



Mar. 30, 2010

First industrial-scale plant contract for climate-friendly chlorine production using Bayer MaterialScience's innovative ODC technology

Lower emissions due to oxygen-depolarised cathode technology

On March 10, 2010, Uhde and Bayer MaterialScience AG of Leverkusen signed a contract for the construction of a new 20,000 tonne-per-year chlorine plant at the Krefeld-Uerdingen chemical park. The plant is due to be commissioned in the first half of 2011. It will be the first time that Bayer MaterialScience's oxygen-depolarised cathodes (ODCs) are to be used in the electrolysis cells developed by UHDENORA/Uhde to produce chlorine on an industrial scale - thus cutting the energy required to produce chlorine by up to 30 percent compared with standard membrane technology and indirectly reducing annual CO₂ emissions by up to 10,000 tonnes.

The project between the two companies, which was initiated in close cooperation with the RWTH University of Aachen, the Technical University of Clausthal and the University of Dortmund, is funded by the Federal German Ministry for Education and Research (BMBF) under the "Research for Sustainability" programme, otherwise known by the German acronym FONA. FONA supports initiatives for improved energy efficiency and higher resource productivity. The projects funded actively contribute to counteracting the effects of climate change.

Within the framework of the "Qualification of NaCl ODC technology for industrial chlorine production" project, Bayer MaterialScience and Uhde are for the first time implementing the industrial-scale use of ODC technology for the production of chlorine on a sodium chloride (NaCl) basis. This innovative, sustainable and environment-friendly technology combines UHDENORA's know-how in cell technology with the expertise of Bayer MaterialScience regarding the oxygen-depolarised cathode.

As a global leader in the production of electrolysis cells and a supplier of chlorine plants, Uhde is already an established partner for Bayer MaterialScience. Bayer MaterialScience has committed to sustainability and therefore firmly focuses on efficient process technologies.

"Our oxygen-depolarised cathode is further proof of how we systematically develop new solutions to tackle climate change. At the same time, we feel a holistic approach is essential - so we also offer other companies our ODC technology for the environment-friendly production of chlorine. From a global perspective, the more CO₂ emissions we can cut, the better," explains Dr. Tony Van Osselaer, Member of the Management Board of Bayer MaterialScience.

"We are proud of our long partnership with Bayer MaterialScience. As a technology company we

are always looking for solutions that are of economic and ecological benefit to our customers. The NaCl ODC technology holds the potential for such a solution," says Dr Sami Pelkonen, Head of Uhde's electrolysis division.

The electrochemical production of chlorine is now one of the most energy-intensive processes in the chemical industry. Large quantities of chlorine are required in particular for the production of plastics, but also for the production of pharmaceuticals. At present, chlorine is mainly produced via so-called membrane processes. The new technology cuts the power consumption of electrolysis plants through feeding in gaseous oxygen. This also reduces CO₂ emissions.

***Uhde** has a workforce of more than 4,500 employees worldwide and is a company in the Plant Technology business area of the ThyssenKrupp Group. The company's activities focus on the engineering and construction of chemical and other industrial plants in the following fields: fertilisers; electrolysis; gas technologies; oil, coal and residue gasification; refining technologies; organic intermediates, polymers and synthetic fibres; and also coke plant and high-pressure technologies. We also provide our customers with professional services and comprehensive solutions in all areas of industrial plant operation. Details are available at www.uhde.eu.*

***UHDENORA S.p.A.** is a joint company of Uhde/Germany and Industrie De Nora/Italy, and has a workforce of 70 employees worldwide. The company's activities focus on the design and construction of chemical and other industrial plants mainly in the following fields: chlor-alkali electrolysis, hydrochloric acid electrolysis and bleaching chemicals. Details are available at www.uhdenora.com*

*With 2009 sales of EUR 7.5 billion, **Bayer MaterialScience** is among the world's largest polymer companies. Business activities are focused on the manufacture of high-tech polymer materials and the development of innovative solutions for products used in many areas of daily life. The main segments served are the automotive, electrical and electronics, construction and the sports and leisure industries. At the end of 2009, Bayer MaterialScience had 30 production sites and employed approximately 14,300 people around the globe. Bayer MaterialScience is a Bayer Group company. Details are available at www.bayermaterialscience.de*