

Renewable energy production – biogas as a promising resource

Renewable energies are on the rise.

Among them, biogas is an important approach in the substitution of fossil fuels.

STANS, TYROL, AUSTRIA, January 30, 2024 /EINPresswire.com/ -- Speaking of renewables, there is a large spectrum of distinctive energy sources one might refer to, rather than one specific method of heat or electricity production. So far, their share in worldwide energy consumption is still comparatively small: Coal, oil, and natural gas are considered as dominant energy sources. However, significant progress is being made in the field of renewable energies, taking over increasing shares in global energy supply.[1]



Biogas is emerging as an increasingly popular renewable energy source. | © Shutterstock (Stock-Foto ID: 1354225391)

Among the renewable energy sources, biogas rises as an extremely promising alternative to fossil fuels. Additionally, [modern and efficient biogas engines](#) are already heavily relied on in areas with unstable energy supply. Huge progress is being made in the attempt of driving progress in the use of biogas as renewable energy source.

Fossil fuels vs. renewable energy sources today

Despite great efforts being taken to establish viable substitutes for fossil fuels, these are still the dominant energy source in several fields. In the production of electricity, for instance, almost 36% of worldwide power generation was carried out in coal by 2022, with natural gas soon after, with 22%.[1]

On the other hand, renewable energy sources seem to be far more diverse, as there is a great variety of different sources. By far the most dominant renewable energy source is hydropower – as in 2020, it ensured 18% of global power supply, which is more than all the remaining

renewable power sources together. The next-smaller share (24% in 2018) in the overall capacity of renewable energy production is taken by wind energy, followed by solar power and biomass.[2]

According to the U.S. Energy Information Administration, biomass covered almost 5% of the United States' primary energy consumption. But yet again, biomass is not a single source of energy, as it can come in various different formats, and can be used in manifold ways – from biofuels based on agricultural crops to biogas produced out of animal manure or solid waste.[3]

Biogas = natural gas? Not quite

The terms “biogas” and “natural gas” may have similarities at the first glance. However, they describe two very distinct energy sources.

The origins of natural gas root back several hundreds of millions of years: Organic material from plants and diseased animals formed layers on the surface and were covered under sand, rocks, and water. The increasing pressure led to the emergence of coal, oil, and natural gas, which is therefore considered a fossil fuel.[4]

Natural gas is a mix of different substances, and mainly composed of methane. It can occur both in combination with oil and separately – either in larger reservoirs or in porous formations. Accordingly, there are different ways of gaining access to natural gas.[4]

Biogas, on the other hand, can also be referred to as renewable natural gas, and derives from biomass like manure or municipal waste. It is the product of an anaerobic decomposition process, when bacteria digest organic material. Similar to natural gas, biogas is a mix of various elements, between 45 and 65% of which is made up by methane.[5]

Biogas as renewable energy source: Current developments & challenges

In many cases, biogas is directly burned to produce electricity or heat. However, further processing steps to increase methane levels also allow it to replace natural gas in many fields, making it a sustainable alternative to fossil fuels.[5]

The possibility to substitute natural gas with biogas is a major reason for the increasing volume of the biogas market worldwide: For 2023, it was estimated to size USD 65.53 billion, with an expected compound annual growth rate (CAGR) of more than 4% between 2024 and 2030.[6]

One of the primary applications of biogas is the production of electricity. Particularly in rural regions, developing countries, and areas with unstable power supply, (bio)gas engines are an integral component of electricity supply. This, however, makes it all the more critical when biogas engines drop out – especially when the manufacturer or a licensed maintenance partner is

located far away from the site where an engine refuses service.

Furthermore, it is essential to maximize the lifetime of these engines, as they are relatively costly installations and require regular maintenance for their safe and efficient operation. In addition, efficiency levels of gas engines need to be constantly improved in order to keep track with technological progress and ensure that they are as sustainable as possible.

How to unleash the potential of biogas energy production

Enormous global effort is being taken to establish viable alternatives to conventional, fossil fuels. Renewable energy sources like biogas are on the rise, with stakeholders worldwide being engaged in constantly improving respective technologies. This does not only apply to gas engine manufacturers themselves, but also to licensed service partners that maintain, overhaul, upgrade and refine gas engines.

Entire companies have been established as specialized partners in not only performing regular maintenance: Some of them design and offer dedicated machine components and spare parts that prolong the lifetime of biogas engines while making them more efficient and reliable.

Another key element in the adoption of biogas as a source of energy is its accessibility. As already mentioned, biogas is often subjected to further processing steps to achieve higher concentrations of methane. It is essential not only to improve these processes, but to design engines that are able to cope with variability in the composition of the biogas they are fuelled with.

By decreasing the need for costly and laborious machine servicing and trusting in innovative technologies, biogas operators can enhance the cost-effectiveness and reliability of biogas engines. This is an additional step in further establishing biogas as a growing component in tomorrow's renewable energy supply.

Sources

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