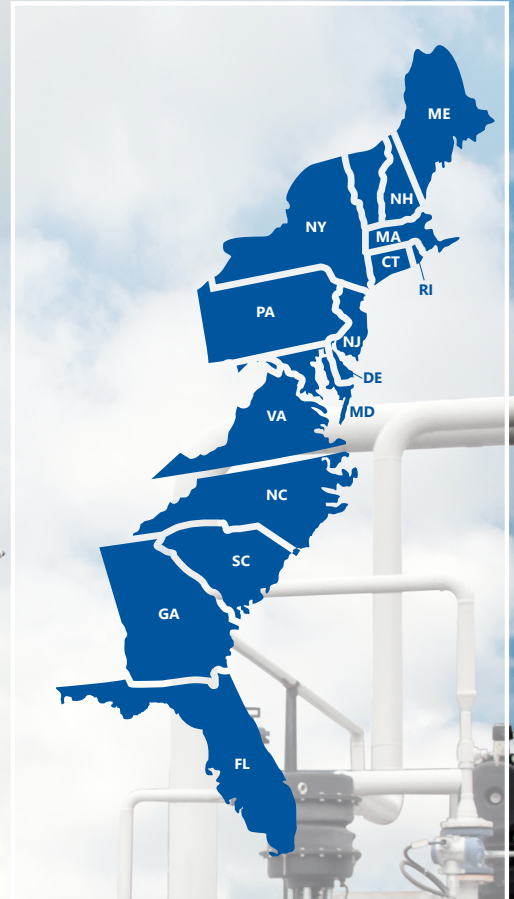




GTI ENERGY

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RAISE
Reliable Affordable Infrastructure
for Secure Energy

JANUARY 2026



EXECUTIVE SUMMARY

Utilizing East Coast Natural Gas Infrastructure

System-Level Pathways for Emerging Fuels,
Infrastructure Modernization, and Regional Flexibility

RAISE East Coast Case Study: Executive Summary

Reimagining East Coast gas infrastructure is central to RAISE's system-level approach to modernizing infrastructure and diversifying fuels. By strategically leveraging existing assets, the region can accelerate deployment of cost-effective emerging fuels, strengthen energy security, and materially reduce carbon intensity without defaulting to greenfield buildout.

From a cost perspective, the case for integration is clear. New hydrogen pipeline construction is estimated at \$5.1-\$18.9 million per mile, whereas repurposing existing pipelines ranges from \$510,000-\$6.7 million per mile.

As states move toward electrification and limit natural gas expansion, existing pipelines face stranded asset risks. Repurposing them for emerging fuels like hydrogen (H₂), renewable natural gas (RNG), and synthetic natural gas (SNG) offers a pathway to preserve infrastructure value while aligning with evolving policy and market conditions.

Modeled scenarios show promising emissions profiles for hydrogen and RNG:

- Hydrogen: 3.12 kg CO₂e/kg H₂ (below Department of Energy's clean hydrogen threshold of 4.0)
- RNG: 5.70 kg CO₂e/kg RNG
By comparison, conventional natural gas combustion emits ~56 kg CO₂/GJ. Hydrogen offers near-zero combustion emissions, and RNG can achieve net-negative emissions when system expansion credits are applied.
- The SNG pathways assessed do not provide emissions reduction benefits.

This case study uses modeled scenarios to examine how emerging fuels could integrate into East Coast energy systems. The results highlight directional insights rather than forecasts; real-world outcomes will depend on market dynamics, local infrastructure conditions, and policy evolution. These findings are intended to inform planning, de-risk decision-making, and catalyze discussion, not prescribe a single pathway.

Other key findings from the case study include:

System Readiness and Resource Positioning

RAISE finds the East Coast is uniquely positioned to support multiple emerging fuel pathways due to the convergence of resources, infrastructure, and demand.

Natural gas backbone: Pennsylvania and West Virginia anchor the region with large reserves and storage capacity, enabling near-term hydrogen production via natural gas reforming with carbon capture at scale.

Renewable power: Solar resources in the Southeast (Florida, Georgia, Virginia) and wind resources in the Northeast (New York, Maine) support regionally differentiated electrolytic hydrogen strategies.

Biomass and waste: The East Coast ranks second nationally in biomass availability. Agricultural and forest residues, combined with large urban waste streams, create strong RNG potential, particularly in high-population states.

Additional information can be found in the ***Resource Availability in the Region*** section of the full report.

Infrastructure Readiness and Constraints

RAISE assesses infrastructure not as a static asset base, but as a flexibility platform with defined limits and upgrade pathways.

- **Pipelines:** Existing natural gas networks can accommodate RNG and SNG with minimal modification. Hydrogen transport is technically feasible in select segments but requires system-specific material and integrity assessments.
- **Storage:** Underground gas storage assets in Pennsylvania, New York, and West Virginia already play a critical system-balancing role and represent potential long-term flexibility options for hydrogen, pending further evaluation.
- **Modernization needs:** Legacy cast iron and bare steel pipelines—particularly in New England and Central Atlantic states—represent both a constraint and an opportunity. Replacement is required for safety and reliability regardless, creating leverage to enable future fuels.

Additional information can be found in the ***Regional Pipeline Readiness, Underground Storage, and Challenges with Infrastructure Materials*** sections of the full report.

Cost, Economics, and Deployment Signals

RAISE modeling highlights where early deployment is economically and operationally credible and where it is not.

- Emerging fuels remain higher-cost than conventional natural gas under current conditions.
- Cost parity generally requires incentives in the range of \$250-\$550 per ton of CO₂ avoided, varying by state and pathway.
- **Most viable near-term opportunities:**
 - Hydrogen via natural gas reforming with CCS in Pennsylvania, West Virginia, and New Jersey
 - RNG from landfill gas in large urban states such as New York and Florida
 - Electrolytic hydrogen in solar-rich states including Florida, Georgia, and Virginia

Additional information can be found in the **State-Level Findings** section of the full report.

Strategic Opportunities

Policy & Regulatory

- Harmonize hydrogen safety standards and permitting across states
- Expand tax credits and consider a regional Low-Carbon Fuel Standard
- Support RNG and hydrogen procurement programs for utilities

Infrastructure

- Accelerate pipeline modernization, focusing on high-risk materials
- Pilot hydrogen blending projects in regions with modernized systems

Workforce Development

- Launch regional credentialing systems for emerging fuels jobs
- Integrate hydrogen safety and carbon capture into vocational training
- Expand partnerships between utilities, technical colleges, and state programs

Technology and Market

- Invest in RNG scale-up technologies (e.g., advanced digesters, co-digestion).
- Develop cost-effective hydrogen separation and retrofit solutions for end-use equipment
- Explore offshore wind for future electrolytic hydrogen production

Additional information can be found in the ***Policy and Regulatory Landscape*** and ***Key Challenges and Opportunities*** sections of the full report.

The East Coast has the resources and infrastructure to lead in emerging fuels. Success depends on strategic siting, modernization, and policy alignment. By leveraging existing assets, incentivizing innovation, and preparing the workforce, the region can achieve significant emissions reductions while maintaining energy reliability.

Background on RAISE

GTI Energy established the Reliable Affordable Infrastructure for Secure Energy (RAISE) collaborative to identify high-impact opportunities for leveraging natural gas infrastructure to reduce emissions and drive economic growth. Through regional case studies, RAISE is mapping technology pathways, total costs, and life-cycle emissions for emerging fuels—hydrogen (H₂), renewable natural gas (RNG), and synthetic natural gas (SNG)—through 2050. By modeling future energy scenarios and assessing today’s pipelines, processing facilities, and storage systems, RAISE provides a roadmap to strengthen energy security and accelerate adoption of low-carbon fuels. These insights help decision-makers prioritize investments, de-risk deployment, modernize infrastructure, and guide policy and capital flow.

East Coast Region Case Study - Overview

RAISE’s East Coast case study covers 17 states: Connecticut, Delaware, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia. Conducted from August 2025 to December 2025, RAISE utilized National Energy Modeling System (NEMS)—the same framework underpinning EIA outlooks—to provide a comprehensive cost-benefit analysis of integrating emerging fuels. Key components included:

- Technoeconomic and lifecycle emissions analysis of 16 fuel production pathways (H₂: 8, RNG: 4, SNG: 4) based on regional resource availability
- Integrated optimization modeling under multiple scenarios to evaluate deployment strategies, energy mixes, and levelized costs through 2050
- Policy alignment review to identify opportunities for regulatory support and investment, addressing technical and R&D gaps

For more information on the case study's background, analysis, and findings, please refer to the full report and appendices available on the RAISE website (raise.gti.energy).