

# INVESTIGATION OF STABILIZING INTERNAL TEMPERATURE AND HUMIDITY OF PELTIER-BASED COOLING REFRIGERATOR SUPPLIED BY SMALL SCALE PV

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## Abstract

The project Investigation of stabilizing internal temperature and humidity of Peltier-based cooling refrigerator supplied by small scale PV. Peltier devices are used for the cooling systems, efficient heat transmission from the module is important. The hotter end of Peltier will be linked to the absorber plate and blade combination. Next, solar panels will be used to collect light energy from sunlight, this will depend on the weather and to put the solar panel at suitable places. Then, the design of the cooling refrigerator had been created to stabilize the temperature and humidity that contains in the cooling refrigerator. Two Peltier devices were used, the expected result of this project is the cooling refrigerator achieved the temperature of 2°C -6°C. The size of the internal cooling box, number of Peltier, temperature surrounding and the values of the good that were put in the cooling box play a huge role for the effectiveness of the project.

## 1. Introduction

The main system in this project title "Investigation of stabilizing internal temperature and humidity of peltier-based cooling refrigerator supplied by small scale PV". Altenkirch was the first to present the thermoelectric refrigeration idea in 1909[1]. The effect creates a temperature difference by transferring heat between two electrical junctions. A voltage is applied across joined conductors to create an electric current. When the current flows through the junctions of the two conductors, heat is removed at one junction and cooling occurs. Solid-state devices are thermoelectric devices. Because there are no mechanical moving parts, they are energy converters that keep the sound down and the shaking down. They are easily portable and low in weight, they are environmentally friendly freezers because no CFC or other refrigerant gas is utilized[2,3]. In comparison to standard AC systems, they use far too much electricity and also natural resources are used to create power to suit their needs, causing the greenhouse effect and aggravating pollution on the planet[4]. With the power of PV arrays, heaters and coolers are both possible using thermoelectric devices, which sun energy is converted into a temperature difference and may be used as either. Solar thermoelectric device powering is

believed to be an appealing option to satisfy refrigeration demands while also addressing energy conservation and environmental concerns[5,6].

At lower than room temperature operating conditions, Peltier coolers can be employed effectively, commercially available thermoelectric devices are extremely dependable. But, according to the based on recent reliability research, these devices may be less dependable as generators when used beyond ambient temperature[7]. To enhance the effectiveness of a thermoelectric research refrigerator, a system for effectively removing heat thermoelectric modules' hottest face must be developed. Solar energy used as electrical supply. PV paired with battery storage is a method for improving distributed power generating resilience and reducing power outages at important sites. Battery addition to a photovoltaic system can help to compensate for the imbalance between energy generation and load demand[8]. The output power from the PV also play a role how long the cooling refrigerator can hold the load demand that require from the Peltier based and other electronics device. The internal temperature and humidity of Peltier-based cooling refrigerator will be investigate to make sure that the product is suitable too be useful for user out there. Temperature control is vitally