

DESIGN AND FEASIBILITY OF MICRO HYBRID BIOMASS PLANT USING MAGNETO HYDRODYNAMIC GENERATOR AND THERMOELECTRIC GENERATOR

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Mode of Study : F. Time

ABSTRACT

Due to modernization, the power demand is increasing day by day resulting in a wide gap between supply and power demands. Efforts may be oriented towards the search of new sources of energy and has led to the growth of other non conventional methods using renewable sources. As a result, rush to biomass systems have been promoted around the globe at a very large scale as biomass is used as a raw material either in primary or secondary processing units. Nevertheless, plants using biomass as raw material are promoting problems like carbon dioxide emissions and methane gas emission which are threat to earth's ozone layer. High ash content and heat release to environment are the harmful effects of biomass plant. In order to get optimal generation conditions, cogeneration of biomass plant is done so as to provide clean energy to environment. For this reason, biomass cogeneration is done using MHD generator, thermoelectric generator so as to increase the reliability and efficiency of the system. Normally the efficiency of boiler is 25-35% but by using the cogeneration, efficiency has increased to 65-85% because flue gases obtained from burning of raw material are cycled again to boiler after passing through MHD and TEG generator. As a result the boiler will need less energy to increase its internal temperature thereby increasing the efficiency of boiler. The flue gases obtained after burning the fuel in boiler is fed to TEG, from where they move to MHD generator. The seeding material is added as the flue gases enter the MHD generator so as to increase the electrical conductivity of the gas. Now, again the flue gases are fed to boiler and consequently the cycle is completed. The output from TEG is utilized by the cogeneration plant itself, so as to fulfill power requirements of the plant such as in cooling systems; fans etc. leading to less power consumption. The other two outputs i.e. from turbine and MHD generator are fed to the grid so as to meet the power demands.