

# Application of bioelectrochemical systems in wastewater treatment and hydrogen production

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## 2.1 Introduction

The world economy is powered by fossil fuels (FFs), including oil, coal, and gas, but the FFs are unsustainable and gradually depleting. In addition, burning of FFs release greenhouse gas (GHG), mainly carbon dioxide (CO<sub>2</sub>), which in turn cause global warming and acidification of the ocean (O'Connor et al., 2020). Hence, cleaner and more renewable sources of energy are being sought to power our world in a sustainable manner. Recently, hydrogen (H<sub>2</sub>) has gained tremendous potential as a fuel and energy source of the future. H<sub>2</sub> is a green fuel with a high energy content of 142 MJ/kg and does not release only water during combustion. Moreover, H<sub>2</sub> can be produced from a variety of renewable feedstocks, mainly organic wastewater (Din et al., 2020a). Currently, 80% of H<sub>2</sub> around the world is produced through a thermochemical process such as steam reforming of natural gas, coal gasification, and electrolysis, which mainly involve using FFs as the