

Levers for effective and efficient climate protection

Solar Electric Fisher Boat for Indonesia

We enable low-carbon technology transfer in developing countries by linking innovative ideas with local needs, providing effective and efficient leverage for global climate change mitigation and global sustainable development.



Problem

For small-scale fishermen Indonesia around 50% to 70% of the total operation cost for a fishing trip is fuel cost and in remote areas fuels are not always available. The coastal area is suffering from air pollution and oil particles into the water which damages the environment and fish ecosystem. Additionally, the diesel and gasoline engines contribute to CO2 emissions causing global warming.



- 50% to 70% of the total operation cost for a sea trip for fishing is fuel cost
- Most fishermen have low-income between USD 70 and USD 270 per month
- CO2 emission of all small fisher boots in Indonesia is over 10 Mio. tones/year

Solution

Low-cost solar fisher boot based on our patented EVA foam construction with world leading solar boat technology will:

- reduce a high amount carbon emission and the environmental impact
- significantly improve the living standard of fishermen



Product

Our boat design is using our patented Ethylene-vinyl acetate (EVA) foam construction and addresses following specific needs and issues:

- 1. Reduce operational cost
- 2. Reduce dependency on fuel availability
- 3. Affordable boat price
- 4. Reduce negative impact on local environment and human health

- 4. Durable and strong stable design to overcome corrosive salty environment and offshore waves.
- 5. Easy to operate and low repaid cost
- 6. Allow for long sea trips and night fishing.

Baterai



Market

- high market potential of 25'000 new small fisher boats / year in Indonesia
- by replacing all small fisher boots in Indonesia over 10 Mio. tons of CO2 can be saved



Business Model

- own production only for local market and for continuous product improvement
- we take 7% license fee from selling price
- share form crediting a recognized standard to receive the highest market value for the CO2 emission reductions

Promotion for end customer



Licensee support

Tutorials



FaQ's















Competitive advantage

- low in manufacturing cost, easier and cheaper to repair
- world leading solar boat technology knowhow
- lighter and strong characteristic against damaged compared to conventional boats
- due to the patented construction with the EVA material, a substantial part of the higher initial costs for the necessary solar technology can be compensated
- break even is already achieved after 1 year





Proof of concept

- Current engineering and development has reached TRL6
- Next steps consist of engineering based on the evaluation of TRL 6 test results
- With world leading solar boat expert Mark Wuest in the team, we are convinced to finalize the boot according to the needs



Main Sustainability Impacts

The solar boat project is aligned with following UN Sustainable Development Goals



The independency from fossil fuel will have a reduction in the cost of fishing while increasing the productivity of fishing activities. As most of the small fishers are living below poverty line, the increase of income will help them and their family improving overall wealth (SDG#1) and this is aligne withspecific needs#1, 3 & 7 (in page 11).

The air pollutions caused by fuel-motorized boats in coastal area like Puger are remarkable high especially at certain high traffic hours endangering human health. The substitution with solar electric boats will reduce air pollutions and improve the marine ecosystem by avoiding risk of oil spillages. In comparison with using fossil-fuel for similar fisher boat size, the use of a solar electric boat can save 17.7 tons CO2/year per boat, assuming the boat is used for 5 fishing trips per week with about 10 km distance each time. It is important to say that global warming has impact to marine biota, bleaching of coral reefs and regeneration of the fish (SDG#3,13 & 14; need#4)

Our patented EVA foam material is not only very robust but also any damage on the hull can be repaired easily with much lower cost. Due to its light weight, the boat can accommodate additional batteries and strong electric motor for ocean requirement. The EVA material has further low material cost (20% lower), thus compensating the higher cost of the solar electric equipment, partially. The savings from fuel cost the complete boat economics are more favorable than traditional boats (SDG#7 & 9 ;needs#3, 5 & 6).

Further, SMI will be able to offer interesting and future oriented jobs to about 20-25 people in the next 5 years (SDG#17). In addition, boat makers who build boat under license and their supplier and work forces will benefit from the raising new technology (SDG#8). To ensure the success, SMI with its networks is pro-actively building collaboration with local and international partners.

The team behind it

Team Members accountability and experiences				
Name	Key Competences	Reference projects	Education	
Thomas Anner	Project lead, CEO teltec systems ag renewables	Workshop for renewable energy project developer. Renewable Energy Entrepreneurship Initiative in Saudi Arabia.	Ing. EurEta, , Post- graduate studies in Economics (NDS-FH), Master in Energy Management, PMP Project Management Professional	
Christian Adinegoro	Requirement Management Risk Management Energy market & finance	Market Plan for SPS Stirling Machine Control system Retrofit of Power Plant. Smart grid in liberalized European Market.	DiplIng. Energy and Process Technology; Leibniz University Hannover. Master in Energy Management.	
Mark Wüst	Marine Solar Technology, Technology Transfer, Boat building.	Constructed more than 40 solar boats with major classification societies such as Bureau Veritas or Rina for successful homologation. Engineered the first solar-powered boat for the first transatlantic crossing "Sun21" Construction manuals for shipyards.	Vocational Degree in Machine design, Boat design and construction	
Silvia Ulli-Beer, Dr. oec.	Innovation management, Business Ecosystem analysis, Business Model Innovation, Actor orchestration for the Buildup of Future Energy Systems	Co-Leader of the Research Focus Sustainable Energy System, Work package Leader for Business Model Innovation and Modelling for Rooftop Solar prosumer communities of the SCCER CREST Research Program, Work package Leader for the socio-economic integration of decarbonization solutions of heating and cooling of the SWEET DeCarbCH Research Program	Lecturer and Research Group Leader at ZHAW Institute of Sustainable Development; Doctor of oeconomiae of the University of St. Gallen, Advanced Studies on Leadership	

Team Members accountability and experiences				
Name	Key Competences	Reference projects	Education	
Felix Pasila	Inventor and Patent registration, Innovation management, Technology transfer leader.	Reference Project: Fast Charger for Electric Motor, Startup Indonesia; Motion Simulator based on Artificial Intelligence, Research Grant, Indonesia; Integrated Circular Maritime Economy Feasibility Study, Lombok, Indonesia; Prove of Concept Project in Electrical Vehicle Ecosystems, Bali, Indonesia	PhD Degree in Robotics, University of Bologna, Italy; MSc Degree, Information and Automation Engineering, Bremen University, Germany; BSc in Electrical Engineering, ITS Surabaya, Indonesia	
Roche Alimin	Mechanical and material design, Manufacturing process, R&D Project leader.	HVAC consultant for building, Industrial automation designer.	B.Sc. in Mechanical Engineering, Petra Christian University, Surabaya; M.Eng. in Mechatronics, Asian Institute of Technology, Bangkok.	
Hazmi Rahman	Boat design and construction, Boat testing & validation, Marine compliance and standards.	Salvage of grounded and sunken ships and barge, Underwater works and survey.	B.Eng. in Naval Architecture and Shipbuilding Engineering, Institut Technology Surabaya (ITS), Surabaya, Indonesia.	
Denny Gultom	Solar panel integration, Electrical design, Drive controls and programming,	Schlumberger Project Manager for ExxonMobil PNG (Melbourne - Australia)	Vocational Degree in Electronics, Politeknik Elektronika Negeri Surabaya.	
Aleh Suhendro & team	Boat making, Fishermen, Member of Fisher union in Puger.	Production of conventional boats in Puger	Senior High School in Jember, East Java.	
Suksmoadji	Site Manager, Community development	Project manager in solar cell research in Rumah Inovasi Pasila.	B.A. in Economy, 17 Agustus 1945 University; M.A. in Missiology, STTII, Surabaya.	
Frans Limbong	Boat certification & registration.	Community Outreach Program at Kediri, Kupang, Mojokerto. Survey and management disaster of tsunami and earthquake in Banyuwangi, Jember, Lumajang, and Malang Selatan.	B.Sc. in Mechanical Engineering, Petra Christian University; M.A. in Public Policy, Brawijaya University.	



Further Information on request