OXFORD ECONOMICS AUSTRALIA

Regional Economic Transition Analysis – Hunter Region

Final report

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Disclaimer

To discuss the report further please contact:

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EXECUTIVE SUMMARY

KEY FINDINGS

Hunter's industrial heritage and strategic assets position it to lead Australia's energy transition.

Mining (11% of value added), health care, accommodation, and tourism anchor the Hunter's economy, supported by strong infrastructure (ports, freight, skilled workforce).

Energy services (16% of economy) plus the REZ, Hunter Hydrogen Hub, and Newcastle Clean Energy Precinct position the region as a hub for hydrogen, ammonia, and clean exports, leveraging Orica and Tomago.

Despite manufacturing and mining decline, the Hunter's skilled workers, defence manufacturing track record, and aerospace/defence assets (RAAF Williamtown, precision SMEs, University of Newcastle R&D) provide a pathway into emerging high-value industries.

The Hunter has key investment opportunities across defence, hydrogen, energy to waste and chemical processing.

Ammonia and hydrogen production in the Hunter region is emerging as a key pillar of NSW's low-emissions industrial strategy.

Established defence manufacturing, maintenance, and training facilities, combined with port and transport infrastructure, position it as a key hub for naval, aerospace, and land-based defence operations.

Biofuels and energy from waste are emerging pillars of the Hunter's clean energy and circular economy capability due to the region's strong agricultural, forestry, and industrial base.

The Hunter has been shifting away from industrial employment and this trend will continue, driven by reduced demand for thermal coal.

The Hunter Region is expected to add between 40,000 to 75,000 net jobs over the next 10 years – the magnitude depending on the transition scenario.

Historical reductions in the industrial workforce will continue, although at a slower rate, as half of the Hunter's 22 coal mines are expected to close by 2035.

Strong growth in health & education is expected with potential upside opportunities in defence, advanced manufacturing and utilities.

Around 11,200 fossil fuel jobs are expected to be lost by 2035, with 2,580 workers retiring and 8,620 workers undergoing a workforce transition.

These workers are predominantly employed in the coal mining industry where closures of coal mines are expected to result in significant job losses.

An estimated 48% of workers are likely to be able to transition to similar roles in other industries with minimal transition support.

An estimated 52% of workers may be able to transition to roles with similar skills requirements with the right support for focused upskilling and reskilling.

Growth opportunities are focused around health and education, with opportunities for high skill engineering roles in professional services and priority investment areas.

Regional employment demand is likely to absorb displaced workers, although there are some role specific barriers to transition

Regional employment demand is likely sufficient to absorb displaced workers, but the specialised nature of fossil fuel roles present a challenge.

The skillset and qualifications held by fossil fuel workers may present as a barrier for movement into the broader workforce, exacerbated by the substantial wage differential with other industries.

There are no major demographic factors that are likely to create barriers for worker mobility, although the high First Nation's footprint may require targeted support measures.

Overcoming investment barriers will be critical to diversifying the industrial base and ensuring the success of reskilling and redeployment levers.

Diversification and retraining are well supported by current policy, with significant investment in attracting new industries to the Hunter and expanding training pathways into associated areas.

Barriers to investment can be addressed through clear policy and demand signals, streamlined approvals, targeted infrastructure and precinct investment, shared infrastructure, priority precinct designations, and strong research partnerships.

Redeployment levers outside the power generation industry have received less policy attention, leaving fewer structured opportunities for workers to transition into equivalent roles that maximise the use of their current skillset.

INTRODUCTION

NZEA has engaged Oxford Economics to support evidence-based action in transition-affected regions.

Project Overview

The Net Zero Economy Authority (NZEA) commissioned this project to understand opportunities presented by the net zero transition for regional communities. There are a number of regions central to Australia's energy system and industrial base that face disproportionate exposure to structural shifts as emissions-intensive activities decline. The Hunter, Central Queensland and Latrobe Valley were prioritised for this project due to the size and complexity of their region and economies, but the analytical framework can be deployed in other regions. These regions also present opportunities to lead in clean energy generation, advanced manufacturing, and resource-based value-adding, provided that the right policy, investment and workforce conditions are in place. The project seeks to inform strategic planning and intervention by forecasting how regional economies will evolve under different decarbonisation scenarios.

Oxford Economics was engaged to deliver a structured, scenario-led analysis across three core domains. These include forward-looking forecasts of industry and labour market change, an assessment of each region's comparative advantages and investment potential, and a detailed examination of transition pathways for fossil fuel and related workers. The analytical framework integrates AEMO's 2025 transition scenarios with regional planning assumptions, closure timelines, and infrastructure settings to ensure alignment with real-world transition drivers. Regional priorities and economic exposures have been informed by the NZEA's own statistical framework, which identifies both downside risks and economic opportunities across Australia's key regions.[1] The analytical framework used within this project can be deployed across other NZEA priority regions beyond the Hunter, Central Queensland and Latrobe Valley.

The project aims to generate region-specific insights that can support practical decision-making across multiple levels of government. By quantifying the scale and timing of industrial change, identifying investment barriers, and mapping reskilling needs, the work creates an evidence base that links long-term economic modelling with near-term policy and program levers. This enables a more coordinated approach to managing transition risk while positioning each region to attract and retain high-value activity.

This work provides a foundation for coordinated, place-based action across governments, industry and communities. Outputs will support the NZEA's role in shaping policy, allocating resources, and engaging stakeholders on transition risks and opportunities. By identifying emerging demand for labour and skills, sectoral growth trajectories, and enablers of investment readiness, the project aims to assist in sequencing investment, workforce support and infrastructure development. Ultimately, the analysis will help ensure that transition efforts are locally grounded, forward-looking, and capable of delivering resilient and inclusive economic outcomes.

Project Components

The project was structured into three core analytical components to align with NZEA's transition objectives. Each stream was applied consistently across the Hunter, Central Queensland, and Latrobe Valley regions. Separate reports were developed for each component in each region to ensure depth, comparability, and regional specificity. In addition, a summary report has been developed synthesizing the key insights across all three project components.

Regional Economic Forecasts

This stream provides scenario-based projections of industry composition, employment, and skills demand across 5, 10, and 25 years. These forecasts are based on AEMO's 2025 transition scenarios and represent regional futures based on current trends and industrial structures within the region. Outputs include identification of sectors likely to decline, grow, or emerge, the timing of major structural shifts, and profiles of key workforce cohorts.

Regional Investment Analysis

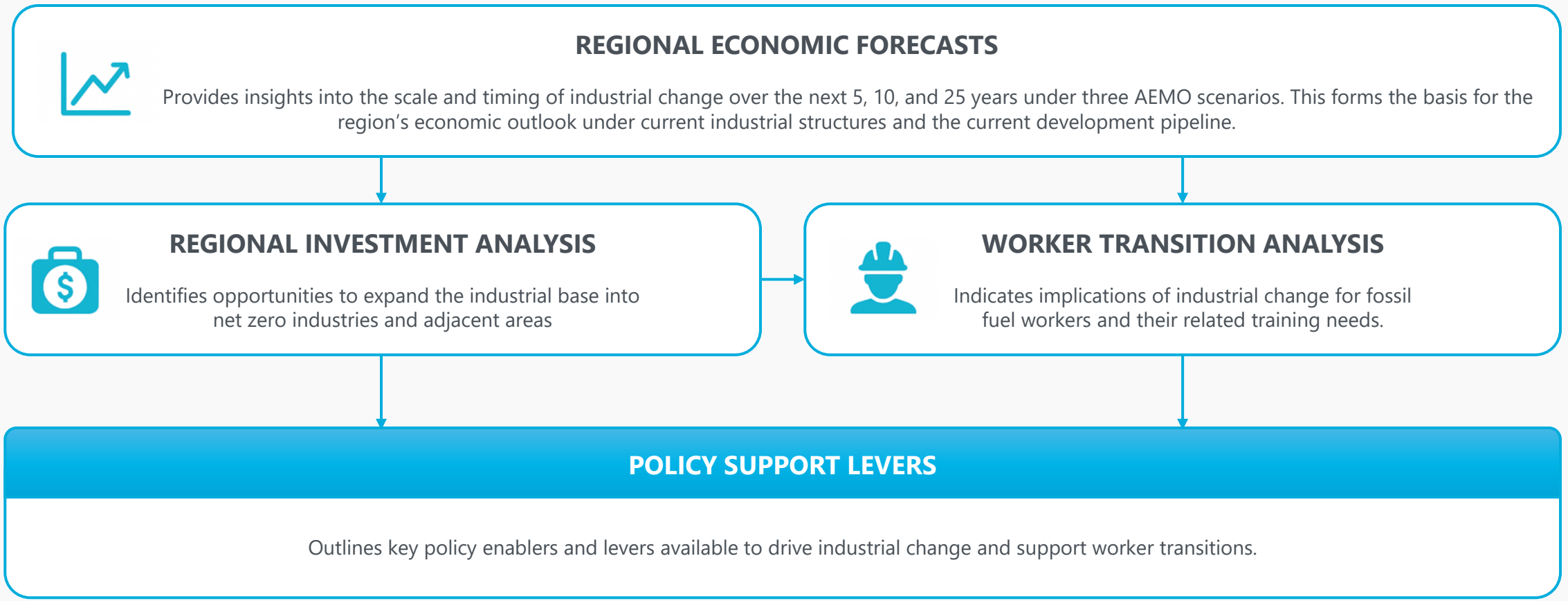
Focusing on each region's strategic position, this stream identifies comparative economic advantages, evaluates barriers to investment, and highlights opportunities to attract net zero aligned industries. It also outlines region-specific enablers such as infrastructure, workforce capability, and resource availability that could support long-term industrial development beyond what is identified in the *Regional Economic Forecasts* report.

Worker Transition Analysis

Centred on transition-affected workers, this stream delivers occupational pathway mapping, retraining requirements, and an assessment of local training system capacity. It also provides targeted support strategies to address cohort-specific barriers and enable workforce mobility within the regional economy. The analysis considers both the likely future economic structure of the region as identified in the *Regional Economic Forecasts* report and opportunities identified in the *Regional Investment Analysis* report.

Our analytical framework brings together three interconnected streams of analysis to identify policy levers that could support the region's transition.

Regional economic transition analytical framework



This report presents findings into the challenges and opportunities facing the Hunter region's net zero transition and implications for supporting workforce transitions.

Purpose of this Report

This report provides an integrated analysis into the economic, investment, and workforce dimensions of the Hunter region's transition to net zero. It forms part of the Net Zero Economy Authority's (NZEA) regional analysis program and supports its broader mandate to coordinate an orderly, inclusive and place-based transition. The focus is on bringing together forward-looking economic forecasts, assessments of regional investment opportunities, and analysis of workforce transition pathways to provide a consolidated evidence base for decision-making.

The report draws on findings from each of the *Regional Economic Forecasts* report, *Regional Investment Analysis* report and *Worker Transition Analysis* report. It highlights the timing and scale of structural change likely to occur in the Hunter economy based on current development pipelines and industrial structures, identifies the most viable opportunities to attract and grow net zero-aligned and other relevant industries to support a thriving Hunter region, and outlines the workforce supports required to enable an inclusive transition for affected communities. The forecasts produced within the *Regional Economics Forecasts* report are underpinned by the Australian Energy Market Operator's (AEMO's) energy transition scenarios* and do not include any crowding-in investment from the areas identified in the *Regional Investment Analysis* report.

Findings from this report will inform strategic planning, investment prioritisation, and workforce development across government, industry and communities. The outputs are designed to help NZEA and relevant stakeholders anticipate the interconnected challenges and opportunities facing the Hunter, and to align policy, investment, and support measures accordingly. These findings are intended to be validated by NZEA with regional stakeholders.

The structure and methodology bring together a single picture of the region's economic transition challenges and opportunities. The regional economic forecasts assess the Hunter's likely economic path based on current industrial structures and the current development pipeline, the investment analysis identifies opportunities for growth and change aligned with net zero priorities, and the workforce transition analysis integrates both dimensions to map the opportunities and needs of affected workers and communities. While each stream provides depth in its own right, this report brings them together to create a single, region-wide narrative and provides a basis for validation with local communities. The analysis is forward-looking and designed to inform medium and long-term decision-making to ensure the Hunter's transition is resilient, inclusive, and economically sustainable.

Report Structure

The report is structured around four core analytical components: analysis of the Hunter's economic outlook, identification of priority investment opportunities, assessment of workforce transition pathways, and consideration of the policy supports and recommendations required to enable an orderly transition. Each of these components provides a distinct perspective on the region's transition, and together they offer an integrated view of how the Hunter can navigate structural change while maximising opportunities for growth and community resilience.

THE HUNTER'S ECONOMIC OUTLOOK: This section provides a forward-looking assessment of the Hunter's likely economic trajectory under different transition scenarios. It draws on industry composition, employment forecasts, and skills demand projections to highlight sectors expected to grow, decline or emerge based on the industrial structure and current development pipeline.

PRIORITY INVESTMENT OPPORTUNITIES: This section identifies the Hunter's comparative advantages and the most viable opportunities to attract and develop net zero-aligned and other relevant industries. It considers enabling conditions such as infrastructure, resource availability, and workforce capability, and highlights barriers that may delay or limit investment.

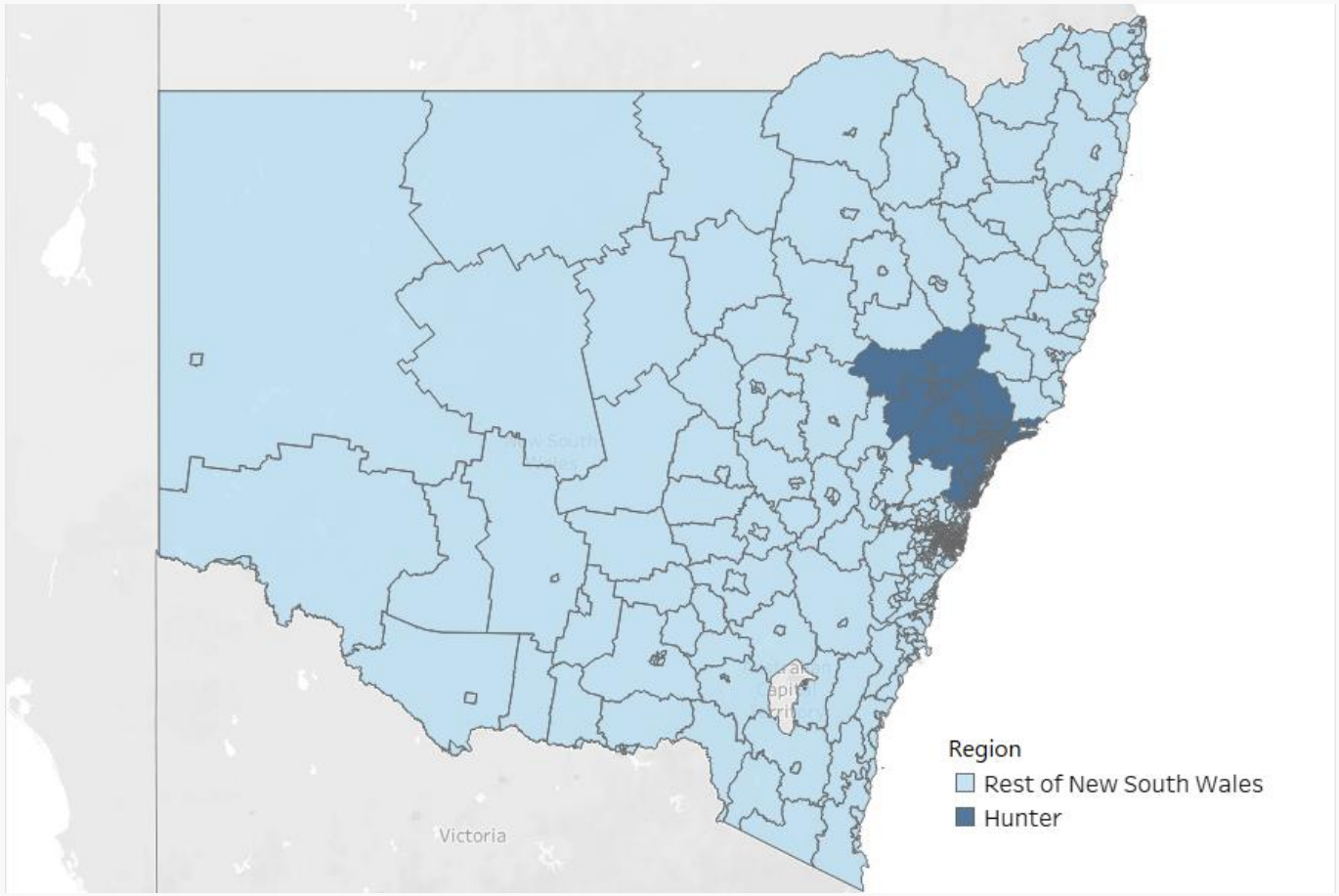
WORKFORCE TRANSITION PATHWAYS: This section examines the implications of industrial and investment change for the Hunter's workforce. It maps potential occupational pathways for affected workers, identifies retraining and mobility requirements, and assesses the region's capacity to support workers through transition.

APPENDICES: This section provides technical detail on the definitions, approaches and data sources used within the analysis of this report.

*The transition scenarios produced by Deloitte Access Economics as part of AEMO's Draft 2025, Inputs, Assumptions and Scenarios Report outline possible demographic, economic and decarbonisation pathways for Australia. These scenarios focus on the pace of the transition, particularly in the energy sector, to support AEMO's long-term energy consumption forecasts. While the forecasts do not explicitly capture the method of decarbonising, the net zero pathway constraint means that emissions-intensive industries are most affected.

The analysis in this report is focused on the Hunter which is defined as the combination of four working zones which cover a total of 85 SA2 regions.

Hunter region map



Hunter Region Working Zone Listing

State	Working Zone Name
NSW	Central Coast and surrounds
NSW	Muswellbrook, Scone and surrounds
NSW	Newcastle, Lower Hunter and surrounds
NSW	Nelson Bay Peninsula and Anna Bay

Source: Net Zero Economy Authority, Australian Bureau of Statistics

Hunter Region SA2 listing

Central Coast and surrounds

SA2 NAME	SA2 CODE
Avoca Beach - Copacabana	102011028
Bateau Bay - Killarney Vale	102021044
Blue Haven - San Remo	102021045
Box Head - MacMasters Beach	102011029
Budgewoi - Buff Point - Halekulani	102021046
Calga - Kulnura	102011030
Chittaway Bay - Tumbi Umbi	102021047
Erina - Green Point	102011031
Gorokan - Kanwal - Charmhaven	102021048
Gosford - Springfield	102011032
Jilliby - Yarramalong	102021049
Kariong	102011033
Kincumber - Picketts Valley	102011034
Lake Munmorah - Mannering Park	102021050
Narara	102011035
Niagara Park - Lisarow	102011036
Ourimbah - Fountaindale	102021051
Point Clare - Koolewong	102011037
Saratoga - Davistown	102011038
Summerland Point - Gwandalan	102021052
Terrigal - North Avoca	102011039
The Entrance	102021053
Toukley - Norah Head	102021054
Tuggerah - Kangy Angy	102021055
Umina - Booker Bay - Patonga	102011040
Wamberal - Forresters Beach	102011041
Warnervale - Wadalba	102021056
Woy Woy - Blackwall	102011042
Wyoming	102011043
Wyong	102021057

Muswellbrook, Scone and surrounds

SA2 NAME	SA2 CODE
Muswellbrook	106041126
Muswellbrook Surrounds	106041127
Scone	106041128
Scone Surrounds	106041129
Muswellbrook	106041126

Nelson Bay Peninsula and Anna Bay

SA2 NAME	SA2 CODE
Anna Bay	106031119
Nelson Bay Peninsula	106031121

Newcastle, Lower Hunter and surrounds

SA2 NAME	SA2 CODE
Adamstown - Kotara	111031222
Belmont - Bennetts Green	111011206
Belmont South - Blacksmiths	111011207
Beresfield - Hexham	111031223
Bolton Point - Teralba	111021215
Bonnells Bay - Silverwater	111021216
Branxton - Greta - Pokolbin	106011107
Cessnock	106011108
Cessnock Surrounds	106011109
Charlestown - Dudley	111011208
Dungog	106011110
East Maitland - Metford	106021614
Edgeworth - Cameron Park	111021217
Glendale - Cardiff - Hillsborough	111011209
Hamilton - Broadmeadow	111031224
Kurri Kurri - Abermain	106011111
Lambton - New Lambton	111031225
Lemon Tree Passage - Tanilba Bay	106031120
Maitland	106021114
Maitland - North	106021116
Maryland - Fletcher - Minmi	111031226
Mayfield - Warabrook	111031227
Merewether - The Junction	111031228
Morisset - Cooranbong	111021218
Mount Hutton - Windale	111011210
Newcastle - Cooks Hill	111031229
Newcastle Port - Kooragang	111031230
Raymond Terrace	106031122
Redhead	111011211
Rutherford (North) - Aberglasslyn	106021615

Newcastle, Lower Hunter and surrounds

SA2 NAME	SA2 CODE
Rutherford (South) - Telarah	106021616
Seaham - Woodville	106031123
Shortland - Jesmond	111031231
Singleton	106011112
Singleton Surrounds	106011113
Stockton - Fullerton Cove	111031232
Swansea - Caves Beach	111011212
Tea Gardens - Hawks Nest	106031124
Tenambit - East Maitland	106021617
Thornton - Millers Forest	106021618
Toronto - Awaba	111021219
Valentine - Eleebana	111011213
Wallsend - Elermore Vale	111031233
Wangi Wangi - Rathmines	111021220
Waratah - North Lambton	111031234
Warners Bay - Boolaroo	111011214
West Wallsend - Barnsley - Killingworth	111021221
Wickham - Carrington - Tighes Hill	111031235
Williamtown - Medowie - Karuah	106031125

PRIORITY INVESTMENT OPPORTUNITIES

Hunter's industrial heritage and strategic assets position it to lead Australia's energy transition and pivot into advanced manufacturing and renewables.

Comparative advantage summary

Segment	Industry	LQ*	Growth**	Skilled labour***	% of economy ****	Infrastructure and endowments
Established advantage	Mining	1.67	-9.1%	9,026	11%	• 13% of Australia's black coal
	Accommodation and Food Services	1.21	1.1%	12,978	2%	• Tourism hubs, Hunter Valley
	Health Care and Social Assistance	1.14	1.5%	59,909	11%	• John Hunter Health Precinct
Net zero opps.	Electricity, Gas, Water and Waste	0.90	-2.8%	3,864	16%	• Hunter-Central Coast REZ (10 GW) • Hunter Hydrogen Hub • Tomago Aluminium smelter, Kurri Kurri industrial precinct
Latent potential	Manufacturing	1.00	-1.6%	18,105	5%	• Orica Kooragang Island ammonia/nitrate complex
	Professional, Scientific and Technical	0.70	2.0%	30,542	3%	• UoN (engineering R&D), Astra Aerolab
Enabling industries	Other Services	1.40	1.3%	20,075	2%	• Newcastle Clean Energy Precinct
	Construction	1.03	0.6%	35,439	9%	
	Rental, Hiring and Real Estate	1.02	1.1%	7,153	12%	• Strong population growth
	Administrative and Support	0.98	1.3%	5,634	1%	
	Education and Training	0.97	2.1%	36,116	5%	• University of Newcastle, Hunter TAFE
	Public Administration and Safety	0.92	2.4%	20,347	8%	• RAAF Base Williamtown
	Wholesale Trade	0.89	1.0%	6,477	2%	• Deep-water port, freight and logistics
	Financial and Insurance Services	0.82	1.1%	11,778	4%	
	Transport, Postal and Warehousing	0.76	0.7%	5,435	2%	• Intermodal terminals, airport links
	Information, Media and Teleco	0.51	1.0%	2,688	2%	• Fibre and broadband infrastructure
	Agriculture, Forestry and Fishing	0.16	-0.2%	1,080	3%	• Fertile land, viticulture
Population serving	Retail Trade	1.24	1.0%	15,737	4%	
	Arts and Recreation Services	0.69	2.1%	4,401	0%	• Newcastle cultural precincts

Source: ABS; REMPLAN; Oxford Economics Analysis

Description

The Hunter region is one of Australia's leading industrial centres. Mining remains core, contributing around 11% of regional value added supported by large coal reserves. Health care and accommodation are also major employers, underpinned by the John Hunter Health Precinct and strong tourism. These sectors are reinforced by deep-water ports, freight terminals, and a skilled workforce in mining and health, with population growth reinforcing demand.

The region's energy and infrastructure profile makes it a strong candidate for net zero transformation. Electricity, gas, water, and waste services contribute 16% of value added, with the Hunter-Central Coast Renewable Energy Zone, Hunter Hydrogen Hub, and Newcastle Clean Energy Precinct enabling clean industry investment. Anchored by Tomago Aluminium Smelter and Orica's ammonia/nitrate facility, the region is positioned to lead in green hydrogen, green ammonia, and energy-intensive industrial decarbonisation.

While employment in traditional manufacturing is forecast to decline (–1.6%/year) by 2035, the Hunter retains over 18,000 skilled workers and scope to pivot into advanced manufacturing. Institutions such as The Net Zero Manufacturing TAFE Centre of Excellence[2] will support this shift, partnering with TAFE NSW, universities, and industry to pilot qualification models. The region also has a strong base in defence manufacturing, delivering components for the Hunter-class frigates and supporting SMEs in global supply chains. RAAF Base Williamtown enhances aerospace and Defence opportunities, while the University of Newcastle and regional TAFE provide robust R&D and engineering pipelines. Together, these assets position the Hunter to evolve into a hub for advanced manufacturing.

Within this broader picture, the Upper and Lower Hunter play distinct roles. The Lower Hunter is shaped by its urban concentration around Newcastle, with strong logistics and civil assets underpinning its industrial and service economy. In contrast, the Upper Hunter retains a more resource and land-intensive profile, but also holds comparative advantage in emerging opportunities in large-scale renewables, supported by land availability and grid infrastructure.

** Location quotient of employment in 2025 relative to national levels; **Employment growth forecast 2025-2035 - step change scenario; *** Defined as workers in industry with skill level 3 and above; ****Defined as the percentage of regional GVA*

The Hunter has a range of growth opportunities based on job potential, policy alignment and comparative advantage.

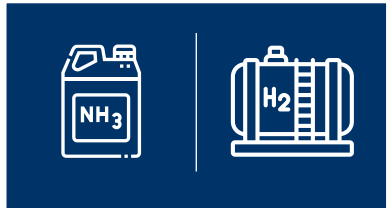
Project type	Lead Times*	Job Contribution	Policy	Comparative Advantage	Average Rating**	Description
Defence maintenance/sustainment	Short	5.00	4.00	5.00	4.67	Williamtown Defence cluster and MRO capability. Strong policy support, job contribution potential.
Hydrogen	Medium	5.00	4.00	5.00	4.67	Strong local interest and infrastructure through Hydrogen Hub.
Energy from waste facilities	Long	4.00	5.00	4.00	4.33	Leverages industrial waste streams and energy infrastructure.
LCLFs, biofuels and biochemicals from waste streams	Medium	3.00	5.00	5.00	4.33	Good match with industrial ecology and bioresource availability.
Defence manufacturing	Short	3.00	4.00	5.00	4.00	RAAF Williamtown and Aerolab precinct provides a strong foundation.
Urea and ammonia production	Short	4.00	3.00	5.00	4.00	High potential due to existing ammonia plant and hydrogen development.
Onshore wind farms	Long	1.00	5.00	5.00	3.67	Strong resource potential but limited local manufacturing/jobs.
Green metals	Medium	3.00	4.00	4.00	3.67	Potential to leverage existing metal processing and manufacturing capabilities.
Renewables component manufacturing	Short	5.00	5.00	1.00	3.67	Implied policy alignment through state and major projects but limited comparative advantage.
Transport and logistics	Medium	4.00	4.00	3.00	3.67	Moderate potential, reliant on targeted infrastructure investment.
Circular economy manufacturing	Short	1.00	5.00	4.00	3.33	Strong fit due to local industrial base, workforce, and strategic state support.
Offshore wind farms	Long	4.00	4.00	2.00	3.33	Strong resource and policy alignment; limited job scale short-term. Several projects have stalled.
Battery energy storage systems (BESS)	Medium	1.00	4.00	5.00	3.33	High infrastructure pipeline; limited ongoing employment.
Carbon capture and storage (CCS)	Long	5.00	2.00	3.00	3.33	Policy interest and early-stage potential but limited current project activity.
Pumped hydro energy storage	Long	2.00	4.00	4.00	3.33	Lacks optimal topography and water availability.
Solar farms	Medium	1.00	5.00	3.00	3.00	Moderate growth potential, contingent on grid upgrades.
Food and fibre product manufacturing	Short	2.00	4.00	2.00	2.67	Some potential - building on local agriculture base.
Data centres	Short	1.00	4.00	1.00	2.00	Limited tech clusters and latency/resource constraints.
Minerals processing	Short	2.00	3.00	1.00	2.00	Limited resources and minimal industrial use cases in the Hunter.
Geothermal heating and power	Long	2.00	1.00	1.00	1.33	Limited policy alignment and comparative advantage

**Note that lead times are not considered when deriving a project type's rating or the subsequent prioritisation. Details and categorisation are retained here for illustrative purposes.*
***Additional detail on methodology to derive scores is present in report appendices.*

Key opportunities Weakest 1 2 3 4 5 Strongest

Hydrogen and ammonia are creating new investment pathways that strengthen the Hunter's industrial base, research capacity, and export potential.

Summary of opportunity – Hydrogen and ammonia manufacturing



Ammonia and hydrogen production in the Hunter region is emerging as a key pillar of NSW's low-emissions industrial strategy. The region's existing industrial base, port infrastructure, and access to renewable energy make it well-placed to produce low-carbon hydrogen and ammonia for domestic use and export. Firms such as LAVO[23] are also exploring hydrogen component manufacturing and energy storage technology. These sectors are central to decarbonising heavy industry, supporting energy security, and maintaining the Hunter's role as a major industrial hub.

Hunter advantages

- Established ammonia production and related industrial operations at Kooragang Island
- Direct access to the Port of Newcastle for distribution and export.
- Expanding hydrogen sector, with strong academic, local government and commonwealth support
- Strong potential to harness local renewable energy resources for green hydrogen production

Actions to realise opportunity

- Hydrogen/ammonia pipelines connecting production sites to the Port of Newcastle and industrial users and port upgrades for storage/handling/export of hydrogen
- Renewable energy and transmission capacity to power electrolysers and ammonia plants
- Environmental and planning approvals, including an Environmental Impact Statement (EIS), State Significant Development/Infrastructure (SSD/SSI) and heritage approvals
- Safety, environmental, and operational licences such as Major Hazard Facility (MHF), EPL, and Grid Connection Agreements

Estimated economic impacts per project*

	Hydrogen		Ammonia	
	Constr-uction	Ongoing	Construc-tion	Ongoing
Investment	$1400m	$420m p.a.	$2,900m	$464m p.a.
GVA	$248m	$136m p.a.	$394m	$282m p.a.
Employment	790 jobs	383 jobs p.a.	1,359 jobs	300 jobs p.a.

Key project examples

- **Kooragang Island Industrial Precinct**
  - Hosts the Hunter's only large-scale ammonia production facility, operated by Orica
- **Hunter Valley Hydrogen Hub**
  - Proposed 50MW electrolyser to supply renewable hydrogen to Orica's ammonia plant
- **LAVO Hydrogen Storage**
  - R&D and manufacturing of green hydrogen storage

Key opportunity areas

Immediate priorities (2025-2030)

1. Build on existing Hunter Valley Hub and Orica projects to scale green hydrogen output using renewable power and recycled water. Explore industrial fuel substitution.
2. Leverage Orica's existing ammonia and ammonium nitrate plants to integrate hydrogen directly into established chemical value chains.

Medium-term opportunities (2030-2035)

3. Develop bulk ammonia storage, loading and shipping facilities at the Port of Newcastle Clean Energy Precinct for global exports.
4. Attract advanced manufacturers in components for electrolysers, hydrogen refueling systems, storage vessels and hydrogen equipment assemblies.
5. Deploy hydrogen for buses, trucks, mining haulage and nearby industrial loads to build reliable domestic demand alongside exports.
6. Establish national service and maintenance hubs for electrolysers and hydrogen equipment, modelled on mining equipment service hubs.

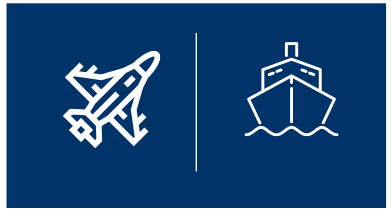
Longer-term opportunities (post-2035)

7. Invest in R&D and demonstration of technologies to convert imported ammonia back into hydrogen, positioning Newcastle as a two-way energy hub.
8. Explore ammonia as a shipping fuel and as a low-carbon option in regional energy generation.
9. Scale CSIRO and University of Newcastle's role in workforce training, certification, and testing services to support exports and domestic scaling.

** Expected investment CAPEX, and Construction and Ongoing employment impacts are taken as averages from publicly available project information. Expected Ongoing investment and GVA impacts are inferred using ratios. See more details in the Appendix.*

Defence infrastructure and market demand are unlocking major investment opportunities for the Hunter in manufacturing, sustainment, and exports.

Summary of opportunity – Defence manufacturing and sustainment



Defence activities in the Hunter are a core part of NSW's strategic industrial capability. The region's manufacturing, maintenance, and training facilities, combined with port and transport infrastructure, position it as a hub for naval, aerospace, and land-based operations. Key opportunities include ongoing sustainment through RAAF Base Williamtown, cutting-edge guided weapons manufacturing anchored by the new Kongsberg facility, and a coordinated industry ecosystem linking SMEs and primes through networks, simulation, and integration platforms. Together, these assets support national security and enhance the resilience of Australia's defence supply chains.

Hunter advantages

- Central role of RAAF Base Williamtown in Defence ecosystem
- Astra Aerolab precinct attracting primes such as BAE, Kongsberg and Boeing and supported by coordinated investment in defence infrastructure
- Active industry networks (Hunter Defence, HunterNet) integrating SMEs into defence supply chains
- Strong workforce pipeline backed by regional skills initiatives and aligned government–industry programs

Actions to realise opportunity

- Expansion of operational facilities at RAAF Base Williamtown, including hangars, maintenance bays, training simulators and improving grid and water connectivity
- Secure transport, logistics and other airport infrastructure for classified or hazardous defence material
- Defence-specific planning and environmental approvals, including EIS and Estate Works Program (EWP) processes.
- Security and accreditation requirements such as DISP membership, site security accreditation and explosives handling licences

Estimated economic impacts per project*

	Defence Manufact.		Defence Sustainment	
	Constr-uction	Ongoing	Construc-tion	Ongoing
Investment	$400m	$295m p.a.	$680m	$612m p.a.
GVA	$87m	$58m p.a.	$148m	$120m p.a.
Employment	148 jobs	263 jobs p.a.	367 jobs	600 jobs p.a.

Key project examples

- **RAAF Base Williamtown**
  - Australia's primary fighter, surveillance, and training base, home to the F-35A fleet sustainment program.
- **Astra Aerolab Precinct**
  - Defence, manufacturing and aerospace business park that hosts multiple defence primes.
- **Kongsberg Defence Australia Missile Facility**
  - Under construction at Astra Aerolab to produce Naval Strike Missiles and Joint Strike Missiles.

Key opportunity areas

Immediate priorities (2025-2030)

1. Build on sustainment contracts tied to the F-35A fleet at Williamtown, including maintenance, upgrades and operational support.
2. Support primes at Astra Aerolab with workforce pipelines, streamlined approvals, and industry certification programs.
3. Strengthen the integration of Hunter SMEs into defence supply chains via DISP membership and accreditation.

Medium-term opportunities (2030-2035)

4. Expand defence-specific infrastructure, including new hangars, training simulators, hardened logistics and secure transport facilities at Williamtown and surrounding bases.
5. Establish a regional defence sustainment services hub (e.g. avionics, electronics, advanced composites, and maritime sustainment), extending beyond aerospace into naval and land platforms.
6. Localise some advanced defence manufacturing (e.g. robotics integration, precision engineering) by looking to local SMEs to reduce reliance on overseas supply chains.

Longer-term opportunities (post-2035)

7. Position the Hunter as a centre for guided weapons and explosive ordnance (GWEO) manufacturing and sustainment, leveraging national investment in sovereign capability.
8. Develop a comprehensive export market capability, enabling Hunter firms to supply into allied defence programs (AUKUS, US/UK aerospace and naval projects).
9. Scale CSIRO and University of Newcastle's role in workforce training, certification, and testing services to support exports and domestic scaling.

** Expected investment CAPEX, and Construction and Ongoing employment impacts are taken as averages from publicly available project information. Expected Ongoing investment and GVA impacts are inferred using ratios. See more details in the Appendix.*

The Hunter is positioned to become a national leader in biofuels and EfW, with infrastructure and feedstock advantages attracting long-term investment.

Summary of opportunity – Biofuels and energy from waste

Biofuels and energy from waste (EfW) are emerging pillars of the Hunter's clean energy and circular economy capability. With its strong agricultural, forestry, and industrial base, the region is well-suited to these industries. In NSW, thermal waste treatment with energy recovery is banned unless excepted under the Protection of the Environment Operations (General) Regulation 2022, which permits it in four designated precincts - Parkes, Richmond Valley, Southern Goulburn Mulwaree, and West Lithgow, with Tomago proposed as a priority infrastructure area.

Hunter advantages

- A strong local agricultural and forestry base supporting feedstock and an existing industrial, chemical processing and manufacturing base are attractive for proponents of EfW projects
- Some transferrable skillsets from coal to EfW (e.g. engineering and fitter roles) and existing advanced skillsets in ammonia production
- Direct access to the Port of Newcastle for distribution, import and export
- Expanding sectors, with strong R&D investment and private sector interest

Actions to realise opportunity

- Secure EIS, SSD/SSI, biodiversity, and Aboriginal heritage approvals, while ratifying Tomago as an EfW precinct to give investors certainty
- Progress grid connections, recycled water access, transport/logistics upgrades and long-term feedstock supply contracts needed for EfW and biofuels projects
- State and Commonwealth approvals including EIS, SSD/SSI consent, biodiversity offset approvals, and Aboriginal Heritage Impact Permits (AHIPs)

Estimated economic impacts per project*

	Biofuels		Energy from Waste	
	Constr-uction	Ongoing	Construc-tion	Ongoing
Investment	$600m	$60m p.a.	$600m	$240m p.a.
GVA	$78m	$20m p.a.	$86m	$62m p.a.
Employment	733 jobs	103 jobs p.a.	539 jobs	385 jobs p.a.

Key project examples

- **Remondis EfW at its Tomago resource recovery facility**[27]
  - Proposed EfW facility that has now triggered an inquiry into Tomago as a potential priority infrastructure area
- **Ethtec Cellulosic Ethanol Pilot Plant**
  - Developing new technology for environmentally sustainable production of ethanol biofuel

Key opportunity areas

Immediate priorities (2025-2030)

1. Anchor EfW development at Tomago by establishing it as NSW's designated EfW precinct and priority infrastructure area, creating certainty for long-term private investment.
2. Unlock scalable EfW projects and biofuel pilots (e.g. Ethtec) that demonstrate commercial pathways and attract early capital.
3. Strengthen biomass supply chains by creating opportunities for local growers, forestry operators and councils to participate in long-term contracts.

Medium-term opportunities (2030-2035)

4. Develop shared precinct infrastructure (logistics hubs, grid interconnections, waste aggregation points) that enable economies of scale and reduce project costs.
5. Support facilities like the Ethtec Cellulosic Ethanol Pilot Plant and other SMEs to move from pilot to commercial scale, focusing on SAF and renewable diesel.
6. Attract international partners to co-invest in EfW boilers, turbines, and bio-refinery technologies while embedding local manufacturing of components and maintenance capabilities.

Longer-term opportunities (post-2035)

7. Position Newcastle as an export hub for sustainable biofuels and renewable energy credits, aligned with global SAF and low-carbon shipping fuel demand.
8. Link EfW facilities with district heating, industrial steam users, and carbon capture technologies.
9. Scale CSIRO and University of Newcastle research on feedstock pre-treatment, gasification, and next-gen bio-refinery processes.

** Expected investment CAPEX, and Construction and Ongoing employment impacts are taken as averages from publicly available project information. Expected Ongoing investment and GVA impacts are inferred using ratios. See more details in the Appendix.*

The Hunter region's industrial transition depends on reducing commercial risk, strengthening infrastructure, aligning skills, and providing clear regulatory certainty

Key barriers

Commercial and market risk

Investors remain cautious due to uncertain demand signals, global competition, and fluctuating commodity/energy prices.

Policy and regulatory uncertainty

Complex approval pathways, overlapping responsibilities, and shifting policy priorities create uncertainty for proponents.

Infrastructure gaps and constraints

Energy, water, transport and port/logistics infrastructure require significant upgrades to support emerging industries.

Specialist skills in short supply

Specialist technical and trade skills are in short supply, while competition for labour across sectors creates retention challenges.

Key enablers

Commercial certainty

Clear demand signals and long-term offtake arrangements can anchor investment.

Governance and regulatory certainty

Streamlined approvals and coordinated policies at federal, state, and local levels provide confidence.

Infrastructure and utilities access

Repurposing existing industrial assets and strategic new investment strengthen the Hunter's comparative advantage.

Workforce transition and R&D potential

A strong existing industrial base, transferable trade skills, and local research partnerships position the region to adapt and innovate.

Description

The Hunter region has strong foundations for industrial transition, but progress depends on overcoming barriers in commercial certainty, infrastructure, skills, and regulation. Growth across hydrogen, ammonia, defence, biofuels, and energy-from-waste requires reducing risk through clear demand signals, regulatory clarity, upgraded infrastructure, and aligned skills pipelines.

For hydrogen and ammonia, high costs, weak demand, and infrastructure gaps, particularly liquefaction, storage, pipelines, and water, have slowed momentum. Project withdrawals highlight the impact of subsidy uncertainty and planning delays. Early opportunities lie in decarbonising existing ammonia production, but scaling requires offtake contracts, shared infrastructure, and clear export policy.

In defence, the loss of Williamtown's priority precinct status has added planning uncertainty, while long contracting cycles, clearance delays, and regulatory complexity raise entry costs. Defence sustainment remains strong, anchored by BAE's F-35 program and national assets at Williamtown, Astra Aerolab, and Newcastle Port, but investment hinges on streamlined contracting, training expansion, and precinct upgrades.

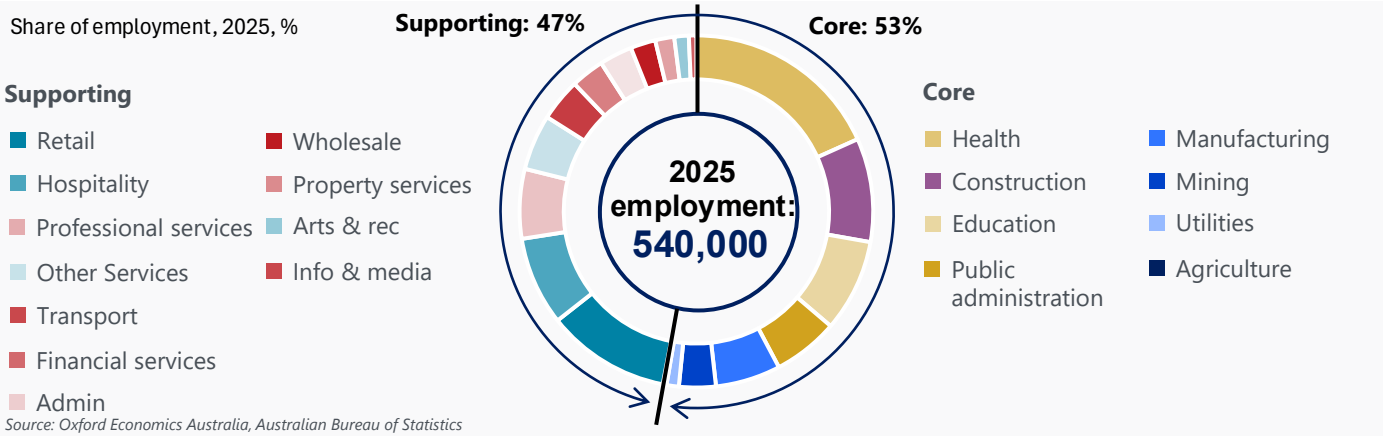
Biofuels and EfW face slow licensing, fragmented feedstock chains, and community concerns. Formalising Tomago as an EfW precinct, expanding tonnage allowances, clarifying waste rules, and carbon credit eligibility would cut risk. Co-location with biofuels and heavy industry can improve feedstock use and provide industrial by-products like heat and steam.

Region-wide, barriers include grid congestion, water security, skills shortages, and fragmented governance. Enablers include port access, industrial assets, transferable workforce, and strong research institutions. Policy signals such as hydrogen hubs, circular economy strategies, and defence prioritisation are building confidence. Yet without timely action on infrastructure and regulation, the Hunter risks losing investment to Queensland and Victoria. Clearer NSW alignment with national transition goals will be critical to securing the Hunter's leadership in clean energy and defence.

HUNTER REGION’S ECONOMIC OUTLOOK

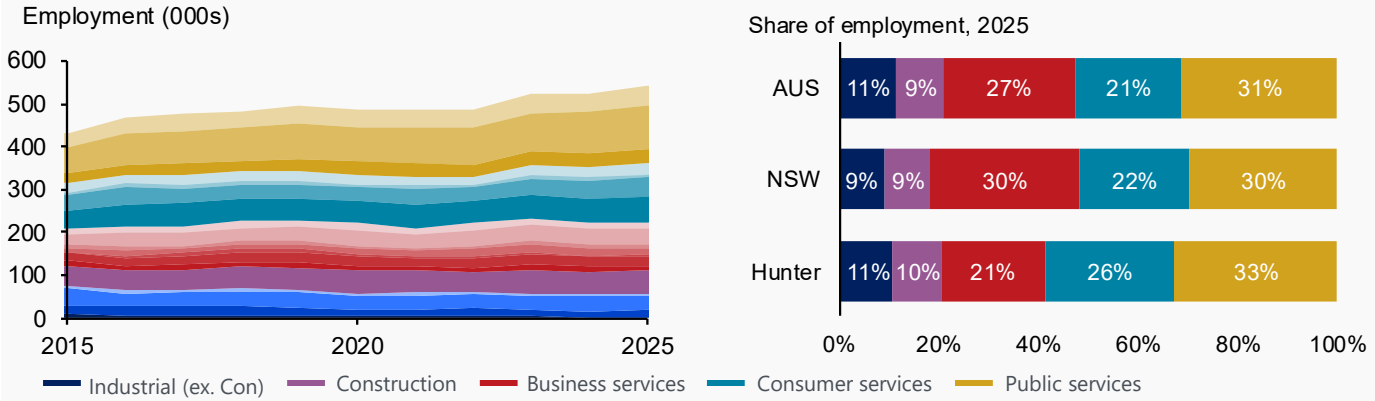
The Hunter region has been shifting away from industrial employment and toward public services for the last decade.

Hunter Region current employment makeup, 2025



Source: Oxford Economics Australia, Australian Bureau of Statistics

Hunter Region employment share and makeup relative to Australia in 2025



Source: Oxford Economics Australia, Australian Bureau of Statistics

Hunter region economic structure

Core* employment sectors represent 53% of employment in the Hunter region with supporting sectors, those interconnected with the core sectors, representing the remaining 47%.

Health, retail and construction are the largest employing industries in the Hunter region and have all increased in importance over the last decade. Health particularly has increased from 14% of the Hunter workforce to 18% in 2025, driven by increasing demand from the aging population and significant state government investment. Over the same period, manufacturing as a share of total employment has fallen from 10% to just 6% and mining from 4% to 3%, reflecting a trend away from high emitting sectors and the economy wide shift towards the service sector. Overall industrials (excl. con) share of employment has fallen by 7 percentage points from 18% to 11%, at the same time public services share has increased from 27% to 33%.

Key sub-industries supporting current employment include coal mining, construction services, public admin, preschool and school education, hospitals and social assistance services. Manufacturing has declined in total size but the mix of sub-industries remains diverse with food product, primary metal and machinery manufacturing each currently employing more than 3,000 workers.

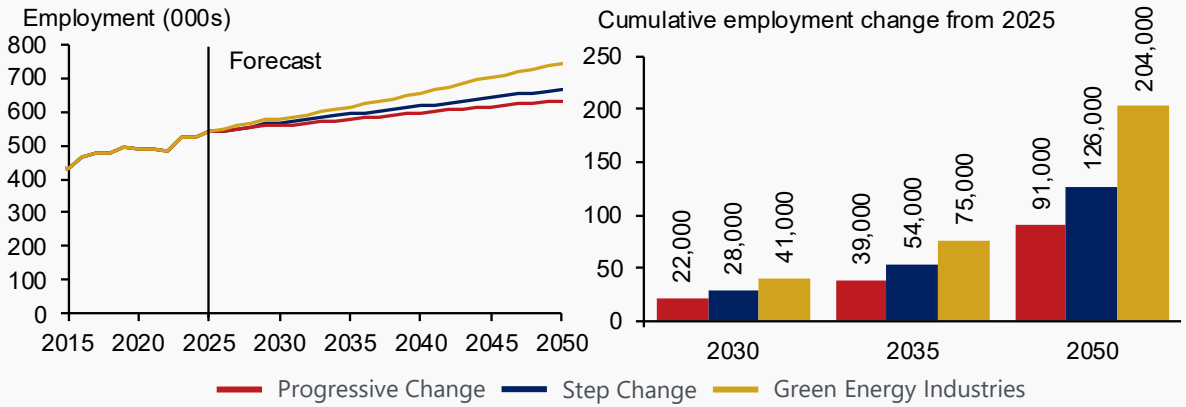
Consumer services and public services makes up a larger share of the Hunter workforce compared to the broader NSW and Australian labour force, driven by strong employment in retail trade and health. The Hunter region is also over four times more exposed to the mining industry compared to NSW as a whole. Business services makes up a significantly smaller proportion of employment in the Hunter, particularly professional services which makes up just 6% of the Hunter workforce compared to 10% for NSW and 9% for Australia.

**Core sectors refers to Mining, Agriculture, Construction, Manufacturing, Utilities, Health, Education and Public Admin.*
Public services includes Health, Education & Public Administration & Safety.
Consumer services includes Retail Trade, Accommodation & Food Services, Arts & Recreation and Other Services.

Business Services includes Wholesale Trade, Transport & Warehousing, Information & Media, Financial Services, Property Services, Professional Services and Administration Services.
Industrials excluding Construction includes Agriculture, Mining, Manufacturing & Electricity, Gas, Water & Waste Services.
***Note:** Employment figures are rounded to the nearest thousand.*

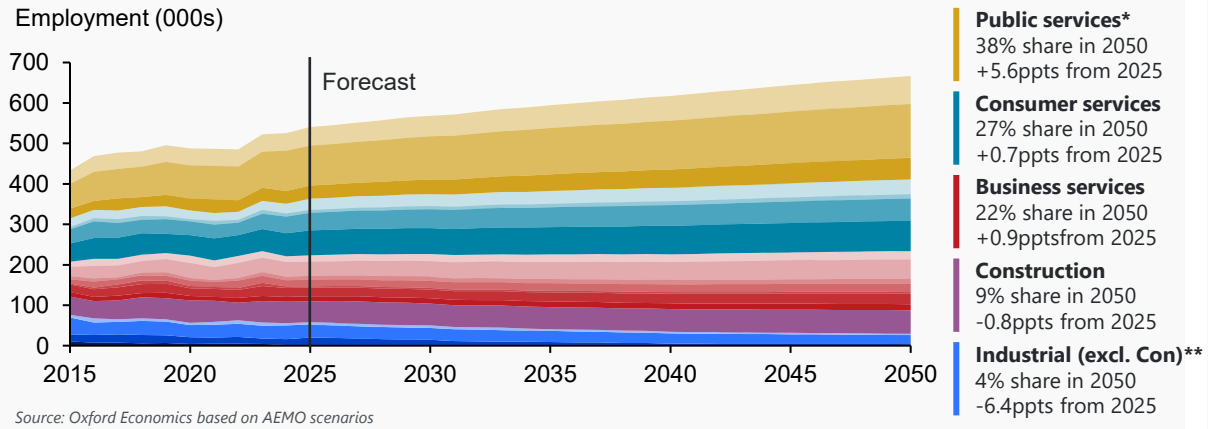
By 2035 the Hunter region's employment base will be larger, more service-oriented, and less dependent on traditional heavy industry.

Hunter region workforce outlook by scenario



Source: Oxford Economics based on AEMO scenarios

Hunter Region employment make-up under Step Change



Source: Oxford Economics based on AEMO scenarios

Public services includes Health, Education & Public Administration & Safety.
Business Services includes Wholesale Trade, Transport & Warehousing, Information & Media, Financial Services, Property Services, Professional Services and Administration Services.

Hunter region workforce outlook

The Hunter region's workforce is set to expand steadily over the next 25 years, but the pace and composition of that growth will vary depending on the transition pathway. This outlook does not include future industrial growth opportunities identified in the *Regional Investment Analysis* report.

Over the next 10 years across all scenarios, total employment is expected to grow. The Hunter workforce is expected to increase from 540,000 today to 580,000 under the Progressive Change scenario, 595,000 under the Step Change scenario, and to more than 615,000 under the more ambitious Green Energy Industries pathway by 2035. This translates to net employment gains of around 39,000 in Progressive Change, 54,000 in Step Change, and 75,000 in Green Energy Industries to 2035. Over this period, the unemployment rate is expected to mimic the wider Australian economy, slowly increasing off the current low base of 3.5% towards 5% by the end of the decade. Economic growth across scenarios is expected to follow a similar path to employment, with the shift away from the high value added mining industry offset by strong employment and productivity growth across the rest of the Hunter economy.

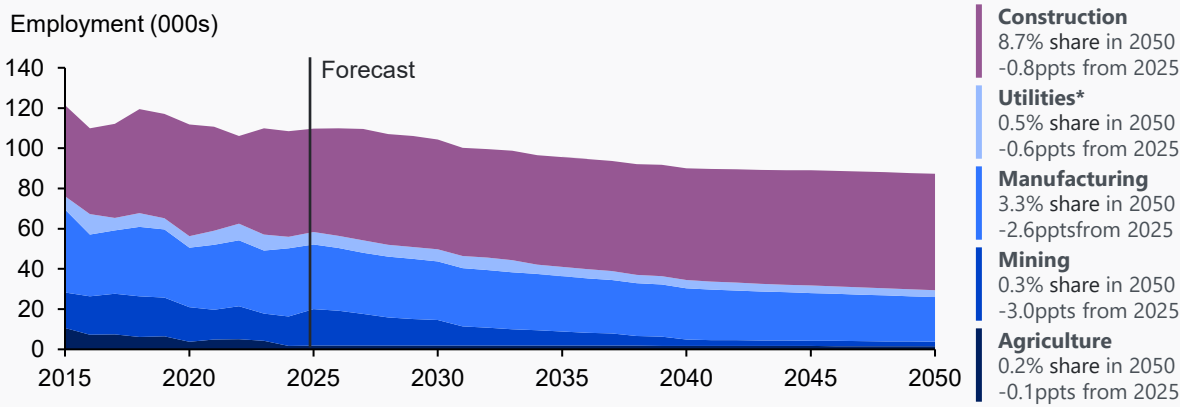
Beyond 2035, the impact of different economic futures on employment in the Hunter widens as demand for fossil fuels decline and investment in clean energy and emerging industries grows at different paces. By 2050, the structure of the Hunter's economy will have shifted noticeably. Industrial sectors excl. construction** share of employment is expected to continue to contract, with around half of this decline driven by mining. As global demand for coal and domestic demand from coal-powered power plants falls, the Hunter's mining and utilities workforce is expected to fall from roughly 11% of jobs today to 4% by 2050. Construction remains a major industrial employer, holding close to 9% of total jobs in 2035 under Step Change, fueled by ongoing infrastructure, housing and renewable energy developments. While the industrial jobs change in share of the labour market is similar across all three scenarios, the number of industrial jobs is much higher under *Step Change* and *Green Energy Industries*. Public services increase their share from around one-third of the workforce in 2025 to about 36% by 2035, reflecting the influence of population ageing, higher participation in education, and elevated government spending on social programs.

Overall, Oxford Economics' forecasts, based on AEMO's transition scenarios, show that by 2035 the Hunter region's employment base will be larger, more service-oriented, and less dependent on traditional heavy industry. The scale and pace of this transformation - and the opportunities it brings - will depend on how rapidly clean energy industries are established and scaled, and on the region's ability to prepare its workforce for the demands of a changing economy.

Consumer services includes Retail Trade, Accommodation & Food Services, Arts & Recreation and Other Services.
***Industrials excluding Construction includes Agriculture, Mining, Manufacturing & Electricity, Gas, Water & Waste Services.*
***Note:** Employment figures are rounded to the nearest thousand.*

Historical reductions in the industrial workforce will continue, although at a slower rate, with upside potential in advanced manufacturing and utilities.

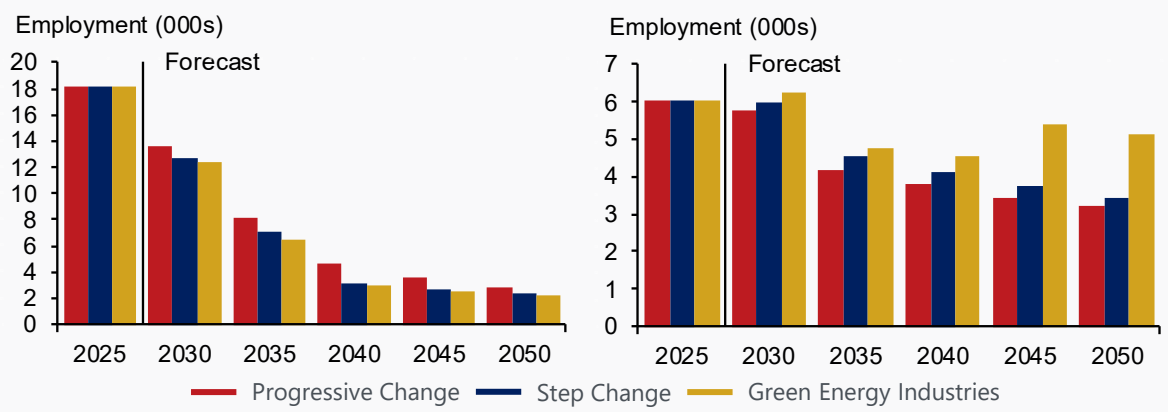
Industries in decline under Step Change



Source: Oxford Economics based on AEMO scenarios

Mining workforce outlook

Utilities workforce outlook



Source: Oxford Economics based on AEMO scenarios

Utilities includes electricity and gas supply activities as well as water and waste services.
Note: *Employment figures are rounded to the nearest thousand.*

Industrial workforce outlook

The industrial workforce has been reducing as a share of the Hunter economy over the past decade, and this is expected to continue with declines in mining employment driving the outlook.

There are 22 coal mines located in the Hunter region, employing an estimated 15,000 people from the Hunter region in 2025. Most of these are export-oriented, with Mount Arthur the largest mine closure expected, currently employing 2,000 people and expected to close in 2030. Myuna and Chain Valley mines supply the Eraring and Vales Point coal-fired power plants respectively. The closure of these mines are expected to coincide with the related power plant closures.

All currently operational coal mines are expected to close by 2050 under the Step Change and Green Energy Industries scenarios, driven by coal power plant closures and the global decline in coal demand. Under the Progressive Change scenario, Mount Pleasant and Hunter Valley North and South mines are assumed to remain open, having sufficient economic and technically accessible resources to continue production. However, their production is still expected to decline, servicing a smaller pool of global demand. Over the next decade, half of the 22 currently operating mines are expected to close under the Step Change and Green Energy Industries scenarios driving a decline in coal mining employment.

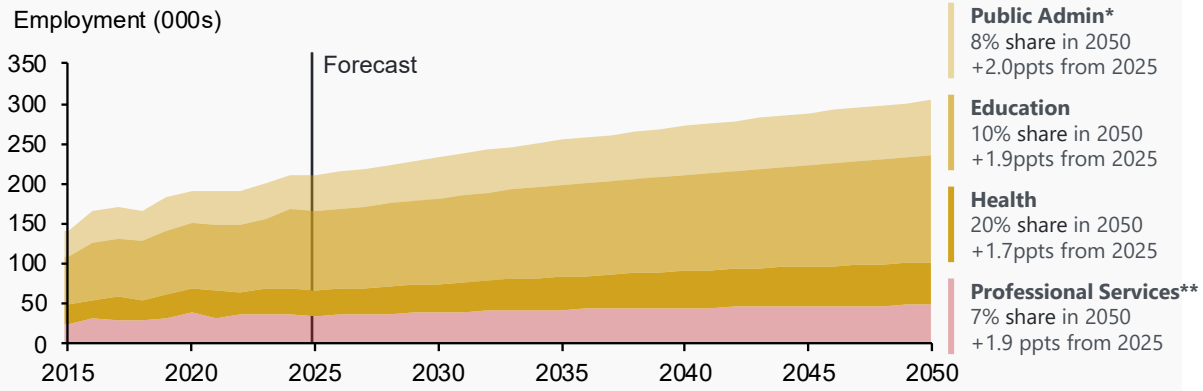
The Eraring (assumed to close in 2027), Bayswater (2033) and Vales Point (2033) coal-fired power plants alongside the Hunter Economic Zone – Peaking Power Station (2036) are expected to close over the next decade. This drop in employment will be partially offset by a significant pipeline of renewables with the Hunter Region within the Hunter-Central Coast Renewable Energy Zone (REZ). The combined 1,680 MW of wind energy at the Liverpool Range (2026) and Bowmans Creek (2028) wind farms are the largest projects over the near-term but these assets typically employ less people per MW than coal-fired plants. The Kurri Kurri Gas project, currently in commissioning phase, is expected to support another 100 jobs in the region.

Offshore wind developments in the Hunter Coast REZ represent an opportunity for the industrial workforce. These projects are relatively speculative compared to other types of renewables. The 2024 ISP from AEMO, the most up to date system plan that long-term assumptions are aligned to, suggests no offshore wind is expected under any of the scenarios. To balance this view with the currently proposed offshore wind projects, the Novocastrian and the Hunter Central Coast offshore wind projects are assumed to go ahead under the Green Energy Industries scenario.

While industrial employment is expected to decline under the baseline outlook, there is potential upside in the hydrogen and ammonia and biofuels sectors if supported by sufficient investment. Analysis of these sectors in explored in the '*Regional Investment Analysis – Hunter*' report.

The Hunter is expected to experience strong growth in health & education, as well as a potential for growth in defence and professional services.

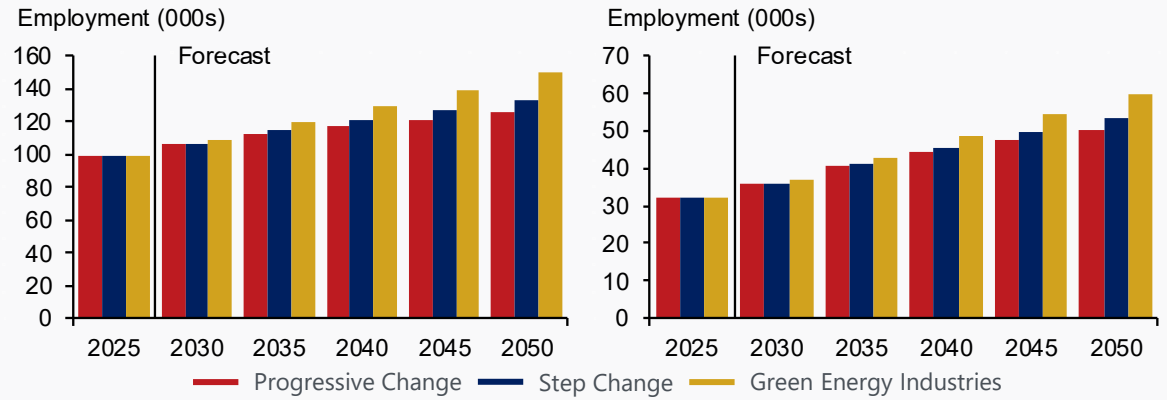
Growth industries under Step Change



Source: Oxford Economics based on AEMO scenarios

Health workforce outlook

Public Admin* workforce outlook



Source: Oxford Economics based on AEMO scenarios

Growth industries workforce outlook

The Hunter's industrial structure is shifting toward service-based, knowledge-intensive sectors. By 2050, public administration, education, health, and professional services will all expand their share of the Hunter's workforce. Together, they will increase their workforce from around 35% today to over 46% of the Hunter's jobs by 2050. Strong growth in these sectors will offset the impacts of fossil fuel industry decline to drive overall growth in the Hunter's workforce. Roles in these growth sectors generally require higher-order competencies across most skill types, as well as a larger footprint of bachelor level degrees.

The health sector is expected to add the largest number of jobs to the Hunter Region - 16,000 additional jobs over the next 10 years – driving its workforce share to 20% by 2035. Growth will be fueled by the Hunter's ageing population and the expansion of aged care and health infrastructure - notably the John Hunter Health and Innovation Precinct and the recently completed $470 million Maitland Hospital.

Over the next 10 years, education (+10,000), public administration* (+9,000) and professional services** (+8,000) contribute a similar number of jobs to the Hunter region. However by 2050, growth in education (+23,000) and public administration (+21,000) outstrip growth in the professional services (+14,000) workforce as demand from regional industrial activity falls behind government investment in public services. Professional services, which includes research, engineering, computer systems, law and accounting among other sub-industries, is also expected to increase its share of employment under the central Step Change scenario, reflecting the Hunter's growing technical and skills base.

Defence-related public administration* is a potential upside opportunity, supported by existing assets in the Williamtown Defence cluster, the Astra Aerolab aerospace precinct, and Lone Pine Barracks. These facilities underpin an established defence presence in the region, with current activities focused on sustainment, logistics, and training. Upgrades to base infrastructure and the development of new production and testing facilities could increase the scope of work undertaken locally and stimulate supporting industries like professional services and manufacturing.

**The Public Administration industry includes government legislative, executive and judicial activities as well as military defence.*
*** Professional Services includes scientific research, architecture, engineering, computer systems design, law, accountancy, advertising, market research, management and other consultancy, veterinary science and professional photography.*
***Note:** Employment figures are rounded to the nearest thousand.*

WORKFORCE TRANSITON PATHWAYS

We have estimated 8,620 fossil fuel workers are likely to undertake a workforce transition by 2035 based on the current make up of the workforce and changes to demand over time.

Method for quantifying the workforce transition need

11,200 fewer fossil fuel roles

Under the *Step Change Scenario* the expected loss of fossil fuel roles is 11,200 due to closures in fossil fuel generators and mines.

2,580 workers likely to retire

Around a quarter of the impacted fossil fuel workforce is aged 55+. We assume that these workers exit the labour market in the 10 years to 2035, reducing the size of the workforce likely to undertake workforce transitions to 8,620.

8,620 workers likely to undertake a workforce transition

Most of the workers likely to undergo a transition into a new role are in key specialist roles (73%), followed by highly transferable roles (20%) and a small number of other specialist roles (7%).

Key specialist roles - 73%

Largest 10 roles with skills highly relevant to fossil fuel activities including drillers, miners & shot firers, metal fitters & machinists, electricians, other building & engineering technicians, truck drivers, production managers, structural steel & welding trades workers, mining engineers, industrial, mechanical & production engineers, and earthmoving plant operators

Other specialist roles - 7%

Other roles with skills highly relevant to fossil fuel activities

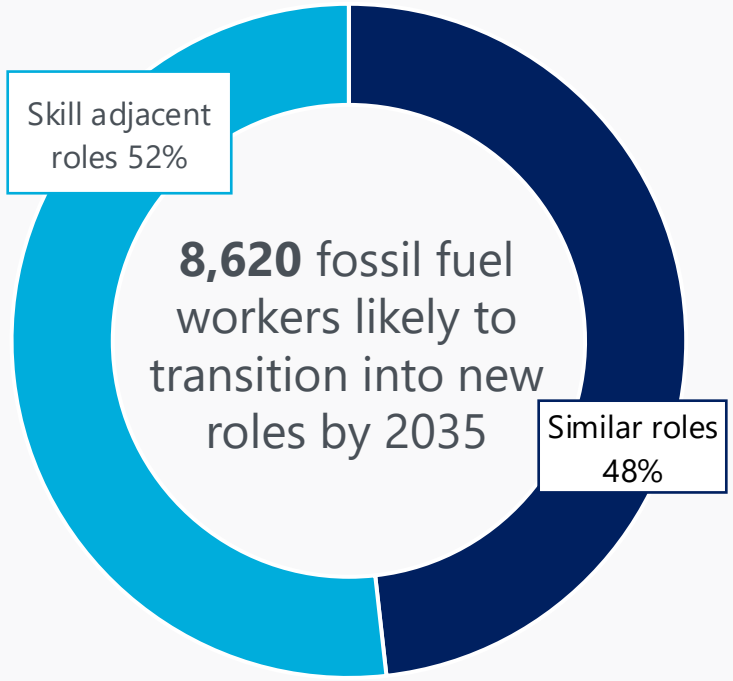
Highly transferable roles - 20%

Back-office functions and transferable on-site functions

Source: Oxford Economics based on AEMO Step Chance scenario

Fossil fuel workers that are likely to transition into new roles have the potential to find both similar and skill adjacent role opportunities.

Fossil fuel workforce transition pathways



Source: Oxford Economics

Headline analysis of transition pathways

Similar roles present a significant opportunity for workforce transition, with around 48% of fossil fuel workers requiring transition potentially able to pursue this pathway. This pathway is predominantly suitable for highly transferable roles due to the industry agnostic nature of their skillset. Roles in finance and human resource functions are likely to be fully absorbed into occupations outside the fossil fuel industry. Many key fossil fuel roles could also utilise this pathway, with electricians, truck drivers, industrial, mechanical & production engineers, and earthmoving plant operators also able to be fully absorbed into roles outside the fossil fuel industry.

Skill adjacent roles present a slightly larger pathway for workforce transitions. Around 52% of the workforce are likely to require support in pursuing this pathway, particularly in key fossil fuel roles where the specialised nature of their work can limit similar role opportunities. Many of the opportunities require reskilling into different specialist skills areas and upskilling in generalist skills such as digital engagement, planning & organising and teamwork.

Growth roles are not a critical pathway for fossil fuel workforce transitions, with similar and skill adjacent roles potentially able to absorb the transitioning workforce. However, the fossil fuel workforce will need to compete with new entrants to the workforce which may impact their ability to move into similar and skill adjacent roles. Potential pathways into high growth roles will also be important to support the workforce transition.

To tap into high growth opportunities fossil fuel workers will need to reskill into areas that are significantly removed from their current area of specialization. Under a *Step Change* scenario, there are some opportunities in a broad set of engineering roles related to professional services. High growth roles are concentrated in high skill health and education roles, with lower skill roles in administrative support and hospitality roles. Priority investment areas for the region as identified in the ***Regional Investment Analysis*** also present important growth opportunities for fossil fuel workers, as these industries are well aligned to the fossil fuel workforce skillset.

Regional conditions and demographic considerations present limited barriers to workforce transition pathways, but there are some role-specific barriers

Workforce barrier analysis

Regional barriers to workforce transition for fossil fuel workers appear to be relatively limited, with sufficient capacity to absorb displaced workers and enable their mobility. There are numerous opportunities for these workers to transition into new roles, particularly in occupations where skills are highly transferable. However, some groups, namely drillers, miners & shot firers, other building & engineering technicians and mining engineers, are likely to face greater challenges. These roles have few similar alternatives and face weak demand outside the fossil fuel sector, making it difficult for these workers to undertake transitions into new roles. The fossil fuel workforce is willing to overcome geographic mobility barriers, as these workers typically commute longer distances than the broader workforce average. However, willingness to travel to new jobs will depend on the nature of the work. Furthermore, the region is well equipped with training facilities, which can support workers who require upskilling or reskilling as part of their career transition.

Role-specific barriers present more significant challenges, particularly relating to the match between qualification requirements and income expectations. The fossil fuel workforce exhibit a varied skill profile, with some groups possessing sufficient foundational and generalist skills set to support a smooth transition, while others are likely to need substantial reskilling. Engineering and managerial workers are usually highly skilled, whereas trades workers and machine operators generally score lower in skill assessment and hold lower formal qualifications compared to the broader workforce average. This limits the direct transferability of their skills to other sectors without targeted training. Furthermore, the fossil fuel workforce typically earn higher wages, largely due to their specialised skills and industry productivity. The income disparity is a potential barrier to transition pathways as many alternative roles may offer lower wages. There is also some risks of competition between displaced fossil fuel workforce and new entrants into the sector, which may further limit the already constrained opportunities. However, the current number of graduates entering the field remains moderate, suggesting this pressure is manageable in the short term. On a more positive note, employment type is unlikely to pose a barrier, with most of fossil fuel workers employed full-time, aligning with the workforce average.

Demographic barriers to workforce movements are minimal. The fossil fuel workforce is unlikely to experience demographic challenges when transitioning into other roles and industries. Except for other building & engineering technicians and production managers who are more likely to fall into older age groups, most fossil fuel workers are within the prime working age, supporting their capacity to reskill and adapt. Additionally, the share of workers requiring assistance are relatively low, suggesting limited need for targeted support measures during transition. There is a higher share of First Nations people in the workforce which may require targeted support measures specific to this cohort.

Workforce barrier assessment by barrier type

Barrier type		Barrier assessment
Regional	Job availability	Low
	Diversification of roles	Medium
	Workforce willingness to commute	Low
	Training availability	Low
Role	Skills*	Medium
	Qualifications*	Medium
	New graduates supply**	Medium
	Wages	High
	Employment type	Low
Demographic	Age	Low
	First Nations	High
	Disability	Low

Source: Oxford Economics.

**Ranking compares the fossil fuel workforce skills and qualifications to the broader workforce.*
***Based on SA4 and OE workforce supply modelling.*

Diversification and retraining are currently the key levers to overcoming workforce transition barriers, with potential for redeployment to take a bigger role.

Barriers

Diversification of roles

- Declining employment demand for fossil fuel workers is likely to be exacerbated by falling employment in the wider industrial sector in the Hunter region, where many similar and skill-adjacent roles exist in higher concentrations.
- Several key specialist roles are highly specialised to mining, and there is a highly limited number of roles they can transfer into within their current occupation and into similar occupations within the region.
- Growth in skill adjacent roles for the fossil fuel workforce more broadly is set to be soft to 2035 as manufacturing and utility roles, which contain high concentrations of skill adjacent roles, also come under pressure from falling demand for employment in industrial roles.

Qualifications & skills

- Declining industrial employment* will potentially hamper the ability of fossil fuel workers to utilise their current qualifications and skills and exacerbate financial pressure if they move into lower-skilled roles not well aligned with their current skillset.
- Fossil fuel workers have marginally lower education levels on average, with workforce education primarily centred around VET and on-the-job training. Despite having lower levels of formal education, they currently receive above-average wages.
- Workers transitioning, being redeployed, reskilling or retraining, may not find comparable wages due to the high levels of compensation present in the fossil fuel industry.

Assessment of current levers

Across all levels of government, diversification and retraining have been the primary levers relied upon by current policy to prepare fossil fuel regions for the workforce transition.

Diversification efforts are primarily directed at the state and local level with the proposed *Future Jobs & Investment Authority*, funded through the *Royalties for Rejuvenation Fund*, empowering coal communities to shape their workforce strategies. In the Hunter, diversification strategies have identified clean energy and advanced manufacturing as industries diversification should target. Policies, including the *Electricity Infrastructure Roadmap,* ensure renewable energy projects in the Hunter–Central Coast Renewable Energy Zone generate local jobs, while the *Hunter Net Zero Manufacturing Centre of Excellence*, *Hydrogen Strategy*, and *Clean Manufacturing Precincts* deliver new training pathways linked to advanced manufacturing and hydrogen.

Retraining efforts have been further supported by the Australian Government with *Fee-Free TAFE*, the *Clean Energy Training Investment Fund*, and the *New Energy Apprenticeships* stream of the *Key Apprenticeship Program*, which target critical skills in identified industries of interest for the region, as well as broader national skill priorities. However, there is a risk if diversification policies do not achieve their stated outcomes; linked retraining could increase competition in key occupations currently forecast to decline in demand.

The Australian Government supports the Hunter through the *Energy Industry Jobs Plan (EIJP),* provides a framework to support workers affected by power station closures through which employers must offer transition assistance. This will be complemented by the *Regional Workforce Transition Plans (RWTP),* which will support workers, their families and communities in regions that are, or will be, significantly impacted by the transition to a net-zero emissions economy.

Additional support to address barriers

Diversification and retraining are well supported by current policy, with significant investment in attracting new industries to the Hunter and expanding training pathways into clean energy, advanced manufacturing, hydrogen and other national employment priorities. In contrast, redeployment has received less policy attention, leaving fewer structured opportunities for workers to transition into equivalent roles.

Currently, the *EIJP* provides a framework which may oblige employers to provide redeployment support to workers at closing power stations in the region as well as dependent employers who are likely to cease a substantial part of their operations due to the closure of the power station. The closure of export coal mines is not covered under EIJP legislation. This program is currently under review, including scope of coverage.

Workers in the Hunter affected by the transition to Net Zero will be supported by the *RWTP*. Support provided by the *RWTPs* is not done on a site-by-site basis but is instead provided to the region at large. The majority of fossil fuel employment in the Hunter is in coal mining, with most coal exported.

An opportunity exists for all levels of government to explore options to prepare export coal mine workers for the transition, both through new and the expansion of existing programs. This would need to consider current and planned supports across government, as well as budgetary implications. A review of the effectiveness of existing transition supports and their applicability to export coal mine closures would be beneficial to inform future government decision-making.

** Industrial employment is made up of employment in agriculture, mining, manufacturing, utilities and construction*

TECHNICAL APPENDIX

ECONOMIC FORECASTING METHODOLOGY

The forecasts in this report align to AEMO's scenarios which capture key uncertainties and material drivers of a range of possible futures.

The scenarios presented in this report are grounded in the Australian Energy Market Operator's (AEMO) *Draft 2025 Inputs, Assumptions and Scenarios Report* (IASR)[2], which is currently in its final consultation phase.

The three scenarios – *Progressive Change, Step Change and Green Energy Industries* - are designed to encompass a broad spectrum of plausible futures for Australia's energy sector, capturing key uncertainties and material drivers in an internally consistent manner. They reflect the policies that Australian governments have committed to for transitioning the economy to net zero emissions by 2050. Each scenario delineates a distinct pace of transition to net zero, influenced by global, national, and sectoral factors, leading to variations in future energy system requirements while aligning with Australia's emissions reduction policy objectives. The scenarios consider the growth trajectory of the Australian economy, including population trends and economic activities across industrial, commercial, manufacturing, mining, transportation sectors, and emerging commercial loads such as data centres. They also identify opportunities for emerging energy technologies that could impact Australia's decarbonisation pathway and export economy, including hydrogen production, green iron and ammonia products, and biomethane.

AEMO's scenarios are aligned with the International Energy Agency's (IEA) 2024 World Energy Outlook (WEO) scenarios to anchor them to global narratives on developments and commitments to the Paris Agreement. This alignment ensures consistency with global economic settings and temperature goals, providing context for Australia's share in meeting various temperature outcomes and guiding multi-sectoral modelling regarding fossil fuel export projections, energy efficiency, and electrification uptake rates and limits across scenarios.

AEMO has engaged in extensive stakeholder consultation to develop these scenarios, incorporating feedback from a diverse range of sectors to ensure the scenarios are robust and reflective of various perspectives. The final 2025 IASR, incorporating insights from this consultation process, was finalised during the preparation of this research report, however as analysis was already underway this report utilises the draft scenarios.

An overview of the high-level narrative for each scenario is provided below and detailed assumptions are included in the technical appendix.

Low scenario - Progressive Change

- Low economic demand and industrial transformation
- The transition proceeds more slowly and reactively under current policy settings, reflecting only existing federal and state commitments without major new initiatives.
- Fossil fuel industries decline due to market and technological pressures rather than policy direction. There is limited economic diversification or new clean industries in regional areas, and minimal development of emerging fuels like hydrogen or biomethane.

Central scenario - Step Change

- Moderate economic demand and industrial transformation reflecting long term average trends
- Australia follows a coordinated and firm transition to net zero emissions by 2050, with electricity playing a central role in decarbonisation and significant deployment of renewable energy, storage, and electrification across sectors.
- Fossil fuel industries decline in a planned manner, with regional opportunities emerging through transmission expansion, Renewable Energy Zones (REZs), and moderate development of hydrogen to support industry and domestic use.

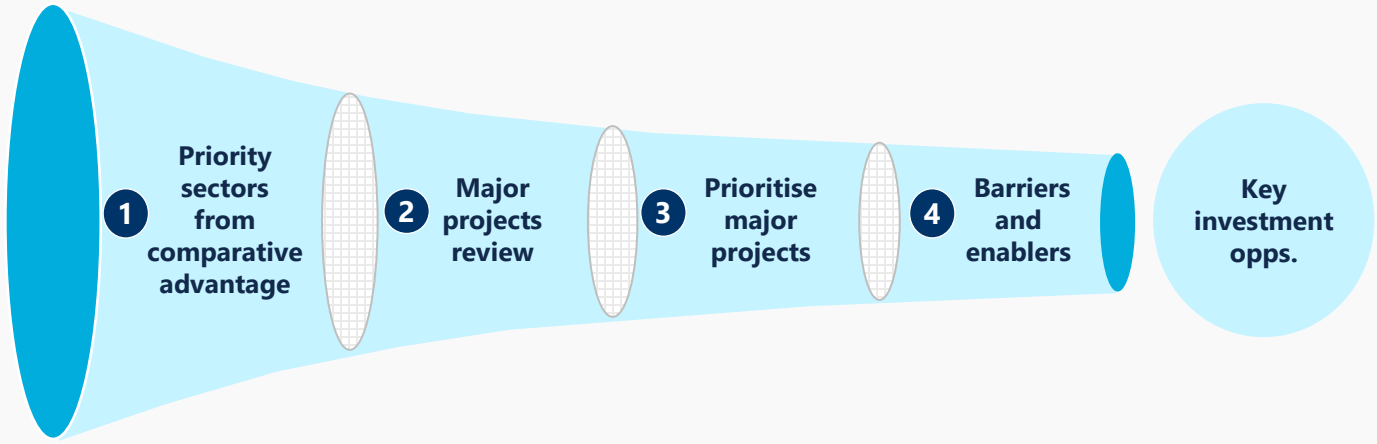
High scenario - Green Energy Industries

- High economic demand and industrial transformation.
- Australia undergoes a rapid and coordinated transformation to become a clean energy economy, underpinned by strong global and domestic climate ambition aligned with a 1.5°C pathway.
- Large-scale renewable energy and hydrogen production are co-located in regional Renewable Energy Zones, supported by major transmission investment and value-added clean exports (such as green iron and ammonia), though this shift brings significant disruption for fossil fuel communities.

INVESTMENT ANALYSIS METHODOLOGY

A four step process was used for identifying and prioritising opportunities.

Investment opportunities methodology



Output

Priority sectors
- Renewable Energy and Storage
- Low-Emissions Manufacturing and Circular Economy
- CCUS
- Advanced Agribusiness and Food

20 opportunities identified by
- Value
- Likelihood of realisation
- Job creation potential

Top 3 opportunities ranked by
- Economic impact
- Jobs
- Comparative advantage
- Lead times
- Policy alignment

Top 3 opportunities
- Barriers
- Enablers
- Constraints
- Key actions to unlock investment

Key investment opportunities for NZEA to focus on and prioritise in each region

Description

The methodology for identifying investment opportunities in the Hunter builds on the region's comparative advantages while aligning with national net zero objectives. It begins by identifying priority sectors where the Hunter has structural strengths and growth potential,. These sectors reflect both the region's established industrial base and its capacity to transition into globally competitive industries.

The next step is a review of the Hunter's major projects pipeline to develop a long list of 20 opportunities. Each is assessed against economic value, likelihood of realisation, and job creation potential, ensuring the pipeline captures projects that can deliver economic transformation and are commercially and technically feasible.

This is then narrowed to the top three opportunities with the greatest impact. Selection is based on economic contribution, alignment with the Hunter's comparative advantage, job creation potential, lead times, and policy consistency. This ensures the region focuses on opportunities that are both ambitious and achievable.

Finally, the methodology considers the barriers and enablers shaping delivery. These include demand signals and offtake agreements, access to enabling infrastructure such as energy, water, and ports, policy and regulatory clarity, and availability of specialist workforce skills. Understanding these factors highlights the key actions required to unlock investment and accelerate delivery.

The outcome is a focused set of three priority opportunities for the Hunter, supported by evidence of their economic potential, enabling requirements, and policy alignment. These opportunities form the basis for targeted investment attraction and coordinated delivery across government, industry, and the community.

We have prioritised project types based on multi-domain criteria, tailored to the specific conditions of the Hunter region.

Comparative advantage alignment

Denoted by a qualitatively derived comparative advantage score out of 5:

1. No alignment with regional strengths or capabilities
2. Minimal alignment; limited local advantages
3. Moderate alignment with some key strengths (e.g. workforce or land)
4. Strong alignment with multiple comparative advantages
5. Excellent alignment; leverages core regional assets and priorities

Project lead times*

Based on a region-specific rank of project types by expected lead time (defined as the time between project inception and construction commencement):

Short Term: Lead time of less than 3 years

Medium Term: Lead time of between 3 and 5 years

Long Term: Lead time of greater than 5 years

Typical job contributions

Based on a quintile rank of project types by expected job-year contribution within 10 years of construction starting:

1. Fewer than 600 job years; short-term or low-quality employment
2. 600–1,600 job years; limited regional employment impact
3. 1,600–2,800 job years; moderate and/or specialised workforce impact
4. 2,800–4,400 jobs; strong job creation with varied roles
5. 4,400+ jobs; transformative workforce impact across skill levels

Government policy alignment

Derived from a review of government documents, as well as a review of the Major Projects Listing.

1. Not mentioned at local, state or commonwealth level; no relevant projects identified in region
2. Mentioned once at a local, state or commonwealth level; or projects identified in region
3. Mentioned twice at a local, state or commonwealth level; or projects identified in region
4. Mentioned three times at a local, state or commonwealth level; or projects identified in region
5. Mentioned at local, state and commonwealth level; and projects identified in region.

Methodology

Project types were prioritised using an equally weighted average of three index scores: comparative advantage, job contribution, and government policy alignment. Each index was scored out of 5 using a tailored methodology. The final score provides a comparative view across project types for the Hunter region.

Comparative advantage was assessed qualitatively, based on factors such as resource endowment, industrial base, infrastructure readiness, workforce availability, and regulatory context. Given the variability across project types, no single indicator set was universally applicable. The assessment relied on structured expert judgement, informed by the most relevant metrics for each case.

Job contribution scores were based on estimated job years, combining construction and ongoing employment over a 10-year operational period. Estimates were drawn from project-level data, supplemented with desktop research where necessary. Final scores were assigned by ranking each project type into quintiles.

Policy alignment scores reflected the presence of each project type in local, state, and federal policy documents, and in the Hunter's major project pipeline.

A separate **lead time analysis** was conducted to support the evidence base. Lead times (from inception to construction) were estimated using proprietary modelling for energy projects and desktop research for others. While not included in scoring, these estimates informed comparative advantage assessments and delivery timelines.

**Note that lead times are not considered when deriving a project type's rating or subsequent prioritisation. Details and categorisation are retained here for illustrative purposes.*

WORKFORCE TRANSITION METHODOLOGY

There are four pathways that fossil fuel workers can take as they transition to other roles in the Hunter economy.

Transition pathway	Similar roles	Skill adjacent roles	Growth roles	Workforce exits
	Similar roles are those that are the same or nearly identical to other roles within the regional workforce.	Skill adjacent roles are roles where qualifications and/or skills have similarities to other roles within the regional workforce.	Growth roles are those with strong demand in the region where specialist skills and qualifications are not well aligned to fossil fuel workers' skill sets.	A proportion of fossil fuel workers will continue to retire each year, exiting the workforce naturally as they enter retirement.
Support measures	**Transition support** will enable workers to identify the types of roles they are suitable for and the industries these roles are often in. This support often takes the form of employment services or financial assistance. Supporting workers into equivalent roles where their qualifications and skills are aligned should be prioritized as this pathways has the lowest investment requirement. Emphasis should be placed on growing and stable industries to provide longer-term role security for transitioning workers.	Supporting workers to identify and undertake **reskilling and upskilling** opportunities that align with current skills and qualifications will enable workers to transition to a skill adjacent role. Minimal training is needed to bridge the gap between a worker's current role and an identified skill adjacent role which can reduce pressure on the education system. Reskilling & upskilling should focus on pathways that minimise time out of employment and educational resources needed, while offering access to stable employment that leverages workers' existing skills and experience.	**Retraining** pathways should highlight qualifications that lead to roles in growing or stable industries to support long-term job security and living standards for at-risk workers. Significant training will be needed to retrain at-risk roles requiring investment from the worker, their employer and the region's education system. There are two key components of retraining support: the provision of training through educational pathways, and support to enable at-risk individuals to identify new employment opportunities.	Workers exiting the workforce due to retirement will not require workforce transition support. In some cases, these workers may need financial advice to support their retirement decisions and planning*.
Additional considerations	Regional demand will determine how many workers can access transition support. Where a surplus of similar roles exists, prioritisation should be given to reskilling & upskilling over retraining.	Where workforce supply exceeds demand for workers in skill-adjacent roles, retraining may be required.	Retraining will also be required where there is a surplus of workers with similar and skill-adjacent roles.	Consideration should be given to the types of roles that tend to have older age cohorts and how this will impact workforce support pathways.

Notes: The workforce transition methodology appendix presents a decision tree outlining how fossil fuel workers can be assessed to ensure they receive the most appropriate employment support for their transition.
** A review of retirement support policies and requirements is outside the scope of this project*

Identifying appropriate transition pathways draws on three sources of information.

Skillsets demanded by the workforce

Skills analysis will identify transition pathways by highlighting viable alternative occupation pathways for fossil fuel workers. Viable pathways are defined as pathways where an occupation's **specialist, generalist** and **foundational** skills are equivalent to or greater than another occupation's skills.

Specialist skills

- Minimum education requirements are based on the Australian Qualifications Framework (AQF) level.
- The field of education is based on the most common field by industry occupation pair.

Generalist

- Are classified as a set of the required proficiency levels in core skills focused on generalist thinking and work-based learning experiences.

Foundational skills

- Are the basis upon which all other skills are built and are common across all occupations. Generalist skills (e.g. reading and numeracy).

Qualifications held within roles

Analysis of identified viable job pathways will be complemented with an assessment of the level and fields of education (**specialist skills**) held by fossil fuel workers.

Level of education (LOE)

- Data on the level of education that fossil fuel workers possess, e.g. Census data on highest educational attainment, will be analysed to confirm alignment with occupations' minimum education requirements.
- Seek data will be used to confirm the LOE that viable job pathways typically ask for, to determine if there are deviations in minimum educational requirements and actual education requirements demanded by employers.

Field of education (FOE)

- Analysis will be undertaken on the distribution of FOE by industry occupation pairs using the Census to understand the implications for viable job pathways on workers who have equivalent industry occupation pairings but a different FOE.

Historic movement patterns

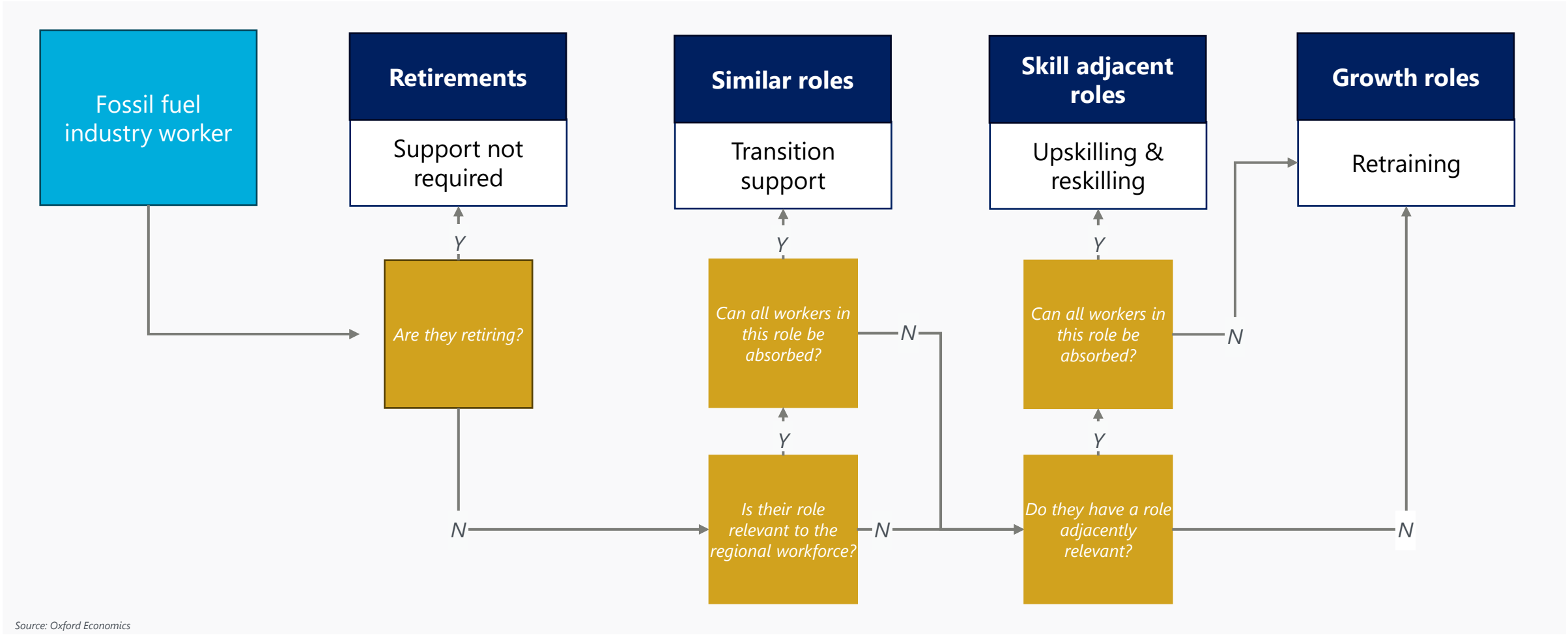
To corroborate that transition pathways are appropriate and viable for fossil fuel workers, Oxford Economics will undertake an analysis of historic movements of fossil fuel workers out of industry.

Historic movements of fossil fuel workers

- Seek data will be used to identify the known pathways by occupation industry pairs that fossil fuel workers have moved into successfully in the past and the propensity for them to do so.
- Historical movements will be tested against occupation industry pair transition pathways identified in the skillsets and qualifications analysis.
- Where viable job pathways have been determined based on our skills framework, and an analysis of actual qualifications held by fossil fuel workers, but there is limited evidence of historic job movements analysis of potential barriers limiting these pathways will be undertaken.

Identifying the workforce transition pathway that fossil fuel workers are most likely to need is based on a decision tree framework.

Fossil fuel worker, workforce transition pathway decision tree



Source: Oxford Economics

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