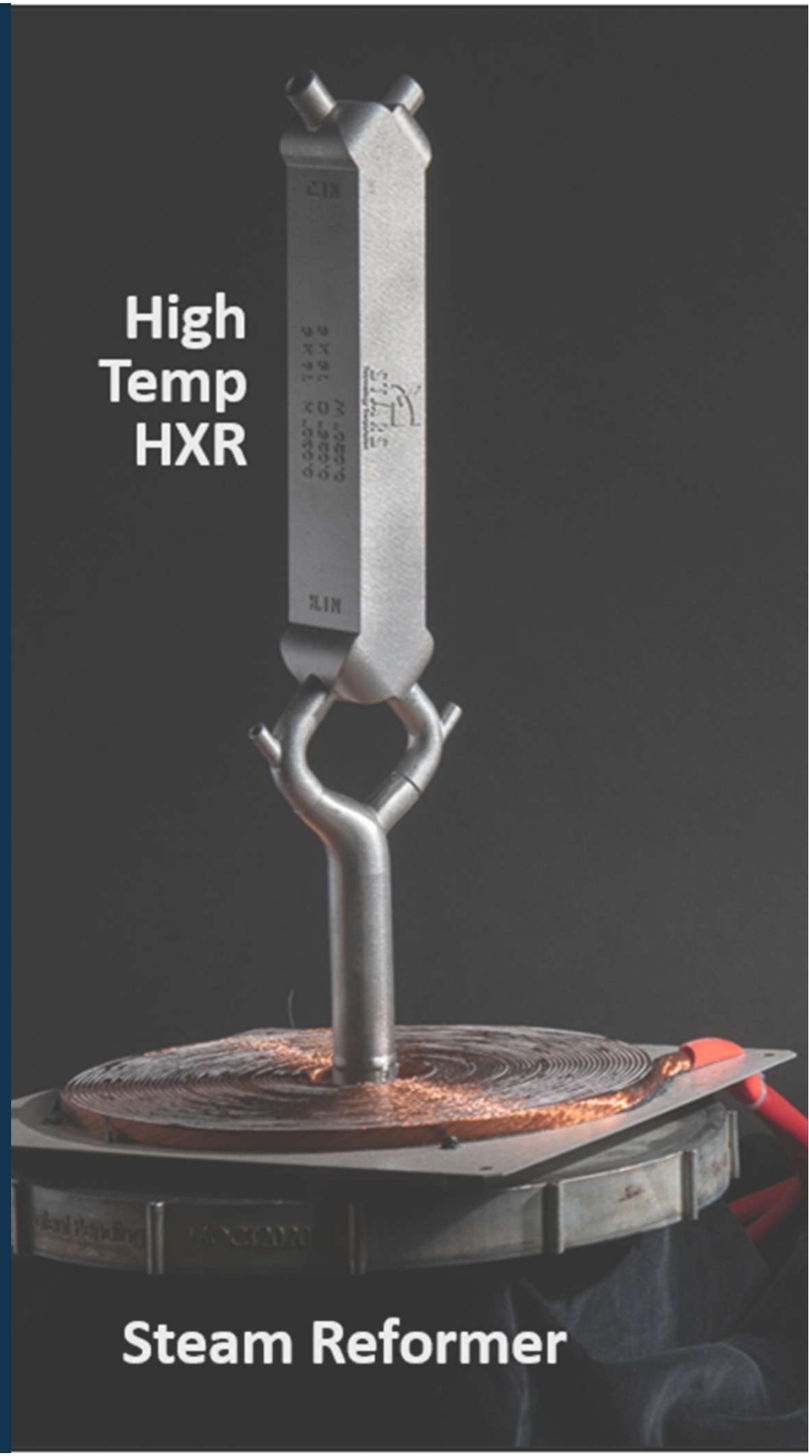
STARS
Technology Corporation

# Farm Waste to RNG, Hydrogen, & Ammonia

## Regional renewable natural gas from farm waste, reformed on site and converted into ammonia for the farming community

**Robert S. Wegeng** President & CTO **Dennis Walters** Chief of Staff



# The fertilizer a farm buys is made from someone else's gas

*Meanwhile the feedstock for it is sitting in the region as waste*

**~80%**
**is fertilizer**

Four-fifths of the ~180 Mt made each year becomes nitrogen fertilizer.

**1.8–2.4 Mt**
**CO2 per Mr**

Emissions from grey ammonia made from fossil natural gas.

**$300–500**
**per Mt grey**

The delivered benchmark the regional route has to beat.



### What that does to the farm

- Nitrogen cost swings with the gas curve, not with the crop cycle
- Product arrives by rail and truck from a handful of distant plants
- Supply shocks land at the worst moment — spring application

### And the resource going unused

- Manure, crop residue and food waste are a regional energy supply
- Digester gas is flared, or shipped far from where it does the most good
- The farms that generate the waste are the ones buying the fertilizer

**Sources: Energy Solutions Intelligence, Green Ammonia for Fertilizer, August 2026; IMARC ammonia plant economics, 2026.**

# *Keep the carbon, the value and the freight inside the region*

## *Farm waste in at one end, finished ammonia out the gate at the other*

**Digest it**

Manure and residue become renewable natural gas.

**Reform it**

STARS modules reform that RNG into hydrogen on site.

**Synthesize it**

Modular Haber-Bosch turns it into ammonia.

**Ammonia is a liquid at modest pressure — it stores for months and moves in the infrastructure agriculture already owns.**

### RNG is a feedstock agriculture already owns

- Dairy and feedlot manure, crop residue and food processing waste
- Manure-derived RNG avoids methane, so the carbon score can go below zero

### The plant goes where the waste is

- Reformer modules sit at the digester — no long pipeline needed
- About 0.6 MW of load, not a multi-megawatt electrolysis service

**About 0.18 kg of hydrogen is required per kilogram of ammonia (3 $H_2$ + $N_2$ → 2 $NH_3$).**



STARS Technology Corporation

# Why a farming region is the right site

***Three constraints that stall most clean ammonia projects are already solved here***

## Feedstock

Farm waste, collected regionally

- Dairy and feedlot manure, crop residue and food processing waste
- Digesters already operating or permitted across the region
- A feedstock contract replaces a volatile fossil gas purchase

## Site

Land, power and gas clean-up in place

- Industrial land, roads and heavy-equipment access already on site
- A modest electrical service — no interconnection queue
- Gas conditioning shared with the existing digester

## Offtake

The farms are the neighbours

- Ammonia demand sits in the same counties as the waste
- Short haul to co-op storage instead of cross-country freight
- Price stability growers will sign a contract for

**The same modular approach applies in every waste-rich region; only the feedstock and offtake contracts differ.**



STARS Technology Corporation

# From farm waste to nitrogen in the soil

*Four modular steps, all inside the region that grows the crop*

**1 Collect and digest**

Manure, crop residue and food waste are digested regionally, and the raw biogas is cleaned to pipeline-quality RNG.

**2 Reform to hydrogen**

Containerized STARS modules reform that RNG into hydrogen at record efficiency, sized 250 to 1,500 kg/day.

**3 Make ammonia**

A modular Haber-Bosch loop combines that hydrogen with nitrogen separated from air — 0.18 kg H2 per kg NH3.

**4 Store and deliver**

Ammonia is stored as a liquid on site and trucked a short distance to co-op terminals for spring and fall application.

Carbon intensity follows the RNG source: manure-derived gas can be carbon-negative, while landfill or residue gas is low-carbon but positive.



STARS Technology Corporation

# What the economics have to clear

## *A feedstock the region already produces, and a fraction of the electrical load*

**Negative**

**with manure RNG**

Avoided manure methane can drive lifecycle carbon below zero; other RNG sources score low but positive.

**0.18 kg**

**H2 per kg of NH3**

Stoichiometry fixes hydrogen demand; reforming efficiency fixes the cost.

**0.6 MW**

**per 1,500 kg/day**

Against roughly 3.4 MW for the same output by electrolysis.



### What a first plant can target

- A 1,500 kg/day module supports roughly 8,000 tonnes of ammonia a year
- Sized to one region's waste stream and one co-op's demand
- Modules are added as digester supply and offtake grow

### How the value stacks today

- Section 45V credits apply to qualifying clean hydrogen production
- RNG earns renewable-fuel and low-carbon fuel credits on the feedstock side
- Carbon pricing raises the delivered cost of imported grey ammonia

**Sources: Energy Solutions Intelligence, August 2026; EPCLand clean ammonia FEED guide, 2026.**

# What each party brings, and what each one takes away

***The structure works because no one is asked to step outside their own business***

## Digester hosts

Turns waste into contracted revenue

- A long-term offtake for RNG made from manure and residue
- Revenue that does not depend on credit markets alone
- Better waste handling, odor control and nutrient management

## Haskell

Design-build and integration

- EPC scope across gas clean-up, reforming, synthesis and balance of plant
- A repeatable modular design rolled out region by region
- A long-term operations and maintenance relationship with each host

## Growers

Local, contracted nitrogen

- Fertilizer made from the region's own waste, on a feedstock contract
- Supply from inside the region, days from the field
- Verified low-carbon nitrogen for the buyers who now require it

**One regional system, three balance sheets — each participant contributes the asset it already owns.**



STARS Technology Corporation

# *Delivered cost, honestly stated*

## *The regional RNG route buys the same molecule with far less electricity*

**Grey today**

$300–500 per tonne, set by fossil gas prices.

**Electrolytic**

$600–1,000 per tonne before incentives.

**Regional RNG**

About one-sixth the power, plus carbon credit on the waste.

**The pathway is cheapest where the feedstock is free of freight and the electrical load stays small — which is exactly on the farm.**

### What we would prove together

- Regional feedstock volume, gas quality and supply contracts
- Offtake volume and contract tenor with regional co-ops

### What a joint FEED would settle

- An AACE Class 3 estimate, −10% to +15%, on a named site
- Module count, storage sizing and delivery logistics

Figures are 2026 market ranges, not a site-specific quotation; a site estimate follows the joint front-end engineering stage.



STARS Technology Corporation

# A staged path to a first plant

*Low-commitment steps first — each one de-risks the next*

**1 Feedstock screening** — Map regional manure, residue and food waste against existing digesters and fertilizer demand. Four weeks, no cost.

**2 Offtake sounding** — Confirm volume and price interest with regional co-ops and large growers before any capital is committed.

**3 Joint FEED** — Haskell-led front-end engineering on the selected site, to a Class 3 estimate with a defined module configuration.

**4 Build, then replicate** — First plant built and commissioned, then repeated in other waste-rich regions as contracts are signed.

STARS carries the hydrogen technology risk; Haskell carries the engineering and construction scope; the host carries the feedstock contract.



STARS Technology Corporation

# Farm waste in. Affordable nitrogen out.

**Invented at PNNL. Proven in the field. Ready to engineer with Haskell.**

| RNG | 0.18 kg | 8,000 t | Negative |
|---|---|---|---|
| from the region's own waste | hydrogen per kg of ammonia | a year from one system | lifecycle carbon with manure RNG |

**Let's map the region's feedstock, size the offtake with the co-ops, and scope a joint FEED. We can make this work for you and your customers.**

**Robert S. Wegeng**, President & CTO
**Dennis Walters**, Chief of Staff

**STARS Technology Corporation**



STARS Technology Corporation