

ABSTRACT

In recent years, the increasing concern of environmental issues of emissions and in particular global warming with the limitations of energy resources has resulted in extensive research into novel technologies of generating electrical power. Normally extensive wastage of thermal energy of around 60% of the fuel burnt is dissipated as waste heat into the atmosphere. So there is a need to convert this waste thermal energy into useful form of electrical energy. An ideal solution would be the use of Thermo-Electric Generators (TEG) for this application. TEG's have emerged as promising devices for alternative green technology due to their distinct meritorious advantages. Thermoelectric power generation offer a potential application in the direct conversion of waste-heat energy into electrical power, where it is unnecessary to consider the cost of the thermal energy input. The application of this alternative green technology in converting waste-heat energy directly into electrical power will definitely improve the overall efficiencies of energy conversion systems.

In this project the integration of TEG's in heat sources like automobile exhausts is employed. The heat from the exhaust pipe is utilized for the generation of electrical power and is stored in the battery which can be utilized for different purposes. The primary source of conversion of heat energy into electrical energy is implemented by using thermo-electric modules which is placed upon the absorber plate and this assembly is mounted on the silencer pipe of the automobile. Sufficient amount of thermal grease is applied on both the sides of the TEG modules as this would increase the thermal conductivity by filling the microscopic air-gaps present due to imperfect flat and smooth surface of the components. A suitable heat sink is also placed upon the modules which are placed on the absorber plate. Heat Sink (HS) is mainly used to cool the TEG module surface by dissipating the heat to the surrounding air so as to maintain proper temperature difference between hot end and cold ends. This thermoelectric module tends to absorb the heat and produce an initial voltage which is fed to the boost converter, which in turn boosts up the generated voltage. The boost converter employed operates between 3 - 6V which helps to drive a load of 12V, 30 W. Hence, this generated electrical power from the boost converter can be efficiently utilized for charging various low power appliances like mobile phones, laptop etc.,