



Joint News Release

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ORLEN Południe plant makes propylene glycol production more sustainable based on BASF technology

- **BASF's state-of-the-art process converts glycerol to renewable propylene glycol (BioPG)**
- **The project with ORLEN Południe has been executed in partnership with Air Liquide Engineering & Construction**
- **ORLEN Południe utilized BASF's commercially proven process technology and proprietary H9-66 catalyst**
- **New plant supports ORLEN Południe's objective to achieve CO₂ neutrality by 2050**

ORLEN Południe, a leading player in biofuels in Poland, has recently concluded the first year of operation of its BioPG plant, converting glycerol, a by-product of biodiesel production, into renewable propylene glycol (BioPG).

BioPG obtained from glycerin is bio-based and a highly demanded product used to produce polyester resins, polyurethanes, paints and de-icing solutions, solvents for the food industry, and is used as an ingredient in deodorant sticks and toothpaste. Compared to fossil-based propylene glycol, BioPG reduces the CO₂ footprint by at least 60 percent whilst offering the same product quality.

Air Liquide Engineering & Construction provided the license, basic engineering, and

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proprietary equipment for the new plant, combining its expertise with commercially-proven BASF technology.

BASF's BioPG technology is operating at full scale for already more than a decade, showing very high selectivity and glycerol conversion using BASF's H9-66 catalyst. The outstanding catalyst performance enables the hydrogenation in liquid phase without any need for separation of intermediates or solvents, leading to lower energy consumptions compared to other processes.

The BioPG plant supports ORLEN Group's objective of achieving CO₂ neutrality by 2050. With an annual capacity of 30,000 metric tons, ORLEN Południe is the first Polish producer of propylene glycol aiming to meet 75 percent of the country's propylene glycol needs.

"We are proud that after a smooth start-up the new plant is operating as planned, for more than one year. The cooperation between ORLEN Południe, BASF, Air Liquide Engineering & Construction significantly promotes our business philosophy with the BioPG technology and improves our value chain. The technical support by BASF and Air Liquide Engineering & Construction was outstanding. This really is a joint success," says Grzegorz Semerjak, Technology Director at ORLEN Południe.

"We are pleased to offer to our customers an innovative bio-based renewable solution that provides many environmental benefits and helps our customers move towards a low-carbon society. We were delighted to work with ORLEN Południe on their project, to provide our expertise and a one-stop shop BioPG solution," says Dominique Rouge, Vice President, Sales & Technology at Air Liquide Engineering and Construction.

"Our propylene glycol catalyst has been operating successfully at customers for over ten years, and we are excited about a successful startup and operation of another commercial plant with ORLEN Południe. Thanks to the G2PG process, ORLEN Południe has opened a completely new business area of bio products and further increased the value creation at its biodiesel plant. As BASF, we are proud to support this development with our innovative technology and catalyst, and to enable a more sustainable BioPG production," says Detlef Ruff, Senior Vice President, Process Catalysts at BASF.

About BASF's Catalysts Division

BASF's Catalysts division is the world's leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF's Catalysts division develops unique, proprietary solutions that drive customer success. Further information on BASF's Catalysts division is available on the Internet at www.catalysts.basf.com.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. More than 111,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio comprises six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €87.3 billion in 2022. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the United States. Further information at www.basf.com.

About ORLEN Południe

The business activity of ORLEN Południe S.A. focuses on the primary product segments related to the production and sales of biofuels and biocomponents, paraffin and solvents. Consistently developed technologies, emphasis on the development of know-how and a series of optimization initiatives are the foundations of the Company's development towards a bio-refinery. The company's offer is supplemented by products obtained through petroleum processing and oil regeneration.

The company's paraffin activity bases on company-owned paraffin hydro-refining installation, the only and the most innovative in this part of Europe. State of the art technological solutions and high-quality raw material guarantee the safety and quality of products manufactured. Forecasts for the paraffin sector anticipate the growth in sales of high-margin products and entry into new market segments. The innovative petroleum solvent production installation launched in 2007 provides low-sulfur and low-aromatic petroleum solvents, which compete with the currently marketed global products in terms of boiling point. Further information at www.ornpoludnie.pl

About Air Liquide Engineering and Construction

Air Liquide Engineering & Construction builds Air Liquide Group production units (mainly air gas separation and low carbon hydrogen production units) and provides external customers with efficient, sustainable, customized technology and process solutions. Air Liquide Engineering & Construction's core expertise in industrial gases, energy conversion and gas purification, enables customers to optimize natural resources. This business unit covers the entire project life-cycle: license engineering

services / proprietary equipment, high-end engineering & design capabilities, project management & execution services. As a technology partner, customers benefit from our research and development to contribute to energy transition.