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Directorate General for New and Renewable Energy and Energy Conservation

LCORE Factsheet

Bioenergy activities

Framework

The objective of "Promotion of Least Cost Renewables in Indonesia" or LCORE-INDO is to promote the application of renewable energy in Indonesia where they show the highest economic viability. One main task of LCORE-INDO is to assess the potential of waste-to-energy in the agro industry in Indonesia to find profitable and economic solutions. Furthermore, it strives at enabling the Directorate General for New and Renewable Energy and Energy Conservation (NREEC) in Indonesia to develop practical policies and promote programs for effective support of renewable energy implementations. The project is executed through studies, pilot projects, capacity building, policy guidelines and monitoring. The following factsheet provides an overview of selected activities of LCORE in the bioenergy sector, all carried out together with the private sector and local partners.

Heat Recovery options for Biogas Plants

LCORE-INDO attempts to demonstrate energy efficiency application in industries by way of heat recovery. Especially in the agro-industry, waste heat from power engines is still emitted to the atmosphere when, coal and diesel is consumed to produce heat energy for use in the production process. LCORE-INDO together with local partners carried out an assesment in one tapioca starch plant in Lampung province and discovered that by using existing waste heat from the gas engine, 50% of the coal used can be saved, resulting in yearly coal saving of around 5,000 tons per average-sized plant. Upscaling the possible CO_2-emission reduction for all tapioca starch factory in Indonesia, an annual reduction of more than 2 million ton CO_2-emissions is achievable.

POME Biogas Power Plant

This power plant in Belitung is the first on-grid biogas power plant in-operation under the previous Feed-in-Tariff of IDR 975/kWh. LCORE-INDO provides technical assistance to the private sector owner for bio-digester optimization which increases power generation capacity from the biogas plant. The project has high replication potential elsewhere in the country.

Figure 1: POME and a covered lagoon digester

POME Sludge Pelletizing

In cooperation with an MOU partner, LCORE-INDO investigated alternative use of Palm oil mill effluent (POME) besides fermentation in cases where the distance of the lagoons for POME treatment or the connecting grid is too far from the POM. Extracting and drying the solids of the POME is an option to get pelletized boiler fuel with high calorific value which can also be sold as animal feed due to their high oil and fiber content.

Sago Bark Biomass Power Plant

Power generation options from one of the two sago starch plants in indonesia were investigated by LCORE-INDO and its local MOU partner in Papua. Using reference project in the region, the assessment shows that the sago bark supply is enough to generate up to 4.5 MW of electricity from biomass power while the plant itself only consumes around 2 MW. Since there is no PLN grid nearby, the electricity can be distributed to nearby villages in partnership with local government and PLN.

Biomass Potential Study

LCORE-INDO published a study entitled "Overview of the Waste-to-Energy Potential for Grid-connected Electricity Generation (Solid Biomass & Biogas) in Indonesia". The study focuses on palm oil, rice paddy and sugar cane as they have been identified as being the most dominant commodities in terms of volume in Indonesia. Making use of these by-products in the agro-industry would result in an electricity generation of:

Photos: © GIZ

- 328 TWh annually, equivalent with a power capacity of 46 GWe.
- Yearly technical power generation of 43 TWh, which results in CO_2 savings of approximately 39 million tons per year.

Palm Oil Mill Mapping Study in East Kalimantan

A palm oil mill mapping study and site visits have been conducted by LCORE-INDO to give a detailed assesment of the waste to energy potential in East Kalimantan deriving from the unused palm oil mill effluent (POME). The result of this study shows the possible electricity generation of around 130.000 MWh/year which corresponds to around 2/3 of the local governmental target and a CO_2 eq.- emissions reduction of around 500,000 tons per year. The most suitable palm oil mills for pilot project implementation are shortlisted for further future action in cooperation with local partners from the private sectors.

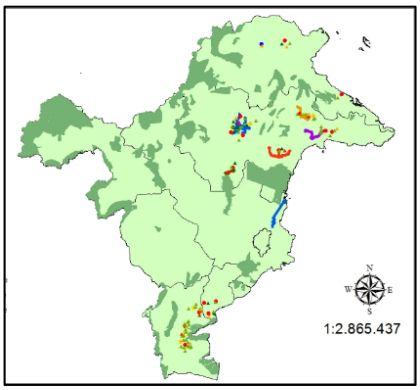

Figure 2. Map of East Kalimantan with possible locations of POME utilization projects

Seminars and Trainings

Beside studies and pilot projects, LCORE-INDO actively provides capacity building for key stakeholders in the bioenergy sector:

- A 5-day advanced, practical-orientated training on bioenergy was organised for selected institutions which were choosen due to their unique and strategic roles in the renewable energy sector in Indonesia. Each participant was trained to adjust and further developed the curriculum for their respective institution. The two best participants were then invited by LCORE-INDO to co-lead a one-day seminar in PV and bioenergy together with an international expert at the sideline of EBTKE ConEx 2014. The two parallel seminars fitting with the exhibition theme of "Time to Deliver Clean Energy for the Nation", were designed to highlight the most important aspects to consider when building a biomass or a biogas plant. The seminar covered the full project development cycle, performance analysis as well as touched upon operation and maintenance of power plant.
- A Focus Group Discussion with representatives of key ministres such as Finance, Energy and Mineral Resources was organized to assess the financial barriers in biogas power projects. The discussion was closed with formulation of an action plan to standardise the Power Purchase Agreement, provide incentive for GHGs mitigation and improve financing facility for project development.
- An introductory course on biomass to NREEC staff working under the Directorate General of Bioenergy was delivered to provide them with an overview of the various biomass feedstock and available technologies.

Barrier Analysis and Feed-in-Tariff (FiT) Revision

LCORE-INDO provided inputs to NREEC in the revision and recalculation of the FiT for biogas and biomass power. Special emphasis was given on finding an appropriate FiT structure that would stimulate the market by covering project risk but also contribute to the country's objective in reducing dependency on diesel-fuelled electricity generation.

LCORE-INDO provided inputs to NREEC in the revision and recalculation of the FiT for biogas and biomass power, including performing barrier analysis and recommending a possible solution to overcome these barriers. The new feed-in tariff was officially launched in October 2014.

Figure 3. Bioenergy seminar and advanced training

Project name	LCORE- Promotion of Least Cost Renewables in Indonesia
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