NEIGHBORHOOD COUNCIL SUSTAINABILITY ALLIANCE®
Advocacy Committee

WHAT ARE NATURAL GAS AND BIOGAS, AND CAN THEY HELP ADDRESS THE CLIMATE CRISIS?

What is natural gas?
Natural gas is flammable gas, consisting largely of **methane**, occurring naturally underground and used as fuel. It is a fossil fuel.
https://www.google.com/search?client=firefox-b-1-d&q=what+is+natural+gas

Is methane worse than carbon dioxide (CO_2) for the climate?
Given our timeline, **yes**. While methane doesn't stay as long in the atmosphere as carbon dioxide, it is initially far more devastating to the climate because it absorbs a lot more heat. Methane stays in the atmosphere for about 12 years, at which point it is converted into CO_2 and water. CO_2 stays in the atmosphere for hundreds of thousands of years. If you want to compare the warming power of the two greenhouse gases, you have to pick a length of time to average over. Methane is 84 times more potent than carbon dioxide in the first two decades after its release. Consider the difference over a century, however, and it is about 30 times more potent.
Methane is what blew from Aliso Canyon in 2015 and 2016, causing an environmental disaster.
https://www.edf.org/climate/methane-other-important-greenhouse-gas
https://www.sciencedaily.com/releases/2014/03/140327111724.htm
https://arstechnica.com/science/2014/02/methane-burned-vs-methane-leaked-frackings-impact-on-climate-change/
https://www.theguardian.com/environment/2012/jan/16/greenhouse-gases-remain-air
https://en.wikipedia.org/wiki/Aliso_Canyon_gas_leak

SoCalGas is promoting biogas as a solution to the climate crisis. What is biogas?
Biogas is the mixture of gases produced by the breakdown of organic matter in the absence of oxygen. It is composed primarily of **methane**. Biogas is made from raw organic (carbon-based) materials called biomass such as agricultural waste (including manure), garbage, plant material, sewage, and food waste.
Biogas creates similar environmental pollutants to ordinary natural gas fuel. Any unburned gas that escapes contains **methane**.
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwjQgvSJtNjjAhXDrJ4KHVS7B6MQFjAAegQIARAC&url=https%3A%2F%2Fwww.agora-energiewende.de%2Ffileadmin2%2FProjekte%2F2017%2FSynKost_2050%2FAgora_SynKost_Study_EN_WEB.pdf&usg=AOvVaw3sfVwMe3MY8VQ0USKL1qOP
https://www.biology-online.org/dictionary/Organic
https://arstechnica.com/science/2014/02/methane-burned-vs-methane-leaked-frackings-impact-on-climate-change/
https://en.wikipedia.org/wiki/Biogas
https://www.britannica.com/technology/biogas
https://www.eia.gov/energyexplained/?page=biomass_home

What is renewable natural gas (biomethane)?
When biogas is upgraded to pipeline-quality natural gas, it becomes renewable natural gas (biomethane). Renewable natural gas is essentially biogas that has been processed to be more pure. Renewable natural gas has more methane than raw biogas, which makes it comparable to conventional natural gas and therefore a suitable energy source in applications that require pipeline-quality gas. Renewable natural gas is composed of at least 90% **methane**.
https://en.wikipedia.org/wiki/Renewable_natural_gas
https://www3.socalgas.com/smart-energy/renewable-gas/biogas-and-renewable-natural-gas
https://afdc.energy.gov/fuels/natural_gas_renewable.html

Does biogas contribute to the climate crisis?

Yes. The important difference between biogas and fossil natural gas is that biogas is often considered partly or fully carbon neutral (meaning that when everything is factored in, it does not result in an overall addition of CO_2 to the atmosphere), since the CO_2 emitted would have been released anyway as materials decomposed, rather than being released from fossil fuels in the ground and increasing the amount of CO_2 in the atmosphere.
Plants absorb the sun's energy and CO_2 from the air we breathe in a process called photosynthesis. This energy is stored as carbon in plants and other biomass. Animals (including us) exhale CO_2 when we breathe out. Plants extract the carbon dioxide from the air and use it with the sun in the photosynthesis process to feed themselves, storing the energy. As plants decompose, CO_2 that was stored in the plants is released back into the atmosphere. This is part of the carbon cycle.
Biogas is made from decomposing material, which, before it decomposes, stores the carbon. When it decomposes, it releases methane. But if the gas leaks (and it does), methane is released (at a faster rate than otherwise) and when it is burned, CO_2 is released back into the atmosphere. So, we are back where we started, but we are cycling through the process more quickly, releasing greenhouse gases at a faster rate than we otherwise would.
https://www.merriam-webster.com/dictionary/carbon-neutral
https://sciencing.com/happens-carbon-dioxide-during-photosynthesis-8527975.html
http://www.columbia.edu/~vjd1/carbon.htm
https://oceanservice.noaa.gov/facts/carbon-cycle.html
https://en.wikipedia.org/wiki/Renewable_natural_gas
https://www.eia.gov/energyexplained/?page=biomass_home
http://biogas.ifas.ufl.edu/FAQ.asp
https://www.homebiogas.com/Blog/141/Advantages_and_Disadvantages_of_Biogas
https://www.eia.gov/energyexplained/index.php?page=biomass_biogas
https://www.energyindepth.org/turning-natural-gas-into-water-hydraulic-fracturing-doesnt-deplete-water-supplies-2/
https://www.drawdown.org/solutions/electricity-generation/biomass

Why the disagreement?
Burning biogas is better than burning fossil fuels, which introduces CO_2 into the atmosphere that would otherwise be trapped underground. But it doesn't lower our emissions—it just doesn't raise them. Some consider it to be what is called a bridge fuel, but unfortunately, we no longer have the luxury of time to build bridges. We have to reduce our greenhouse gas emissions as quickly as possible while storing as much carbon as possible instead of releasing it back into the atmosphere. And we have the technology to do so. This includes electrification. Folks, we're in a crisis. "Better than fossil fuels" just isn't good enough at this point.
https://www.drawdown.org/solutions/electricity-generation/biomass
https://www.foodandwaterwatch.org/insight/fact-sheet-socalgas-rush-greenwash-gas
https://www.sfchronicle.com/bayarea/article/Berkeley-becomes-first-U-S-city-to-ban-natural-14102242.php

Can renewable natural gas help us fight the climate crisis?
In certain limited circumstances, maybe. We already know the solutions to the climate crisis—we have them and the technology necessary. What we are lacking is the political will, and SoCalGas is a distraction that is slowing us down when we need to speed up. Folks—we have fewer than 12 years!
https://www.wri.org/publication/renewable-natural-gas
https://www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments/
https://cleantechnica.com/2018/02/08/new-jacobson-study-draws-road-map-100-renewable-energy/

How does biogas compare to electricity?
Renewable gas is very inefficient because it takes so much energy to make it, so there is a really high conversion loss that makes it a non-starter in most (not all) situations; **it is too expensive, and more expensive than electrification**. When there is no other viable option, renewable gas is a potential solution, but it is not the first choice.
http://www.agora-energiewende.de/fileadmin2/Projekte/2017/SynKost_2050/Agora_SynKost_Study_EN_WEB.pdf
https://ww2.energy.ca.gov/research/notices/2019-06-06_workshop/2019-06-06_Future_of_Gas_Distribution.pdf
https://www.sierraclub.org/articles/2019/06/study-transitioning-california-gas-could-lower-costs-and-prioritize-low-income

Then why is SoCalGas promoting it?
Because SoCalGas is a gas company.

For more information, visit https://www.ncsa.la/advocacy.