

Development and implementation of small-scale biogas balloon digester in Bali, Indonesia

Master's Thesis–Double master program(Nordic five tech) in Environmental Engineering

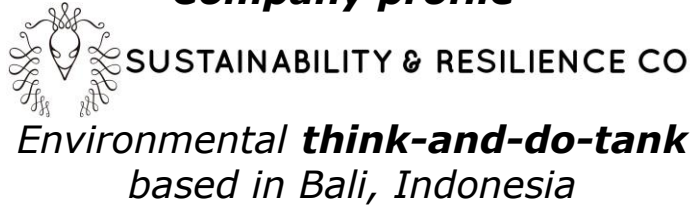
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Project background and objectives

Master thesis work: part of GREENWIN PROJECT → improve energy access in rural areas in Indonesia to alleviate poverty.

Company profile



Background: Farmers in Indonesia still rely on fossil fuel and natural resources, dangerous for the health and not sustainable energy source. Actual fixed dome biodigester technology diffused in Indonesia is inefficient due to low quality material, cracks caused by earthquakes and complex logistics required.

Objective:

- understand the issues showed by the prototype developed by the company, piloting the technology
- Develop a final product based on the result of the pilot test
- Implement and assess the technical and economic feasibility of the improved balloon digester, as a valid alternative of the actual problems and to provide a clean and sustainable energy source to the farmers

How the improvements are carried out and outcomes

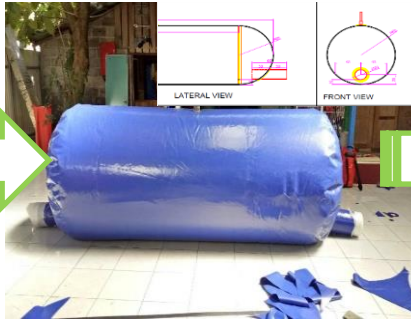
Technical analysis of the prototype

Improve it according to the result of the technical assessment

Implement and test the improved system as a final product

Technical and economic analysis of the improved technology

	Prototype	Improved tech
Material	PVC 550	Reinforced PVC 550
HRT	25 days	20 days
Volume of digester	0.13 m ³	2m ³
Biogas produced	20 min/day	Up to 3 hours/day
Daily input quantity	2.5 kg org. waste	25 kg org. waste
Empty weight	5 kg	30 kg
Empty volume	0.1 m ³	0.28 m ³
Installation	3h, removable	1 day, Removable



Results and achievements

How this technology could contribute to solve the energy problem?

Easy to transport in remote areas where energy is expensive and not always available

Simple to install and to use by the farmers

Production of clean energy from organic waste

Possibility to use it for temporary energy needs, running agricultural machineries with biogas

Faster and higher biogas production compared to conventional system

Low cost entry technology, leasing system applicable to economically support the farmers

