

Biosolids Energy - Feasibility Study

City of Atlanta, Georgia
R.M. Clayton WWTP

In this study, AHP shows that it is economically feasible to recover waste heat from the biosolids combustion process at the R.M. Clayton Waste Water Treatment Plant (WWTP).

The study focused on recovering the heat energy released from the multiple hearth furnaces (MHFs)



during the combustion of the biosolids. It was shown that it was economically and technically feasible to recover waste heat from the biosolids combustion process utilizing a Rankine cycle. A Rankine cycle includes a closed-loop working fluid, heat exchangers to collect the waste heat, a waste-heat boiler to convert the fluid to a vapor (such as steam) and a turbine driven generator to generate electricity.

The waste heat left over from the electrical generation process would be used to provide heat for the plant's anaerobic digesters, offsetting or replacing the need to burn digester gas to heat the digesters. This makes more digester gas available to offset purchased natural gas and also provide additional heat for conversion to electricity, thus maximizing and optimizing the energy efficiency of the operation. Design considerations related to the heat energy recovery equipment are discussed. Costs are estimated for various options yielding total turnkey construction cost estimates. Also included are yearly operating and maintenance cost estimates for each recovery method option. In addition, electric utility cost avoidance is estimated for each recovery method, and the simple project cost payback time calculated. With total energy (electrical and natural gas savings) included, the estimated simple cost payback for the project was approximately four years.