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Description:	S2.2C Eric Guter, Hydrogen for Mobility Solutions
Filer:	Raquel Kravitz
Organization:	Hydrogen for Mobility Solutions
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Moving forward

California Energy Commission 2021 Integrated Energy Policy Report (IEPR) Workshop July 28th, 2021

Eric Guter, Vice President, Hydrogen Mobility Solutions

Air Products is the world's leading hydrogen producer

Built on deep experience, strong performance, high ambitions

1 only US-based global industrial gas company	**19,000** employees	**1,800** miles of industrial gas pipeline	**50** patents for hydrogen fueling
$8.9 billion in sales from operations	**81** years in business	**1.5 million** fuelings per year	**30+** years supporting California's clean fuels program
~$60B market cap	**750+** production facilities	**250+** H_2 fueling projects	**$8B+** announced to accelerate transition to zero-carbon transportation

Ready to support sustainable transportation goals by providing 100% carbon-free hydrogen for mobility

Air Products is #1 in hydrogen

Moving forward

Hydrogen Production Key Figures

>110 Hydrogen production Facilities

(SMR, PHG, LHY, BHY, Electrolysis)

>8,000 MTD Capacity

Incl. ~600MTD Blue H2 of Port Arthur

>1,600 MTD to be built over next 5 years


Fort Saskatchewan, Alberta


Corunna [SMR & LHY]


Rotterdam


CAPC (Chengdu)


Zhangjiagang


Marathon (Catlettsburg)


Tarragona


Kochi


Pasadena


Valero (Port Arthur)


Shell (Convent)


Port Arthur, TX

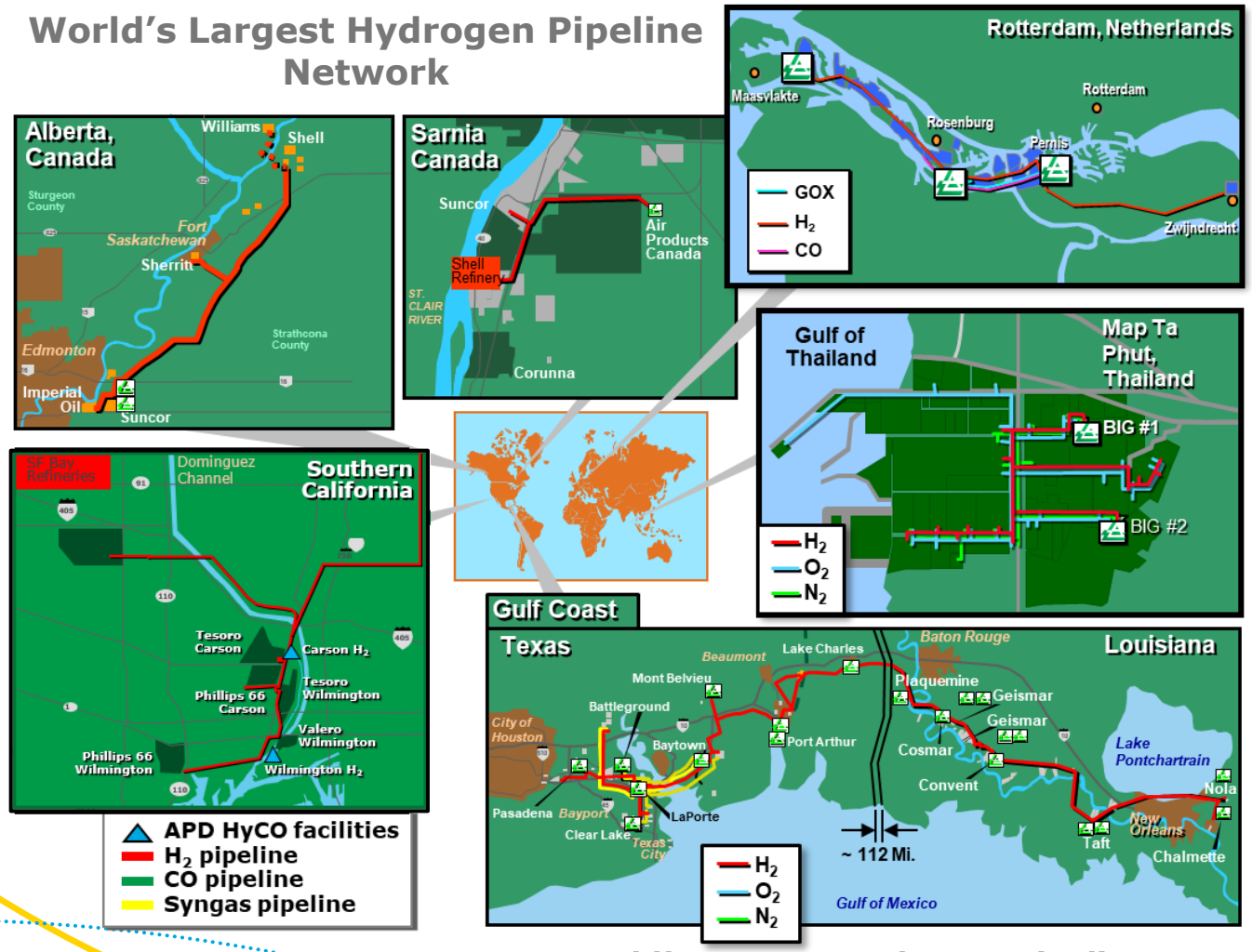

LaPorte


Covestro (Baytown)


ExxonMobil (Baton Rouge)

Air Products offers a full range of distribution options

World's Largest Hydrogen Pipeline Network



World's Longest Hydrogen Pipeline
≈700 miles (>1100 Kms)

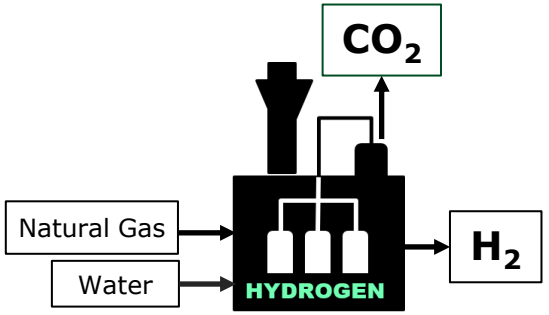
15 Million miles (24 Million kms) Driven / Year

NH_3 as fuel or as carrier for H_2

The world is moving towards low-carbon hydrogen production

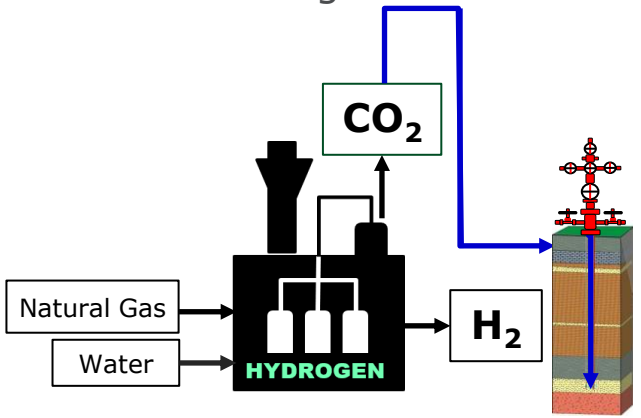
Grey Hydrogen

- Steam methane reforming (SMR)
- Currently, ~95% of hydrogen in the world is gray and produced by SMR



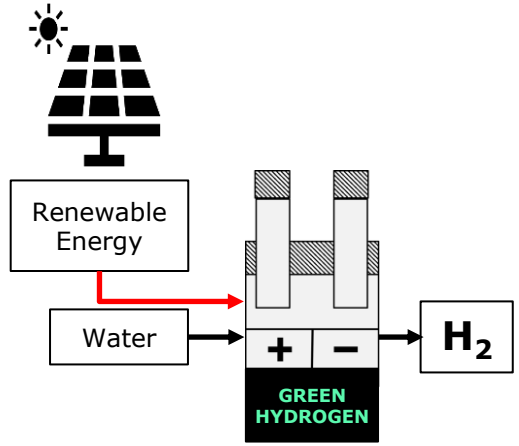
Blue Hydrogen

- SMR with CO_2 capture and storage
- Enables decarbonization of plants that are already built
- Can achieve negative carbon emissions utilizing biomass



Green Hydrogen

- Electrolysis of water with renewable energy
- CO_2-free, requires new construction and low-cost renewable energy



Current state
(~70 million tonnes H_2 annually)

Carbon-free future
(50–100+% CO_2 reduction w/CC, carbon-free w/Electrolysis + Renewable Power)

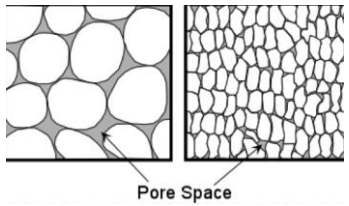
Key to decarbonization:
Implementation of effective policy that is technology agnostic

Renewable energy and hydrogen are complementary for decarbonization transportation and heavy industry

	Renewable energy & Battery electric technologies		Hydrogen & Fuel cell technologies	
Mobility	Cars	Buses on shorter routes	Buses	Port equipment (drayage trucks, yard switchers etc.)
	Light- and medium-duty trucks	Commuter rail (via catenary)	Medium- and heavy-duty trucks	Rail
Industry / heating	Light industries	Heating / cooling	Heavy industries (Shipping, aviation, steel, aluminum, concrete, etc.)	
Energy storage	Short-term lithium ion		Long-term storage of renewable energy	

Opportunities to accelerate the energy transition

Production



Policy encouraging rapid development of new, decarbonized sources of hydrogen

- Easy access to pore space for permanent sequestration of CO_2 from industrial processes
- Increased financial support for qualified hydrogen production projects

Infrastructure

Support to expand infrastructure to drive and meet growing demand

- Extend LCFS capacity credits (HRI) to heavy-duty applications
- Contracts for differences or other mechanism to support fueling station network development

Market Certainty

Clear regulatory signals that influence fleet purchasing decisions and planning

- Long-term visibility on purchase incentives for transit, heavy-duty, and off-road fuel cell and other ZEV
- Clear policy signals to decarbonize industry and power plants, including using CCS and low-carbon hydrogen

Streamline permitting