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## PRODUCING ZERO-EMISSION AMMONIA WITH AN ELECTRO-CHEMICAL PROCESS

 AGRICULTURE & ENERGY

### **A novel method for producing green ammonia could eliminate carbon emissions associated with traditional production**

**Spotted:** Around half of all global food production is dependent on ammonia, which is used in fertilisers, as well as in marine fuel and industrial heating systems. Ammonia is essential to many industries, but is also extremely emissions-intensive, producing 2.5-3.8 tonnes of CO<sub>2</sub> for every tonne of ammonia. For this reason, there is a great deal of interest in more sustainable, green production methods for ammonia.

One such system has been developed by startup Nitrofix. It uses a novel electrochemical process to produce ammonia (NH<sub>3</sub>) without emitting any CO<sub>2</sub>. Unlike traditional carbon-intensive methods for producing ammonia, Nitrofix's method uses a low-cost selective catalyst that enables the reaction to proceed at low-voltage – meaning low power consumption.

Nitrofix's method also uses water as a source of protons in the reaction, instead of fossil fuels. This further reduces the activation energy needed to combine the nitrogen (N) and hydrogen (H) to produce ammonia. The result is a much more sustainable process.

This method holds great promise for delivering ammonia with zero carbon emissions, using just water and air. The company has recently announced that it has raised \$3.1 million in a Seed funding round led by Clean Energy Ventures.

In a press release, Daniel Goldman, co-founder and managing partner of Clean Energy Ventures said that, “Out of the many green ammonia companies we assessed, Nitrofix was the only company to disrupt the conventional fossil energy and carbon-intensive Haber-Bosch approach and create an economic path to decarbonising a global industry.”

approach is unique, the company is not allowing itself to search for a solution to producing at scale. Other recent innovations include a [demonstration project](#) for developing new methods of ammonia production and a company extracting ammonia from [urine](#).

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5th September 2023

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### **Takeaway:**

Ammonia is currently produced using a century-old industrial process that accounts for around [2 per cent](#) of total final energy consumption worldwide. Given that the process is almost entirely reliant on fossil fuels, this has a significant impact on the planet, with ammonia production producing emissions [equivalent](#) to those of South Africa's entire energy system. Given that ammonia is a vital component of both fertilisers and many promising future fuels, producing green ammonia will mean re-engineering the ammonia production system – something Nitrofix has already achieved. The key now will be to ensure the company can rapidly scale up its production.