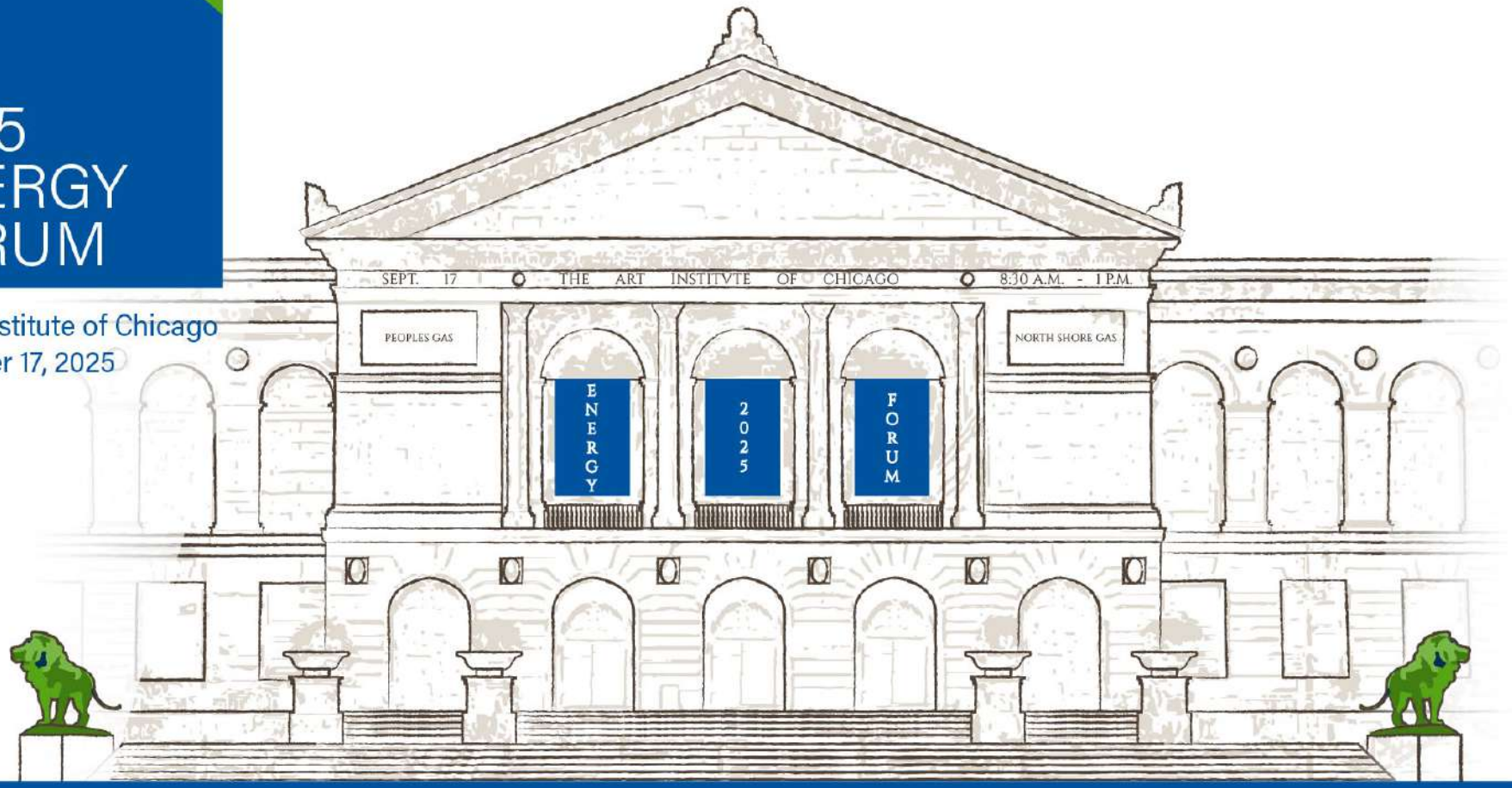
2025 ENERGY FORUM

The Art Institute of Chicago
September 17, 2025



PEOPLES GAS®
ENERGY EFFICIENCY PROGRAM

NORTH SHORE GAS®
ENERGY EFFICIENCY PROGRAM

2025 Energy Forum

Sept. 17, 2025

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Welcome

Christina Frank

Director — Energy Efficiency and
C&I Customer Strategy

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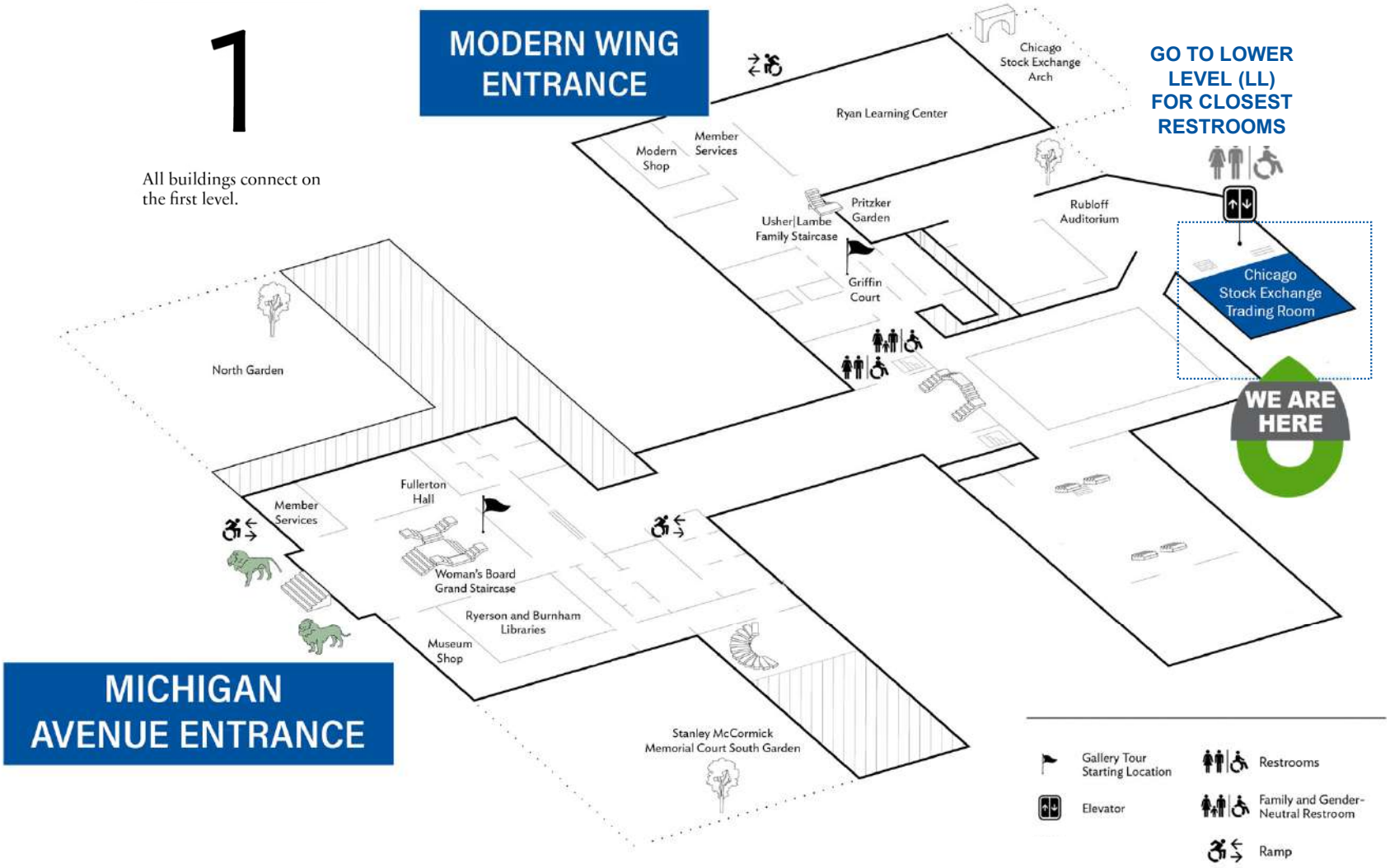
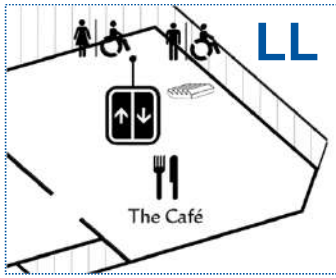
Agenda

Time	Presentation	Presenter
8:30 – 9:00	**Registration, Breakfast, and Networking**	
9:00 – 9:05	**Welcome**	Christina Frank
9:05 – 9:20	**Keynote Speaker**	Maria Bocanegra
9:20 – 9:30	**Regulatory Update**	Tom Aridas
9:30 – 9:45	**Insights on Natural Gas Market**	Sarah Mead
9:45 – 10:05	**Hydrogen in the Energy System's Transformation**	Todd Duffield
10:05 – 10:15	**Energy Efficiency Overview**	Jarred Nordhus
10:15 – 10:25	**Customer Spotlight: The Art Institute of Chicago**	T.J. Kennedy
10:25 – 10:45	**Energy Efficiency Awards Presentation**	Jarred Nordhus
10:45 – 10:50	**Closing Remarks**	Christina Frank
10:50 – 12:00	**Lunch**	
12:00 – 1:00	**Group Photo and Museum Tour**	

1

All buildings connect on the first level.





Safety Message

- Change your furnace air filter
- Clear dust and debris from any outdoor HVAC units
- Clean your HVAC registers and ducts
- Move any combustible products away from your furnace
- Change the water panel of your home humidifier

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Keynote Speaker

Shaping the Future of Energy

Maria Bocanegra

President – Peoples Gas and
North Shore Gas

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Environmental and Community Impact

ENVIRONMENTAL IMPACT (since 2012)

161,000,000
Therms saved

853,000
Carbon reduction in tons

1,046,000
Acres of trees planted

181,000
Cars removed from the road

100,000
Homes' energy use offset

COMMUNITY IMPACT (since 2017)

1,028,000
Residential homes served

204,000
Income-qualified homes served

6,900
Businesses served

$61 million
Business rebates/incentives

549
Direct jobs

25%
Diverse spend (2022-2024)

Regulatory Update

Tom Aridas

Vice President — Local Affairs and Community Relations

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Pipe Replacement Program (PRP)

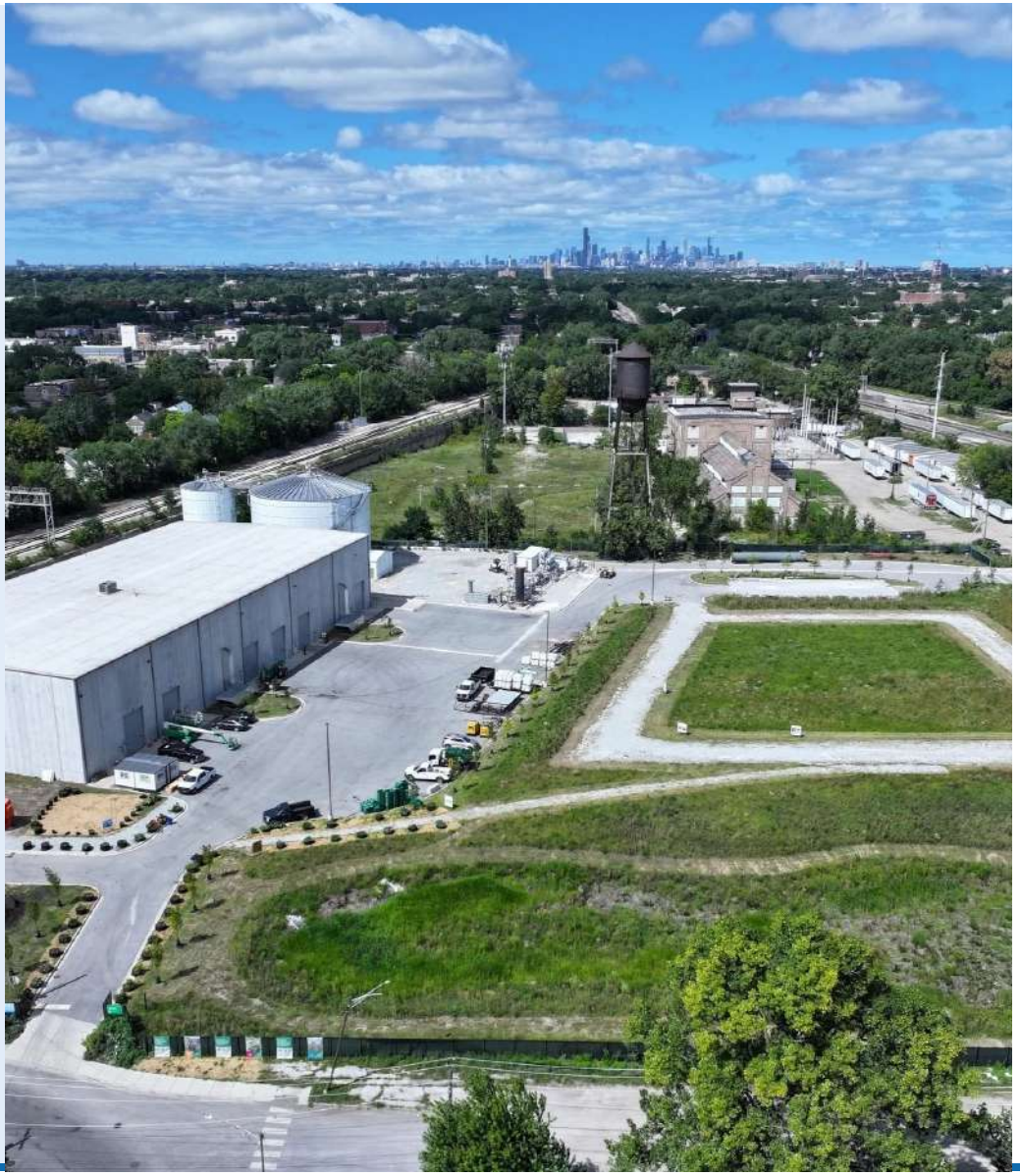
- ICC requirements and obligations
- Current state and planning
- Next steps

ICC Future of Gas Proceeding

- Pilot selection process
- Decarbonization pathways study
- Phase 3 – legislative process
- Next steps

State Legislative Updates

- Omnibus energy bill did not pass in 2025 spring session
- Veto session – October 2025
- 2026 new session



Green Era Chicago Renewable Energy Center

- Grand opening ribbon cutting - April 25
- Operational update

Insights on Natural Gas Market

Sarah Mead

Director — Gas Supply

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Natural Gas – Regulation Bodies

- Federal Regulation (FERC) – Federal Energy Regulatory Commission
  - Transportation, storage and sales of natural gas in interstate commerce
- State Regulation
  - Tariff (distribution rates, extension rules, service rules)
  - Gas cost rates (transportation & storage, gas purchases, hedging)
  - Pipeline safety (federal and state rules)

Natural Gas – Regulated

- Natural gas commodity is de-regulated
- Transportation of natural gas is highly regulated
  - Interstate transport
    - Provide the market “open access” to gas transportation assets
    - Mitigate abuse of limited gas transportation assets

Natural Gas - Supply and Demand

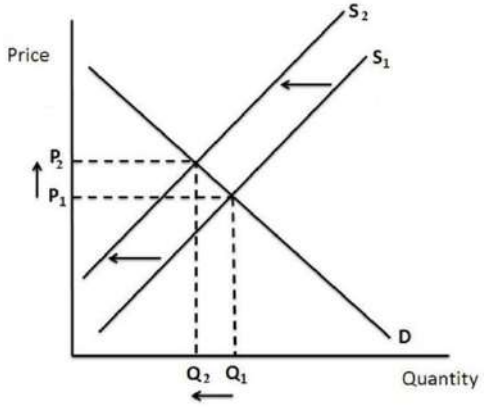
- Follows the law of supply and demand—always looking for the balance
  - When supply exceeds demand, prices are lower
  - When demand exceeds supply, prices are higher

Drivers for lower prices:

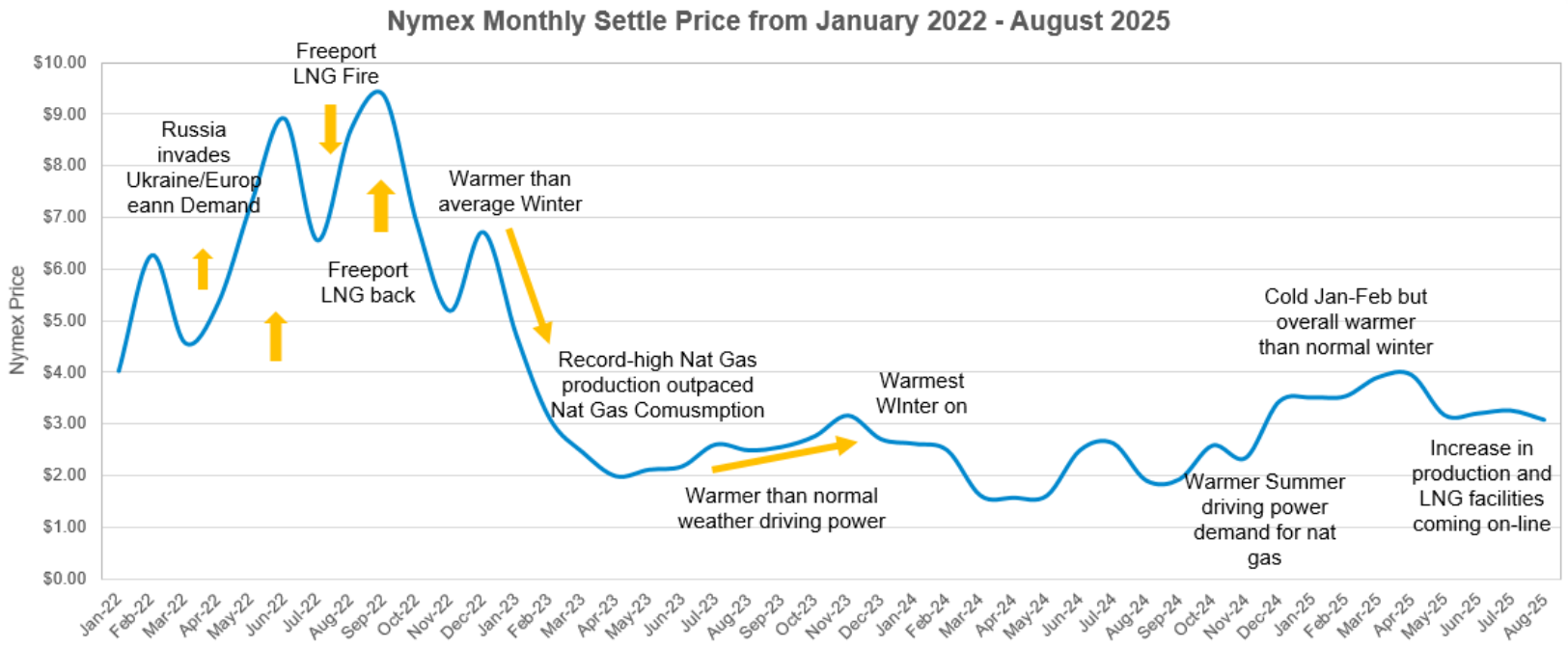
- Increased production (supply)
- Adequate storage inventories (supply)
- Greater energy efficiency (demand)
- Economic down-turn (demand)
- Weather (demand)
  - Warm winter
  - Cool summer

Drivers for higher prices:

- Production losses (supply)
- Low winter storage inventories (supply)
- Increased gas usage for (demand)
- Economic recovery (demand)
- Weather (demand)
  - Cold winter
  - Hot summer

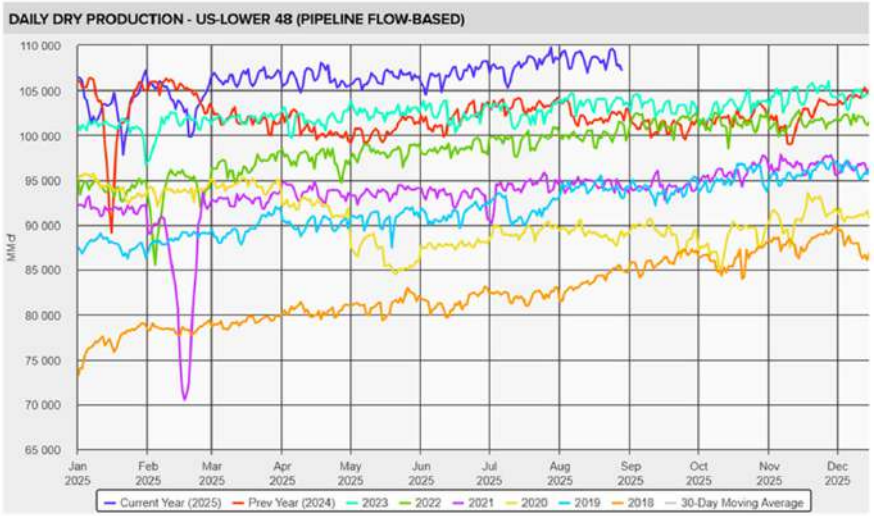


Natural Gas – How Balanced Is It?



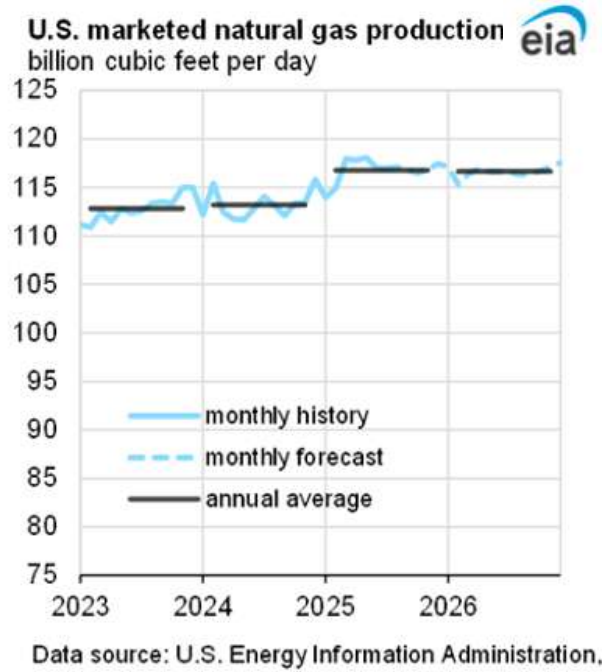
Natural Gas – U.S. Production

- Upward trend of U.S. natural gas production
- In 2018, production increased from 75 Bcf/d to the upper 85 Bcf/d range
- By 2020, average had increased above 90 Bcf/d until seeing a slight decrease due to demand decline during the pandemic
- Trend continues to climb to a current level above 100 Bcf/d in 2024 and 2025
- **Risk to this trend is if the price of natural gas falls to a level where it is unprofitable for the producer**



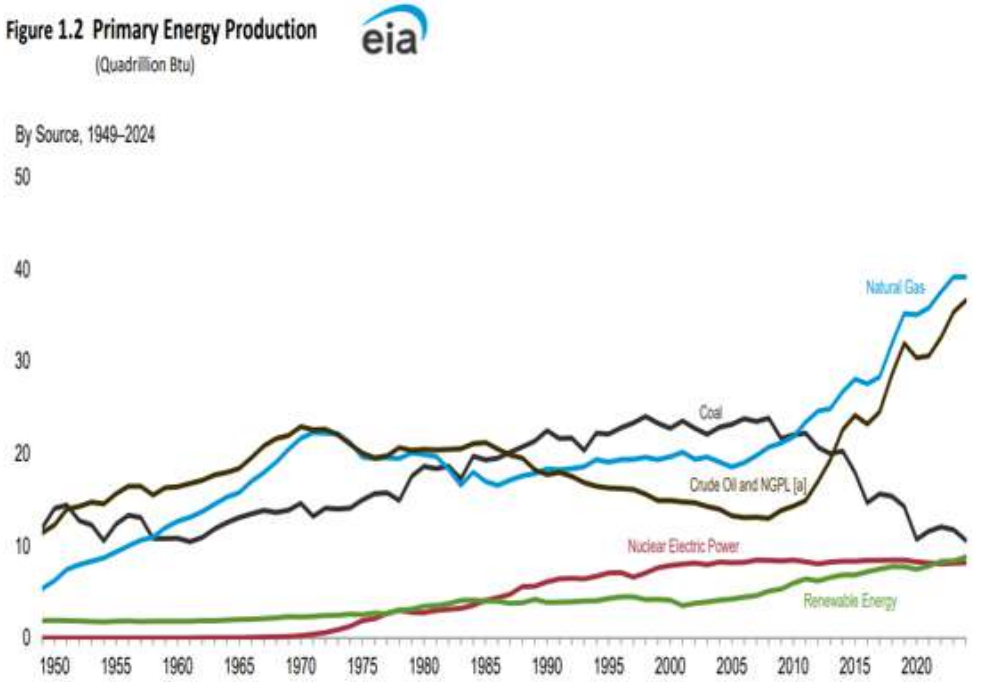
Natural Gas – Production Forecast

EIA is forecasting a continued increase of U.S. natural gas production over the next few years, up to the 115 to 118 Bcf/day range by 2026



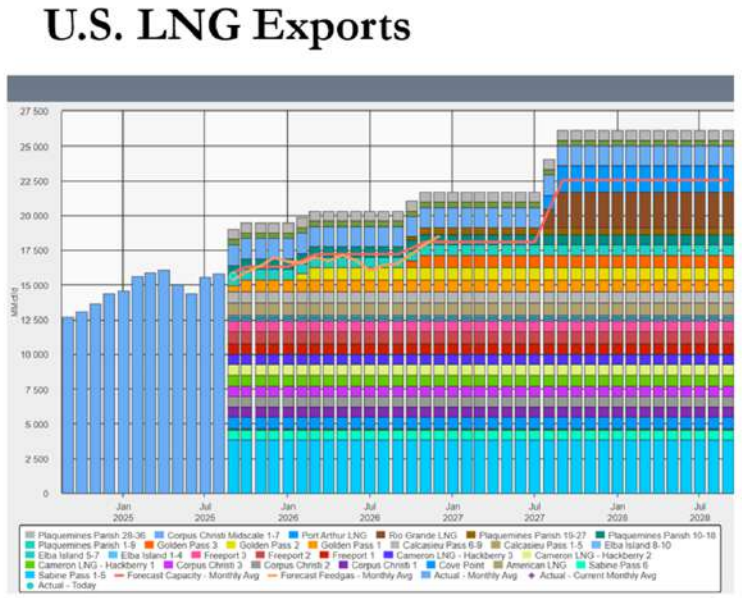
Natural Gas – Energy Production by Source

- Natural gas continues to have a solid footprint in U.S. primary energy production over the last half century
- As coal decreases, increases in renewables such as solar and wind technology continue
- Natural gas has risen to fill the gap between the decline in coal and the growth in renewables



Natural Gas – LNG Exports

- U.S. liquefied natural gas (LNG) exports current and planned through 2028
- Current average is 16 Bcf with capacity to go up to 18 Bcf/day
- More LNG facilities are expected to come online, raising exports to 26 Bcf by 2028



Average LNG Facility Gas Inflows – 15.9 Bcf per day

Data - Reuters

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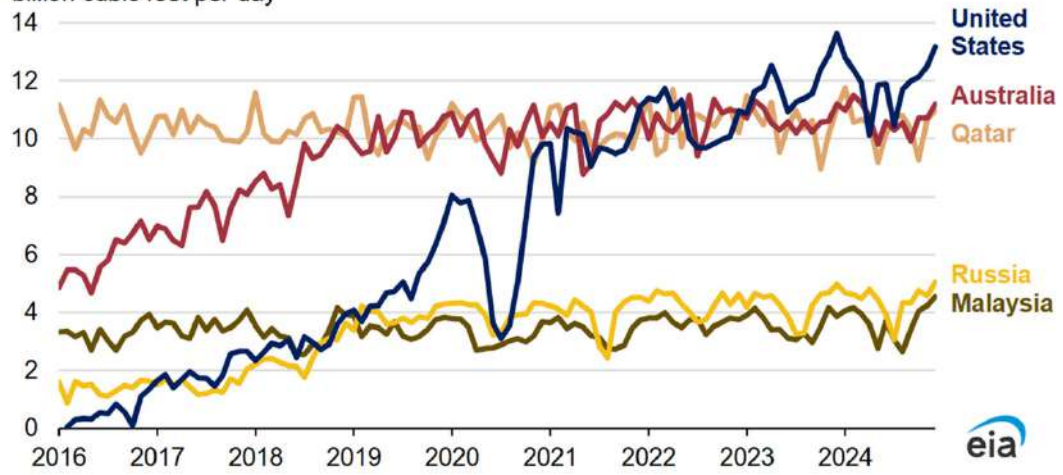
Natural Gas – LNG Exports

MARCH 27, 2025

The United States remained the world's largest liquefied natural gas exporter in 2024

Monthly liquefied natural gas exports from select countries (Jan 2016–Dec 2024)
billion cubic feet per day



Data source: U.S. Energy Information Administration, *Natural Gas Monthly*; Cedigaz

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Supply Risks and Costs

- Purchasing natural gas
  - Gas trades in the market the day before it is consumed
  - An unexpected outage would require same day purchases from suppliers
  - Can only purchase the **quantity** that is available at the **price** offered
    - February 17 – 18, 2025
      - Gas Supply purchased 100,000 dth at $12/dth, totaling $1.2M
    - February 13 – 16, 2021 Chicago Citygate prices were $130/dth
- Risk of low/no available supply at Chicago Citygate
  - Pipeline capacity is fully subscribed in the Midwest
  - If any utility or supplier needs additional supply, they are likely buying it at the Chicago Citygate
    - Increased demand will reduce available supply

Manlove Field

- Located in Champaign, IL
- Underground storage
  - 36.5 Bcf capacity
    - Enough to warm 320,000 homes each year
  - 29% of Chicago peak day
- Liquefied natural gas (LNG)
  - 1 Bcf capacity in 2 tanks
  - 16% of Chicago peak day

Questions?

Hydrogen in the Energy System's Transformation

Todd Duffield
Market Strategist — Natural Gas Infrastructure and Fuels

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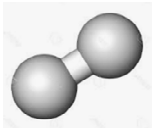
Hydrogen in the Energy System's Transformation

- Why hydrogen and where does hydrogen fit?
  - Insight from Electric Power Research Institute
- Leveraging infrastructure and expertise for hydrogen
  - Insight from Sandia National Laboratories, US Geologic Survey (USGS) & Advanced Research Projects Agency – Energy (APRA-E)
- Peoples Gas and North Shore Gas - leadership on the long journey
  - Energy transition readiness
  - Supporting innovation

Why Hydrogen? Hydrogen Properties Compared to Natural Gas

Hydrogen (H_2) 

Natural gas (methane-CH_4)

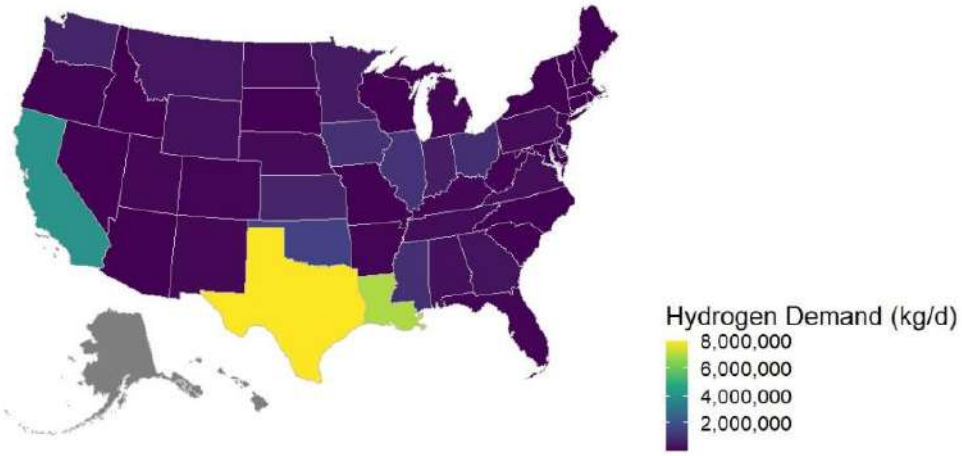
	Hydrogen	Natural Gas	Notes
Symbol	H_2	CH_4	Hydrogen has no carbon
Mass (g/mole)	2	16	Hydrogen is smaller/lighter
Flammability limits	4% to 70%	7% to 20%	Higher % easier combustion
Flame speed	250	35	Faster speed - complete combustion
Heating value (btu/ft3LHV)	266	881	Hydrogen volume needs 3 to 1 to replace natural gas
Primary emissions	H_20*	H_20, CO_2	Hydrogen – absence of carbon

Where Does Hydrogen Fit?

- Worldwide hydrogen production: ~100 MMT
- Hydrogen has historical uses
  - Town gas
  - Space applications
- Currently hydrogen's main use is in industrial applications
  - Refining petroleum, producing chemicals
  - Treating metals, production of stainless-steel alloys
  - Pharmaceutical manufacturing
  - Glass manufacturing
  - Electronics, semi-conductor chip manufacturing
- Increasingly used as clean energy carrier
  - Energy storage, electricity generation, heating, transport sectors, etc.

Ammonia (NH_3) for fertilizer

US State Total Daily Demand of Hydrogen
Current Hydrogen Demands



Source: EPRI, SEP North American Hydrogen Market Model

Hydrogen Usage in the U.S. Today

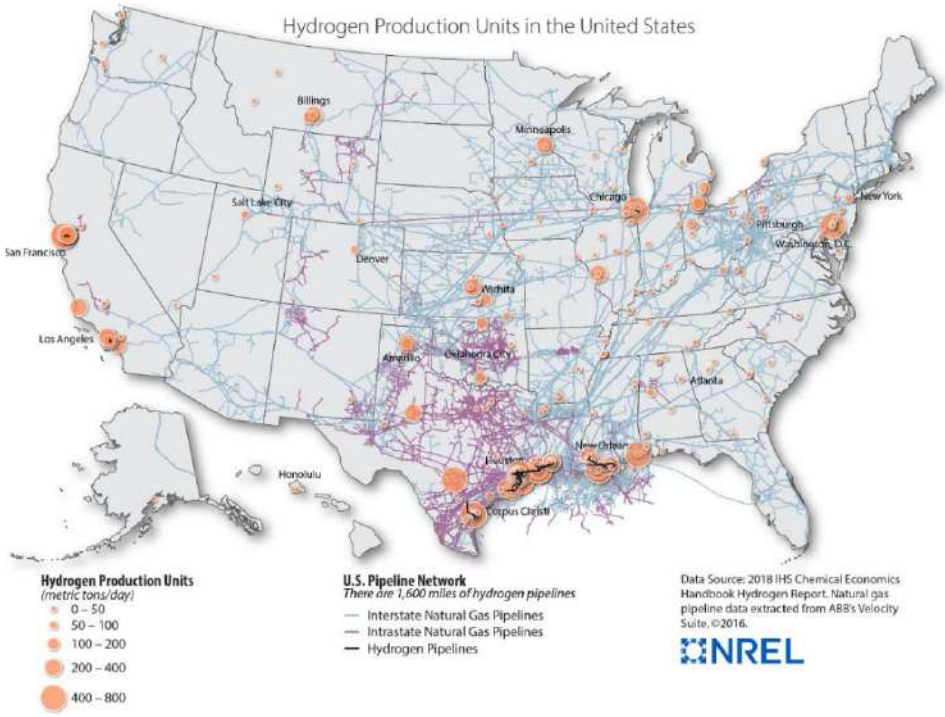
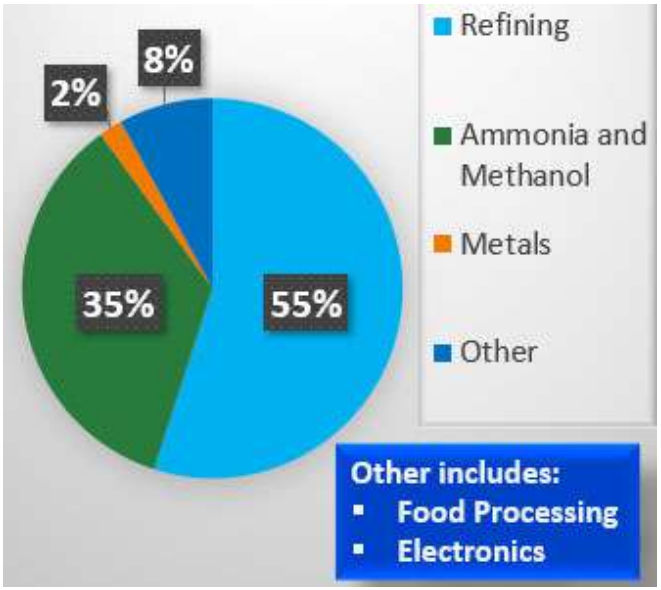


Figure 23: Hydrogen production units and pipelines for hydrogen and natural gas in the United States.

U.S. Department of Energy (DOE). "DOE National Clean Hydrogen Strategy and Roadmap," 2023. https://www.hydrogen.energy.gov/library/roadmaps-vision/clean-hydrogen-strategy-roadmap

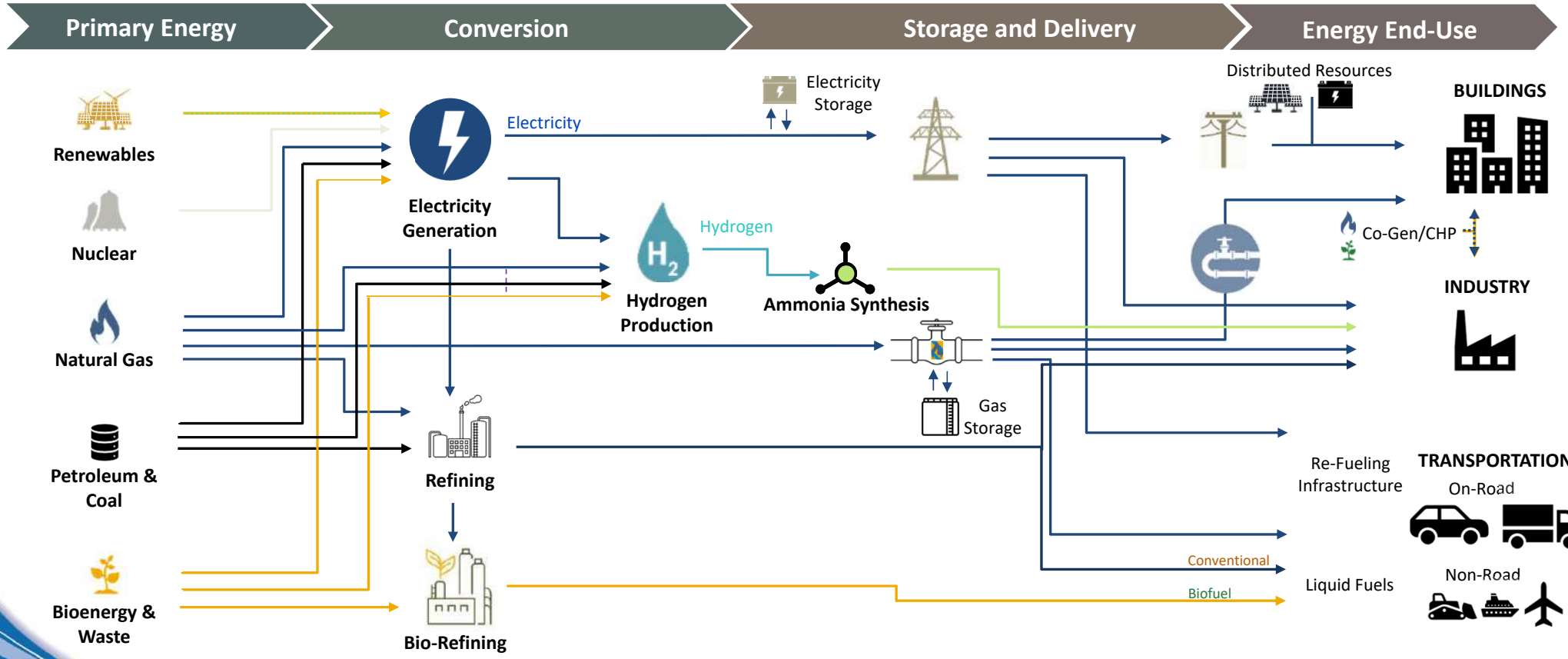
US Total Production & Use (~10 MMT)



Emerging Hydrogen Deployments in the US

- >500 MW Backup Power
- >60,000 Forklifts
- >3.7 GW Electrolyzers
- ~80 – 150 Fuel Cell Buses
- ~50 H_2 Retail Stations
- >16,000 Fuel Cell Cars

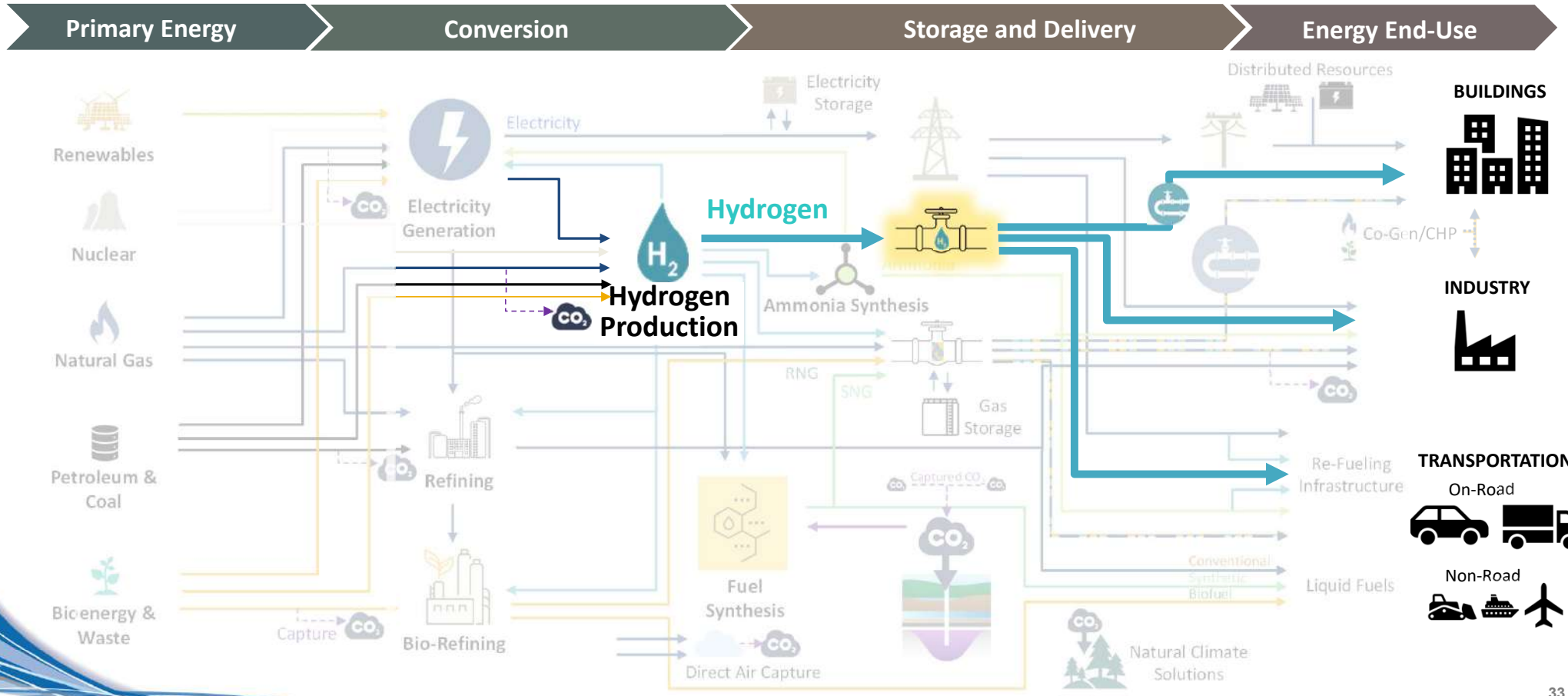
Today's Energy System



New Resources and Players

A Glimpse into the Future

How will They Fit and Transition?



New Resources and Players

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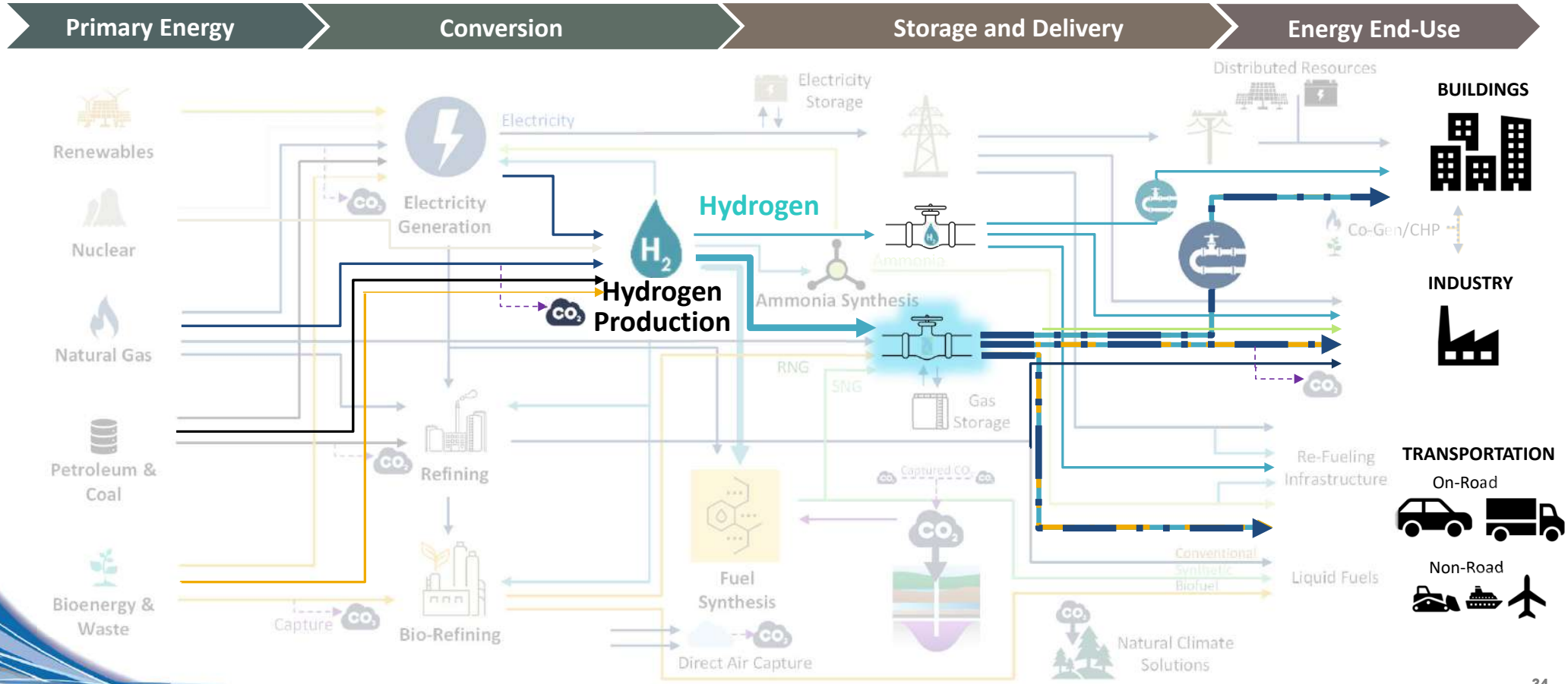
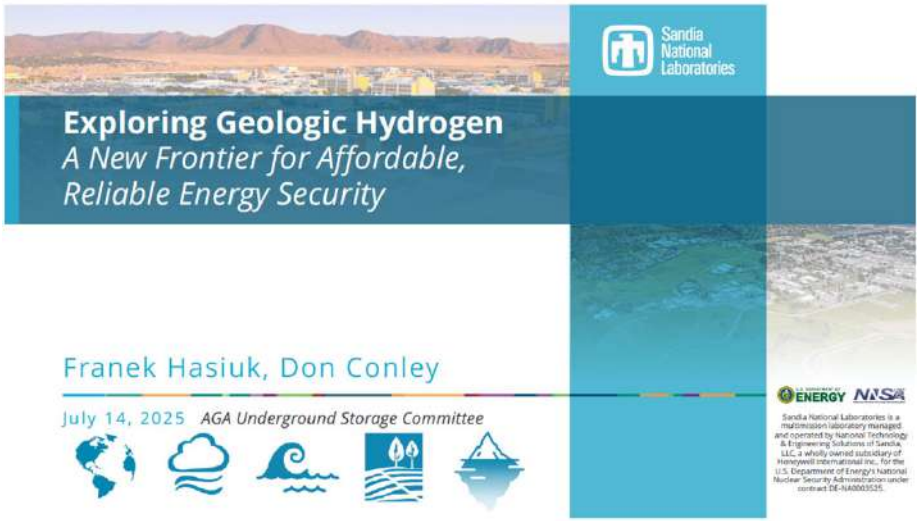
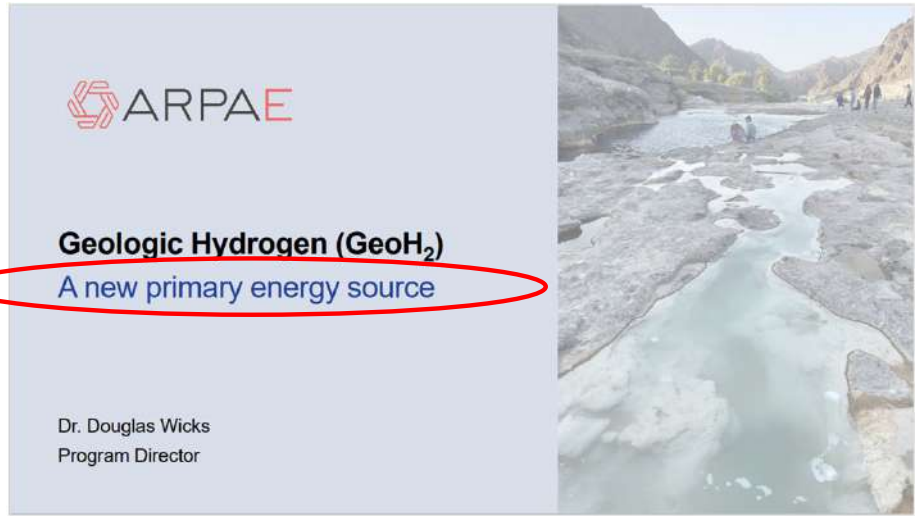


Sourcing Hydrogen in the Energy System's Transformation

Insight from Sandia National Laboratories, US Geologic Service and Advanced Research Projects Agency – Energy (APRA-E)





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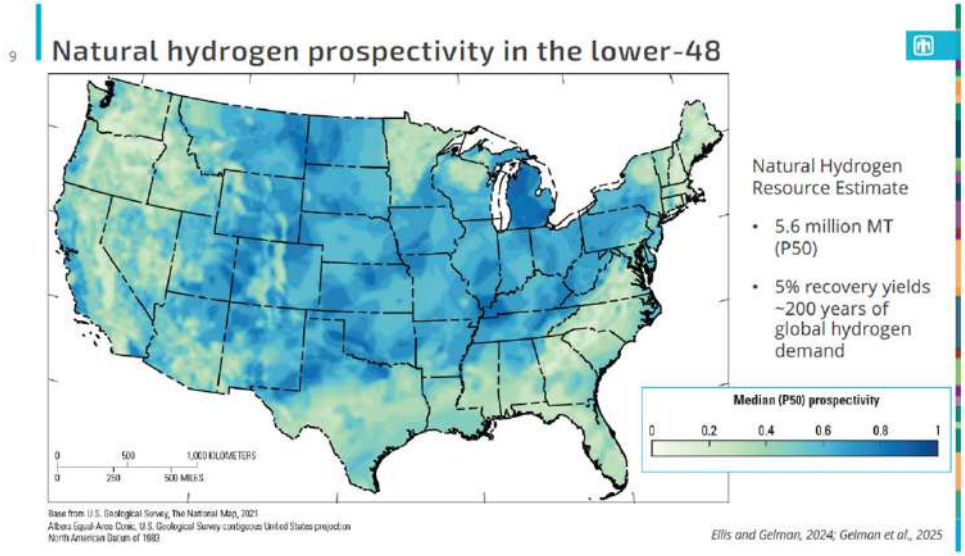
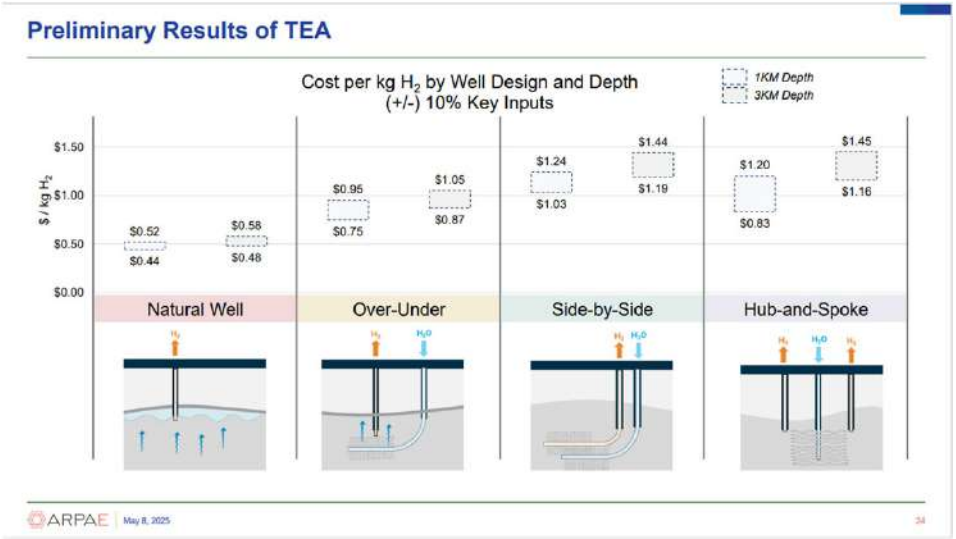
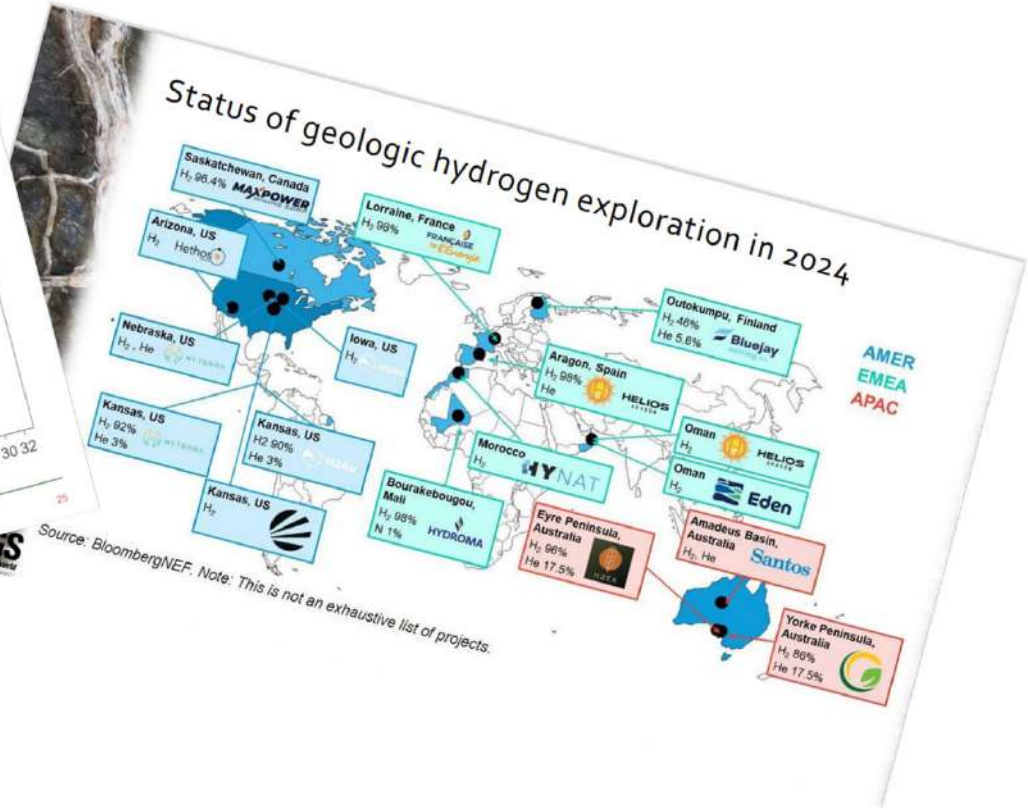
Prospects for Geologic Hydrogen Contributing to Transformation

- Geologic hydrogen is potentially abundant and economic
- 5% recovery yields 200 years of global demand



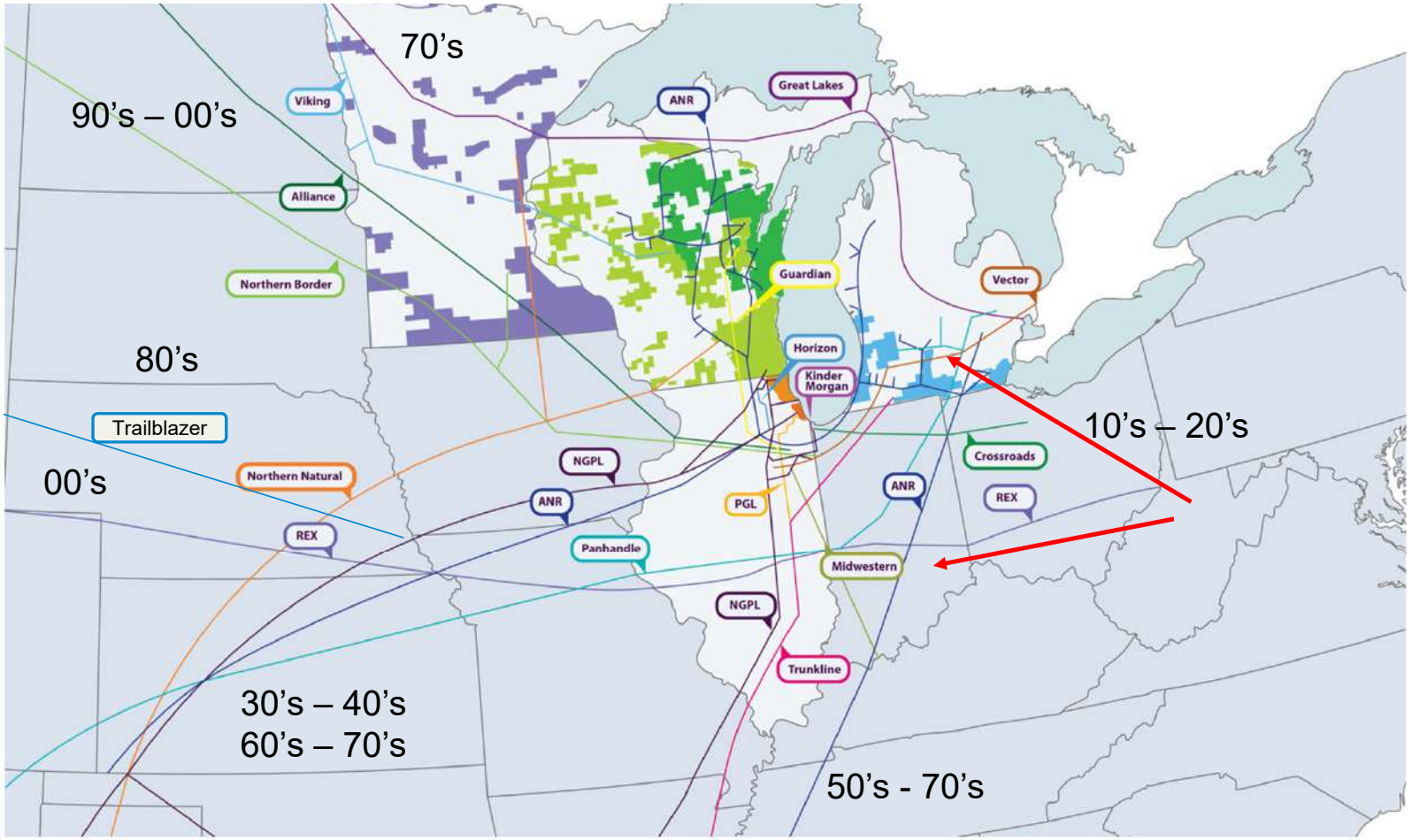


Geologic Hydrogen – Least Expensive, Clean and Discoverable



Transformation Will Be a Long Journey

PGL and NSG Pursuing Hydrogen Readiness Now



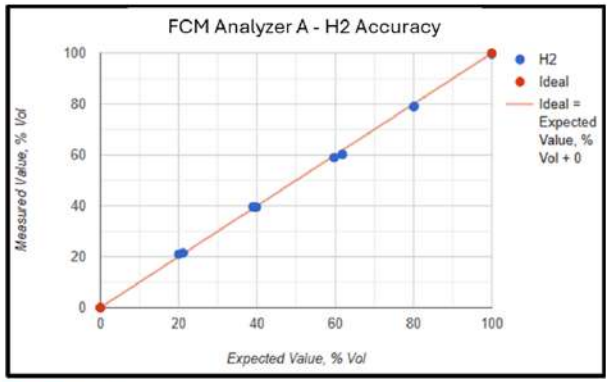
Hydrogen Readiness:

H_2 Analyzer Pilot at Peoples Energy Training Center

Supply of green hydrogen

Prepare sampling header for fuel composition monitors

Connect to supply of natural gas and return of hydrogen blend to gas city



EPRI field pilot of 10 hydrogen fuel composition and ambient air monitoring technologies hosted at Peoples Energy Training Center

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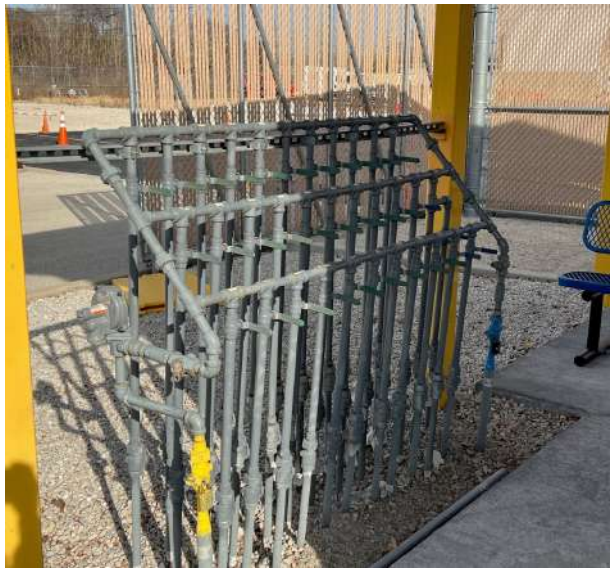
Hydrogen Readiness – Safe and Reliable Hydrogen Detection

Pre-mixed blends of hydrogen and methane

Leak test and apply hydrogen detection tape to joints

Place stationary hydrogen sensors



Identify leaks among some 65+ locations in Gas City

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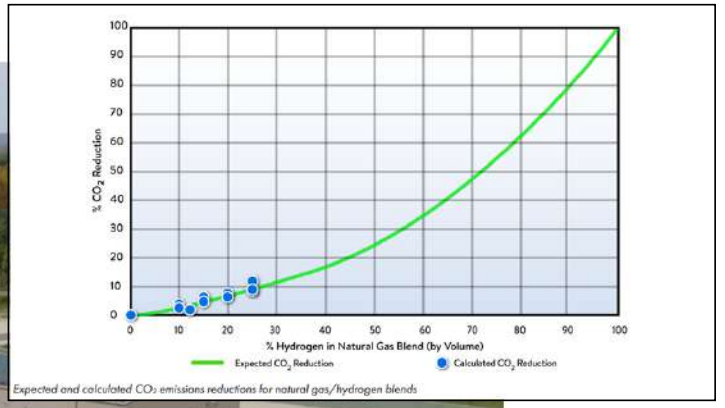
WEC EPRI Wartsila – First-in-the-world hydrogen fuel blending pilot

UMERC – AJ Mihm Generating Station



Expected and calculated CO_2 emissions reductions for natural gas/hydrogen blends

Safe implementation
Successful carbon reduction
Engine performance maintained
Met all emissions limits per existing permit

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The Transformation Has Begun!

2

TRANSFORMING AN ENERGY SYSTEM

The evolution of the manufactured gas industry and the transition to natural gas in the United States (1807–1954)

Joel A. Tarr

It has been neatly said that the self-styled cities become such in reality when they are lighted with gas.
The History of Clinton County, Iowa (1879)

Source: Tarr, J. A. (1999). Transforming an energy system: The evolution of the manufactured gas industry and the transition to natural gas in the United States (1807–1954). In O. Coutard (Ed.), *The governance of large technical systems* (pp. 19–37). London: Routledge.

Questions?

Energy Efficiency Program Updates

Jarred Nordhus

Principal Customer Program Manager
— Energy Efficiency Programs

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Who We Serve and How

- Privately owned business customers
  - ✓ Manufacturers, office buildings, hotels
  - ✓ Small businesses like dry cleaners, restaurants, churches and nonprofits
- Public buildings
  - ✓ Schools, transit and hospitals

Our Team

Energy Advisors and EEP Team

Principal Account Managers

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Paul Flerick

Dan McGowan

John McKendry

Questions?

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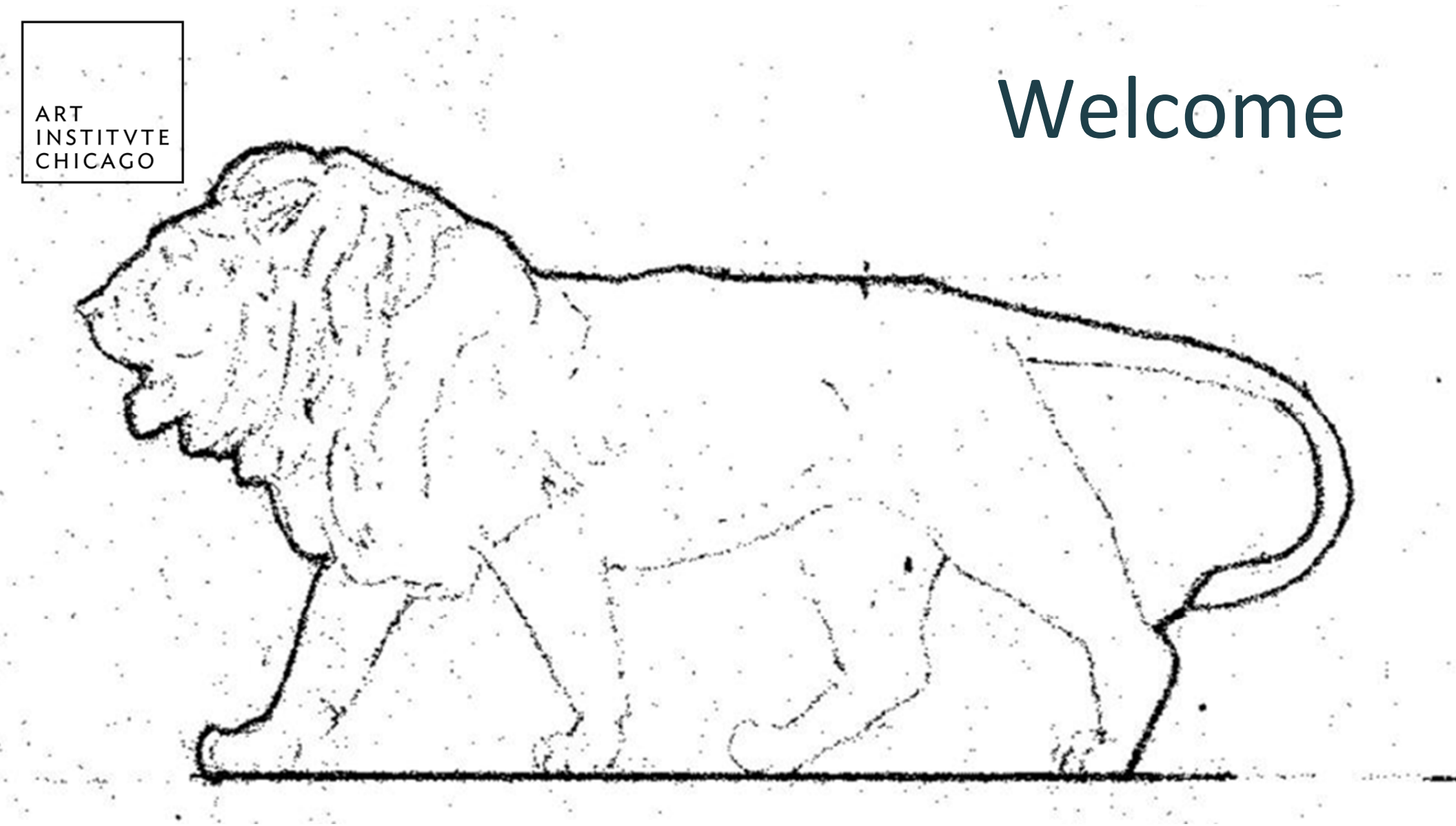
ART
INSTITVTE
CHICAGO

Welcome



Overview

Introductions

Building History

Facility Overview

Environmental Standards

Peoples Gas Energy Efficiency Partnership

Optimization

Summary

Q & A

ART
INSTITVTE
CHICAGO

Tom Ryan

Vice President, Facilities and Logistics

The Art Institute of Chicago

T.J. Kennedy

Chief Engineer

The Stone Group

The Art Institute of Chicago

Jared Hughes

Director of Performance Assurance

Ameresco, Inc.

A Brief History

1866 – origin of the museum as the Academy of Design

1882 – named changed to The Art Insitute of Chicago, Michigan Avenue and Van Buren chosen to be the site for a custom building

1893 – building completed and occupied, designed by Boston firm Shepley, Rutan and Coolidge

President Charles L. Hutchinson - "We have built this institute for the public...not the few. I want all of Chicago here!"

In 1894, with the lions *en garde*

ART
INSTITVTE
CHICAGO

Expansion Begins…

Allerton Building - 1893

Shepley, Rutan and Coolidge

Fullerton Hall - 1898

Shepley, Rutan and Coolidge

Ryerson Library - 1901

Shepley, Rutan and Coolidge

Blackstone Hall - 1903

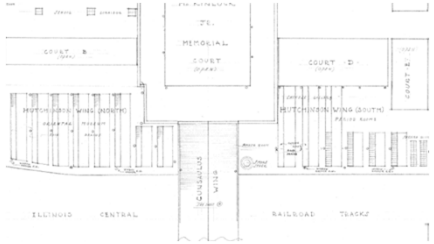
Shepley, Rutan and Coolidge

Gunsaulus Hall - 1916

Shepley, Rutan and Coolidge

Burnham Library - 1920

Howard Van Doren Shaw
Addition to Ryerson Library



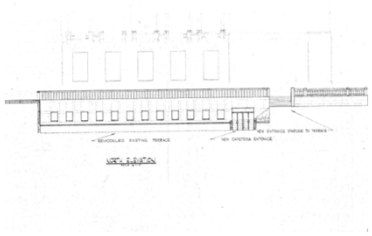
Hutchinson Wing - 1924

Coolidge and Hodgdon
Portions remain

Goodman Theatre - 1925

Howard Van Doren Shaw
Demolished 2000

Expansion Continues…



Mather Wing - 1925

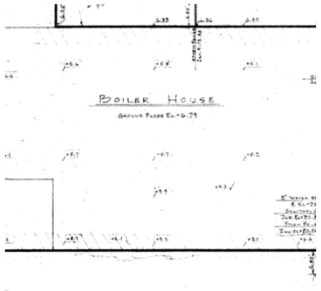
Shepley, Rutan and Coolidge

McKinlock Reno - 1943

Holabird and Root

B.F. Ferguson Building - 1958

Holabird, Root, and Burgee



Boiler House - 1958

Holabird, Root, and Burgee

Morton Wing - 1962

Shaw, Metz and Associates

East Entry/SAIC - 1976

Skidmore, Owings and Merrill

Rice Building - 1987

Hammond, Beeby and Babka

Modern Wing - 2009

Renzo Piano


2009
1939
1958
1898
1910
1901
1893
1903
1916
1924
1976
1988
1924
1991
1962
1957
1957

By the Numbers

264,000-square-foot Modern Wing, completed in 2009, brought total size to one million square feet

273 galleries spanning 562,000 square feet

300,000 works of art

Numerous campus renovations – with portions of at least 13 “buildings” intact today

200 trees

5 gardens

1.5 million+ visitors annually

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Chicago Stock Exchange Room

Original Chicago Stock Exchange was at 30 N. LaSalle, designed by Adler & Sullivan, completed in 1894.

Preservationist Richard Stanley Nickel obsessively catalogued and preserved ornaments of the Stock Exchange Building, even as the building was being demolished in 1972.

Nickel said "Great architecture has only two natural enemies – water and stupid men."

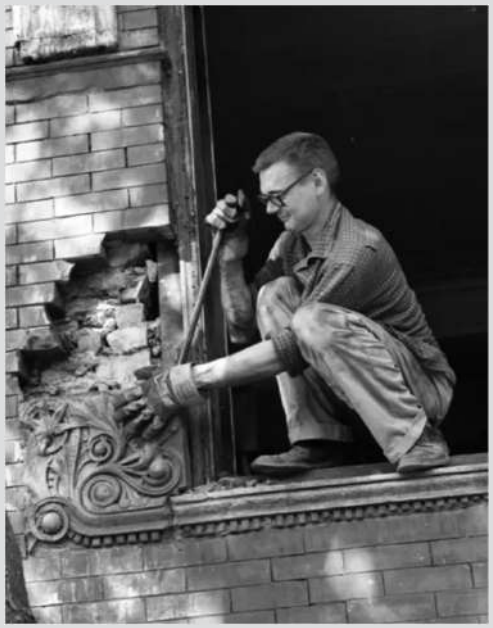
Nickel went missing while working in the Stock Exchange – 26 days later his body was found in the sub-basement of the building, more than 10 feet below ground.

In tribute to Nickel and Sullivan, sections of the Trading Room stencils, molded pilaster capitals, and art glass were preserved.

The Art Institute created a complete reconstruction of this significant room in 1977.

And the monumental entry arch of the Stock Exchange was erected on the museum grounds near the corner of Monroe Street and Columbus Drive.


CHICAGO STOCK EXCHANGE BUILDING.
Adler & Sullivan, Architects.



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Operations Overview

Operations By the Numbers

- 59 air handlers circulate 1,228,485 cfm throughout the building
- 2300 BHP high pressure plant provides 100psi of steam year-round
- 2 metered natural gas services supply boilers, kitchens, kilns, and foundry with fuel
- 50,000 gallon capacity in emergency fuel oil tanks
- 5 chillers capable of 4,750 tons of cooling in central plant
- 2 plate and frame HX present in cooling plant . (9,600 kBtu/hr each)
- 16 metered electrical services
- 2 standby generators
- 70°F/50% maintained year round in exhibition spaces.
- 401 automated shades throughout the Modern Wing building

Environmental Guidelines

- For all galleries and storage rooms (except special exhibition galleries)
- Temperature set points in the winter are:
  - **68° F and 45% RH**
- Temperature set points in the summer are:
  - **72° F and 50% RH**
- **Conditions must not vary +/- 2° OR +/- 5% RH over a 24 hour period**
- Maintaining these environmental conditions is an energy intensive task
- The Art Institute is committed to lowering our carbon footprint and investing in sustainable solutions
- Peoples Gas Energy Efficiency Program has been an integral part of achieving our sustainability goals

Waste Heat Recovery Study

McGuire Engineering study determined the feasibility of Feedwater Economizers in the Central Steam Plant.

Based on this analysis, incorporated waste heat recovery technology - featuring an economizer to capture and exchange energy (heat) from the boiler's flue gas with the boiler's feedwater.

Est. Annual Cost Savings	$77,684
Est. Energy Savings Annually	112,913 therms
Simple Payback	4.2 Years

Peoples Gas Energy Efficiency Program
McGuire Engineering
Hill Mechanical

Night Time Setbacks

Building Automation System was revamped to include programming for occupied/unoccupied hours.

Fan speeds and outside air dampers are brought to a minimum when the museum is closed.

Since environmental conditions must be maintained 24/7, regardless of building occupancy, parameters were put in place to allow fan systems to operate at full speed should the gallery conditions drift.

Annual Gas Savings $86,390

Peoples Gas Energy Efficiency Program
McGuire Engineering
Johnson Controls

Steam Trap Surveys

Regular steam trap surveys

Cost for testing and trap replacements offset by the rebate program

Steam Traps Tested	470
Failed Traps	28
Potential Utility Savings	$78,390

Peoples Gas Energy Efficiency Program
Affiliated Steam
Stone Group Engineering

Insulation Removables

Custom fabrication and installation of removable insulation covers on steam piping and equipment in two larger mechanical spaces

142 covers installed on pressure reducing valves, steam traps and ancillary equipment

Project Cost	$124,896
Pre-approved Rebate	$35,133
Est. Annual Utility Savings	$35,133
Return on Investment	2.5 years

Peoples Gas Energy Efficiency Program
Nelson Insulation

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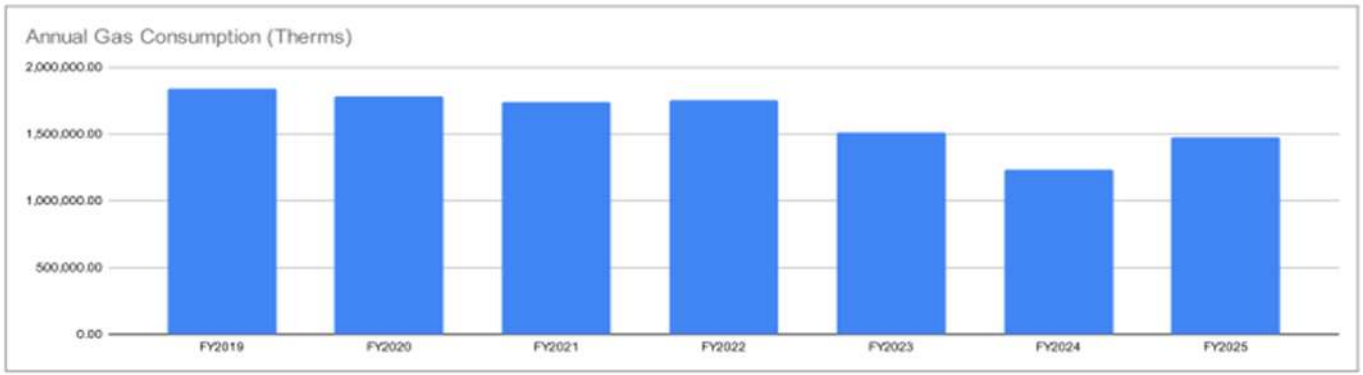
Department of Facilities and Logistics
6 Year Utility Review

6 Year Review - Monthly Electric Consumption (kWh)						
Consumption data sourced from Energy Provider and confirmed with On-Site Interval Meters						
	FY 2024	**FY 2023**	**FY 2022**	**FY 2021**	**FY 2020**	**FY 2019**
JUNE	1,949,604	1,707,438	1,902,752	2,195,828	1,502,367	2,133,760
MAY	1,594,751	1,650,153	2,230,563	1,680,928	1,675,213	1,959,309
APRIL	1,481,740	1,643,114	1,855,578	1,654,632	1,374,011	2,004,169
MARCH	1,529,219	1,692,651	1,997,272	1,717,286	1,931,300	2,060,083
FEBRUARY	1,893,818	1,670,622	1,912,991	1,900,800	2,373,770	1,869,496
JANUARY	1,717,375	1,815,933	2,140,025	1,918,439	2,298,689	2,205,221
DECEMBER	1,638,749	1,789,538	1,916,372	1,876,299	2,178,176	2,197,900
NOVEMBER	1,518,910	1,781,555	1,664,824	1,809,621	2,000,843	2,024,027
OCTOBER	1,635,402	1,618,247	1,881,379	1,901,232	2,219,356	1,764,570
SEPTEMBER	1,931,457	2,138,711	2,502,155	2,307,438	2,333,714	2,773,025.00
AUGUST	2,100,145	2,281,957	2,236,360	2,188,283	2,361,688	2,432,763.00
JULY	2,036,803	2,203,753	2,163,030	2,167,625	2,761,753	2,665,663.00
Totals	**21,027,973**	**21,993,672**	**24,403,301**	**23,318,411**	**25,010,880**	**26,089,986**
	4.59% Decrease over Previous Year	**10.95% Decrease over Previous Year**	**4.65% Increase over 2021 ****	**6.76% Decrease**	**4.31% Decrease**	
24.07% Decrease over 2019			*Curtailment events were not enabled during months of elevated COVID	MUSEUM CLOSURES IN GREY		



Machine Learning & Predictive Analysis

Machine learning – setpoint optimization

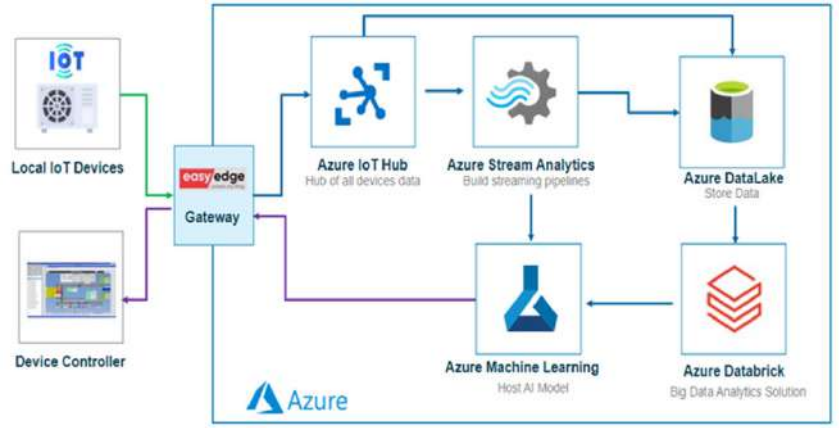
-Optimize discharge setpoints in gallery air handlers throughout facility

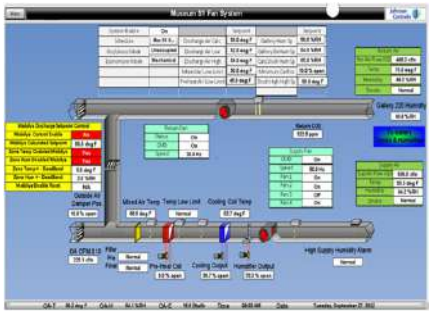
-New setpoint frequently calculated based on numerous factors

-Reduces simultaneous cooling and dehumidification, followed by reheat and humidification, while maintaining zone conditions

-Provides better zone condition control with less energy consumption

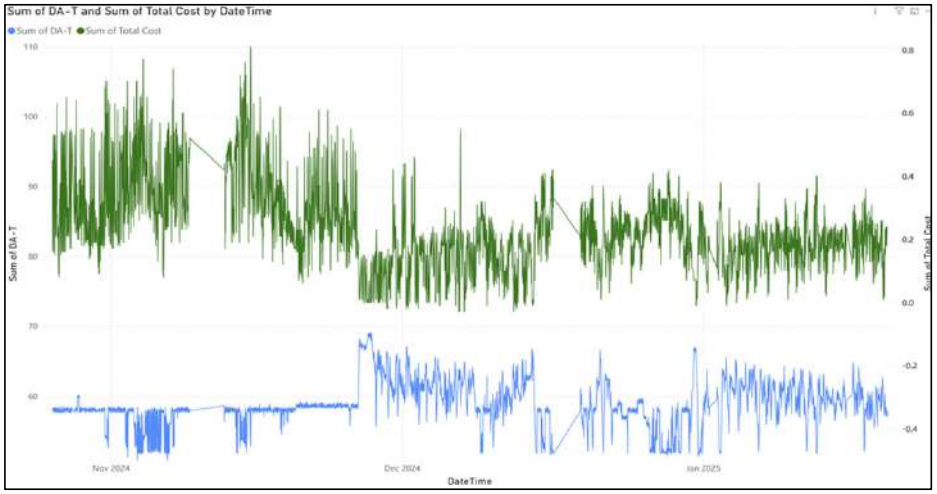
-BAS programming reverts to status quo if setpoints not maintained



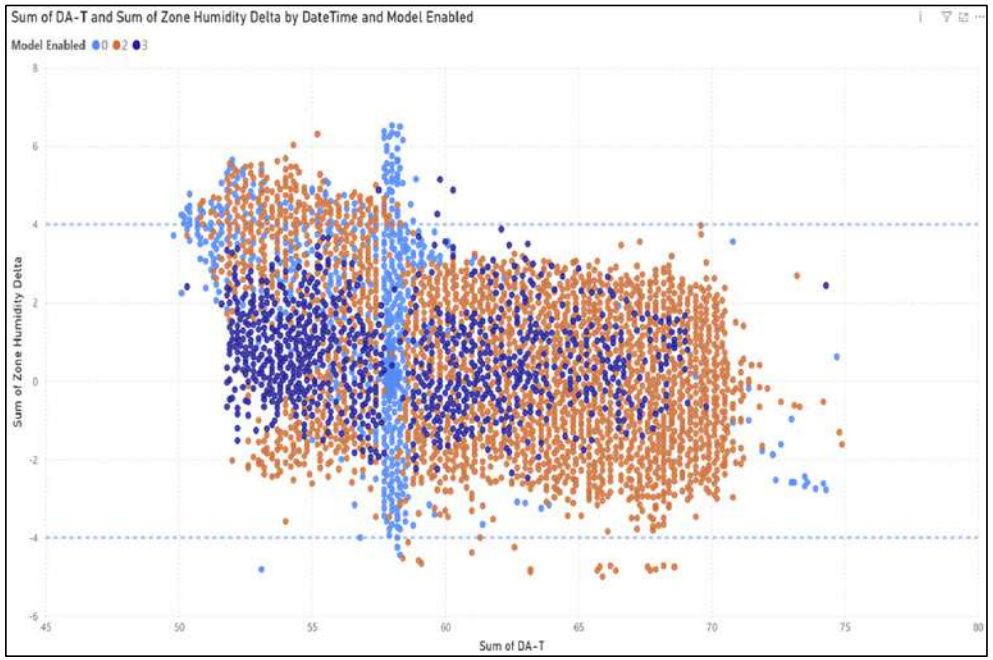


Discharge Setpoint Control	
Control Enable	Yes
Calculated Setpoint	64.9 deg F
Zone Temp Disabled	No
Zone Hum Disabled	No
Zone Temp + - DeadBand	5.0 deg F
Zone Hum + - DeadBand	3.0 %RH
Disable Reset	N/A

Energy Results



Humidity Results



Questions?

Thank you!

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Energy Efficiency Awards

PEOPLES GAS®
ENERGY EFFICIENCY PROGRAM

NORTH SHORE GAS®
ENERGY EFFICIENCY PROGRAM

Honor Roll

Peoples Gas

Commitment to Efficiency
Swedish Hospital

Commitment to Efficiency
Aon Center

Commitment to Efficiency
Chicago Public Schools

Newly Engaged Customers of the Year
CBRE Chicago

North Shore Gas

Commitment to Efficiency
Waukegan School District 60

Newly Engaged Customer of the Year
Beach Park School District #3

PEOPLES GAS® ENERGY EFFICIENCY PROGRAM | NORTH SHORE GAS® ENERGY EFFICIENCY PROGRAM

Long Term Energy Saver:

School of the Art Institute of Chicago

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Long Term Energy Saver:
Mount Sinai Hospital

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Partner of the Year:

Rush University Medical Center

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Large Saver:

Vantage Specialty Chemicals, Inc.

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Long Term Energy Saver:

University of St. Mary of the Lake

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Partner of the Year:

United States Navy
Naval Station Great Lakes

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Congratulations!

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Thank You!

Please Enjoy Lunch and the Museum Tour

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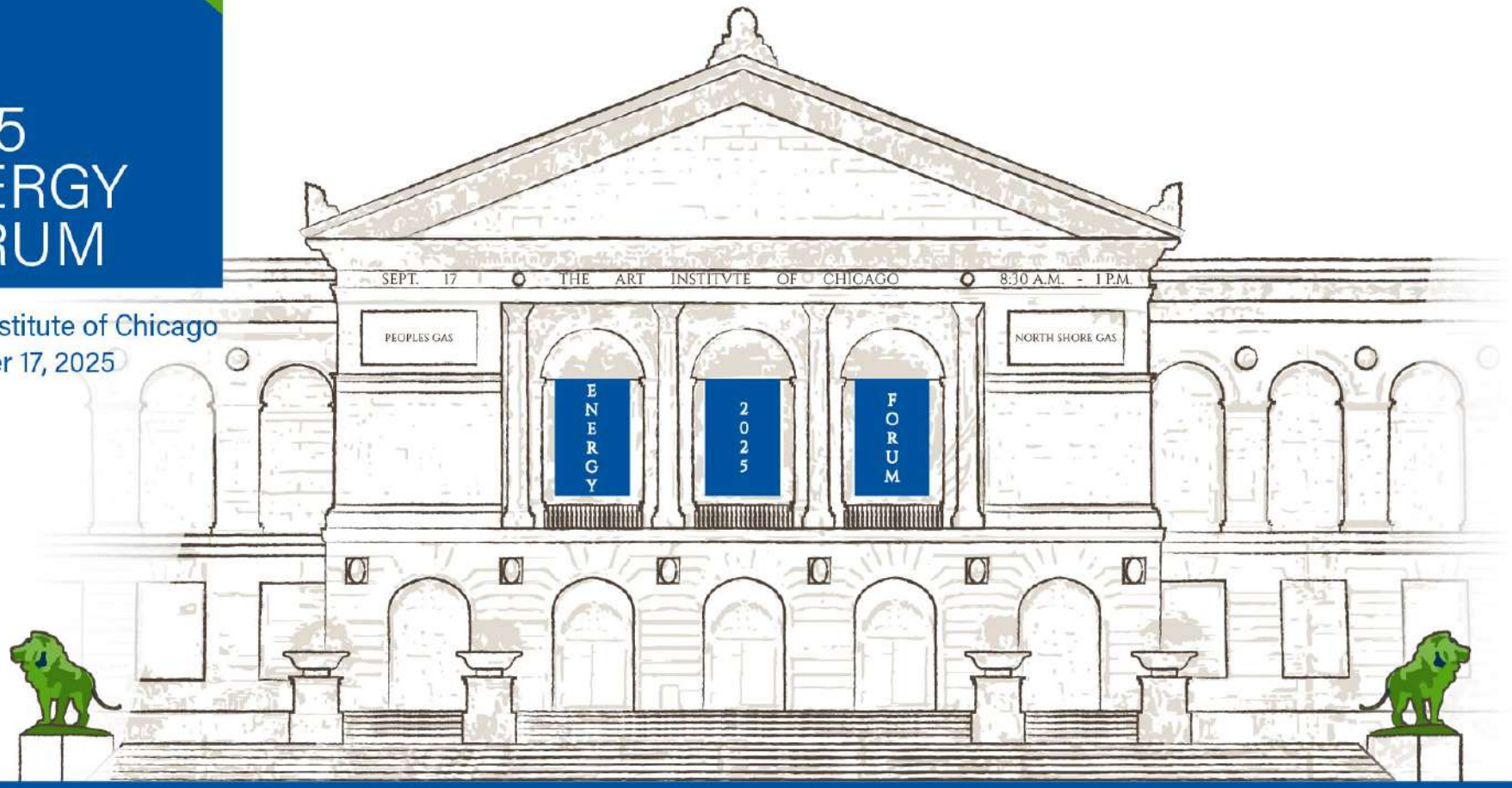
2025 ENERGY FORUM

The Art Institute of Chicago
September 17, 2025



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