

RENEWABLE NATURAL GAS

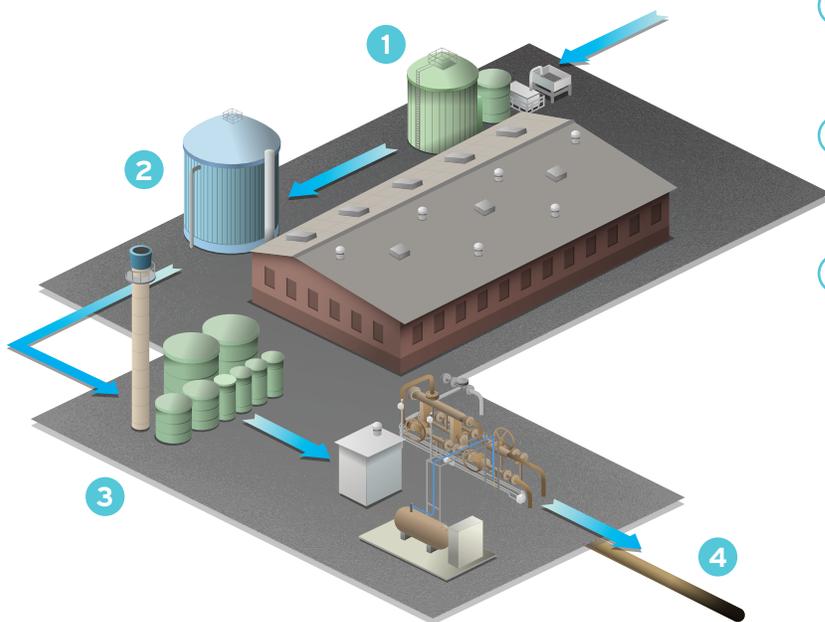
PART OF CALIFORNIA'S RENEWABLE ENERGY FUTURE

WHAT IS RENEWABLE NATURAL GAS?

Traditionally, pipeline natural gas comes from deep underground wells and is often associated with petroleum production. On the other hand, renewable natural gas (RNG) is natural gas derived from organic waste material found on the surface of the earth. In California, and throughout the United States, there are a variety of sources of this organic waste, which we see in daily life. These include food waste, garden and lawn clippings, animal and plant-based material as well as degradable carbon sources such as paper, cardboard and wood. The abundance of this material can allow for production of biogas in significant quantities.

The most common source of biogas is the naturally-occurring biological breakdown of organic waste at facilities such as wastewater treatment plants and landfills. Biogas typically consists of methane and carbon dioxide, with traces of other elements. Biogas is cleaned and conditioned to remove or reduce non-methane elements in order to produce RNG. The converted RNG is then put into the utility pipeline as a replacement for traditional natural gas. This process helps promote the safe and reliable operation of the natural gas pipeline distribution network as well as the natural gas equipment and appliances used by customers.

HOW ORGANIC WASTE IS CONVERTED INTO RNG



- 1** Waste products, such as sludge, food waste or manure are processed in a biodigester.
- 2** The biodigester breaks down the organic material to create biogas – a mixture of methane and other elements.
- 3** The biogas can then be processed and conditioned leaving behind RNG, which can be used interchangeably with traditional natural gas.
- 4** This RNG can be used where it is produced for things like generating electricity or fueling vehicles, or it can be injected into a utility pipeline for transportation to other customers.



GREENHOUSE GAS REDUCTIONS

RNG comes from organic sources that originally removed carbon dioxide from the atmosphere during photosynthesis, so it is considered a carbon-neutral fuel. However, RNG can be produced from organic waste that would otherwise decay and create methane emissions. Capturing these methane emissions can actually make RNG a carbon-negative fuel by removing emissions from the atmosphere. Reducing carbon dioxide and other greenhouse gas levels is important to help reduce global warming.

GREEN ENERGY AROUND THE CLOCK HELPS CALIFORNIA'S ECONOMY

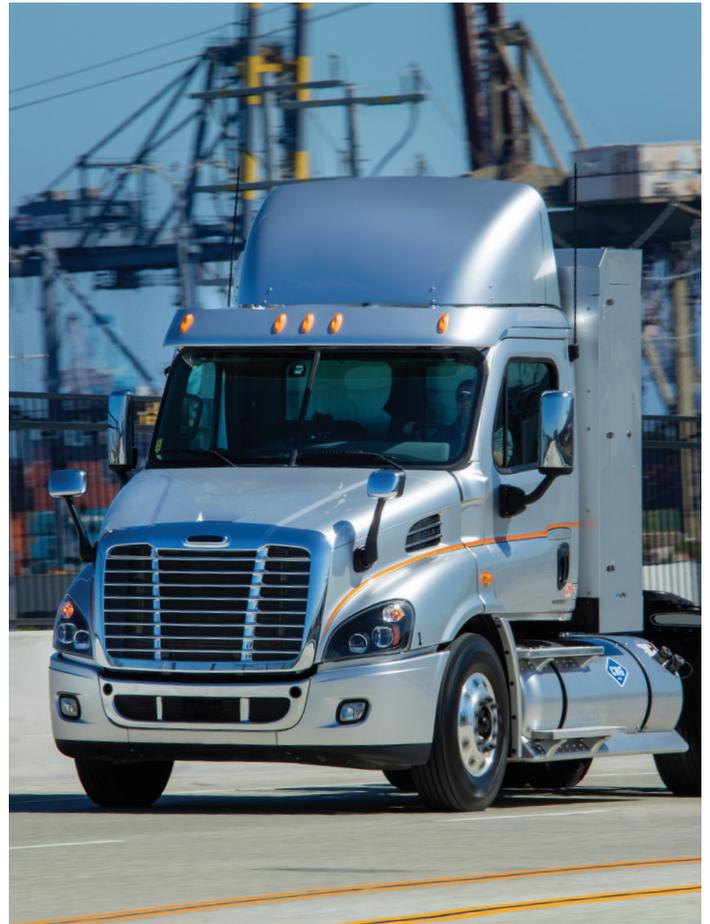
Unlike certain other sources of renewable energy, such as solar and wind technologies, RNG is available 24 hours per day, seven days a week. It can be deployed when and where it is needed through the existing pipeline network. Converting waste products into RNG can help California meet its energy needs with local resources. Investing in RNG production in California can create jobs in all regions of the state while improving air quality by better managing our waste streams.

UP TO 400 PERCENT CARBON DIOXIDE REDUCTIONS FOR TRANSPORTATION

The Bioenergy Association of California has estimated that more than 10 percent of California's current natural gas supply can be provided by RNG derived from our state's existing organic waste¹. That's enough RNG to power two to three million homes or replace 75 percent of the state's diesel vehicle fuel. This can help reduce the need for other fossil-based fuels, and increase our supplies with a local renewable fuel. According to the California Air Resources Board², RNG sourced from landfill diverted food and green waste can provide a 125 percent carbon dioxide reduction, and RNG from dairy manure can result in a 400 percent carbon dioxide reduction when replacing traditional vehicle fuels.

¹ Decarbonizing The Gas Sector: Why California Needs A Renewable Gas Standard, November 2014: http://www.bioenergyca.org/wp-content/uploads/2015/03/BAC_RenewableGasStandard_2015.pdf

² Low Carbon Fuel Standard Pathway Certified Carbon Intensities: <https://www.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm>



More than half of all natural gas dispensed in California for transportation is RNG, powering buses, refuse trucks and heavy-duty trucks.

SOCALGAS® IS A SUPPORTER OF RNG

As part of our commitment to help the environment and support California in meeting its greenhouse gas reduction goals, SoCalGas offers expertise and assistance to customers and project developers who want to convert organic waste material into biogas or RNG. Through our network of natural gas pipelines, SoCalGas offers the opportunity for RNG to be accepted into our transmission and distribution system and delivered to our customers.

FIND OUT MORE

For more information visit:

socialgas.com/smart-energy

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