

*The
Energy Council*

Vincent J. DiCosimo

The Role of Natural Gas in Electricity Generation, Chemical Manufacturing and Refining

June 6, 2025

Washington DC



Personal and Forward-Looking Statements

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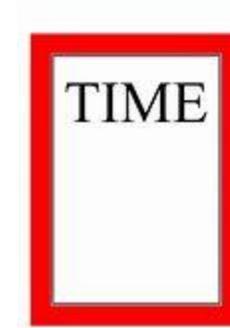
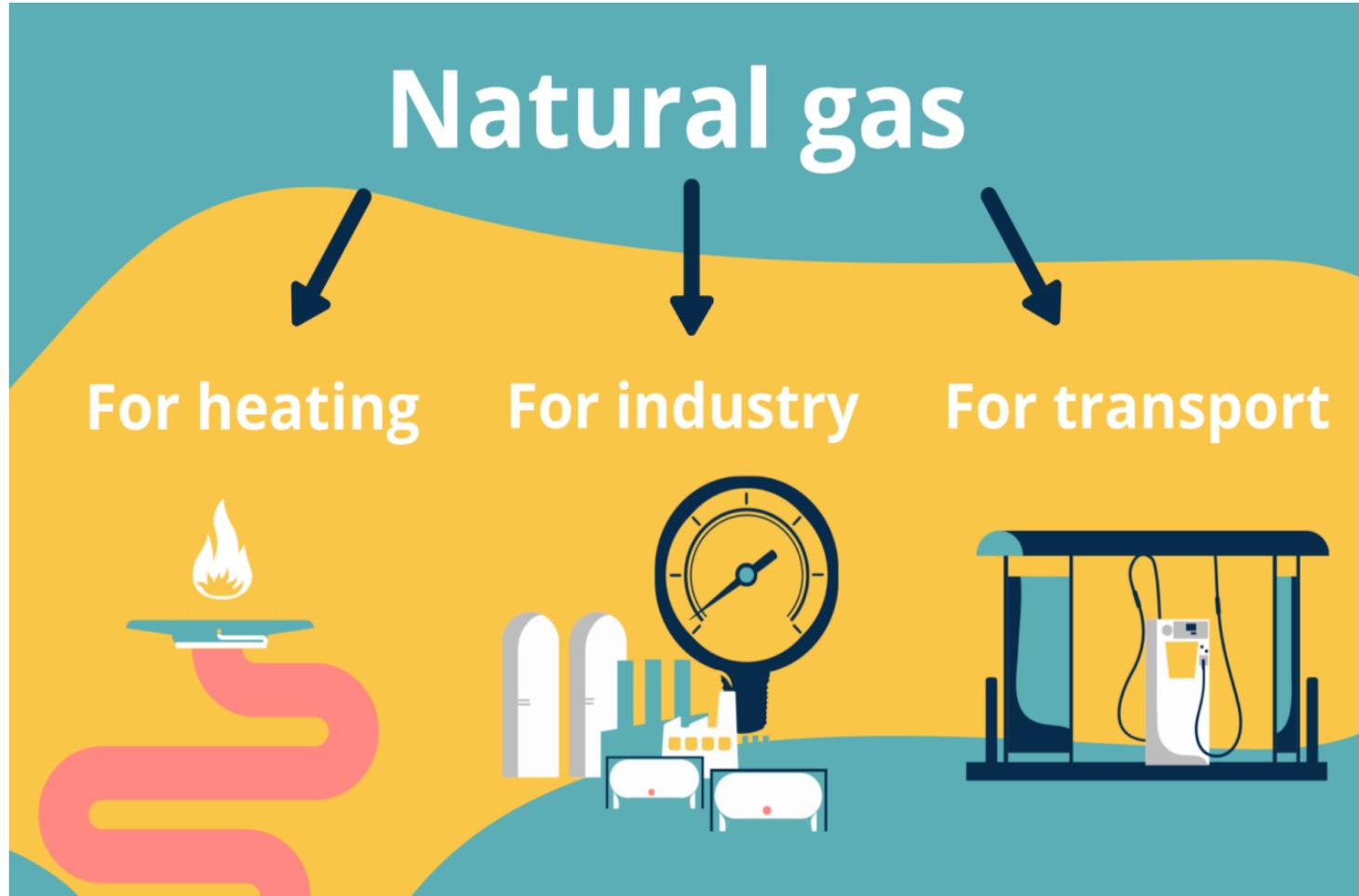
These forward-looking statements rely on a number of assumptions concerning future events and are subject to a number of uncertainties, factors and risks, many of which are outside the Company's control, which could cause results to differ materially from those expected by Vincent DiCosimo or the management of the Company. Such risks and uncertainties include, but are not limited to, actions by the Organization of the Petroleum Exporting Countries ("OPEC") and non-OPEC oil producing countries, weather, political, economic and market conditions, including a decline in the price and market demand for natural gas, natural gas liquids and crude oil, the timing and success of our completion of capital projects and business development efforts, the expected growth of volumes on our systems, the impact of pandemics or any other public health crises, commodity price volatility due to ongoing or new global conflicts, the impact of disruptions in the bank and capital markets, including those resulting from lack of access to liquidity for banking and financial services firms, and other uncertainties.

Natural Gas Origins to Destinations



[Oil and Natural Gas formation | A look at how oil and natura... | Flickr](#) / Gas Processors Association / EIA

Naturally Loved- *Naturally*

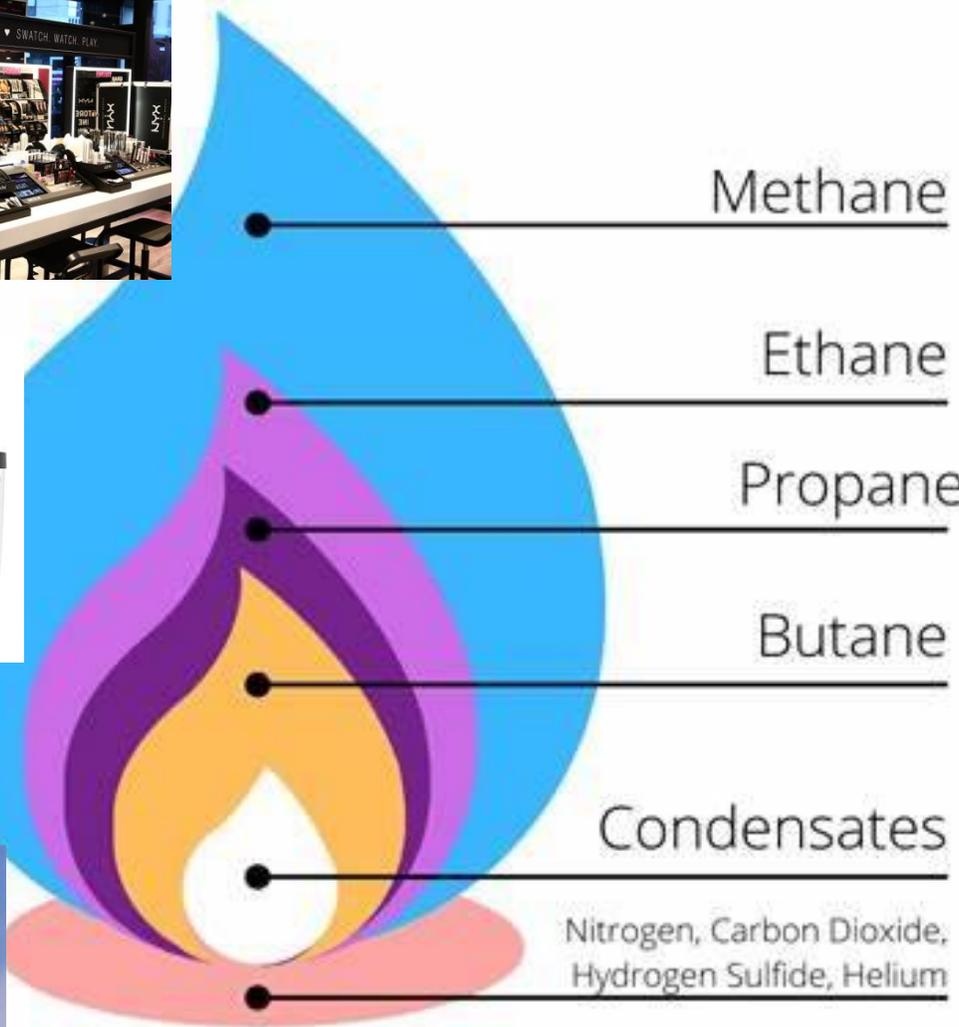


May 12, 2022

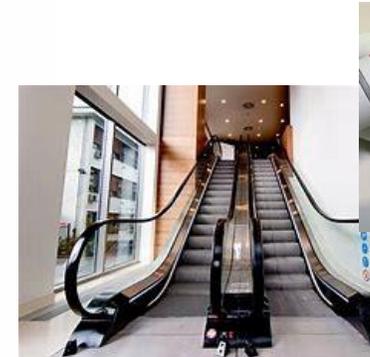
“The Modern World Can’t Exist Without These Four Ingredients. They All Require Fossil Fuels”

- Cement
- Steel
- Plastics
- Ammonia (fertilizers)

Natural Gas (Methane) Is So Much More



The Petrochemical Industry uses all of these molecules as feedstocks for products.

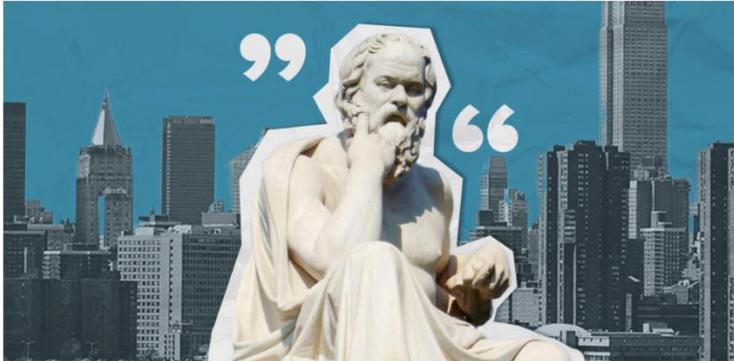


The Role of Natural Gas in Modern Industry and Society

cost strategic
natural
jobs gas
energy plentiful
security effective

Electricity
Petrochemical
Refining

Modern Societies

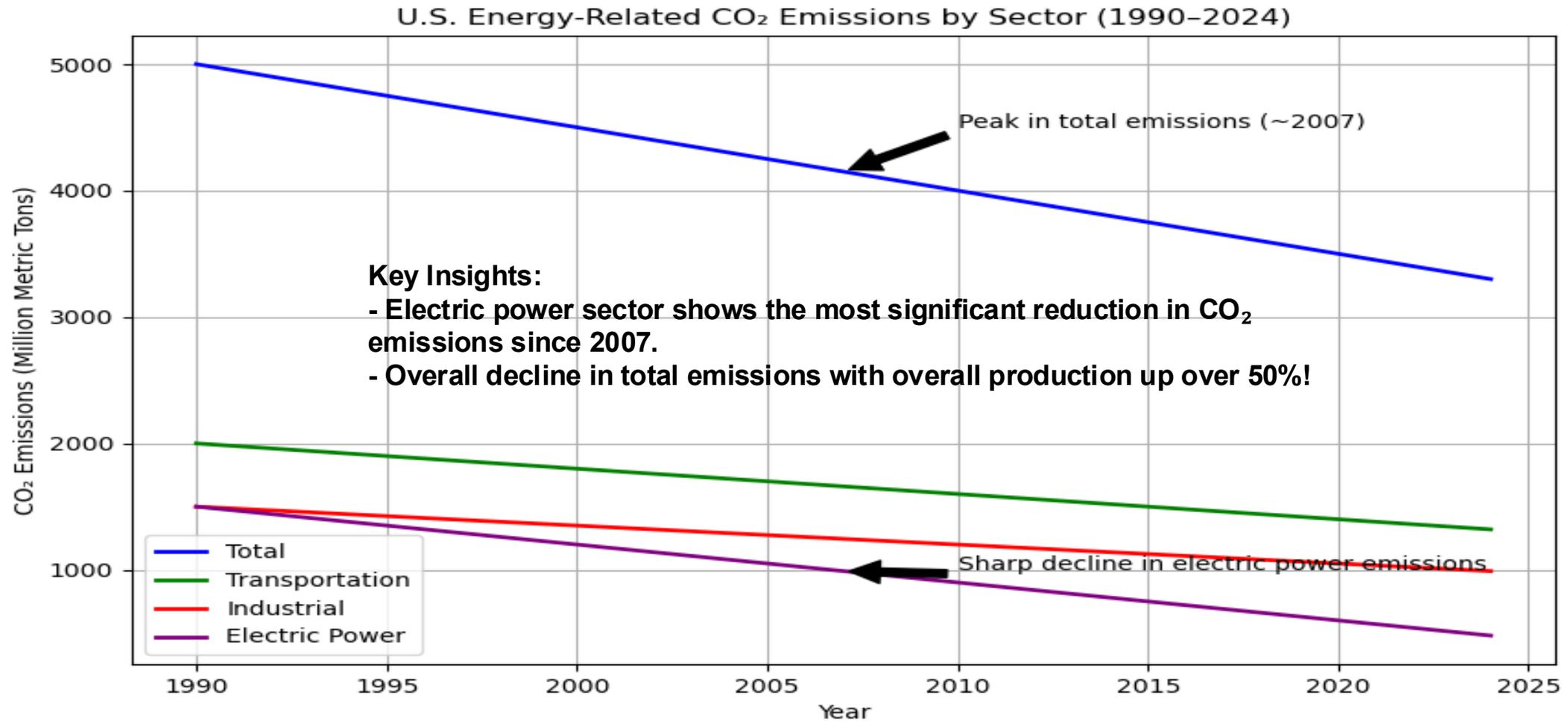


Modern societies would be impossible without mass-scale production of many man-made materials. We could have an affluent civilization that provides plenty of food, material comforts, and access to good education and health care without any microchips or personal computers: we had one until the 1970s, and we managed, until the 1990s, to expand economies, build requisite infrastructures and connect the world by jetliners without any smartphones and social media. But we could not enjoy our quality of life without the provision of many materials required to embody the myriad of our inventions.



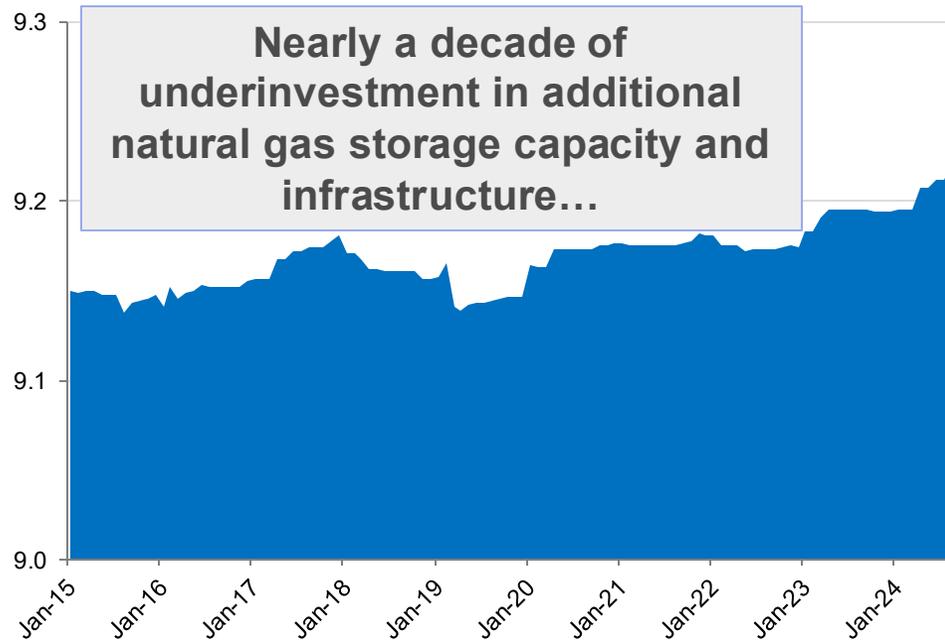
Time Magazine May 12, 2022 The Modern World Can't Exist Without These Four Ingredients. They All Require Fossil Fuels By Vaclav Smil

U.S. Natural Gas Macro Overview

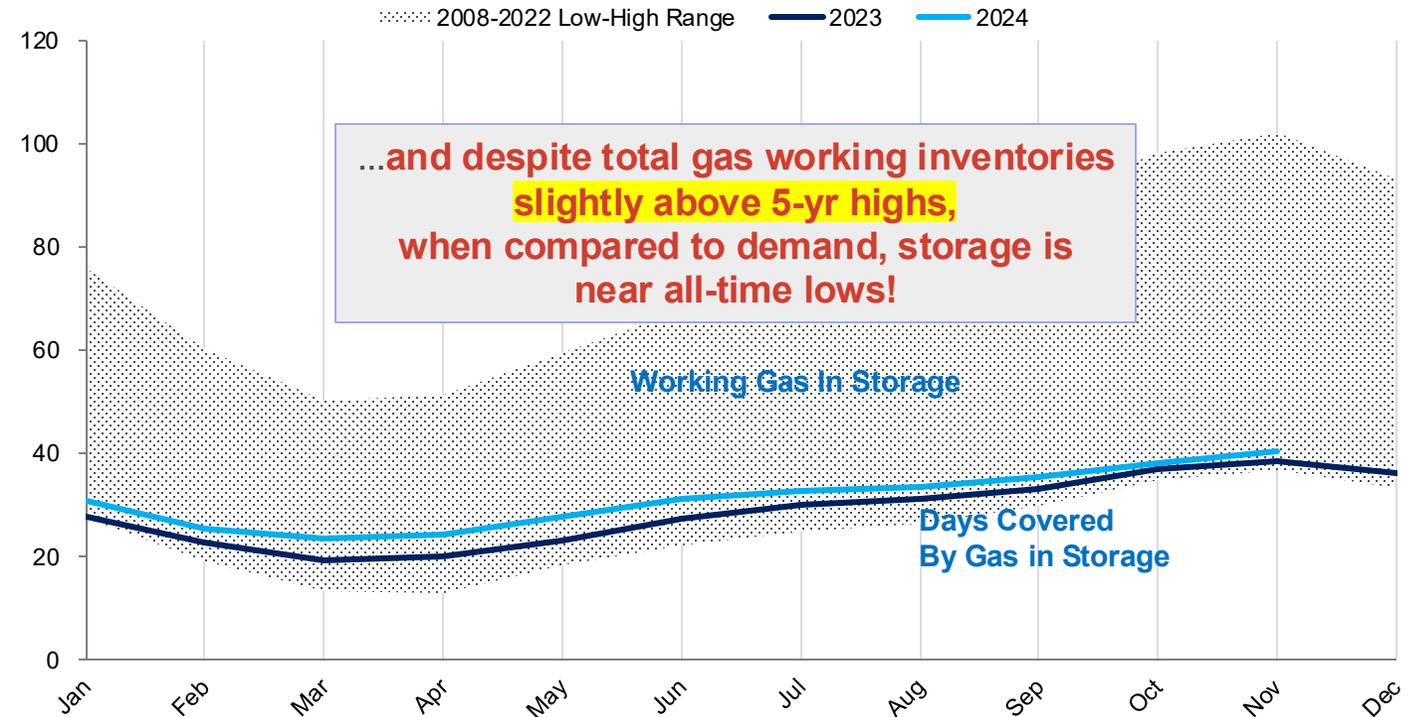


U.S. Natural Gas Storage and Demand

Total Lower 48 Natural Gas Underground Storage Capacity (Tcf)



Storage Expressed in Days' Demand Cover



...has led to gas storage capacity relative to total demand near all-time lows...

Source: Bloomberg and EIA.
 Note: Days of demand cover = Storage / Daily gas demand. Represents the days of gas demand available in storage.

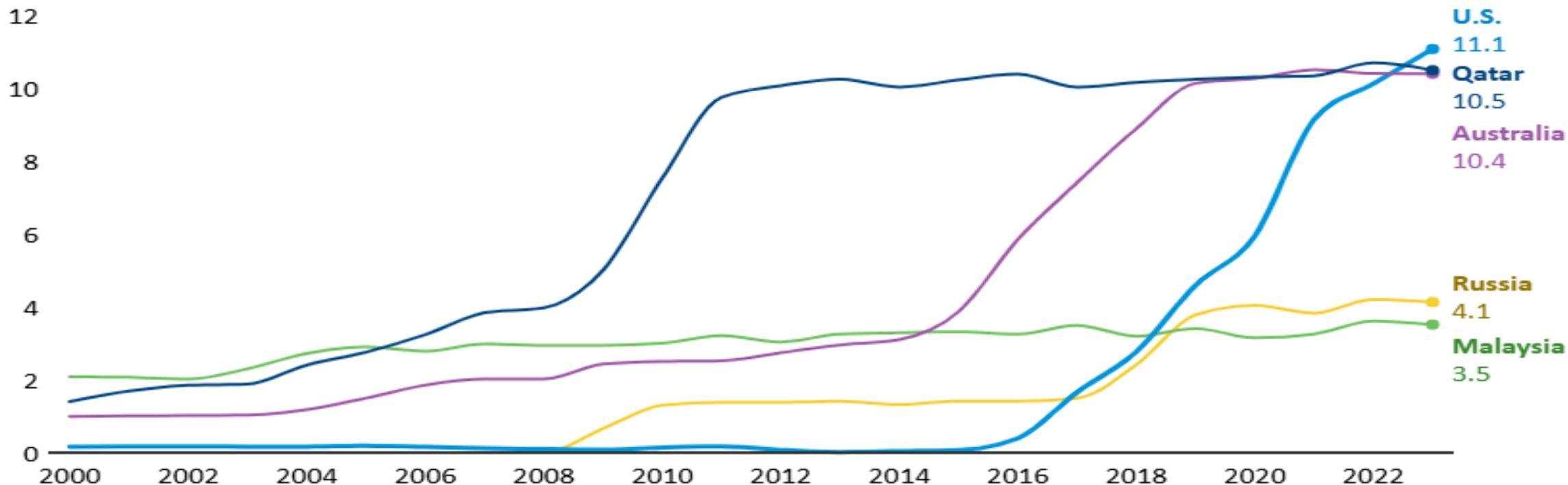
U.S. LNG Exports Grow to 30 BCF/D by 2030

U.S. LNG Growth by Project (Operational + Under Construction)

How do U.S. LNG exports compare to other countries?

The U.S. became the largest LNG exporter in the world in 2023

Annual LNG exports (billion cubic feet per day)



Source: [Energy Institute](#) • [Download image](#)

Source: Company Reports, EIA, and Scotiabank.



Natural Gas in the Role of Energy Production and Grid Reliability

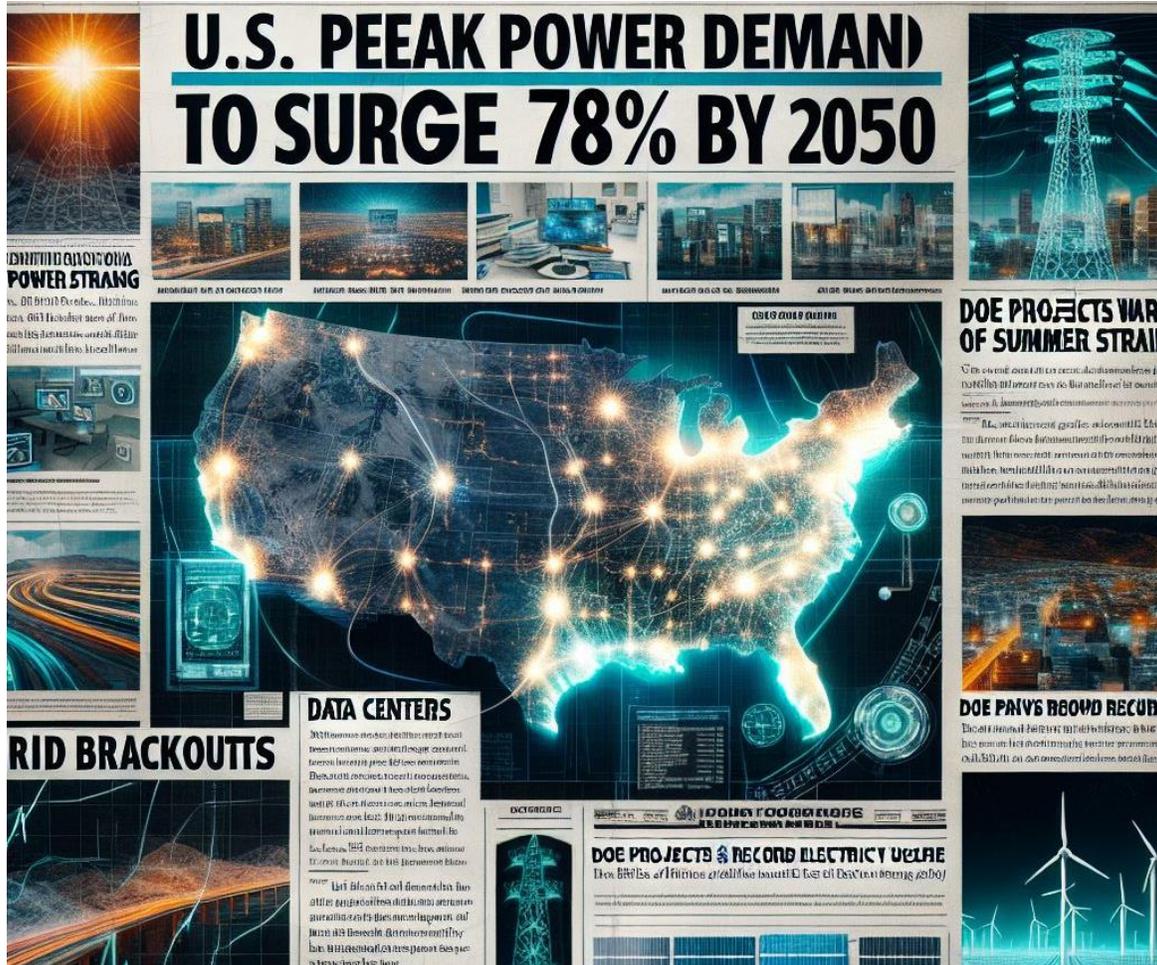
The Bonneville Power Administration plans to join the Southwest Power Pool's Markets+ real-time and day-ahead market reaching new customers in Data Center centric areas and having broader access to customers even in Louisiana.

Data source: U.S. Energy Information Administration

25 electricity supply regions represent U.S. power markets.

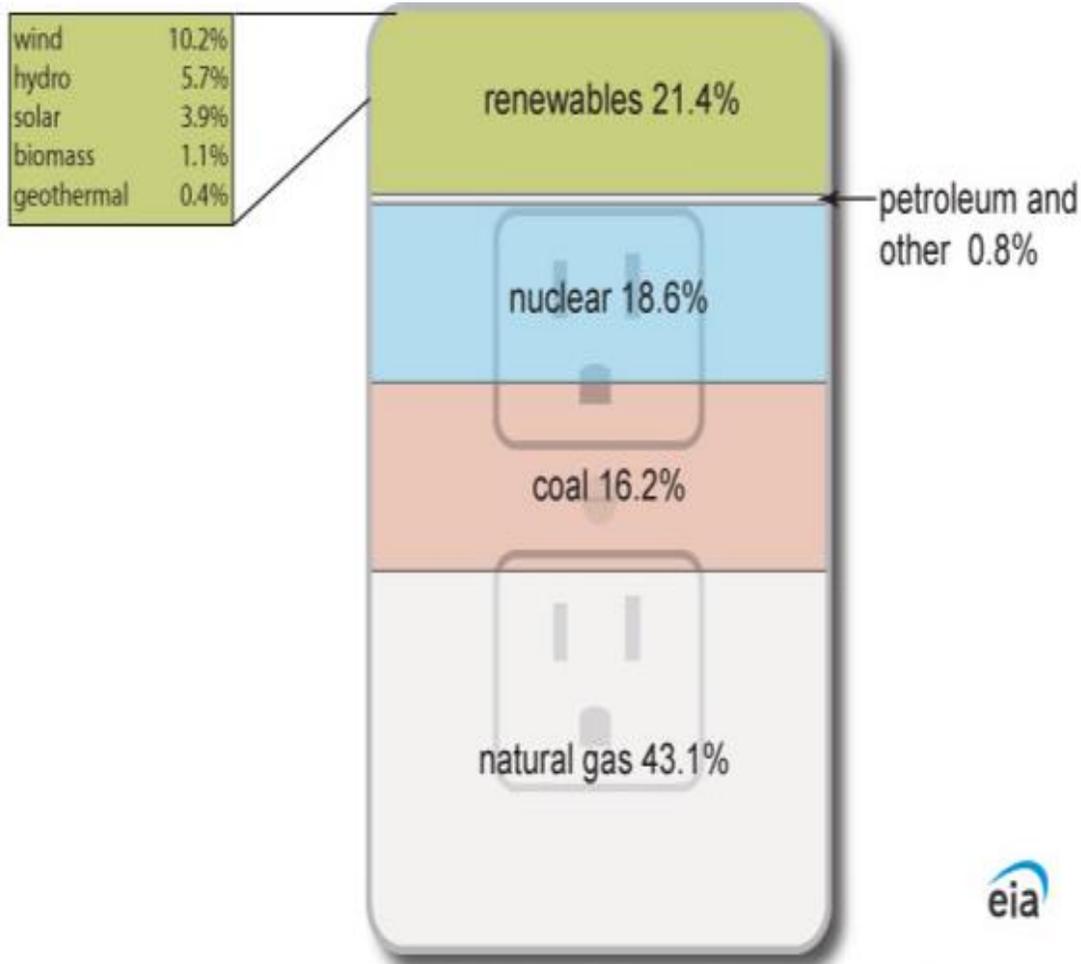
ALL 25 regions require Natural Gas for power generation.

AI and Data Centers are the Current Drivers for Future Demand



- "AI Boom Exposes Power Crisis in Data Centers" – AI workloads are pushing U.S. data center energy consumption past 176 terawatt-hours, accounting for 4.4% of total national consumption.
- "AI Boom Exposes Infrastructure Gaps" – Asia-Pacific could face a shortfall of 15 to 25 gigawatts of data center capacity by 2028, despite rapid expansion.
- "New Massive AI Data Centers Driving Up Electric Bills" – AI data centers are causing electric rates in New Jersey to skyrocket by 20%, with one facility consuming enough power to run 400,000 electric cars.
- "AI Could Soon Consume More Electricity Than Bitcoin Mining" – AI's energy demand may surpass Bitcoin mining and even entire countries by late 2025.
- "AI to Drive 165% Increase in Data Center Power Demand by 2030" – Goldman Sachs forecasts global power demand from data centers will rise 50% by 2027 and 165% by 2030.

U.S. Power Generation by Fuel Sources= Natural Gas #1



- U.S. net power generation in 2024 was 4% above net generation in 2019- BUT IS IT ENOUGH?
- Total Renewable generation represents 21.4% of total U.S. power supply (vs 9% in 2019)
- Despite renewable penetration, **power generation supplied by natural gas has increased 20% since 2019 and represents ~43% of total U.S. power generation (vs ~38% 5-yr avg)**
- **Natural gas (and renewables) has more than offset lower coal usage**, which is down 30% since 2019 (~16% of current supply stack vs ~24% in 2019)

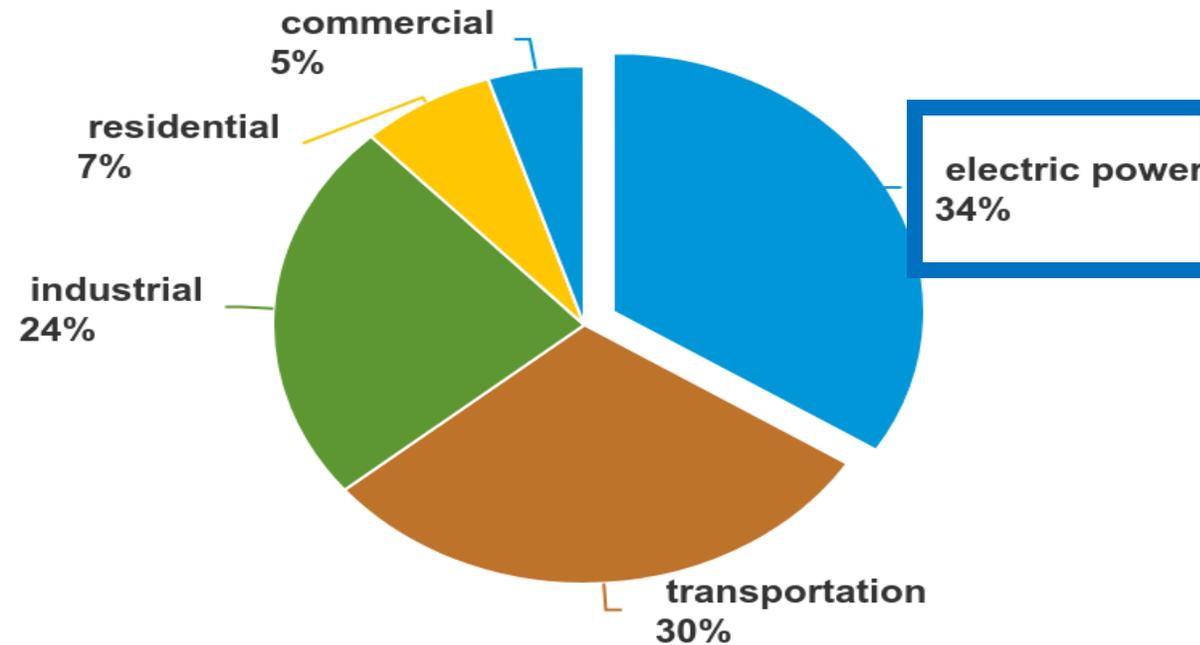
Data source: U.S. Energy Information Administration, *Electric Power Monthly*, February 2024, preliminary data

Source :EIA.

Electric Power Demands 34% of Total Energy *

Percentage share of total primary energy consumption by U.S. energy use sectors, 2023

Total = 93.59 quadrillion British thermal units



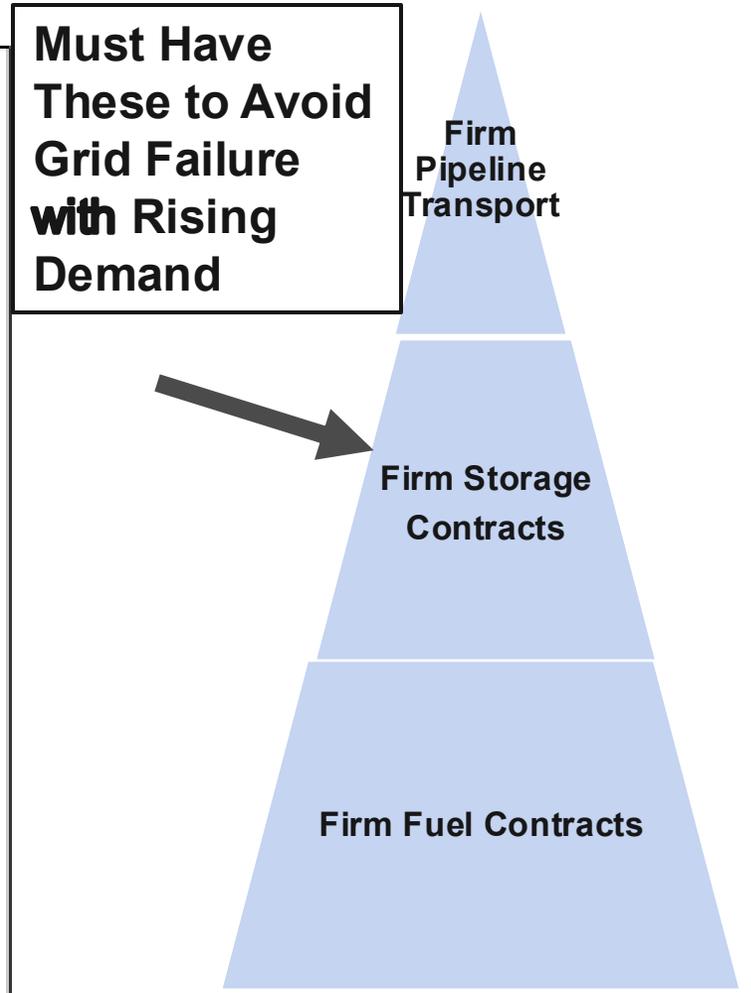
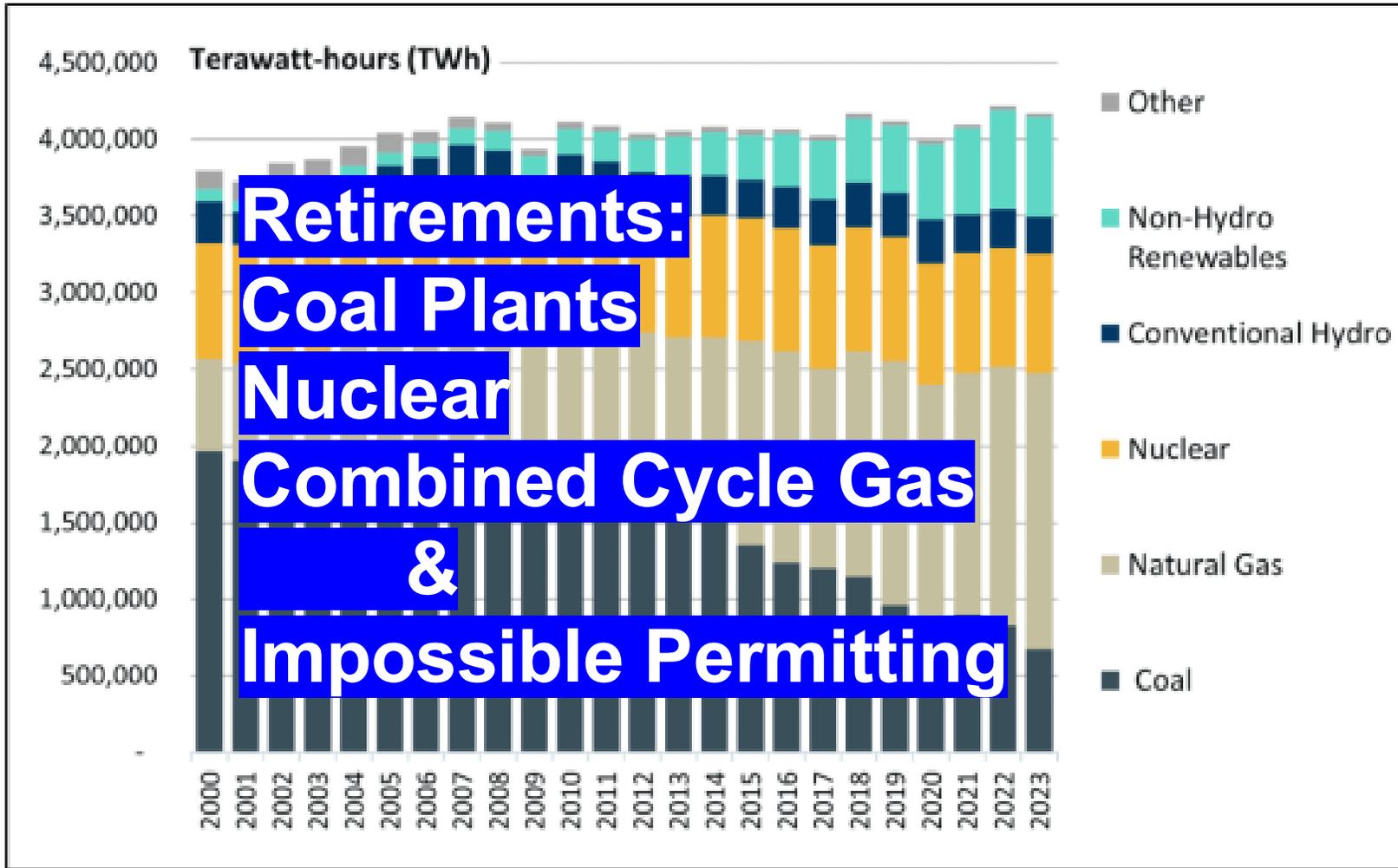
Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Tables 2.1a and 2.1b, April 2024, preliminary data

Note: Sum of individual percentages may not equal 100 because of independent rounding.



Note: *Total Energy Includes All Sources: wind, solar, battery, natural gas, gasoline, jet, coal, natural gas, fuel oil etc.

Annual U.S. Electricity Generation by Energy Source



U.S. Data Centers Could Use Almost 9% of the Grid by 2030

Nine of the top 10 U.S. electric utilities said data centers were a main source of customer growth.

Minimum uptime guarantees requirements are 99.99% uptime per year.

Difference between Crypto and Data Centers- **UPTIME**

Where is the need today?

- **PJM** is expected to see the highest demand growth at **30%**.
- **MISO** follows closely with **25%**.
- **CAISO** and the **Southeast** are projected at **20%** and **15%**, respectively.



TAKEAWAY: Today only Natural Gas with combined cycle can provide 99.99% uptime and be built in timely manner.

Demand Requires New Projects and New Projects Require Permits

- To realize the benefits of historic investments in the **Energy Act of 2020, Infrastructure Investment and Jobs Act, and the Inflation Reduction Act, timely and predictable permitting is key to getting the projects enabled by these laws built, providing energy security, and reducing greenhouse gas emissions and other pollution.**
- Nearly every major energy project with a federal review requires an Environmental Impact Statement (EIS), the most comprehensive type of NEPA review (now under review). Today an **EIS takes 4.8 years to complete on average, delaying needed energy and minerals projects.**
- Even after the years that it takes to complete EISs for energy and natural resources, approximately **25% are litigated.**
- Many energy projects take so long to permit that delays lead to cancelations, even if the project would have ultimately been approved and that's the plan of many on the opposition.
- **For example: key pipeline projects that provide energy security and reduce emissions have been repeatedly delayed; there are approximately 20 interstate transmission projects in various stages of planning; and the United States needs new mines, especially for critical minerals where we currently rely on foreign supply chains— but these projects historically take 5–10 years to permit.**
- **Energy security goals cannot be met without permitting improvements**

Natural Gas in Petrochemical and Refining

Natural gas plays a crucial role in both petrochemical manufacturing and refining processes.

Feedstock for Chemical Production:

- **Ethylene:** Derived from ethane, used to produce plastics and other chemicals.
- **Propylene:** Derived from propane, used in the production of polypropylene and other chemicals.
- **Methanol:** Produced from natural gas, used in various chemical applications

Fuel for Refinery Operations:

- Natural gas is used as a fuel for fired heaters, boilers, and gas turbines within refineries

Hydrogen Generation:

- Essential for hydrocracking and other refining processes, natural gas is used to produce hydrogen

Integration with Petrochemicals:

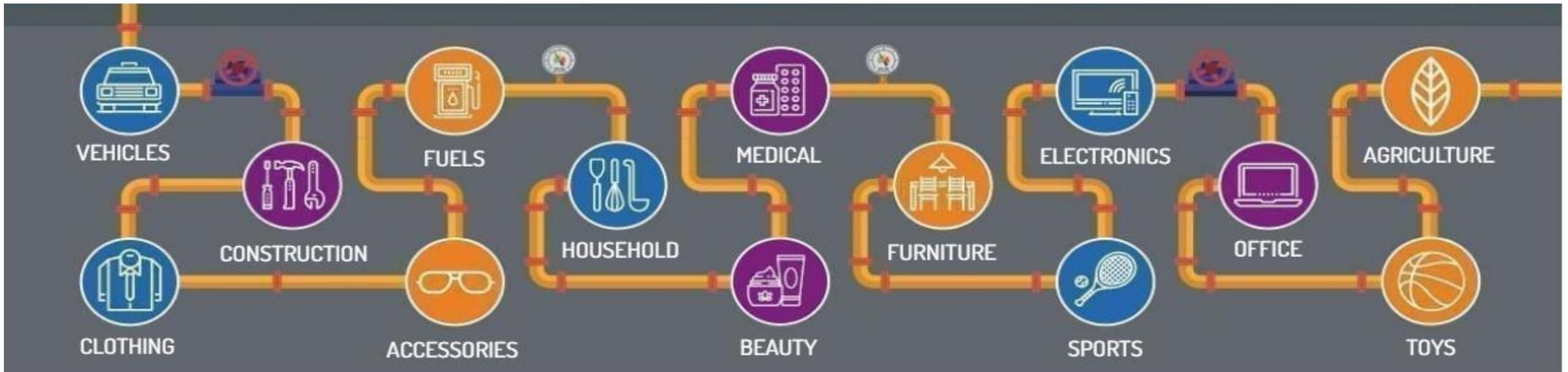
- Refineries often integrate with petrochemical complexes to maximize efficiency and reduce carbon emissions. Natural gas helps in recovering valuable components from refinery off-gases and facilitates the production of petrochemical feedstocks

Natural gas's versatility and efficiency make it a cornerstone resource in these industries, contributing to both economic and environmental benefits.

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Natural Gas for Refining for Your Lifestyle

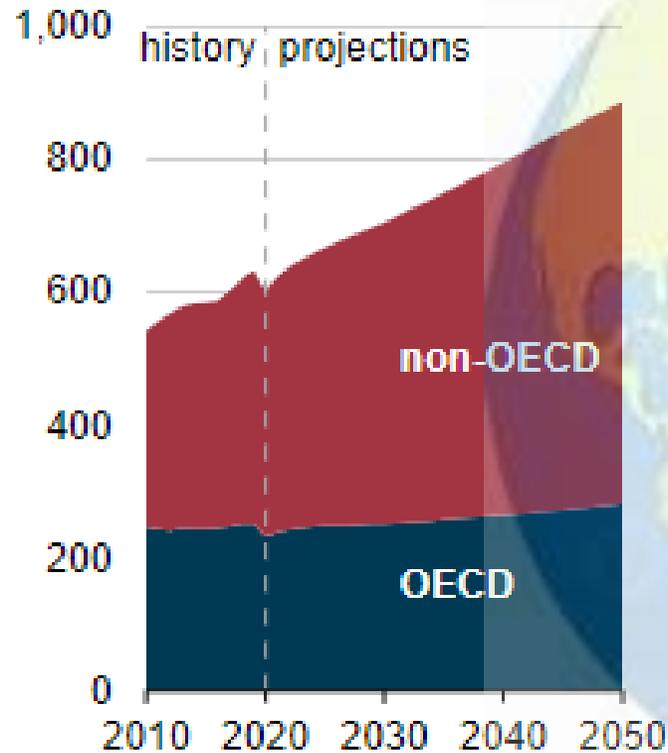
A Lifestyle Two Thirds of the World Desires



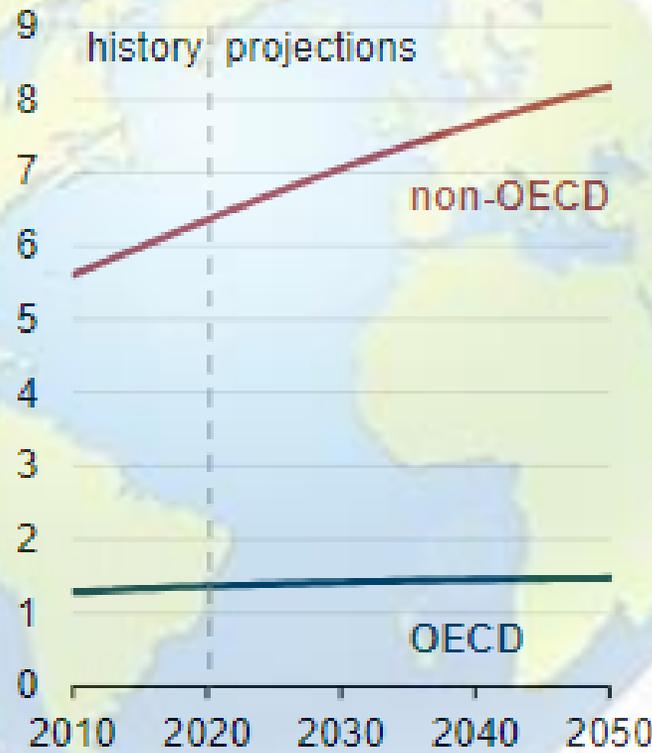
Forbes/EIA/OGPA

By 2050 Global Energy Demand Increases by Nearly 50%!

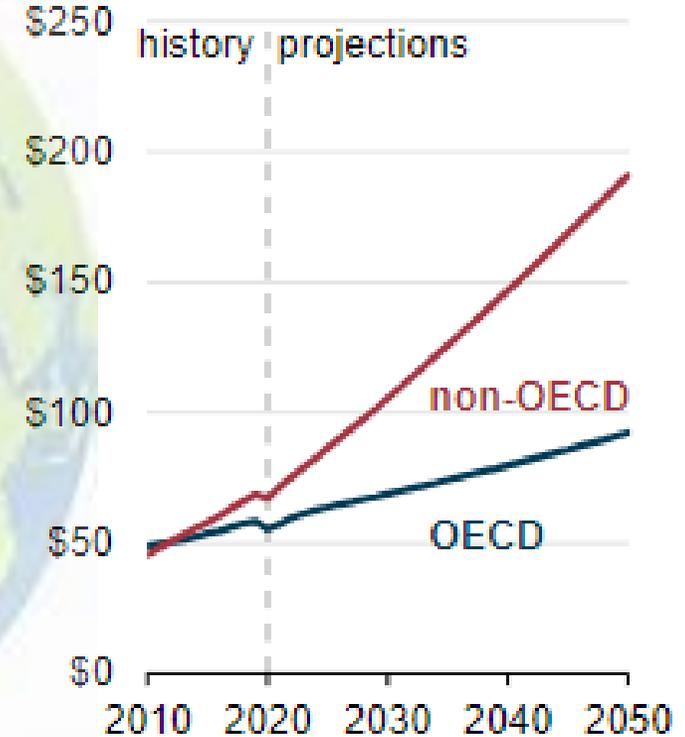
World energy consumption
quadrillion British thermal units



World population
billion people

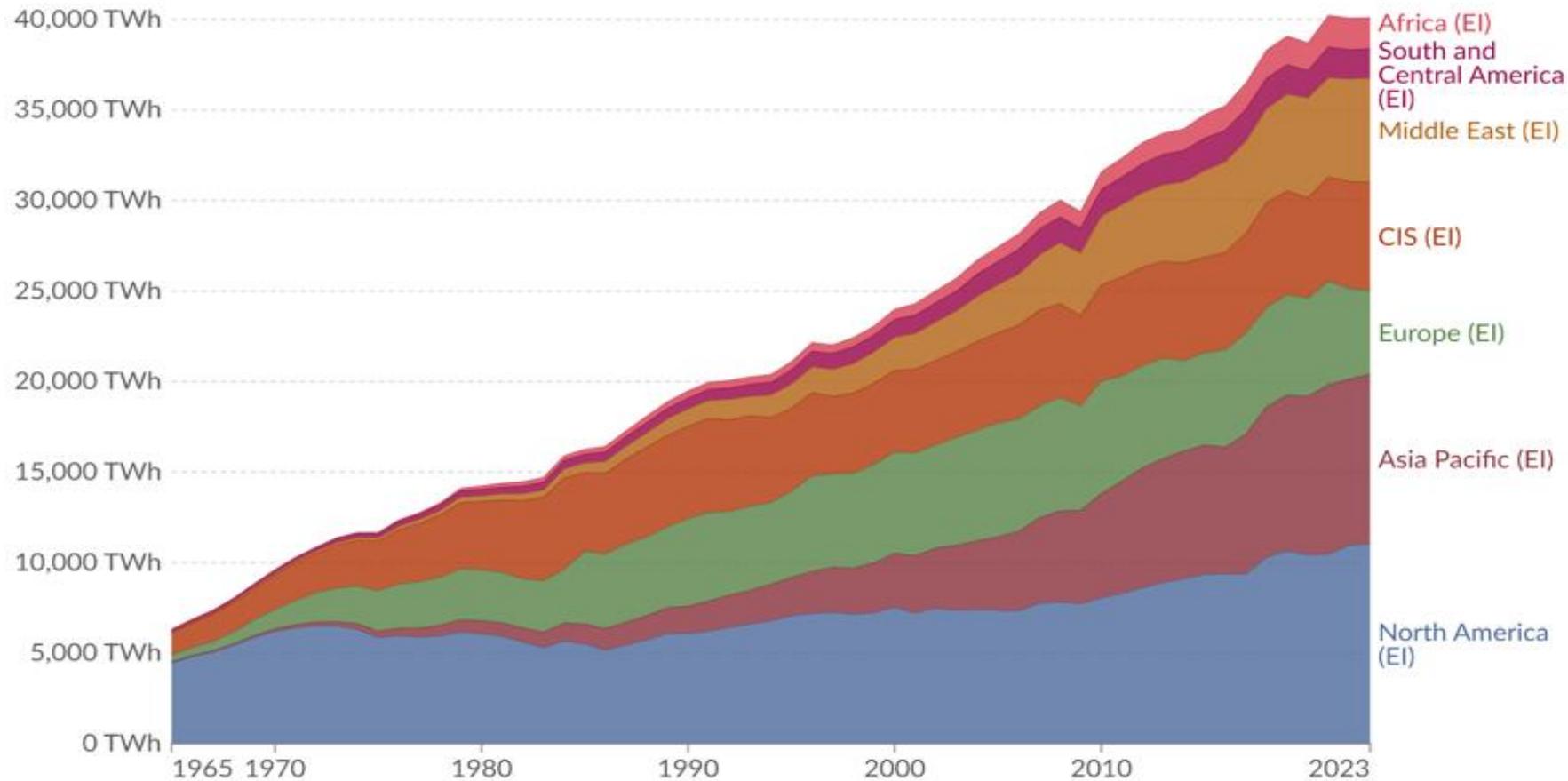


World GDP
trillion 2015 dollars,
purchasing power parity (PPP)



Source: U.S. Energy Information Administration, *International Energy Outlook 2021* (IEO2021) Reference case

Gas Consumption by Global Region



Takeaways:

The United States, Russia, China, Iran and Japan are the world's largest natural gas consumers.

The US alone is responsible for 21.7% of global natural gas use.

Data source: Energy Institute - Statistical Review of World Energy (2024)

OurWorldinData.org/fossil-fuels | CC BY

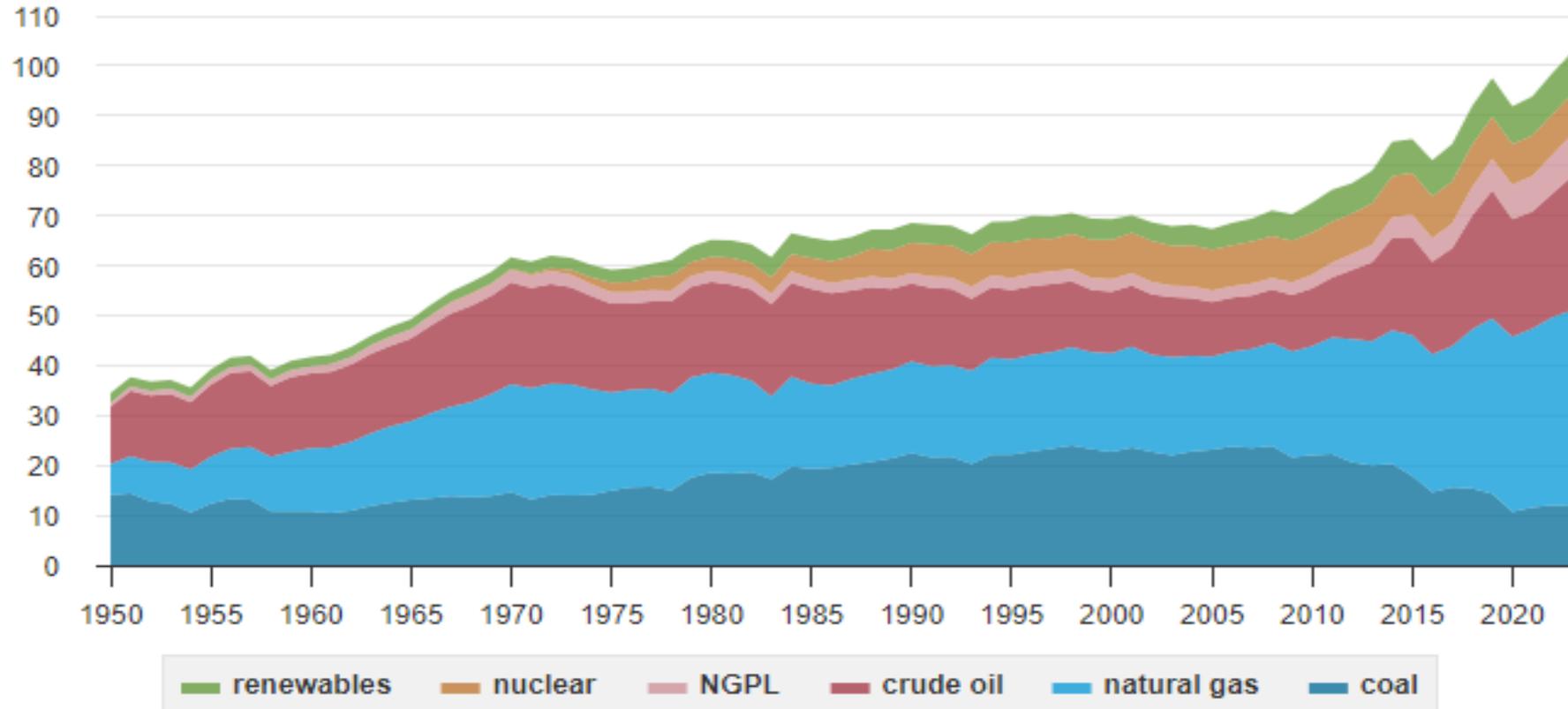
Note: CIS (Commonwealth of Independent States) is an organization of ten post-Soviet republics in Eurasia following break-up of the Soviet Union.

Annual natural consumption is measured in terawatt-hours (TWh)

Since 1950 a 3X Increase in Demand in All Fuel Sources

U.S. primary energy production by major sources, 1950-2023

quadrillion British thermal units



Takeaways:

Even with renewables in the fuel mix, all fuels have grown.

Natural Gas continues to grow as the most clean and reliable fuel.

Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.2, April 2024, preliminary data for 2023

 Note: NGPL=natural gas plant liquids

The Long and Winding Road* Ahead- The Takeaways

- **For 2025 and years to come**, the United States is projected to have a diverse mix of power generation sources, with renewable energy (particularly solar and wind) and **natural gas leading the way**, and the continued decline of coal production.
- **Natural gas production** must keep up with demand growth and to do so **will require permitting reform** for expedited projects and streamlined EIS approval.
- **Natural gas remains a major player, expected to account for about 43% of U.S. electricity generation**, with plans to add approximately 4.4 GW of new natural gas-fired capacity in 2025. **Natural Gas and Nuclear are the only completely dispatchable power for AI with competent up times.**
- **Petrochemical demand is continuing to grow at unprecedented rates** as the population grows to 10 billion by 2050.
- **A serious supply chain issue**: New-project timelines face delays due to limited upstream capacity for equipment such as transformers and turbines.

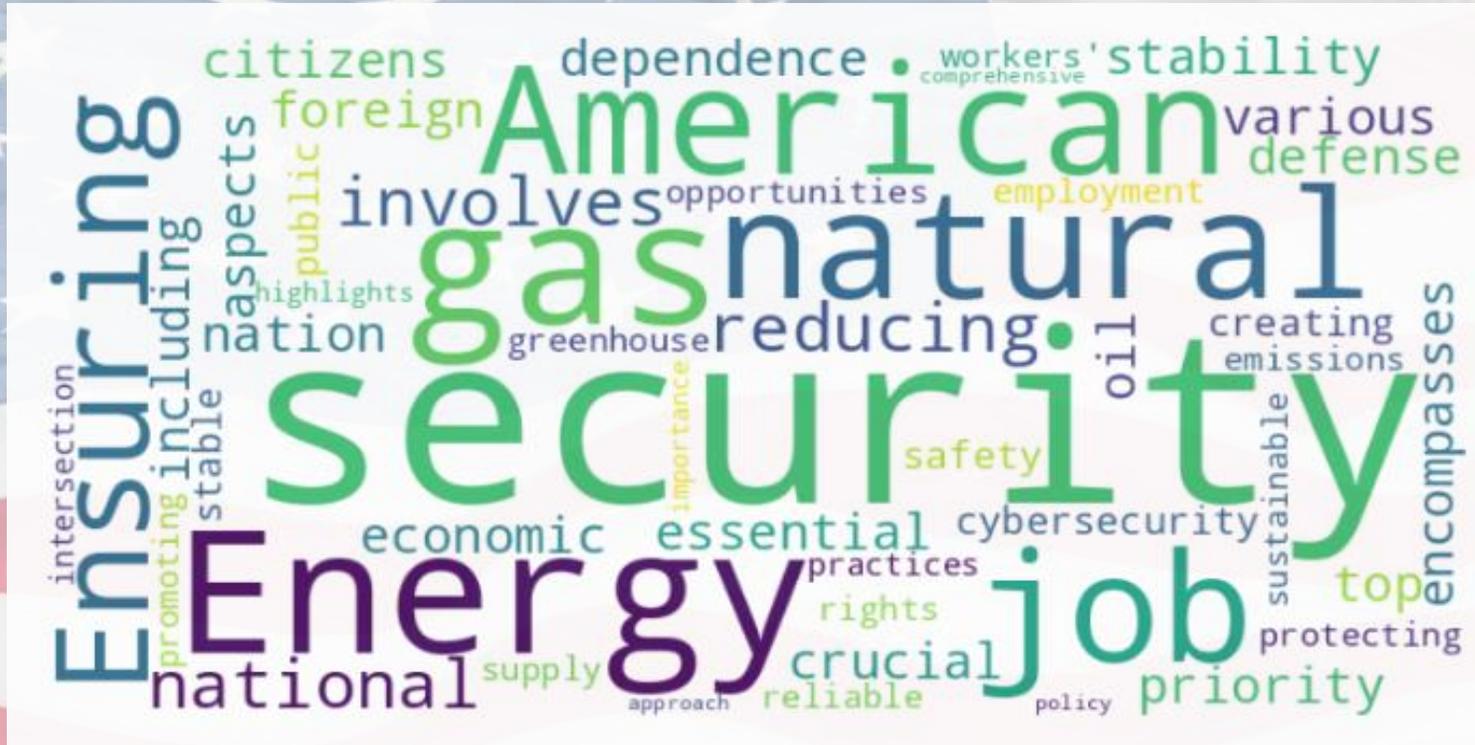


Other issues to consider:

- Labor availability
- Re-shoring and manufacturing
- Tariffs and Policy
- Marine issues- Section 301 and Export Licensing

Securing Jobs, Energy Security and National Security

BECOME AN ENERGY AMBASSADOR



Source: AI generated by Copilot

A photograph of an industrial refinery or chemical plant. The scene is filled with a complex network of silver-colored metal pipes, valves, and large cylindrical storage tanks. In the background, several large industrial vessels or ships are docked at a pier under a clear blue sky with some light clouds. A bright yellow banner is overlaid on the top left of the image.

THANK YOU

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