

PROJECT DETAILS

Project Title

Techno-economic study of a membrane desalination driven by solar and waste heat

Project Summary: aims, significance, expected outcomes and potential research impact.

While some studies have focused on individual renewable energy sources (e.g. solar and low-grade waste heat) coupled with membrane distillation, there is limited research that examines the synergistic effects and optimal integration strategies of these sources of energy for maximizing system efficiency and cost-effectiveness. Investigating this aspect could provide valuable insights into the design and operation of sustainable desalination systems.

The basic theoretical frameworks of the proposed study could include,

- 1) assessing the thermodynamic performance of solar and waste heat-driven membrane desalination,
- 2) considering the effects of solar collectors and waste heat streams with different temperature ranges on the system performance,
- 3) assessing techno-economic analysis of the system to demonstrate its viability, and
- 4) optimising the system using genetic algorithm multi-objective optimization approach, with regard to maximizing water production and minimizing water production cost.

Preferred applicant skill set, describe the capabilities of the HDR applicant.

This research proposal is ideal for a self-driven PhD candidate having a background in mechanical engineering and demonstratable outstanding research achievements. The candidate should have strong organizational, problem-solving, and project management skills, along with a proven track record aligned with the research scope. Additionally, the candidate must have strong analytical and experimental skills relevant to the project.

Contact person for the project:

Name:	Mehdi Khiadani	Contact number:	+618 6304 5825
Email:	m.khiadani@ecu.edu.au		