

## ASIA

### Pelakar (SINAR MAS, Indonesia)



After five years of a complete Operation and Maintenance (O&M) service of this 1,6 MW Biogas Plant under a "Delegated Administration" contract, with 8 permanent employees on site, BIOTEC officially returned the Administration to the SINAR MAS Group. This biogas plant had been built by BIOTEC in 2009. This long term O&M contract allowed SINAR MAS to learn about this technology that was new for it at that time.

### Tuing (PT EVANS Group, Indonesia)

In November 2016, BIOTEC commissioned a new biogas plant at Bangka Island for the PT EVANS Group. It is a RAC-L 20 model for a 45 T/h mill. Due to mill design and operation, POME generation is lower than 0,5 m<sup>3</sup>/T FFB and COD is higher than 100.000 ppm. Between Christmas and New Year, BIOTEC supported MULTICO commissioning of a 600 kW biogas engine for KCP operation and during April 2017 of other 2 x 1 MW gas engines to generate electricity for the Grid. This is the only POME biogas plant we know in the world dealing permanently with TS around 10% and a COD far higher than 100.000 ppm.



### The South-East Asian Market for Biogas



In Indonesia the biogas market is driven by the demand for renewable energy through the feed-in-tariff by the national Grid (PLN). The tariff is function of the location. In Malaysia the biogas market is driven by environmental commitments: to capture the Greenhouse Gases and to eliminate avoid effluent discharge in watersheds.

### New projects 2017

- ★ BBS (2 MW) at Bangka Island (Sumatra) for Biogas Bangka Synergy
- ★ BTB (2,4 MW) in Kalimantan for the Sewatama Group (Nagata developer)

Both projects are planned to be commissioned early 2018



### Biotec in Malaysia



Our BIOTEC subsidiary in Malaysia (BIA) had been affected in 2016 by a strong mismanagement, highlighted by a HQ audit in September 2016. HQ executives took control of the subsidiary in October and restructured and reoriented the Company, who has now clear goals and a strong Business Plan (see hereunder). BIA subsidiary returned to profitability. We thank our Malaysian suppliers and contractors who helped BIA in this transition period.

### Spom (Benta Group) & Taner (Malaysia)



These two biogas projects for palm oil mills located in Sabah, Malaysia, will be commissioned in July and August 2017 by BIOTEC INTERNATIONAL ASIA (BIA).

### Wana 1 (Best Group, Indonesia)

#### BIOTEC finalized in April its support to the Wana 1 mill

in Kalimantan. The purpose was to optimize an existing biogas plant. This action is part of the new BIOTEC "rescue activity".

Main improvements during BIOTEC management:

- ★ POME feeding: 500 ⇔ 800 m<sup>3</sup>/day
- ★ Biogas generation: 16 ⇔ 33 m<sup>3</sup>/m<sup>3</sup> POME
- ★ Methane conversion: 0,11 ⇔ 0,25 m<sup>3</sup> CH<sub>4</sub>/kg CODin



### The PIPOC event 2017



BIOTEC will be present as usual at PIPOC 2017, as every two years. In this opportunity the focus will be placed on our global environmental & agricultural proposals for the Malaysian palm oil sector with the disruptive integration: BIOGAS – EVAPORATION – DRYING – BAGGING – ORGANIC FERTILIZATION

### Financing

BIOTEC fine-tuned financing modalities for its biogas plants. As a Belgian Company, BIOTEC can offer attractive loans from Belgium to its clients all over the world through BUYERS CREDITS implemented by the Belgian BELFIUS BANK and the CREDENDO insurance company.

New stakeholders start investing in biogas plants, as third party, on the same way they invest in wind mills/farms or in solar power plants. This business model is now blooming in some countries where renewable energy generation is becoming attractive, like Indonesia or Argentina. They are "developers". They ask for higher commitments from technology providers and are pulling up the technical criteria for biogas plants construction and operation. The sector needed this new expertise.

### Specific Business Plan for Malaysia

#### In Malaysia, renewable energy production is not a national priority.

Priority is environmental commitment for CPO sustainability and international image. It implies cutting Greenhouse gases (GHG) emissions and avoiding any discharge in the rivers. Therefore BIOTEC developed a specific Business Plan for the Malaysian palm oil sector: no GHG emission + no discharge, with the transformation of biomethanated POME into a dry (powder) organic fertilizer. This is a disruptive solution where biogas is providing the energy required for evaporation and drying. In cases where renewable energy has a local value, the treated POME is applied to the plantation through a monitored ferti-irrigation system: the FORLIM system (developed by BIOTEC in Latin America) with dosed and controlled application of liquid organic fertilizer on each palm tree. A 60 T/h mill generates enough fertilizer for 2.000 ha of plantations.



### Evil tongues:



Malicious rumours not only spread on social networks; they can penetrate the business world. Due to the BIOTEC HQ audit of September 2016 to its BIA subsidiary and due to the posterior retrenchment inside this Company, some "evil tongues" sent messages of BIOTEC Group leaving the Malaysian market. Let's rather laugh with gossips. Who is interested in spreading them?

**"BIOTEC is more present than ever on the Malaysian market!"**



JUNE 2017

BELGIUM | COLOMBIA | BRAZIL | ARGENTINE | MALAYSIA | INDONESIA

## AMERICA

### Aguan-G (Honduras)



During 2016, the two 1,5 MW gas engines consumed 5,3 million m<sup>3</sup> of biogas to generate 12 million kWh. The remaining biogas of this BIOTEC biogas plant (2 x RAC-L 15 model) is generating steam for the oil refinery boilers.

### Citrícola San Miguel (Argentina)

Thanks to the success of our CITRUSVIL biogas plant in Tucumán, Argentina, for the treatment and valorisation of CITRUS (lemon) effluents, BIOTEC had been contracted for operation support of the 7.000 m<sup>3</sup> UASB biodigester of the SAN MIGUEL Citrus Plant, the second major lemon Plant of the world after Citrusvil.



### Brazil!



BIOTEC is now betting on the biogas development in Brazil at a very large scale, as Brazil is by far the leader in sugarcane bioethanol production in the world.

BIOTEC already mounted two RAC-25 (lagoon type, 25.000 m<sup>3</sup>) units to treat the effluents of the AGROPALMA mill.

### Bioethanol (Brazil)

BIOTEC is building a disruptive Business Model with the local Brazilian Company GASGRID to invest in biogas plants in bioethanol distilleries (vinasses biodigestion), offering an environmental services to distilleries and offering renewable energy on the Brazilian market for local use in the distilleries (captive fleet) or for renewable natural gas marketing at national level (basically for Sao Paulo city).



### Aceites y Energía Manuelita (Colombia)



This Company is the main biodiesel and biogas producer in Colombia, respectively 130.000 T/year and 6.3 million m<sup>3</sup> CH<sub>4</sub>-equiv./year. These two BIOTEC RAC-L20 biodigesters process a mixture of POME and biodiesel effluents, reaching a production of 19 m<sup>3</sup> CH<sub>4</sub>-equivalent per ton of FFB. As far as we know it is the first time a biodigester is processing these two effluents jointly. Biodiesel and oleo

chemical effluents are not easy to process. This project allows the Biodiesel Plant to be self-sufficient in renewable energy (steam + electricity) up to 70%.

### "Nueva Esperanza" Municipality (Argentina)

BIOTEC is leading a Master Plan for household (bio)gas supply and for electricity generation for this 10.000 inhabitants remote town in the North of Argentina. The objective of the Mayor is to complement the (deficient) national electric grid and to create a local gas grid with local biogas, generating a circular economy with the purchase of forage to local farmers as feedstock of a large biogas plant.



### Viluco Soya Biodiesel Plant (Argentina)



BIOTEC services had been requested by this large soya crushing plant and biodiesel plant of the LUCCI Group for biogas generation from (contaminating) oleo-chemical effluents. A pilot plant has been built and is the starting point of the feasibility study.

## Business Development

### ENERGY FARMS

The major BIOTEC R&D investment in these last 7 years has been the development of the concept of ENERGY FARMS which allow gas and electricity generation in remote off-grid regions of the Tropics. BIOTEC set up the AGROGAZ Company to develop this concept. AGROGAZ uses a combination of BIOTEC and SAUTER technologies, the first one leader in lagoon-based biodigesters and tropical conditions and the second one leader in grass and maize silage biodigestion in Europe. Colombia and Argentina are the first target market, Colombia (tropical country) with King Grass crops, and Argentina with more traditional maize and sorgo silages.

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"We are looking for a world moved by renewable energies"

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