

What is Hydrogen Hub and Is It Coming to Nebraska

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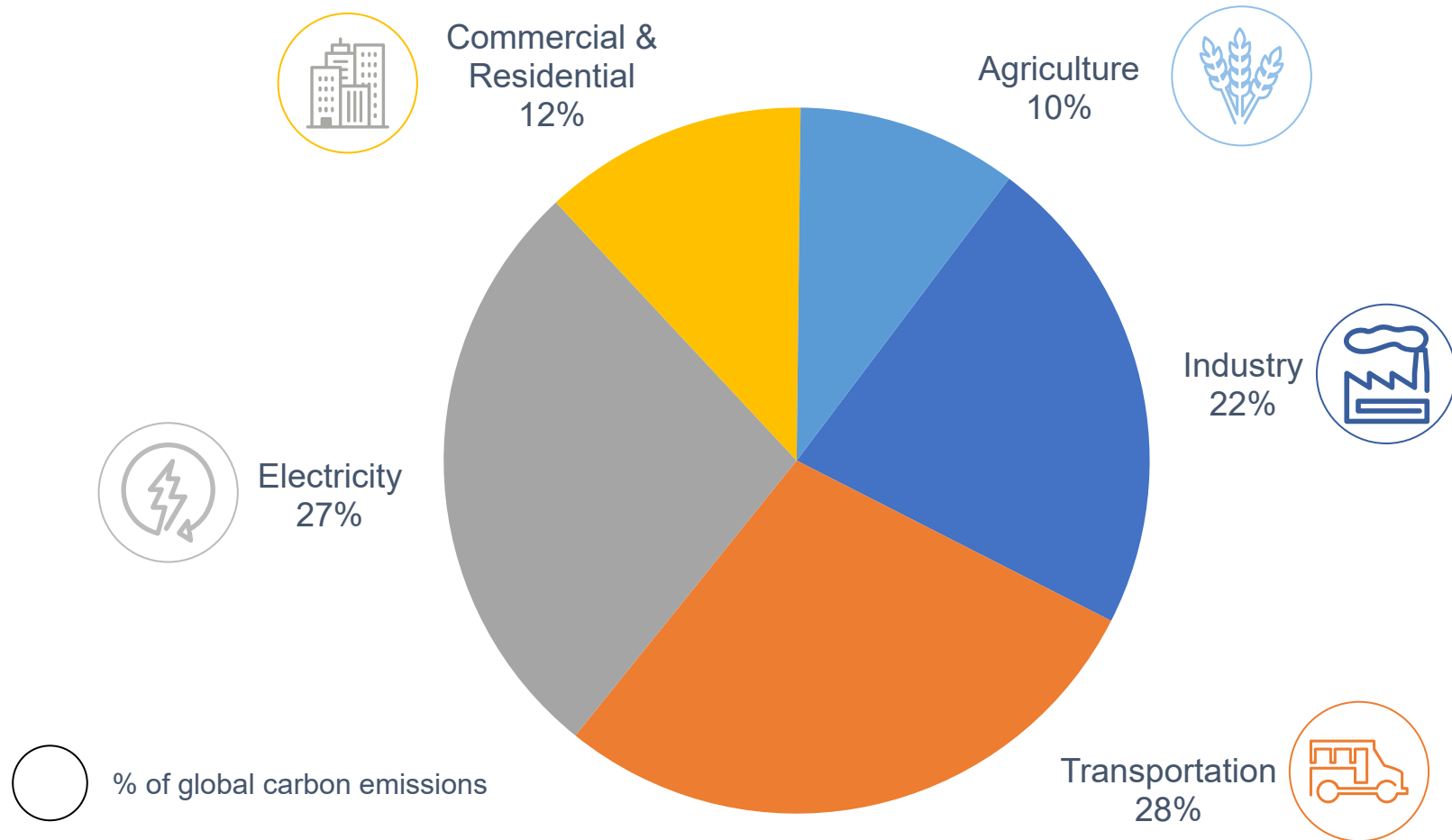




The Hydrogen to Power a Green World.

Anna Wishart
**Director of Government Affairs &
External Relations**

Need for de-carbonization



Monolith's solution addresses >85% of the CO₂ from the highest emitters

Source: EPA

Clean Hydrogen is a key pillar of de-carbonization

Renewable energy



Key markets served:

- Electricity Market

Battery innovation



Key markets served:

- Short Term Electricity Storage
- Med/Light Duty Transportation

Clean hydrogen*



Key markets served:

- Heavy Duty Transportation
- Marine & Air Transportation
- Steel Industries
- Chemical Industries
- Agriculture
- Long Term Electricity Storage

**Clean hydrogen has broadest reach given unique ability to eliminate hard-to-abate CO₂ emissions*

Life Impact

Shipping/Transportation



Aviation/Air Travel

Marine Shipping



Shipping/Products



Steel Manufacturing

Long-Haul Trucking/
Products



Clean Hydrogen from electricity and natural gas

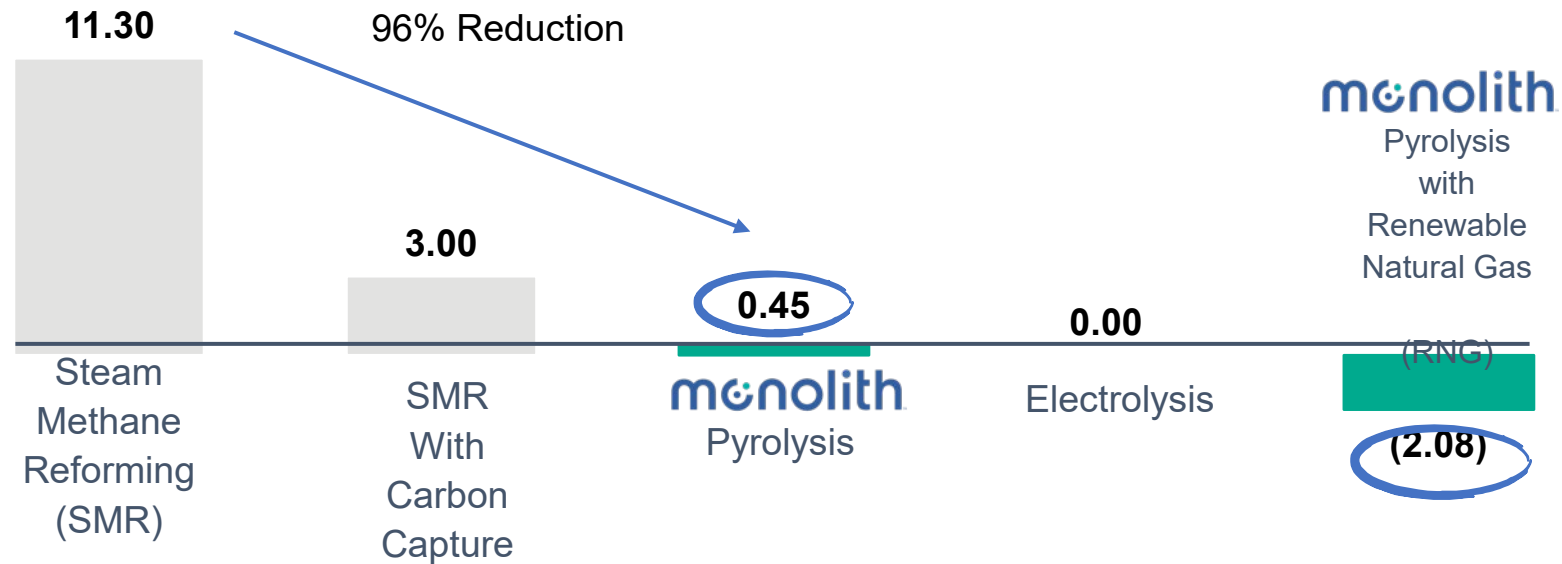
monolith
Protected Methane Pyrolysis Technology



Olive Creek 1 (OC1)
Commercialization of technology complete

Potential for lowest hydrogen carbon emissions

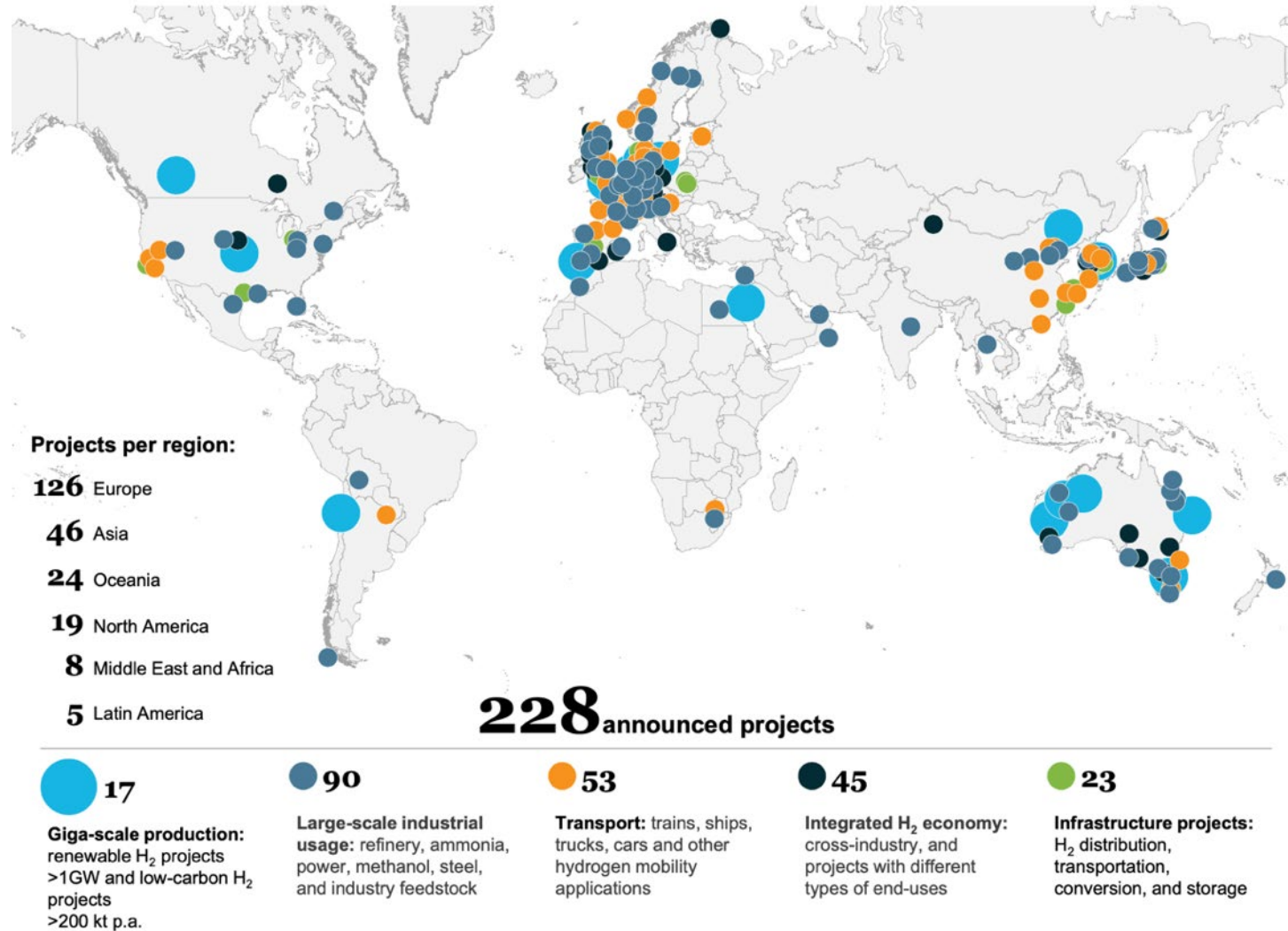
Carbon Intensity Of Hydrogen Production – Well To Gate (kg CO₂e / kg H₂)



Note: Electrolysis and pyrolysis assume 100% renewable energy

Sources: NREL Hydrogen Analysis (H2A) Production Models, Version 3.2108, Central SMR without CCUS; NREL Hydrogen Analysis (H2A) Production Models, Version 3.2108, Central SMR with CCUS; Based on third party study using GREET1_2020 and AR5 GWP (CO₂, N₂O, CH₄); NREL Hydrogen Analysis (H2A) Production Models, Version 3.2108, Central Electrolysis (Process emissions only); Based on third party study using GREET1_2020 and AR5 GWP (CO₂, N₂O, CH₄)

North America WAS lagging in hydrogen development



Source: Hydrogen Insights Report 2021, p 6., Hydrogen Council

Nebraska Hydrogen Initiative

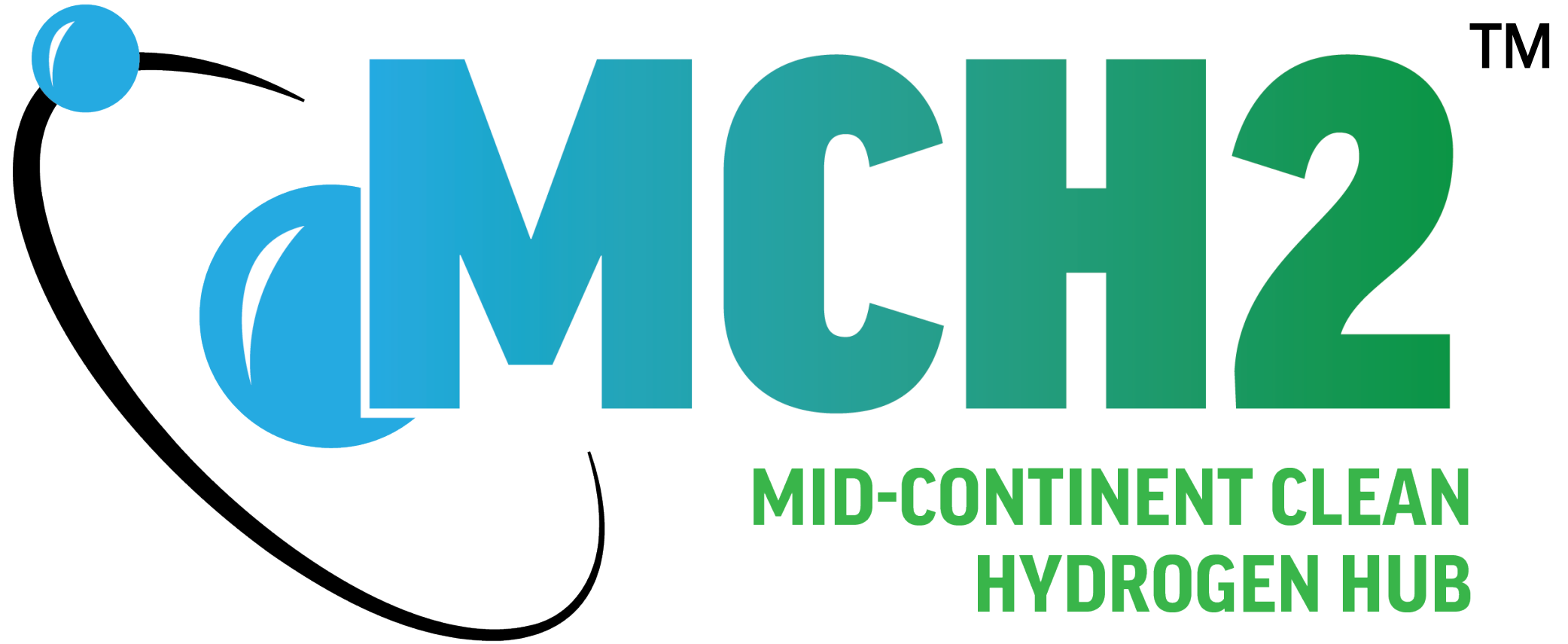
Wind and Solar Conference
Lincoln, NE
October 25, 2022

John Swanson
Director, Generation
Strategies & Research



Nebraska Public Power District

Always there when you need us



**MID-CONTINENT CLEAN
HYDROGEN HUB**

Mid Continent Clean Hydrogen Hub - Background

- The Federal Infrastructure Investment and Jobs Act was signed into law in November 2021
- As part of that act, the U.S. Department of Energy (DOE) was authorized to fund an \$8 billion program to develop **regional clean hydrogen hubs**
- Subsequent to that act, Governor Ricketts signed LB 1099 in March of this year for the Nebraska Department of Economic Development to create the Nebraska Hydrogen Hub Industry Work Group
- NPPD has been working with a number of parties to develop a concept for a regional clean hydrogen hub

LB 1099 Committee

Tom Kent – President & CEO, NPPD

Mark McHargue – President, NE Farm Bureau

Amy Ostermeyer – Executive VP of Development, Monolith

Blake Hotzel – VP of Business Development, Tallgrass Energy

Scott Moore – Senior VP of Corporate Relations, Union Pacific

Chad Dittberner – Senior VP Van/Expedited Division, Werner Enterprises

MCH2 Formation

- **4 Committee Groupings:**
 - Agriculture
 - Energy
 - Transportation
 - Environmental, Social, Economic Development

≡ MCH2 Blueprint

- Agriculture

- Food Security – crop and animal
- Renewable Natural Gas (RNG)
- Ethanol
- Ammonia

- Manufacturers of Hydrogen

- Natural Gas Pyrolysis (unique)
- Autothermal or Steam Reforming
- Ethanol

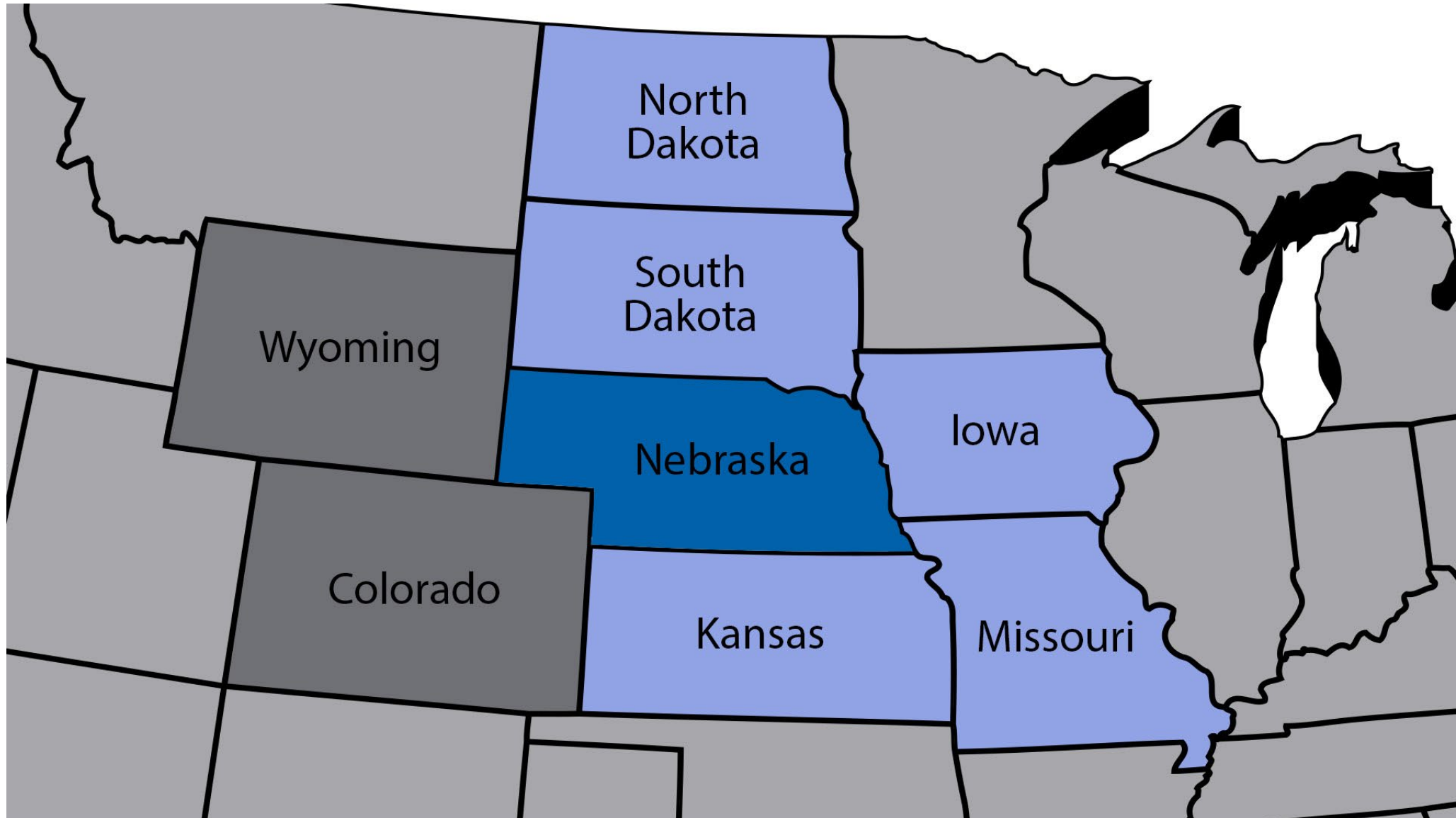
MCH2 Blueprint

- **Products**
 - Renewable Diesel (soy and corn oil)
 - Sustainable Aviation Fuel (SAF)
 - Green Chemicals (methanol, urea, etc.)
- **Transportation**
 - Airline (SAF)
 - Maritime (ammonia, methanol)
 - Rail (hydrogen fuel cells and renewable diesel)
 - Trucking (hydrogen fuel cells and renewable diesel)
- **Social, Economic Development**

DOE Regional Clean H2 Hubs

Title	Anticipated # of Awards	Anticipated <i>Minimum</i> Award Size for Any One Individual Award (Fed Share)	Anticipated <i>Maximum</i> Award Size for Any One Individual Award (Fed Share)	Approximate Total Federal Funding Available for All Awards	Anticipated Period of Performance (years)	Required non-federal cost share level (minimum)
Regional Clean Hydrogen	6-10	\$400 Million	\$1.25 Billion	\$6-7 Billion	8-12	50%

Hydrogen Hub “Regional” Perspective



Hydrogen Hub

- **Process is fiercely competitive**
- **Hydrogen supply, transportation, and usage identified**
- **Federal dollars used to accelerate projects**
- **Hired Burns & McDonnell (1898 & Co.)**
- **Hired Holland & Knight**
- **Currently in conversations with multiple states**
- **Concept Papers due November 4, 2022**

Questions?

Stay connected with us.



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