnel
- 2 general site cleaners and grounds maintainers

Furthermore there are expected to be an additional 8 contractors directly engaged on a full-time equivalent basis. Verdant Earth Technologies intends to maximise the use of local labour where ever possible and it is expected that many of these workers will be sourced directly from the Singleton LGA and the Hunter Region. Total wages and salaries paid to directly created roles within the power station and head office are estimated at $14.1 million.

The Redbank Power Station's operations will also indirectly support generation of employment in Singleton LGA and Hunter Region businesses and industries from increased economic activity and spending at businesses providing goods

and services to support activities. The Redbank Power Station once operational is also anticipated to support a large number of indirect jobs. For example the following contractors are expected to be part of the Redbank's Power Station's operation:

- Specialist contractors for conveyors
- Stockpile management
- Electrical contractors for switchboards
- Control system specialists
- Refractory contractors for the furnace
- Fire system specialists
- Cooling tower contractors
- Valve specialists
- Pump specialist contractors
- General Equipment/spares suppliers
- Engineering consultants
- Electrical, plumbing, painting, landscape, roads, utilities;
- Third party inspection services (water testing, fuel testing, pressure vessel verification, environmental testing, NDT, etc)
- OEM contractors (turbines, generators, pumps, controls, fabric filters, emissions controls, water treatment plant)
- Specialist maintenance and operations for grounds, stormwater, plant and equipment;
- Financial, design, engineering, planning, environmental, and strategic consulting;
- Testing, monitoring, analysis for water quality, fuel quality.

In addition, employee wages will be spent in supermarkets, restaurants and cafes, licensed hotels and outlets, sporting/entertainment facilities and other retail and hospitality businesses within Singleton LGA and the Hunter Region thereby creating further employment opportunities. The total indirect jobs (excluding haulage) created by the power stations operations are estimated at 34 FTEs.

Finally given the nature of the Redbank Power Station's feedstock there will be a substantial reliance on haulage contractors to transport waste wood residues to the power station. The facility has been designed to have capacity of 850,000 tonnes (T) per annum, and deliveries will be undertaken by b-doubles. Accordingly a non-plantation farm haulage workforce is estimated at 62 contractors and is accounted for separately in estimates.

In summary, the reopening represents an important potential employment opportunity for local job seekers. The employment impacts in the operation phase of Redbank Power Station are shown in Table 15. It is estimated that there will be employment growth of 174.5 long term FTE jobs in the Singleton LGA, Hunter Region and NSW.

Table 15: Restart - Direct and Indirect Jobs Supported During Operational Stage (FTEs)

Impact	Singleton LGA	Hunter Region (not including Singleton)	NSW (outside of Hunter Region)	Interstate & Overseas	Total
Direct Jobs Created – RPS	26.5	40	-	-	66.5
Direct Jobs Created – Head Office	-	-	12	-	12
Indirect Jobs Created	10	17	7	-	34
Haulage Contractors	25	37	-	-	62
Total Jobs Created	61.5	94	19	-	174.5

Source: AEAS 2021

8.3.2 Operational Stage Economic Activity

The Redbank Power Station will require around $46 million expenditure per annum to operate together with $14.1 million in employee wages and salaries . This expenditure will directly and beneficially impact the economies of the Singleton LGA and the Hunter Region.

Table 16: Restart - Direct and Indirect Value Added ($ millions) During Operational Stage – Annual

Impact	Singleton LGA	Hunter Region (not including Singleton)	NSW (outside of Hunter Region)	Interstate & Overseas	Total
Direct Value Added	$11.77	$19.62	$5.88	$1.96	$39.23
Indirect Value Added	$8.88	$14.79	$4.44	$1.48	$29.58
Total Value Added	$20.64	$34.41	$10.32	$3.44	$68.82

Source: AEAS 2021

As detailed in 8.3.1 there is an extensive supply chain that indirectly creates economic activity for the Singleton LGA and the Hunter Region. Again it is Verdant Earth Technologies intention to maximise the local content for its operations by maintaining current and seeking new relationships with local suppliers. This will be combined with the expenditure of employee wages throughout the community further creating economic activity. Table 16 shows the impact of Redbank Power Station during operation on economic value added in the Singleton LGA and Hunter Region.

In the first full year of operation the Redbank Power Station is expected to directly create $39.23 million worth of value add to the Singleton LGA, Hunter, NSW and interstate economies. The indirect economic activity from Redbank Power Station's annual operations is estimated at $29.6 million. The total annual value add to the economy in the operation of the power station is estimated at $68.8 million.

8.4 Total 'Restart' Economic and Employment Contribution

The restart of the Redbank Power Station involves an extensive process and capital expenditure. The whole process is expected to take between 8 to 12 months as some activities are substantially well progressed. Initially the reopening will rely on sourcing residual wood waste residuals before transitioning to purpose grown biomass.

The actual restart process and expenditure will create a number of direct and indirect economic impacts which will benefit the Singleton LGA, the Hunter Region and NSW. The total capital expenditure associated with the reopening of the Redbank Power Station is estimated at $69,431,601 excl GST. The Redbank Power Station when operational will require around $46 million expenditure per annum to operate together with $14.1 million in employee wages and salaries.

Accordingly the reopening of the Redbank Power Station is anticipated to be a significant economic project to both the Singleton LGA and the Hunter Region. The Redbank Power Station reopening will provide both direct and indirect opportunities for local businesses during construction and operation resulting in employment. In total there will be 1,009.5 direct and indirect jobs supported and the 25 Year NPV of the reopening of the Redbank Power Station is $901.1 million.

Table 17: Restart - Total Direct and Indirect Jobs Supported (FTEs)

Impact	Total
Direct Jobs Created – RPS	397.5
Direct Jobs Created – Head Office	12.0
Indirect Jobs Created	538.0
Haulage Contractors	62.0
Total Jobs Created	1,009.5

Source: AEAS 2023

Table 18: Total Direct and Indirect Value Added (NPV $ millions)

Impact	Total
25 Years plus construction	$901.1

Source: AEAS 2023

9.0 Evaluation of Social Impacts

9.1 Methodology

The reopening of the Redbank Power Station will both positively and negatively impact the Singleton LGA, Hunter Region and broader NSW through both the economic and social impacts that it creates.

AEAS has evaluated the overall significance of identified socio-economic impacts based on the evaluation of significance matrix within the NSW Department of Planning, Industry and Environment's Social Impact Assessment Guidelines for State Significant Projects (2021).

In doing so, AEAS was able to evaluate, compare and contrast the negative social-economic impacts and positive social-economic impacts to indicate the expected overall social impact of the project utilising likelihood and magnitude scales. The ratings of likelihood and magnitude – and therefore overall significance – typically have both subjective and objective components, as these depend on individual experiences and/or perceptions as well as technical evaluations. However the overall outcome is indicative of the social impact of the Redbank Power Station.

Table 19: Likelihood Levels of Social Impacts

Likelihood Level	Meaning
Almost certain	Definite or almost definitely expected (e.g. has happened on similar projects)
Likely	High probability
Possible	Medium probability
Unlikely	Low probability
Very unlikely	Improbable or remote probability

Source: NSW Government Social Impact Assessment Guideline for State Significant Projects July 2021

Table 20: Dimensions of social impact magnitude

Magnitude level	Meaning
Transformational	Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.
Major	Substantial deterioration/improvement to something that people value highly, either lasting for an indefinite time, or affecting many people in a widespread area.
Moderate	Noticeable deterioration/improvement to something that people value highly, either lasting for an extensive time, or affecting a group of people.
Minor	Mild deterioration/improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
Minimal	Little noticeable change experienced by people in the locality.

Source: NSW Government Social Impact Assessment Guideline for State Significant Projects July 2021

Table 21: Social Impact Significance Matrix

	Magnitude Level				
Likelihood Level	1 Minimal	2 Minor	3 Moderate	4 Major	5 Transformational
A Almost certain	Low	Medium	High	Very High	Very High
B Likely	Low	Medium	High	High	Very High
C Possible	Low	Medium	Medium	High	High
D Unlikely	Low	Low	Medium	Medium	High
E Very unlikely	Low	Low	Low	Medium	Medium

Source: NSW Government Social Impact Assessment Guideline for State Significant Projects July 2021

9.2 Construction

Table 22 and presents a summary of the negative social and economic impacts of the Redbank Power Station's construction, along with the outcomes of the evaluation of significance. The rating of likelihood and magnitude are combined to determine overall significance of both positive and negative social impacts. The evaluation of magnitude of social and economic impacts is based on the social risk matrix presented in table 21 and the AEAS discussion provided below.

Table 22: Redbank Power Station Construction Negative Social Impacts

Impact	Likelihood	Magnitude	Consequence
Potential impact on accommodation prices due to increased demand for rental housing from construction workers	Possible	Moderate	Medium
Potential impacts on social infrastructure and community facilities due to increased demand by construction workers	Unlikely	Minimal	Low
Impact on road safety due to increased construction traffic	Possible	Minimal	Low
Amenity impacts on nearby residential uses	Unlikely	Minor	Low
Visual impacts of construction activities	Unlikely	Minor	Low
Impact of construction on community values relating to the environment	Unlikely	Minimal	Low

Source: AEAS 2021

Discussion relating to the likelihood and magnitude assessments and the resulting consequence ranking is provided below:

- Housing and accommodation: During construction and restart activities, the project will support employment for up to 331 workers across the construction period. The construction timeframe would generally occur over ten to twelve months. The majority of the construction workforce is expected to be sourced from communities in the Singleton LGA (100 employees) and wider Hunter region (165 employees), including Newcastle. This would help to reduce demand for temporary worker accommodation although, it is likely that some short-term visitor accommodation or rental housing would be needed to accommodate workers from outside of the area and surrounding region (for example, those required for speciality tasks). However it is likely that there will be capacity in the existing accommodation sector given the relatively low numbers of construction workers expected to require accommodation. Any impacts associated with increased demand for accommodation are expected to be managed through the use of a variety of accommodation types and locations where workers are accommodated.

- Rental Prices: It is possible that some construction workers may choose to rent within the study area for the duration of the works. This has potential to increase pressure on rental prices. Increases in rental costs may affect the availability of affordable rental housing and rental affordability for some groups on low or fixed incomes (e.g. unemployed, elderly, students), contributing to rental housing stress for some households or result in some households having to move to more affordable accommodation elsewhere. However, any such impacts from increased demand for rental accommodation are likely to be low given demand for rental accommodation near the project area by workers is expected to be minimal.

- Social infrastructure: The Singleton LGA and Hunter Region accommodate a high level of community services and facilities, including health and medical services, emergency services, cultural facilities and sporting and recreation facilities. Potential impacts on existing Council and NSW Government social infrastructure and community services due to increased demand by construction workers is unlikely, given the size of the construction workforce in relation to the existing populations of the Singleton LGA and Hunter Region. Where possible, the construction workforce would comprise existing residents from the wider Hunter Region, which would help to reduce the size of the non-resident workforce required for the project.

- Transport and access: Construction of the project would generate construction traffic associated with the haulage and delivery of construction materials and equipment, transport of construction workforce, and general site activities. Construction vehicle movements generated by the project are not expected to impact on the operation of the surrounding road network.

In addition the Hunter has a highly developed network of highways and arterial roads. Increased construction traffic has potential to impact on road safety for road users. It is likely that residents and workers in the study area are familiar with the presence of heavy vehicles due to the presence of major mining industries.

- Amenity, Visual and Community values: The project is generally removed from social infrastructure and community facilities. As such, noise, dust and traffic from increased construction activities are not expected to affect the use or enjoyment of social infrastructure in the project area. In addition construction activities for the project are not expected to result in significant construction noise, dust or lighting impacts for nearby communities, with the nearest dwellings generally located more some distance from the project site.

Table 23 presents a summary of the positive social and economic impacts of the Redbank Power Station's construction, along with the outcomes of the evaluation of significance. The evaluation of magnitude of social and economic impacts is based on the social risk matrix presented in table 21 and the AEAS discussion provided below.

Table 23: Redbank Power Station Construction Positive Social Impacts

Impact	Likelihood	Magnitude	Consequence
Creation of direct employment opportunities for Singleton LGA and Hunter Region	Almost Certain	Moderate	High
Indirect benefits for employment due to increased demand for goods and services by construction workers and construction activities	Likely	Moderate	High
Spending with local suppliers for construction related activities	Likely	Moderate	High

Source: AEAS 2021

- Economic and employment: Local jobs are also important to the community, and the direct and indirect generation of jobs through the construction stage are likely to be seen as a positive by the community in the Singleton LGA and the wider Hunter Region, particularly with a concentration of jobs currently exposed to future reduction in coal mining.

9.3 Operation

Table 24 presents a summary of the negative social and economic impacts of the Redbank Power Station's operation, along with the outcomes of the evaluation of significance. The rating of likelihood and magnitude are combined to determine overall significance of both positive and negative social impacts. The evaluation of magnitude of social and economic impacts is based on the social risk matrix presented in table 21 and the AEAS discussion provided below.

Table 24: Redbank Power Station Operation Negative Social Impacts

Impact	Likelihood	Magnitude	Consequence
Potential impact on accommodation prices due to increased demand from power station workers	Possible	Minimal	Low
Potential impacts on social infrastructure and community facilities due to increased demand by power station workers	Unlikely	Minimal	Low
Impact on road safety due to increased traffic associated with haulage of waste wood residues feedstock	Possible	Minimal	Low
Amenity impacts on nearby residential uses	Unlikely	Minor	Low

Source: AEAS 2021

Discussion relating to the likelihood and magnitude assessments and the resulting consequence ranking is provided below:

- Demand for Housing: The operation of the power station will require a workforce of approximately 66.5 FTEs. The workforce required for the operation phase will be sourced primarily from the Singleton LGA (26.5) and the Hunter Region (40) where possible. It is possible that workers will be sourced from outside of the region. In this case it is possible that these persons will relocate to the Singleton LGA and some may bring their families with them. However their impact on housing is assessed to be low.

- Social Infrastructure: The expected impact on the local population during the operation is expected to be small. However, any increase in population will place additional demand on community and social infrastructure including housing, education and health facilities. Despite this additional demand and due to the small nature of the likely population increase, it is expected that any population increase will be absorbed by the current level of social infrastructure in the Singleton LGA and Hunter Region.

- Transport and access: Operations of the power station are anticipated to generate traffic associated with the haulage and delivery of the bioass feedstock, materials and equipment, transport of workforce, and general site activities. Vehicle movements generated by the power station are not expected to materially impact on the operation of the surrounding road network. This is due to the location of the power station on the B84 and the fact that the Hunter has a highly developed network of highways and arterial roads. A traffic study has been undertaken indicating that the current roads are designed and capable of handling the proposed volumes and accordingly there is minimum or low impact on existing roads. This was assessed by third party specialists using the NRMS approved modelling requirements and tools. Increased traffic has potential to impact on road safety for road users. It is likely that residents and workers in the study area are familiar with the presence of heavy vehicles due to the presence of major mining industries.

- Amenity, Visual and Community values: Power station activities are not expected to result in significant noise, dust or lighting impacts for nearby communities, with the nearest dwellings generally located some distance from the power station. Operational emissions to air and noise from the power station will be managed within limits prescribed by the NSW EPA and subject to detailed assessments.

Table 25 presents a summary of the positive social and economic impacts of the Redbank Power Station's operation, along with the outcomes of the evaluation of significance. The evaluation of magnitude of social and economic impacts is based on the social risk matrix presented in table 21 and the AEAS discussion provided below.

Table 25: Redbank Power Station Operation Positive Social Impacts

Impact	Likelihood	Magnitude	Consequence
Creation of direct employment opportunities for local and regional communities	Likely	Moderate	High
Population Growth	Likely	Moderate	High
Generation of Taxation and Revenue for Government	Likely	Minor	Medium
Improved Social and Economic Sustainability	Likely	Moderate	High
Downward pressure on electricity prices & more reliable supply	Likely	Moderate	High

Source: AEAS 2021

- Population growth and Employment: During operation, the project would generate permanent employment for about 66.5 full-time equivalent persons in the Hunter Region. It is expected that these workers will live locally, helping to support local employment and contribute to the local economy through spending of wages at local and regional businesses.

- Government Revenue: Operation of the Redbank Power Station will generate a number of Federal, NSW and Local Government revenues. Federal Government revenue will be realised through such taxes as Company tax, Income tax and GST payments. The NSW Government will receive additional revenue from taxes including Payroll tax, and Stamp Duties. The Singleton LGA may receive revenue through an increase in rates revenue from any additional housing, as well as from other taxes and charges however any increase in revenue is expected to be modest.

- Improved Social and Economic Sustainability: The power station reopening will bring greater sustainability to the Singleton LGA as well as to the wider Hunter Region. The greater sustainability will be felt through an improved long term economic and social outlook. This will be a direct result of increased and more secure employment opportunities over the long term; increased business opportunities to service the power station and the workforce; increased investment in the area as new industries set up to take advantage of the creation of a readily available supply of competitively-priced electricity.

9.4 Socio Economic Outcomes – Implications for Singleton LGA and Hunter Region

In summary, the negative socio-economic impacts from the construction and reopening of the Redbank Power Station are assessed to be low and will be managed responsibly by Verdant Earth Technologies. At the same time the socio-economic benefits such as employment creation, population growth, economic diversity, downward pressure on electricity prices and more reliable supply of renewable energy are assessed to have a high and positive consequence.

Appendix One: References

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Appendix Two: AEAS Business Information

Australian Economic Advocacy Solutions delivers services in economic analysis, research and advocacy in Australia and was set up by Nick Behrens following two decades of experience applying these skills in the real world for Australia's business community. More specifically AEAS provides:

- Economic Contribution and Valuation Analysis;
- Data Analysis, Market research and Economic Modelling;
- Stakeholder Consultation; and
- Government Relations and Submissions.

AEAS delivers services nationally to exemplary organisations including Australian Industry Group, Australian Gas Industry Trust, BASF, Brisbane Airport Corporation, CCIQ, Canegrowers, IOR Petroleum, LifeFlight, Master Builders Australia, Natroads, Port of Brisbane, Property Council of Australia, Queensland Resources Council, RACQ, Remondis, Suncorp, VTA, Victorian Waste Management Association, unions, local government authorities, the Commonwealth and State Governments and many others.

We can be engaged for either a special project (for the entire project or just the parts our clients need help with) or on an ongoing basis. We will take the time to understand your unique challenge and create a partnership with you to tailor a solution specific to your budget. We engage with confidentiality and integrity. Choose AEAS for our expertise, professionalism and ability to work with our valued clients to achieve exceptional results.

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Across his professional career Nick has realised many outstanding outcomes to complex challenges for the business community. He possesses significant experience in gathering and presenting information, and leveraging that information to achieve results across a range of areas including economic, taxation, regulatory environment, workers compensation, employment legislation, population, infrastructure and planning issues. As Director of Australian Economic Advocacy Solutions (AEAS), Nick provides:

- Exceptional understanding of social, political and economic issues impacting on business and the economy;
- Considerable real-world application of project, business and economic research and analysis;
- Significant expertise in advocacy, including government and stakeholder relations;
- In-depth and firsthand knowledge of the workings of Government;
- Extensive networks in political, government, business and community sectors;
- Previous appointments on a number of high level Government committees; and
- Media commentator and public speaker.

Nick's representations are based on extensive research and his preferred approach to economic analysis, research and advocacy is to achieve results by working with stakeholders behind the scenes to secure positive and lasting outcomes. He places much emphasis on having a thorough and convincing evidence that is readily understood and in turn leads to real world application and solutions.

AEAS

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