Bioenergy in Thailand

Thailand is the second largest economy in Southeast Asia with a population of 68 million people and a strategic location to serve regional markets. The country is also a major producer of agricultural products, such as rice, sugercane, cassava, corn, rubber and palm oil. Together with its increasing energy demand and government programs to promote the use of renewable energy, this provides interesting business opportunities for Dutch companies active in the bioenergy sector.

Thailand's energy consumption has risen sharply during the past decade and will continue its upward trend in the years to come. Currently, more than half of its energy supply depends on foreign imports. To meet its domestic energy demand in a more sustainable way and to increase its energy security, the Thai government is promoting the use domestic renewables.

Thailand's economy is heavily based on agriculture, leading to the production of large amounts of agriculture and municipal waste that could be converted into usable energy. Every year around 80 million tons of agriculture waste is produced. The materials readily available in the country are solid waste from rice, sugarcane, cassava, corn, rubber and palm production.

According to the Thai Alternative Energy Development Plan (AEDP) of 2015, the largest renewable energy contribution to electricity and heat generation in 2035 will come from solar power, followed by biomass. At this moment hydropower is still the largest renewable energy source and biomass being second.

Fuel type	2014 (MW)	AEDP Target 2036 (MW)
Waste	66	550
Biomass	2,452	5,570
Biogas	312	600
Energy Crop	-	680
Small Hydro	110	376
Wind	220	3002
Solar	1,570	6,000

The Energy Policy and Planning Office (EPPO) introduced a 'merit order' which prioritizes the operation of power plants based on the capital cost plus social and environmental benefits. As a result, electricity generation from biomass and biogas is ranked second and third (out of 8). This means that biomass power plants will enjoy priority in starting up their operation first and stopping their operation at the latest, based on the electricity demand in the area.

The country's major supply of resources, supportive government policy, strategic location, and good infrastructure, provide interesting business opportunities for Dutch companies active in this sector.

Biomass and biogas

Most biomass and biogas power plants are located in the central and north-western Thai provinces due to the existing grid connectivity. These areas are also dominated by the agricultural sector.

In 2014 biomass and biogas accounted for 58% of the renewable energy generation in Thailand. Due to the short-run energy focus, bioenergy will still dominate the renewable energy mix with 62.5% share by 2025 as predicted by Business Monitor International (BMI). This forecast is aligned with the AEDP 2015, where bioenergy is deemed to be the most important form of alternative energy in the coming years.

Under the AEDP, the Thai government aims to increase the electricity generation from biomass from 2,452 MW in 2014 to 5,570 MW. Apart from electricity generation, the Department of Alternative Energy and Efficiency Development (DEDE) also set ambitious targets for heat generation from renewable energy. Compared to 5,775 kilotonne of oil equivalent (Ktoe) produced in 2014, the AEDP targets 25,088 Ktoe to be produced in 2036. The usage of biomass is expected to dominate in heat generation, providing 32.3% of the national demand in 2036.

In the latest Feed-in-Tariff scheme (FiT), bioenergy projects are supported for a period of 20 years. FiT-rates for producing electricity from biomass vary from 4.24- 5.34 TBH/KwH, with the highest rates for Very Small Power Producers (VSPP) producing less than 1 MW. FiT-rates for biogas vary from 3.76 - 5.34 TBH/KwH, also granting the highest subsidies to VSPP's. The use of energy crops for biogas generation receives considerably higher FiT rates than gasifying or incinerating conventional agricultural residues.

The application process for FiT's consists of two phases. The first phase started early 2016 and only accepted projects for the three southern provinces. The second phase, in which projects for all the other provinces will be accepted, is expected to start late 2016 or early 2017.

Biofuel

The Thai government is promoting the use of biofuel to reach the targets set in the AEDP. In 2005, B2 was introduced - containing 2% of biodiesel - as a product from palm oil. Since then, the government has increased the proportion from 2% to 5%. Currently, consumers in Thailand are using B7, the diesel that contains 7% biodiesel. The government aims to introduce B10 - containing 10% biodiesel - by 2018.

In terms of benzene portfolio, Thailand's main three biofuels include gasohol E10 (10% bio-ethanol), gasohol E20 (20% bio-ethanol) and gasohol E85 (85% bio-ethanol). The Thai government would like to increase the proportion of bio-ethanol.

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The biofuel production in 2015 was already significantly high, with a daily production of 66.9 million liters. The aim is to increase the production to nearly four times which will result in the production of 253 million liters of biodiesel and bio-ethanol per day in 2036. This would mean 25% of the fuel demand would come from renewable sources.

Apart from subsidizing biodiesel and bio-ethanol at the pumps, the Thai government also stimulates the demand for biofuel by providing incentives for car, truck and motorbike manufacturers that can drive on biofuel.

Trade fairs

- *Cogen Small Power Plant Expo*
  Bangkok, 14-16 September 2016
- *Asia-Pacific International Biomass Energy Exhibition*
  Guangzhou (China), 26-28 September 2016
- *Renewable Energy Asia*
  Bangkok, 7-10 June 2017

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