



Renewable energies



## LEYTE ISLAND

Rice husk and straw, coconut husk and bagasse are non-alimentary agricultural wastes existing in very large quantities in South-East Asia. Only in the Philippines where half the land is agricultural, around 25 million tons of coproducts are generated every year. Some of these biomasses, considered as wastes, are wildly burnt for the large majority causing important air pollutions (rice straw in particular), despite effective regulatory laws forbidding such practice (Clean Air Act).



Philippines consists in more than 7000 islands with a complex electrical grid. Part of these islands still depend massively on diesel engines for power production, leading to an important economic and environmental burden for those territories particularly affected by climate change.

In view of those considerations, ENERTIME has been looking since 2008 at agricultural co-products valorization, especially rice straw, for decentralized power production through ORC technology. ENERTIME has developed a local partnership with Novergy Inc based in Manila, an engineering company specialized in renewable energies and has sent consecutively two engineers between 2011 and 2014.

This local representation has led to the development of a first project on Leyte Island (Visayas group of Islands). ENERTIME aims at the construction of a 2 MWe ORC power plant that should be commissioned at the end of 2017. The plant will recover rice husk and straw as fuels from a radius of 30 km around the facility. It will be composed of a steam boiler adapted for high silica and alkali content fuel combustion and a high temperature and performance ORC working with a non-flammable fluid on an innovative cycle. The Organic Rankine Cycle modules are thermodynamic machines working on the same principle than steam plants, except they use an "organic" working fluid instead of water. Thanks to their different physical properties,

the use of these fluids lead to a better reliability and higher efficiency for small and medium power generation, offering a better option than steam cycle for these sizes.

The objective of this project is to supply a competitive, reliable and robust ORC solution adapted to rice co-products combustion for the production of base electricity for applications where the use of flammable fluids creates an unacceptable hazard and where electrical efficiency optimization is sought, as it is in some remote areas in Philippines.

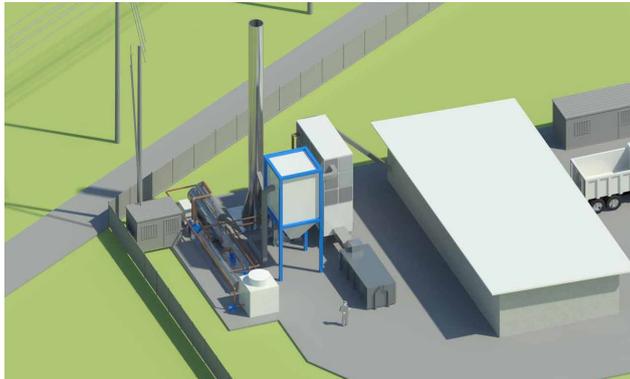
The aim of this project is to be duplicated in decentralized zones in the Philippines territory that quasi-exclusively depend on diesel engines, and by extension in the entire world.

Such project enables to save 11 720 t CO2 eq/an.

Other positive impacts include :

- Numerous local job creation ;
- Supply of competitive, reliable and stable 24h/7 electricity responding to population needs in terms of energy. Limitation of electricity availability to just few hours a day hinders economic growth in these areas, encouraging exodus in major metropolises;
- Re-injection of several millions of pesos per project in the local economy, ensuring an additional revenue to farmers for their co-products;
- Reduction of energy dependency towards fossil fuels importation ;
- Reduction of public subsidies for rural electrification.

<sup>1</sup> Organic Rankine Cycle



To keep contact with ENERTIME : [pierre.dubaret@enertime.com](mailto:pierre.dubaret@enertime.com)