

EXPLOITING UNDERUTILISED WASTE HEAT TO GENERATE ENVIRONMENTAL FRIENDLY ENERGY

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ABSTRACT

The growing concern over the continued usage of fossil fuels for electrical energy generation and hence the need to significantly reduce reliance on this non-renewable energy source as well as the requirement for long-lived power supplies have necessitated the pragmatic shift towards the realization of cleaner, safer, and renewable energy sources. The increasing interest in space exploration, satellite activities, structural health monitoring and terrestrial monitoring in harsh and inaccessible environments place a high demand for energy sources for autonomous systems. The existing battery technologies that can be utilized for autonomous systems are plagued by short-life, low energy storage density, associated unwanted maintenance burdens of recharging or replacement and disposal of unwanted batteries which poses a threat to the environment. Autonomous energy sources from waste heat for home appliances and industrial machineries will also mitigate the effect of global warming which threatens the environment as a result of fossil fuel energy based sources that release undesirable carbon-monoxide into the atmosphere. Thermoelectric energy generation, based on Seebeck effect, an innovative approach to convert heat energy into usable forms can significantly contribute towards sustainable energy development and meet the growing need for power in small scale applications due to its relative advantages over other sources of energy generation. This paper presents an insight into various ways by which underutilize waste heat can be exploited to meet the growing energy demand. While there is growing concern for generation of 'clean' energy, and it is a relief that there is a large amount of underutilise or waste heat capable of generating 'clean' energy.

KEYWORDS: Autonomous Systems, Energy, Fossilfuels, Seebeck Effect, Thermoelectric