



NATURAL GAS: UPSTREAM



**INDUSTRY
OVERVIEW
SEGMENTS**



Today's Agenda

- ▶ Market Overview
- ▶ The Trump factor
- ▶ Emerging Opportunities
- ▶ Industry Resources
- ▶ What to watch
- ▶ Questions & Answers

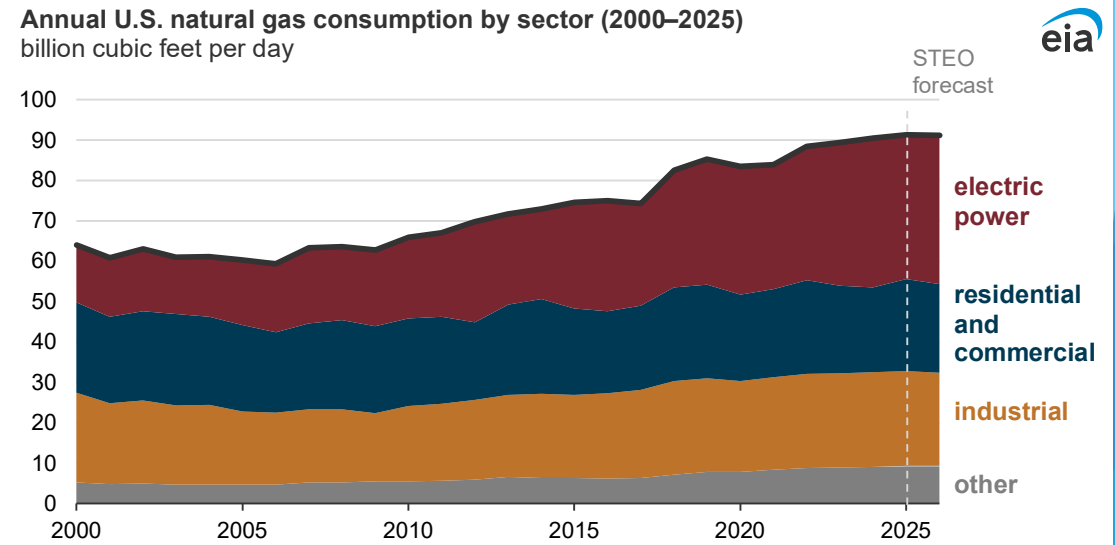
NATURAL GAS: UPSTREAM

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**ENERGY &
MANUFACTURING**
in Appalachia

Natural Gas Production

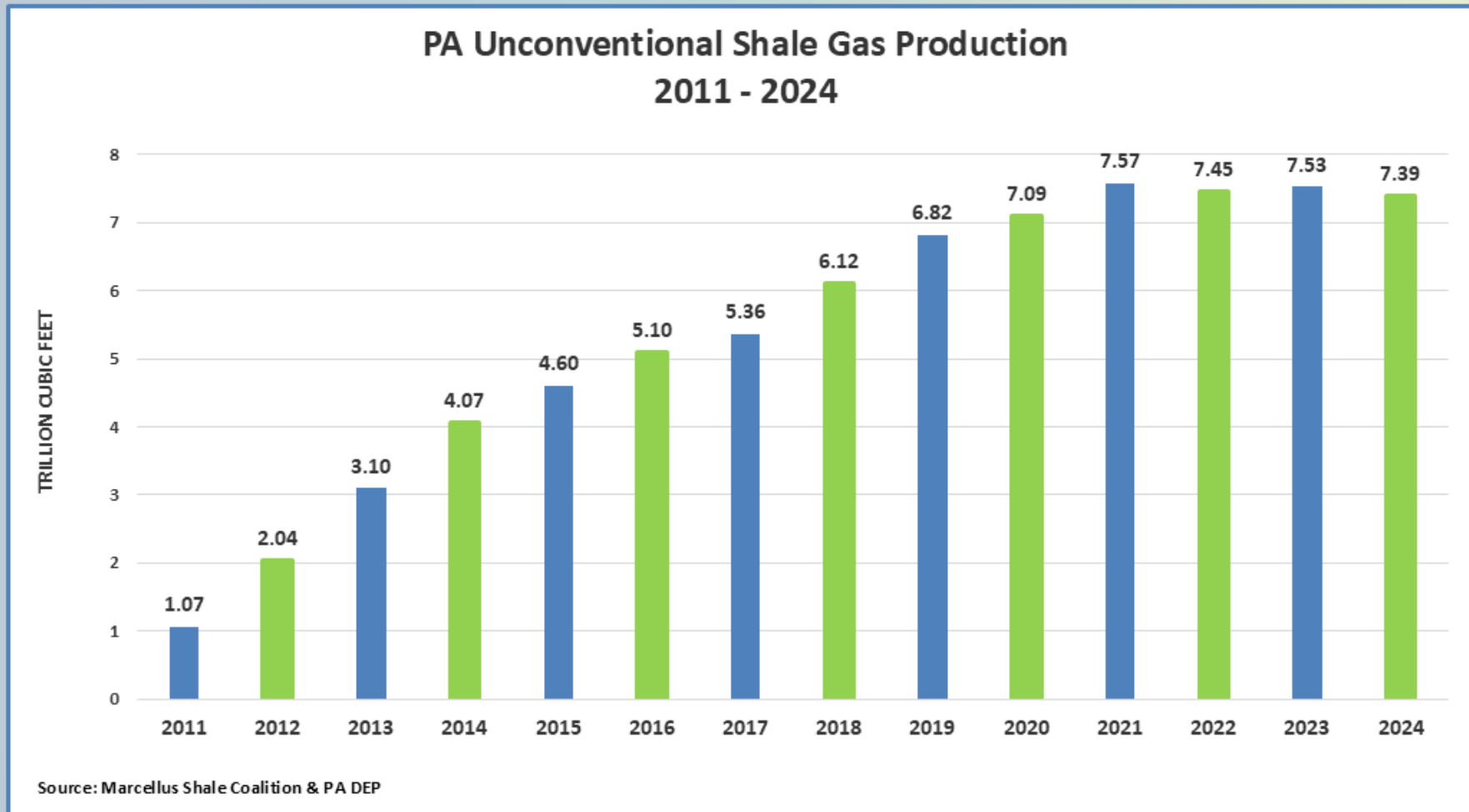
- ▶ US consumes approximately 90 BCF/D
 - ▶ Power 35 BCF/D, Industrial 23 BCF/D, Residential 11 BCF/D, Commercial 8 BCF/D
- ▶ US produces approximately 117 BCF/D
 - ▶ Exports - pipeline 9.5 BCF/D, LNG 14 BCF/D
- ▶ Appalachian Region Production - 36 BCF/D
 - ▶ PA 23 BCF/D
 - ▶ WV 8.5 BCF/D
 - ▶ OH 4.5 BCF/D
 - ▶ MD & NY



Marcellus & Utica Shale Formation



Production Over the Years



Trump Administration Impact

- ▶ At least 11 executive orders related to energy development
 - ▶ Unleashing American Energy
 - ▶ Declaring a National Energy Emergency
 - ▶ Protecting American Energy From State Overreach
 - ▶ Strengthening Electric Grid Reliability
 - ▶ Ending Market Distorting Subsidies for Unreliable, Foreign-Controlled Energy Sources
 - ▶ Reinvigorating the Nuclear Industrial Base
 - ▶ Ordering the Reform of the Nuclear Regulatory Commission
 - ▶ Reforming Nuclear Reactor Testing at the Department of Energy
 - ▶ Deploying Advanced Nuclear Reactor Technologies for National Security
 - ▶ Prioritizing American Coal for AI Data Centers
 - ▶ Putting America First In International Environmental Agreements



Trump Administration Impact

▶ Trade & Tariff Negotiations

- ▶ European Union: \$750 billion energy purchases over 3 years (2026-2028)
- ▶ Japan: \$550 billion investment fund including \$7 billion annually in energy purchases
- ▶ South Korea: \$100 billion energy purchases over 4 years
- ▶ Indonesia: \$15 billion in energy purchases
- ▶ Philippines: Trade deal with tariff reduction to 19%, energy purchase commitments
- ▶ Malaysia: Reciprocal tariff of 19%, energy purchase commitments (estimated \$3 billion annually in LNG)
- ▶ Thailand: Tariff at 19%, additional LNG purchase commitments
- ▶ Vietnam: Tariff reduction on LNG imports from 20% to 2%
- ▶ **Approximately \$1.4 trillion in deals related to energy**



Emerging Opportunities

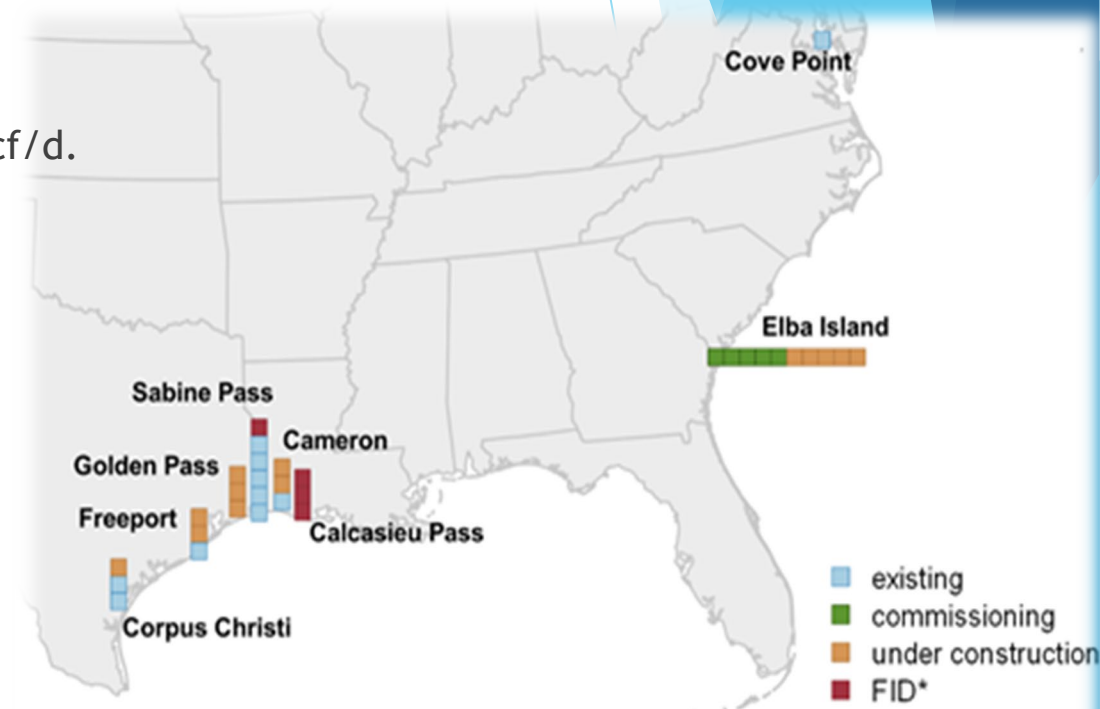
- ▶ Exports - LNG
- ▶ Data Centers
- ▶ Power Generation
- ▶ Emissions reduction, capture, and measurement still relevant
- ▶ Rare earth minerals
- ▶ Technology driven industry



LNG Facilities

- ▶ Plaquemines LNG (Phases 1 and 2) in Louisiana: Combined capacity about 2.6 Bcf/d nominal, with peak capacity near 3.2 Bcf/d.
- ▶ Port Arthur LNG Phase 1 in Texas: Around 1.8 Bcf/d capacity.
- ▶ Rio Grande LNG Phase 1 in Texas: Approximately 2.2 Bcf/d.
- ▶ Delfin FLNG offshore Gulf of Mexico: About 0.4 Bcf/d.
- ▶ Alaska LNG in Alaska: Roughly 2.55 Bcf/d.
- ▶ Lake Charles LNG (Energy Transfer) in Louisiana: Approximately 2.2 Bcf/d.
- ▶ Commonwealth LNG in Louisiana: Around 1.3 Bcf/d nominal.
- ▶ Louisiana LNG (Driftwood) in Louisiana: About 3.7 Bcf/d.
- ▶ Corpus Christi Midscale Trains 8 & 9: Around 0.7 Bcf/d.
- ▶ Rio Grande LNG Phase 2: About 1.2 Bcf/d.

- ▶ Around 20 BCF/D of increased production

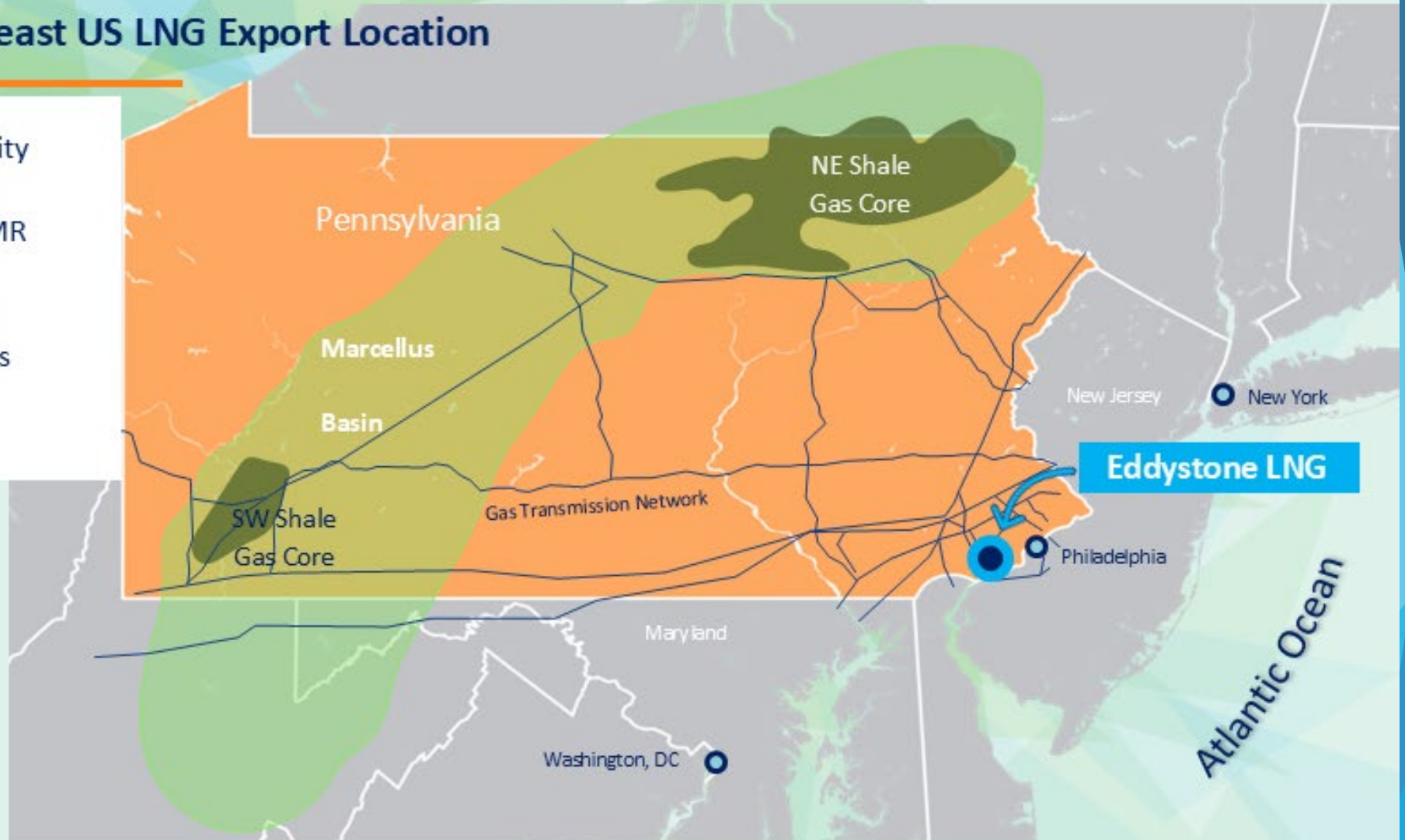


Source: U.S. Energy Information Administration, company investor presentations
Note: Each square represents one LNG train. Elba Island plans to deploy 10 small-scale modular liquefaction units sequentially in two phases.

*FID: Final Investment Decision

Premier Northeast US LNG Export Location

- 7.5+ MTPA Capacity
- World Class EPC
- Honeywell AP-DMR
- Electric Drive
- Existing Pipelines
- Deep water access
- FID 2027
- COD 2030/31



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AI Data Centers

- ▶ Nearly \$100 billion in announced projects
- ▶ TECfusions is building an AI Data Center on a 1400-acre site, planned capacity of 3 GW.
- ▶ Homer City, PA has a 3200-acre site planned with a 4.5 GW natural gas data center and power generation facility.
- ▶ Williams Companies is developing a 200 MW Socrates South Power Generation project
- ▶ Frontier Group \$3.2 billion to transform former Bruce Mansfield coal powerplant
- ▶ Range, Liberty Energy, and ILC are developing a site in Robinson Township, PA for data center use.
- ▶ PA Data Center Partners and Powerhouse Data Centers announced a \$15 billion, 1.3 gigawatt, three-campus data center hub near Carlisle, Pennsylvania.

- ▶ Anticipated energy demand ~ 30 GW or 4.5 BCF/D (if all natgas)



Power Generation

- ▶ PJM ~ Approximate size 200 GW
- ▶ Anticipated retirements around 40 GW
- ▶ Report showing gas turbine projects costs escalating ~ \$2 billion per GW (2x increase)
- ▶ If 100% natural gas, approximately 6 BCF/D increased demand



Emerging Opportunities

- ▶ Emissions reduction, capture, and measurement still relevant
 - ▶ Company investments
 - ▶ Export market
 - ▶ Continued emission reductions
- ▶ Rare earth minerals
 - ▶ Lithium extraction to support battery storage
 - ▶ PA - legislative or regulatory action most likely needed
- ▶ Technology driven industry

Resources

▶ Trade groups

- ▶ Marcellus Shale Coalition (MSC)
- ▶ Pennsylvania Independent Oil & Gas Association (PIOGA)
- ▶ Ohio Oil & Gas Association (OOGA)
- ▶ Gas & Oil Association of West Virginia (GO-WV)
- ▶ American Petroleum Institute (API)

▶ Online

- ▶ Penn State Extension Energy Team
- ▶ Marcellus Drilling News
- ▶ Company investor reports



Marcellus Drilling News

Helping People & Businesses Profit from Northeast Shale Drilling

What to watch

- ▶ Reality check - can natural gas continue to fuel the nation?
 - ▶ **IF** 100% data centers are powered by natural gas = 4.5 BCF/D increase
 - ▶ **IF** 100% grid power is powered by natural gas = 6 BCF/D increase
 - ▶ **IF** 100% LNG projects are developed = 20 BCF/D increase
- ▶ All shale is not created equally
 - ▶ Utica wells limited decline curve
 - ▶ Oil / liquids
- ▶ FERC
 - ▶ Chairman Rosner emphasizes grid reliability and new infrastructure development
- ▶ Regulation reform
- ▶ PJM - tells data centers to BYOG
- ▶ Trade deals
- ▶ PA - Supreme Court Decision on RGGI

Impact to Manufacturing - Energy Cost

- ▶ Approximately 30 BCF/D increased use of natural gas if **100% conversion**
- ▶ Recall: US produces approximately 117 BCF/ D
- ▶ LNG Exports started 2016 - net exporter around 2022
- ▶ Timeline is measured in years - industry in past has increased production to meet demand

Questions?

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