



**Institute for Energy Economics  
and Financial Analysis**

# CCS and Gas Power

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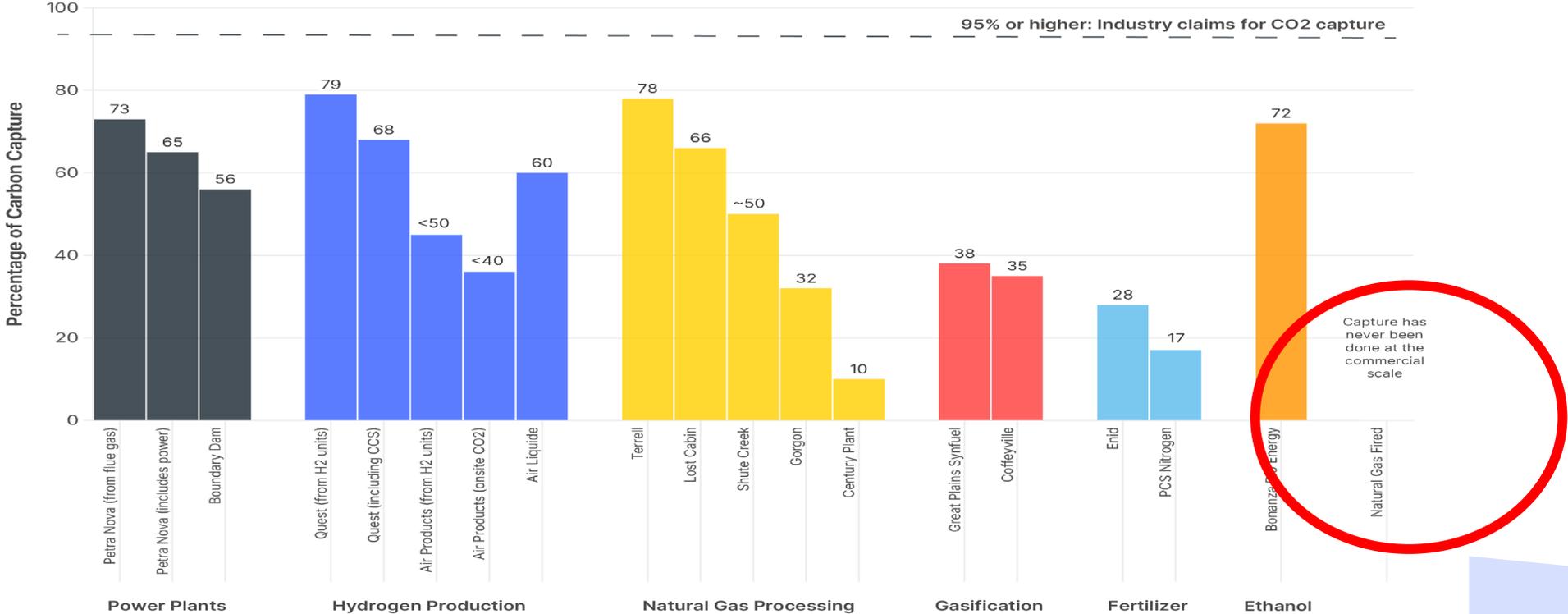
Unproven Performance, Uncertain Costs

**Dennis Wamsted**

November 6, 2025

# CCS and Gas-Fired Turbines – It’s Never Been Done

Real World CCS Operating Performance

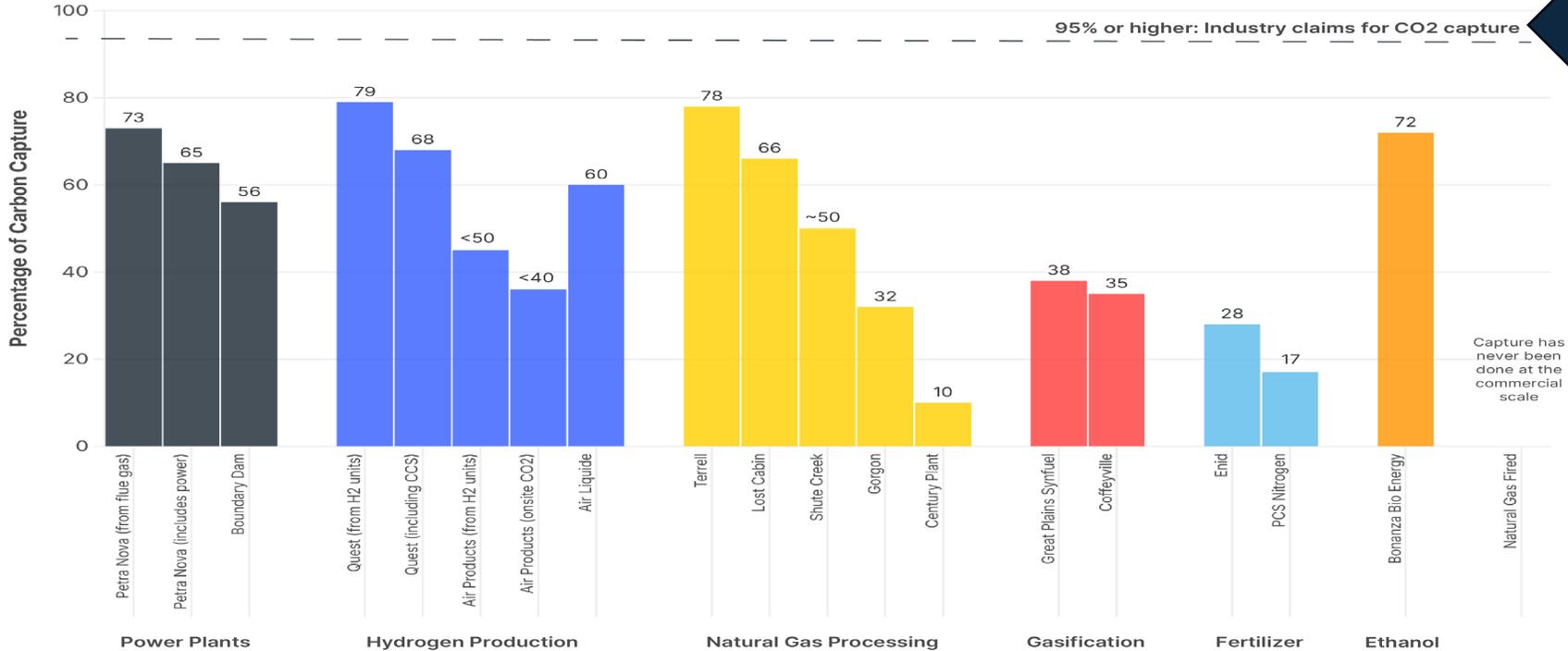


Sources: IEEFA, Shell Quest Project annual reports, Boundary Dam 3 status reports, U.S. EPA FLIGHT database, NRG; Emirates Steel, and DOE



# CCS and Gas-Fired Turbines

Real World CCS Operating Performance



Projects have uniformly failed to hit the 95% marker

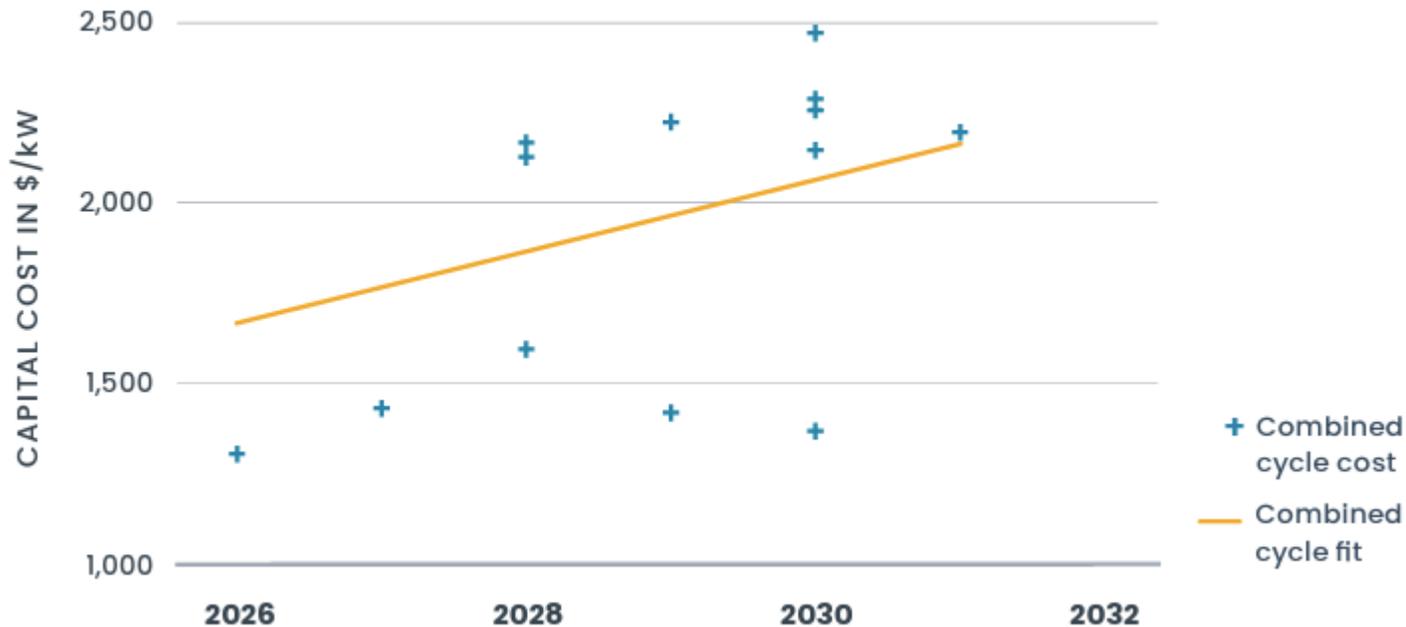
Sources: IEEFA, Shell Quest Project annual reports, Boundary Dam 3 status reports, U.S. EPA FLIGHT database, NRG; Emirates Steel, and DOE



# CCGT Costs Rising Rapidly

## COMBINED CYCLE GT COST VS. OPERATING YEAR

Linear regression includes only operating year

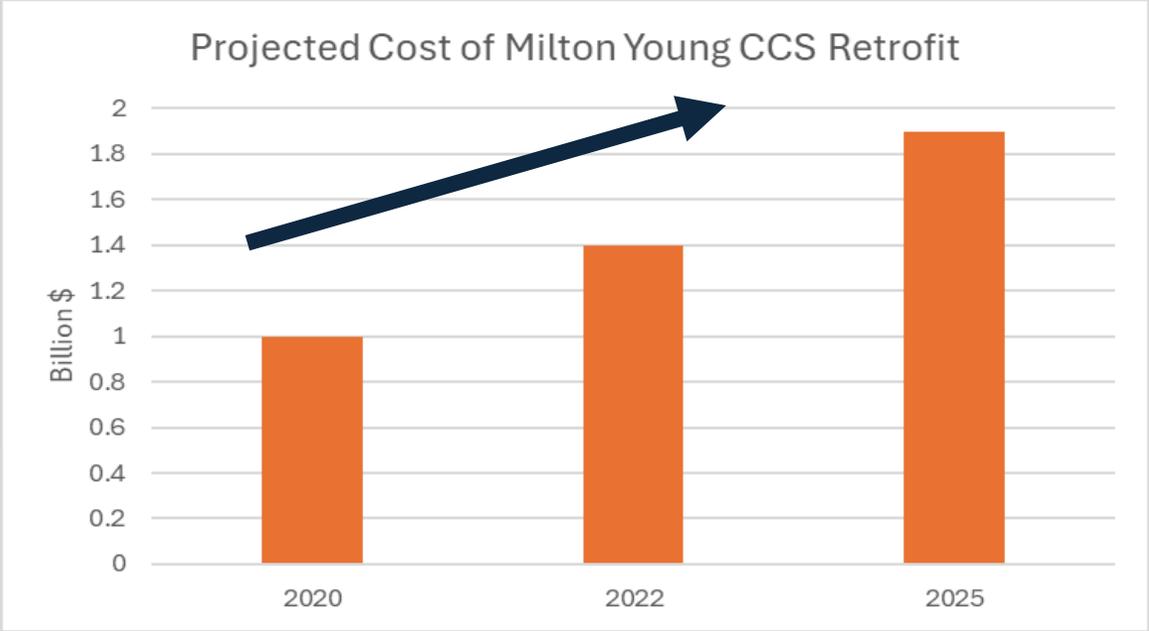


Source: GridLab

- GE says CCGT costs are now at ~\$2,500/kW
- That would push cost of PIESAC proposed turbine to ~\$1.2 billion – TOTAL project cost was estimated at ~\$1.3 billion

# CCS Costs Rising Rapidly

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- Costs for proposed CCS retrofit at Milton R. Young coal plant in North Dakota have risen sharply

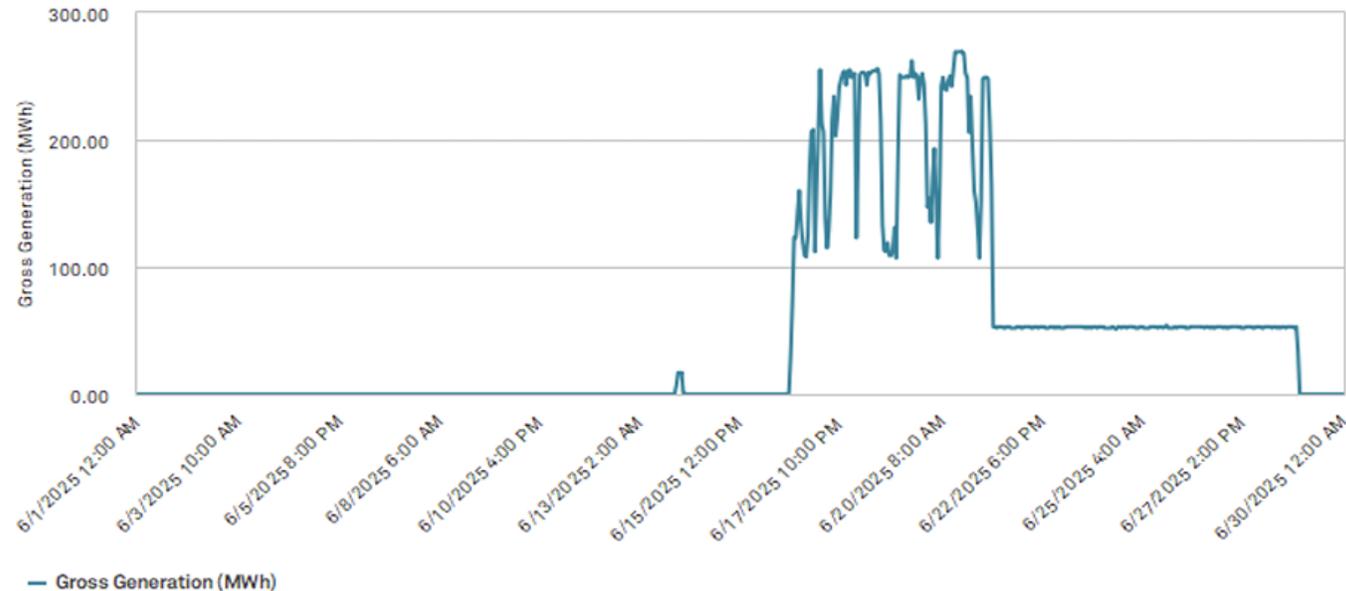
# Operational Questions – One Month

Cherokee Gas Fired Plant | Unit Hourly Operations

Periods From: 06/01/2025 To: 06/30/2025

Chart

Cherokee (CO) CC 6 - Gross Generation (MWh)



- Gas plants don't operate at a steady state
- CO<sub>2</sub> capture equipment works best at steady state

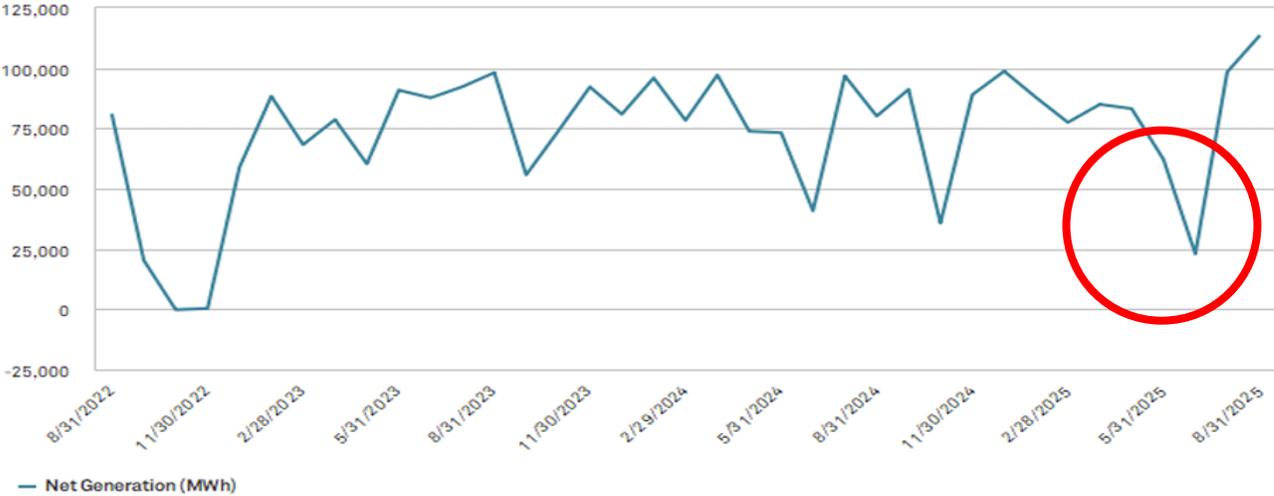
# Operational Questions – Every Month

Cherokee Gas Fired Plant | Generation Chart

Reporting Level: Cherokee (CO) CC 6  
Frequency: Monthly  
Period: 3 Years

Chart

Cherokee (CO) CC 6 Net Generation (MWh)



- Gas plants don't operate at a steady state - ever
- CO<sub>2</sub> capture equipment works best at steady state

# CCS and Gas Power – The Takeaways

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- It's never been done at commercial scale
- Low flue gas concentrations make capture hard/costly
- Costs for gas turbines and CCS equipment are rising
- Operational characteristics for gas power / carbon capture equipment do not mesh

**“ CCS remains many years from being proven to be a technically feasible, adequately demonstrated, and commercially viable solution for reducing CO2 emissions.**

**American Electric Power ”**

# CCS and Gas Power

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