

4CleanTech discusses the future of combined heat and power (CHP) technology with biomethane and hydrogen

The future of energy supply

In the past, energy was simply a fixed cost factor in the value chain of a company, but this has changed fundamentally in the last decade.

By using renewable energy sources, energy-intensive businesses, in particular, can not only reduce their carbon footprint but also secure decisive market advantages through cost reductions. Decentralised energy generation with combined heat and power (CHP) units will play an important part in reaching this target.

What is a CHP?

In simple terms, a CHP unit consists of an internal combustion engine with an alternator to generate electricity and heat. It is an extremely efficient process to produce electricity and heat from only one source, normally natural gas. Unlike traditional power stations, CHPs can be decentralised and located exactly where they are needed. From an environmental perspective, there are fewer carbon emissions with maximum energy savings.

The CHPQA Scheme

On average, a CHP's efficiency ranges between 75%- 90% and is, therefore, up to 40% more efficient than a traditional power plant.

CHP power is considered green electricity under the Greenhouse Gas (GHG) protocol. To support these types of CHPs, the UK Government has set up a CHP Quality Assurance (CHPQA) programme.

A successful CHPQA application grants eligibility to

a range of benefits, including the Climate Change Levy (CCL) exemption for natural gas and electricity, enhanced capital allowances, and preferential business rates.

Future gas supply will be increasingly renewable

As the majority of CHPs are running on natural gas, there are concerns that the reduction of carbon emissions may no longer be sufficient enough. The reason for this is the ever-increasing percentage of renewable sources in the UK electricity grid. Also, although natural gas is considered a green gas under the GHG protocol and is a significantly cleaner fuel compared to coal or petrol, it is not a renewable energy source.

This is about to change, as the increased content of biomethane and hydrogen in the gas supply will improve the carbon footprint

calculation effectively. After the Renewable heat incentive programme for the production of biomethane ended this year, the government is about to install the Green Gas Support Scheme (GGSS) to support the emerging UK's biomethane industry.

It is already possible to obtain natural gas with a content of up to 10% biomethane from energy suppliers like Good Energy, for example. In other countries like Denmark, the overall content of biomethane in the gas grids is around 7%. They are, however, aiming for 63% of biomethane content by 2030.

Green hydrogen is a second pillar for renewable sources in the gas supply. As the government has made it clear in its Energy White Paper¹ published in December last year, investments in hydrogen technologies will be an important factor on the

way to a net-zero future.

Since the first developments in 2012, leading CHP suppliers can now run systems on pure hydrogen and, of course, with hydrogen contents in natural gas. It is important to note here that existing CHPs can be converted into 100% hydrogen fuel-powered CHPs.

Making the right decision

Taking into consideration the energy policy of the future described in the Energy White Paper, the cost situation for the traditional purchase of electricity and gas will continue to worsen in the coming years.

CHPQAs offer a transitional solution for energy-intensive companies from a cost and environmental perspective. Since existing natural gas CHPs can be converted into running with up to 100% hydrogen, companies can react to changing gas supply situations in the future.

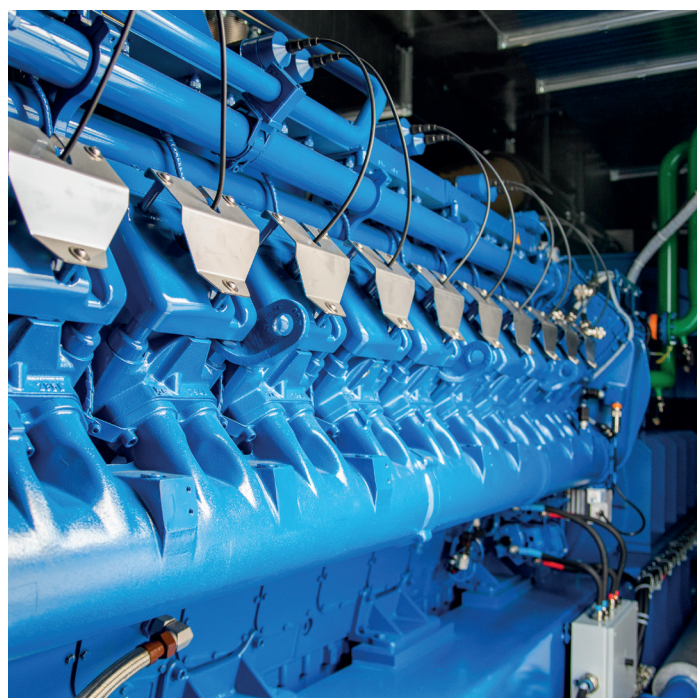
Realisation without investment

Regarding the realisation of such projects, a Power Purchase Agreement (PPA) from Kent-based company 4-CleanTech is a welcome alternative to a direct purchase. A PPA enables companies to enjoy all the benefits of a CHP without having to invest by itself or having to pay for the maintenance and service of the machine. ●

References:

1. [gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future](https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future)

For more information:
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The higher the CHP capacity, the greater the electricity efficiency