

ABSTRACT

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**TITLE: STUDY OF THE SCOPE FOR THE
RECOVERY OF WASTE HEAT FROM
DIFFERENT INDUSTRIES AND IT'S
OPTIMIZED UTILIZATION TOWARDS
IMPROVING ENERGY EFFICIENCY**

Energy access is a fundamental factor in human development; it is the major building block of the modern society. Energy is needed to create goods from natural resources and to provide many of the services of which we are habitual. Waste heat recovery is considered in this research. Present work is an attempt to identify the research gap through intense literature review and to optimize the Organic Rankine Cycle by taking multiple parameters to maximize the waste heat recovery. A comprehensive literature review was done to understand the present status of research and research in related field. Research gap was found and the available techniques and methodologies were examined and evaluated for comparison and decision making about the cycle performance. The main contribution of this study lies in optimizing the ORC and in establishing the fact that the thermodynamic cycles such as organic Rankine cycle can be effectively

optimized by using the unconventional techniques such as graph theoretic approach, Taguchi's method and genetic algorithms. Further, overall optimization of the performance of the cycle is more important than finding the values of individual parameters for the best performance. Above techniques are capable to optimize the cycle performance as a system approach. All techniques revealed that there lies an optimum combination of all operating parameters which gives the best performance. A scope for the future researchers has been discussed. More number of variables may be considered in future researches and also the other thermodynamic cycles which are capable of converting low grade waste heat into useful work may be considered for optimization. Other refrigerants may be selected for the analysis. Through and sincere efforts in the recovery of waste heat will definitely reduce the burden on fossil fuel as well it will have a positive impact on the environment.