

GEGHA Project Frequently Asked Questions

What is the GEGHA Project?

The Good Earth Green Hydrogen and Ammonia ('GEGHA') Project is an integrated solar energy to hydrogen and ammonia plant that will be constructed at the Wathagar cotton gin in northern NSW.

The majority of hydrogen will be used on site to produce low-carbon fertiliser (anhydrous ammonia). There will also be a quantity of hydrogen available for use in on-farm fuel conversion and displacement of high-carbon fuels and feedstock in industrial manufacturing and heavy vehicle transport refuelling.

The project will involve the construction and operation of a new 27MW (DC) solar farm, electrolysis plant, ammonia plant, hydrogen storage, ammonia storage and ancillary infrastructure and connections.

Why is the project needed?

The GEGHA Project is needed for three key reasons:

1. **Green energy:** The Project will enable its off-takers to access fuel and fertiliser derived from renewable energy sources, providing a pathway to decarbonise agricultural production and transport supply chain.
2. **Local production:** Hydrogen and Ammonia will be produced, delivered and used in the region. The GEGHA Project will save thousands of kilometres of fuel and ammonia transport to the region from Newcastle and Brisbane.
3. **Security of supply:** The GEGHA Project is focused on agriculture and heavy goods transport in the region. The Project will provide certainty and security of supply, placing priority on agricultural customers with products that will be decoupled from fossil fuel driven supply cycles and fluctuations in price.

Who are the project partners?

The GEGHA Project is being delivered by the Hiringa Sundown Project Trust ('HSPT'). The HSPT is a joint venture between Sundown Pastoral Company and Hiringa Energy Limited, managed by Hiringa Energy Pty Ltd (together referred to as Hiringa).

- Sundown Pastoral Company is a privately owned Australian agricultural and pastoral company with a renowned reputation for innovative farming techniques, sustainable agricultural production methods and environmental stewardship since establishment in 1964.
- Hiringa Energy is a privately owned hydrogen company founded in New Zealand with a physical Australian presence, and a strategic focus on hydrogen solutions for hard-to-abate sectors. Since 2016, Hiringa has been developing low-carbon hydrogen production projects to supply industry, agriculture and transport, including utility-scale wind and solar to hydrogen and ammonia production.

What does the GEGHA Project involve?

- The GEGHA Project's key components consist of the construction and operation of:
- 15 MW of hydrogen electrolysis utilising high pressure alkaline electrolyzers:
- Nominally 6 tonnes per day
- Nominal 2,200 tonnes per year
- 16 tonne per day ammonia (NH₃) plant, to convert green hydrogen and atmospheric nitrogen feedstock into green ammonia.
- Production limited to nominally 4,500 Tonnes per year (based on energy availability).
- Up to 3 tonnes of Hydrogen storage to balance production and demand.
- Up to 600 tonnes of ambient temperature ammonia storage capacity to buffer against seasonal ammonia demand and renewable energy variability.
- Approximately 51 ML of water per year.
- Evaporation pond with a capacity of 16,200 KL.
- Ancillary power and water pump/ connections, water treatment, telemetry, security camera system, switch room and control room.
- Protective perimeter fencing.
- Custody transfer metering for both hydrogen and ammonia.
- Ammonia and Hydrogen Load out facilities adjacent to storage vessels.
- Car park and site office.

It is proposed that the ammonia and hydrogen production will be powered by:

1. A new 27 MW (DC) solar farm adjacent to the site;
2. 25 MW of Battery Energy Storage System (BESS) adjacent to site;
3. Utilising redundant energy from the existing 8.65 MW (DC) Wathagar Stage 1 solar farm in close proximity to the development.
4. Low capacity grid connection for firming and stability with renewable energy Power Purchase Agreement (PPA).

What are the project timelines?

Planning and design phase commenced in Q2 2023 and will continue until Q4 2024. Construction is planned to commence mid 2025 with the plant operational by early to mid 2026.

What will the plant produce?

The hydrogen electrolyser will produce up to 2,200 tonnes of hydrogen each year with 3 tonnes of storage on site to balance supply.

The ammonia plant will also produce up to 4,500 tonnes of Anhydrous Ammonia per year with provision to store up to 600 tonnes on site.

Where will the hydrogen and ammonia be used?



A portion of the hydrogen and ammonia will be used by Sundown Pastoral Co. on property.. The remaining ammonia will be



transported offsite to a number of local and regional offtakers.

More broadly, Hiringa is developing a hydrogen refuelling network with the intention of supplying hydrogen from the GEGHA Project to that network, providing a supply for transport operators in the region to incorporate hydrogen into their fleets.

What is the GEGHA Project's Planned Operational Life?

The GEGHA Project will be designed for an operational life of at least 30 years.

How much water will be used?

The annual Plant needs up to 51 megalitres of water annually to produce approximately 2,400 tonnes of hydrogen and 4,500 tonnes of Ammonia.

What are the GEGHA Project's water and energy needs?

It takes approximately 20 litres of raw water (10 litres of ultra pure water) and 51-54 kWh of energy to produce a kilogram of hydrogen.

It takes approximately 10-15 kWh of energy to produce a kilogram of Ammonia via the Haber-Bosch process.

Where will the water be sourced from?

The project is aligned with the principles of the circular economy and proposes to source water for Hydrogen production from an existing drainage dam on Sundown's property. The drainage dam is replenished by rainfall runoff from the Keytah property and from the area encompassed by the Wathagar gin yard levee bank. Groundwater from the Lower Gwydir Groundwater source will be required to supplement the dam water supply to balance operational water need. An existing water bore at the Wathagar gin will be utilised to extract the groundwater.

How much waste water will there be?

Water will be demineralised for use in the hydrolysis process via treatment. Up to half of the water volume is released from the electrolysis process as reject water (water that carries impurities removed from the raw water). This water will be sent to an evaporation pond that will be located a short distance to the north of the plant.

Can the waste water be re-used?



There may be some beneficial reuse opportunity for the produced water generated from the electrolysis process but

that will be subject to further assessment following the plant's commissioning.



Where will the energy be sourced from?

The Project's energy needs will be supplied primarily by the adjacent Wathagar Solar Farm and battery arrangement. A new 27MW (DC) 'Wathagar Stage 2' solar farm will be constructed as part of the Project immediately adjacent to the Stage 1 site.

What will I be able to see from the Gwydir Highway?

The project location has an existing levee bank surrounding it which provides screening from the Gwydir Highway. Hiringa has engaged a visual specialist to prepare a 3D model of the plant that will be presented in the Environmental Impact Statement. The existing levee bank will obscure the majority of the site from the Gwydir highway. Surrounding residences are located some way away and will not be affected by the development.

What other licences and designations will the plant require?

GEGHA will be a prescribed Major Hazard Facility (MHF) under the Work Health and Safety Regulations 2018. MHFs require additional rigour in design and safety standards that must be demonstrated through the plant's construction and operation. MHF's also have additional site security requirements.

The storage component of the plant is a scheduled activity under the Protection of the Environment Operations (POEO) Act 1997. This means that the operation of the facility will require an Environmental Protection Licence (EPL). EPLs are issued and administered by the EPA NSW.

The Project will also require ancillary permits and approvals including a Crown licence to enable a road entrance upgrade, a Water Supply Work/Use approval and a Water Access Licence to access groundwater.

How well established is anhydrous ammonia production and use?

Ammonia is the second most globally produced and traded chemical with 85% of ammonia being used as a fertiliser or in fertiliser production.

The standards for safe production, storage and use of Ammonia are well established in Australia with anhydrous ammonia having been first used in Australian agriculture in the 1960s.

In the Moree region, anhydrous ammonia is a conventional fertiliser option with farmers and agricultural contractors continuing to invest in equipment and vessels needed to store, move and apply ammonia safely and effectively.

Will the GEGHA Project impact on accommodation in Moree?



The project's Environmental Impact Statement will provide an analysis of accommodation options. Moree has over

800 motel beds available each night with the project likely to have 80-120 personnel on site at its peak during construction. It is not envisaged that construction and commissioning of the GEGHA plant will impact availability rates.



Is the GEGHA Project publicly funded?

The NSW Government is contributing grant funding under the Hydrogen Hub initiative which is a key action under the NSW Hydrogen Strategy.

How can I get more project information?

You can send an enquiry or join the project mailing list at www.gegha.com.au or otherwise contact the project team via the Project email gegha@hiringa.com.au.