Valorization of Glycerol for Monomer Plastic Production: A Pathway to Sustainable Bioplastics in Indonesia

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The rapid growth of biodiesel production in Indonesia, driven by government mandates such as B30 and B35 programs, has significantly increased the generation of crude glycerol as a byproduct. For every 10 tons of biodiesel produced, approximately 1 ton of crude glycerol is generated, leading to an oversupply issue. While crude glycerol contains impurities that limit its direct application, it offers substantial potential as a renewable raw material. The valorization of this byproduct is critical to enhancing the overall sustainability and economic viability of Indonesia's biodiesel industry.

One promising approach to glycerol valorization is its conversion into monomers for bioplastic production. Through chemical and biological pathways, glycerol can be transformed into high-value compounds such as lactic acid, propylene glycol, and propylene. Lactic acid serves as a precursor for polylactic acid (PLA), a leading biodegradable plastic, while propylene glycol and propylene are essential for producing various polymeric materials. These pathways not only provide a sustainable alternative to petrochemical-based plastics but also create opportunities for Indonesia to develop a circular bioeconomy. Harnessing glycerol for bioplastic monomer production thus aligns with national goals for waste minimization, renewable resource utilization, and industrial innovation in the green economy sector.

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