TECHNO ECONOMIC ANALYSIS OF DRY LEAVES VIA LOW TEMPERATURE MECHANISM

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ABSTRACT

Biomass resources has been introduced by scientist decades ago. However, the world still depends on fossil fuel resources as a source of energy in their daily lives. With increasing price of fossil fuels and depletion over the years, fossil fuel cannot sustain the world future since the sources are limited. Moreover, fossil fuels produce more pollution and contribute to the greenhouse effect. This research is mainly conducted to study the techno economic analysis of dry leaves as a biomass resources by using low temperature mechanisms process. Two process are chosen to be studied in this research which are pyrolysis and torrefaction. A simulation will be created to compare the two process in terms of yield and cost. The tools used for this study is Aspen Hysys.

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INTRODUCTION

1.1 BACKGROUND STUDY

Leaves has been considered to be the most cost-effective biofuels around the world. For countries with four seasons annually, they have been using this method to convert biomass into energy for years. In America alone, up to 30 million tons of leaves end up in landfills every year (Biswal et al., 2013). In fact, leaves account for 75% of the solid waste in the world. Biofuels such as methanol and ethanol are produced from corn, which have potential to provide cleaner energy. About 20% of ethanol produced are converted into energy. These energy are then used to create diesel, natural gas, medicine and fertilizers. They are also used in refinery industry and acts as fuels to the machineries. Leaves are tremendously abundant, and could provide an unlimited and naturally renewable energy source.

Leaves can also act as a secondary fuel in coal-burning power plants. These leaves can be transformed into energy by using a low temperature mechanism method that involves conversion process such as Torrefaction, Pyrolysis and gasification. It can provide fuels to produce electricity in power plant and thus, the potential seems to exist for tree leaves to emerge as a new, renewable energy source. Bio-fuels have been proven to be a necessity to the world. Other than source of energy, bio-fuels also can act as fuels to most of the transportation that exist nowadays.