

## RENEWABLE ENERGY FROM BIOMASS

With the price of petroleum increasing as demand escalates and supplies dwindle, and laws and regulations for the protection of the environment and the mitigation of the drastic climate changes brought on by the industrial age multiply exponentially, alternative energy sources that can be sustained without diminishing our world resources are gaining acceptance socially and also politically. Converting livestock waste to biogas energy meets the challenge of sustainable agriculture.

We were the first to

- experiment with the engineering of biogas production from pig wastes, back in 1963 in Iowa, when the term pollution had not yet become the topic of neither social conversation nor of political action;
- design, construct, back in 1970 in Ohio, monitor the operation of an automated biological treatment plant that aerated the wastewater from a pig farm in Ohio, and returned the treated water to the barns to flush out the wastes;
- build and monitor a mechanically agitated digester for the fermentation of pig wastes and the generation of electricity of biogas, back in 1984 in Singapore;
- develop from over 50 years of professional experience computer programs such as *PigShud.exe*, *DairyShud.exe*, *PoultryShud.exe*, *CattleShud.exe*;
- analyze every kind of farm and synthesize potential methods of handling and managing the farm wastes in terms of the cost of such alternatives and also in terms of their environmental impact;
- identify the chemistry of malodors from pig wastes and develop schemes to prevent fatal accidents from mishandling of noxious gases in livestock farms.

We specialize in:

- The design and costing of facilities for the production of renewable energy in the form of:
  - electrical power to meet the electrical needs of the farm;
  - thermal energy for space heating;
  - flare the biogas to receive carbon credit under the provisions of the United Nations Kyoto Protocol on climate change
- The design of facilities and systems for biological wastes with solids separation for:
  - the recycling of treated and clarified liquids for flushing to remove wastes from barns;
  - the reuse of solids for bedding in dairy units and for soil amendments in pig farms

Our lead expert is an environmental engineer who

- served in academia for 20 years as professor specializing in livestock waste management in 2 of the best universities in the United States of America,
- has written books in English and Spanish on the management of solid and liquid wastes,
- supervised the design, construction, and operation of full-scale livestock waste treatment plants that included the production and utilization of biogas for electrical energy,
- served as chief technical adviser in the management of wastes in Europe, Asia, and North and Latin America at the behest of international agencies such as the United Nations, Environmental Protection Agency of the United States, national and regional governments, international enterprises, institutes, and universities;
- Served for 10 years as general environmental adviser, marketing consultant, and developer of training programs for the engineers of a German company that manufactures and sells waste handling equipment.

For a professional fee, we will analyze your farm to answer questions such as:

- How much would it cost to install a biogas plant on my farm?
- Would it be worth it financially and environmentally to have a— biogas plant?

- What are the best processes and equipment to use for the management of wastes to minimize malodors and meet environmental standards?
- Could I receive subsidies or other assistance for such installations?

We offer specialized engineering services such as:

- an analysis of your farm and a custom-designed project for it;
- development of the essential design criteria and engineering parameters needed for the design of a biogas, treatment plant for your farm;
- estimated costs for the installation of a biogas plant for the production of electricity and or thermal power, or to flare for carbon credit;
- associated biological and physical processes to meet your specific goals;
- assistance in the selection of an internationally credited company for the construction of the recommended facilities with the provision of paying for the facilities through the carbon credit provisions of the UN Kyoto Protocol.

## TO SERVE YOU SPECIFICALLY AND INDIVIDUALLY PLEASE FILL OUT A SHORT QUESTIONNAIRE

Name of owner or Manager \_\_\_\_\_  
 Address \_\_\_\_\_  
 Telephone \_\_\_\_\_ Mobile \_\_\_\_\_ FAX \_\_\_\_\_  
 E-mail: \_\_\_\_\_ Webpage www. \_\_\_\_\_

### TYPE OF ANIMAL FARM

#### ➤ CATTLE FARM

##### ○ DAIRY FARM

- Milking Cows, Number now \_\_\_\_\_ final \_\_\_\_\_
- System of Housing
  - Free Stalls, Number \_\_\_\_\_
  - Tethered Cows, Number of stalls \_\_\_\_\_
- Method of handling wastes
  - Scrape every \_\_\_\_\_ hours or times per day \_\_\_\_\_
  - Flushing Volume of water used \_\_\_\_\_ m<sup>3</sup> per day
  - Use of bedding straw \_\_\_\_\_ m<sup>3</sup> or tons \_\_\_\_\_ per month
- Volume of water used in the milking parlor \_\_\_\_\_ m<sup>3</sup> per day
- Number of dry cows or other animals that send wastes to the collection pit \_\_\_\_\_
- Capacity of collection pit \_\_\_\_\_ m<sup>3</sup>

##### ○ BEEF CATTLE CONFINEMENT FEEDLOT

- Number of beef cattle \_\_\_\_\_ Average live weight \_\_\_\_\_ kg/head
- Method of handling the wastes
  - Scrape with a chain scraper every \_\_\_\_\_ hours
  - Flushing, volume of water used \_\_\_\_\_ m<sup>3</sup> per day

#### ➤ PIG FARMS

##### ○ FARROW TO FINISH

- Sows current number \_\_\_\_\_ finally \_\_\_\_\_
- Final weight of sold porkers \_\_\_\_\_ kg/head No. sold \_\_\_\_\_ per year
- Method of handling the wastes \_\_\_\_\_
  - Volume of waste and or wastewaters \_\_\_\_\_ m<sup>3</sup> per day
  - Volume of water used \_\_\_\_\_ m<sup>3</sup> per day
  - Days of storage of excreta in the collection pits \_\_\_\_\_
  - Method of collection \_\_\_\_\_
  - Capacity of the central collection pit \_\_\_\_\_ m<sup>3</sup>
  - Storage away from the housing units \_\_\_\_\_ m<sup>3</sup>

##### ○ FATTENING FARM

- Weight of pigs coming in \_\_\_\_\_ kg/head; Number \_\_\_\_\_ every \_\_\_\_\_ days
- Weight of pigs sold \_\_\_\_\_ kg/head; Number \_\_\_\_\_ per year

➤ POULTRY

- Broilers Number \_\_\_\_\_ per year \_\_\_\_\_ kg per year
- Egg Layer Farm \_\_\_\_\_ Number

➤ OTHER

- State the nature and numbers \_\_\_\_\_