

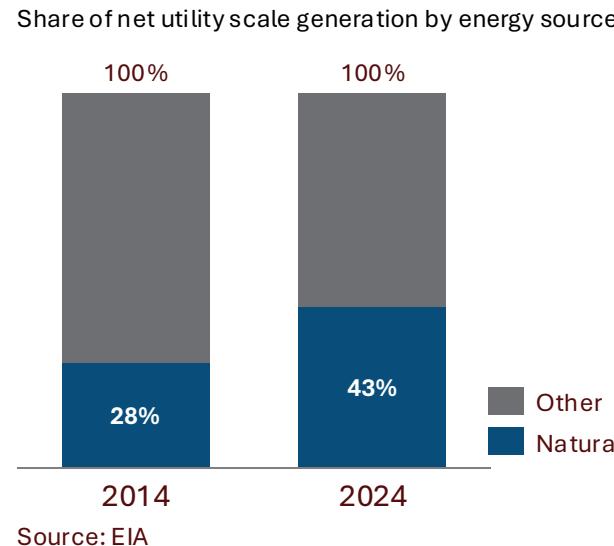


Reliable Energy

**Delivering on the Promise of
Gas-Electric Coordination**

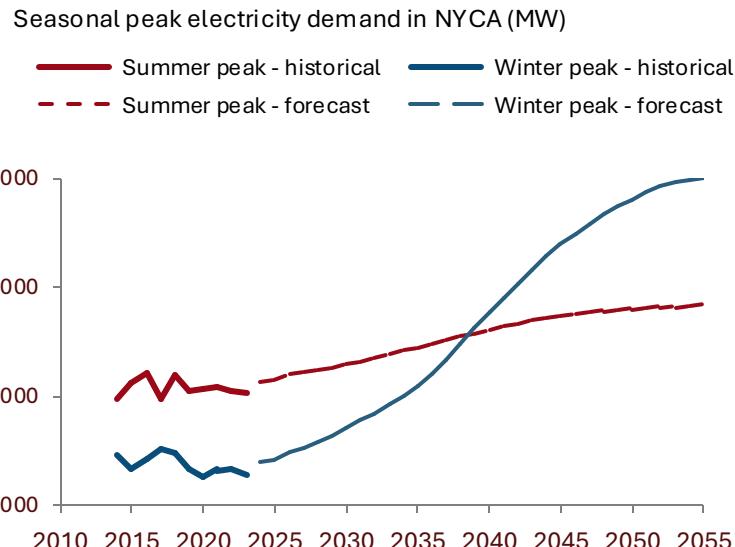
Context – NPC Gas-Electric Coordination Report

Natural gas is helping to power the US economy ...



Natural gas is now the dominant fuel for US electricity generation, providing **43%** of utility-scale power supply in 2024, up from **28%** in 2014.

... but there is pressure on both gas and electric sectors ...



- Both sectors face rapid demand growth (particularly in winter), infrastructure constraints, and more frequent extreme weather events.
- Disruptions in one sector can now cascade into the other, risking widespread outages and higher costs.

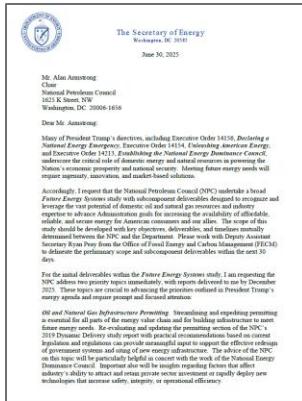
... and a clear need for a better path forward

We need to:

- Analyze the **roots and impacts** of gas-electric misalignment.
- Highlight **key risks** and recent reliability events.
- Recommend **actionable strategies for better alignment**, reliability, and resilience across both sectors.

Introduction – NPC Gas-Electric Coordination Report

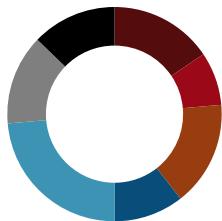
A mission for better coordination ...



DOE Secretary Wright requested the NPC bring unique insights into the misalignment of the gas and electric sectors, which may threaten energy security, reliability and affordability.

... to develop a holistic cross-sectoral review ...

Organization representation by sector on the Study Committee, Coordinating Subcommittee, and Task Groups



- Upstream oil & gas
- Midstream pipeline & energy infrastructure
- Natural gas utilities & associations
- Electric grid operators & reliability organizations
- Electric power generation & utilities
- Consulting & advisory services
- Research, non-profit, and academic institutions

Report was directed by a study team composed of senior leaders from the gas and electric power industries, along with representatives from government, academia, and public interest organizations.

... that covers major events and studies from the past ~20 years

~5

months of research and analysis

+30

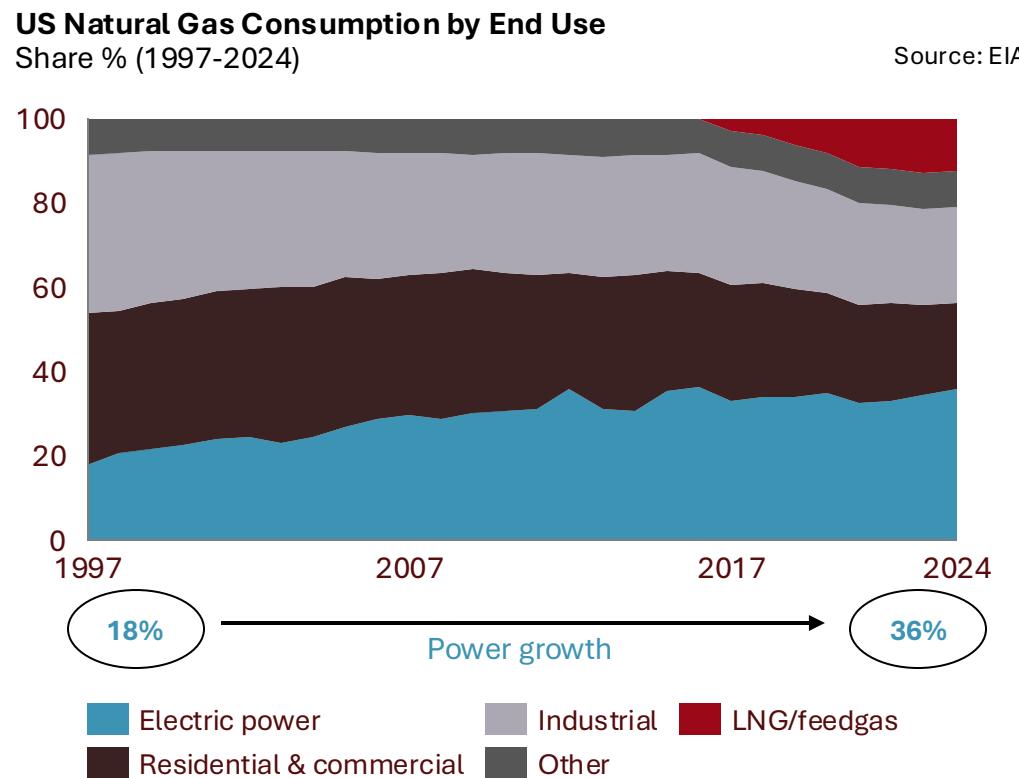
sources reviewed in a comprehensive literature scan

10

final recommendations developed for the report

Historical development of the gas and electric sectors

Electric power is the largest consumer of gas and is forecast to continue to grow



Gas and power sector regulation has historically developed separately



Gas

Regulation driven by:

- Supporting gas utility peak load
- Supply gas to large non-power consumers (industrial loads)
- Cost recovery
- Regional production dynamics and supply basins



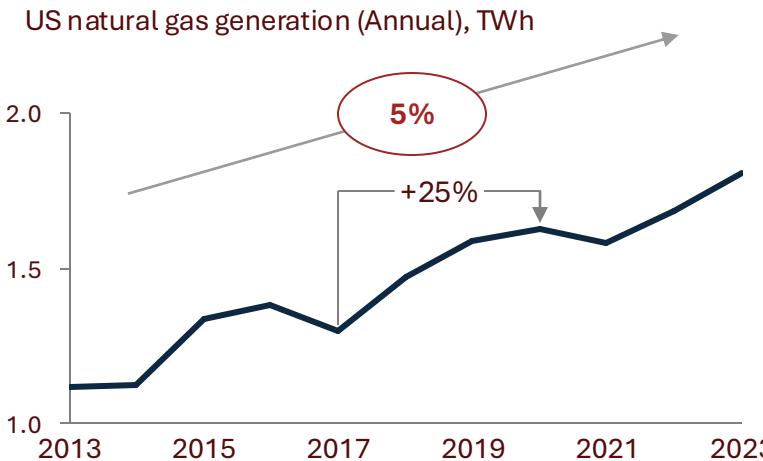
Power

Regulation driven by:

- Competitive markets across ISOs/RTOs and vertically integrated markets
- Balance of short-term availability and supply
- Reliability standards

The state of the gas and electric markets today

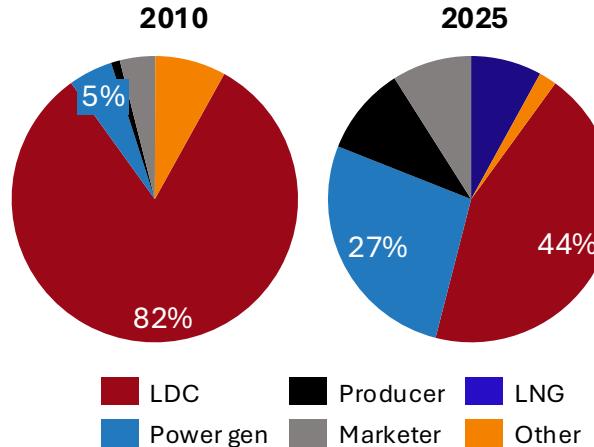
Gas use is growing in the US electricity sector



Gas generation has grown at a 5% CAGR from 2013 to 2023, including a 25% surge between 2017 and 2020 during the early years of the shale revolution.

Gas demand is more variable with rise in flexible gas power

Firm transportation capacity on Transco pipeline, %



- Power generation has significantly increased its use of gas pipeline capacity.
- Gas demand is now more variable, with generators often relying on interruptible capacity.
- Gas power plants are critical for grid balancing.

This strong connection between the two sectors and the growing variability in demand means **misalignments are growing** and becoming **more consequential**.

Fundamental differences between gas and power

Non-Exhaustive Examples



Gas

Operational

- Physical delivery dependent on pipeline capacity and storage
- Limited short-term flexibility; linepack and storage are main balancing tools
- Gas Day from 9:00 a.m. Central through 9:00 a.m. Central the following day

Commercial

- Nominations and re-nominations on fixed schedules
- Bilateral transportation and storage contracts
- Flexible commodity acquisition opportunities

Market Design

- Limited transparency; less centralized trading

- No single real-time balancing market

Governance

- Regulated by FERC (interstate) and state commissions (intrastate)

- Market participants include producers, pipelines, and local distribution companies



Power

- Must balance instantaneously (supply = demand at every moment)
- System operators dispatch in real time (e.g., every 5 minutes)
- Frequency control and spinning reserves maintain reliability
- Power Day trades within the standard calendar day of midnight to midnight in local time zones

- Variable demand patterns to supporting peakers and intermittent renewables
- Locational marginal pricing (LMP) reflects congestion and losses

- Centralized organized markets (ISO/RTOs)
- Co-optimization of energy, reserves, and ancillary services

- Overseen by FERC and regional ISOs/RTOs

- Stakeholder committees influence market rules and planning

4 key challenges have developed that need to be addressed

There are **4 key categories of challenges or ongoing misalignments** emerging from the literature review that still exist in the current market:

Key challenges/misalignments	Ways it can be improved
1 Operational Inefficiencies and Misalignments	• Increasing investment and development of fit-for-purpose infrastructure across the energy value chain
2 Market Design – Economic Inefficiencies and Fuel Assurance Misalignments	• Fuel assurance, resource adequacy, and other critical reliability metrics on a state-by-state basis
3 Commercial – Gas Services Design and Fuel Assurance and Power Sector Misalignments	• Ensure gas generators have adequate risk-based incentives to secure firm gas transportation capacity and supply to maximize fuel certainty
4 Fragmented Governance, Planning, and Reliability Coordination	• Embrace comprehensive long-term planning by regulators and government to take immediate action to ensure permitting reform unlocks fit-for-purpose infrastructure investment

Why healthy alignment matters

Healthy alignment requires robust infrastructure, shared priorities, clear accountability, and flexible market design. Failing to address misalignments increases the risk of outages, higher costs, and reduced resilience for consumers.

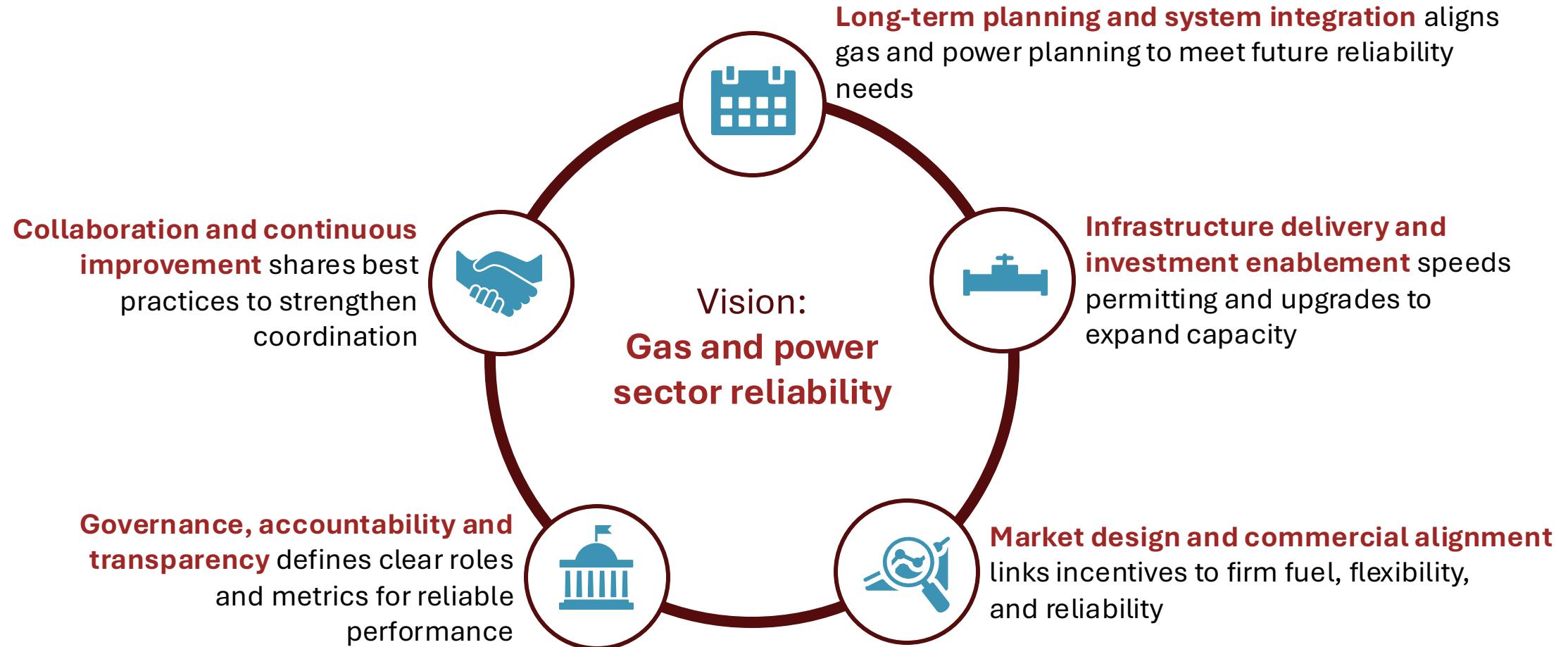


Principles of healthy alignment include:

- 1 **Infrastructure Serves as the Foundation for Healthy Alignment** → Strong, well-planned infrastructure enables reliable, flexible markets.
- 2 **Inherent Physical Limitations Between Natural Gas and Electric Sectors Are Acknowledged** → Recognize and plan around physical constraints like pipelines and storage.
- 3 **Reliability and Resilience Are Shared Priorities** → Coordinate to ensure dependable performance under all conditions.
- 4 **Accountability Requires Transparency** → Clear roles improve risk management and system response.
- 5 **Level of Service Expectations are Consistent** → Shared reliability standards align performance across sectors.
- 6 **Commercial Solutions Enhance Alignment and Mitigate Risk** → Market tools manage risk and improve reliability efficiently.
- 7 **Market Design Provides Flexibility to Adapt to Changes in Supply and Demand** → Flexible designs balance evolving system and market needs.
- 8 **Policy Environment is Constructive** → Stable policies foster investment and accountability.
- 9 **Participants Are Motivated to Reduce Misalignment and Friction** → Stakeholders collaborate to minimize inefficiencies.
- 10 **Costs of Alignment Are Clearly Identified** → Transparent cost analysis guides effective action.

Recommendations to deliver on principles of healthy alignment

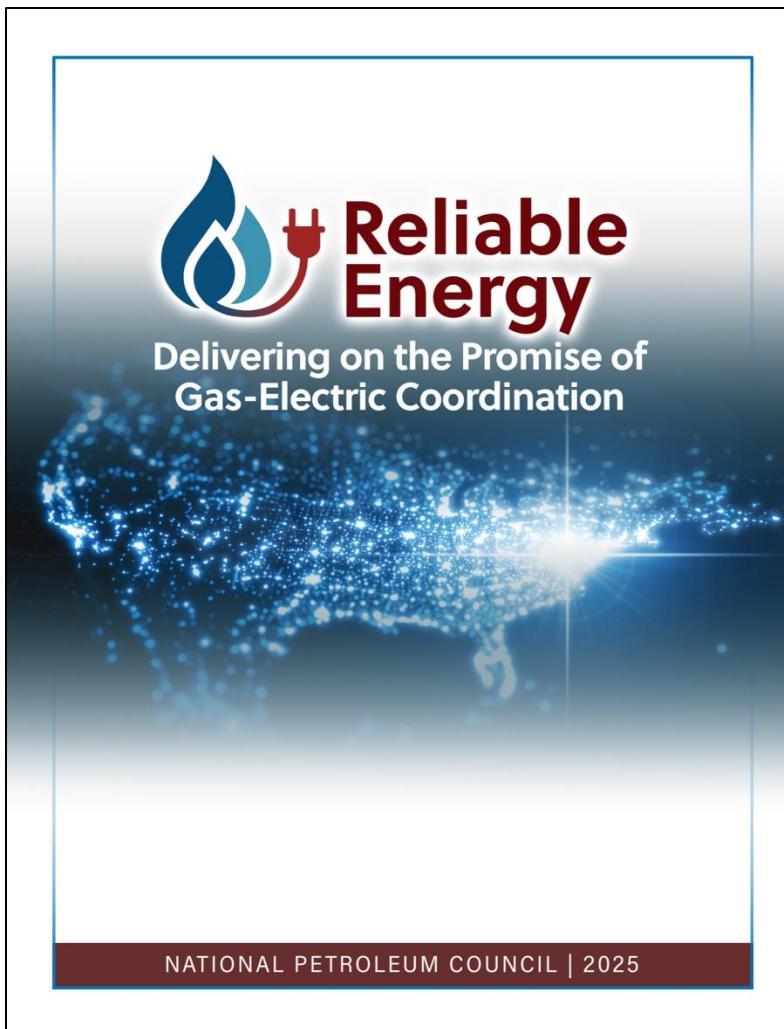
The report makes 10 recommendations across the below 5 buckets:



Full List of Recommendations

- 1. Comprehensive Long-Term Planning:** Integrate resource adequacy and fuel assurance across sectors.
- 2. Reform Permitting :** Streamline processes to accelerate infrastructure investment.
- 3. Build New Infrastructure:** Construct fit-for-purpose pipelines, storage, and assets.
- 4. Enhance Existing Infrastructure:** Upgrade current assets for near-term reliability.
- 5. Reform Market Compensation:** Incentivize generators to secure reliable fuel supply.
- 6. Accountability Framework:** Require prudent fuel supply arrangements and readiness plans.
- 7. Expand Pipeline Service Offerings:** Develop flexible gas service offerings for variable generator needs.
- 8. Clarify Roles and Responsibilities:** Clearly define accountability for reliability and fuel assurance.
- 9. Leverage Existing Forums:** Use current industry groups to share leading practices.
- 10. Improve Performance Metrics:** Expand and regularly report on reliability and fuel assurance metrics.

Download the Report



<https://gas-electric.npc.org/>

