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European Commission funds H2FUTURE Project

voestalpine, Siemens and VERBUND are building a pilot facility for green hydrogen at the Linz location

The European Commission has awarded the H2FUTURE project consortium, consisting of voestalpine, Siemens, VERBUND and Austrian Power Grid (APG) as well as the research-partners K1-MET and ECN, the contract for the construction of one of the world's largest electrolysis plants for producing green hydrogen. The project-partners will work and research cooperatively on implementing an innovative hydrogen demonstration plant at the voestalpine site in Linz.

Vienna, 7th February 2017

Both industry at large and energy providers are currently confronted with serious energy policy challenges in Europe: The EU's climate and energy goals stipulate a 40 percent reduction of CO₂ emissions by 2030, which poses almost unsolvable problems for energy-intensive industries. The European electricity sector is experiencing a radical change, with overcapacities of volatile new renewable solar and wind energy. Green Hydrogen produced based on CO₂-free green electricity presents enormous potential for use as an industrial process gas, as well as for energy storage. The H2FUTURE project is an important milestone on the path towards coupling the energy and industry sectors.

Commenting on the launch of H2FUTURE, Bart Biebuyck, Executive Director European Commission, Fuel Cells and Hydrogen Joint Undertaking (FCH JU) said, "The FCH JU is thrilled to see the launch of such ground-breaking project. H2FUTURE gathers a constructive partnership which is decisive in the process of greening the industry while harnessing the power of renewables.

This is key to positioning industry and the sector on the right way to help meeting the Cop 21 agreement targets. After having supported 25 projects in the field of electrolyser, the FCH JU is proud to see the birth of the most ambitious project in this field, aiming to build one of the largest PEM electrolyser."

The H2FUTURE Project

The FCH JU has allocated about 12 million EUR in funding from the EU Horizon 2020 programme for implementing this project with the goal of producing green hydrogen. The green hydrogen for industrial use and for balancing the power reserve market will be produced in one of the largest and most modern electrolysers with proton exchange membrane (PEM) technology. The total project volume amounts to about 18 million EUR over the course of 4.5 years.

The key partners in the project are the companies voestalpine, Siemens and VERBUND. The plant will be built and operated on the premises of voestalpine in Linz. The green hydrogen generated there will be fed directly into the internal gas network, allowing the testing of the use of hydrogen in various process stages of steel production. The technology supplier for the proton exchange membrane electrolyser is Siemens. VERBUND, the project coordinator, will provide electricity from renewable energy sources and is responsible for development of grid-relevant services. Further partners in the project are the research institution ECN from the Netherlands, which is responsible for the scientific analysis of the demonstration operation and the transferability to other industrial sectors, and the Austrian transmission system operator APG, which will provide support in integrating the plant



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 735503. This Joint Undertaking receives support from the European Union's Horizon2020 research and innovation programme and Hydrogen Europe and N.ERGHY.



into the power reserve markets. The Austrian COMET Competence Center K1-MET provides its expertise in the operation of the plant and demonstrates the potential applications in the European and global steel sector.

With H2FUTURE, key questions about sector coupling will be handled, such as evaluating potentials and possibilities for using green hydrogen in various process stages of steel production. In addition, the transferability of this technology to other industrial sectors which use hydrogen in their production processes will be investigated. A further focus is integrating the responsive PEM electrolysis plant into the power reserve markets by developing demand-side management solutions, thus compensating for short-term fluctuations in the increasingly volatile power supply by means of load management for bulk consumers.

voestalpine on its way to CO₂-neutral steel production

voestalpine has long been regarded as an environmental and efficiency benchmark in its industry. In the last ten years, the technology and industrial goods group has spent more than 2.2 billion EUR on the ongoing operation of its environmental facilities in Austria. "We are working consistently on the further development of our processes towards the gradual de-carbonization of steel production in order to be optimally positioned for the future challenges in terms of climate and environmental protection," said Wolfgang Eder, chairman of voestalpine AG.

voestalpine is striving for the replacement of coal through the use of alternative energy sources in steel production over the next two decades by bridging technologies, primarily based on natural gas, like in the new reduction facility in Texas.

"With the construction of the new pilot plant for the production of CO₂-neutral hydrogen at our Linz location, we are taking a further step towards the long-term realization of the technology transformation in the steel industry", Eder adds.

However, the prerequisites needed are the provision of sufficient energy from renewable sources as well as political framework conditions, which allow for a secure long-term planning.

Siemens' PEM Electrolysis System Represents a Key Technology for the Energy Future

Sustainable electricity generation is gaining increasing global importance against the background of shrinking resources. The development of renewable energies is intended to significantly reduce CO₂ emissions, among other things. One of the challenges is in capturing excess wind and solar energy and feeding it back into the grid as required. Siemens has developed an electrolysis system based on PEM (proton exchange membrane) technology, which enables large quantities of energy to be captured and stored through the conversion of electrical current into hydrogen. The electrolysis system is already successfully in use in several projects and is subject to on-going development by Siemens. With a capacity of 6 megawatts, the latest generation of the technology will now be applied in a closed cell unit in Linz. "The hydrogen produced has a multitude of applications, for example as a raw material in the industry – as is seen in Linz, but also as a fuel for mobility and as an energy carrier in electricity and gas supply," explains Wolfgang Hesoun, CEO of Siemens Austria. More than 500 billion cubic metres of hydrogen are used annually worldwide, more than 95 per cent of which was hitherto produced via a CO₂-intensive gas reforming process. "This CO₂-heavy hydrogen can be replaced by hydrogen from electrolysis, greatly improving the emission balance resulting from industrial processes. Moreover, if the electrolysis is undertaken with electricity from renewable sources, the hydrogen production is virtually climate-neutral."

VERBUND on the way to being a 100 percent CO₂-free energy provider

Already today, VERBUND generates around 96 percent of its electricity from renewable energy sources, primarily hydropower. In addition to generating, transmitting, trading and marketing electricity, the company is increasingly focusing on the expansion of energy-related services for industrial and commercial clients, as well as for household customers. "With H2FUTURE we are consistently



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continuing on the path to becoming a 100 percent CO₂-free energy provider. “We welcome this forward-looking project, which links the challenges of the production industry and the efficient use of clean energy in an ideal way. Our common goal is the reduction of CO₂ emissions and strengthening Austria as a business location through the use of state of the art green technology,” VERBUND Chairman of the Board Wolfgang Anzengruber confirms. “Green hydrogen in particular offers great potential for industrial use and also as a storage medium, to balance out the volatile electricity generation from new renewable energy sources and to ideally integrate them into the energy system.”

The voestalpine Group

In its business segments, voestalpine is a globally leading technology and capital goods group with a unique combination of material and processing expertise. voestalpine, which operates globally, has around 500 Group companies and locations in more than 50 countries on all five continents. It has been listed on the Vienna Stock Exchange since 1995. With its top-quality products and system solutions using steel and other metals, it is one of the leading partners to the automotive and consumer goods industries in Europe and to the oil and gas industries worldwide. The voestalpine Group is also the world market leader in turnout technology, special rails, tool steel, and special sections. In the business year 2015/16, the Group generated revenue of EUR 11.1 billion, with an operating result (EBITDA) of EUR 1.6 billion; it has 48,500 employees worldwide, who are collectively a major shareholder in the company with a stake of 14.5 percent.

About Siemens Österreich

For more than 130 years in Austria, Siemens has stood for technical performance, innovation, quality, and reliability. Siemens AG Österreich ranks among the leading technology companies in the country. The business activity is concentrated on the areas of industry, energy, and health, as well as on infrastructure solutions, especially for cities and greater urban areas. In the fiscal year 2011, Siemens AG Österreich achieved incoming orders of around 2.4 billion euros, and the turnover amounted to more than 2.4 billion euros. Siemens employs about 12,300 persons in Austria. Within the global corporation, Siemens Österreich assumes the business responsibility for the 19 countries of the Siemens cluster “Central Eastern Europe” (CEE). In the entire CEE cluster, approximately 36,500 employees generated a turnover of 8.7 billion euros in the last fiscal year. More information: www.siemens.at

About VERBUND

VERBUND is Austria's leading electricity company and one of Europe's largest hydropower electricity producers. More than 96 percent of the company's electricity is generated from hydropower. VERBUND trades in electricity in 12 countries, and in 2015 with around 3,000 employees, it achieved an annual turnover of 3 billion euros. Along with its subsidiaries and affiliates, VERBUND is active from electricity generation to transport and on to international trading and marketing. VERBUND has been listed on the Vienna Stock Exchange since 1988, and 51 % of the share capital is held by the Republic of Austria. More information: www.verbund.com

About the FCH JU:

The Fuel Cells and Hydrogen Joint Undertaking (FCH JU) is a unique public private partnership supporting research, technological development and demonstration (RTD) activities in fuel cell and hydrogen energy technologies in Europe. Its aim is to accelerate the market introduction of these technologies, realising their potential as an instrument in achieving a carbon-lean energy system.

Fuel cells, as an efficient conversion technology, and hydrogen, as a clean energy carrier, have a great potential to help fight carbon dioxide emissions, to reduce dependence on hydrocarbons and to contribute to economic growth. The objective of the FCH JU is to bring these benefits to Europeans through a concentrated effort from all sectors.

The three members of the FCH JU are the European Commission, fuel cell and hydrogen industries represented by Hydrogen Europe and the research community represented by the Research Grouping N.ERGHY.

Website: <http://www.fch.europa.eu/>



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