

Abstract

The objective of this study is to select the best location for Biogas Power plant using cow dung from dairy farm. Using the Expert Choice Program to compare 3 locations which are the area with highest household density, Co-operative area and the area with highest cow density, the results are displayed graphically. The analysis was divided into 2 parts namely revenue and cost of biogas power plant. Three factors considered regarding the revenue are electricity income factor, fertilizer income factor and carbon credit income factor. Another three factors were considered regarding the cost: installation cost factor, operating and maintenance cost factor and logistic cost factor. For installation cost factor, the key parameter is technology. There are 5 technologies considered in this study: (i) upflow anaerobic sludge blanket technology (UASB), (ii) cover lagoon or modified cover lagoon, (iii) completely stirred tank reactor technology (CSTR), (iv) fixed film technology and (v) hybrid channel digester technology. The operating cost factor was focused on how to manage the electricity outcome. There are 3 management methods: (i) running 24 hours a day and selling the electricity to Provincial Electricity Authority (PEA), (ii) running only on peak period and selling the electricity to PEA and (iii) using the within the co-operative area and selling exceeded electricity to PEA. The logistic cost is affected by 2 factors, the logistic factor considering vehicle which are pick-up truck and small 6-wheel truck and the logistic factor considering fuel price that changes continuously. In sensitivity analysis, three risk factors are considered in term of revenue and cost ratio changes that vary from 10%, 20% and 40% of cost or revenue. The scope of this study covered 733 households with 18,962 cows, located in Lamprayaklang Reform Land, Muaklek district, Saraburi Province. According to the result from Expert Choice program based on the ratio between revenue and cost ratio at 0.602:0.398, the dairy co-operative is the best location for biogas power plant with the score of 48.7%. From the sensitivity analysis, the change of revenue to cost ration according to the risk factor have no significant effect to the selection of biogas power plant location.