

## **ABSTRACT**

Due to the major concern on the decreasing of fossil fuels nowadays, research and development (R&D) has been established to find alternative sources of fuels that are environmental friendly, sustainable and economical. With response towards this matter, renewable energy has been considered as the primary option of energy sustainability after fossil fuel. The most promising types of renewable energy are biomass. This report basically discusses the preliminary research done and basic understanding of the chosen topic. Gasification is the conversion of biomass into a fuel gas which can be used as a renewable energy. Oil palm fronds are one of the most abundant agricultural byproducts in Malaysia with an estimated availability of 30 million tons annually. There are some research has been proposed to investigate the potential of oil palm fronds as a major and unsuitable to be fed into gasification process. This is because high water content will reduce the possibility of ignition in the process and reduces the heating value of the product gas due to needed to evaporate the additional moisture before combustion or gasification. The objective of this project is to identify the optimum and economical method of drying the oil-palm fronds, especially in terms of minimum temperature for drying, humidity, drying time (shorter drying time is preferred) and the form of oil-palm fronds itself. The challenge in this project is to investigate the drying characteristic of the fronds from the most suitable drying condition to the least suitable condition. The drying test will be done using the oven in the lab under various conditions. The outcome of the project will be useful in determining the drying method for large-scale biomass gas production.