



Biofuel Production



1. Project name	Biofuel Production from Innovative Algal Bioreactor Treating Domestic Wastewater
2. AIT Lead Faculty	Prof. Thammarat Koottatep
3. Objective	Algae-based wastewater treatment systems apply "Artificial Intelligence" for optimum growth of algae in Photo Sequencing Batch Reactors (PSBR) and Attached-Growth High-Rate Ponds (AG-HRP). Algae will remove or recover nutrients from domestic wastewater or septic tank effluents, whereas algae cells, rich in lipid content, will be used for biofuel. This project deals with optimizing algae growth in fluctuating domestic wastewater characteristics (nutrients) while ensuring the discharge standards of treated water (effluent).
4. Short Descriptions	Algal-bacteria symbiosis in engineered photo bioreactors has emerged as a promising platform to support low-cost and sustainable WWT. The Photo-sequencing Batch Reactor (PSBR) or Attach-Growth High-Rate Algal Pond (AG-HRAP) using algae-bacteria consortia is regarded as an eco-friendly wastewater treatment technique. On the other hand, algae is one of the most promising plant-based biofuel alternatives. Physical (e.g., light, temperature), chemical (e.g., nutrients, pH, CO ₂), biological (e.g., species competition), and operational (e.g., bioreactor design, mixing rate) elements all influence the effectiveness of algal-bacterial systems for WWT and biofuel generation. AIT will develop efficient algal-based WWT systems, such as PSBR and AG-HRAP, in this context. Machine learning and Internet of Things (IoT) techniques will be used in the system's operation to maximize algae output biofuel and WWT efficiency.
5. Output/Social Impact	This technologies exist in high nutrient removal efficiency and low energy demand.
4. Partners	-
5. Donors	Bangchak Initiative and Innovation Centre at AIT (BIIC@AIT)
6. Project Duration	2 January 2018 – 31 December 2019
7. Total grant amount	2,000,000 THB
8. Please specify SDG s to which this project belongs	SDGs 6 and 7