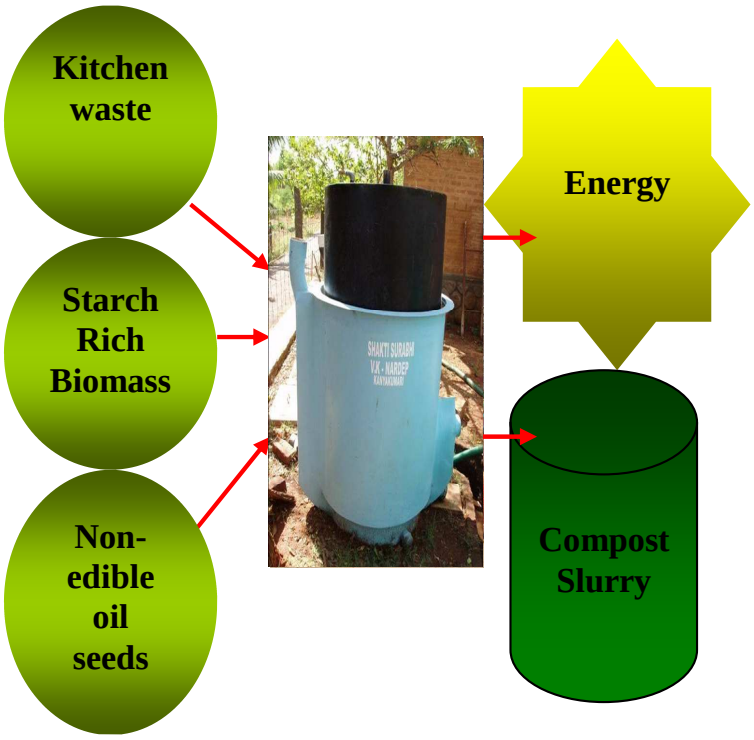
SHAKTI SURABHI
ENERGY PLANT IN YOUR BACK YARD



You can avoid pollution and get Benefit from the solution

Vivekananda Kendra

nardep

(Natural Resources Development Project)
Kanyakumari - 629 702.

SHAKTI SURABHI
ENERGY PLANT IN YOUR BACK YARD

Shakti Surabhi is a Biomethanation plant developed by Vivekananda Kendra – Natural Resources Development Project (**nardep**) for producing biogas from kitchen and vegetable waste. The plant is a result of research of almost a quarter century as well as

field work put forth by the engineers and extension workers of VK - **nardep**. It is an improvement over the general floating drum type biogas plant.

1. Benefits from Shakti Surabhi plant

- Alternative fuel for cooking gas
- Waste disposal - very good for bio degradable waste management system
- Hygienic - no odour and flies
- Arrests green house gas
- Digested outlet slurry is good as an organic manure

2. Advantages

- Suitable for both Rural and Urban areas. (user-friendly design)
- Esthetic look – Available in various colours
- Different capacities (from 500 liters to 1500 liters of gas)
- Easy to handle.(easy for relocating)
- Very good for individual households.
- Can be kept on terrace

3. Components of the plant

- Inlet Pipe for waste feed
- Digester,
- Gas holder
- Water jacket
- Gas delivery system
- Manure outlet

4. Feed material

- Left over Cooked food (Rice, chapatti, Dal, Subji etc.,)
- Non-Veg.food Wastes (Fish and Meat etc.,)
- Vegetable Wastes (Waste from vegetable markets)
- Waste material from flour mill (Wheat, Rice, Tapioca, Maize, etc.,)
- Non edible oil seed cakes (Neem, Jatropa, Rubber etc.,)

5. How it works

The main digester is initially fed with cattle dung, for it is rich in methanogenic bacteria that produces methane from cellulosic material. Subsequently, cattle dung is not needed. Afterwards, one can start feeding the plant daily with kitchen / vegetable waste.

The ratio of waste and water should be 1:1.This will facilitate easy flow of waste through inlet into the bio-methanisation plant. The value of pH of the kitchen waste should be ideally kept in the range of 6.8 to 7.5 for optimum production of biogas. About 5 kg. of kitchen waste is required for 1 cum. plant. Gas coming out of the plant can be used in the kitchen with the help of biogas stove while the slurry coming out from the outlet can be used as manure. The gas generated will have 60 to 70% methane, 5 to 10% water vapour (moisture) and the balance will be Carbon-di-oxide.

6. Bigger size Shakti surabhi plant

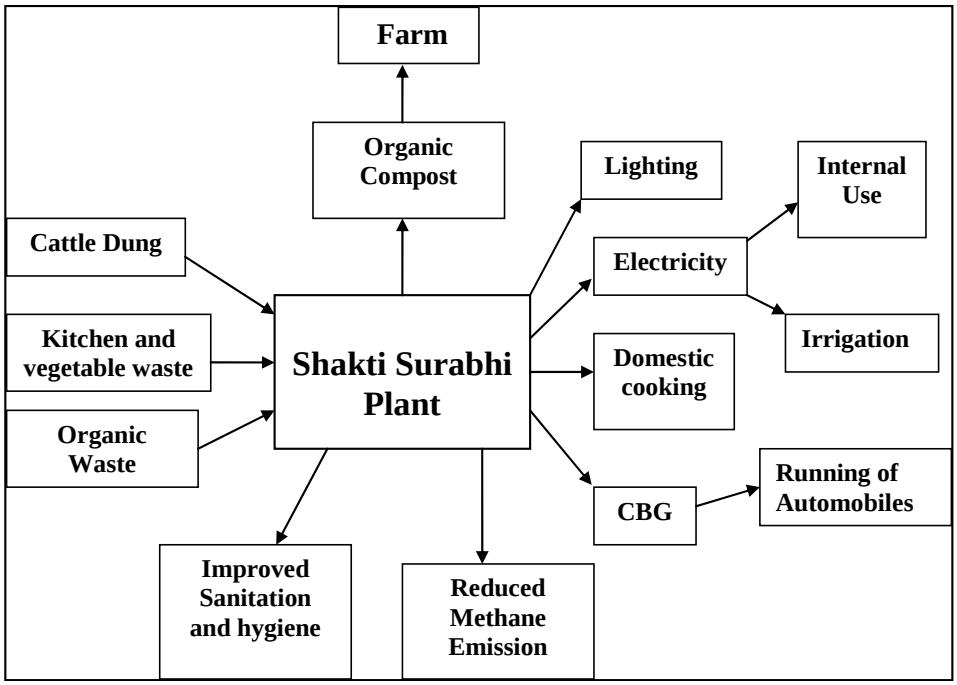
- Range 1 cum to 100 cum and above.
- Working principle same as of portable except digester is under ground and inlet and outlet constructed with masonary work.
- Good for hotels, hostels and municipalities.
- Apart for cooking, gas can be converted into Electricity or C.B.G (compressed Bio gas and thus can be used for Automobiles).
- Users can get subsidy based on different usages of gas.
- Pay back period of plant will be 1 to 2 years.

7. Basic Details about Shakti surabhi

- Cow dung required for initial charging.
- 1cum of Shakti Surabhi gas is equal to 0.43 kgs. of L.P.G.
- About 5 kgs of kitchen waste (depends on type of waste) is reguired for 1 cum. plant per day.

8. Biogas and its various facets

The schematic diagram given below shows the multifarious facets of biogas. A green energy system, it is also a boon for the sustainable development.



9. Conversion of biogas in to electricity.

The Diesel generator (D.G) sets can be easily modified to run on the methane gas. If a D.G.. set is of 10 KW capacity, then Biogas Engine will give assured 50% power, (which comes to 5 KW.). The gas consumption is about 1 cum. for 1 KWH power. Conversion kits are available in the market. One can install directly the gas engine for running the generator.

10. Biogas purification and biogas CNG

Biogas also can be converted into compressed biogas (CBG like CNG) after purifying through the removal of CO2 and other gases and can be used in automobiles. The system requires huge quantity of gas to make it a viable unit.

11. Green House Gases and Cow

Guillermo Berra, a researcher at the National Institute of Agricultural Technology, Argentina, says that "Every cow produces between 8000 to 1,000 litres of methane (23 times more dangerous than CO2) emission every day.

The highlights of our contributions in the field Biogas are as follows:

VK - nardep is one of the leading Organisations in India working in the field of Biogas since 1986. **The organisation, has, over a period of quarter of a century -**

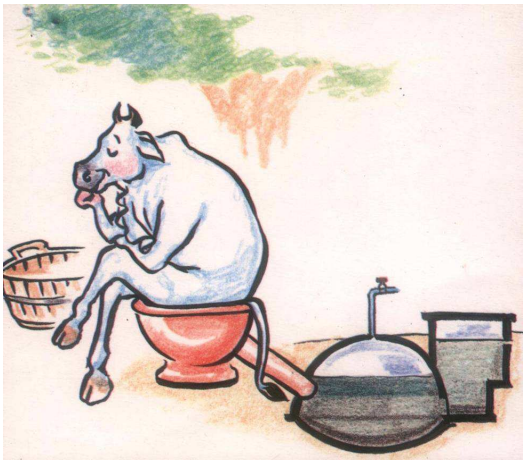
- **Constructed** more than 2000 Biogas plants through out India
- **Developed** cost-effective model VINCAP – using bamboo instead of bricks
- **Published** the following books on Biogas Technology with the support of Ministry of New and Renewable Energy Sources - (MNRE), New Delhi.

  - Repair and Maintenance of Biogas plant
  - Biogas a boon
  - Masons Manual
  - Biogas Users' Guide
  - Biogas Manure Users' Guide

Most of the books are in English as well as Tamil and Hindi for the use of end-users as well as masons and maintenance personnel.

- VK - **nardep** is the member of International SNV Network on Biogas.
- VK - **nardep** received the prestigious International Ashden Award (London) for its work in the year 2006 in the field of Biogas.
- VK - **nardep** has developed "Shakti - Surabhi" model for Bio-methanation of kitchen waste, which will help to have a clean environment.

- **Are you an owner of a hotel or lodge or hostel or any institution with a large kitchen?**
- **Is disposal of kitchen waste a problem for you?**
- **Has your kitchen become a breeding house of disease causing insects?**
- **Is your kitchen waste a source of stinking pollution around?**



Then
Shakti Surabhi©
is the answer to all your problems.

STOP BY, CALL OR VISIT OUR CENTRE
FOR MORE INFORMATION

Secretary

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"From Waste to Energy, Waste to wealth"