

## Documents

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**Microalgae cultivation in flat panel photobioreactor as a method of carbon capture: A review**

(2023) *IOP Conference Series: Earth and Environmental Science*, 1281 (1), art. no. 012010, .

**DOI:** 10.1088/1755-1315/1281/1/012010

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**Abstract**

Biomass is one of the renewable energy technologies that plays a crucial role in fulfilling our energy needs while helping to mitigate carbon release. Microalgae biomass is a valuable product that can be utilized for a variety of applications which are generally high in proteins, carbohydrates, and lipids. In relation to that, photobioreactor (PBR) is known to be the appropriate system for microalgae to grow efficiently under controlled conditions. Nevertheless, handling this system can be challenging due to its complexity since it operates through different physical and chemical processes. This paper describes a systematic review of the recent literature published on flat panel photobioreactor (FPPBR) systems for microalgae cultivation that served as one of the critical technologies for the sustainable production of microalgae biomass and bio-based products. A total of 115 publications have been identified and analyzed from the literature search focusing on identifying different designs of FPPBR that have been developed and validated experimentally and numerically. Ultimately, this review is able to provide valuable insights into the current state of FPPBR implementation for microalgae cultivation that can aid in sorting out new strategies to support climate change attenuation and the commercialization of microalgae-based products. © 2023 Institute of Physics Publishing. All rights reserved.

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**Publisher:** Institute of Physics

**Conference name:** 6th International Conference on Clean Energy and Technology 2023, CEAT 2023

**Conference date:** 7 June 2023 through 8 June 2023

**Conference code:** 196055

**ISSN:** 17551307

**Language of Original Document:** English

**Abbreviated Source Title:** IOP Conf. Ser. Earth Environ. Sci.

2-s2.0-85182377589

**Document Type:** Conference Paper

**Publication Stage:** Final

**Source:** Scopus

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