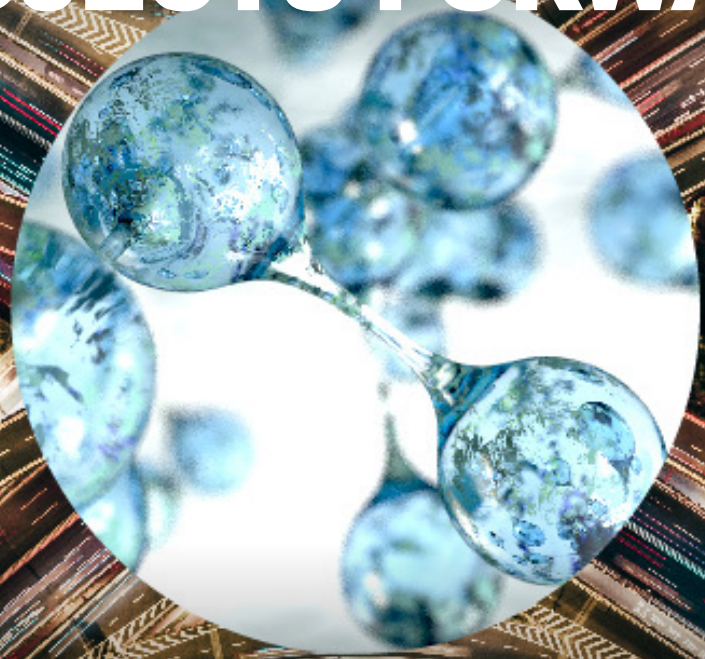
LOW CARBON HYDROGEN OPTIMIZATION
MOVING PROJECTS FORWARD



TIM BALLAI
SENIOR PRODUCT MANAGER

October 15, 2024

Honeywell
UOP

FORWARD LOOKING STATEMENTS

This presentation contains certain statements that may be deemed “forward-looking statements” within the meaning of Section 21E of the Securities Exchange Act of 1934. All statements, other than statements of historical fact, that address activities, events or developments that we or our management intends, expects, projects, believes or anticipates will or may occur in the future are forward-looking statements. Such statements are based upon certain assumptions and assessments made by our management in light of their experience and their perception of historical trends, current economic and industry conditions, expected future developments and other factors they believe to be appropriate. The forward-looking statements included in this presentation are also subject to a number of material risks and uncertainties, including but not limited to economic, competitive, governmental, technological, and COVID-19 public health factors affecting our operations, markets, products, services and prices. Such forward-looking statements are not guarantees of future performance, and actual results, and other developments, including the potential impact of the COVID-19 pandemic, and business decisions may differ from those envisaged by such forward-looking statements. Any forward-looking plans described herein are not final and may be modified or abandoned at any time. We identify the principal risks and uncertainties that affect our performance in our Form 10-K and other filings with the Securities and Exchange Commission.

AGENDA

01 Honeywell UOP in Sustainability

02 H_2 & CO_2 Capture Portfolio

03 Optimized Low Carbon Hydrogen Processes

04 Low-Carbon Hydrogen Case Studies

05 Closing / Q&A

HONEYWELL OVERVIEW

NASDAQ: **HON** | **~717** sites | **~97,000*** employees | **Charlotte, NC** headquarters | **Fortune 500**

Aerospace Technologies

Our products are used on virtually every commercial and defense aircraft platform worldwide and include aircraft propulsion, cockpit systems, satellite communications, and auxiliary power systems.

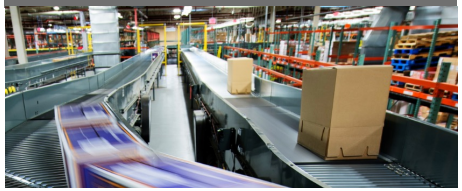
Building Automation

Our products, software, and technologies are in more than 10 million buildings worldwide, helping customers ensure their facilities are safe, healthy, energy efficient, sustainable, and productive.

Energy and Sustainability Solutions

We are positioned to serve customers with high-quality performance chemicals and advanced materials, and process technologies. By supporting the global transition towards renewable energy and a low-carbon economy, we are accelerating a more sustainable future and changing the world.

Industrial Automation



We develop and deploy an innovative range of solutions, software, and services that help keep people healthy, workers and workplaces safer and more productive, and supply chains and assets more efficient, accurate, and reliable.

Honeywell Connected Enterprise

Across our segments, we accelerate our customers' digital transformation via our enterprise performance management solution, Honeywell Forge, which brings together the data, processes, and systems into a cloud-based solution to help customers make sense of it all, creating the OT system of record. HCE's focus is software development, from the gateway to end-user applications, bringing scale and capability across all of Honeywell.

Shaping the Future Across Industries

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HONEYWELL UOP AT A GLANCE

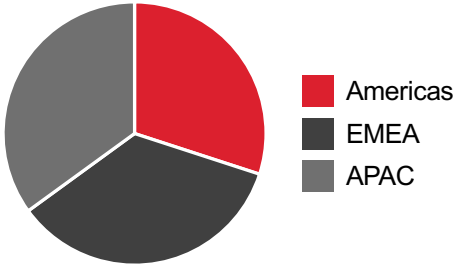
100+ Years of Global Expertise and Leading Technology Development

UOP TECHNOLOGY POWERS

- **90%** of biodegradable detergents
- **70%** of the world's polyester
- **60%** of the world's gasoline
- **60%** of the world's on-purpose propylene
- **60%** of the world's paraxylene
- **50%** of the world's renewable fuels
- **40%** of LNG processed
- **15M** tons of captured CO_2

GLOBAL REACH

Diversified regional presence that can effectively react to changes in demand



NEW TECHNOLOGIES

Honeywell UOP creates new technologies that convert oil and natural gas into transportation fuels, energy, and petrochemicals

EXPERTISE

Broadest range of downstream refining and petrochemical technologies; leading process technology licensor

2,000
Engineers and scientists

4,900
Active patents and applications

LARGEST
process licensing organization
in the world

31 out of **36**
refining technologies in use today were developed by
UOP

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SUSTAINABLE TECHNOLOGY SOLUTIONS

A New Business Unit for Honeywell

RENEWABLES FUEL	CARBON CAPTURE/ BLUE HYDROGEN	GREEN HYDROGEN	PLASTICS CIRCULARITY	ENERGY STORAGE
Reducing Diesel and Jet GHG Emissions >80%[1]	**Low Emissions Fuel for Hard to Decarbonize Applications**	**Driving toward Zero Emissions Power**	**Removing Oil & Gas Extraction from Plastic Production**	**Reducing CO_2 Emission**
UOP Ecofining™, Ethanol to Jet, and UOP eFining™ can deliver **substantial profits** plus **significant reduction in GHG emissions**	Honeywell UOP provides **efficient, tailored CO_2 capture** for pre-, post-, and oxy-combustion applications	UOP proprietary catalyst coated membrane can reduce PEM electrolyzer stack capex by 35%[2]	Honeywell Upcyle Plastics Recycling can **increase waste plastic circularity** if collection and sorting is improved	Ready-now technology to significantly **reduce CO_2 emissions** from energy and industrial point sources

Committed to Commercialization of Sustainable Technologies

Honeywell UOP

1 Greenhouse gas emission savings calculations based on California Air Resources Board methodologies

2. based on a PEM water electrolysis system using renewable power to produce 2,220 MT H2/y with 8,760 operating hours/year using UOP internal lab test results of UOP's HiFlux-114P PEM CCM and a commercially available PEM CCM

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H_2 & CO_2 Capture Portfolio

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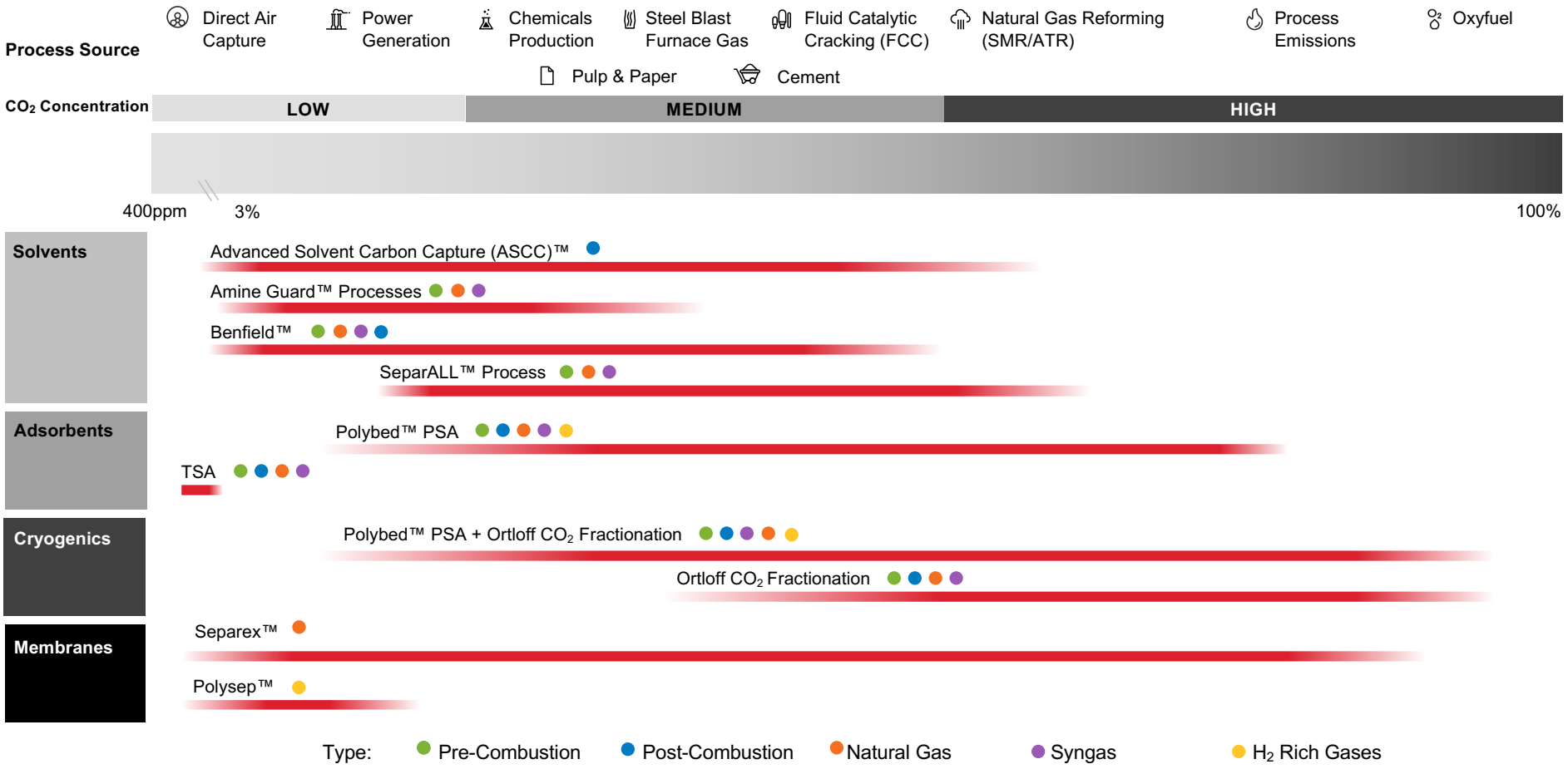
HONEYWELL CO_2 SOLUTIONS



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CARBON CAPTURE REFERENCES

Existing Units Capture Ready & Capturing			
#	**Facility**	**Technology**	**Installed CO_2 Capture Capacity (kMTA)**
1	FPSO	Membranes	26,000
2	Gas Processing Plant	Cryo-Selexol	8,400
3	Fertilizer Plant	Selexol	1,000
4	Power Plant Indiana	Selexol	1,500
5	Gas processing plants	AGFS, Selexol, Benfield	>6 Bscfd of installed capacity transitioning to CO_2 Capture plants
6	Bulk CO_2 Removal Plants	Separex	>3 Bscfd of Bulk CO_2 removal capturing & capture ready
Recent Awards			
1	ExxonMobil Baytown	Cryo-PSA	7,500
2	Wabash Valley Resources	Cryo-PSA	1,650
3	Duke DOE OECD Selection	ASCC	3,600
4	Ecopetrol, FCC	ASCC	75
5	SMR Flue Gas	ASCC	218
6	CCGT Demo	ASCC	10
7	Confidential	Cryo-PSA	6,700
8	Calpine Pastoria	ASCC	Confidential

Capturing >15 Mt per year with capacity to capture more

Honeywell UOP

Sources: ExxonMobil to Deploy Honeywell Carbon Capture Technology, Honeywell Technology Enables Large U.S. Carbon Capture And Storage Project, OCED_CCFEEDs_AwardeeFactSheet_Duke_1.5.2024.pdf (energy.gov), Ecopetrol selects Honeywell technology for advanced solvent carbon capture study (digitalrefining.com), https://www.energy.gov/fecm/project-selections-foa-2614-carbon-management-round-3

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Optimized Low-Carbon Hydrogen Processes

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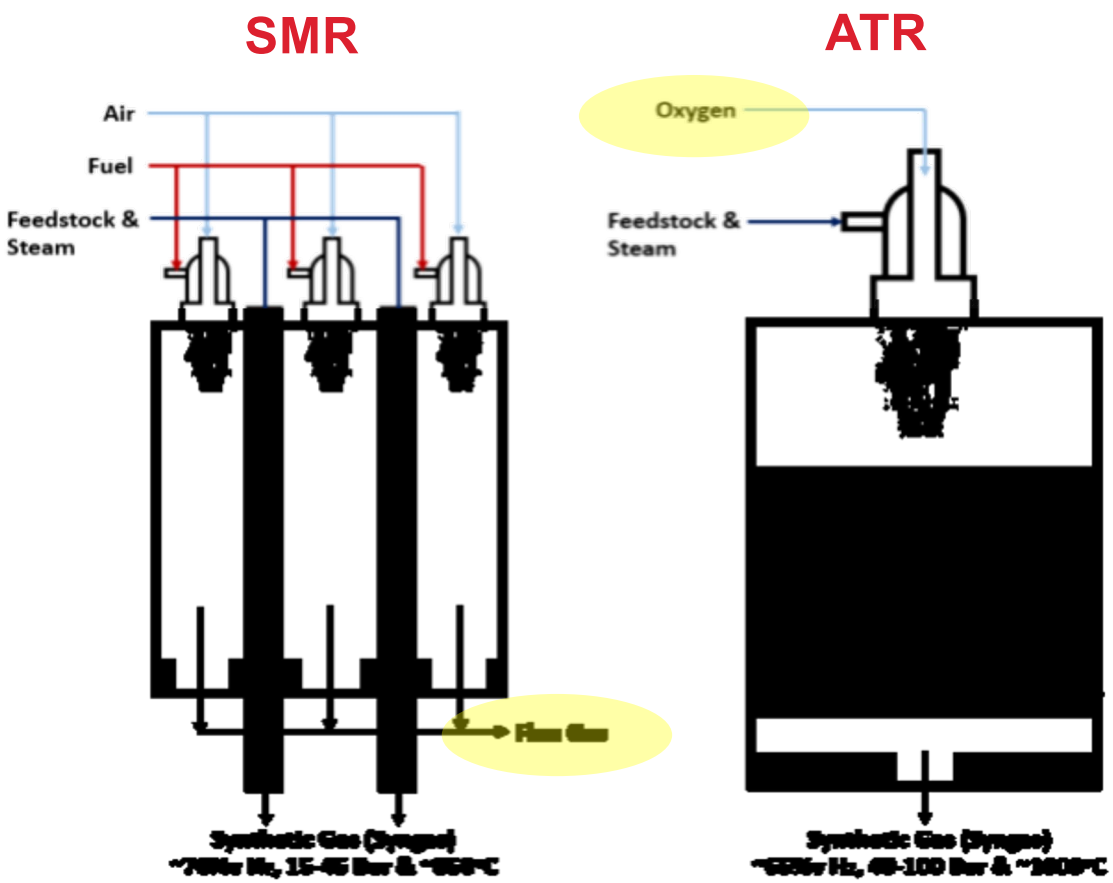
H_2 GENERATION PROCESS



Steam Methane Reforming (endothermic)
$CH_4 + H_2O \rightarrow CO + 3H_2$
$\Delta H = 206$ kJ/mol

Oxidation of Methane (exothermic)
$CH_4 + 1/2\ O2 \rightarrow CO + 2H_2$
$\Delta H = -36$ kJ/mol

Water Gas Shift (exothermic)
$CO + H_2O \leftrightarrow CO_2 + H_2$
$\Delta H = -41$ kJ/mol

Source: IEAGHG

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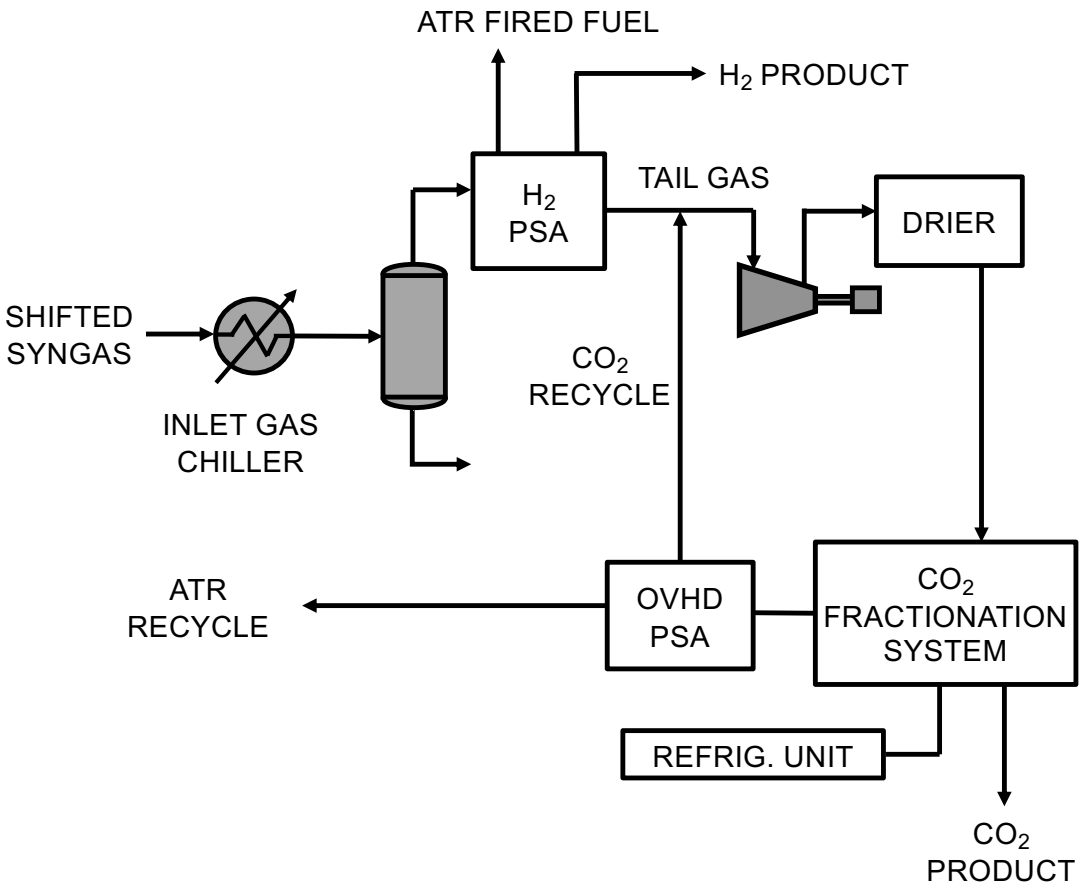
ATR RECYCLE
LOW C.I. CONFIGURATION
UOP CO_2 FRACTIONATION SYSTEM



Off-gas Recycle to ATR Feed

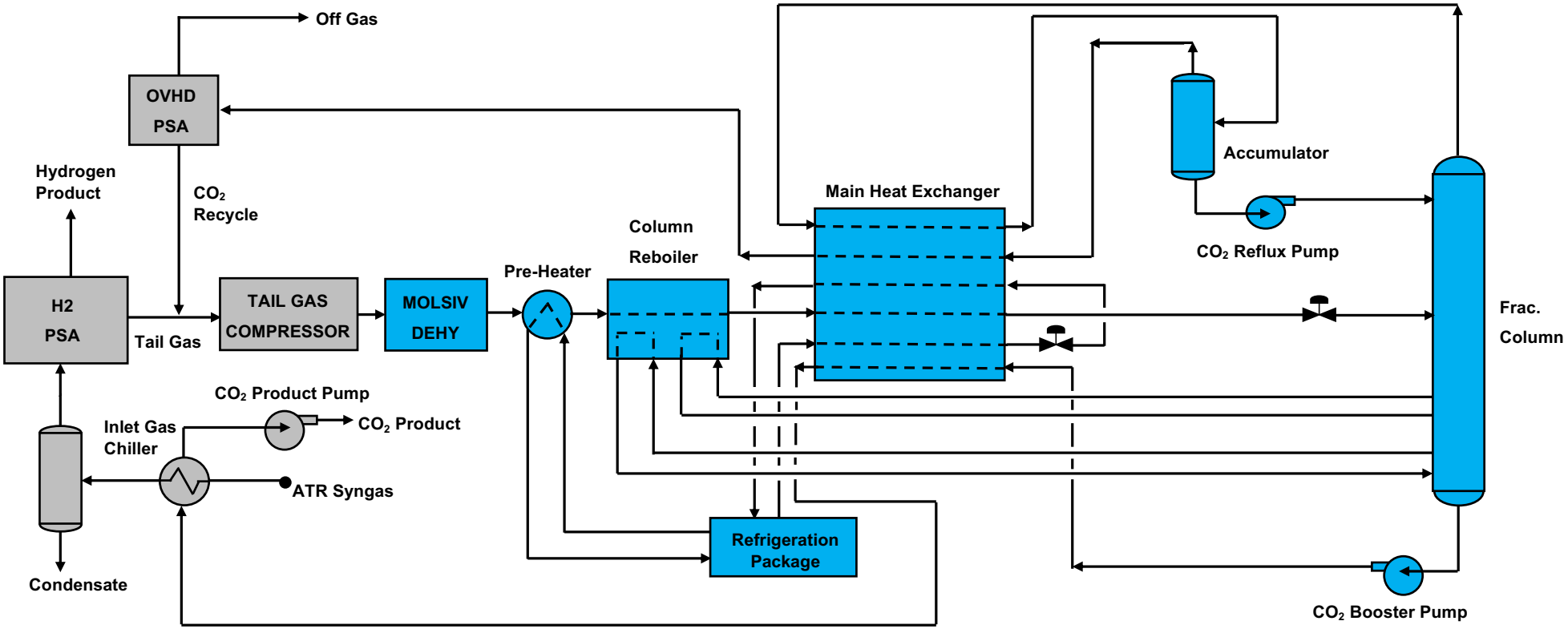
- Low Carbon Emissions
- Higher Feedstock Efficiency

Scope 1 Emissions: <0.1 kg CO_2 / kg H_2

Carbon-free fuel gas stream produced in H_2 PSA

- Selective rejection of inerts
- Approximately 30 psi(g)
- Approximately 90 mol% H_2 and 10% N_2 + Argon

CO_2 FRACTIONATION SYSTEM



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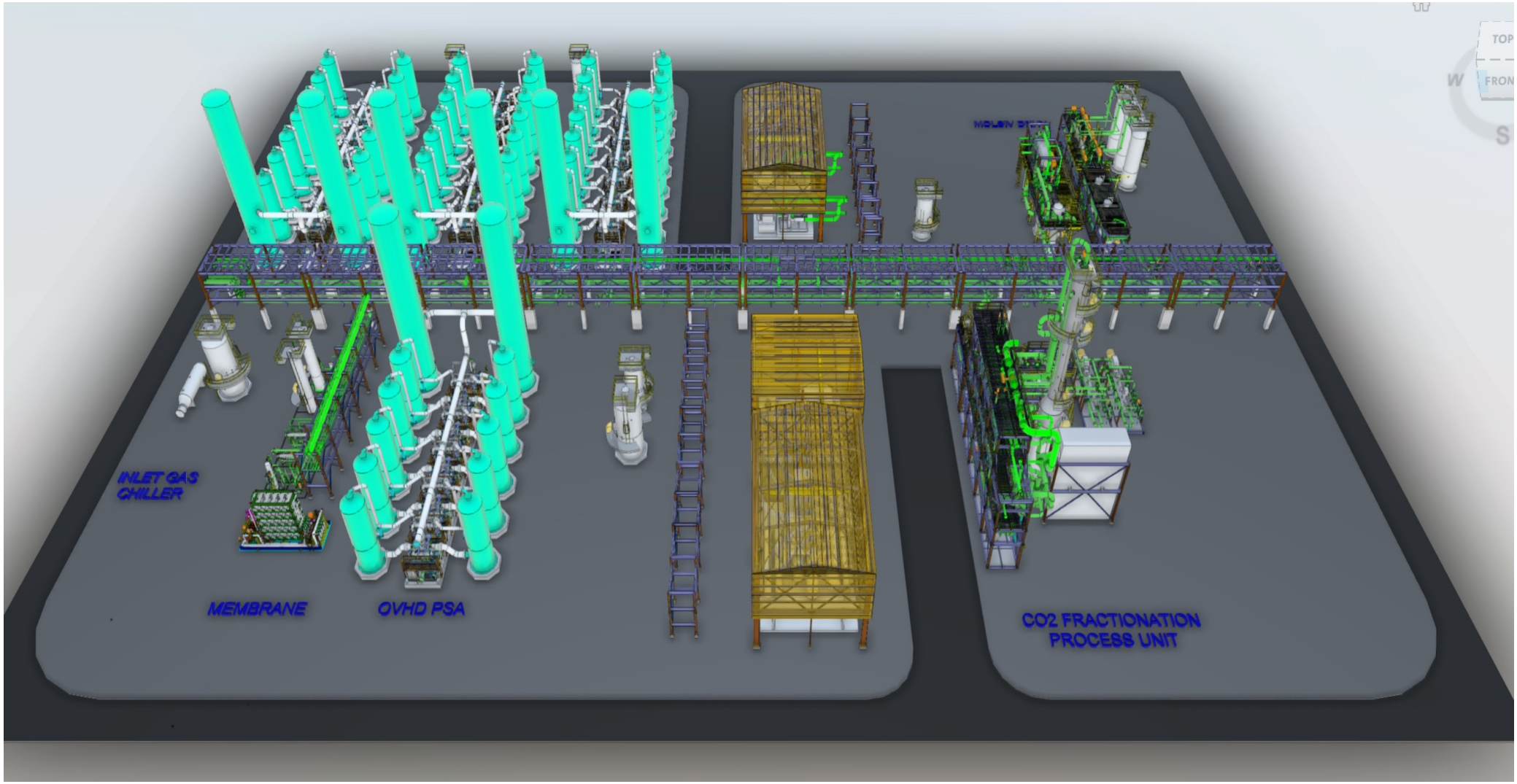

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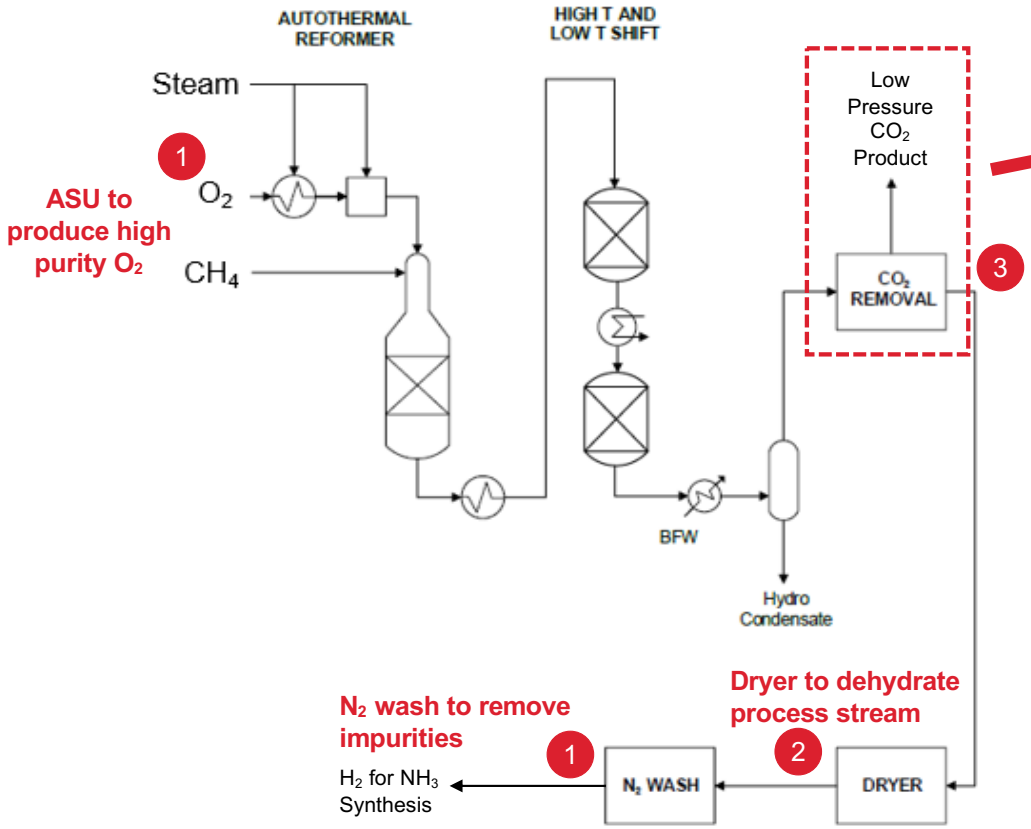
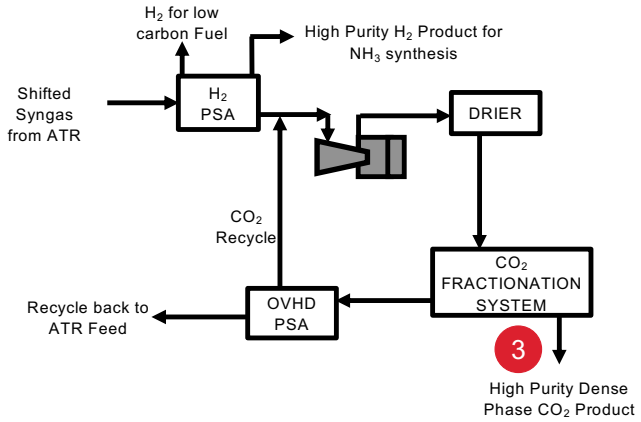
CO_2 FRACTIONATION IN AMMONIA PRODUCTION





1. Argon Management critical: PSA+Cryo can reduce project cost at 99.8% O_2 purity because the **Argon purge from the PSA is enough to eliminate the need for the N_2 wash process**.
2. Drying inherent to H_2 separation in CO_2 Fractionation Process
3. CO_2 Fractionation **process inherently produces high purity CO_2 at up to 2,200 psig**, where only pumping is required to provide a liquid product stream. Pumps can be provided in parallel to maximizes reliability of the system at a low cost.

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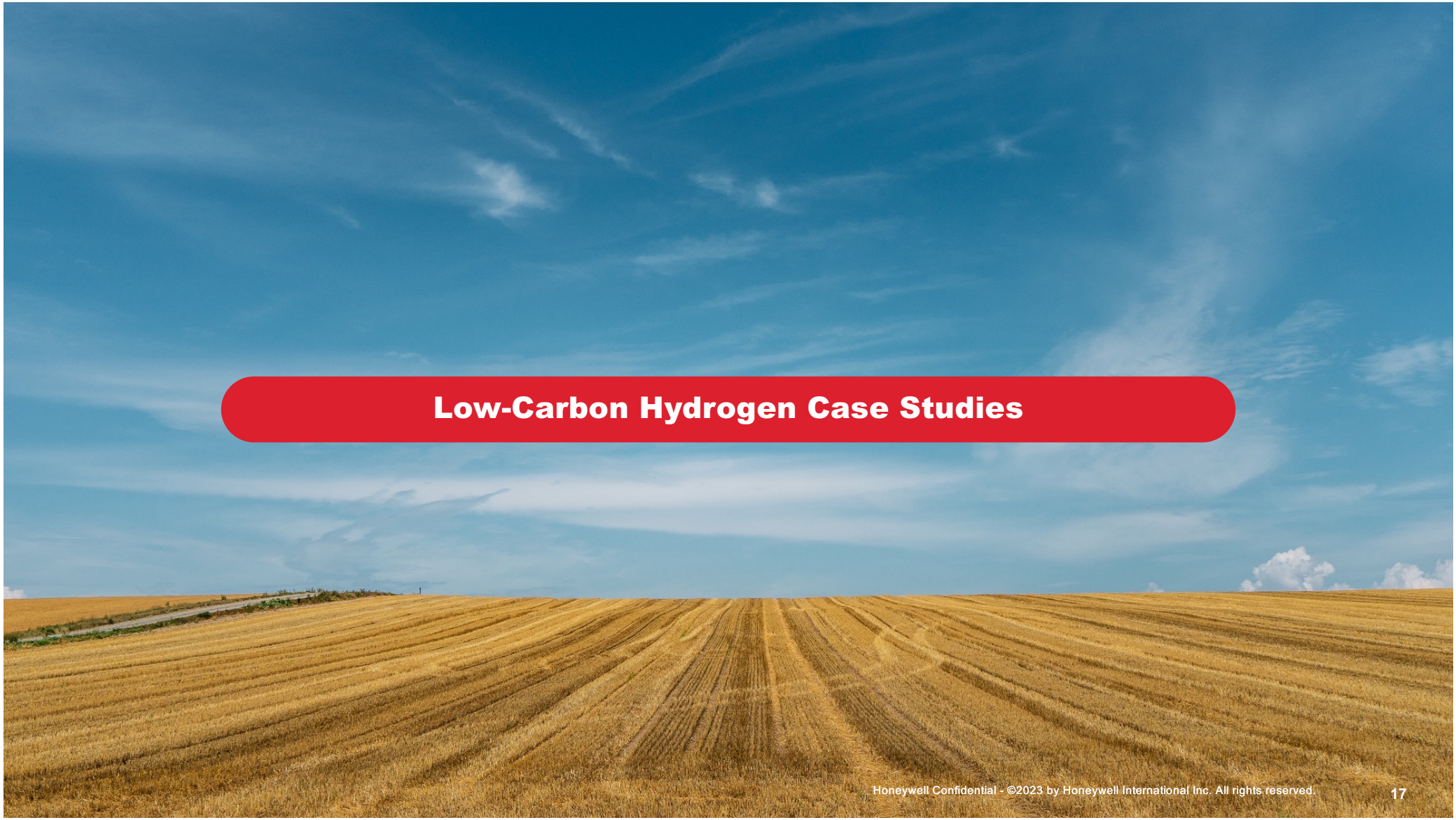

Low-Carbon Hydrogen Case Studies

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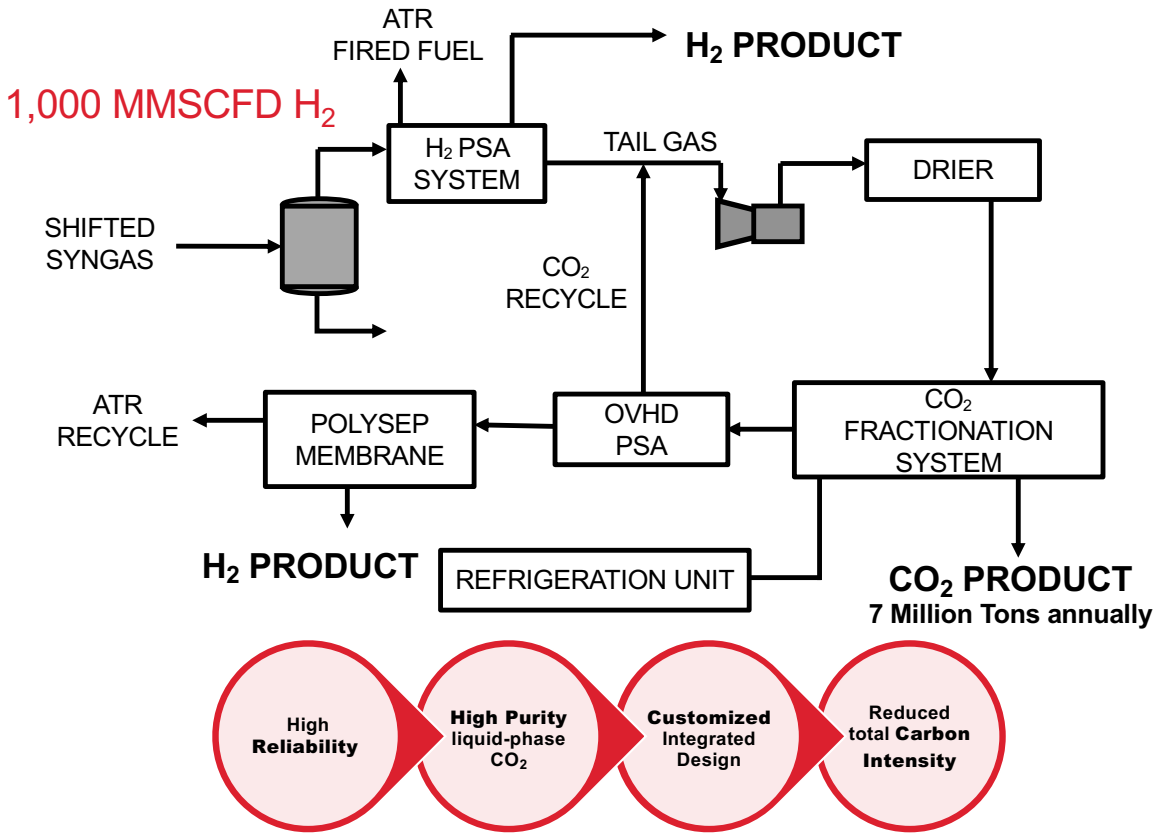
EXXONMOBIL CASE STUDY

UOP H_2 PURIFICATION AND CO_2 FRACTIONATION



CO_2 Fractionation System

- Enables the capture of about **7 million tons of CO_2 annually**, equivalent to the emission of 1.5 millions of automobiles for one year[1]
- **98% CO_2 emissions captured** across Low-Carbon Hydrogen production facility[2]

H_2 Purification

- **High Purity H_2 produced** from Pressure Swing Adsorption and Polysep™ Membrane technologies
- ExxonMobil's H_2 production project will enable **up to 30% of scope 1 and scope 2 emissions** reduced at their Baytown facility[3]

[1] Based on the EPA's GHG equivalency calculator comparing nearly 7 million tons of CO2 per year with gasoline-powered passenger vehicles on the road.

[2] CO_2 equivalent emissions is a calculated value based on the combined carbon compounds emitted from the Hydrogen production and Carbon Capture equipment plus the combined carbon compounds in the H2 product.

[3] Based on press release issued Feb 15, 2023, announcing HON H2 tech in Exxon Baytown facility. Link

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WABASH VALLEY RESOURCES

Overview

UOP selected as technology provider for carbon capture and H_2 purification for clean H_2 production from gasifier at **Wabash Valley Resources (WVR)** in West Terra Haute, Indiana, United States

Why it Matters

- One of the largest **CCS projects** (1.65 Mt/yr CO_2)
- Second US project to sequester CO_2 in permanent geologic storage
- **Demonstrates large-scale commercially viable clean H_2 and CCS projects under current regulatory and policy framework**

Technology

Integration of Modular MOLSIV, Modular Ortloff CO_2 Fractionation System, Modular PSA

Solution Advantages

- Commercially proven technologies
- Lower Capex / Opex
- Faster modular execution
- Parallel on-site and module fabrication execution
- High-quality shop-fabricated equipment
- Efficiency: single supplier for technology and equipment allows for less handoff
- Bankability: well-recognized in the market for both technology licensing and modular equipment

One of the largest carbon capture and clean H_2 production facilities in the US to date

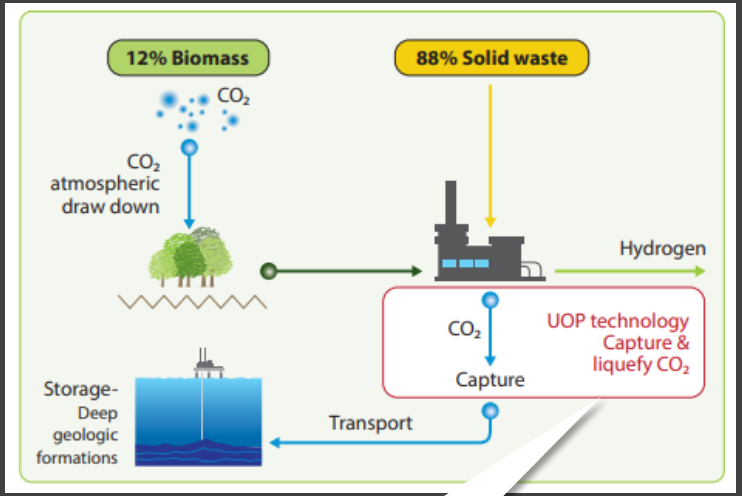

Figure 1: Overall flow scheme

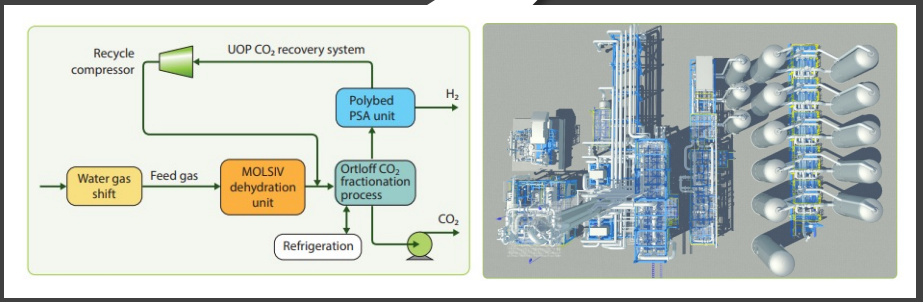

Figure 2: Honeywell CO_2 capture solution

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THANK YOU
FOR YOUR PARTICIPATION

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