

Kittapas Suppagornmongkol 2014: Strategy Plan at Community Level for Diesel Fuel Production of Fast Growing Tree Species Biomass. Doctor of Philosophy (Sustainable Land Use and Natural Resource Management), Major Field: Sustainable Land Use and Natural Resource Management, Interdisciplinary Graduate Program. Thesis Advisor: Assistant Professor Nikhom Laemsak, Ph.D. 91 pages.

Needs for alternative fuels to replace fossil fuels which cause global warming and environmental pollutions, entice investigations into various sources of energy. Biomass is one of the choices when considered Thailand as an agriculture based country. The objective of this research was to prepare a draft strategic plan for the community in the production of fuel from biomass by 1) analysis for suitable areas in Thailand for growing two popular species of fast growing trees, 2) The costs and benefits for diesel production from individual biomass were studied including the attitudes towards biomass and diesel productions were surveyed.

The result showed that a suitable area for planting Eucalyptus was any area of deep soil and good drainage system while Acacia needed an area of high humidity. The suitable areas for planting the two species were located which covered approximately 10.22 percent of the country's area. The financial feasibility study of diesel production from Acacia of a 20 year project showed that the net present value (NPV) was 31,685,196 bahts, rate of return (IRR) was 0.087 percent and a payback period was 8.7 years. On the other hand, Eucalyptus was superior because the NPV was 45,665,289 bahts, the IRR was 0.106 percent and a payback period was 8.3 years. Furthermore the environmental analysis showed that planting Eucalyptus and Acacia could stock carbon more than 120,000 tons of carbon dioxide over the project period. Besides, diesel fuel from biomass emitted less carbon dioxide than the regular diesel.

It could be concluded that for a successful in the commercial term, implementation of diesel fuel production from biomass needed to be encouraged throughout the supply chain from upstream to downstream. Strategies at the community level can be formulated as follows: 1) A development of biomass of fast growing tree species 2) A development technology to produce diesel fuel from biomass and 3) A market promotion for diesel fuel from biomass.

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