

thyssenkrupp Uhde signs Master Agreement with Ma'aden and Metso on phosphogypsum recycling and CO₂ capture project

- **Joint development of environmentally friendly solution**
- **Low-emission calcination process enables CO₂ capture in limestone**

thyssenkrupp Uhde has signed a master agreement with Ma'aden (Saudi Arabian Mining Company) for the development, engineering and licensing of a calcination plant for phosphogypsum processing. The purpose of the proposed plant, to be located at Ma'aden's Ras al Khair site in Saudi Arabia, will be to recycle phosphogypsum and enable the capture of CO₂ emissions. The joint research and development will be carried out together with thyssenkrupp Polysius and Metso Outotec.

Hassan Al-Ali, Executive Vice President, Ma'aden Phosphate: "We look forward to working with our partners to develop this unique solution, utilizing our new patented technology to reduce carbon emissions and recycle phosphogypsum into a useful resource. With this ambitious project, we will contribute significantly to the Saudi Green Initiative and create lasting impact in line with our Kingdom's Vision 2030."

"We are honored to be chosen by our esteemed customer to provide our technology and expertise," said Lucretia Löscher, COO thyssenkrupp Uhde. "We are providing the innovative process to turn the phosphate industry into a circular economy. This project will be another important milestone for thyssenkrupp Uhde in enabling the green transformation of our customers."

Currently, significant amounts of phosphogypsum are produced as a by-product of phosphoric acid production, which is essential for producing phosphate fertilizers. The options for using phosphogypsum directly are very limited due to impurities and the general properties of this material. The innovative phosphogypsum treatment process will have three major benefits: First, it converts phosphogypsum into quicklime (calcium oxide, CaO). By using alternative fuels such as hydrogen or sulfur, this calcination step is low in CO₂ emissions. Additional know-how for this process is provided by thyssenkrupp Polysius, a full range-supplier of the cement and lime industry. Secondly, it enables the recovery of sulphuric acid, which can be recycled and reused as feedstock for phosphoric acid production. And thirdly, the quicklime binds CO₂ through a carbonization process to form limestone. The limestone can then be used, for example, in the construction industry or for cement production.

About Ma'aden

Ma'aden is the largest multi-commodity mining and metals company in the Middle East and among the fastest-growing mining companies in the world, with revenues of SAR 40.3 billion (US\$ 10.7 billion) in 2022. We are developing the mining industry into the third pillar of Saudi economy in line with Vision 2030 and aim to be a role model in responsible and sustainable operations.

We operate 17 mines and sites, have 6,500+ direct employees and export products to over 30 countries. We are embarking on massive growth over the next 18 years across phosphate, aluminum, gold, copper and new minerals – to leverage the Kingdom's estimated US\$ 1.3 trillion mineral endowment and international opportunities.

For more information, please visit <https://www.maaden.com.sa>

About thyssenkrupp Uhde

thyssenkrupp Uhde combines unique technological expertise and decades of global experience in the engineering, procurement, construction and service of chemical plants. We develop innovative processes and products for a more sustainable future, and thus contribute to the long-term success of our customers in almost all areas of the chemical industry. Our portfolio includes leading technologies for producing base chemicals, fertilizers and polymers as well as complete value chains for green hydrogen and sustainable chemicals. www.thyssenkrupp-uhde.com

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