

Environmentally friendly conversion of wood wastes into useful energy: How ECO Special Waste Management Pte. Ltd. will do it.

ECO SWM PROJECT BACKGROUND

Supporting the Singapore's effort for a cleaner and safer environment, ECO SWM's 530 kWe cogen plant is in line with the company's mission to help the city state manage its waste efficiently and safely. This investment does not only help alleviate the woodwaste disposal problem in Singapore, but generates substantial savings associated with the energy costs of the recycling plant.

LOCATION

ECO SWM plant is located in Tuas, a major industrial area in Singapore.

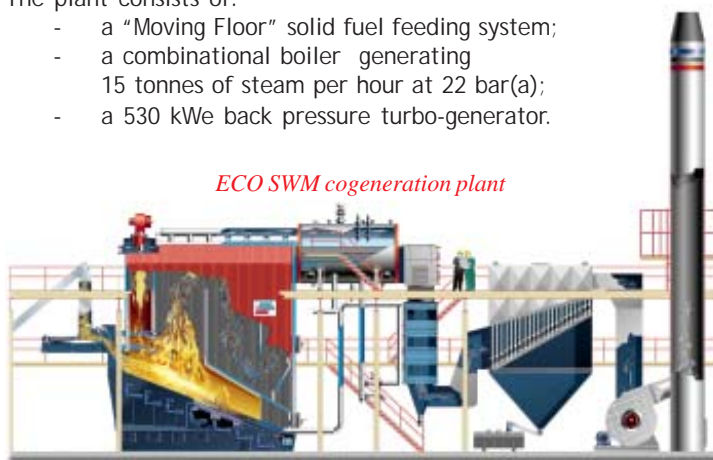
ECONOMICS

The total investment costs amount to Euro 1.8 million, excluding civil works and building foundations. By producing their own power, energy savings could be realised amounting to around Euro 150,000 per year, compared to the normal electricity consumption from the grid. The fuel being obtained at a negative cost of Euro 900,000 per year, the expected pay back period is less than 3 years after commissioning.

TECHNOLOGY

The plant consists of:

- a "Moving Floor" solid fuel feeding system;
- a combinational boiler generating 15 tonnes of steam per hour at 22 bar(a);
- a 530 kWe back pressure turbo-generator.



ECO SWM cogeneration plant

CUSTOMER VIEWPOINT

"ECO SWM is a one-stop waste management solution provider. It offers efficient and safe waste management through comprehensive waste minimisation, recovery and disposal. Being a major waste management company in Singapore, ECO SWM's recycling facility receives wood wastes such as pallets, packing material, boxes, formwork, and sawdust from the industries. The wood waste-fired power plant consists of a boiler supplying steam to a turbo-generator producing 530 kW for the recycling plant as well as 15 tonnes of steam per hour for the downstream waste treatment process, explains Col. (RTD) Chua Tiong Guan, Managing Director of ECO SWM.



Col. (RTD) Chua Tiong Guan

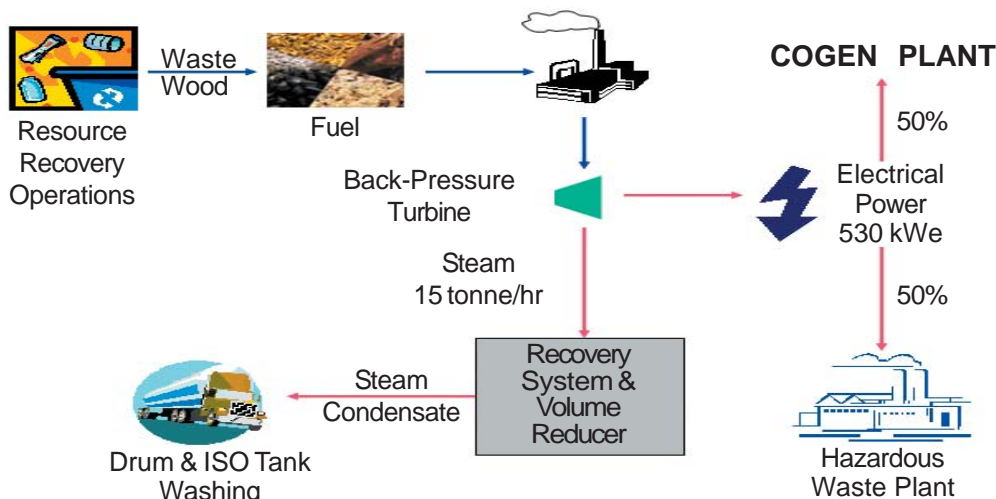
The selection of Vyncke instead of other suppliers is a reflection of our confidence in the Vyncke system to provide us with a modern, efficient and reliable boiler, which would be easy to operate and maintain. In our selection process for the most suitable system and technology, we were delighted by the assistance and expertise made available through the EC-ASEAN COGEN Programme (COGEN 3)," pursues Col. Chua.

He adds: "The plant is currently being constructed and installed and we look forward to its completion and commissioning. It further strengthens our mission to contribute towards the protection of the environment through efficient waste management. We expect to realise the benefits of savings in fuel cost, efficiency of operation and minimal pollution from this system."

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ECO SWM COGEN PLANT



SUPPLIER VIEWPOINT (VYNCKE BOILER)



Mr. Jef Mestdagh

"We have been in the energy business since 1912, offering solutions to turn industrial waste into clean process energy. We strategise combustion technology, boiler construction and control energy under one roof. This project is the reflection of the quality that we provide for more than 3000 energy plants, each specifically tailor-made to suit individual customer requirements worldwide."

"The Vyncke plant at ECO SWM includes automatic fuel supply and ash handling. The heart of the plant is our worldwide-patented Dynamic Watercooled Stepgrate and is most probably the best available combustion technology," says Jef Mestdagh, the Regional Manager of Vyncke in South East Asia.

"This combustion system has been selected to meet the emission standards of Singapore, which are the most stringent emission regulations in South East Asia. This plant with its state-of-the art combustion system is located in the economical center of South East Asia and we are very happy that ECO SWM has not spared any effort to make it a real showroom plant."

"Initially, the project was only about a wood waste-fired boiler that would supply steam to the waste treatment process. But upon advice from experts from COGEN 3 and with their assistance in showing the viability of cogeneration, it quickly became clear that cogeneration was even a better solution for ECO SWM. With electricity generation of 530 kWe, it makes the energy plant self sustaining with extra electricity power output to their waste treatment process."



Vyncke boiler

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SUPPLIER VIEWPOINT (KKK TURBINE)



Mr. Albert Cheong

Jebsen and Jessen Technology (JJT) business unit had been in the cogeneration business since the 1960s, with over 600 turbines successfully installed and commissioned in the ASEAN region. KKK started the turbine business in 1895 and has over 18000 installations worldwide.

Mr. Albert Cheong, Senior Manager of JJT said, "In this project, we are looking for a very efficient turbine that will optimise the investment return for ECO SWM, and, therefore, we selected a high efficiency impulse back pressure turbine that can generate 530 kWe with 15 tonne of steam per hour. The isentropic efficiency for this machine, 60 %, is an excellent single stage impulse machine. This ECO SWM waste-to-energy plant will have an overall conversion efficiency of at least 68.5%, compared to 30% for conventional fuel-to-electricity facilities."

ECO SWM is a waste management organisation that collects tree trimmings for a fee from the Singapore authority. Waste collected also includes wooden packaging cases and pallets, which are broken down for combustion.

Such waste-to-energy solutions are attracting a lot of interest, particularly among waste disposal companies. It is an economically friendly investment, with a long-term sustainable renewable resource like wood wastes.



KKK turbine

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COGEN 3

The objective of COGEN 3 is to promote the use of cogeneration using biomass, coal or gas as fuel. This is achieved through partnerships between ASEAN industries and European suppliers.

The EC-ASEAN COGEN Programme Phase III is financed by the European Commission. It is co-ordinated in ASEAN by the Asian Institute of Technology (AIT), Bangkok, Thailand and in Europe by Carl Bro International, Sweden. COGEN 3 started its operation in January 2002 and will continue until December 2004. Besides Thailand and Sweden, COGEN 3 has offices in Cambodia, Indonesia, Malaysia, Philippines, Singapore and Vietnam.