



GIGAPTX

ENABLE FORCES – SIMPLIFY LOGISTICS
FUELLING HOMELAND DEFENCE

TAKING RESPONSIBILITY IN A CHANGING WORLD

 **RHEINMETALL**

A secure supply of fuel for the armed forces is a basic prerequisite for their combat readiness. Fossil fuel supply chains established today for “peacetime operations” are logistically complex and fragile. In the event of war, these supply chains are likely to collapse. Investments in local renewable energy sources and in the ability to synthesise e-fuels will secure the energy supply for the armed forces in Europe as a key combat capability, which can be implemented cheaply and quickly, is robust, uses existing logistics systems and at the same time contributes to defossilisation.

Rheinmetall has over 20 years of experience with hydrogen technology and successfully realises projects along the entire value chain. The aim is to develop marketable solutions and components with which hydrogen can be produced, stored, transported and utilised with the greatest possible efficiency at low cost. For military applications, hydrogen is an essential component for the production of synthetic fuels.

There is no alternative to hydrocarbon-based fuels for the armed forces due to their ease of use and high energy density. This is why fossil diesel and fossil kerosene form the backbone of the armed forces’ energy supply today. The fuel requirement in the event of war is between 20 and 60 litres per day and soldier (averaged across all branches of the armed forces). Fuel logistics ties up forces. 60% of all casualties of NATO forces in Afghanistan occurred in the area of logistics, with a focus on fuel logistics.

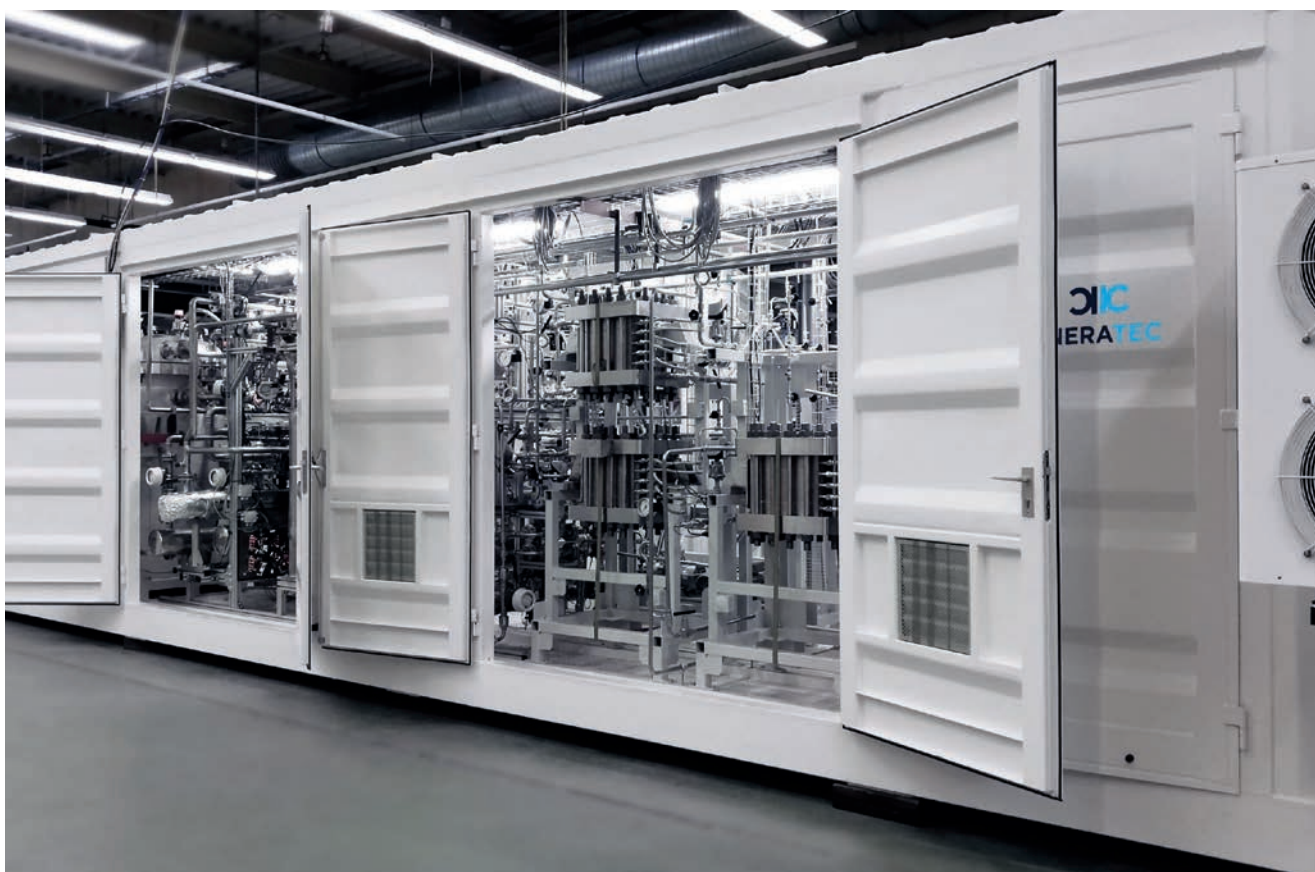
This is where synthetic drop-in fuels come into play. These can be produced anywhere from electricity, water and CO₂ and can be used in existing logistics systems, vehicles and aircraft due to their properties. Rheinmetall’s Giga-PtX project vision is a network of several hundred decentralised, large-scale synthetic fuel production plants with a unit size of up to 50 MW. Each plant locally combines the components of energy generation, hydrogen, CO₂ supply, and fuel synthesis and is ideally installed in close proximity to military units or pipeline systems. Using renewable energy, several thousand tonnes of fuel can be produced per plant each year. Thanks to this concept, no expansion of the electrical grid is required.



Different kinds of e-fuels can be provided, such as sustainable aviation fuel, diesel and marine diesel.

Short term, the CO₂ can be obtained from point sources (power plants, cement works, biogenic sources), so that direct air capture is not absolutely necessary.

The Europe-wide distribution of plants makes Giga-PtX as a whole more difficult to attack. Due to the moderate plant sizes, the technology can be scaled up quickly and then realised at low risk by replicating a tested prototype system. Together with its technology partner INERATEC, Rheinmetall is already offering the basis for a 'ready to scale' and subsequently 'ready to replicate' solution, so that an urgent problem on the way to resilience and war fighting readiness of the armed forces can be solved.



Compact and modularised chemical plant for e-fuel production.



E-fuels can be produced from recycled CO₂ and renewable energy using the Fischer-Tropsch synthesis.

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