REALIZING THE PROMISE OF RENEWABLE ENERGY

Securing a Role for

RENEWABLE GAS

AGA
American Gas Association
Securing economic growth and protecting the environment—long viewed as competing ends—are increasingly seen as interdependent. As a result, efforts to pursue these goals through both government policy and private investment have focused to a great extent on renewable resources such as wind and solar energy. But attention is turning as well to the role that Renewable Gas will play in achieving the critical objectives of a clean energy economy: reducing greenhouse gas emissions, creating thousands of sustainable jobs and increasing the diversity of the domestic energy supply portfolio, thereby enhancing America’s energy security. At its full potential Renewable Gas could well be the most reliable and the most cost-effective renewable energy source.

As called for by President Obama in his “Blueprint for a Secure Energy Future,” expanding access to, and the use of, natural gas will play a key role in enhancing the nation’s energy security. Equally important in the president’s view is harnessing America’s clean energy potential through technological investment and the development of clean energy alternatives, which include support for Renewable Gas.

A broad national study of the potential for Renewable Gas to play a leading role in enhancing our energy security and environmental quality was conducted by the American Gas Foundation (AGF) earlier this year. The benefits and potential of Renewable Gas identified by AGF suggest that policy makers and other stakeholders should further explore ways to enhance the production, distribution and use of this renewable resource.

What is Renewable Gas?
Renewable Gas is the term that is used to describe pipeline-quality biomethane produced from biomass. It is interchangeable with natural gas. It is carbon neutral, extremely versatile and fully compatible with the U.S. pipeline infrastructure. It can be used in homes and businesses, in manufacturing and heavy industries, for electricity production and as an alternative fuel for transportation.

1 The Potential for Renewable Gas: Biogas Derived from Biomass Feedstocks and Upgraded to Pipeline Quality, May 2011, analysis performed by the Gas Technology Institute as commissioned by the American Gas Foundation
2 At 2010 annual rate of residential consumption (EIA). According to the GTI/AGF study, in a practical long-term scenario Renewable Gas has the potential to add up to 2.5 quadrillion Btu annually to our domestic natural gas supply.
THE PROMISE OF
Renewable Gas

Renewable Gas is a unique solution that has the potential to play a significant role in the future of energy. Renewable Gas is one of the few options that can reduce greenhouse gas (GHG), create jobs and enhance America’s energy security within a relatively short period of time, utilizing proven and available technologies that are rapidly advancing. Renewable Gas is produced from existing waste streams and a variety of renewable and sustainable biomass sources, including animal waste, wastewater treatment plants, landfills, woody biomass, crop residuals, energy crops and food waste.

Greenhouse Gas

From a greenhouse gas emissions perspective, Renewable Gas demonstrates tremendous benefits. That is because, when captured for conversion into Renewable Gas, methane from animal waste and other biomass sources that otherwise would have entered directly into Earth’s atmosphere is instead combusted as Renewable Gas. This results in the release of greenhouse gases that are approximately 21 times less potent than methane released directly into the atmosphere. The use of Renewable Gas represents the recycling of carbon that is already circulating in the environment, whereas burning a fossil fuel represents the release of new carbon emissions that were previously sequestered in the earth.

Additional Benefits

Renewable Gas production via anaerobic digestion provides the agricultural sector additional environmental benefits by improving waste management and nutrient control, in addition to dramatically reducing carbon emissions. In many farms today animal waste is converted into biogas and used to generate electricity right on the premises. Other farms produce Renewable Gas for sale back to the grid and earn supplemental income. In both cases, there is the double benefit of producing energy and reducing both the amount of natural methane that enters the atmosphere and the amount of animal waste that otherwise would run off into local waterways, causing groundwater contamination. Similar benefits can be found in cities with respect to turning landfills into Renewable Gas.

What is the Potential of Renewable Gas?

The environmental advantage is best illustrated in the following scenarios outlined in the AGF report.

MAXIMUM SCENARIO

In the Maximum scenario, 100 percent biomass utilization and conventional conversion efficiency result in a total Renewable Gas production of 9.5 quads per year. This production level would result in CO₂ reduction of 556 million tons per year—the equivalent of taking about 114 million cars off the road.

Further, in this Maximum scenario the number of jobs created is more than 316,000, and because this renewable energy resource is domestically produced these jobs can’t be exported.

AGGRESSIVE SCENARIO

The AGF report also presents an Aggressive scenario, which assumes between 15 and 75 percent biomass utilization. Renewable Gas production under this scenario represents about 2.5 quads a year, or about half of current residential natural gas demand.

Energy Security

Increasing the production of this domestic, renewable energy could help displace imported oil in the transportation market, enhancing both our energy and national security.
Jumpstarting the Renewable Gas market

Renewable Gas has great promise as a domestic energy resource that is fully interchangeable with natural gas, and if it is allowed to compete with other renewable energy sources on a level playing field, that promise will be fulfilled. Unfortunately, today there is a vast disparity between government policies that support or incentivize the production of Renewable Gas and those that support or incentivize renewable electricity or renewable transportation fuels. Renewable Gas production does not receive tax credits similar to other renewable energy products with which the public has become more familiar. Thus the potential of Renewable Gas to contribute to our energy portfolio in its most effective and efficient manner is hindered by the existing tax incentive structure on renewable energy.

The direct use of natural gas in end-use applications such as home heating, cooking and water heating is more efficient than converting natural gas to electricity to power similar electric end-use applications. Therefore the current government policies promoting renewable electricity or liquid fuels at the expense of the direct use of Renewable Gas may be counterproductive in terms of achieving national energy efficiency and GHG abatement goals.

Well conceived changes in government policies will expand the use of Renewable Gas across the country.

These policy changes should incorporate the following:

**Parity**
The playing field needs to be leveled so that Renewable Gas is valued, supported and incentivized in ways equal to renewable electricity or liquid transportation fuel. As a first step Congress should create an investment tax credit for facilities that produce renewable pipeline quality gas.

**Accessibility and integration**
Our nation’s pipeline infrastructure should facilitate the purchase and transfer of Renewable Gas in order to more easily meet local, state, or federal goals for renewable fuels.

How is Renewable Gas Produced?

**WITH PROVEN TECHNOLOGY.**
Two technological processes can produce Renewable Gas—anaerobic digestion and thermal gasification. While anaerobic digestion is commercially available, the thermal gasification of biomass and converting the output gas to methane is a proven technology expected to reach commercial-scale implementation within the next 10 to 12 years.

**Anaerobic Digestion (AD)**
In the AD process high-moisture organic material—such as livestock manure and municipal waste—is broken down by bacteria, and in the process generates methane and carbon dioxide.

**Thermal Gasification (TG)**
The TG process converts lower moisture feedstock such as forestry waste, energy crops, and crop residue into Renewable Gas via thermal breakdown into gases.

About the American Gas Foundation Study...and the Path Forward

For the foreseeable future we will need to ensure the full and best use of every available energy source—natural gas, oil, coal, renewables and nuclear—in order for America to maintain our economy and standard of living. Likewise, creating greater diversity in our energy resource portfolio is of paramount importance if we are to enhance our energy security and economic prosperity. Increasing the use of renewable energy resources is an imperative if we are to achieve the balance that we seek. However, the pace, timing and extent of this replacement will depend on a careful balance of economic, environmental, societal and governmental factors.

It is the mission of the American Gas Foundation to conduct studies of current and significant energy and environmental issues with respect to natural gas, and to assess how they might affect, and be affected by, different public policy approaches. Consistent with that mission, AGF and its trustees hope that the study provided here will serve as a catalyst for dialogue among federal and state policymakers, thought leaders and other interested stakeholders regarding how public policy can be shaped in a manner that provides renewable energy sources, particularly Renewable Gas, with an appropriate opportunity to help meet the needs of our emerging clean-energy economy.