

Renewable natural gas (RNG) transforms organic waste into renewable energy that can be delivered through existing infrastructure to fuel fleets and heat homes

What's RNG?

Renewable natural gas (RNG) is produced from organic materials like food leftovers, municipal sewage, livestock manure, landfills, and woody residues from forestry and agriculture.

It can be stored and delivered via the existing natural gas system for use in space and water heating, cooking, process loads and any other natural gas application. It can also be compressed and used as a low-carbon, clean alternative fuel in the heavy-duty transportation sector.

Turning waste into renewable energy

Waste from landfills, dairy farms and wastewater treatment plants releases greenhouse gas emissions. Today, new technology allows us to clean up those waste streams and turn them into renewable natural gas for delivery to your home or business through NW Natural's system.

This provides a solution to local waste and a new energy source that has similar climate benefits to wind and solar.

That's why the highest environmental and economic value for these local waste streams is to transform them into renewable natural gas.

Reducing emissions with RNG

States like Oregon and Washington have committed to steep reductions in greenhouse gas emissions by 2050. Locally produced biofuels like RNG will be key to this economy-wide transformation.

A recent report found that adding 25% RNG into the existing natural gas system for use in heating homes and businesses can help Oregon and Washington achieve these climate goals while avoiding significant infrastructure costs and risks¹. Locally produced RNG can also create economic opportunities for our communities.

The Oregon Department of Energy, in its first inventory of technical potential, estimates enough feedstock statewide to produce 50 billion cubic feet (BCF) of RNG. That's equivalent to the amount of natural gas used by all Oregon residential customers today.

On the road to clean with CNG

Compressed natural gas (CNG) provides a low-carbon and clean-air option for heavy-duty vehicles. Natural gas engines with near-zero emission technology produce 90% fewer nitrogen oxide (NOx) emissions than even the cleanest diesel engines, without harmful particulate matter from diesel exhaust.

Conventional CNG delivers a 20% reduction of greenhouse gas emissions compared to diesel, while renewable CNG can go beyond 100% emissions savings in some cases. >>

A UTILITY RNG PURCHASE PROGRAM

THE CHALLENGE

Natural gas utilities are regulated by the Public Utilities Commission and under current rules have an obligation to deliver the least-cost commodity to customers. This is a key barrier to the purchase and distribution of RNG to Oregon customers.

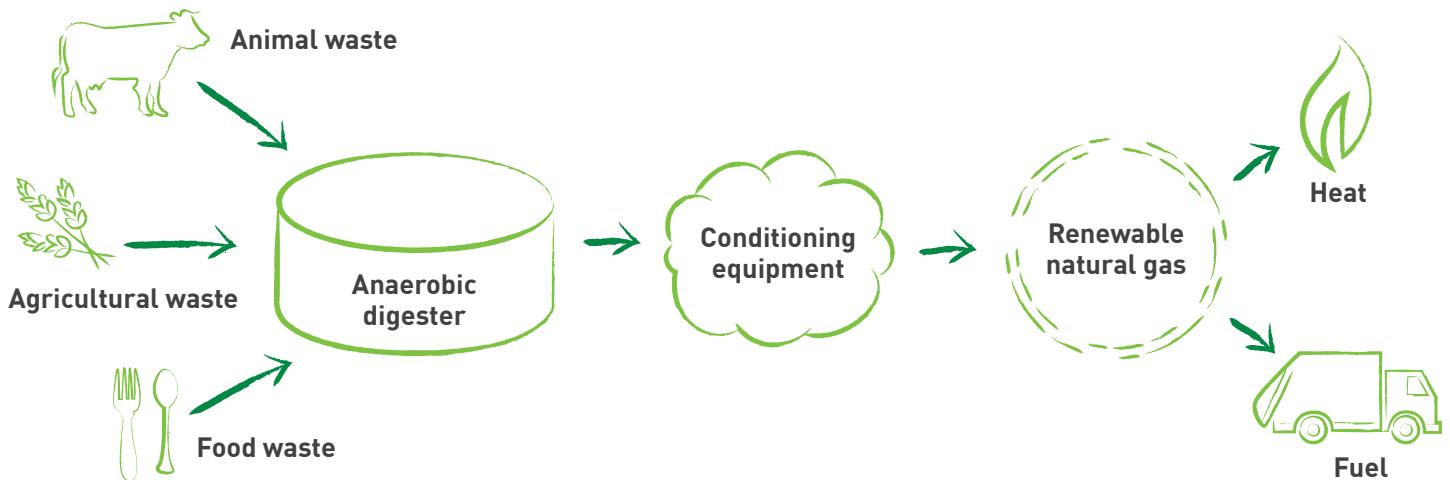
Delivering RNG via the natural gas pipeline network is technically feasible today, and of interest to consumers. Adding RNG to our mix is an important strategy in helping gas utilities provide customers with a renewable product that lowers a customer's greenhouse gas impact.

THE SOLUTION

The 2019 Oregon Legislature will consider a proposal that allows natural gas utilities to purchase and distribute a certain amount of RNG to retail ("sales") customers.

This voluntary program would enable gas utilities like NW Natural to begin acquiring RNG on behalf of Oregon customers. The program, overseen by state regulators, would set limits for RNG purchases, protecting utilities and ratepayers from excessive costs as this market develops.

RENEWABLE NATURAL GAS



RNG can be produced locally by turning waste streams into renewable sources of natural gas.

Cost of RNG

Production costs can range from \$5 to \$30 per MMBtu. Price depends on a number of factors. For some RNG feedstocks, such as landfills, biogas is already captured and cleaned, so production of RNG requires less capital investment. Others, such as livestock operations, may need larger up-front investments.

Many RNG projects can offset these costs with financial incentives through the federal Renewable Fuel Standard and the Oregon Clean Fuels Program. In some cases, RNG can earn credits within these programs well above the cost of production.

RNG and NW Natural

At the outset of 2018, over 40 RNG projects had connected to natural gas infrastructure in the United States, with just as many proposed or under construction. In Oregon, a handful of projects have plans to interconnect with the NW Natural systemⁱⁱ.

These may include RNG produced at municipal wastewater treatment plants (see City of Portland, sidebar), food waste facilities, dairies or landfills. Initially, NW Natural will transport this gas on behalf of third-parties, rather than selling it directly to our customers. NW Natural is also looking into fueling its CNG vehicles with RNG purchased from third-party marketers.

Adding RNG to the pipeline system can lower the carbon intensity of the energy NW Natural delivers.

It's something that's capturing customer interest as people become more familiar with the idea. A recent poll of NW Natural customers found that 90% surveyed supported the idea of NW Natural providing RNG to customers, and 80% of all respondents were willing to pay more to get it.

CITY OF PORTLAND WASTEWATER TREATMENT PLANT

The City of Portland is developing one of the region's first RNG projects at its Columbia Boulevard Wastewater Treatment Plant. Biogas from sewage treatment will be captured and conditioned to pipeline quality renewable natural gas.

NW Natural has worked as a partner to the city on this landmark project, which includes a CNG fueling station on site, and an interconnection to NW Natural's distribution pipeline infrastructure.

When complete in 2019, the project is expected to reduce annual GHG emissions by 21,000 tonnes, generate up to \$3 million in city revenues a year, and replace 1.34 million gallons of diesel truck fuel with clean-burning renewable CNG.

Online: www.portlandoregon.gov/bes/RNG



Learn more about RNG at LessWeCan.com.

ⁱ Energy and Environmental Economics, "Pacific Northwest Pathways to 2050," 2018. Online at www.ethree.com.

ⁱⁱ Projects reported by Renewable Natural Gas Production Facilities in North America, December 2018.