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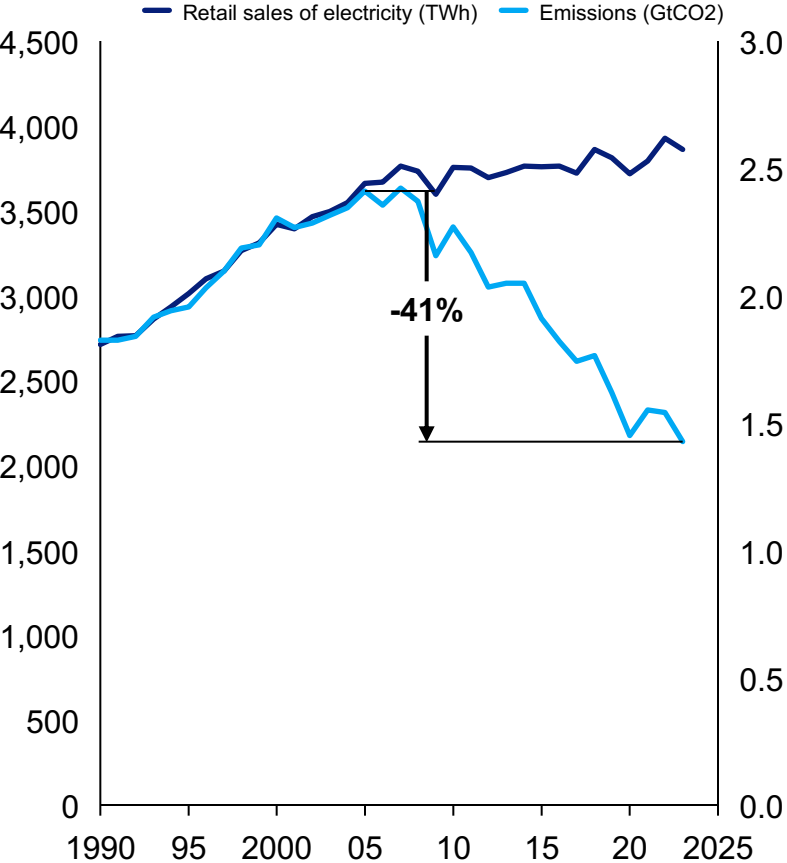
# NASEO Energy Security Bootcamp

June 13<sup>th</sup> 2024

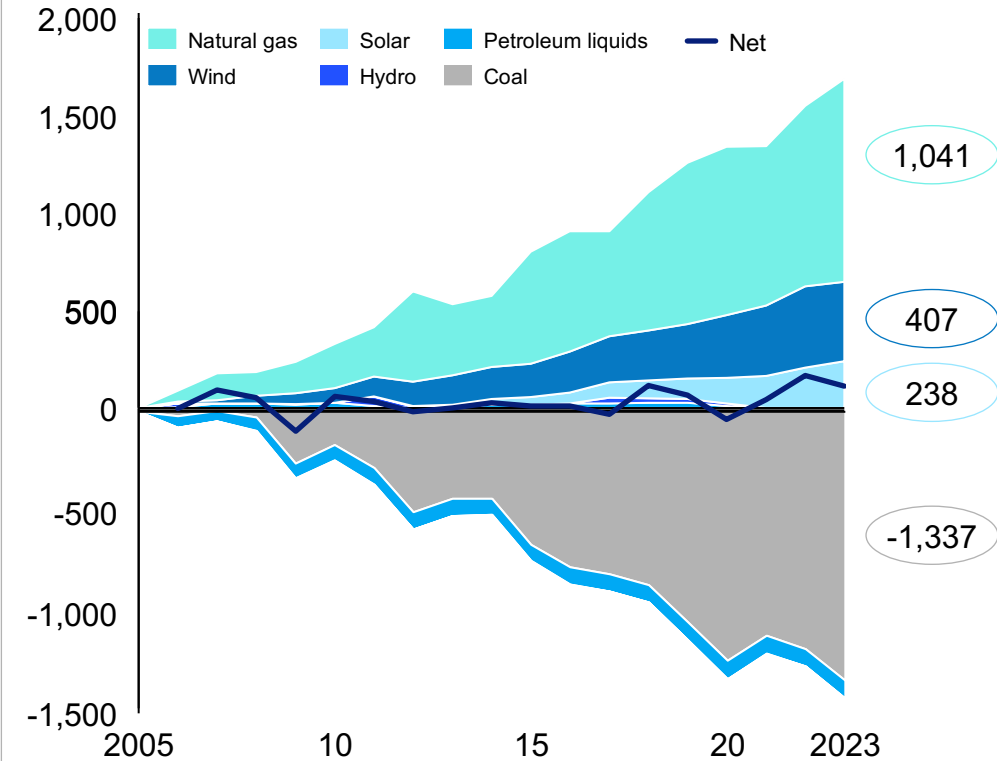
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# The US power sector has significantly grown RES and gas-fired generation, reducing emissions by 40% in the past decade

**US retail electricity sales and emissions, TWh / GtCO<sub>2</sub>**



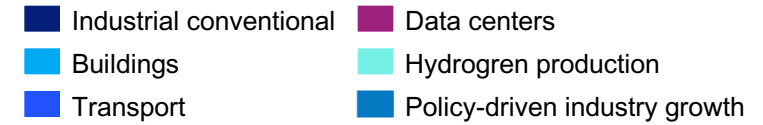
**Change in US net generation by fuel, relative to 2005, TWh**



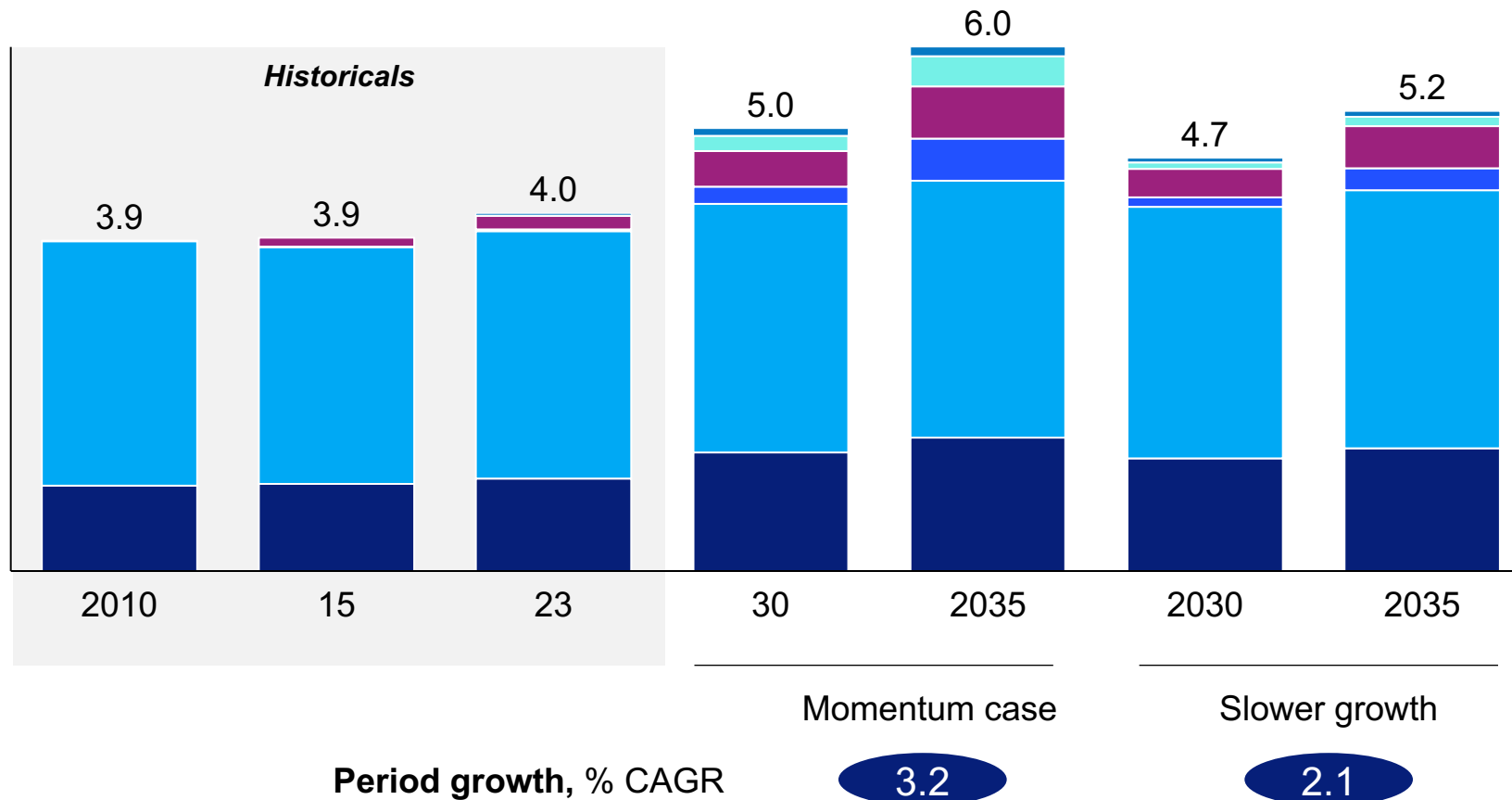
- The US power sector has reduced emissions by 40% in the past 20 years, while generation volumes have remained stable
- Sector emissions intensity improvements have arisen primarily from displacement of coal-fired generation, while improved average heat rates across the gas fleet are responsible for additional gains

Source: EIA forms 923, Electricity Monthly April 2024

# US power demand is expected to deviate from recent historical trends, and grow by ~2-3% p.a., in the near term



US Power demand<sup>1</sup> by sector 2022-2040, kTWh



## Comments

Key drivers of increased power demand expand beyond traditional growth (e.g., building sq ft), and include new load from H2, transport, and datacenters

A departure from recent historical growth rates is expected in all cases, with trends reverting to pre-2010's levels of growth

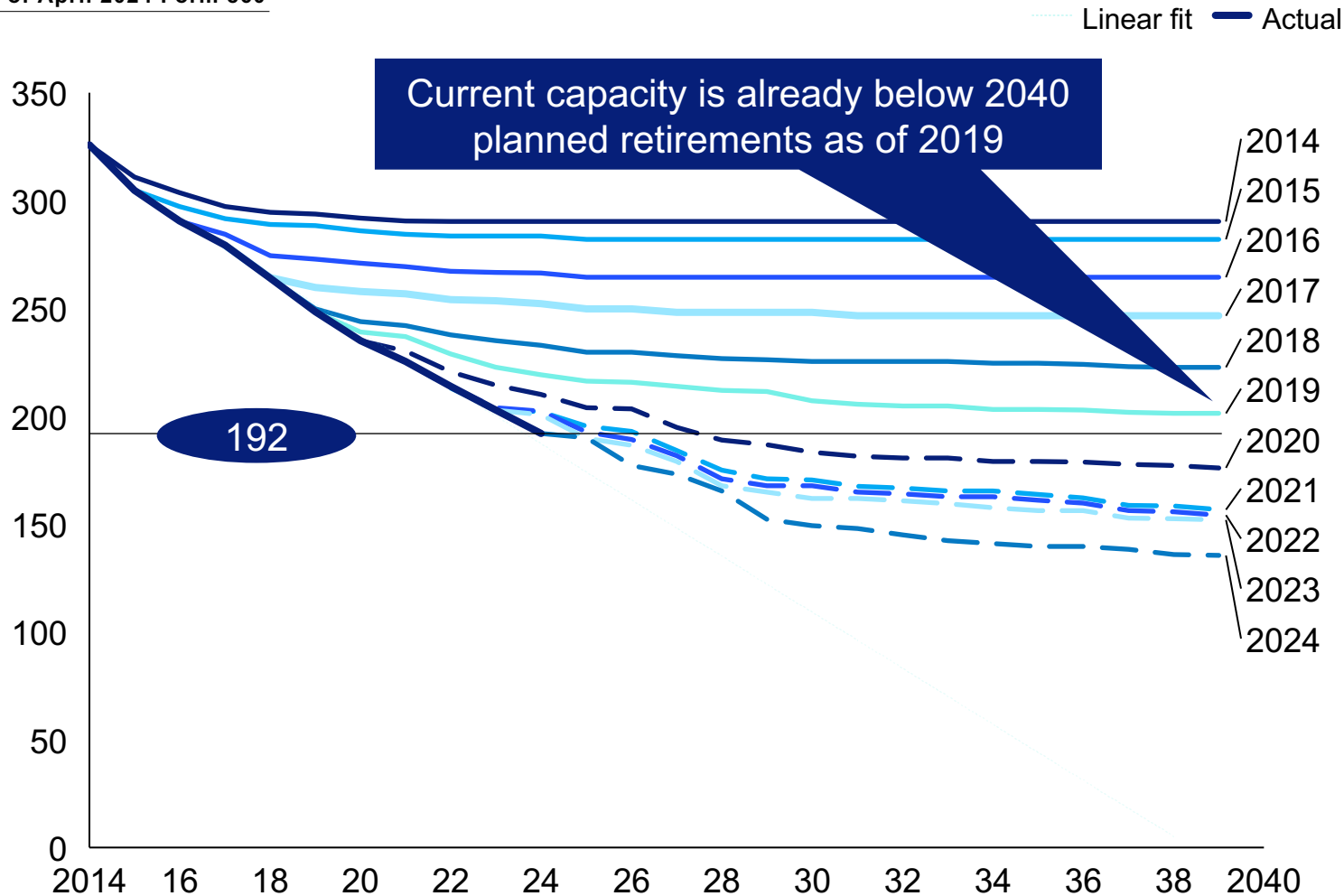
Datacenter growth is most robust

1. Volumetric power demand load is total downstream sales, comparable to EIA 861, gross of DG, BTM, and T&D losses. Historical actuals are from EIA 861.

# US coal plant retirements have outpaced plans in recent years, as more closures are announced

US year-end coal nameplate capacity and planned retirements by year of report, GW

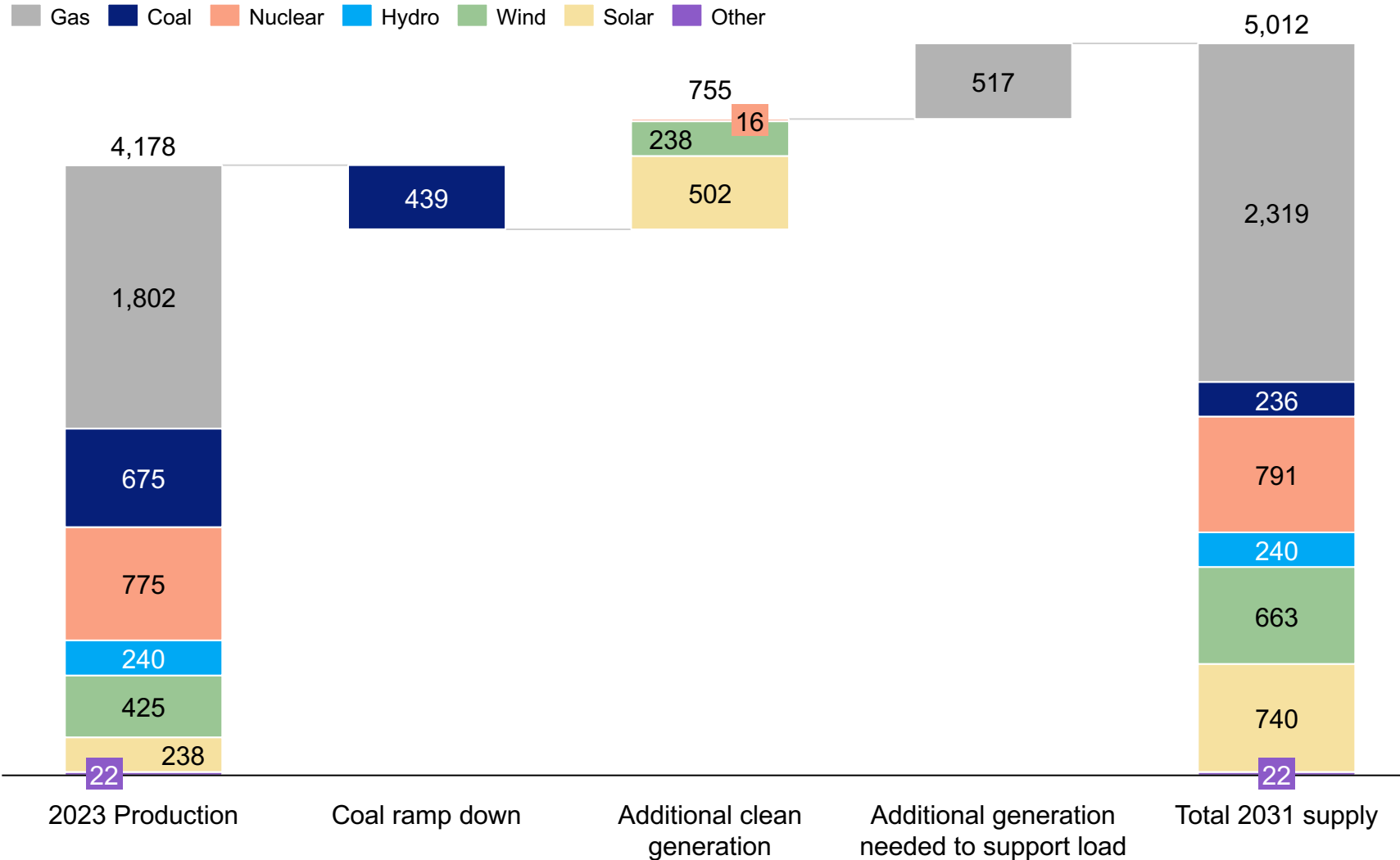
As of April 2024 Form 860



- Annual announced closures have consistently under-represented the actual closure rate – even in the short term
- The long-term closure plan is not a forecast, but rather a ceiling on potential capacity
  - Continuing the recent trend would suggest that the US coal fleet would be completely retired before 2040 (~13GW/yr closures)
  - Near-term forces could further accelerate the trend, particularly from demand loss, low gas prices, and federal policy

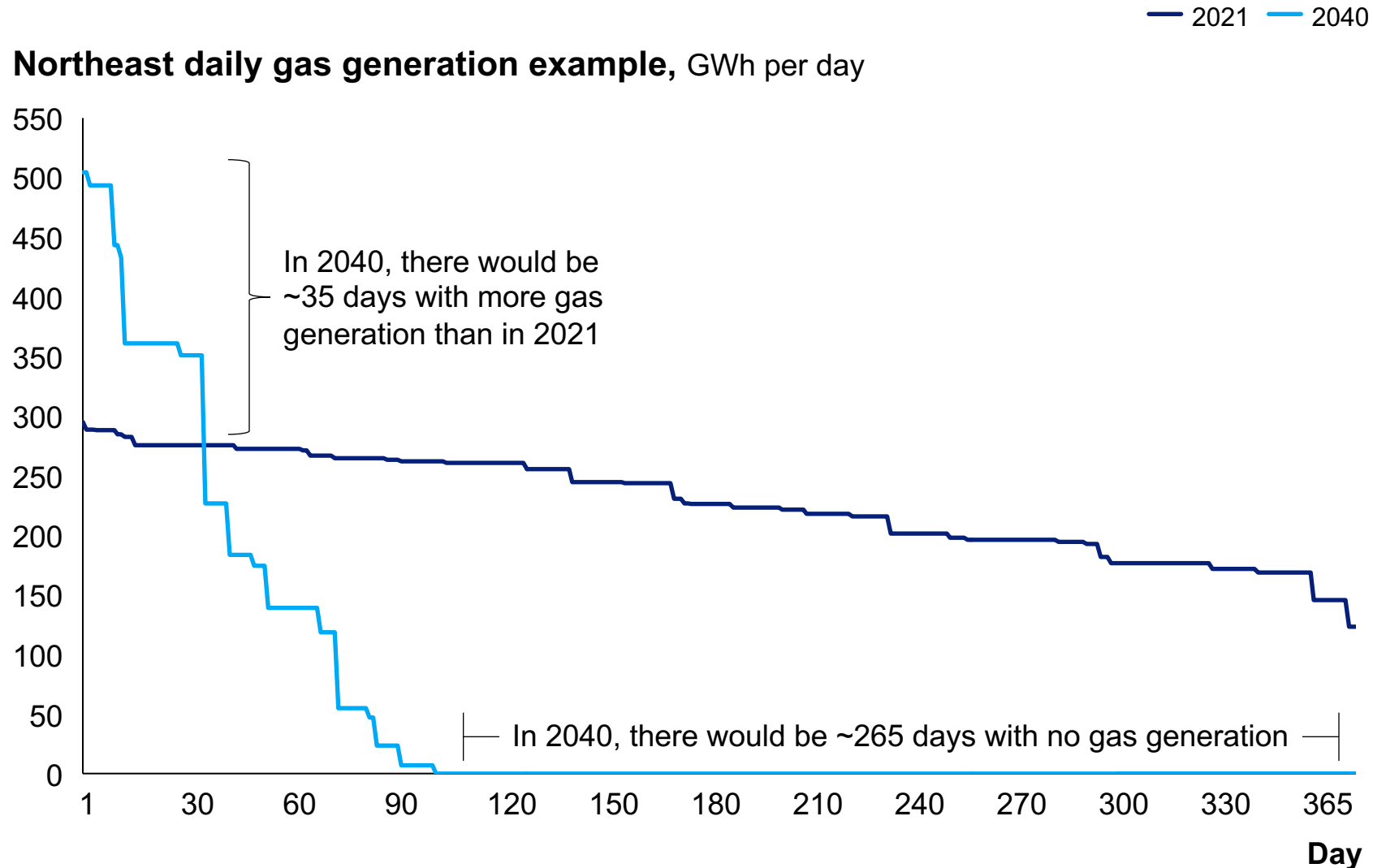
1. Includes addition 4 months of data

# In the near term, however, the US would need to plug the US power supply, TWh



- Annual growth of wind and solar installations of 15% would dramatically increase US supply from these resources
- However retirement of coal-fired generation and load growth require even more power to backfill – which may be supported by natural gas
- The overall demand for clean power will accelerate, and the opportunity for developers to fulfill this demand will grow

# Over time the gas supply will be critical, and peak needs grow, even with decreasing volumes



## Key Takeaway

- Based on detailed modeling, in an aggressive decarbonization scenario, this would require more gas in 2040 for ~35 days than it does today. However, for ~265 days there would be virtually no gas generation
- In this scenario, it is uncertain how regulators and customers would react to paying for infrequently used capacity
- There is an opportunity to change midstream contracting structure to ensure power reliability and possibly deploy additional capital