

1. WHAT IS PROJECT POWER-UP?

The POWER-UP Programme is a €11.5 million project, backed by €6.1 million from the EU Fuel Cells and Hydrogen Joint Undertaking (FCH JU) partnership. It is AFC Energy's leading project to generate and supply electricity by using surplus Hydrogen produced at a major chemical plant in Stade, Germany. When installed, this will be one of the world's largest alkaline fuel cell power systems.

2. WHO IS INVOLVED?



Work at AFC Energy's Dunsfold laboratories

AFC ENERGY PLC is the Coordinator of the EU FCH JU POWER-UP project. Founded in 2006, AFC is re-engineering proven alkaline fuel cell technology to reduce the cost of electricity generation. By using platinum free, advanced materials, design tools and manufacturing processes at scale, AFC Energy is developing fuel cells that will compete with conventional power generation technologies. The KORE fuel cell module used in this project is the newest fuel cell system the company is producing.

Here is the list of partners involved in the project:

COMPANY / ORGANISATION	COUNTRY	WEBSITE
AFC Energy PLC	UK	www.afcenergy.com
Air Products PLC	UK	www.airproducts.com
GB Innomech Limited	UK	www.innomech.co.uk
Zentrum für Brennstoffzellentechnik ZBT GmbH	Germany	www.zbt-duisburg.de
Paul Scherrer Institut	Switzerland	www.psi.ch
European Hydrogen Association	Italy	www.h2euro.org

3. WHAT IS THE AFC KORE FUEL CELL MODULE?



3D model of the KORE fuel cell module

The AFC KORE module consists of three independent levels, each comprised in turn of eight fuel cell cartridges which can produce about 10kW_e power output per cartridge. It can provide electrical power continuously, as long as you feed it with hydrogen and air. The only by-products are demineralised water and heat – both of which can also have commercial uses. Excluding this water, the AFC KORE alkaline fuel cell system is a zero emission device.

Composed of two ca. 250kW_e KORE modules, the alkaline fuel cell plant in Stade will have a nominal capacity of around 500kW_e.

4. PROJECT WORK HIGHLIGHTS

In order to prepare for the Stade power plant installation a lot of work has been taking place in AFC Energy's offices in Dunsfold Park. The manufacturing facilities have been upgraded with the introduction of an automated catalyst extruder unit, a necessary step in stocking the cartridges with fuel cells. This will ensure the cartridge assembly can accommodate the installation and operation requirements of the two KORE fuel cell modules in Stade.



AFC catalyst extrusion unit



Assembly of the first AFC KORE module for Stade

The first KORE fuel cell module is now being assembled at Dunsfold, alongside the detailed engineering design drawings that are being finalised. Individual component testing in-situ is currently underway. The KORE module still has to be assembled in its entirety, then it will have to go through post-assembly tests prior to its shipment to the project site at Stade.

Planning preparations are currently underway for the building and infrastructure in Stade, in order to apply to local authorities for a building permit and operating license. The application process will take place in parallel to the engineering design of the KORE facilities. The site has recently been cleared of undergrowth and a topographical survey is soon to follow.



POWER-UP Stade site before and after clearance



H₂ mechanical tie-ins

Work on the Stade hydrogen infrastructure has begun. This is to ensure that the continuous flow of high purity hydrogen to the building housing the KORE modules is supplied in a safe, controlled manner complying to German Law and Air Products' high quality standards. The mechanical tie-ins will tie the existing Air Products hydrogen infrastructure in to a hydrogen pressure let-down station and pipes leading to the AFC Energy KORE installation.

Work is being done by ZBT and PSI to ensure that:

1. the POWER-UP project complies with all relevant standards,
2. the project's technical and commercial viability is soundly demonstrated over the long term.

If you are interested in further information on the project you can email us on info@afcenery.com or contact us at +44 (0) 1483 276726. Alternatively, you can sign up for our mailing list on <http://project-power-up.eu/>.