

Brief project description of the waste-to-energy project

LAWI EtaPlant[®] - 7 MW RDF Power Plant Ayutthaya

Commissioning: October 2019 Location: Ayutthaya | Thailand



Renewable Power Plant Technology



Project Overview

Type: 7 MW RDF Power Plant with LAWI EtaPlant®

Location: Ayutthaya, Thailand

Commercial Operation Date: October 2019

Design Fuel: RDF from Industrial Waste

Scope of LAWI:

EPC supply of *LAWI EtaPlant*[®] boiler island incl. feed water system, de-ashing and ash storage system

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LAWI EtaLogic[®] automation and process automation system





Municipal solid wastes (MSW), industrial waste and other residual wastes are available in large quantities almost all around the world and its thermal utilization is an efficient approach of not only waste management but also carbon neutral electricity generation. With increasing amounts of waste produced and spill-over landfills waste management has become a huge challenge for the authorities all around Asia.

Thailand's government has started taking steps to waste recycling in the provinces around the country and in 2017, Thailand's *Alternative Energy Development and Efficiency Department* has informed, that 15 waste-to-energy (WtE) power plants are successfully operating in Thailand. One of which is the 9.4 MW RDF power plant in Saraburi province built by LAWI Engineering in 2017.

This 9.4 MW RDF power plant in Saraburi province has laid the foundation for LAWI's reputation as a technology owner that is capable of successfully designing, building, and commissioning its *LAWI EtaPlant*[®] to convert Thailand's challenging waste reliably and efficiently into renewable energy.

The Ayutthaya project presented herewith is characterized by fuel design requirements that reflect a very wide range in the calorific value, from 7,500 kJ/kg to 21,000 kJ/kg and moisture ranging from 10% to 45%. To accommodate an incineration design that is flexible enough to allow a reliable and efficient thermal utilization of such a wide range of fuel characteristics (especially if the fuel is inhomogeneous waste of different types), LAWI extended the adiabatic design of its *LAWI EtaComb*[®] incineration system which has been especially designed for low calorific and high moisture fuel with a partly water-cooled grate and partly water-cooled combustion walls to lodge the higher end of the required calorific value range.



Technical Project Data

Firing Design Capacity: 30 MW_{th}

Steam Boiler Design: 35 tph | 53 bar(a) | 450 °C

Generator Capacity: 7 MW_{el}

Design Fuel Consumption: 5.3 tph

Net Heat Rate: 14,624 kJ/kWh_{el}

Gross Electrical Efficiency: 28.1 %

The Ayutthaya power plant has a firing design capacity of 30 MW_{th} , and a steam boiler output of 35 tph. The steam so generated enables to drive a 7 MWe turbo generator set at a gross electric efficiency of 28.1 %.

The sophisticated technology adjustment of the *LAWI EtaComb*[®] for the fuel requirements of this project together with the committed operation management of the operator allowed the plant to be operated 7,820 operation hours and to produce 52,835 MW/h in the first full year of operation (2020). This power output fully satisfies the financial feasibility of the project and therefore also the investor's expectations.

The LAWI EtaPlant[®] incineration combined with an Eckrohrkessel[®] licensed waste heat boiler controlled by the LAWI EtaLogic[®] process automation system allows to reach a boiler thermal efficiency of over 89 % with a very low excess air rate with oxygen content < 5 %, and low emissions of CO (< 50 mg/Nm³ @ 11 Vol-% O₂, dry, daily average) and TOC (10 mg/Nm³ @ 11 Vol-% O₂ dry, daily average). Emissions at stack are controlled through a SNCR and dry sorption bag-filter combination so that emitted values fully meet the local emission regulation.





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Recommendation Letter

We, Recovery House Co, Ltd., with our place of business located 8/888 Moo. 4, Bang phra Khru, Nakhon Luang, Phra nakhon Si Ayutthaya 13260, Thailand, herewith declare that LAWI Engineering GmbH, Siemensstraße, 24118 Kiel, Germany has designed, built and successfully commissioned the "Boiler Island" of the 7 MWe RDF power plant that we own and operate in Ayutthaya province in Thailand.

This power plant is designed to convert 44,000 tons of RDF annually into electric energy and the plant successfully operates according to its design figures (gross electric efficiency > 28%) since its commissioning and commercial operation in November 2019.

The works of LAWI Engineering GmbH were implemented with due diligence and we are - in all honesty- recommending the technology as well as the sincere attitude of LAWI Engineering GmbH as the technology partner and cooperation partner for Waste-to-Energy projects.

Sincerely

Mr. Sumeth Laokum, Project Manager Recovery House Co, Ltd.

