

## Climate Protection in Aviation

Hessian Ministry of Economics, Energy, Transport and Housing

### Hessen becomes a technology hub for alternative fuels

In the middle of Germany, next to Frankfurt Airport, an innovation hub for CO<sub>2</sub>-neutral alternative fuels is being developed on the base of the Industrial Park Höchst. “Since we have established *the Centre of Competence for Climate, Environment and Noise Protection in Aviation* a year ago, much has changed here in Hessen, as well as on the national and European level. Meanwhile it has also become more obvious what the direct benefits of our position as Hessen are - an international airport, an important logistics sector and the Industrial Park Höchst” said the Hessian Minister of Economics and Transport Tarek Al-Wazir today during an introduction of the planned developments of the Industrial Park Höchst together with the companies Infracore Höchst, INERATEC and CAPHENIA.

The INERATEC GmbH plans a Power-to-Liquid pioneer plant. Starting from 2022 it aims to produce up to 4,6 million litres a year. At the same time, a company CAPHENIA develops an innovative Power-and-Biogas-to-Liquid (PBtL) technology for production of the renewable fuels and chemicals.

Up to the beginning of the corona pandemic the CO<sub>2</sub> emissions in aviation have been rising steadily. “We urgently need CO<sub>2</sub> reduction in transport, especially in aviation. For more climate protection in transport we need to encourage people to take short trips by train and make airplanes more fuel-efficient. Moreover, however, we also need CO<sub>2</sub>-neutral fuels especially for the intercontinental flights, many of which usually start in Frankfurt am Main” said the Minister. “That is why we now invest into Power-to-Liquid technologies and infrastructure as the State of Hessen, especially into synthetic kerosene.”

### The State of Hessen has been already working for two years on this topic

Already at the end of 2018 it was agreed on in the *Hessian Coalition Agreement* that the construction of the pilot facility for synthetic fuels will be pursued. This will allow for important experiences to be gathered and the push for the fuel trend shift to take place especially in the aviation sector. Since then a lot of work has been done constructing the needed legal framework and building up national networking to support this emerging technology and promote the exceptional setting of the State of Hessen.

“In the beginning of 2020 *the Centre of Competence for Climate, Environment and Noise Protection in Aviation* has started its work. Furthermore, there are alternative fuels production companies in the region who want to realise their projects on the base of the Industrial Park Höchst” said the Minister.

“We proactively support such developments here in the State of Hessen and already see it becoming an innovation hub for synthetic kerosine. We support such activities not only with the money from our regional budget, but we are also actively bidding for money from the national budget. Multiple synergies come to life in Höchst, and our colleagues in Berlin acknowledge that the State of Hessen is a very attractive setting for such technologies of tomorrow.

### **Hessen is actively involved in the roadmap „Power-to-Liquid“ of the German government**

In 2020 the Power-to-Liquid theme has gained a strong dynamic. The EU and the German state authorities have been working on a regulatory framework. The German state has allocated extra funds from the German state budget for alternative fuels and production of the “green” hydrogen as a starting point for production of the Power-to-Liquid fuels. At the same time a roadmap was put together by the state, industry, and the regional governments in order to work out a Power-to-Liquid roadmap. The State of Hessen is heavily involved in those negotiations, working on the positioning a hydrogen technology centre in Hessen. Together with the State Energy Agency (LEA) and the Hessen Trade and Invest, the Hessian state supports the Transport Ministry in creating a base for such consortium of industry, research, and trade promotion at Frankfurt Höchst.

“The corona crisis has raised enormous challenges for the aviation sector. The major setback in the number of passengers at the Frankfurt airport sets its operations years back. Yet with our engagement in CO<sub>2</sub>-neutral fuels we think about the times past the corona pandemic. People would want to travel again. Unfortunately, the climate crisis did not go on a quarantine; we need more climate protection in transport” said the Minister. “As the CO<sub>2</sub> emissions in electrification have gone down, they are still high in the transport sector. Wherever it is possible, transport should be electrified. As for middle- and long-haul flights as well as ship transport there are no solutions for rapid electrification of those routes in the upcoming years yet. That is why we here in Hessen start such transport-orientated projects for the industry, for example here in Höchst, welcoming companies such as INERATEC and CAPHENIA.“

“The Industrial Park Höchst is an exceptional site for the development of the sustainable technologies. Its infrastructure offers ideal conditions for innovative companies” said Dr Joachim Kreysing, managing director of the Infraserp Höchst. Infraserp Höchst is the operating company of the 4,6 km<sup>2</sup> of industrial space west of Frankfurt am Main. For years different companies have been developing sustainable technologies here. The first public hydrogen filling station was opened on this site back in 2006. Technology of fuelling fuel cell trains are already being put in place. The Industrial Park Höchst plans not to use coal-sourced energy already in 2022 - it is now investing 300 million euros into the gas turbines. Moreover, together with INERATEC and other European partners in the context of the EU project ICO<sub>2</sub>CHEM, a research unit for transformation of CO<sub>2</sub> into chemical products was established on its ground.

“For us as a partner of the chemical industry, energy efficiency and climate protection are highly important” stressed Dr Kreysing. “We acknowledge and support goals of the industry to become CO<sub>2</sub>-

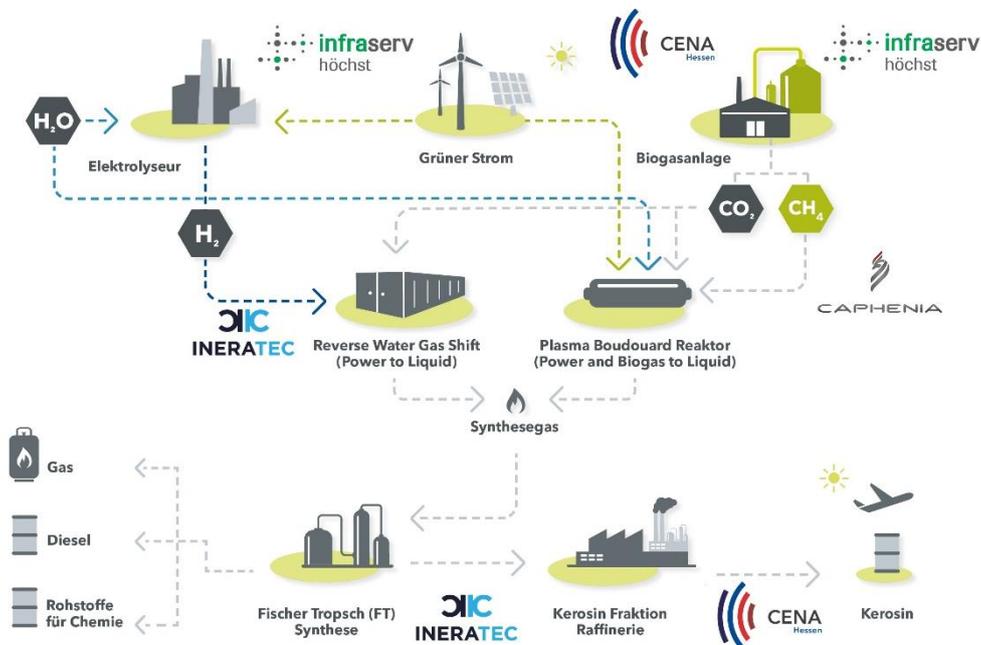
neutral until 2050. In order to achieve successful decarbonisation, such technologies like Power-to-Gas and Power-to-Liquid are quite central” said Dr Kreysing.

The managing director of INERATEC Philipp Engelkamp: “With the INERATEC Power-to-Liquid pioneer plant the CO<sub>2</sub>-neutral synthetic fuels will be broadly available for the first time. Due to the modular concept, the production capacities worldwide will be further expanded.”

“We are very happy about this milestone in the development of our highly efficient novel route of production of the synthetic fuels at the Industrial Park Höchst, directly next to the Frankfurt airport” said the managing director of CAPHENIA Dr Mark Misselhorn during the joint presentation.

Bernhard Dietrich, the head of CENA: “In order to enable the Sustainable Aviation Fuels breakthrough we actively support technological advances, construction of the interconnected infrastructure and enabling of a framework for a functioning market for such fuels”.

**Principles of the production of the sustainable synthetic fuels at the Industrial Park Höchst**



**INERATEC** was founded on the base of Karlsruhe Institute of Technology, Germany. The company develops, builds, and operates modular units for production of synthetic fuels and waxes through the Fischer-Tropsch process. At the moment it plans the world largest production unit for PtL at the Industrial Park Höchst in Frankfurt am Main, Germany.

**CAPHENIA** develops an innovative Power-and-Biogas-to-Liquid production process for renewable fuels and basic chemicals. The raw materials are biomethane, CO<sub>2</sub>, water, and electricity from the renewable sources. The first pilot unit for this technology will be also located at the Industrial Park Höchst in Frankfurt am Main, Germany.

**The Centre of Competence for Climate, Environment and Noise Protection in Aviation (CENA Hessen)** was initiated by the State of Hessen und funded by the money from the regional budget. It became a part of the Hessen Trade and Invest GmbH and is based at the House of Logistics and Mobility (HOLM) in Frankfurt am Main. One of its emphasis lies in proactive support and establishment of the fuel trend shift in aviation in lines with synthetic kerosine, with the goal of making aviation industry and services in Hessen climate friendly and future orientated.

**Infraserv Höchst** is the leading partner for chemical and pharmaceutical industry in hosting research and production facilities. It offers individual, modular solutions as well as innovative, integrated running services. The service areas of the companies range from energy supply, waste disposal, network management, site services, work, and health protection up to environment protection and facility management. With the subsidiary companies the Infraserv Höchst Group also covers services which include logistics, building and process technology. The Infraserv Höchst Group offers workplaces for around 2.700 employers and 193 apprentices. The turnover of the Infraserv Höchst together with its subsidiaries was over 1 billion Euro in 2019. Infraserv Höchst is the operating company for the 460 Hectare the Industrial Park Höchst. This is a site with around 90 companies from the areas of pharmaceuticals, biotechnology, basic- and special chemistry, plant protection, food additives, where around 22 000 employers are working. The sum of investment starting from the year 2000 is around 8 billion Euro.

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