

Potential of Solid Biomass Energy as a Source of Sustainable Energy to Reduce the Impact of Energy Crisis and Environmental Pollution

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Abstract—The use of fossil energy sources since the 19th century has produced an adverse effect on our environment. Environmental pollution, global warming, floods, extreme winters, volcanic eruptions, tsunamis and earthquakes that hit us were the results of our actions in the name of development and modernization. But we still need fossil energy sources to sustain life that we enjoy. But fossil energy sources are also facing rapid depletion at the present rate of consumption. We are called to address these issues by finding solutions in the use of renewable energy as well as energy savings through energy conservation. Biomass is a renewable energy source with high potential in Malaysia as an agricultural country. Waste from various agricultural sources is estimated to generate 1500MW of electricity. Although it is not enough to overcome the demand of 20GW, it still serves to shift our total dependence on fossil fuel.

Solid biomass energy sources can be used more efficiently through a gasification process that converts solid fuel into a fuel gas called producer gas or synthesis gas. Several gasifiers were developed to utilize various types of biomass wastes. The synthesis gas can be used in internal combustion engines, gas turbines, fuel cells, stoves, cyclone and porous medium burners etc. for the production of electricity and thermal power. The bio-energy electrical generator developed is a combination of the gasifier system and diesel engine generator that saves 60% diesel consumption or 100% by using a petrol engine. The thermal power generation system generates hot air for drying agricultural products.

Biomass power plant depends on several factors. Among these are economic incentives, transport logistics and energy sales contracts between power producers and TNB. The governments, NGOs and communities need to be aware of the importance of renewable energy sources for sustainable future.