

Hybrid Renewable Energy → H₂ → Green Steel / Ammonia

Vision: New integrated analysis capability, GreenHEART, to analyze optimized GW-scale off-grid, purpose-built systems composed of wind/PV/storage tightly coupled electrolyzers, optimized for LCOH, co-located with steel/ammonia production facilities.

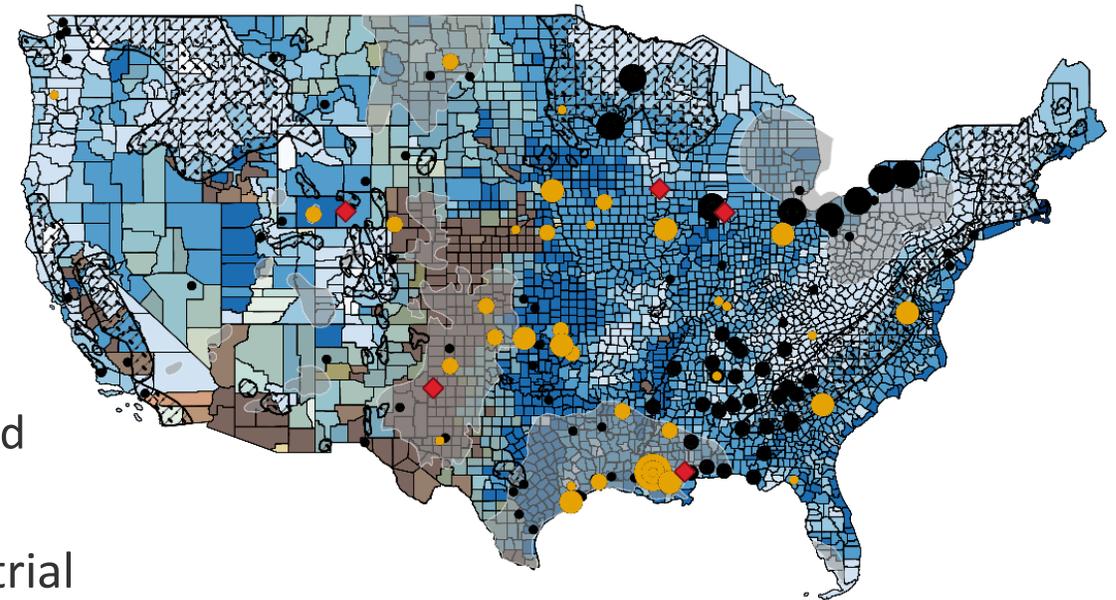
National Roadmap, locally optimized for green H₂ production and industry end use.

Novelty and Advantages:

- Optimized LCOH for the specific end use,
- Holistic approach, increased efficiency, & reduced capital costs,
- Independence from natural gas price volatility, grid connection permits and new large-scale transmission build outs.

Reduce risks and accelerate H₂-based pathways to industrial decarbonization.

5 DOE Lab Collaboration NREL (lead) + ANL, LBNL, ORNL, & SNL
Co-funded by DOE Hydrogen and Wind Offices.



Legend

Selected Locations

Hydrogen Demand for Ammonia Production (MT)

- 0 - 35,000
- 35,000 - 110,000
- 110,000 - 250,000
- 600,000 - 810,000

Hydrogen Demand for Synfuels and Metals (MT)

- 0 - 1,000
- 1,000 - 50,000
- 150,000 - 700,000
- ▨ Hardrocks
- Salt Caverns

Water scarcity index (-)

- 0 - 5
- 5 - 10
- 10 - 30
- 30 - 50
- 50 - 70
- 70 - 100

H2 Potential from Solar and Wind (MT/km²)

- 0 - 10
- 10 - 250
- 250 - 500
- 500 - 1,000
- 1,000 - 5,000
- 5,000 - 95,000