

## Bioconversion of Glycerol into Biofuels—Opportunities and Challenges

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### ABSTRACT

Rising pollutants and greenhouse gas emissions from fossil fuels are serious environmental concerns that led to a tremendous focus of scientific research. The use of renewable resources as feedstock to produce fuels could help preserve the environment and offer economic and social sustainability. This preceded the development of alternative fuels such as biodiesel, and bioethanol. Over the last decade, the substantial expansion of biodiesel production indicates stoichiometrically increased crude glycerol co-production. Due to the surplus availability of the crude glycerol (as it does not find any potential application for complete utilisation), its market value has fallen and is even seen as a waste stream instead of a lucrative co-product. While high-purity glycerol is used in cosmetics, food, paints, and pharmaceutical industries for medicines, crude glycerol is an attractive organic carbon substrate to produce value-added products through microbial fermentation or physicochemical processing. The review discussed the recent developments in glycerol to produce fuels such as bioethanol, hydrogen, and methanol. Besides, it highlights the opportunities and challenges in utilising crude/waste glycerol generated from the biodiesel industry.

**KEYWORDS:** Crude glycerol, Fermentation process, Biofuels, Ethanol, Environmental sustainability

**DOI:** <https://doi.org/10.1007/s12155-021-10353-6>

## **ACKNOWLEDGEMENTS**

The authors are grateful to Universiti Malaysia Pahang for providing financial support through higher education Malaysia's ministry under the fundamental research grant scheme number FRGS/1/2019/STG05/UMP/01/1 (RDU1901123)

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