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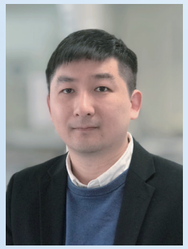
Cover story

(Faraz Montazersadgh, Hao Zhang, Anas Alkayal, Benjamin Buckley, Ben W. Kolosz, Bing Xu, Jin Xuan, pp. 208–219)

The cover image shows the vision of our e-bio-fuel project, joint funded by the UK's Department of Transport and SuperGen Bioenergy Hub in 2019. It aims to develop a new electrochemical platform to produce low-carbon fuels through integrated co-valorisation of biomass feedstocks with captured CO_2. In this approach, CO_2 is reduced at the cathode to produce drop-in fuels while value-added chemicals and fuels are produced at the anode from selective oxidation of bio-feedstocks. Our vision is to intensively increase the sustainability of the road transport sector, while enhancing renewable energy security.

In this work, a numerical model of a continuous-flow e-bio-fuel electrochemical reactor considering various anodic and cathodic reactions was built to determine the most techno-economically feasible configurations from the aspects of energy efficiency, environment impact and economical values. The reactor design was then optimized via parametric analysis. Through the study, the feasibility of our e-bio-fuel process has been proven.



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