

Chapter 6

Conclusions and Recommendations for Future Works

6.1 Conclusions

Myanmar has enormous potential of biomass sources that can be utilized to increase the growing demand of energy. Biomass gasification technology could be suitable for the rural grid electrification. Therefore, a literature survey of small scale distributed power generation unit with biomass gasification technology has been carried out. Suitable technology has been recognizing for a remote village area in Myanmar.

The Myanmar Engineering Society has issued a letter suggesting 4 potential sites and site survey has been undertaken. The 4 sites are (i) Nyaung Da Gar, (ii) Sann Ywar, (iii) Kha-Lok, and (iv) Dagoon Daing in the Twantay Township about 50km from Yangon. The most suitable village is Dagoon Daing to be used as a site for the project. The village has over 300 households.

Biomass samples available around Dagoon Daing area were collected. They were wood, rice straw, rice husk and bamboo. The sampled were sent for proximate, ultimate analyses, heating value, density, ash composition and fusion behavior determination. Rice husk was later identified as an appropriate biomass to be used as fuel in the gasifier-engine-generator system.

A 50 kW biomass gasifier-engine-generator system to produce electricity was constructed and commissioned. The system consists of Downdraft gasifier reactor, cyclone separator, water scrubber, gas cooler, Carbon fiber filter, fine filter units and gas damper. The system is housed under a 56 m² building that is partitioned into operation area, control room and fuel storage room.

Electrical poles were erected along the village's main road. Wiring and network were connected from the power plant to about 350 households. A 20 W light bulb and switch were given for free to each house. 40 lambs were also installed on top of the poles for road lighting.

The system has been operated since 20 November 2007. It was scheduled to run from 1800–2400 pm, everyday. Preliminary results showed that the system can be operating without any trouble. Start-up and shut-down can be done with ease. Rice husk consumption was measured to be about 32.64 kg/hr at 31.28 kW load. A diesel substitution rate of 65.11 % was obtained with overall system efficiency of 13.49 %. The system can be run without major problem.

There is a great opportunity to generate electricity for households and other productive activities. The rural grid electrification project was found to contribute to upgrading the living standards of villagers in term of quality of life, longer study hour, safer environment and improved productive and income-generating activities.

6.2 Recommendations

If village committee can construct the private rice mill, they will get enough rice husks from this mill because they will need to buy more rice husk from other rice mills in the future.

Since the installed capacity of 50 kW can be distributed by this project, this can extend to the neighbor villages for lighting because the present electricity consumption in the village is 31.28 kW.

Before starting the project, they cost about 15,000 kyat/month for lighting. But, they can reduce their cost about 2,000 kyat/month after project. So, the economic benefit becomes 86.67% per month safer than before project in term of lighting.

By using electricity after project, it can reduce air pollution in these environments because they don't need to use candles and oil lamps. On the other hand, they can possess more healthy lives because of lighting.