

Assessing Transition to Renewable Energy for Transportation in Indonesia through Drop-in Biofuel Utilization

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Abstract : In increasing its self-sufficiency on transportation fuel, Indonesia is currently developing commercial production and use of drop-in biofuel (DBF) from vegetable oil. To maximize the level of success, it is necessary to get insights on how the implementation would develop as well as any important factors. This study assessed the dynamics of transition from existing fossil fuel system to a renewable fuel system, which involves the transition from existing biodiesel to projected DBF. A systems dynamics approach was applied and a model developed to simulate the dynamics of liquid biofuel transition. The use of palm oil feedstock was taken as a case study to assess the projected DBF implementation by 2045. The set of model indicators include liquid fuel self-sufficiency, liquid biofuel share, foreign exchange savings and green-house gas emissions reduction. The model outputs showed that supports on DBF investment and use play an important role in the transition progress. Given assumptions which include application of a maximum level of supports over time, liquid fuel self-sufficiency would be still unfulfilled in which palm biofuel contribution is 0.2. Thus, other types of feedstock such as algae and oil feedstock from marginal lands need to be developed synergically. Regarding support on DBF use, this study recommended that removal of fossil subsidy would be necessary prior to applying a carbon tax policy effectively.

Keywords : biofuel, drop-in biofuel, energy transition, liquid fuel

Conference Title : ICETSCD 2021 : International Conference on Energy Transition and Sustainable City Development

Conference Location : Sydney, Australia

Conference Dates : August 30-31, 2021