

# IMPLEMENT PILOT PROJECTS TO DEMONSTRATE THE FEASIBILITY OF THE COMPACT BIOGAS DIGESTER IN VANUATU

## TECHNOLOGY DESCRIPTION

Conduct urban household's evaluation on acceptability of the technologies and Identify selected sites for the pilot project

### TECHNICAL DESCRIPTION

The compact biogas digester plants are made from cut-down high-density polythene (HDPE) water tanks, which are adapted using a heat gun and standard HDPE piping. The standard plant uses two tanks, with volumes of typically 0.75 m<sup>3</sup> and 1 m<sup>3</sup>. The smaller tank is the gas holder and is inverted over the larger one which holds the mixture of decomposing feedstock and water (slurry). An inlet is provided for adding feedstock, and an overflow for removing the digested residue. A pipe takes the biogas to the kitchen, where it is used with a biogas stove. The gas holder gradually rises as gas is produced, and sinks down again as the gas is used for cooking. Weights can be placed on the top of the gas holder to increase the gas pressure.

Compact Biogas Digesters for Urban Households are aimed at helping the urban households to partially replace imported liquefied Petroleum gas (LPG) or kerosene used for cooking with biogas. The Compact biogas digesters will also minimize charcoal use which is exerting pressure on natural forests. This will in turn conserve the CO<sub>2</sub> sink. Use of a compact biogas digester which could be accommodated in an urban household is recommended for this purpose. The feed stock for the biogas digester would be household domestic waste and/or dried and powdered (energy plant) leaves to be made available in user-friendly packs from the grocery shops.

### CURRENT TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

CRI Level 2, commercial trial in that CBD is in early stage of development, public support and creation of enabling environment for diffusion is remained crucial

### CLIMATE RATIONALE OF THE TECHNOLOGY

A small-scale biogas digester is a very useful waste management tool for reducing the wood fuel and kerosene use which will cut down household pollution and save money. The traditional use of firewood and gas for cooking will be replaced by biogas. The findings of several studies showed that the amount of GHG emissions is less than one-quarter when biogas was used as an alternative fuel instead of firewood and gas. The annual difference in the amount of GHG emitted before and after using biogas is 16.01 tCO<sub>2</sub>e.household.

Although using biogas as alternative energy helps to reduce the greenhouse gas effect, it cannot be denied that there is still a small amount of greenhouse gases emitted from the biogas digesters. When they are used inappropriately, the

amount of biogas will be released into the environment. More in-depth research is needed to come up with the right policies for biogas use. We also suggested that detailed training for biogas users is needed so that users can maximize the benefits they obtain from the digesters. Experimental studies that check and monitor the use of biogas digesters are also essential.

## AMBITION OF THE TECHNOLOGY

### SCALE FOR IMPLEMENTATION AND TIME-LINE

Few Vanuatu homes have tried to install such systems but were not sustained due to their designs.

The timeline for the implementation of the policy is 2 to 3 years.

### AMBITION FOR TECHNOLOGY READINESS LEVEL OR COMMERCIAL READINESS INDEX

CRI-Level 3 –commercial scale up, this can be addressed through effective R&D to see where there is a need to organize the supply chain to provide regular supply of biodegradable materials in a readily usable form to the households.

## EXPECTED IMPACTS OF THE TECHNOLOGY

The Compact Biogas Digester will definitely reduce the kitchen waste that has to be transported out of site and be dumped on the designated area allocated by the municipal council.

## POLICY ACTIONS FOR TECHNOLOGY IMPLEMENTATION

### EXISTING POLICIES IN RELATION TO THE TECHNOLOGY

The national policies and strategies includes;

1. National Sustainability Development Plan 2016 to 2030
2. Updated Vanuatu National Energy Road Map 2016 to 2030
3. National Determined Contribution 2020 to 2030
4. Waste Management Act
5. Third National Communication, 2020

### PROPOSED POLICIES TO ENHANCE TECHNOLOGY IMPLEMENTATION

- 1, GHG Emission Policy

### COSTS RELATED TO THE IMPLEMENTATION OF POLICIES

Indicative total project cost (Donor partner + co-finance) is VUV10M



## USEFUL INFORMATION

### CONTACT DETAILS

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### LINKS TO TNA REPORTS

<https://tech-action.org/>