



CLEAN ENERGY PRECINCT

ENABLING THE PORT OF THE FUTURE IN NEWCASTLE

As Australia's Deepwater Global Gateway, Port of Newcastle has an important role ensuring Australia is a major global player in hydrogen production and exports by 2030.

The Hunter Region has been identified as a priority hydrogen hub location by both the NSW and Australian Governments. The NSW Government's Hunter Regional Plan 2036 identifies our Port as a global gateway and catalyst for growth and diversification of trade.

Buoyed by existing capability, future potential, strong partnerships and a \$100-million Commonwealth Government investment, Port of Newcastle is best positioned to establish a dedicated Clean Energy Precinct with common use, open access and shared infrastructure to drive decarbonisation, propel diversification, create new low carbon job pathways, capture export opportunities and support Australia's clean energy economy and our Region's future prosperity.

Port of Newcastle: Australia's Deepwater Global Gateway

Port of Newcastle is more than just a port; it exists to build Australia's prosperity with responsible, integrated and innovative supply chain solutions. With trade worth about \$37-billion to the national economy each year, Port of Newcastle enables Australian businesses to successfully compete in international markets.

The Port currently handles over 25 different types of trade, 4697 ship movements and 166-million tonnes of cargo annually. With a deepwater shipping channel operating at 50% of its capacity, significant Port land available and enviable access to national rail and road infrastructure, Port of Newcastle is positioned to further underpin the future prosperity of the Hunter, NSW and Australia.

As custodians of the Region's critical asset, Port of Newcastle is diversifying its trade as it strives to create a safe, sustainable and environmentally and socially responsible future. Our last two years have seen the highest diversified trade volumes recorded in 25 years.

As Australia's deepwater global gateway, and the world's largest coal export port, we have set a clear diversification strategy underpinned by three key pillars; our Deepwater Container Terminal, Environmental, Social, Governance (ESG) commitments, and the Clean Energy Precinct.

Our Clean Energy Precinct pillar will position Newcastle as a leading hub for all traditional and future clean energy products and technologies through establishing a dedicated precinct for all forms of energy, future fuels, and associated technologies. This landmark project will enable Port of Newcastle to be a catalyst for employment, growth & diversification and a key driver of Australia's strengthening green economy.



Port of Newcastle: At A Glance







- · Water supply, treated water and wastewater
- Bulk Liquid hydrogen storage (LH2) large-scale ryogenic storage tanks and transf
- Standard and specialised services

Port of Newcastle: Our Competitive Advantage

Port of Newcastle's ambitions to deliver the Clean Energy Precinct is underpinned by three pillars:



Establishing a dedicated Clean Energy Precinct benefits the Hunter region as a clean energy powerhouse within the state of NSW and Australia.

Port of Newcastle: Accelerating Domestic Decarbonisation

Port of Newcastle's diversification will support Australia's largest embedded utilities network. Three out of the state's top five electricity and gas users are located within 20 kilometres of the Port and the Precinct will integrate clean energy production and storage with the Hunter's Hydrogen Hub gateway projects, the State's Renewable Energy Zones and offshore wind developments.



The Clean Energy Precinct delivers value for money, aggregating demand, common use infrastructure, and provides a level playing field for:

New investment and trade

Export energy commodities to existing trading partners with security of supply and create new jobs, green product manufacturing and research partnerships drive innovation, skills and training, significant international investment.

International partnerships

Government to government relationships advance cross-cultural and sovereign economic outcomes.

Green energy opportunities

Electricity grid optimisation and efficiency, variable load complements increased generation capacity in renewable energy zones, development of offshore wind to benefit regional Australia, recycled water and wastewater solutions.

Domestic decarbonisation

Decarbonise hard to abate sectors and support emissions reduction for energy intensive industrials.

Port of Newcastle: Clean Energy Precinct *Diversifying for the Future*



CLEAN ENERGY PRECINCT



Deliver Australia's Largest Energy Hub at Scale



Accelerate Domestic Decarbonisation



Integrate Australia's Energy Supply Network



Diversify to Support a Thriving Port and Hunter Community for the Future



Drive Job Creation and Career Pathway Opportunities





Underpin the Clean Energy Economy of Australia



Partnerships will be key to the success of the Port's Clean Energy Precinct and we are actively working to form or strengthen relationships with a range of stakeholders as well as producers, users and exporters to leverage economies of scale through the co-location of common user, open access and shared infrastructure across clean energy storage, transport and export facilities. We believe that this approach will enable the region, and Port of Newcastle, to play a critical role in ensuring Australia is a major global player in hydrogen production and exports by 2030.

Newcastle's Port of the Future: Unveiled

In May 2023, Australia's deepwater global gateway unveiled its blueprint for the Port of the Future, releasing three artist impression images of Stage 1 of its future Clean Energy Precinct site.

The Clean Energy Precinct will leverage economies of scale by co-locating hydrogen producers, users and exporters in one location, whilst common user, open access, shared infrastructure will drive down the cost of hydrogen.

The establishment of Stage 1 of the Port's Clean Energy Precinct will enable future production, storage, distribution and export of clean energy types for further development stages, including green hydrogen and green ammonia, using common user, shared infrastructure. Fully constructed, the project would facilitate clean energy production, storage, transmission, domestic distribution and international export. Stage 1 of the project would comprise establishment of lead-in infrastructure including electrical infrastructure, water infrastructure and ancillary works, construction vehicle and workforce vehicle parking, construction laydown and stockpiles and construction of a clean energy storage facility.

Proposed Stage 1 of the Clean Energy Precinct Project development includes:

- Ancillary and civil works including site buildings, offices and administration facilities, internal roads, car parking, warehousing, laydown areas, storage yards, staging areas and a clean energy storage facility with associated pipeline infrastructure.
- Electrical infrastructure including grid connection, transmission infrastructure, substation and switchyard.
- Water and wastewater infrastructure including network connection and supply corridors.

FIND OUT MORE

If you'd like to learn more about the Clean Energy Precinct, or register to attend our next Clean Energy Precinct Industry Briefing, please email Energy@portofnewcastle.com.au

Further information about Port of Newcastle's diversification strategy, trade operations and Clean Energy initiatives can be found on our website www.portofnewcastle.com.au.





Through the Clean Energy Precinct, Port of Newcastle will support all hydrogen, and clean energy projects in the Hunter by providing land, utilities, storage, transport and export infrastructure and services – in turn generating over 5800 jobs, new educational pathways and expanded economic growth.

Craig Carmody - CEO







Port of Newcastle Clean Energy Precinct Stage 2





CURRENT STATE Future Port of Newcastle Clean Energy Precinct Site



FUTURE STATE

Future Port of Newcastle Clean Energy Precinct Site

15

Artist Impression Potential future Clean Energy Precinct

Port of Newcastle Driving a Clean Energy Economy



Port of Newcastle *Powered by Partnerships*

Standing at the forefront of the development of a new economy we at Port of Newcastle believe that partnerships, both local and international, which bring together infrastructure, investment, knowledge, skills and resources, will be critical in the establishment and scale-up of a domestic clean energy economy and export trade pathway at Port of Newcastle.

By combining local, Australian and international expertise and research, we can remain agile in this landscape and work collaboratively to provide a faster pathway to scale. The Port's Clean Energy Precinct project has attracted a broad range of local and international support, with 15 Memorandum of Understanding Agreements secured and 15 supporting partner letters of intent or support for the once-in-a generation project already secured across skills and training, mobility, heavy industry, export and bunkering, clean energy production, power, generation, gas network and electricity market.



CLEAN ENERGY PRECINCT

| PROUDLY ENABLED BY THE FOLLOWING MOU PARTNERS |
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| PROUDLY SUPPORTED BY THE FOLLOWING PARTNERS |
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CLEAN ENERGY DIVERSIFICATION

ENABLING NEWCASTLE'S PORT OF THE FUTURE





Port of Newcastle

Working Together to Enable a Clean Energy Economy



Federal Minister Chris Bowen and Port of Newcastle CEO Craig Carmody with the Clean Energy Precinct's MOU and Supporting Partner Organisations (July 2023)

Port of Newcastle A Word from our Partners





Port of Newcastle *Project Partners*

Building opportunities for clean energy producers, potential off-takers, skills, training and industry support.

- Economic Benefits 5800+ jobs and \$4.2-billion increase to gross regional product of the Hunter Region*
- Decarbonisation 660kpta potential emissions avoided domestically through clean hydrogen
 production and 1mtpa potential emissions avoided as a result of clean energy export*
- Re-Skilling Existing 16,000 Mining Equipment Technology Services (METS) workforce supports diversification

* Based on the number of full-time equivalent job years created during ramp up to 2031 (Source: Port of Newcastle Green – Economic Impact Assessment 2022)



Offtake figures provided above are highly indicative demand profiles, based on volumes received from partners by way of Letters of Support. The demand profiles provided contemplate scaled increase as technology (and the industry at large) matures.

EXPORT/BUNKERING

Export and bunkering trials

Design optimal trials and required infrastructure for shipments of green ammonia to key trading partners. Indicative H2 export demand profile is circa 406 ktpa between 2025 and 2030 and 1400 ktpa from 2030. Green ammonia exports are expected to be in excess of 10,000 ktpa by the end of the decade and in excess of 30,000 ktpa from 2030 onwards.

HEAVY INDUSTRY

AMPCONTROL

InfraBuild

Heavy industry can be unlocked

Range of heavy industry can be unlocked as green industrial hub expands: aluminium, steel, synthetic fuels, mining.

MOBILITY



Mobility trials and feasibility

Determine optimal refuelling and hydrogen supply solutions for a range of mobility trials. Indicative H2 demand for domestic use cases associated with mobility is 4 ktpa between 2025-30 and 20 ktpa from 2030.

SKILLS AND TRAINING



Technology and workforce skills

Leveraging research organisations and vocational providers building capabilities and pilot projects across: hydrogen infrastructure, fuel cells generation and transport trials.

Port of Newcastle *Frequently Asked Questions*

What is Port of Newcastle's Clean Energy Precinct?

enabler for clean energy future products and technology development.

A new market in clean energy is required to meet emission reduction targets globally. The Hunter Region has been identified by the NSW and Commonwealth Governments as a priority location for this new industry in Australia, with the Commonwealth Government committing \$100-million funding contribution to this landmark project. As Australia's deepwater global gateway, and a long-term energy trader, Port of Newcastle is a critical

Port of Newcastle has earmarked a 220-hectare parcel of available land to establish a dedicated Clean Energy Precinct for all forms of clean energy and associated technologies through establishing a large-scale clean energy production precinct, supported by common user, shared, infrastructure with electricity supply and services.

The Port's Clean Energy Precinct will enable the development of clean energy in the Hunter with common use, open access, shared infrastructure across clean energy storage, transport and export facilities, positioning the Hunter Region as a clean energy enabler, a global gateway and catalyst for employment, growth and diversification, and the decarbonisation of industry.

The Clean Energy Precinct will support hydrogen and ammonia production and storage, distribution and export for all clean energy vectors (e.g., methanol, SAF and biodiesel) enabling a credible pathway to scale for export, with capacity to diversify the Hunter Region and decarbonise industry across NSW and Australia.

Where will the Clean Energy Precinct be located?

The Clean Energy Precinct will be located on a 220-hectare parcel of land on Kooragang Island. This piece of land was once the industrial wasteland of the former BHP Steelworks site and has been remediated for future use. Port of Newcastle intends to regenerate the site to support a new clean energy economy.

Why Port of Newcastle?

Port of Newcastle's diversification to the Clean Energy Precinct will support Australia's largest embedded utilities network. Three out of the state's top five electricity and gas users are located within 20 kilometres of the Port and the Precinct will integrate clean energy production and storage with the Hunter's Hydrogen Hub gateway projects, the state's Renewable Energy Zones and offshore wind developments.

Our Clean Energy Precinct pillar will position Newcastle as a leading hub for all traditional and future clean energy products and technologies through establishing a dedicated precinct for all forms of energy, future fuels, and associated technologies. This landmark project will enable Port of Newcastle to be a catalyst for employment, growth & diversification and a key driver of Australia's strengthening green economy.

Furthermore, Port of Newcastle is more than just a port; it exists to build Australia's prosperity with responsible, integrated and innovative supply chain solutions. With trade worth about \$37-billion to the national economy each year, Port of Newcastle enables Australian businesses to successfully compete in international markets with our key destination markets predominantly with close partners in Asia, such as Japan, Taiwan and South Korea.

The Port currently handles over 25 different types of trade, 4697 ship movements and 166-million tonnes of cargo annually. However, with a deepwater shipping channel operating at 50% of its capacity, significant Port land available, and enviable access to national rail and road infrastructure, Port of Newcastle is positioned to further underpin the future prosperity of the Hunter, NSW and Australia.

Why is Port of Newcastle transitioning to clean energy?

Port of Newcastle is diversifying, not transitioning. As the world's largest, and most efficient, coal export port. Port of Newcastle is on an exciting and ambitious diversification journey underpinned by three pillars: our Clean Energy Precinct, Newcastle Deepwater Container Terminal and our ESG Strategy, with the goal of generating more than 50% of revenue from sources outside coal by 2030.

We view diversification as must do in order to support the future of the Port and the Region and, as custodians of the Region's critical asset, Port of Newcastle is diversifying its trade as it strives to create a safe, sustainable and environmentally and socially responsible future.

Global demand for clean energy is driving the development of this new economy and with capacity, and the future of coal demand anticipated to fluctuate, the Port sees opportunity to be a global leader in the enablement of this diversified industry.

Who is behind the Port of Newcastle Clean Energy Precinct Project?

For the past three years, Port of Newcastle has self-funded and received competitively awarded ARENA funding toward the early-stage development of the project. The project has also attracted a \$100-million Commonwealth Government grant.

Port of Newcastle believes that partnerships, both local and international, which bring together infrastructure, investment, knowledge, skills and resources, will be critical in the establishment and scale-up of a domestic clean energy economy and export trade pathway at Port of Newcastle.

By combining local, Australian and international expertise and research, we can remain agile in this globally emerging landscape and work collaboratively to provide a faster pathway to scale.

The Port's Clean Energy Precinct project has attracted a broad range of local and international support, with 15 Memorandum of Understanding Agreements secured and 15 supporting partner letters of intent or support for the once-in-a generation project across skills and training, mobility, heavy industry, export and bunkering, clean energy production, power, generation, gas network and electricity market.

Memoranda of Understanding agreements have been formalised with coNEXA, EnergyCo, Energy Estate, Eurus Energy, Fortescue Future Industries, Hunter Hydrogen Network, KEPCO (Korea), Lake Macquarie City Council, Lumea (Transgrid), Mitsubishi Heavy Industries (Japan), MOL Group (Japan), Orica, Origin, Platform Zero (Rotterdam) and University of Newcastle.

Among those to also pledge their support formally for the Port's Clean Energy Precinct plans are AGL, Ampcontrol, Aurizon, bp Australia, Business Hunter, Hunter iF, Hyundai Australia, Infrabuild, Jemena, Keolis Downer, Linde Engineering, NewH2, Newcastle City Council, Snowy Hydro and Westrac.

Collectively, these relationships represent key industry support across clean energy production, mobility, export and bunkering, energy generation, transport, infrastructure, offtake, agriculture, education, innovation, research and development.

Port of Newcastle Frequently Asked Questions

What are the stages of the project?

The project stages include development application lodgement and approval for utilities connection; commercial agreement for production, offtake and supporting industry; delivery of infrastructure to accelerate green hydrogen production projects; and trials for clean energy export.

The stages fall across the following broad categories:

- Engineering design to support construction readiness and further enablement of this state significant, Australian-first project;
- 2. Purchase and delivery of items that are critical to determining the capacity of the Clean Energy Precinct and key commercial drivers for the precinct;
- 3. The development of the electricity and water supply utilities;
- 4. The development of storage, distribution and export facilities for clean energy; and
- 5. The development of clean energy production

What stage is the project at?

Port of Newcastle has undertaken significant industry and community engagement and feasibility investigation since the conceptualisation of this diversification opportunity in 2020.

At present (July 2023), the project is progressing toward the Secretaries Environmental Assessment Requirement (SEARs) lodgement stage for a State Significant Development (SSD) with the NSW Government Department of Planning and Environment.

How long will the stages take to complete? When will it be complete?

Pending planning and legislative requirements and timeframes, we anticipate that the project will support large scale enablement of the clean energy economy in the Hunter Region within the decade.

Companies in Korea and Japan are listed as exporting partners – what does this mean for local supply?

Domestic supply remains a priority. The Clean Energy Precinct project will accelerate clean energy production driving domestic decarbonisation across a range of hard to abate industries, skills and training pathways in Australia enabling clean energy industry development, new jobs for existing (and future) energy industry workers within our region, NSW and across the country. Collaborative Precinct relationships will unlock global export markets with key existing markets of Japan and Korea including with companies Port of Newcastle and Australia already has established export relationships with.

What is involved in producing renewable energy, storing it and exporting it?

Producing renewable energy and utilising this energy to produce hydrogen and ammonia for exporting involves a combination of renewable energy generation, conversion and transportation technologies. Developing the necessary infrastructure for the export of hydrogen and ammonia is crucial. This includes constructing terminals, storage facilities, and transportation infrastructure like pipelines, ships, or trucks.

Depending on the export destination, infrastructure needs may vary, and specific agreements and logistics arrangements need to be established. Port of Newcastle's Clean Energy Precinct intends to offer best practice infrastructure to support safe renewable energy production, storage and export.

What are the safety risks? Should I be concerned?

As with all Port of Newcastle operations, staff and community safety is paramount to the organisation and underpins every decision. Hydrogen and ammonia require careful handling and safety measures throughout the production, storage, and transportation processes. Port of Newcastle are consulting with SafeWork NSW, Department of Planning and Environment and the Office of Energy and Climate Change to ensure all hazards are identified, assessed and mitigated.

Port of Newcastle will work as necessary to ensure stringent safety protocols, including leak detection systems, proper training, and adherence to international safety standards, are adopted to ensure the safe export of hydrogen and ammonia.

Is hydrogen for ammonia manufacturing safe?

Generally, all port operations pose some level of risk, however the Port of Newcastle is well versed in minimising risk and promoting strong safety culture and management.

The manufacturing and storage of ammonia and hydrogen is considered safe if proper safety measures and protocols are followed. Both ammonia and hydrogen can pose risks if mishandled or stored improperly. However, with appropriate precautions, these risks can be minimised.

Port of Newcastle intends to continue to prioritise community and employee safety and will ensure appropriate risk management and response plans are in place, safety procedures are adopted, training and safe handling management protocols are adopted, and community concerns are addressed.

How many jobs will this project create?

This project has the potential to create an estimated 5800 jobs and create flow on career pathways for generations of TAFE and University students and re-skilling opportunities for the region's highly skilled workforce.

How can I ask questions, get more information or raise concerns about this project?

Community, neighbours and industry will be engaged with regularly through all stages of the project. Community will be invited to engage in a variety of consultation sessions throughout the development stages of the project. To stay informed either:

- Check our regular updates regarding the progress of this project on the Port of Newcastle website at www.portofnewcastle.com.au/majorprojects
- 1. Register for our community information sessions by emailing Energy@portofnewcastle.com.au
- Reach out to one of our Community Liaison Group representatives to raise concerns or learn more about the project. To find the representative for your local area, visit <u>www.portofnewcastle.com.au/community-andnews/community-liaison-group/</u>



AUSTRALIA'S DEEPWATER GLOBAL GATEWAY:

DIVERSIFYING FOR THE FUTURE AND INVESTING TO SUPPORT THRIVING COMMUNITIES, LOCAL JOBS AND A PROSPEROUS HUNTER REGION

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