

# Developing the Natural Gas of the Future



## NATURAL GAS PRACTICES AND TECHNOLOGIES TO ACHIEVE THE AMBITION OF NET-ZERO EMISSIONS

Greater use of natural gas has already reduced U.S. emissions intensity significantly, but our industry is advancing additional technologies and practices in the pursuit of the natural gas industry's ambitious climate goals, consistent with the Paris Agreement<sup>1</sup>. The following are the most promising developments in natural gas, including **certified natural gas, renewable natural gas, carbon capture and hydrogen**.

### NGSA RECOMMENDATIONS FOR POLICYMAKERS

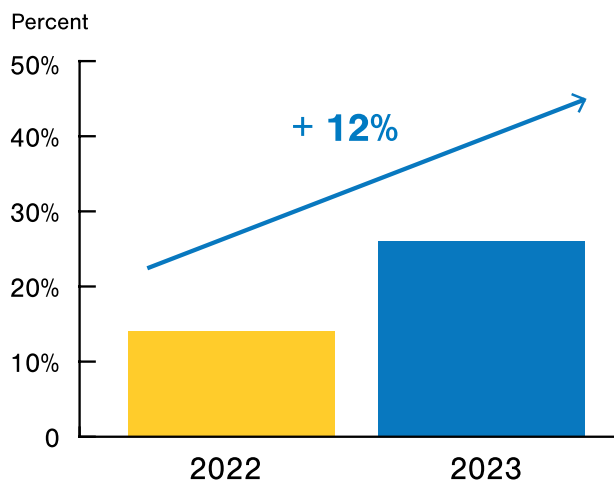
Encourage research & development for lower emission natural gas products and technologies through public and private partnerships.

Stimulate investment and support efforts to scale lower emission natural gas products and technologies.

Enable transparency and collaboration among government, business and customer stakeholders to drive progress and aid development.

Establish clear permitting processes for all energy sources, including lower emission natural gas products, infrastructure (carbon dioxide (CO<sub>2</sub>), hydrogen (H<sub>2</sub>) pipelines) and technologies.

### GROWTH OF CERTIFIED GAS



- Producers are driving growth in this space. In 2022, an estimated 14% of U.S. production went through certification.<sup>1</sup> In contrast, 26% of U.S. production has gone through certification in 2023.
- Regulations, particularly in Europe, and voluntary initiatives regarding measurement, reporting and verification may spur additional growth.

## CERTIFIED NATURAL GAS

### Here now and rapidly growing

- Natural gas that is available to customers and has gone through a strict evaluation process to meet certain environmental, social, and governance metrics for lower emissions.
- Several companies and independent platforms are currently certifying natural gas.
- Market impact: Customer demand for certified natural gas is in the early stages but showing potential.

## RENEWABLE NATURAL GAS

### Here now and flourishing

- RNG is methane derived from food and agricultural waste, landfills, livestock and other common sources of biogas.
- RNG captures and recovers methane that would otherwise have been released into the atmosphere.
- As of 2022, there were almost 200 landfill and agricultural RNG projects in the United States.

- The market for RNG is projected to grow, due to the inclusion of RNG in Low Carbon Fuel Standards and Renewable Fuel Standards.
- Market impact: Projects are typically smaller in scale; however, the emissions-reduction impact is greater per MMBtu than with certified gas.

## CARBON CAPTURE

### Scaling up investment

- Carbon capture utilization and storage (CCUS) covers a suite of technologies that capture and store or re-purpose CO<sub>2</sub> emissions from natural gas and other processes, preventing its release into the atmosphere.
- There are currently almost two dozen large carbon capture projects globally, with North America leading the way.<sup>2</sup>
- The eventual impact of these technologies is substantial; and with continued development of the technology, emission reductions can be achieved at a meaningful scale.
- Recent legislation like 2021's Infrastructure and Jobs Act and 2022's Inflation Reduction Act have provided important incentives to further develop CCUS, and growth is expected in the coming years.
- Market impact: The International Energy Agency has set 2,500 large CCUS facilities as the target to achieve.
  - Since 2022, project developers have announced ambitions for roughly 50 new carbon capture facilities by 2030.

## LOW-CARBON HYDROGEN

### Hubs on the drawing board now; commercial operations still years away

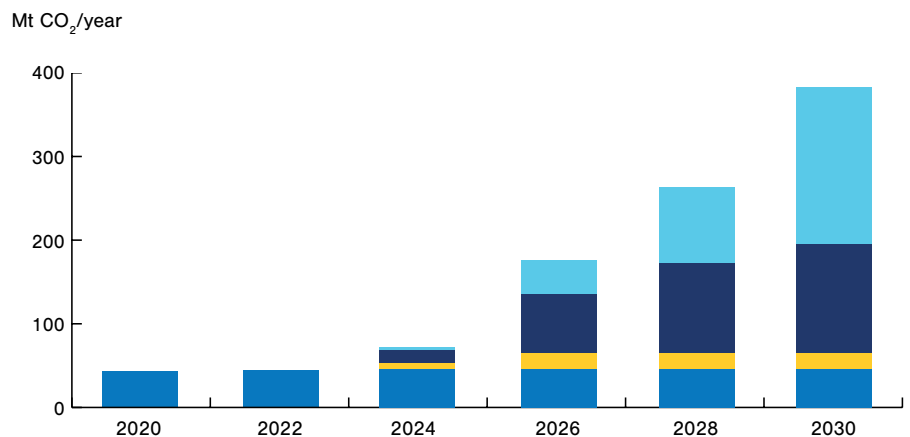
- Hydrogen is a clean fuel that has tremendous potential as a source of energy particularly for power and transportation.
- "Blue hydrogen" is produced from natural gas, with most of the carbon produced during the process captured and stored permanently or re-purposed.
- Blue hydrogen is considered essential to reduce operational emissions from hard-to-decarbonize sectors such as refining, manufacturing and heavy-duty transportation.
- The U.S. Department of Energy announced \$7 billion in funding for development of 7 regional hydrogen hubs, which will require a network of hydrogen producers, consumers and infrastructure to establish a robust market.<sup>2</sup>
- Market impact: Hydrogen has the potential to reduce emissions from high-emitting sectors such as industrial manufacturing and heavy industry by 60-80 percent.<sup>3</sup>

### Closing:

**NGSA's member companies believe that by working with stakeholders, we can pave a path forward for these innovative and ambitious technologies and practices to help us achieve our climate goals.**

## CAPACITY OF CURRENT AND PLANNED LARGE-SCALE CO<sub>2</sub> CAPTURE PROJECTS, 2020-2030

- Operating
- Under construction
- Advanced development
- Concept and feasibility



Source: IEA, Capacity of current and planned large-scale CO<sub>2</sub> capture projects vs. the Net Zero Scenario, 2020-2030

<sup>1</sup> <https://www.ogci.com/>

<sup>2</sup> <https://www.iea.org/energy-system/low-emission-fuels/hydrogen>

<sup>3</sup> <https://lowcarbon.exxonmobil.com/lower-carbon-technology/hydrogen#Interview>