Fact Sheet: Distributed Green Ammonia

March 2026

What is distributed green ammonia?

The localized, modular production of green ammonia at smaller scales is referred to as distributed green ammonia. “Distributed” refers to using smaller, decentralized production facilities closer to agricultural end users, ideally managed by farmer-owned co-ops. “Green” refers to using carbon-free electricity for powering the production. In smaller, community-scale facilities, that power can come from local renewable energy sources. Many agricultural areas have an abundance of renewable energy reserves (both wind and solar).[1]

Key things to know:

- Distributed green ammonia bolsters rural economies and energy independence by enabling local production that reduces reliance on volatile international fertilizer markets and utilizes local renewable energy resources.
- Green ammonia reduces emissions by replacing fossil-based ammonia with carbon-free, renewable-powered production, offering farmers a near-zero-carbon substitute to one of agriculture’s largest sources of greenhouse gases.
- Green ammonia provides decarbonization opportunities beyond fertilizer, serving as a clean fuel and hydrogen carrier for industries such as steelmaking and shipping, positioning agricultural regions at the forefront of the clean energy transition.

How green ammonia is produced

Green ammonia production begins by using electricity from renewable energy sources to split water molecules into hydrogen and oxygen through a process called electrolysis. The resulting renewable hydrogen is combined with nitrogen to produce green ammonia.

Green ammonia is used in the same applications as traditional ammonia, which is the primary input for most nitrogen-based fertilizers used in conventional agriculture. Nitrogen fertilizers account for about 2 percent of global emissions and 10.6 percent of agricultural emissions.[2] Conventional ammonia production relies heavily on natural gas, a carbon-intensive process.

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[1] Anne Schwagerl, vice president, Minnesota Farmers Union, presentation at the Green Ammonia Summit, December 10, 2024.

[2] Stefano Menegat, Alicia Ledo, and Reyes Tirado, “Greenhouse gas emissions from global production and use of nitrogen synthetic fertilisers in agriculture,” *Scientific Reports* 12, 14490 (2022).

This fact sheet adapts and republishes information from the report, Distributed Green Ammonia: Demonstrating Modular Systems for Sustainable Agriculture (January 2026), prepared for the Hydrogen Economy Collaborative, a project of GPI, by GPI’s Dreek Morgan, Val Stori, Gabrielle Olson, and Emmy Curtis.

Benefits of distributed green ammonia

Here are some of the benefits of distributed green ammonia:

- **Strengthens local economies** by creating new value-added industry for rural communities, local jobs, and new tax base.
- **Local production reduces the need for long-distance shipping.**
- **Makes farms less dependent on volatile global supply chains and global commodity markets.** For example, in Minnesota, farmers spend an estimated $500 million to $1 billion every year[3] on importing fertilizer from the Gulf Coast.[4]
- **Bolsters energy independence**, departing from a reliance on natural gas and centralized production infrastructure, which is primarily located on the Gulf Coast.

Rather than producing power for wholesale markets, local renewable energy development can contribute directly to the agricultural economy. DGA thus uses local resources to produce a value-added product for a local need and market. This method keeps more value in the community and strengthens both energy resilience and the local economy.

Lastly, locally produced ammonia can support local and rural economies by keeping dollars in the communities.

Green ammonia markets use cases

Green ammonia's potential goes beyond agricultural uses. Here are some additional use cases for green ammonia:

- Green ammonia as an energy carrier. Ammonia can be cracked back into hydrogen for use in petroleum refining, steel production, and other industrial processes. The Midwest plays a major role in the nation's steel production, from iron ores in Michigan and Minnesota[5] to the top-producing states of Indiana and Ohio.[6] Hydrogen from green ammonia can be used in direct reduced iron processes to replace coal.
- Green ammonia as a fuel. Ammonia has great potential to replace conventional combustion fuels in several use cases, including shipping fuels, agricultural operations like grain drying, and power production to meet local peak demands.

[3] Anne Schwagerl, Minnesota Farmers Union, presentation at the Green Ammonia Summit.
[4] TJ Kirk, Anton Krimer, Sheran Munasinghe, Elina Rodriguez, Joaquin Rosas, and Quailan Homann, *Roadmap for Distributed Green Ammonia in Minnesota* (RMI, 2024), 28.
[5] Christopher Watson, *Domestic Steel Manufacturing: Overview and Prospects, Congressional Research Service Report*, No. R47107 (Congressional Research Service, May 17 2022).
[6] Candice C. Tuck, "Iron and Steel," in Mineral Commodity Summaries 2026 (US Geological Survey, February 2026).

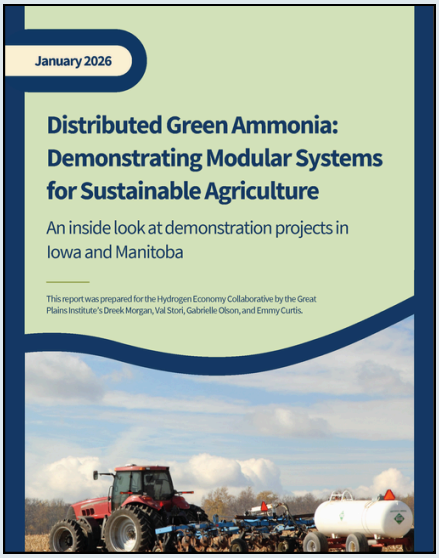
Case studies

The West Central Research and Outreach Center (WCROC)

Since 2013, WCROC has operated the world's first wind-to-ammonia pilot plant.[5] In 2026, a next-generation facility, collocated with wind and solar production, is expected to begin operation and produce up to 365 metric tons of ammonia per year.[6]

Landus/Talus collaboration in Iowa

In Boone, Iowa, Landus Cooperative and TalusAg partnered to build North America's first modular green ammonia production system, which is producing up to 1 ton of green ammonia per day using renewable energy.[7] Renewable energy certificates are procured to substantiate the use of renewable energy.[8] The modular system enables local fertilizer production at lower prices than conventional ammonia.[9] This collaboration demonstrates a model to strengthen rural economies and advance agricultural decarbonization.



Learn more about distributed green ammonia in our report prepared for the Hydrogen Economy Collaborative, *Distributed Green Ammonia: Demonstrating Modular Systems for Sustainable Agriculture*, by GPI's Dreek Morgan, Val Stori, Gabrielle Olson, and Emmy Curtis, published in January 2026.

Contact us with questions: info_renewable_energy@gpisd.net

[7] Sheila Crowley, "Green Hydrogen & Ammonia: Implications for Minnesota & Beyond," recap of a presentation by Michael Reese, WCROC, to the Rural Minnesota Energy Board, September 25, 2023, published by Clean Energy Resource Teams, October 2023.

[8] "West Central Research and Outreach Center Tour," 4th Symposium on Ammonia Energy, University of Minnesota, accessed March 24, 2026.

[9] Talus Renewables, "Talus Renewables Announces $22 Million Raised in Series A Financing," PR Newswire, November 2, 2023, news provided by Talus Renewables.

[10] Rob Davis, CleanCounts, email to author, January 11, 2026.

[11] Tristan Peitz (TalusAg), email to author, May 7, 2025.