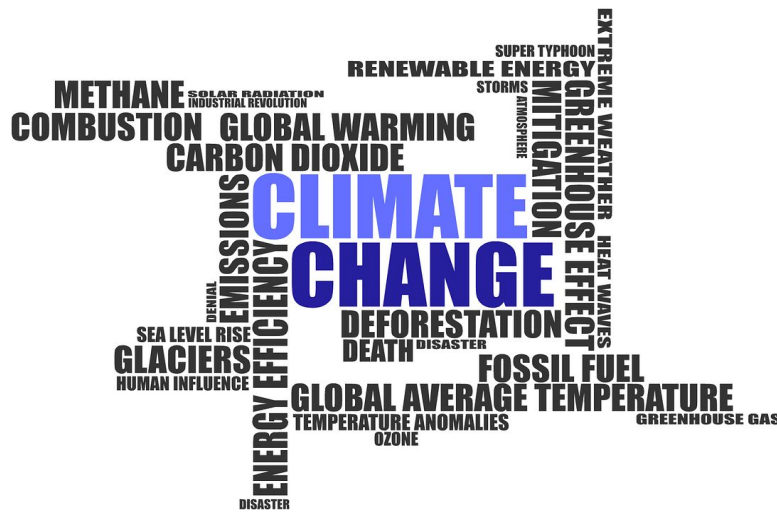


pacifikoop  
PACIFIC GREEN COMMUNITY

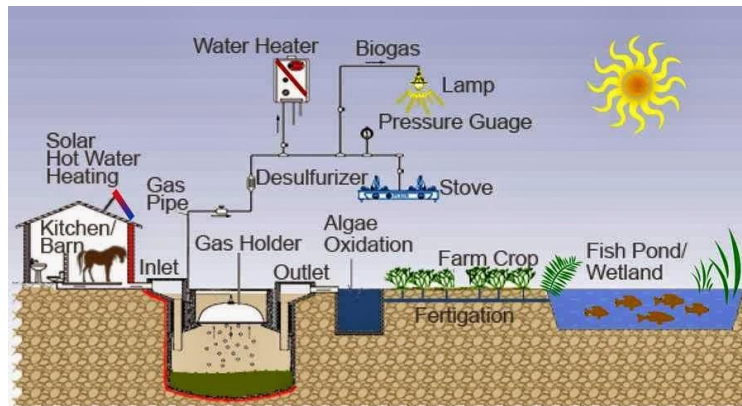


## Autonomy=Freedom

Biogas system-Desalination system-Solar panels for electricity and water  
pumping-Electric vehicles-Water recovery -Ecological houses  
Prefabricated ecological houses-Electric vehicles for waste transport...

**PACIFIKOOP BIO-GAS** ©, the system that improves the economy for ; primary, secondary Schools, university, government Buildings, Public service, Private sector, Resorts, Hotels, Motels, and all Vanuatu residents....

# INTRODUCTION



## Biogas presentation

### Functionality

In the absence of oxygen, biogas is produced by fermentation animal or vegetable organic matter. Its composition varies depending on the nature of the incoming substrates and conditions operating. It can be burned at its place of production to obtain heat and electricity or purified to obtain biomethane that can be used like natural gas.

### BIOGAS ADVANTAGES

- 1/ **Free energy** all year round obtained by waste recovery.
- 2/ **Access to energy** for location not connected to the network.
- 3/ **Ecological awareness** for pupils and students of importance of natural resources through knowledge and education on waste recycling..
  - a/ **Recycling domestic waste** by students and students parents who participate in functioning the Bio-gas system by a daily or bi-weekly organic waste supply(food, poultry droppings, plants, kava/maca roots, etc.)
  - b/ **Students will participate** "naturally" in the Bio-gas system, through their daily intake of human faeces (toilets connected to the Bio-digester)
- 4/ **Production of organic and powerful** fertilizers for crops and gardens vegetable.

**5/ BIO GAS Free production** for FOOD cooking and Health improving (NO MORE cooking wood CO2 EMISSIONS).

**6/Nature Preservation**, no wood cutting for kitchen cooking . ( environmental protection) More time for families, studies, leisure, stop collecting wood.

**7/ Financial advantages**, increased cash flow, greater autonomy, more or no electricity or natural gas bills.

**8/ Access to financing NGOs or World Bank**, investment funds for energy autonomy, World Bank, Ministry of the Environment. ( Cop 21 act/ 2015)

### **PACIFIKOOP BIOGAS SYSTEM ©**

**should be in all Vanuatu schools.**

PACIFIKOOP examines the files on a case-by-case basis, on presentation of an energy bill ( Unelco) in order to assess the establishment's energy needs as accurately as possible. Number of students, internal or external, geographical position of the school....

## **Implementation of a BioGas unit in a school**

**FRESH WOTA**

**Port Vila Vanuatu**

### **KEY FIGURES**

<b>FRESH WOTA</b>	<b>Months/Year</b>	<b>TOTAL</b>
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Consumption/UNELCO FRESH WOTA	SCHOOL	<b>6</b>	<b>2.100.000 VT</b>
Consumption/UNELCO		<b>12</b>	<b>4.200.000 VT</b>
Consumption/ /2016/2017/2018	UNELCO	<b>3 years</b>	<b>13.100.000 VT</b>

## **--FINANCIAL OFFER /SEE IN ANNEX--**

**Savings achieved with the autonomous/ Biogas + Photovoltaic system = 100 % after 3 years.**

## **BENEFITS**

The system after 3 years is free(amortized) and does not require any additional investments for next 10 years. The facilities do not produce CO2 emissions and are in compliance with the standards of the COP 21 agreements ratified by **the Government of Vanuatu.**

By providing the Dio digester system several times a week, children acquire a responsibility and a better awareness of preservation of natural resources by naturally promoting the elimination of domestic waste, the residual product obtained by the digester produces an organic fertilizer for working the soil, for the parent's garden or the school if director has planted a vegetable garden in its establishment.

Digestate can be used as a fertilizer, to feed crops or as an amendment, for soil balance. In addition to reducing the use of synthetic fertilizers, it is a fertilizer of excellent quality that can be easily assimilated by plants.

## **Fresh wota Consumption in Kwh**

**Current energy consumption of the FRESH WOTA school  
(peak consumption/ UNELCO)**

**4.000 Kwh / month, that is / 180 Kwh/day / 350.000 VT  
/Month/ Average-25 Days-8 h/day**

**To cover Consumption FRESHWOTA Energy needs /**

**1-BioGas Digester system = 90 Kwh/Day**

**2-Solar panels system = 120 Kwh/Day**

# BIOGAS DIGESTER + SOLAR PANEL SYSTEM

## 1/BIOGAS PACIFIKOOP DIGESTER

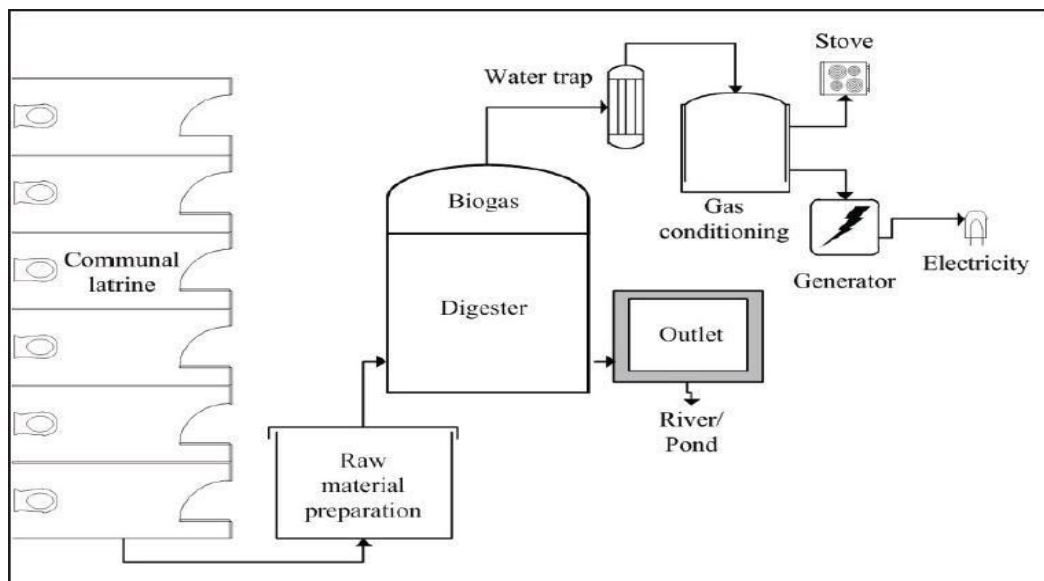
(annex 1)

Combine Organic Waste + Human manure  
waste ( from Laterines)

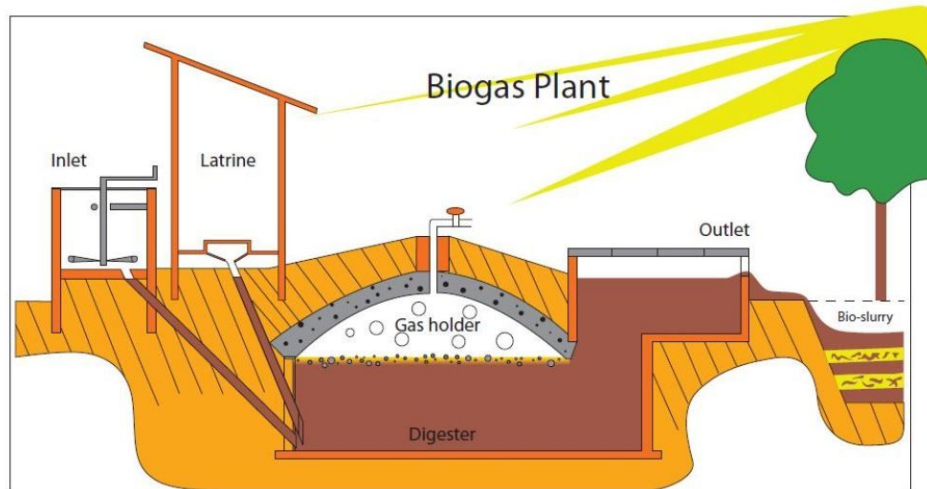
Storage 100 M3

a/Organic waste / Food / plant residues, KAVA MACAS  
-Poultry droppings/ Animal Manure...

Energy supply = 90 Kwh / Day



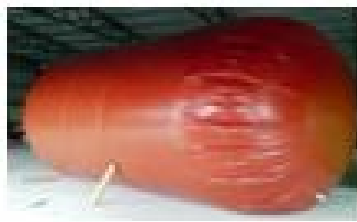
**b/ + Digestate of human organic waste  
( From Laterines)**



**DIGESTER  
STORAGE  
TANK**



**BIOGAS  
GENERATOR**



**WASTE HUMAN MANURE**

The application of biogas from human excreta can have various environmental and health benefits.

Provide an alternative energy source. The production from human excreta / human faeces per 1,000 people produces 10.85 m<sup>3</sup> or 235.7 MJ/day or **66 kWh/day of energy**.

**2/ FULL SYSTEM SOLAR PANELS SYSTEM**





## ( annexe 2 )

96 Photovoltaic panels

64 Gel storage batteries

Energy supply = 120 Kwh /Day/average

Total Daily Production: Bio-Gas organic materials +  
Bio-Latin Gas + Photovoltaic System =

210 Kwh / Day An additional 30 Kwh/day is stored  
in Biogas Tank.

## Monthly Production-6,300 Kwh

BIOGAS surplus is used to replace the natural gas used for  
cooking in the canteen kitchens, by replacing the purchase of  
LPG type bottles.



Using the Biogas for /Gas Cooker / Gas Lamp / Gas Lamp / Water Heater...



BIOGAS COOKING



BURNER ORGANIC



WASTE CRUSHER

## 3/SOLAR STREET LIGHTS

(Annex 3 )

4/ An installation of 20 solar panel street light / At the moment  
School is lit with bulbs that consume too much energy 380,000 Vatus per  
year.



## GLOSSARY

**Biogas** : gas resulting from the biological degradation process of organic matter in the absence of oxygen. It contains a high proportion of methane (50%) and therefore has a high potential calorific and energetic gas résultant du processus de dégradation biologique

**Digestate** : "digestate" is the digested material. He's introducing himself, at the outlet of the digester, in the form of a wet product: liquid (mud type), pasty or solid.

**Digester**: Given to the reactor where fermentation takes place waste with a high organic matter content. This reactor is composed of a gas-tight and thermally insulated tank

**Manure storage tank**: tank temporary for the transit of livestock manure (manure, slurry...).  
The effluents are either introduced directly into the digester or transferred to a mixing tank.

**Digestate storage tank**: tank in which the digestate is temporarily stored before use at a later date.

**Methanization**: biological degradation of organic materials in the absence of oxygen. éthanisation

**Post-digester**: The name given to the reactor in which the substance is completely decomposed. After passing through the digester, the substrate is sent to the post-digester.

**Substrate**: organic matter intended for fermentation.

### Annex 1 / BioGas System - Assembly Biodigester

Full System ( see details quotation ) 120 M3 Production.....U\$ 49.865

..... VT 5.838.329

### Annex 2/SPK 20 PACIFIKOOP SOLAR POWER SYSTEM

120 KwH / DAY- 20.000 Watts - 56 Solar Panels - 32 Gel Batteries.....U\$ 40.100

.....VT 4.695.000

Annex 3/ SOLAR STREET LIGHT x 20 UNITS ..... VT 498.000

GRAND TOTAL.....VT 11.031.329