

### **### Abstract: Building Resilience in the Chemical Industry – The Rheticus® Process and Renewable Carbon**

The global chemical industry faces mounting challenges as geopolitical conflicts, supply chain disruptions, and fluctuating fossil resource availability threaten its stability. Recent wars and crises have underscored the urgent need to shift toward resilient and sustainable feedstock solutions. Renewable carbon sources offer a transformative pathway to reduce dependency on fossil resources, ensuring both environmental sustainability and supply chain security.

Evonik's Rheticus® process is an innovative biotechnological solution that addresses these challenges by utilizing carbon dioxide (CO<sub>2</sub>), green hydrogen, and bioethanol as feedstocks to produce high-value specialty chemicals. The process employs two highly specialized bacterial strains to convert CO<sub>2</sub> into fatty acids in a fermenter, which are then purified. This approach not only enables efficient and sustainable chemical production but also reduces reliance on geopolitically sensitive fossil feedstocks.

To accelerate the adoption of this technology, Evonik is planning the construction of a demonstration plant, aiming to scale the Rheticus® process to industrial levels. By integrating renewable carbon sources into chemical production, this technology contributes to a more resilient and adaptive industry model.

The molecules produced through the Rheticus® process serve as versatile building blocks for applications in lubricants, cosmetics, animal feed, and plastics. Their CO<sub>2</sub>-based production offers a sustainable alternative to conventional materials, improving the carbon footprint while ensuring supply chain stability in volatile times.

This presentation will highlight the critical role of renewable carbon technologies in addressing current global challenges, the science behind the Rheticus® process, and its potential to enhance resilience and sustainability in the chemical industry.