"PROTOTYPE SOLAR STIRLING GENERATOR"

(Sponsored by Karnataka State Council for Science and Technology (KSCST), Bangalore)

A Project Report

Submitted in partial fulfilment of the award of the degree of

Bachelor of Engineering in Electrical and Electronics

Visveswaraya Technological University, Belgaum

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2011-2012

ABSTRACT

In order to satisfy the rising energy demands of global consumption, a new cleaner and renewable power source needs to be explored, conceptualized, and developed. Solar energy is a free and clean energy resource which can be used to generate power without damage to humans or the local ecosystems. To efficiently capture this solar energy as a feasible power source, a Stirling engine is being developed and will use sunlight as a source via a solar concentrator. This project intends to utilize methods of gathering solar energy that have not yet been commercially implemented, and modifications to traditional Stirling engines will be made in order to maximize the efficiency of solar Stirling engines. These modified solar Stirling engines can produce power for a wide variety of applications. The nature of the engine allows for both the scalability to create a solar farm as well as use for producing power in remote areas and disaster relief.

The consumers' demand for "green products" has increased due to global warming and also lead to an increased effort to stop or decrease pollution. Worldwide attempts are being made to increase the use of our renewable energy sources more efficiently. Waste heat recovery forms a substantial part of the latter and is the focus of this project. Stirling technology finds application in both the renewable energy sector and in waste heat recovery. Investigating the applicability of Stirling engines in these fields is relevant to develop more efficient external combustion units as well as to utilize our renewable energy sources. Developing a design analysis and a working prototype capable of optimizing Stirling powered units forms the main objective of this project.