Reuse of rice husk in Thailand

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Utilizing biomass for power generation is one of the viable options for Thailand to increase self-sufficiency of energy supply, as Thailand is basically an agriculture-based society which produces a large amount of residues from agricultural and forestry sectors. This includes rice husk from rice mills, which amounts to about 4.5 million tons per year by our estimates. Roughly a half of them is used as fuel at rice mills or for compost, but the remaining half is mostly piled up to rot or burnt away in open fields, causing various environmental damages. Therefore using rice husk for power generation is a sensible strategy towards reducing those environmental damages while concurrently saving fossil fuel consumption and producing husk ash as by-product, which could be used for various purposes.

Thus we conducted a case study on a rice-husk power plant (the Roi-et Green Power Plant) in Roi-et Province in northeast Thailand. It generated a net electricity of 8.8 (MW) that was sold to the Electricity Generating Authority of Thailand (EGAT). The sole input for the power generation was rice husk (300 t/day; 1.28 t/MWh) collected at nearby rice mills. The Plant annually generated electricity of 56,120 (MWh/year), which was equivalent to 4,800 (ton-oil eq/year), or to reducing 52,250 (ton-CO2 eq/year) of greenhouse gas emission. Meanwhile the husk ash, by-product at the plant, contained a significant amount of soluble silicate which could act as silicate supplement for farmland soils. In conclusion, the positive effects of rice-husk power generation were summarized as follows: (1) reduce consumption of fossil fuels; (2) thereby reduce greenhouse gas emission; (3) reduce environmental damages caused by rotten husks or smokes from burning husks; and (4) produce silicate-rich ash as by-product which could be reused as soil conditioner or industrial materials.