

Renewable Energy

World's only palm plantation company with 28 biogas plants and first to develop a palm based Bio-Compressed Natural Gas (Bio-CNG) plant via collaboration with MPOB in 2015 at Sg Tenggi Palm Oil Mill

FGV's Renewable & By-products division is the backbone of the Group's Waste-to-Wealth initiatives. FGV utilises biomass (gas, solid, liquid) at its palm oil mills to produce biogas fuel for national, rural grid connections and bio-compressed natural gas (bio-CNG). We have consistently embarked on renewable energy initiatives since early 2000.

The division, which is under FGV Palm Industries (FGVPI), consists of by-products, renewable energy and zero investment projects relating to biomass produced from palm oil mills. It has three units, namely By-Products, Renewables and Business Development.

Our By-Products unit manages sales, sourcing, pricing, hedging, freight planning, arbitraging and other by-product trading-related activities. We execute trading transactions to ensure products meet customer's requirements and are delivered efficiently.

Our Business Development is a unit develops, strategises and manages existing B00 projects and explores new business opportunities for biomass including biogas to FiT, bioCNG, hexane red oil extraction and various other potential products from palm oil mills.

Our Renewables unit manages the operations of FGV's five biogas plants for Feed-in-Tariff (FiT) projects, bioCNG plants and biogas plants for rural electrification. Additionally, we also manage the Sahabat Biomass-EFB Power Plant in FELDA Sahabat (7.5 MW) for rural electrification and internal power, and FTJ Power Plant-EFB in FELDA Jengka (12.5 MW) for the FiT project, including co-composting plants, and EFB shredded stations.

There are 3 rural townships in Sabah powered by electricity produced from biomass-renewable energy source managed by us, namely Sahabat Biomass-EFB Power Plant, Baiduri Ayu Biogas Plant, and Umas Biogas Plant. They provide power to the township areas of FELDA Sahabat, FELDA Cenderawasih, and FELDA Umas, respectively.

We have reduced more than 100,000 tonnes of Carbon Dioxide equivalent through our initiatives such as methane capturing and destruction using our Biogas and BioCNG plants, as well as fossil fuel (diesel) replacement.

The Journey

2016 - 2020

2011 - 2015

2006 - 2010

2001 - 2005

1995 - 2000

- 2016 : 23 biogas capturing plants successfully commenced operations
- Baiduri Ayu & Umas Biogas Plants started to operate for rural electrification programme.
- 2017 : FTJ Power Plant-EFB on target for up to 12.5 MW as Feed-In Tariff Project
- First foray into bio-CNG through a strategic collaboration with MPOB and PEMANDU – certified World's First Palm-Based Commercial Scale BioCNG Plant

- Zero investment-oriented projects with three parties;
 - i. 2018 : Green & Smart completed 1 biogas power plant as Feed-In Tariff Project
 - ii. 2019 : CGESB successfully completed 4 biogas power plants as Feed-In Tariff Project
 - iii. 2019 : 30 biogas capturing plants successfully commenced operations

- Serting Hilir Biogas Plant was successfully connected to the grid, becoming the nation's first Biogas Power Plant for grid connection project.
- 2012 : SEDA was created & Feed-in-Tariff was established – selling electricity to National Grid is revenue generating endeavor without depending on CDM
- FGV continued to build more biogas projects in mills, effectively increasing wastewater treatment for selected mills, ensuring regulatory compliance while minimising carbon footprint.

- 2006 : CDM was strongly promoted for biogas capture
- EFB compost facilities installed were targeted for internal consumption, utilising POME to be eligible for CDM projects
- Seriting Hilir and Besout became the first few biogas plant constructed in Malaysia

- Board Of Directors approved first EFB-based power plant in Sahabat Complex for rural electrification
- IPP Sahabat recognised as First Clean Development Mechanism (CDM) Project in Malaysia

- 1998 : R&D collaboration with the Malaysian Palm Oil Board (MPOB)
- 1999 : Designed and built Empty Fruit Bunches (EFB) processing equipment

Key Initiatives

Rural Electrification

Biogas is used as a diesel substitute to generate electricity for local grids, Gugusan Umas and Baiduri Ayu, reducing power generation cost as well as displacing fossil fuel. In addition, the projects are able to generate up to 24 hours to suit the load and demand fluctuations for a rural mini grid. This project also helps to preserve nature and river cleanliness, empowering community to improve their quality of life.

National Grid

Biogas is utilised as fuel for electricity generation via gas engines to supply electricity to National Grid through Feed-

In-Tariff (FiT) mechanism governed by SEDA Malaysia. FGV has always heeded calls from the government to champion renewable causes. For example, Seriting Hilir is the first FiT project in Malaysia to achieve COD in 2006. FGV has continued constructing the projects over the years, with Tenggaroh, Maokil and Nitar achieving COD with a total installed capacity of 4.0 MW in 2016 and recently Triang (scheduled for IOD in February 2020) and Keratong 9 (scheduled for IOD in April 2020).

Renewable Energy Plants

Biogas Plants

Biogas Plants

Biogas plant is a crucial part of a mill operation. It enhances wastewater treatment, thus ensuring regulatory compliance and better water discharge quality. It also burns methane gas, which consists about 50 – 65% in biogas composition, reducing immense carbon footprint from the mills.

Potential utilisation for biogas is plenty, due to methane having significant calorific value, thus enabling mills to explore additional revenue stream such as biogas to FiT and bioCNG projects, depending on load power availability and location.

Composting Plants

Composting Plants

We have established four composting plants with a total production capacity of 41,700 MT annually. The compost plants are located in Maokil (Labis, Johor), Sampadi (Lundu, Sarawak), Jengka 21 (Maran, Pahang) and Kalabakan (Tawau, Sabah).

Compost organic fertiliser was derived from the aerobic decomposition of Empty Fruit Bunches (EFB) mixed with Palm Oil Mill Effluent (POME).

Compost is very useful to neutralise soil condition, improve soil moisture and feature and at the same time enhance the efficiency of nutrient uptake by the plant.

EFB Power Plant

EFB Power Plant

We have developed the first power plant located at FELDA Sahabat, Lahad Datu Sabah and the second project through Joint Ventures (JV) with Tenaga Nasional Berhad (TNB) to form FTJ Biopower Sdn Bhd in Jengka, Pahang.

The Sahabat Empty Fruit Bunch Biomass Project is a biomass-fired cogeneration plant located in FELDA Sahabat, Lahad Datu, Sabah.

It started its operations in May 2006.

FTJ Power Plant started its operations in September 2016, and supplies electricity to National Grid as Feed-In Tariff Project with a total capacity of 12.5 MW. The plant uses EFB to generate steam and electricity which are supplied to its two major power consumers in Sahabat Oil Products and Sahabat Kernel Crushing Plant. Besides these, the electricity is also supplied for non-manufacturing consumption (domestic) at FELDA Sahabat Complex. The plant is a 7.5 MW turbine generator equipped with auxiliary facilities such as boilers, water demineralisation plant, cooling tower, air pollution control devices and EFB storage yard. The plant is a 'Clean Development Mechanism (CDM)'s registered project since April 2006 with issued 'Certified Emission Reduction (CER)' of 72,380 tCO₂eq for the period of January 2006 till December 2009.

Extraction Plant

Extraction Plant

In October 2018, we signed a Build-Own-Operate and Transfer (BOOT) agreement for the development of Palm Fibre Oil Extraction Plant (PF0E Plant) in our palm oil mills with Eonmetall Carotene Oil Sdn Bhd (ECOSB) being the first-of-its-kind project entered into by FGV.

ECOSB is a subsidiary of Eonmetall Group Berhad and is principally involved in the construction and operation of Palm Fibre Oil Extraction plants across Malaysia.

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By-products

Oil Palm By-Products are obtained as by-products or residues from palm oil processes. The main products produced by the palm oil mills are crude palm oil and palm kernel. However, it also produces huge quantities of residues such as sludge palm oil, mesocarp fibre, palm kernel shell and empty fruit bunches. Dry residues from oil palm wastes can be utilised to produce various type of products. Palm By-Products main principal use is in the manufacturing of of quality soaps, animal feed, biofuels, among many others. It is widely used in various industries, such as in the manufacturing of candles, cosmetics, toiletries and pharmaceutical products.

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