



PROJECT PROFILE



The first hydrogen-fuelled combined heat and power plant is in operation in the United Kingdom

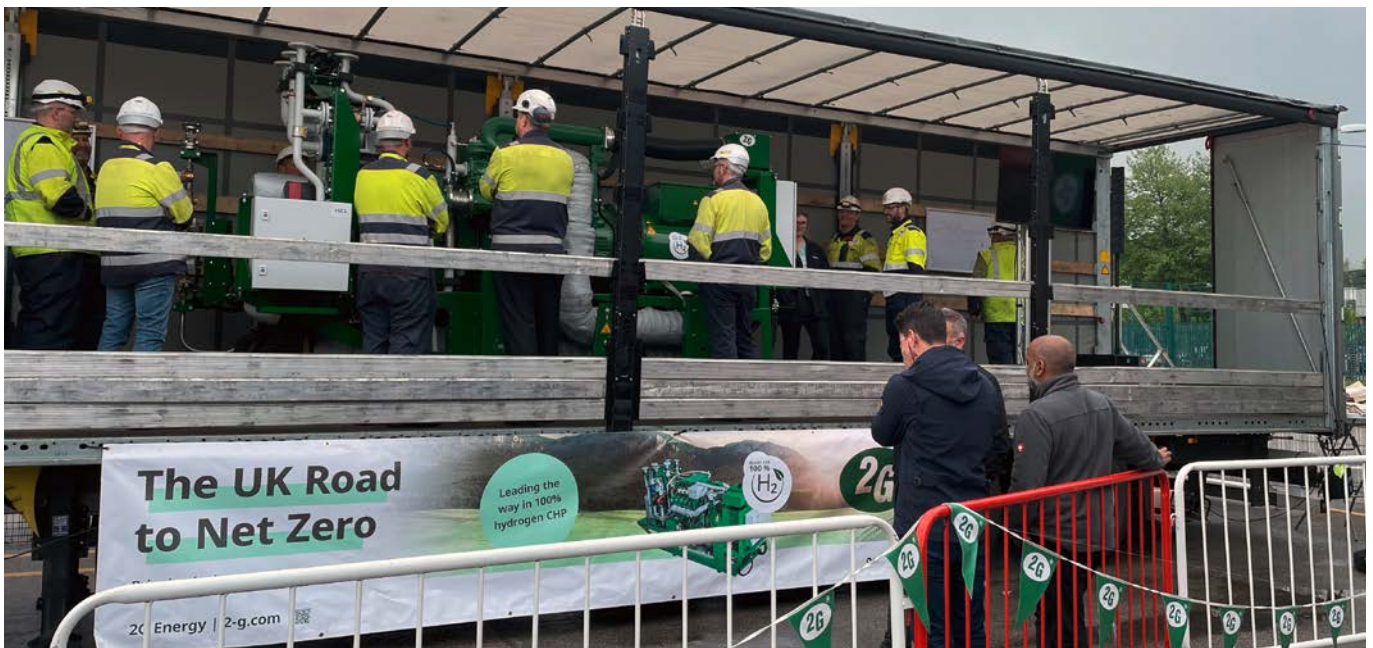
The combination of using hydrogen as an energy source and decarbonising the economy is attracting more and more attention – not least because the increasing expansion of renewable power generation capacities helps to boost the production of green hydrogen. There is also major interest in utilising hydrogen in the United Kingdom, where large capacities for offshore wind power generation have already been developed. According to a hydrogen strategy published in 2021, the aim is to increase hydrogen production capacity to ten gigawatts by 2030. Scotland in particular offers great potential as a hydrogen producer due to its potential in wind, wave and tidal power.

However, the use of hydrogen requires existing energy infrastructures to be adapted. Technologies that work with both fossil and biogenic fuels, as well as hydrogen, are particularly valuable for the transition. A good example of this is the combined heat and power plant (CHP) from 2G Energy AG, which was installed at Kirkwall Airport on the Orkney Islands in Scotland with the Renewable Energy Solutions Programme (RES Programme)

as part of the German Energy Solutions Initiative supported by the Federal Ministry for Economic Affairs and Climate Action. It can produce heat and electricity from pure hydrogen, which is generated by a nearby tidal power plant. 2G Energy AG is an international German manufacturer of CHP units to provide decentralised electricity and heat. The European Marine Energy Centre (EMEC) is also working at Kirkwall Airport together with the airport operator Highlands and Islands Airports Limited (HIAL) to make it carbon-neutral by 2040.



2G Energy information stand during the roadshow in the UK



Viewing the CHP unit at one of the stops during the roadshow

2G Energy AG installed an agenitor 404c CHP unit with an electrical output of 115 kW and a thermal output of 128 kW. The unit was housed in a container specially developed by 2G and was installed 50 metres away from the main building. The container is connected to the airport building via a heat and power line to cover part of the heat and power requirements of the airport's main building. The reference system has already been used for a longer test period at the airport and is the first hydrogen-fuelled CHP unit to be installed in the UK.

This type of CHP unit can be operated with natural gas, biomethane or hydrogen. Systems already in use that were previously operated with natural gas can be converted to green hydrogen in the future without major investment. This is one of the significant advantages of 2G Energy's technology, which enables the transition to the hydrogen economy to be made gradually.

'Hydrogen is set to play a vital role as the UK looks for long-term ways to meet its carbon reduction targets. Hydrogen's importance has become increasingly clear over the past few months of energy supply upheaval and the impact of war in Ukraine.' Mark Holtmann, Managing Director of 2G Ltd., Subsidiary based in the UK 'With our innovative 100% green hydrogen CHP system installed at Kirkwall Airport on the Orkney Islands, we wanted to bring this technology on the road to reach as many people as possible. We are committed to promoting hydrogen to achieve a net zero world and we want to demonstrate how CHPs can be integrated into a wide variety of industries and applications such as hospitals, schools, hotels and leisure facilities to provide energy reliability and resilience.'

Mark Holtmann,
Managing Director of 2G Ltd.,
Subsidiary based in the UK

As part of the RES Programme, the German Energy Agency (dena) supported 2G Energy AG in marketing its innovative and climate-friendly technology in the United Kingdom. This revolved around a large roadshow in which a CHP unit was transported to various locations around the UK by lorry and presented there. Newly acquired sales partner

Centrica also played a major role in this. Centrica has been designing and selling energy systems to companies and local authorities in the UK for over 200 years and is now adding 2G’s climate-friendly CHP units to its portfolio. First follow-up orders were secured as a result of the roadshow.

Company Description



2G Energy AG is an international manufacturer of combined heat and power plants (CHP) to provide decentralised electricity and heat generated from hydrogen, biomethane, biogas, sewage gas, landfill gas or natural gas-powered reciprocating engines. The 2G portfolio includes systems with an electrical output of 20 to 4,500 kW for various applications. In addition to its headquarters (Development and Production) in the German municipality of Heek, Münsterland, 2G has subsidiaries in several European countries and North America and employs around 920 people worldwide as of 2023. Since its foundation in 1995, 2G has sold more than 8,500 systems worldwide.

System Information	
System type	2G agenitor 404c hydrogen CHP unit
Output	115 kW electrical, 128 kW thermal
Estimated annual hydrogen consumption	74 tonnes per year
CO ₂ savings	192 tonnes per year

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