Blue Hydrogen
Another Energy Source for the Future
$4.5 Bn Investment in Louisiana

October 14, 2021
Forward-looking Statements

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The Energy Transition

**Renewable Energy**
- Solar
- Wind
- Hydro
- Nuclear
- Bio

**Transportation**
- Heavy Buses & Trucks
- Trains
- Ships
- Airplanes

**Direct Use**
- Light Transport
- Heating
- A/C - Cooling
- Lighting
- Light Industry

**Heavy Industry**
- Steel
- Chemicals
- Refining

**Clean Electricity** → **Electricity** → **Hydrogen**

**Electrolysis**

**Hydrogen**
It is a “Transition”

Most of the world’s vast energy use today comes from fossil fuels - so the transition to all Electric and Green Hydrogen cannot happen overnight.
Hydrogen Energy Transformation Stages

Stage 1 – Today: **Gray Hydrogen**

- Natural Gas
- Oil
- Coal
- Other Hydrocarbons

Conversion

Gray Hydrogen

CO₂ to Vent
Hydrogen Energy Transformation Stages

Stage 2 – Tomorrow: **Blue Hydrogen**

- Natural Gas
- Oil
- Coal
- Other Hydrocarbons

Conversion

**Blue Hydrogen**
(can be converted to Blue Ammonia for Global Distribution)

**CO₂ - Permanent Sequestration Underground**
>95%
Hydrogen Energy Transformation Stages

Stage 3 – Tomorrow: **Green Hydrogen**

Solar → Wind → Hydropower → Nuclear → Electricity Generation → Electrolysis → Green Hydrogen

Green Hydrogen (can be converted to Green Ammonia for Global Distribution)
What We Are Announcing Today

Air Products will build the world’s largest facility producing Blue Hydrogen for local and export markets.
Louisiana: The Facility

Natural Gas

Natural Gas Gasification

>750 Million SCFD

Oxygen

ASU

Nitrogen

Ammonia Plant

CO₂ Capture

Permanent Sequestration in Air Products Dedicated Underground Facility

Blue Hydrogen

Injection into the Air Products ~700-Mile Long Hydrogen Pipeline on the Gulf Coast

Blue Ammonia

Exported to Global Hydrogen Markets
Air Products’ US Gulf Coast Hydrogen Pipeline System
From New Orleans to Texas City

- ~700-mile system
- >1.9 billion SCFD capacity
- ~25 plants
Air Products’ US Gulf Coast System Can Provide Both Gray and Blue Hydrogen
Air Products’ Blue Hydrogen Facility

Air Products will invest $4.5B to build-own-operate the world’s largest Blue Hydrogen production facility in Louisiana.

The facility will capture over 5 million tons per year of CO$_2$, making it the largest Carbon Capture for Sequestration (CCS) facility in the world.

The facility is expected onstream in 2026, producing Blue Hydrogen for local and export markets.
Air Products Blue Hydrogen Facility Enables Significant CO$_2$ Emission Reductions

- If all the hydrogen was used for long-haul trucks, **down over 4 million TPY of CO$_2$ vs diesel**

- If all the hydrogen was used for power production, **down over 8 million TPY of CO$_2$ vs coal**
Why is Air Products Building this Facility?

Investment is in line with our stated **Growth Strategy**
- Hydrogen
- CO₂ Capture
- Gasification

Investment is also in line with our stated **Higher Purpose**
- Bringing people together to collaborate and innovate solutions to the world’s most significant energy and environmental sustainability challenges
Air Products’ Position in the Energy Transformation to Hydrogen

**Gray Hydrogen**
from Hydrocarbons

Air Products is the Global Leader in Gray Hydrogen Today

**Blue Hydrogen**
from Hydrocarbons with CCS

Air Products will be the Global Leader in Blue Hydrogen after Executing the Canada Project & the Louisiana Project

**Green Hydrogen**
from Wind and Solar

Air Products will be the Global Leader in Green Hydrogen after Executing the NEOM Project
Thank you

tell me more
Carbon Sequestration: >5 MTPY

- Blue Product Plant
- CO₂ Capture Equipment
- CO₂ Pipeline
- Sequestration Well
- Continuous Monitoring
- Drinking Water Zone
- Geology & water quality confirmed during testing
- Sealing Cap Rock
- Porous Rock & Storage Zone

CO₂ sequestered in pores

Approximately one mile beneath the earth’s surface

Depth
1,000 feet
3,000 feet