

The Environmental and Economic Analysis of Extended Input-Output Table for Thailand's Biomass Pellet Industry

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Abstract : The demand for biomass pellets in the industrial sector has significantly increased since 2020. The revised version of Thailand's power development plan as well as the Alternative Energy Development Plan, aims to promote biomass fuel consumption by around 485 MW by 2030. The replacement of solid fossil fuel with biomass pellets will affect medium-term and long-term national benefits for all industries throughout the supply chain. Therefore, the evaluation of environmental and economic impacts throughout the biomass pellet supply chain needs to be performed to provide better insight into the goods and financial flow of this activity. This study extended the national input-output table for the biomass pellet industry and applied the input-output analysis (IOA) method, a sort of macroeconomic analysis, to interpret the result of transactions between industries in the monetary unit when the revised national power development plan was adopted and enforced. Greenhouse gas emissions from consuming energy and raw material through the supply chain are also evaluated. The total intermediate transactions of all economic sectors, which included the biomass pellets sector (CASE 2), increased by 0.02% when compared with the conservative case (CASE 1). The control total, which is the sum of total intermediate transactions and value-added, the control total of CASE 2 is increased by 0.07% when compared with CASE 1. The pellet production process emitted 432.26 MtCO_{2e} per year. The major sharing of the GHG is from the plantation process of raw biomass.

Keywords : input-output analysis, environmental extended input-output analysis, macroeconomic planning, biomass pellets, renewable energy

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