



# Yara Pilbara Renewable Ammonia

Knowledge grows

## About Us

Yara Pilbara is part of a global company specialising in agricultural nutrition, industrial products and environmental protection agents.

Throughout the world our highly technical processing plants help create a diverse range of products including fertilizers and applications that reduce emissions from industry and land and sea transport.

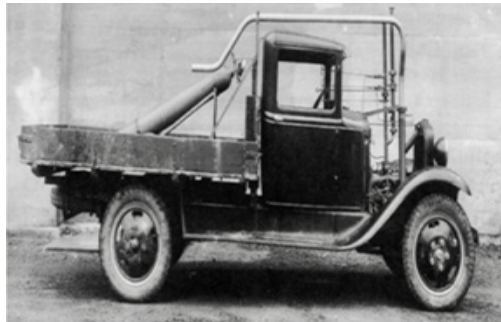
## The Pilbara

Yara Pilbara operates ammonia and technical ammonium nitrate plants located in the Burrup Strategic Industrial Area in Western Australia's Pilbara region, two hours flight from Perth.

The Yara ammonia plant is one of the largest ammonia production facilities in the world. The technical ammonium nitrate plant is a joint venture with Orica. Both facilities are adding value to the key building block in our production process – Western Australian gas.



1905 – The world's first nitrogen fertiliser factory



1933 – Ammonia/Hydrogen run truck



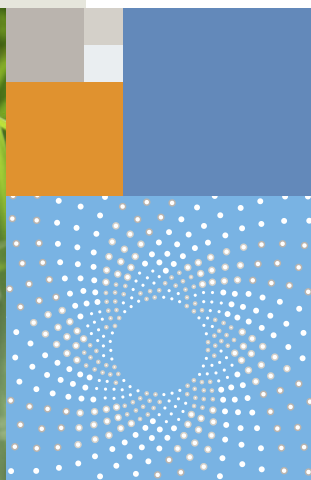
Yara Pilbara TAN Plant

## Renewable Hydrogen and Ammonia

Yara has a history of innovation spanning more than 100 years.

In the Pilbara we are applying Yara's experience, knowledge and creative thinking to explore the production of renewable hydrogen for conversion to ammonia through a process of electrolysis using seawater which is purified and harnessing solar energy to separate the hydrogen and oxygen.

The ammonia produced acts as an energy store, that can be used to transport hydrogen. Increased hydrogen use would reduce dependence on fossil fuels, its key ingredients are abundant, and the only by-product of hydrogen fuel is water.

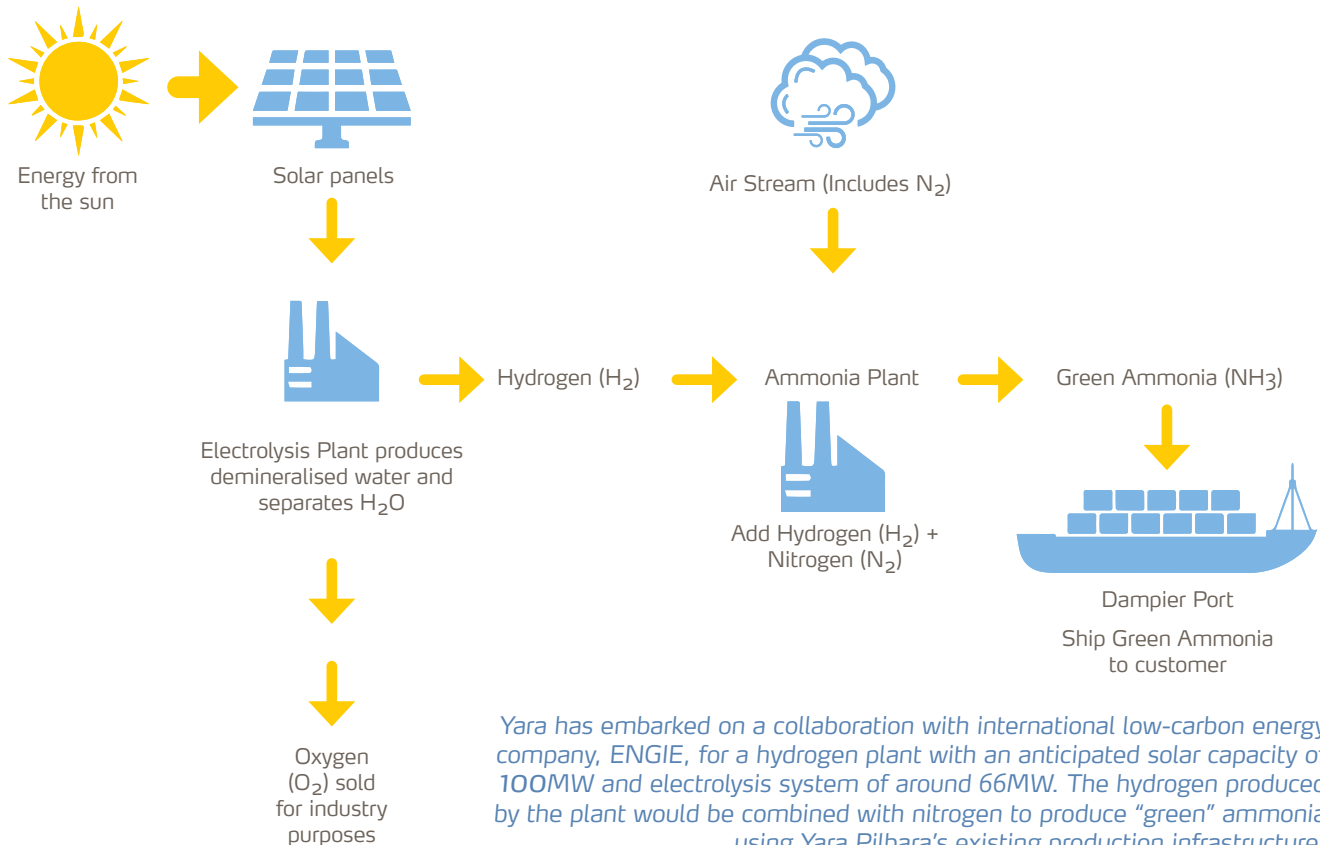




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## The Renewable Ammonia Process



Yara has embarked on a collaboration with international low-carbon energy company, ENGIE, for a hydrogen plant with an anticipated solar capacity of 100MW and electrolysis system of around 66MW. The hydrogen produced by the plant would be combined with nitrogen to produce “green” ammonia using Yara Pilbara’s existing production infrastructure.

## A Potential Pilbara Export

The ENGIE collaboration is an exciting project which has the potential to build a new export industry for the region and Australia.

A key issue for the transportation of hydrogen in liquid form is its low density. Turning the hydrogen into ammonia overcomes that, producing a higher density “vehicle” for shipping and then allowing conversion back to hydrogen at its destination.

Yara Pilbara’s operations produce an average 840,000MT of ammonia annually which is exported to domestic and world markets from nearby Dampier Port.

Yara globally is working towards carbon-free fertiliser and “green” ammonia from the Pilbara operations would be the key ingredient.



## FAST FACTS:

Yara Pilbara’s ammonia tanks can hold 80,000 tonnes of ammonia. Equivalent to renewable hydrogen for:

- Approx. 250,000 MWh electricity
- Fuel for 60,000 Fuel Cell cars each travelling 20,000km
- Every 1kg of renewable H<sub>2</sub> makes 5.6kg of NH<sub>3</sub> and offsets over 5.5kg of CO<sub>2</sub> production