East Germany becomes epicentre of hydrogen economy revolution

A revolution would break out in the hydrogen power economy if only it were possible to use a specialised chemical process to transform, store, transport and give continual access to the electricity generated in wind and solar plants – the accumulation of which is so weather-dependent – in the form of hydrogen. While there is currently no industrial scale solution to this problem, the Hypos project is leading the way. The name Hypos is an acronym composed of the initials of the project's English title: 'Hydrogen Power Storage & Solutions East Germany'.

A consortium consisting of 90 businesses has come together to put the idea into practice. The members pertain to different industries, come from East as well as from West Germany, and include small and medium-sized businesses as well as universities and research institutions. The consortium counts globally active companies such as Linde and Air Liquide among its numbers. It also includes VNG, an importer of natural gas and network operator, as well as medium-sized businesses such as Sunfire GmbH (Dresden) or Bitterfeld-based Miltitz Aromatics.

In April, the consortium submitted a plan to the Federal Ministry of Education and Research (BMBF) which was as extensive as it was detailed. The plan serves as the basis for an application to be admitted to the 'Twenty20 - Partnership for Innovation' ('Zwanzig20 - Partnerschaft für Innovation') programme. The BMBF has allocated a total of €500m to the programme until 2019, from which ten prospective projects will benefit. The Hypos consortium has already overcome the first hurdle and is now in the final round. At the end of June, a selection jury determined that Hypos would be among the 19 consortia allowed to present their ideas and their plans in Berlin on 16 July. Subsequently, it will be decided which ten projects are going to benefit from the programme's support. A total of 59 consortia applied for admission into the highly attractive BMBF programme.

Hypos was initiated by the Industrial Initiative for Central Germany (IICG) ('Wirtschaftsinitiative für Mitteldeutschland GmbH'), the Fraunhofer Institute for Mechanics of Materials IWM and the Central German Chemical Industry and Plastics Cluster (Cluster Chemie/Kunststoffe Mitteldeutschland'). According to them, Hypos signifies the feeding of surplus renewable electricity into the energy system via the innovative linkage of hydrogen generation technology with the already existing natural gas pipeline and storage facility infrastructure. This 'green' hydrogen will not only be utilised by the chemicals industry to produce chemical changes, it will be used to fulfill the requirements of electromobility and as a source of energy as well. 'Aside from achieving a breakthrough for the success of the energy revolution, such a development would trigger far-reaching, large-scale social and economic effects as well', Wehrspon stated in explaining the the Hypos consortium's vision. Christoph Mühlhaus, spokesman for the Central German Chemical Industry and Plastics Cluster, compares Hypos to the challenges that had to be overcome in order to preserve and reorient the East German chemicals industry at the beginning of the 1990s. Wehrspohn und Mühlhaus both agree that, 'sustainable chemistry is on the way'. They underscore that Hypos is driving the kind of economic growth in which especially small and medium-sized businesses will participate.

From the two men's perspective, East Germany is an especially suitable place to turn this idea into reality. This is particularly true considering the elevated demand for hydrogen – currently produced almost exclusively from natural gas – which the enterprises of the Central German Chemistry Triangle are characterised by. The essential Central German Chemistry Triangle sites are inter-connected via the second largest hydrogen pipeline in all of Germany. Facilities that accommodate the implementation of the Hypos project already exist in the vicinity of the chemical park locations. Traditionally, the area has been home not only to the utility companies' powerful electrical substations which connect the sites to the grid. Massive natural gas storage caverns and nodes from the natural gas grid are located in the vicinity as well. This means that business and locations engaged in the chemicals sector dispose of the know-how to handle hydrogen on an industrial-scale, including its purification, pressurisation and storage. They already have a great deal of experience safely handling hydrogen. The region also possesses considerable expertise when it comes to water electrolysis and methanation research. Mühlhaus emphasised the possibility that Hypos may be able to gradually replace natural gas as the substance enabling the material use of hydrogen. As a result, CO_2 emissions would be reduced by approximately 700,000 tonnes per year in the Central German Chemical Triangle alone. It is presumed that Hypos will start to break even in 2020. At that point, the business plan projects, the profitability of 'green' hydrogen will become a reality. It recommends that, 'the solutions, which were initially developed in the region, can be applied on a Germany-wide and even on a European scale'. The Hypos parents estimate a total investment volume of around €100m. Some €35m in equity capital have already been committed by consortium partners. 'We have already started thinking about the first major investments', Wehrspohn revealed. 'I am certain that there will be more to come, investments about which we currently have no idea', he added.

The consortium wholeheartedly trusts that Hypos will be admitted into the BMBF programme. that Even if it turns out that the consortium is not admitted, Mühlhaus assured, the idea would still come to fruition, simply via a different route. Projects such as the construction of a pilot plant or the expansion of infrastructure would come anyhow. Hypos was combing its resources however, making everything run more quickly, Wehrspohn underscored. 'We are presenting the right solution at the right time. Hydrogen pipelines will become the new arteries of the economy. Their heart beats in East Germany', he stated, full of conviction.

Contact: Fraunhofer-Institut für Werkstoffmechanik IWM
(Fraunhofer Institute for Mechanics of Materials IWM)
Prof. Dr. Ralf B. Wehrspohn
Walter-Hülse-Straße 1
06120 Halle
Germany
Tel: +49 345 5589230
E-Mail: ralf.wehrspohn@iwmh.fraunhofer.de
Web: www.hypos-eastgermany.de

Add page