

## A.T. Biopower Rice Husk Fuelled Power Plant

Electricity Generation from biomass is a Government policy, through the Ministry of Energy, the policy is to encourage private participation by establishment of Small Power Producers or SPP. These SPPs generate electricity from renewable sources such as rice husk, sugar cane, corn leaves, tapioca, palm shell and woodchips and sell electricity to the Electricity Generating Authority of Thailand (EGAT). This is the effort to promote alternative energy to supplement and strengthen the existing electricity generating capacity of Thailand, and to reduce imported fuel. At present, about 90% of electricity generation relies on oil, coal and natural gases, which are fossil fuel and non renewable. It is forecasted that in the next 30 years, the supply of coal and natural gases in Thailand will be completely exhausted if there is no new exploration and discovery of new energy sources.

The utilization of agricultural waste such as rice husk, for energy generation does not only yield positive impact on the country's economy, but clean and modern technology helps to reduce pollutions, minimize impact on the environment, as well as promotes the development and employment for local community.



## The Project

Project Location	: Pichit, Nakhon Sawan and Nakhon Pathom Province
Type of Power Plant	: Thermal Power Plant
Generating Capacity	: 22 Megawatt
Fuel	: Rice Husk
Daily Fuel Requirement	: 500 tons
Daily water requirement	: Approx. 2,200 m <sup>3</sup>
Fuel Storage	: Stored on an open field of 40 rai (1 rai = 1,600 m <sup>2</sup> ), surrounded by 12-meter high net fences and 3 layers of perennial plants to prevent rice husk from the wind
Water Discharge	: No waste water discharge from the project
Precipitator System	: Electrostatic Precipitator (ESP), detecting 99.5% of particulates

## Rice Husk: Plentiful Energy Source

Thailand is one of the world's biggest rice producers and has the supply of 5 million tones of rice husk annually. This supply can be used to generate more than 500 megawatts of electricity, and, as a result, save more than 800 million liters of imported oil per year. Although rice husk is used for electricity generation and other industries, there is still abundant supply in many areas, which is simply burned or left to decay, without yielding any benefit at all.

## Benefits of Rice Husk as Fuel

- Steady supply of fuel which can be stored for a long period of time within the project boundary
- Reduced pollution, due to the complete combustion that does not release nitrogen oxide and sulfur dioxide
- Reduced demand for imported fuels, such as petroleum, natural gases and coal.



## Measures to prevent environmental impacts

A.T. Biopower Co., Ltd. has the measures to prevent environmental impacts, according to the Environmental Impact Assessment (EIA) as followed:

- Installing the electrostatic precipitator (ESP), which can catch more than 99.5% of particulates and has a secure system for collecting rice husk ash, which can be sold to other industries.
- No wastewater will be discharged from the power plant. Water that has been used for generating purpose will be treated and used for other activities, while the remaining water will be kept in the evaporation ponds.
- Rice husk storage field is surrounded by fine net fences and 3 layers of perennial tree on the outer boundary.
- Fuel transportation will avoid rush hours in the morning and evening and will conform to all traffic regulations.
- The power plant will be regularly inspected by relevant authorities and if any problem is detected governmental, corrective measure must be carried out immediately. For example, if it has been found that the noise level is too high, a device to absorb noises must be applied to the origin of the excessive noise and its surrounding areas, to ensure that the noise level is within the allowable limit.

## Benefits of this project for the local community

1. Approximately 70 million baht (1 US\$ = 40 Thai Baht approximately) will be generated through various employments for local people during the construction of the power plant.
2. Once the power plant is operated, the company will employ 70-80 local people for various positions in the project.
3. The Tambon Administration Office (TAO) will have revenue of over a million baht per year in taxes.
4. The company also enters into a social contract with the local community where the power plant is located, in order to jointly develop the residential areas, temples, schools and health centers, with the budget of 1 million baht per year.
5. The local community will no longer suffer from fluctuation of electricity because the Provincial Electricity Authority will distribute electricity to the local community before other areas.
6. Revenue can be generated by local people, through long term rice husk supply contract with local rice mills. This will also improve the price of rice in the area.
7. The power plant can be the center for knowledge of modern and clean technology for public.
8. The power plant may promote tourism and trade in the surrounding areas.
9. The project helps Thailand with its environmental preservation efforts and reduce the use of foreign exchange reserve for imported oil.
10. The closed combustion using modern technology helps to reduce pollution in the areas.

## Project Developers

Dr. Thawat Watanatada, founder and the first Chief Executive Officer of A.T. Biopower Co., Ltd., worked for 18 years with the World Bank in the US. During that time, he specialized in the development and management of infrastructure and energy projects. The present Chairman of the Board of Director and Chief

Executive Officer is ML. Chanaphun Kridakorn, former Deputy Governor of the Electricity Generating Authority of Thailand.

Developers who have played important roles in this project are:

- Al Tassar Energy Limited (ATE) from United Arab Emirate.
- Private Energy Market Fund LP (PEMF) from Finland.
- Finnish Fund for Industrial Cooperation Limited (Finnfund) from Finland.
- Flagship Asia Corporation (FAC) from Malaysia.
- Chubu Electric Power Company International from Japan.

## Project Construction Contractor

Electrowatt-Ekono from Switzerland is responsible for the construction of A.T. Biopower power plant. The contractor has extensive experience and expertise in all types of power plants, including biomass power plant. Electrowatt-Ekono has worked together with McBurney, which is an American company, specializing in designing, manufacturing and installing boilers for all types of fuels, including biomass. The work of McBurney has been widely accepted worldwide for many generations.

## Progress of the Project

The Environmental Impact Assessment of all three projects at Pichit, Nakhon Sawan and Nakhon Pathom have already been approved by the National Environment Committee. The construction of the project in Pichit started in December 2003 and is schedule to be completed by the end of 2005. The construction of the projects at Nakhon Sawan and Nakhon Pathom will begin in 2006 and 2007 respectively.

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### Energy Generation from Agricultural Waste Project

