

Hunter Hydrogen Network Presentation to NewH2





Development Principles

Traditional owners first



Commitment to the UN SDGs



Targeting biodiversity outcomes



Using and amplifying 'local'



accelerating the transformation of the energy sector

We strive to help our partners and clients achieve net zero outcomes and passionately advocate for local supply chains and capacity building. Our development principles embed the Sustainable Development Goals in all aspects of our business.

Our goal is to deliver a portfolio of onshore wind, offshore wind, solar, green hydrogen/e-fuels and transmission projects focussed on renewable energy zones and industrial precincts.

By taking our current pipeline of projects through development, construction, and into operations, we will seed the next generation of decarbonising infrastructure.



SDG artwork by Jordana Angus of the Wiradjuri people

Development



Acceleration





Industrial

precincts

Green

chemicals

Sustainable

EVs and transport

Sustainable mining

Advisory Services:

Commercial Development Master Planning Transition planning Eurus Energy Group, a global renewable energy independent power producer and developer, is jointly owned by Toyota Tsusho Corporation and the Tokyo Electric Power Company, two of Japan's most respected and significant companies.

Eurus currently own and operates over 3.3GW of renewable assets across 15 countries including Japan, Korea, USA, Chile and Europe, and owns 72MW of operating wind assets in Australia.



What is the Hunter Hydrogen Network?





Our other H2 projects - HyNQ





Our other H2 projects - Sunshine Hydro & Superhybrids



Energy Estate has partnered with Queensland company Sunshine Hydro to develop the world's first SuperHybrid project in Central Queensland.

The Flavian SuperHybrid, an integrated renewable energy, pumped hydro energy storage and green hydrogen project, will be located 60km southwest of Gladstone - within the Central Queensland Renewable Energy Zone.

This SuperHybrid will use Sunshine Hydro's AESOP (Advanced Energy Storage Optimising Program) software to optimise design and operation of the different components of the project to supply firm green energy and green hydrogen to local energy users.

Flavian is the first of 3 SuperHybrids in the CQ region and these large scale long duration energy storage and green hydrogen production facilities will help integrate over 5GW of new wind farms into the system.



H2N - Development Principles





TRADITIONAL OWNERS FIRST

- Recognition of traditional land custodians
- Reconciliation Action Plan for all projects

COMMITMENT TO THE UN SDG

- All development activities support achieving the UN Sustainable Development Goals
- Community Fund to reflect best practice in Australia and alignment with NSW Electricity Infrastructure Roadmap goals and vision



TARGET BIODIVERSITY OUTCOMES

- Enhancing biodiversity
- Co-locating agricultural grazing and vegetation rehabilitation
- Replacing vegetation after project construction



USING AND AMPLIFYING 'LOCAL'

- Mandating local employment and local content
- Employment diversity and appropriate representation
- Support for training/education



Why H2N? Economic Opportunities



H2N is intended to complement the existing and proposed electricity transmission network in the Hunter region. The backbone infrastructure will enhance energy security and allow industry to invest with confidence knowing that there are diversified sources of energy and adequate and robust infrastructure.



DECARBONISED H2 AND CHEMICAL SUPPLY

H2N will supply hydrogen into domestic markets (such as transport, mining and replacement for LPG) and global export opportunities for ammonia, renewable fuels and green chemicals



NEW EMPLOYMENT OPPORTUNITIES

H2N's proximity to a skilled and flexible labour force with a high proportion of trade and technical expertise will provide opportunities for H2 industry training and skills development



LONG-TERM COMPETITIVENESS OF THE INDUSTRIAL ECOSYSTEM

H2N will create synergies for the growth of the local industrial ecosystem as a result of H2N's proximity to heavy industry in the Newcastle region and Hunter Valley. H2N will support the build-out of large scale renewable energy generation, support the development of new industries and Renewable Energy Industrial Precincts in the Hunter and ensure that the Hunter is positioned to play its role in a competitive, global hydrogen economy.



Why H2N? Geographic Advantages



PROXIMITY TO REZs

Upper Hunter ideally placed at the top of the Hunter/Illawarra REZ with the New England REZ to the north and the Central West Orana REZ to the south-west. Large scale hydrogen production in Upper Hunter can support efficient and accelerated development of the NSW REZs.



LARGE SCALE STORAGE OPTIONS

Large-scale storage of renewable energy, enabling class leading utilization factor for green hydrogen production through electrolysis and grid export for peak power pricing. Viable options for hydrogen storage along the transmission pipe and laterals



There are good water resources in the immediate vicinity. Bayswater and Liddell power stations currently have significant water entitlements, drawn from abundant nearby resources and the different coal mines have long term water access rights which may become available.



GENERATION & TRANSMISSION OPTIONS

H2 production at Upper Hunter can reduce the need for additional complex upgrades to the transmission network through the Hunter Valley. The H2 pipeline will move bulk supplies of energy through the Hunter Region and allow the transmission network to service existing electricity consumers.



FLEXIBLE H2 DELIVERY

Flexible delivery of green hydrogen, oxygen and ammonia and other derivative products to export or domestically via one of the only deep-water ports in the region, the national highway and coastal railway



H2N has achieved a significant number of key development milestones over the last year:

Section	Task	Status
Scoping Study	Project Concept Development - product, site, opportunity, social licence	Complete
	Initial Project Infrastructure, technology, design, layout, constraints & costs	Complete
Business Case	High Level Business Model, Development budget and timelines	Complete
	Initial Route to Market strategy, products and customers, revenue & Demand	Complete
Development	Feasibility brief and quotes - Engineering	In process
	Feasibility brief and quotes - Planning	In process
	Stakeholder Engagement	In process
	Land for Electrolysers and downstream production	In negotiation
	Pipeline Easements investigation	In process
	E-fuels and Methane downstream production	In consideration
	Green ammonia/SAF/e-methanol offtake contracts	In consideration
	Co-development agreement – Eurus Energy	Complete
Environment, So cial, Regulatory & Government	Government Engagement strategy	In process
	Detailed engagement with NSW DPIE, Treasury and P&C, Regional and Invest NSW	In process
	Detailed engagement with NSW Ministers, local government and local business associations, community groups	In process
	Detailed engagement with ARENA, CEFC, DISER	In process



Potential Future Structure of H2N

Energy Estate and its partners may establish to separate joint-venture-style development companies for the different components of H2N and the downstream activities. This is a very usual structure for large integrated chemical and gas projects.

These potential partnerships are represented by the **light blue dotted boxes** around each potential downstream activity.



Hydrogen

Development Projects

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H2N Ammonia

What the future looks like - European Hydrogen Backbone







Why Australia - Hydrogen Investability Index

1 Germany

- Government funding to unlock GWs of electrolyser production and thousands of kms of H2 pipelines
- Half of Europe's solt covern hydrogen storage potential
- Supply and consumer CfD schemes underway
- H2Global Initiative offers German officile to international projects. Europe's largestH2 production and significant heavy industries to decarbonise
- _____

4. Australia

Geographically well positioned among "hydrogen export" countries to serve growing Asian markets

2. Spain

Europe

Best renewable energy resources in

Substantial industrial and heavy

transportation demand with RJ

regulatory pressure to decorbonise

EURLEDn in green hydrogen funding

from Government through to 2023

hydrogen projects supported by loost

strategic players such as Iberdirala,

Large pipeline of announced

EDPR and Repsol

- Excellent anshore wind and solar resource with potential for megaprojects due to low population density Largest pipeline of green hydrogen and ammonia projects.
- State Governments strongly stimulating hydrogen industry including manufacturing and local demand

3. United States

- Warld class solar and wind resources Immense heavy industry and transport sector
- and track record as trusted energy supplier and investment destination
- Significant existing H2 pipeline infrantucture and strang potential for storage and repurpoing Q&G infrastucture Expectations of ITC/PTC support for production and manufacturing as part of the current legislative package under consideration by Federal Government.

Part of Rotterdam is a significant natural

advantage. Europo's second largest producer of gray H2 and 1000km of existing H2 pipelines. Strang Government and industry support to capture apportunity and develop large

Europe.

6. Netherlands

scale production and trading hubs

Large offshore wind resource. Second

largest salt covern storage potential in

7.italy

- Europe's second largest steel and oil refining sectors Good cambined wind and solar resources Network of existing ports and infrastructure can accelerate hydrogen bays and valleys with NextGenerationEU support Oridoparator Snam first mover
 - investing BLR 37bn over 2020-2024 to H2 transmission infrastructure and investor in electrolyser manufacturing (ITM Pow ar)

11. Japan

- Long term hydragen import strategy and global leader in hydrogen shipping technologies. Increasing local demand such as cohiling of green ammonia, mobility and industrial demand Potential for local production with scale of affihice windressurce
- USD34bn Government clean hydrogen spending allocated

14. Chile

- World class solar and wind resources
- Government encouraging investment launched a USD50m hydrogen auction in Sept 2021
- Stong green H2 project pipeline with innovative projects like the Haru Oni e-fuels project
- High potential for export partnerships such as German H20lobal and with Asian markets

20. UAE

- World diass solar resources, first GCC country to cammit to Net Zero by 2050
- Innovative dean H2 initiatives, such as SAF and green steel
- Large H2 producing NOC with robust blue H2 plans
- Attractive investment dimate and



5. France Significant ammonia, steel and all refining installed base supported by EU decarbonication initiatives

- NECP target to convert 20-40% industrial H2 consumption to low carbon by 2028. EUR3.4bn in committed funding through 2023, plus EUR2bn for industrial
- electrolysis projects by 2022



🔅 energy estate

Energy Estate maintains an office in Sydney on the traditional lands of the Gadigal people of the Eora Nation, and in Adelaide on the lands of the Kaurna people.

We recognize their continuing connection to the land and waters and thank them for protecting this land and its ecosystems since time immemorial. We pay our respects to Elders past, present and emerging.