

Conversion of renewable raw materials – transformation to biorefinery

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The chemical industry is one of the key branches of the processing industry. In Poland, it's one of the important elements of the economic system and one of the most important components of GDP (Gross Domestic Product). The increasing energy demands, gradual depletion of fossil fuels and rise of crude oils price are foremost motivations for exploration of renewable resources for sustainable production of energy, fuels, organic chemicals, fine chemicals and polymers [1]. All of this is also extremely important in the context of European Union regulations.

There have been many definitions and types of biorefinery. One classification covers the whole range of biomass and is based on well-known conversion technologies. Additionally, technologies and products are expected to be expanded in near future in response to use of novel feedstock and further scientific advancements [2].

Utilization of renewable raw materials gain importance in the chemical conversion of substances in industry. Partial or even complete adjustment of economies to renewable raw materials require completely new approaches in research, development, and production. As predicted chemical and biological sciences play a leading role in the building of future industries [3]. To develop this direction, chemists should support this change and collaborate with colleagues in adjoining disciplines, for example biotechnology, agriculture, forestry.

ORLEN Południe rationally utilize raw material resources, forming the basis for the development of our company towards to the biorefinery. It is significant for most recipients, including large enterprises concerned with their eco-friendly image and implementing a sustainable development policy.

In 2021, we launched the first plant in Poland and the largest in Europe for the production of green propylene glycol. The "ECO" designed plant significantly reduces overall greenhouse gas emissions (GHG) per unit of propylene glycol production compared to conventional technologies – reducing emissions by 60-80%. This feature is significant for most recipients, including large enterprises concerned with their eco-friendly image and implementing a sustainable development policy.

In line with the strategy aiming for emission neutrality within the ORLEN Group, we are developing a new branch of future fuels – high-purity hydrogen 5.0 for buses and passenger cars. In the Trzebinia refinery of ORLEN Południe, an innovative technology for producing lactic acid using microorganisms is being developed. We are also implementing an ambitious program for the production of advanced fuels, including second-generation bioethanol. The plant for its production is underway at our manufacturing facility in Jedlicze.

During the speech, specific examples and results of completed investments, implemented technologies and ongoing research and development (R&D) projects will be presented, which are implemented by ORLEN Południe in accordance with the biotransformation strategy.

References

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