

Balon.Energy Proposal

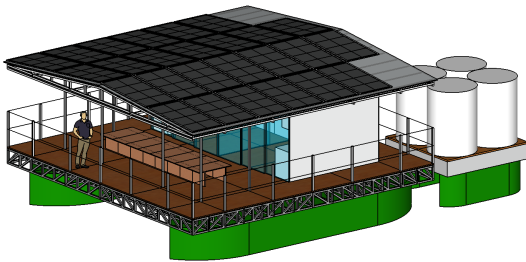
Developing non toxic floating solar hydrogen, and improve mangrove resilience

Indonesia rapid growth has an energy demand expected to quadruple between 2023 and 2050¹, yet less than 15% of that energy mix comes from renewable sources². As the world's largest archipelagic country with abundant access to water and solar exposure, Indonesia is best positioned to develop large scale floating solar.

Interestingly, green hydrogen from water electrolysis produces both hydrogen for human use, and oxygen that can be pumped underwater to improve dissolved oxygen levels, which is beneficial to marine life. Indonesia also tops the list for having the most mangrove which can sequester a very large amount of carbon.

Based on the key information above, we want to

build a floating laboratory to investigate the production of non-toxic green hydrogen from solar power, in a way that scales positively for the marine environment by pumping oxygen into depleted mangrove waters.



Dimensions: 9 x 9m, 6m high, max 7 tons.

Materials: fiberglass, resin, steel, wood, plastic.

Roof max solar capacity: 10,000 W

Motor: Electric, with 40 HP conventional backup

Capacity: 20 passengers

Research lines: 4 real time IOT (internet of things) to enable real-time open data sharing

Labs: chemistry and biology. Traditional and advanced digital fabrication.

We want to accelerate green hydrogen adoption and ecosystem restoration by reducing the negative environmental effects of green hydrogen production, as well as its cost and rare material requirements.

General Areas of Work

We have three main areas of work:

¹ Electricity demand prediction in Indonesia. Source: "Design of Building Lighting Management System with Increasing Solar Shine Penetration for Climate Change Mitigation". October 2016. https://www.researchgate.net/publication/311085789_Design_of_Building_Lighting_Management_System_with_Increasing_Solar_Shine_Penetration_for_Climate_Change_Mitigation

² "Indonesia Energy Transition Outlook 2022" IESR.id. <https://iesr.or.id/wp-content/uploads/2022/01/Indonesia-Energy-Transition-Outlook-2022-IESR-Digital-Version-.pdf>

1. **Research** (below)
2. **Education**
 - a. Vocational certification
 - b. Youth & Adult education
 - c. Citizen Science
 - d. Ecotourism
3. **Community Services**
 - a. Mangrove planting
 - b. Biodiversity mapping
 - c. Incubation of mangrove social enterprises

Areas of Research

1. **Energy** (mainly hydrogen)
 - a. Offshore hydrogen production
 - b. Low-pressure storage
 - c. Underwater ambient pressurization
 - d. Non Toxic Catalyst
2. **Environment** (mainly mangrove)
 - a. Oxygen levels and biodiversity
 - b. Blue carbon sequestration optimization
 - c. Automated mangrove planting
 - d. Biodegradable anti-erosion mesh
3. **Design Research**
 - a. Youth & indigenous innovation & leadership
 - b. Cultural conservation
 - c. Mangrove Entrepreneurship

Purpose of the 10k USD and -> deliverables

(8k) Complete the construction of the floating platform -> a unique low cost, high performance multipurpose floating platform.

(2k) Socialise with the indigenous community the concept and co-create the governance structure as well as outline the educational and ecotourism activities -> Learnings from building an inclusive community combining Balinese indigenous knowledge together with an international research community.

Timeline (5 years project 2024-2029)

1. 2023 Oct: Engineering of the main structure
2. Nov: Socializing the concept and co-creating the governance structure with the locals
3. Dec: Assembly of the floating platform and put in the water
4. 2024 Jan: Installation of the on board systems and commissioning of the lab equipments
5. Feb: start of the research programs
6. Mar: start of educational programs

Impact & Metrics

We use the theory of change framework with the following categories:

1. **Environmental:** CO2 emissions reduction. Biodiversity increase. Environmental toxicity (air & water).
2. **Cultural:** cultural integration and ownership. Production of valuable new knowledge.
3. **Social:** diversity and inclusion
4. **Economic:** jobs for indigenous people, direct and indirect. Revenue for the municipality and local businesses.