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INVESTIGATION OF POWER PLANT WASTE HEAT UTILIZATION IN BIOGAS BASED ELECTRICITY PRODUCTION PROCESS

ABSTRACT

In this paper, biogas reactor heating system using power plant waste heat as a heat source is conducted in the first time in literature. The feasibility of utilization of biogas for electricity and increase in efficiency of overall system electricity production are investigated. Can power plant in Çanakkale, Turkey is chosen for the investigation in this case study. Can power plant releases 195MW thermal energy to air in condenser unit with relatively low temperature (43°C). Given temperature range is ideal for mesophilic bacteria growth in digestion process during the biogas production process. 39.8MW biogas based electricity production potential is available for Can power plant condenser waste heat. Overall electricity production energy efficiency can be increased by 9.7%. This analysis will provide a very good example to recover the released high amount of waste heat with low temperature for many power plants. Motivation of authorities on huge capacity biogas based electricity production can be increased by designing such kind of applications.

Keywords: Power Plant, Waste Heat, Energy Recovery, Biogas Production, Electricity Production, System İmprovement

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