

Financial feasibility with feed-in tariffs and CDM incentives for investment in sugarcane industry for clean electricity generation in Thailand

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Abstract

Bagasse, the sugarcane residues in biomass power plants, provides a useful source for clean electricity generation. And if it is evaluated in the Clean Development Mechanism (CDM) of the Kyoto Protocol these sugar cane projects are helpful for renewable energy investors. On the positive side, this analysis, which draws in part from a data set of electricity generation production at sugar mills with the feed-in tariff scheme under government incentives for renewable energy investors, if these projects are also within CDM projects, they provide the investors in the short terms return of investments in developing countries with a cost-effective means to achieve GHG emission reductions and to achieve carbon credit selling to Annex I investors. This analysis also confirms that the marketplace in the sugar cane industry together with CDM-derived is robust and competitive in terms of financial feasibility. From this study, the selected four out of 46 sugarcane power plants in Thailand have been investigated under CDM subsidization. The capacity of these four power plants can mitigate CO₂ emissions of 269,268 Certified Emission Reductions (CERs) or ton CO₂ per year under the CDM projects in Thailand. Therefore, it has lots of opportunities and potential to motivate and to promote CDM projects in the sugarcane industry in Thailand. These four power plants are analyzed in terms of both technical and economic potential for CO₂ mitigation.

Keywords: Bagasse for electricity generation, Clean Development Mechanism, Carbon dioxide reduction, Certified Emission Reductions, Incentive investment.

1. Introduction

From the government plan in increasing renewable as energy sources for electricity generation in 2015 called AEDP 2015-2036 is aiming to increase the share of renewable energy penetration in electricity generation in Thailand to 30%, which is equivalent to 19,635 MW by 2036, the AEDP plan [1] is expected to be integrated renewable energy in electricity generation increasing from 4,279 MW at the end of 2014 to 19,635 MW in 2036. Since Thailand is an agriculture-based country and with high solar irradiation potential, the sources of renewable capacity are highly projected to solar power

(6,000 MW), and followed with biomass (5,570 MW), hydro power (3,282 MW), wind power (3,002 MW), biogas (600 MW), municipal solid waste (501 MW), and electricity from energy crop (680 MW). The energy target from biomass-based is a challenging energy management of a sustainable development for the Thai government. However, the feed-in tariff scheme in Thailand has changed due to energy policy in each government. New renewable energy investors have to assure for long term electricity generation. Another incentive is the Clean Development Mechanism, CDM provides for each ton of CO₂ equivalent reduced in a