

Report on the Biogas Upgrading and CBG Roundtable 2019, 14 – 15th August 2019, Chiang Mai, Thailand

The event was held at the Energy, Research and Development Institute (ERDI), Nakornping, Chiang Mai University, Chiang Mai, Thailand. The event was organized by ICESN (International Clean Energy Sustainability & Network), Singapore and ERDI. The event comprised of one and half day forum and half day site tour to a Municipal Waste Management (MSW) and Biomethane Facility inside the campus of the Chiang Mai University. The event was attended by local and overseas delegates and speakers. ANGVA Executive Director spoke on “Next Generation Fuel for the Transport Sector: Renewable Natural Gas (RNG) / Biomethane.



Top: At the Event

Highlights of the presentation:

Thailand

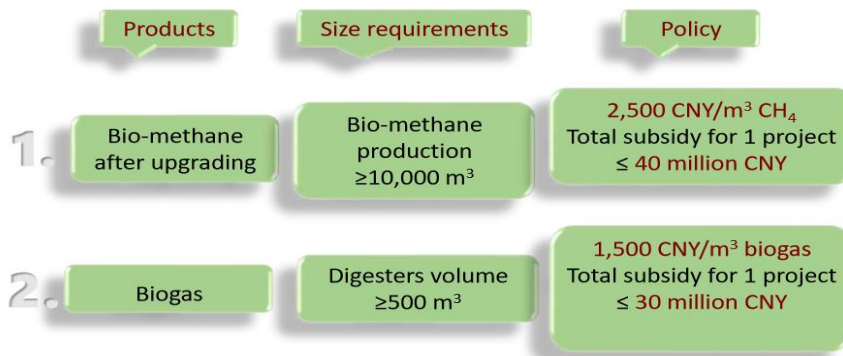
1. Under Thailand Ministry of Energy’s Alternative Energy Development Plan (AEDP) 2015 – 2036, revised in 2019, the target production of Compressed Biomethane Gas (CBG) is 4,800 ton/day by 2036. Current production of CBG in Thailand is 15 ton/day. **Note:** CBG is known as Biomethane in Europe and Renewable Natural Gas (RNG) in North America. RNG / Biomethane is upgraded biogas that has the same quality as fossil natural gas being supplied / distributed in the referred country. RNG / Biomethane is utilized for the transport sector in the form of BioCNG or BioLNG as fuel for Natural Gas Vehicles (NGV)..
2. The Energy, Research and Development Institute (ERDI) of Chiang Mai University is at the forefront of research, development, demonstration and commercialization of RNG in Thailand. ERDI latest project is the design, construction, commissioning, and operation of a Municipal Solid Waste (MSW) Biogas Plant in the campus of Chiang Mai University to produce BioCNG to fuel 6- 10 natural gas vans belonging to the University. Delegates visited this biogas plant on the second day of the Biogas event (see report below).
3. ERDI estimated the potential of RNG in Thailand as: 1362 ton/day from waste water (POME, cassava starch, livestock manure) and 3600 ton/day from energy crops (napier grass). The estimated production cost of RNG is 0.21 – 0.33 USD/kg and the economic benefits is going to be >USD10 billion per annum for the country.

Malaysia


4. The first commercial BioCNG plant in Malaysia at FGV Palm Oil Mill in Sg Tenggi, Selangor, came into operation in 2016 with an annual capacity of 80,000 mmbtu utilizing approximately 4 -5 mcm of biogas from palm oil mill effluent (POME) per year. Currently 30,000 mmbtu of BioCNG per year is sold to a factory not far from the plant.
5. The challenges faced by this plant thus far are: 1) Inconsistent supply of FFB (fresh fruit branch) which affected the biogas yield and quality; 2) Hydrogen sulfide fluctuations affected the Activated Carbon longevity, hence cost; 3) Inconsistent quality of incoming POME which contained oil, debris and contaminants; and 4) oil loss accumulation in mixing pond which resulted in seepage to the biogas.

China

6. Currently there are more than 60 Biomethane / RNG plants running or under construction in China and only 7 – 8 plants are in full load commercial operations. Production of RNG is currently 576 mcm and the target is to produce 30 bcm/year by 2030. There are 540 Biomethane plant in Europe.
7. Government provides the following subsidy for Biogas and Biomethane plants in China:



8. Example of a Biomethane / RNG plant in China:



Minhe bio-natural gas plant in Shandong

Agricultural Field

Processing capacity:
chicken manure 700 tons/d
Waste water 800 tons/d

Biogas production:
70,000m³/d

Bio-methane production:
42,000m³/d

GHG reduction:
266,000 tons of CO_{2eq}/year

Indonesia

9. Currently there are 81 existing biogas plants in Indonesia. There is big potential for biogas industry in the country as there are more than 1000 palm oil mills, almost 200 tapioca mills, 62 sugar cane plants, almost 50 sago mills, and 37 feedlot companies.
10. The first commercial BioCNG plant in Indonesia is under construction (started in 2018) in Kalimantan, on the island of Borneo. The plant is located at a 60TPH (ton per hour) Palm Oil Mill, which will produce 500 Nm³/hr of BioCNG from 1000 Nm³ of biogas. The plant will also generate 2x600Kwh of electricity.

Site Visit to a MSW Biogas Plant at Chiang Mai University

In the afternoon of 15th August 2019, a site visit to a MSW Biogas plant was arranged by the Organizer. The plant was located inside the campus of Chiang Mai University. The plant treats waste generated on campus by students plus manure from a cow farm.



Reported by: Lee Giok Seng, Executive Director, ANGVA, 2nd Sept 2019.