

RENEWABLE ENERGY DIVISION

CORPORATE PROFILE



ANJUR EKAR SDN BHD HAS BEEN A LEADER IN PROVIDING MACHINE-GENERATED POWER GENERATION SOLUTION FOR DECADES NOW, EMPHASIZING ON OUR AIM TO BE A 'PREFERRED POWER SYSTEMS PROVIDER' IN MALAYSIA.

This is evident in the way we progressed from being a humble supplier of power generators to customizing and creating high quality power generation solution to suit our clients' changing needs.

Anjur Ekar today has multiple licences and registrations including the Kementerian Kewangan Malaysia (Sijil Bumiputera) (MOF), MS ISO 9001:2008, Kementerian Kewangan Malaysia (Kontraktor) (MOF), Petronas Licensing, Pusat Khidmat Kontraktor (PKK) Gred Pendaftaran G7 (Bumiputera), CIDB Malaysia, Suruhanjaya Tenaga (ST), Kastam Dan Eksais Diraja Malaysia, Jabatan Keselamatan Dan Kesihatan Pekerjaan Selangor (DOSH), Akta Penyelaras Perindustrian 1975 Lesen Pengilangan (MIDA).

These priorities and commitments in excellence gave rise to our household brand, AEP Gen power generator sets, which is custom built to cater to specific client needs.

We have also won over the trust and confidence of large foreign corporations that led to awards of distributorship and dealership of major brands like Nippon Sharyo (Japan) for its quality Sound Proof Canopy Power Generators, JCB for its Comprehensive Diesel Engine

Power Generators range and Kohler (The U.S.A.) for its Gas Engine Power Generators Clean and Reliable Power.

[Realizing the growth of renewable energy especially biogas in Malaysia, Anjur Ekar Sdn Bhd has now evolved further and established a new division under its wings which is the Renewable Energy Division \(RED\).](#)

Together with its experienced team in the plantation and biogas industry, Anjur Ekar Sdn Bhd brings the right and appropriate technology for the application in palm oil mill industry. It has the most track record in South East Asia today with the use of biogas with gas engines for power generation. The technology has footprints in Thailand, Malaysia, Indonesia and Papua New Guinea.

Expanding further as well, Anjur Ekar is embarking into solar hybrid projects for rural development whereby there is no local grid connection available. Energy is a need and critical for day to day living in rural areas.

PROJECT SCOPE

Anjur Ekar proposes for palm oil mills the project scope, whereby the project will aim to meet 2 main phases:

Effluent Treatment

Install and implement in-ground bio-digester system to treat POME. The bio-digester system has 85 - 90% efficiency in reducing COD concentration. Effluent from the bio-digester system is discharged into the existing ponds.



Renewable Energy

The biogas will be captured, stripped via biological scrubbing system and sent to the boiler to save shells. Electricity generation can also be provided if required via biogas engines generator set from 1 to 2 MW or even more which depends on the mill's capacity.



Solar Hybrid

Realising the need of power in remote areas whereby there is no nearby national grid to remote villages, Anjur Ekar realised the opportunities in this area specifically in Sabah and Sarawak. Solar power is used to displace 70 percent of the diesel genset usage that is used in villages. A smart system manages the solar power and diesel genset to fulfil the need of electricity by the villages and create diesel savings at the same time.



PROJECTS & TRACK RECORD



Agro
Sumatera



Mosa
Papua New Guinea



Cakra
Kalimantan

PROJECTS & TRACK RECORD



Ulu Kanchong
Negeri Sembilan



Srisawai & Topi
Thailand



Gabon, Ghana, Nigeria
West Africa



PALM OIL MILL OPERATING PROJECT REFERENCES

Univanich PLC, 3 sites in Krabi, Thailand

They have been operating for up to 5 years. Performance data is available and visits are possible.

Srisawai POM, Krabi

This project has been constructed by an investor. Waste from a 45 tonne mill generally goes to a cooling pond before the digester, nevertheless there is a mixing tank and heat exchanger. Gas is sufficient to keep a 1 MW Jenbacher engine fully engaged. The site is not landscaped, is missing paths and good housekeeping. The investor is happy with the investment returns. A visit may be possible.

Saraff Energies, Krabi

This site squeezes EFB for a power plant and collects a small amount of POME from a nearby loosefruits mill and another mill A 1.2 MW Guascor engine is fully used. There is scope for expansion and an additional 1.2 MW engine with CHP is being discussed. Housekeeping is improving. A visit may be possible.

New Britain Palm Oil, Papua New Guinea

Two projects each about 3 MWe in capacity, CDM projects, constructed to a high standard. Visits are possible by arrangement, however the location would be relatively expensive and time-consuming to visit. Data is available on request.

REA Kaltim, East Kalimantan

Two projects currently 2 MW each with significant extra gas, large CDM projects, well built. Requires about two days travel some of which is upriver on company river boat. Must stay in company guest house. Visitors may be possible, not encouraged. Data is not currently available.

Musim Mas Projects, Sumatra and Kalimantan

4 currently operating projects. Generally visit requests are politely declined.

Felda Sungai Tengi

This project has started gas production. There is a flare but currently no gas engine.

PKL - Sumatera

Operating for 2 years producing 2MWe for KCP and Estate Housing. Excess biogas is flared.

MAS - Kalimantan

SSM 1 - Kalimantan

SSM 2 - Kalimantan

BSS - Sumatera

BKL - Sumatera

Agro - Sumatera

Cakra - Kalimantan

Perdana - Kalimantan

Kumbango - Papua New Guinea

Mosa - Papua New Guinea

Srisawai - Thailand

Saraff - Thailand

Topi - Thailand

PALM OIL MILL PROJECTS IN DESIGN OR ONSTRUCTION

Felda Triang

Design more-or-less complete, gas handling not finalized. DOE approval gained, site clearing and earthworks have commenced

New Britain Palm Oil, Papua New Guinea

Warastone project partly designed, delayed due to company finance position. Two other projects on New Britain Island scheduled.

Felda Keratong Nine

Design more-or-less complete, gas handling not finalized. DOE approval gained, site clearing and earthworks have commenced.

Investor Projects, Sumatra

Two 3 – 4 MW projects in northern Sumatra are more-or-less designed. Finance is recently obtained, agreements with PLN are in place.

Kretam Mill, Sabah

Design more-or-less complete. DOE approval gained, earthworks tender process commenced. This project has been signed for several years, commencement delayed due to low FIT and the client building another mill as preference to a biogas project.

Sinarmas, Indonesia

Biogas generated is used for electricity generation using biogas engine for the kernel crushing plant.

KMSTT Project, Perak

Doe approval in process

Ulu Kanchong, Negeri Sembilan

Biogas generated from the 60 T/hr mill is used fully in 2 boilers as phase 1. Next plan was to sell power to the national grid.

Musim Mas Projects, Sumatra and Kalimantan

4 in various stages of construction, design complete.

West Africa

3 biogas projects built in Ghana, Gabon and Nigeria in palm oil mills. Biogas is used for internal consumption and refinery.

TYPICAL OPERATING PERFORMANCE

The technology used for In-Ground Anaerobic Reactor is the most efficient design available for POME, using mixing and recirculation with a relatively long residence time and low loading rate. Operation is very steady with no examples of overloading or having to shut off feed. There is inbuilt gas storage and biological inertia so that production of waste from the mill, conversion of waste to biogas and consumption of biogas in gas engines can all operate independently.

Typical overall conversions vary from 22 tonnes FFB required to generate 1 MWhr down to 16 tonnes FFB in Papua New Guinea.

The nature of the fresh fruit and the mill process configuration create the differences. More or less effort can also

be given to extracting the best conversion from suspended solids.

Operating power of the anaerobic reactor, scrubber and gas handling including dehumidifier is about 75 kW.

The anaerobic reactor itself can be operated by one person on a shift roster, and the plant may be left unattended at night provided a gas engine operator operates gas handling and respond to power outages etc. Supervision and technical management is required

Security, lab tests, landscaping and maintenance would normally be included in the work roster of mill staff, and would require additional staff for an independent project.

Site Performance data may be available for specific purposes.

OUR EXPERTISE AND EXPERIENCE

Anjur Ekar carries itself with people within the company as well as having trusted technical partner with vast experience in the South East Asia region. Having experience in palm oil mill operations and biogas to power, Anjur Ekar brings years of experience in Malaysia, Indonesia, Thailand, The Philippines, West Africa and Papua New Guinea.

Our experience ranges from various project development from acquiring biogas projects in SEA, project investment, BOOT and finally EPCC.

The list of projects and track record speaks for itself. Treating POME is one of the hardest effluent.

Anjur Ekar also covers in other area of renewables such as solar hybrid and biomass. There are opportunities in these areas that are potential in the region.

ANJUR EKAR PROPOSED SYSTEM FOR A 60 TONNE / HOUR PALM OIL MILL

Anjur Ekar will undertake the full design, planning, engineering, construction and commissioning of the biogas plant(s) for the client's mills.

The project duration is approximately 12 to 14 months for the biogas to be used in a boiler or for power generation. Anjur Ekar will commence with a pre-feasibility study on each plant to collect and analyse data of the mills operations and its effluent management configuration.

The collected data will provide Anjur Ekar the information to devise and design the bio-digesters according to the effluents characteristics and requirements. Based on our formulated models, the In-Ground Anaerobic Digester system will be constructed.

The scope of the project covers:

POME Treatment System

- Effluent cooling
- Anaerobic digestion in a newly built In-Ground Anaerobic Digester
- Sedimentation pond for sludge recirculation
- Treated effluent discharge in the existing system

Biogas Capture & Use System

- Biogas capture (flexible cover)
- Rainwater handling system around bio-digester
- Biological treatment of the biogas
- Biogas upgrading (H₂S, water removal, temperature control)
- Biogas compression (blowers)
- Control room with instrumentation (flow meters, pressure meters, flame detectors, PLC and SCADA)
- Biogas flaring
- Biogas energetic use in boiler or with biogas engine(s) for power generation

Anjur Ekar will assist with the application with DOE and DOSH for the licenses / permit for the construction of the biogas plant.

For operation and maintenance, each plant will have a team of people supplied by the client and can be

managed by Anjur Ekar on a periodical basis based on an O&M contract for better supervision. The team shall have approximately 4 -5 people per plant. Anjur Ekar will provide training and can be in charge of managing and directing the personnel.

RENEWABLE ENERGY DIVISION ORGANIZATION CHART



RENEWABLE ENERGY DIVISION CERTIFICATIONS

Anjur Ekar is committed to providing complete power solutions to its customers. In light of this, Anjur Ekar has the following qualifications and certificates

- Kementerian Kewangan Malaysia – Sijil Akuan Pendaftaran Syarikat
- Kementerian Kewangan Malaysia – Sijil Akuan Pendaftaran Bumiputera
- Construction Industry Development Board (CIDB) – Perakuan Pendaftaran G7
- Petronas – Lesen Membekal Peralatan / Memberi Perkhidmatan Kepada Syarikat Carigali dan Pengeluar Minyak / Gas di Malaysia
- Suruhanjaya Tenaga Perakuan Pendaftaran Sebagai Kontraktor Elektrik Kelas A
- ISO 9001 : 2008 – Quality Management System
- Pusat Khidmat Kontraktor – Sijil Kontraktor Kerja Taraf Bumiputera
- Sijil Perolehan Kerja Kerajaan
- DOSH
- FELDA
- Sime Darby
- TNB
- SESB

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Renewable Energy Division (RED)

In order to meet growing needs for alternative energy, Anjur Ekar has established itself as a turnkey solutions provider of renewable energy solutions. Using major renewable energy sources including solar power, biogas, biomass and hydropower, we are dedicated in creating sustainable environments and ensuring more economical ways to meet our customers' needs.