ICC FUTURE OF GAS WORKSHOP 8 SUMMARY

1/13/25

Presentation 1: EPRI's Low-Carbon Resources Initiative (LCRI) analyzed decarbonization pathways across multiple sectors, focusing on renewable natural gas (RNG), hydrogen, bioenergy, carbon capture, utilization and storage (CCUS), and electrification. The analysis used the US-REGEN model to explore technology and policy scenarios for net-zero emissions by 2050. Under this analysis, RNG production reached 130 BCF in 2023, with an additional 154 BCF under development. Projected 2030 clean hydrogen production costs range from $1.5 to $5.5 per kilogram, depending on the method. Bioenergy supply curves indicate potential but show rising costs at higher production levels. CCUS costs vary based on CO_2 sources and capture methods. Electrification could increase electricity demand by 1.5 to 2.5 times by 2050.

Despite RNG production growth, it meets only 1.5% of U.S. natural gas heating demand, raising concerns about its scalability and overall emissions impact. The analysis focuses on production and distribution while largely ignoring end-use emissions, which often account for over 80% of life cycle emissions in many energy systems. This omission weakens the assessment of RNG and hydrogen's true environmental impact. The wide range of projected hydrogen production costs reveals economic uncertainty, and EPRI does not provide a detailed evaluation of hydrogen's competitiveness against other energy sources. The report also fails to examine the economic consequences of large-scale RNG, hydrogen, and bioenergy infrastructure, including stranded assets and customer rate increases.

EPRI does not address key technical challenges such as hydrogen blending into natural gas infrastructure, materials compatibility, and modifications needed for end-use appliances. The analysis also neglects efficiency losses across hydrogen production, transportation, and usage. The report lacks details on the feasibility of transitioning heavy-duty long-haul transport and aviation to low-carbon fuels. Similarly, the industrial sector analysis does not fully address the challenges of decarbonizing high-temperature process heat applications.

While EPRI provides a broad analysis of decarbonization pathways, it does not adequately address the risks and limitations of these approaches. A more balanced discussion would strengthen the assessment and provide a clearer understanding of the challenges in scaling these technologies.

Presentation 2: GTI Energy presenters asserted that renewable natural gas (RNG) and hydrogen offer significant opportunities for decarbonization. They emphasized that RNG with negative carbon intensity (CI) scores can provide carbon dioxide equivalent (CO2e) emission reductions at competitive costs, ranging from $21 to $82 per ton. It's worth noting that the methodology behind calculating negative CI scores requires transparency and could impact their real-world applicability. The wide range of projected costs indicates uncertainty in future hydrogen competitiveness. The blending approach raises questions about upgrade costs, end-user equipment compatibility, and long-term economic efficiency compared to dedicated hydrogen

infrastructure. GTI Energy does not address the increase in cost burden to end-use customers through bill increases as a result of investments in hydrogen pipelines. GTI Energy also did not compare these costs against alternatives like targeted electrification. GTI Energy suggests that blending hydrogen into existing natural gas infrastructure could leverage existing assets. They present data showing that testing of over 80 heating equipment units with hydrogen/natural gas blends revealed no immediate malfunctions or significant adverse impacts.

Presentation 3: discusses **Roanoke Gas Company's renewable natural gas (RNG) project in partnership with Western Virginia Water Authority (WVWA)**.

Roanoke Gas developed its biogas project under Chapter 30 of the Virginia Energy Innovation Act, which allows utilities to recover costs and earn enhanced returns on equity (ROE) for biogas infrastructure initiatives. The company owns the digester gas cleaning system (DGCS) and interconnecting pipeline located on Western Virginia Water Authority (WVWA) property. The State Corporation Commission approved the project in January 2023 and authorized an $8.6 million rate base with a 100-basis-point ROE adder. Roanoke Gas estimates initial RNG production at 62,000 to 66,000 Dth per year and expects potential growth to 120,000 Dth per year. The project's $8.6 million cost qualifies for a 30% tax credit on hard costs.

Roanoke Gas claims the project reduces emissions by 13,700 metric tons, supplies up to 200 Dth per day of additional gas, improves air quality near the project site, and contributes to the city of Roanoke's tax base. The company participates in the EPA Renewable Fuel Standard (RFS) Program by generating Renewable Identification Numbers (RINs) and hiring a broker to sell them, which lowers revenue requirements. The project's economics raises several concerns. Roanoke Gas only produces a small volume of RNG, which meets 1% of firm sales demand and limits the project's impact on decarbonization and energy supply. The $8.6 million investment for this limited output requires scrutiny, and the 100-basis-point ROE adder may overcompensate for the project's risk profile, potentially increasing costs for ratepayers. Roanoke Gas relies heavily on RIN sales for financial viability, exposing the project to market risks, including volatile RIN prices and policy changes.

Roanoke Gas's engineering and emissions claims require further examination. The company must verify its estimated 13,700 metric tons of emissions reductions and align them with its overall emissions profile. Conducting a comprehensive life cycle assessment would clarify net emissions reductions, particularly methane leakage during production and distribution. The company also needs to assess whether emissions reductions represent true additionality or merely fulfill existing regulatory requirements. Roanoke Gas ignores end-use emissions from RNG combustion. Additionally, the company should evaluate alternative uses for biogas, such as electricity generation, which could provide greater environmental or economic benefits. Roanoke Gas demonstrates the potential for biogas projects but faces challenges related to scale, cost, and reliance on regulatory support.

Presentation 4: Green Era has developed **a circular economy project in Chicago's Auburn Gresham neighborhood**, transforming a 9-acre former brownfield. The project integrates an

anaerobic digestion facility for food waste processing, renewable natural gas (RNG) production, urban farming, local food production, and education and community outreach programs. Green Era estimates the facility will generate 173,000 MBTU of clean power annually (nearly 2 MW), recycle food waste, and produce over 26,000 pounds of fresh food annually. The project also aims to create 240 construction jobs and 47 permanent roles in agriculture and food sectors.

The scalability and replicability of this project require further analysis to determine whether Green Era's economic model can succeed in other urban areas. The presentation did not address regulatory challenges or opportunities for replicating similar projects in other jurisdictions. Green Era did not provide specific data on RNG production volumes or the percentage of local gas demand it meets, limiting the ability to evaluate its broader energy impact. At a total cost of $32 million, funded by state investments, federal grants, and New Markets Tax Credits, stakeholders need to assess whether RNG production offers a cost-effective alternative to other renewable energy sources. Green Era claims the project will reduce up to 42,500 tons of CO_2 annually, equivalent to removing 9,182 passenger vehicles from the road. However, the lack of a comprehensive lifecycle assessment leaves questions about net GHG reductions, including emissions from food waste transportation and processing. The project's environmental justice and community impact also require consideration, particularly the risks of gentrification and local air pollution due to leakages and emissions.

Presentation 5: Nicor Gas has launched several initiatives to integrate renewable natural gas (RNG) into its distribution system. The company offers TotalGreen, a voluntary pilot program that allows customers to participate in emissions reduction efforts by paying a premium for buying and retiring RNG environmental attributes and carbon offsets.

To facilitate RNG integration, Nicor Gas has implemented two key tariffs. Rate 81, the General Renewable Gas Interconnection Service Pilot program. Under this Rate, Nicor Gas investment is capped at $16 million total, with a $3.2 million per project limit. The Illinois Commerce Commission (ICC) approved this rate, which took effect on July 15, 2021, and remains valid for 2 years. Rate 82, the General Renewable Gas Interconnection Service, allows new RNG interconnection requests without investment limits but requires RNG producers to pay all costs for additional facilities. The ICC approved this rate with effect on December 1, 2023.

The company connected its first Rate 81 project with Air Liquide's Winnebago RNG facility in Rockford, Illinois, which went live on June 12, 2024. This facility uses biogas from the adjacent Winnebago Landfill and projects to produce 1.3 million MMBtu of RNG annually, equivalent to replacing natural gas in 12,000 homes. Additionally, Nicor Gas contracted its first Rate 82 project in Q4 2024, which it projects to come online in 2026.

While these initiatives demonstrate Nicor Gas's commitment to RNG integration, several aspects remain unclear. The company has not fully explained the economic incentives for RNG producers to participate in Rate 82. Nicor Gas lacks a comprehensive life cycle assessment of RNG production, including potential methane leakage. The company has not addressed the long-term impact on natural gas prices for non-participating customers.