

Management of Small Scale Biomass Gasification Plants at Village Level

ABSTRACT

Grid electricity is not available throughout the day in rural areas, and if available, its quality is poor. To solve this problem often off-grid stand-alone devices is installed in villages. Biomass gasifier is one of them. For generating electricity a constant supply of biomass is essential. Apart from wood, biomass can also be obtained by cultivation of crops such as *Dhaincha* and shelled maize cobs which can be used without any processing. Other crop residues (biomass) can also be used for gasification if they properly processed. The study envisages assessment of biomass (crop residues) to be used in gasifiers available from farmers. Increasing quantity of biomass may lead to scarifying social requirements like seed, food and energy, as more area is to be allocated to crops like Jute, *Dhaincha* and Maize. Through application of linear programming, it has been found that if social constraints are not considered by farmers then maximisation of income would be through allocation of area only to wheat, *Dhaincha* and Jute. While considering electricity generation from off-grid stand-alone devices the cost of electricity may be more. Thus an attempt is made to arrive at the Cost of Electricity (COEE) from biomass gasification in two modes of operation - pure gas and dual fuel, and the results with diesel generating sets are compared. It is found that COEE is less for pure gas biomass gasifier in comparison to other systems. So far COEE has been calculated on the basis of electricity generation and not on basis of demand from end users. This is because most of the power generating units generates electricity at much lower Plant Load Factor (PLF). The study concludes that if biomass gasifier electricity is generated on the basis of demand then the COEE would reduce further and an increase in biomass price will result in an increase in COEE.

Key words: Biomass gasification, Cost of electricity and management,