

Environmentally friendly conversion of municipality wastes into useful energy: First in ASEAN: How Rayong Municipality will do it.

RAYONG MUNICIPALITY PROJECT BACKGROUND

Rayong Municipality intends to construct, own and operate a new municipal solid waste (MSW) treatment plant with an annual capacity of 25,550 tonnes of MSW to produce organic fertiliser and 5,100 MWh of electricity per year. It is planned to serve the Municipality for 20 years.

The plant shall be provided with front-end treatment, anaerobic digestion, including biogas utilisation system with its generator, and all necessary auxiliary equipment. The heat and electricity produced from the biogas will be used for internal consumption. The surplus electricity will be sold to the Provincial Electricity Authority (PEA).

The project comprises of two systems:

- waste to biogas & fertiliser process;
- biogas-fired cogeneration process.



Rayong Municipality cogeneration plant

LOCATION

Rayong Municipality is located in Rayong Province, 180 km South East of Bangkok.

ECONOMICS

The total investment costs amount to about Euro 3.60 million. The expected pay back period is 9 years after commissioning.

TECHNOLOGY

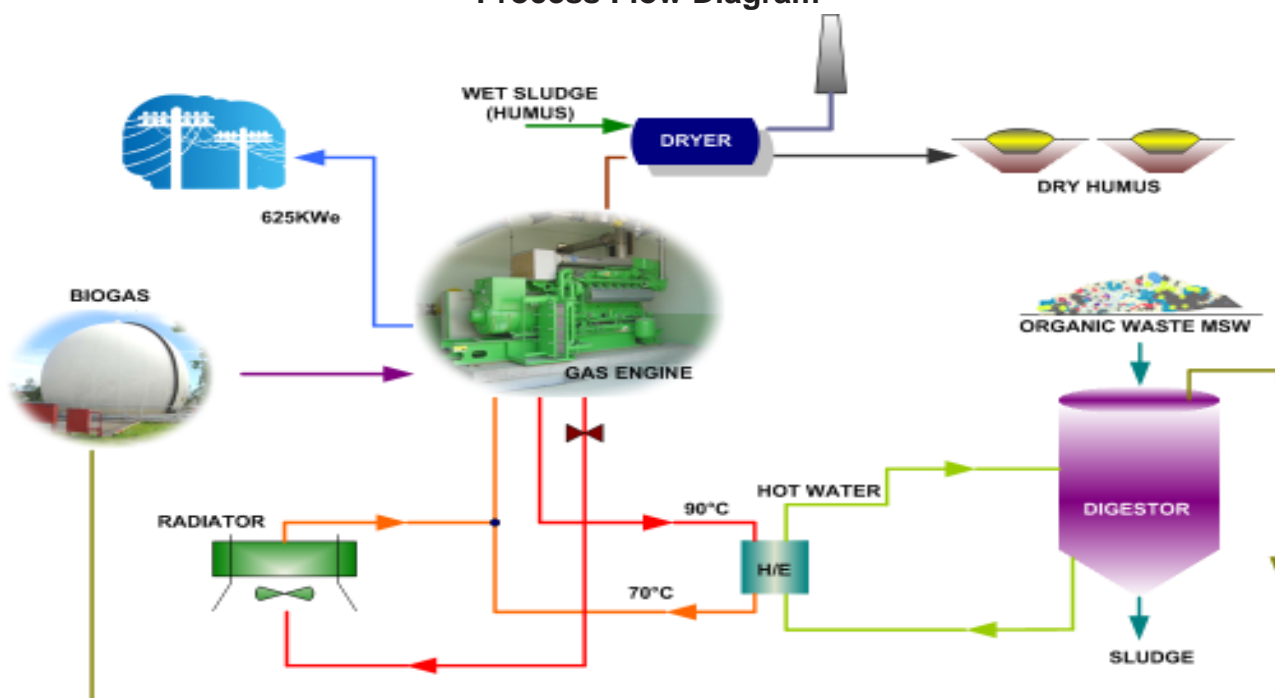
The plant consists of:

- a front end treatment plant;
- an anaerobic digestion plant;
- a 625 kWe gas cogeneration set.



Rayong Municipality biogas storage tank

Process Flow Diagram



CUSTOMER VIEWPOINT



*Mr. Varavit Supachokchai
Mayor, Rayong City*

Mr. Varavit Supachokchai, Mayor of Rayong City said: "The development of Rayong Municipality Waste to Fertiliser & Energy Project is seen as one of the major milestones toward applying state-of-the-art technology to convert waste into useful and environmentally friendly energy. The plant is designed with the concept to reduce municipality organic waste, minimise the landfill area, and further reduce green house gas effect." He added: "This pilot plant is one of its kind in Thailand to demonstrate the combination of technologies for solving and managing municipality waste for the city. The plant takes care of non-organic wastes and selected recycled materials and other rejects to landfill. For the organic waste, the technology selected is HLAD (High Organic Loading Anaerobic Digestion), which produce biogas and humus for use as soil improvement and can further turn to organic fertiliser."

The Mayor emphasizes: "In order to reduce the plant operation cost, we need to encourage people to participate in organic waste sorting in their homes."

The plant can manage and handle a maximum of 70 tonnes/day. The production of biogas is fed into a gas genset to produce electricity for internal consumption. The electricity surplus will be sold to PEA. Fertiliser or humus is expected to give full benefit to farmers and orchid growers. It can reach a very reasonable price. Other recycled materials, which have been sorted and separated will be sold and generate additional incomes.

The project is providing a state-of-the-art technology for local organisation to demonstrate the proper and efficient use of waste management facilities. The high efficiency of the HLAD and integrated biogas cogeneration system should give rise to a new era of municipality solid waste management. The cooperation with the COGEN 3 team and European suppliers has been very fruitful. They provided very good advice throughout the project.



Rayong Municipality cogeneration plant

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SUPPLIER VIEWPOINT (GE Jenbacher)



*Mr. Prasong Limsirichai
STFE Vice President,
Marketing & Sales Division*

STFE and the Finnish consortium (MK Protech Oy) have been awarded the contract to supply a turnkey project for the Rayong Municipality to build on this Waste to Fertiliser & Energy project.

Mr. Prasong Limsirichai, STFE Vice President, Marketing and Sales Division said: "GE Jenbacher was selected for this project due to their worldwide experience in the field of cogeneration. The gas engine/generator (genset) configuration was selected to match the expected maximum biogas production and to produce a maximum energy even with a low calorific fuel such as biogas. We expect the gas genset configuration to be an established standard for the country and the region."

Mr. Prasong continued, "The 625 kWe cogeneration unit has a designed electrical efficiency of 38% and a combined efficiency of 61.3%. The hot exhaust gas is used to dry the humus."

He also added, "STFE is the local agent for GE Jenbacher. It has strong sales and after sales teams. The success of this project and the promotion by COGEN 3 should encourage other potential customers to use non-natural gas engine/generator for cogeneration."



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COGEN 3

The objective of COGEN 3 is to promote the use of cogeneration using biomass, coal or gas as fuel. This is achieved through partnerships between ASEAN industries and European suppliers.

The EC-ASEAN COGEN Programme Phase III is financed by the European Commission. It is co-ordinated in ASEAN by the Asian Institute of Technology (AIT), Bangkok, Thailand and in Europe by Carl Bro International, Sweden. COGEN 3 started its operation in January 2002 and will continue until December 2004. Besides Thailand and Sweden, COGEN 3 has offices in Cambodia, Indonesia, Malaysia, Philippines, Singapore and Vietnam.