

# LSB Industries

Mark Behrman, CEO

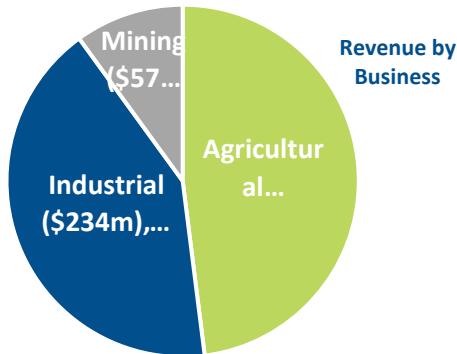
November 15, 2022



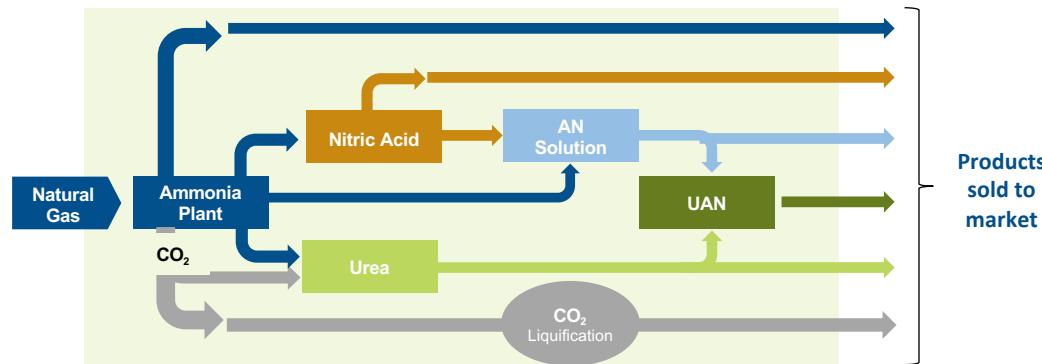
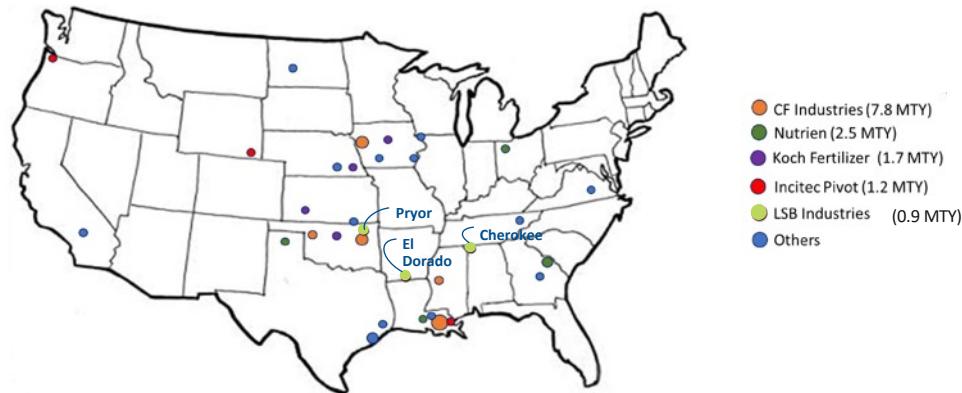
# LSB Industries at a glance

## Business Overview

- LSB Industries, founded in 1968 and headquartered in Oklahoma City, OK, is a publicly traded company that manufactures and sells chemical products for the agricultural, mining and industrial markets
  - \$550+m in annual revenue in 2021
- Three production facilities strategically located near customer demand areas
  - El Dorado, AR: Manufactures ammonia, ammonium nitrate, nitric acid, sulfuric acid, CO<sub>2</sub> and AN solution
  - Cherokee, AL: Manufactures UAN, ammonia, AN solution, nitric acid, CO<sub>2</sub> and diesel exhaust fluid
  - Pryor, OK: Manufactures UAN, ammonia and CO<sub>2</sub>

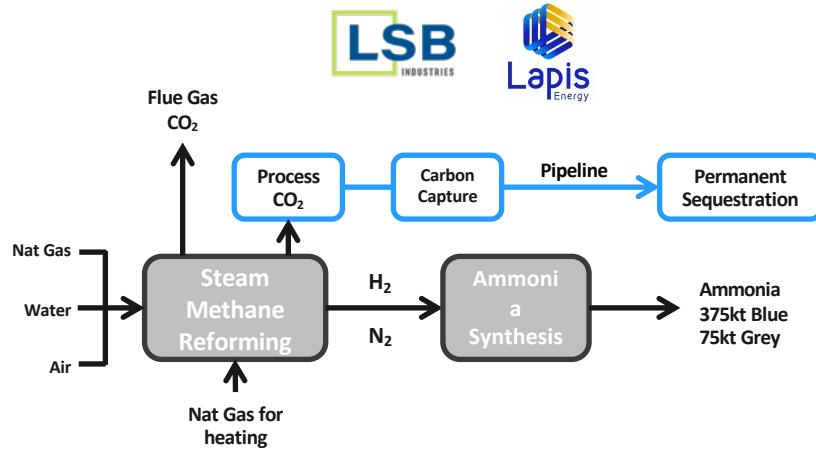


## LSB is the fifth largest ammonia producer in the U.S.

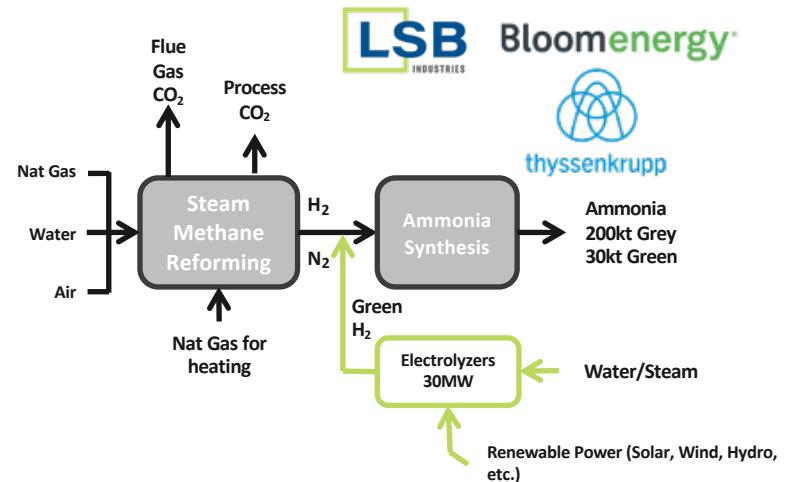


# LSB Industries clean energy developments

## Blue Ammonia Project at El Dorado, AR



## Green Ammonia Project at Pryor, OK



- Agreement with Lapis Energy to develop a carbon capture and sequestration (CCS) site to permanently sequester >450k metric tons of CO<sub>2</sub> annually, generating >375k metric tons of blue ammonia
- Expecting operations to begin by early 2025, subject to EPA permitting
- The sequestered CO<sub>2</sub> will reduce the company's scope 1 GHG emissions by ~25% from current levels

- Completed a feasibility study to retrofit an existing ammonia plant and replace a portion of the conventional hydrogen with green hydrogen, producing 30k metric tons of green ammonia per year
- Expecting operations to begin by 2024. 10 MW Bloom SOEC electrolyzer and 20 MW of alkaline technology
- Electrolyzers will operate on renewable power from solar and wind facilities and the plant CO<sub>2</sub> emissions will decline by ~36k metric tons per year



# Hydrogen

Accelerating lower carbon solutions



Ammonia Energy  
Association

Prerna Jain

# Our Energy Transition strategy

## Advance a lower carbon future

### Lower carbon intensity of our operations

#### Target

35% carbon reduction in Upstream by 2028

#### Maintain

1<sup>st</sup> quartile performance in oil and gas GHG intensity

#### Focus

on methane, flaring and energy management

#### Aim

2050 net zero aspiration\* for upstream  
Scope 1 & 2 emissions

### Grow lower carbon businesses



Renewable fuels  
& products



Hydrogen\*\*



Carbon capture,  
utilization & storage



Offsets & emerging lower  
carbon opportunities

Chevron expects to triple our lower carbon capital versus prior guidance to over \$10 billion between now and 2028:  
**\$2B in carbon reduction projects and \$8B in low carbon investments**

\* Upstream emission intensity Scope 1 and 2 in kgCO<sub>2</sub>e/BOE. Achieving the Upstream 2050 net zero aspiration will require continued partnership and progress in technology, policy, regulations, and offset markets.

\*\*Chevron's approach to hydrogen envisions the use of green, blue, and gray hydrogen. See Climate Change Resilience Report pg 51 to learn more.



# Hydrogen fits within Chevron's strategy

## Higher returns, lower carbon

### CNE Hydrogen narrative

We believe the future is lower carbon.



#### We believe

hydrogen, ammonia, and other derivatives will be produced from a portfolio of supply sources, for global utilization across the transportation, power and industrial sectors

these products will be competitively distributed and priced to enable adoption at scale because costs across the value chains will be significantly lowered through technology advancement



#### In the journey towards this future,

we will leverage on our existing assets and capabilities to enable us to apply the technologies and develop infrastructure required to enable these future competitive value chains



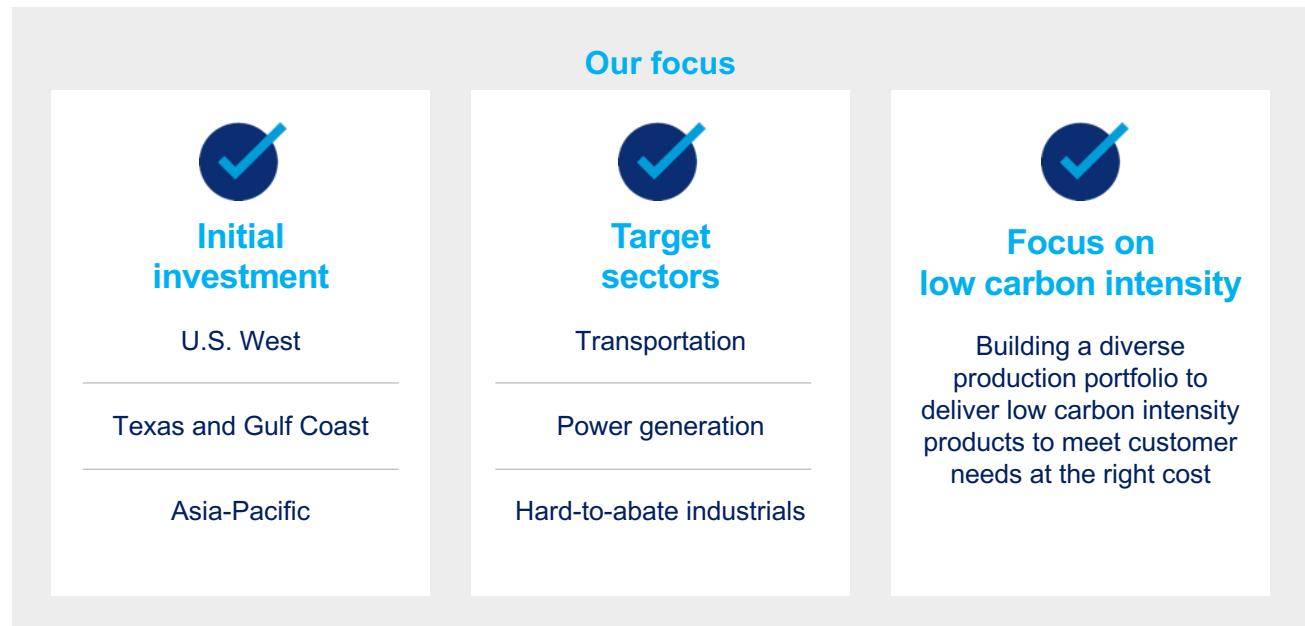
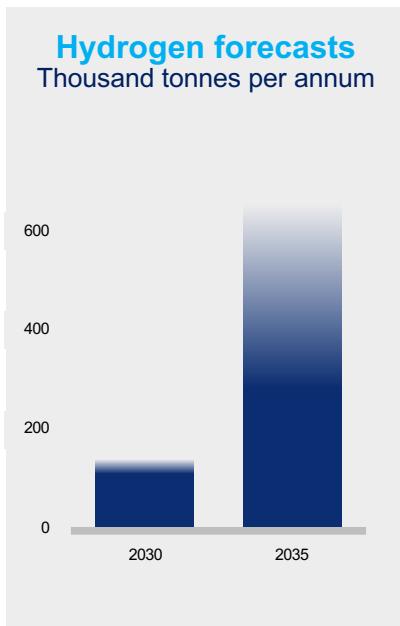
#### We will produce hydrogen

from a portfolio of ever-cleaner supply sources, including natural gas, geothermal, waste/ biomass, wind, and solar, to be able to scale offerings to meet growing customer needs and achieve profitable businesses as the world develops pathways to a sustainable future



# Chevron New Energies – Hydrogen

**Chevron is seeking to create a profitable, large-scale hydrogen business**  
building upon our assets, our capabilities and our customer relationships





# Renewable Hydrogen Production, Storage & Delivery

**Claire Behar**  
**Chief Commercial Officer**

HY STOR ENERGY

# A growing opportunity underground



HY STOR ENERGY



## Renewable Hydrogen

Renewable hydrogen has the power to decarbonize the hard-to-abate sectors such as heavy-industry and transport where direct electrification is not an option. These sectors require a high volume and flexibility of non-intermittent hydrogen supply that only salt cavern storage can provide.



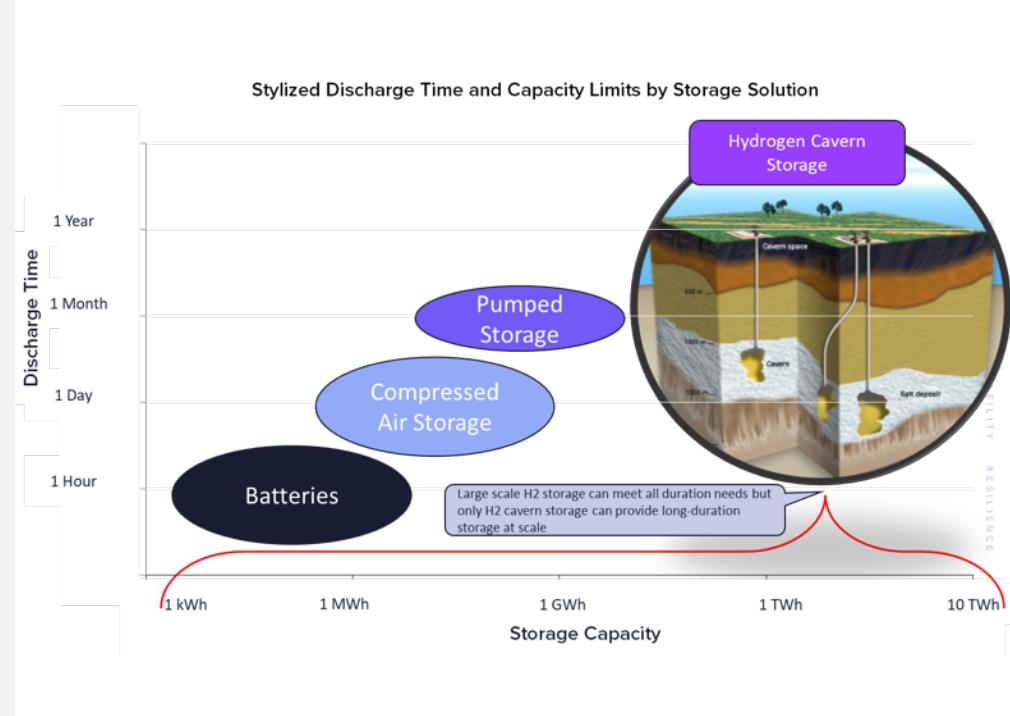
## Salt Caverns

Hydrogen storage in salt caverns is the only commercially available solution today for the long duration and seasonal storage of renewable energy. **It offers the lowest-cost solution for storing massive quantities of hydrogen** with a limited footprint and reduced visual impact.

# Hydrogen Storage in Salt Caverns

**At scale, salt cavern storage is the lowest per-unit cost solution.**

The withdrawal of hydrogen from storage is highly flexible in rate, duration, and volume. Allowing it to dispatch several days, weeks, seasons and years' worth of green hydrogen.



# The Mississippi Clean Hydrogen Hub

## Explore the MCHH Facilities & Markets

### OUR FACILITIES

- 1 **Renewable Power Source**  
Solar, Wind, Geothermal, Hydropower & Green H<sub>2</sub>
- 2 **Renewable H<sub>2</sub> Production**  
Electrolysis
- 3 **Salt Cavern Storage**

### MARKETS

- A **Heavy Industry**  
Steel, Fertilizer & Plastics
- B **Maritime Transport & Port Operations**
- C **24/7 Backup & Load Balancing**
- D **Datacenters**
- E **Heavy-Duty Transport**
- F **Rail**
- G **Aerospace**
- H **Aviation**





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Guiding heavy industry through the great green upgrade

**Jacob Susman, CEO | November 2022**  
**Ammonia Energy Association**



# We are a “pure-play” green hydrogen developer

## Our Mission

Ambient Fuels is guiding heavy industry through the great green upgrade.





## Our Impact

Adopting a zero-carbon molecule solution enables our industrial and utility customers to strengthen energy security, achieve low-carbon goals, and position themselves to capitalize on declining green hydrogen costs.



## Our Approach

We deliver custom-engineered green hydrogen solutions.

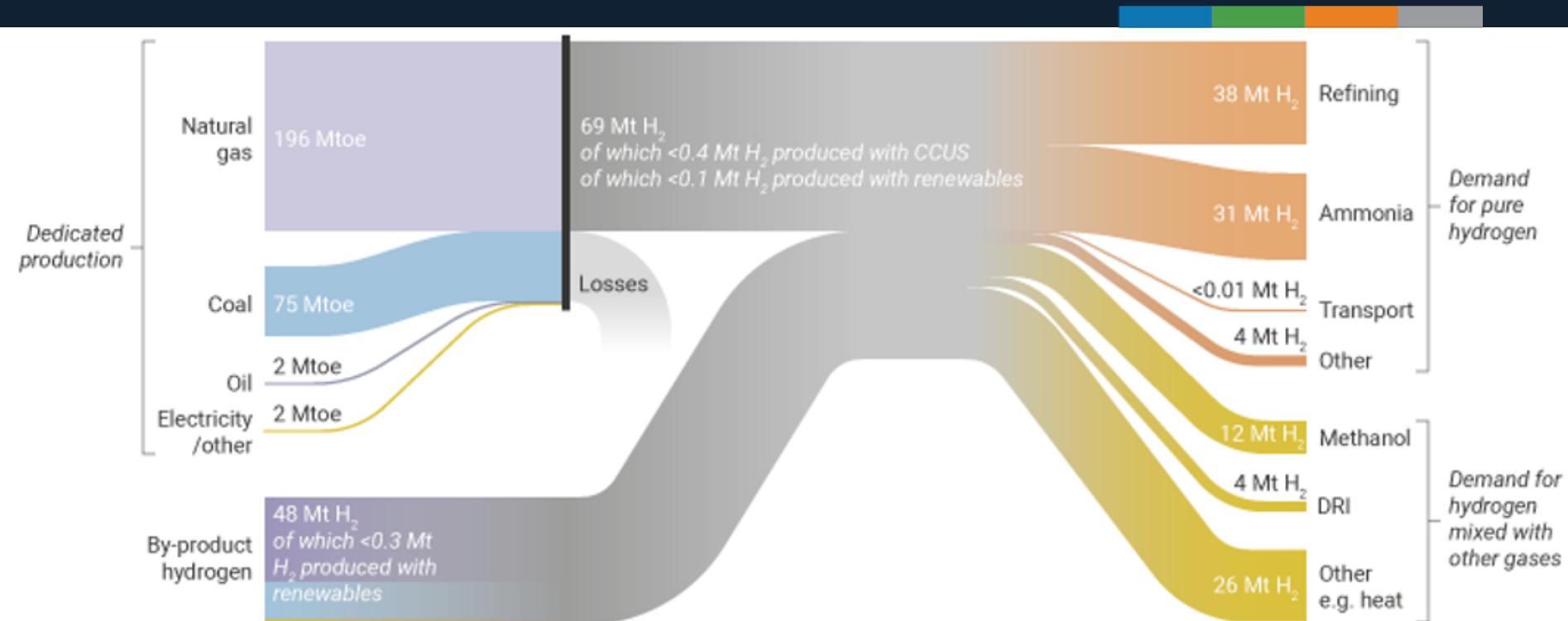
Blending development and technical expertise with our renewable energy and industrial process experience, we oversee every step of execution — from project development and design to financing and construction.



**“The IRA has dramatically boosted the cost-competitiveness and deployment of green hydrogen at scale, underscoring the importance of moving early to secure key equipment, sites, customers, and team members.”**

— Jacob Susman, CEO and Co-Founder

# Today's Hydrogen Landscape



# Key US Federal & State Government Policies



- Carbon Capture & Sequestration and Blue Hydrogen incentives via Section 45Q tax credit
- Bipartisan Infrastructure Bill: Over \$9.5 billion for Clean Hydrogen
  - \$8bn for DOE Hydrogen Hubs
  - \$1 billion for demonstration, commercialization, and deployment of electrolyzer systems
  - \$500,000,000 to support a clean hydrogen domestic supply chain
- Inflation Reduction Act (adopted 2022): 10-year spending plans over \$13 billion for Clean Hydrogen
  - Added production tax credits (PTC) and investment tax credits (ITC) for hydrogen produced via low-carbon methods
  - Extends the 30% fuel cell ITC through 2024
  - Adds a new provision to the energy ITC for energy storage, including hydrogen storage, available through 2024
- California's Low Carbon Fuel Standard credits (adopted 2009, amended 2018)
  - Market system where users and producers of clean energy, including EV fleets, earn credits through their emission reductions, while emitters purchase those credits to offset their carbon footprint



# CCS, Section 45Q Credit & Blue Hydrogen

Carbon Capture & Sequestration Credit (courtesy of CRS)  
The tax credit for carbon oxide sequestration—often referred to using its IRC section, 45Q—is computed per metric ton of qualified carbon oxide captured and sequestered. The amount of the credit depends on when the equipment is placed in service (Table 1). [The Tax Credit for Carbon Sequestration \(Section 45Q\) \(congress.gov\)](https://www.congress.gov/)

**Table I. Key Elements of the Section 45Q Credit**

Equipment Placed in Service Before 2/9/2018	Equipment Placed in Service on 2/9/2018 or Later
<b>Credit Amount (per Metric Ton of CO<sub>2</sub>)*</b>	
<u>Geologically Sequestered CO<sub>2</sub></u>	
\$23.82 in 2020. Inflation-adjusted annually.	\$31.77 in 2020. Increasing to \$50 by 2026, then inflation-adjusted.
<u>Geologically Sequestered CO<sub>2</sub> with EOR</u>	
\$11.91 in 2020. Inflation-adjusted annually.	\$20.22 in 2020. Increasing to \$35 by 2026, then inflation-adjusted.
<u>Other Qualified Use of CO<sub>2</sub></u>	
None.	\$20.22 in 2020. Increasing to \$35 by 2026, then inflation-adjusted.

## 45Q Enhancements in the Inflation Reduction Act

- Making projects eligible for "Direct Pay" for first five years of project and/or eligible for transferability
- Raising the credit value of 45Q:
  - Saline Storage: From \$50 per tonne to \$85/tonne
  - EOR Storage: From \$35 per tonne to \$60/tonne
  - Carbon Utilization; From \$35 per tonne to \$60/tonne
  - Direct Air Capture: To \$180/tonne for saline storage, \$130/tonne EOR storage, and \$130/tonne for carbon utilization
- Extending the commence construction window from 2026 to 2032
- Reducing eligibility thresholds based on quantity of CO<sub>2</sub>
  - 12,500 tonnes per year for industrial facilities
  - 18,750 tonnes per year for power plants
  - 1,000 tonnes per year for Direct Air Capture facilities



# Potential for Hydrogen Hubs

## HyDeal Los Angeles

- first initiative in North America to develop a competitive, high-volume supply chain for green hydrogen

## Corpus Christi

- Poised to lead in green ammonia
- Existing infrastructure is key

## NYSERDA Northeast Hub

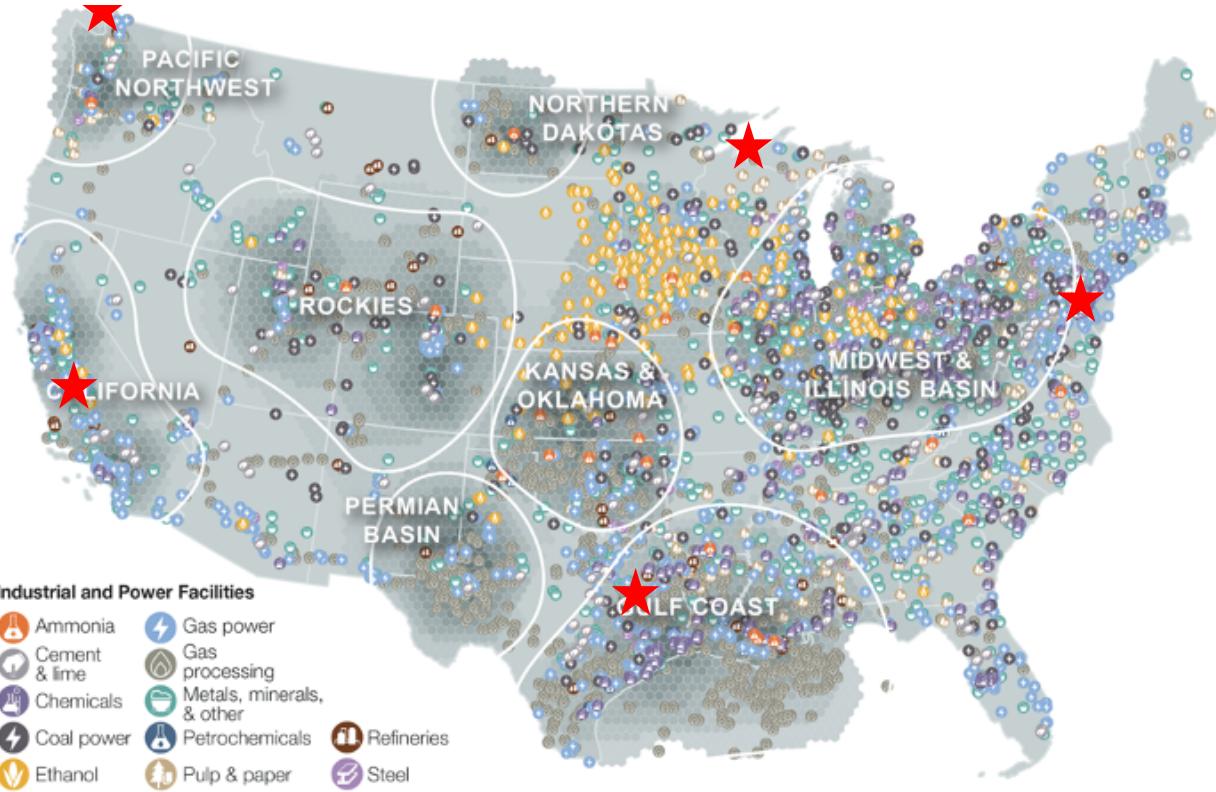
- 6 states and over 60 ecosystem partners (utility, private sector and academic)

## Hubs on the horizon

- Mississippi Clean Hydrogen Hub
- HALO (AR, LA and OK)
- Port of Houston
- Pacific Northwest Hydrogen Association
- Upper Midwest



\$8 billion program under the Bipartisan Infrastructure Law to develop at least four large-scale clean hydrogen production and utilization hubs across America



# The Inflation Reduction Act

U.S. is now the country with the  
“...single largest pot of money  
available explicitly for clean  
hydrogen projects.” —BNEF, 9/22



Iron/Steel



Power generation



Data centers



Utilities

## Key hydrogen provisions in Section 45V

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10-year Production Tax Credit with direct pay for the first 5 years

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Construction must begin by end of 2032

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Option to elect the 30% Investment Tax Credit instead of hydrogen PTC

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Hydrogen storage is included among “energy storage technology” newly eligible for the ITC (fuel cells were already eligible)

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No explicit req't that hydrogen production be co-located with renewable generation



# IRA: Credits for H2 deployment with **no upper limit**

Strong refundable tax credit incentives of up to \$3 per kilo of H<sub>2</sub> based on lifecycle greenhouse gas emissions



Iron/Steel



Power generation



Data centers



Utilities

kg CO <sub>2</sub> equivalent per kg of H <sub>2</sub>	PTC Credit %	Credit Value (\$/kg)
Not greater than 4kg and less than 2.5 kg	20%	\$0.60/ kg of H2
Less than 2.5kg and not less than 1.5kg	25%	\$0.75/ kg of H2
Less than 1.5kg and not less than .45kg	33.4%	\$1.00/ kg of H2
<b>Less than .45kg</b>	<b>100%</b>	<b>\$3.00/ kg of H2</b>

Additional \$0.30/kg PTC each for certain domestic content and energy community siting requirements. Additional grant and loan guarantee opportunities for H<sub>2</sub> projects and for customer modifications to use hydrogen.



# California Low Carbon Fuel Standard



## Transportation Applications using Hydrogen Eligible for LCFS Crediting

### Hydrogen Used in Fuel Cell Electric Vehicles (FCEV)

- Light-Duty FCEV
- Heavy-Duty FCEV
- Fuel Cell Forklifts

### Renewable Hydrogen Used for Fuel Production

- Renewable hydrogen used in the production of another transportation fuel, such as in hydrotreating renewable diesel
- Renewable hydrogen used at a petroleum refinery is eligible for Project-based Crediting under the Renewable Hydrogen Refinery Credit Program



# International Context



- REPowerEU plan (adopted 2022)
  - Increased renewable hydrogen production targets to 10 million metric tons
  - Set aside €200 million in new funding for renewable hydrogen projects
- Japan's Green Growth Strategy (launched in 2021)
  - Outlines international cooperative strategy to promote renewable hydrogen and ammonia production and usage
- Australia's National Hydrogen Strategy (launched 2018, issued Oct. 31, 2022)
  - National Gas Law extended to cover hydrogen
  - Bolsters regulatory certainty to promote hydrogen investment, development, and usage



**Open question:**  
**How will certification be handled across jurisdictions?**

