

Mini - Project Idea Note

Generic Name of Project: *Energy Industrial Park (EIP) #1, Biogas Electricity Generation Plant and Biomass fired Boiler Plant for Ethanol Plant Project*

Date submitted: *26th April 2007*

Technical summary of the project	
Greenhouse gases targeted	<input checked="" type="checkbox"/> CO ₂ / <input checked="" type="checkbox"/> CH ₄ / <input type="checkbox"/> N ₂ O / <input type="checkbox"/> HFCs / <input type="checkbox"/> PFCs / <input type="checkbox"/> SF ₆
Field of activities	<input checked="" type="checkbox"/> a. Energy supply <input type="checkbox"/> b. Energy demand <input type="checkbox"/> c. Transport <input checked="" type="checkbox"/> d. Waste management <input type="checkbox"/> d. Manufacturing industries <input type="checkbox"/> e. Chemical industries <input type="checkbox"/> f. Mining/mineral industries <input type="checkbox"/> g. Fugitive emissions from fuels (solid, oil, gas) <input type="checkbox"/> h. Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride <input type="checkbox"/> i. Solvent use <input type="checkbox"/> j. Agriculture and livestock
Objective of the project	<p>To reduce greenhouse gases which are CO₂ and methane (CH₄) emissions. The greenhouse gases will be mitigated by:</p> <p>(i) Mitigation of CH₄ gas generated ethanol plant's wastewater by using anaerobic digester plant for treating wastewater instead of traditional open lagoons system. Biogas produced from the wastewater treatment plant shall be used to generate electricity to serve for the ethanol plant; and,</p> <p>(ii) Substitution of bunker oil use for producing steam supply to the ethanol process. Biomass boiler shall be installed to generate process steam, which will cause an abatement of CO₂ emissions from the burning of fossil fuels.</p>
Project description and proposed activities	<p>Under the project, the Industrial Energy Park company limited shall develop the ethanol plant with a capacity of <i>200,000 liters/day</i>, using dried tapioca chip (percentage of starch more than 65% by weight) as raw material. The ethanol plant requires an amount of dried chip tapioca of approximately <i>200,000 ton/year</i>.</p> <p>In order to produce ethanol, the production process needs approximately <i>22 ton/hour</i> of saturated steam at <i>13 bar(a)</i> and <i>3 MW</i> of electricity. The ethanol production process shall produce an amount of approximately <i>1,200 m³/day</i> of wastewater at an average COD of <i>60,000 mg/liter</i>.</p> <p>All wastewater effluent from ethanol shall be fed to the</p>

	<p>wastewater anaerobic treatment plant to remove the organic material in the wastewater, thus reducing the Chemical Oxygen Demand (COD) of wastewater. Approximately <i>30,000 Nm³/day</i> Biogas (with 65% CH₄) shall be produced from the digestion process.</p> <p>Produced biogas shall be fed to the biogas internal combustion engines-generators which could generate approximately <i>3.0 MW-net</i> or <i>23,760 MWh per year</i> of power supply to the ethanol plant, substitute for importing electricity from the grid. Biomass (rice husk) boiler shall be installed to supply approximately <i>22 ton/hour</i> of process steam at <i>13 bar(a)</i> to the ethanol process. The boiler plant shall consume approximately <i>42,000 ton/year</i> of rice husk, which causes the displacement of approximately <i>11,969,600 liters/year</i> of fuel oil.</p> <p>GHG emission reduction shall come from (i) the amount of electricity substituted from Thailand's grid electricity generation, (ii) the reduction of CH₄ emissions released to the atmosphere from traditional wastewater treatment in open lagoons, and (iii) the amount of substituted bunker oil that is used to produce steam supplied to the ethanol plant.</p>
<p>Technology to be employed</p>	<p>The technologies to be employed in this project are divided into 2 categories:</p> <p>(i) An anaerobic digester that shall be used to remove the organic material in the wastewater, which will reduce the Chemical Oxygen Demand (COD) and subsequently mitigate CH₄ emissions from traditional treatment in open lagoons.</p> <p>A rice husk-fired boiler plant to produce approximately <i>22 ton of steam/hour</i> of saturated steam at <i>13 bar(a)</i>.</p>
<p>Location of the project</p>	
<p>Brief description of the location of the project (Region and Country where the project will be implemented)</p>	<p>The project will be located in Chainat Province of Thailand.</p>
<p>Expected environmental and social benefits</p>	
<p>Estimate of Greenhouse Gases abated (in metric tons of CO₂-equivalent)</p>	<p>Potential GHG-emission reductions is approximately of <i>120,851 tCO₂-equivalent/year</i>, or <i>1,812,766 tCO₂-equivalent</i> for the project duration (estimated to <i>15 years</i>)</p>
<p>Socio-economic aspects What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project?</p>	<p>The project activity will contribute to the sustainable development of Thailand in the following ways:</p> <ul style="list-style-type: none"> • Enhance Thailand economic sustainability by reducing the country's dependence on the use of fossil fuel in power generation; • The utilised biogas will reduce methane emission and

	<p>thus decrease the impact on the global warming;</p> <ul style="list-style-type: none"> • The problem of bad odors caused by the wastewater digestion in open lagoons will be reduced; • Support the government policy in promoting the use of renewable energy; • Create local employment opportunities especially during plant's construction and operation; • Increase income and liquidity to local economies through many supply-chain activities which shall be developed, for example, tapioca farmers, owners of tapioca drying yard and suppliers, biomass suppliers, transporters, plant operators, maintenance and service supplier, etc.; and, <p>Create value added for Thailand's cassava industry through conversion of tapioca chip which are usually used as raw material or feedstock into an energy commodity.</p>
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PIN/PDD Developer-Intermediary	
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Expected schedule	
Earliest project start date	<i>By 2007</i>
Expected first year of CER delivery	<i>2009</i>
Project lifetime	<i>15 years</i>
Current status or phase of the project	<p><input type="checkbox"/> Identification and pre-selection phase</p> <p><input type="checkbox"/> Opportunity study finished</p> <p><input type="checkbox"/> Pre-feasibility study finished</p> <p><input checked="" type="checkbox"/> Feasibility study finalized</p> <p><input checked="" type="checkbox"/> Negotiations phase</p> <p><input type="checkbox"/> Contracting phase (mention what contracts)</p> <p><input type="checkbox"/> etc.</p>