A REVIEW PAPER ON THERMOELECTRIC GENERETOR

[1]Praveen Sharma, [2]Rajat Chaudhary, [3]Gaurav Agrawal

[1]*B.Tech Scholar, Dept. of Mechanical Engineering, Arya Institute of Engineering & Technology, Jaipur, Rajasthan,*
[2]*B.Tech Scholar, Dept. of Mechanical Engineering, Arya Institute of Engineering & Technology, Jaipur, Rajasthan,*
[3]*Assistant Professor, Dept. of Mechanical Engineering, Arya Institute of Engineering & Technology, Jaipur, Rajasthan, India.*

Abstract: By using an exhaust generator, the combustion engine generates a large amount of residual thermal energy from the exhaust. The remaining thermal energy can be converted into electricity that can be used by a thermoelectric generator (TEG), which can use the batteries produced to produce semiconductor materials. When residual heat is recovered from the exhaust pipe, TEG can improve engine efficiency, generating more energy or less fuel intake, the same amount of electricity, reducing air pollution. There will be less fossil fuel combustion), making the system more sustainable. A power plant that uses a thermoelectric generator (TEG) that recovers the thermal energy emitted by the generator's combustion gas. The temperature value is obtained from a thermal imager and a type K laser thermocouple. The monitoring system is responsible for collecting data and generating graphs and reports.

Keyword: - thermoelectric generator, Supervisory System, temperature, electric generator, TEG, cells, thermal energy, laser thermocouples.

I. INTRODUCTION

A heat generator (TGG), also known as a vacuum generator, is a powerful energy device that can directly convert thermal energy into electrical energy, known as the cultural effect. Heat generators do not have light moving parts that function as heat engines. However, TEG is usually more expensive and less effective. In May 1821, Thomas John Search beck explained that the change in temperature between two different carriers produces electricity. The fact is that the thermal fluctuations of the material in the center of the heat exchanger can cause heat leakage. This led to the expansion of stores. The flow of charge carriers between the hot zone and the cold zone causes the voltage to change. In 1834, Jean Charles Athanas Peltier discovered a reaction that took place at the intersection of two asymmetric conductors, depending on the direction and origin of the current. . Works as a refrigerator or freezer.

II. RESEARCH REVIEW:

- **PRINCIPLE OF THERMOELCETRIC:**

The heat of happiness is directly related to electricity. Juz board, export heat products are exported, you can do as you prepare Minerals. Noted that there is a voltage difference between the joints. This result is due to the difference in the adhesion temperature of two different metals. Seebeck's results create a tiger-like situation. The current density from the Mo power plant can be calculated by the following methods.

- **PURPOSE OF THERMOELECTRIC GRENERATOR:**

The average goal of thermoelectric generators is to utilize waste heat associated with the industrial and household sectors.

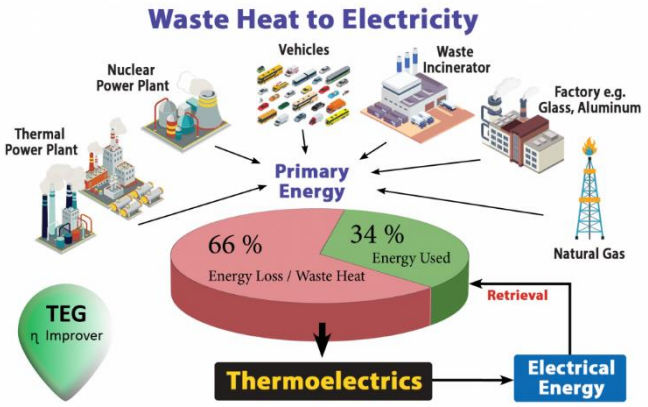

Fig 1. : Waste heat to electricity

III. COMPONENTS OF TEG:

- **Thermoelectric material:**

Thermal materials directly generate thermal differences in heat by converting them into voltage. These materials must have high electrical conductivity (σ) and low thermal conductivity (κ) in order to have good thermal conductivity. The presence of low thermal energy ensures

that the other side is cooled during preheating and helps to generate high voltage during thermal evaluation. Depending on the temperature difference of the material, the number of electrons is measured by the integrin (S). The efficiency of the material is determined by the heat generated in part by the "good gift" = S2σT /K.The three main semiconductors called Bi2Te3, Lead Ion (PBT), and Silicon Germanium (CG) have been known over the years. These materials contain very unusual ingredients that make them very expensive.

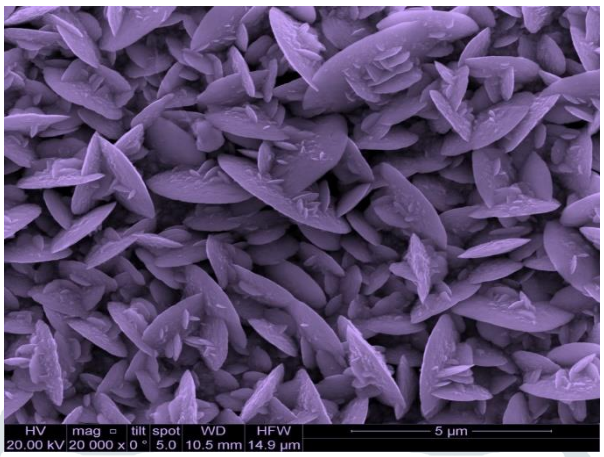

Fig 2. : Antimony bismuth telluride

- **Thermoelectric module:**

Thermoelectric modules are circuits containing thermoelectric materials that directly generate a flow of heat. Thermoelectric modules are composed of two different thermoelectric materials with their ends connected: n-type (negatively charged carriers) and p-semiconductors (positively charged carriers). When there is a temperature difference between the edges of the material, DC current flows through the circuit. Usually, the actual queue is proportional to the temperature change:

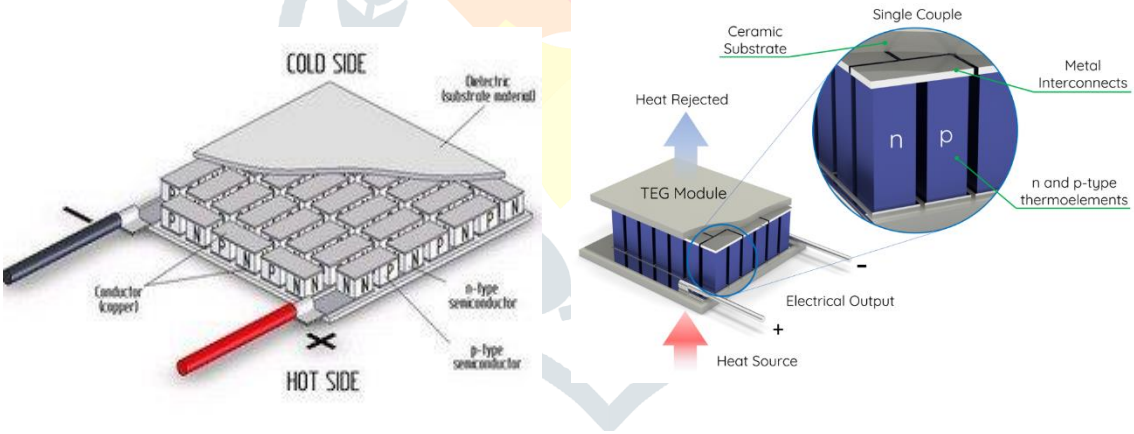

Fig 3. : TEG Module

- **Seeback effect:**

The main component of the heat generator is heating. The thermometer consists of a P-type semiconductor and an N-type semiconductor and the semiconductor is connected continuously with several circuits. Semiconductors are also called heat exchangers, dyes or pumps.

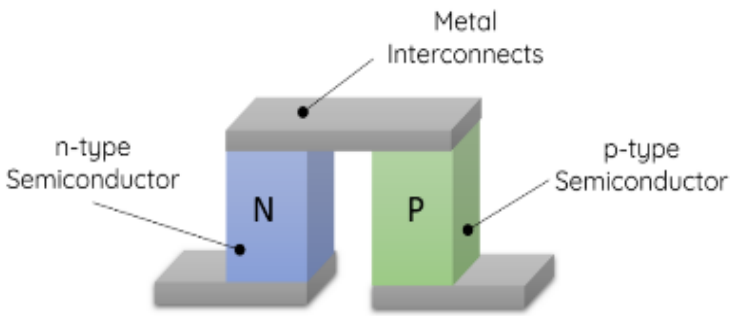

Fig 4. : Seeback effect

- **Thermoelectric system:**

Make sure to connect the energy of the heating system to the thermocouple and operate the heat from the heat source and fireplace. To use it, the system needs a large cooler, and the actual application is not easy. The staying side should be cooled. In addition to Heften and Kühlen, other matters related to the Wfter heat exchanger. The design of a reliable TEG system in high temperature conditions poses many challenges. In order to achieve high efficiency of the system, it is necessary to make a complete technical formation to compensate for the heat flow through the units and to increase the gradient temperature through them. To do this, you need to design a heat exchanger. Systems technology is one of the most important aspects of TEG technology. In addition, the system must reduce heat loss in some places due to intermediates between materials. Another challenge is to avoid a large drop in pressure between heat and cooling sources. When AC power is needed (for a power generator) the DC power must be transmitted through a transmitter that will reduce the power supply and increase the cost and complexity of the system.

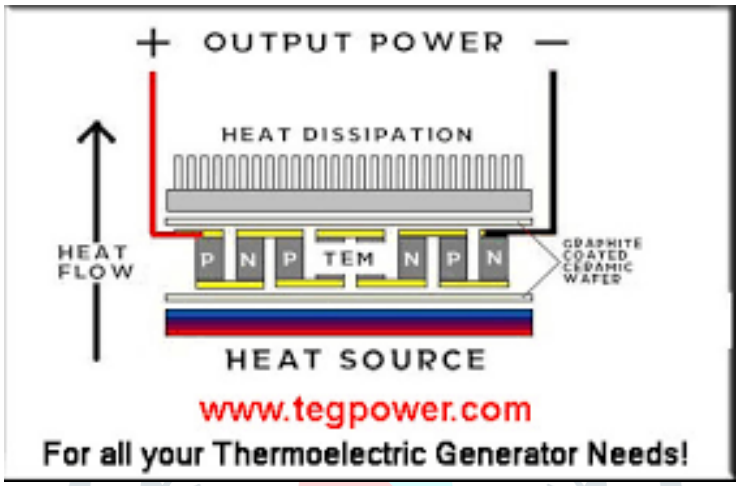

Fig 5. : TEG system

- **CONVENTIONAL MATERIAL:**

1. Low temperature materials (up to around 450 K): Alloys base on bismuth (Bi) in combinations with antimony (Sb), tellurium (Te) or selenium (Se).
2. Intermediate temperature (up to 850 K): such as materials based on alloys of lead (Pb)
3. Highest temperatures material (up to 1300 K): materials fabricated from silicon-germanium (SiGe) alloys.

IV. WORKING OF TEG:

Thermoelectric generators (TEGs) are semiconductors and semiconductors that are suitable for direct current and thermal heat fluctuations. Thermoelectric semiconductor components use the CIPIC effect to generate voltage. The resulting voltage controls the current and generates useful energy during transportation.

Devices of the heat generator. A heat generator is not the only one choosing a thermoelectric refrigerator. (I can connect to the TEC unit, Peltier module, cooling plugs, solid state cooling system). Unlike the heat generator, there is a built-in heat cooler. When voltage is applied to thermoelectricity, it is a regular electrical product. This current stimulates the Peltier effect. This effect transfers heat from cold to hot. Refractory thermoelectric are part of solid-state solid-state semiconductors. Composers have a common heat output, but the design of the composers differs from the design of the work.

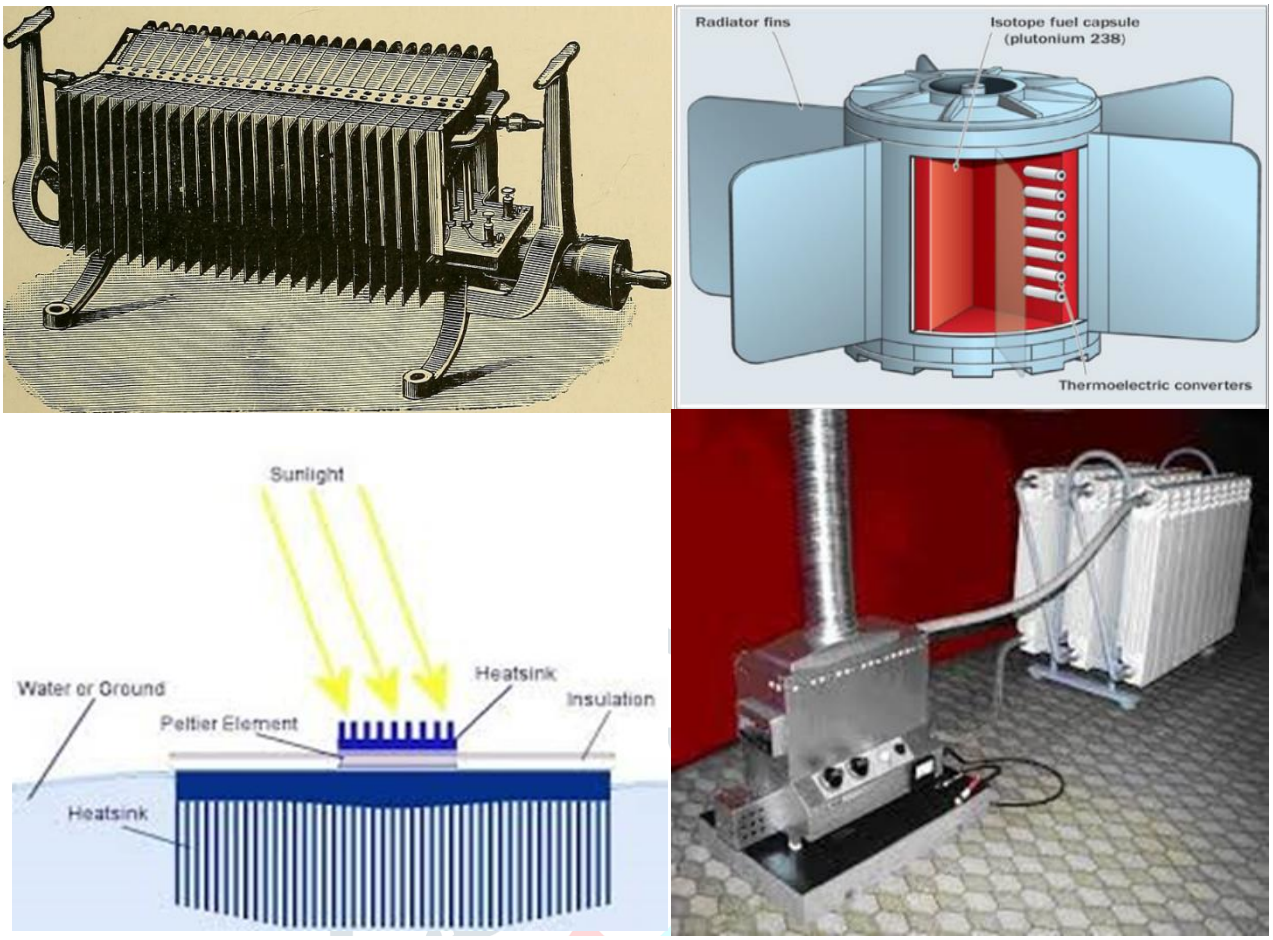

Fig 6. : Thermoelectric generator

Heat generators are used to generate electricity, and Peltier refrigerators are used to remove or increase heat. Mo cooling systems have many applications in the fields of refrigeration, heating, cooling, temperature control, and thermal management. The heater is the remaining axis at this location.

V. USES OF TEG:

- Thermoelectric generators are currently used in gas pipes. For example for cathodic protection, radio communication and other telemetry. Pipeline generators are Gentherm Global Power Technologies (formerly Global Thermoelectric), (Calgary, Canada) and TELGEN (Russia).

- Temperature generators are primarily used in remote areas such as remote and off-grid power plants. In these situations, the most reliable power plants (without static units) (therefore free of charge) operate non-stop in all weather conditions, and the battery can operate carelessly. Although solar photovoltaic systems have also been introduced in remote areas, solar PV may not be a suitable solution if solar radiation is low, i.e. Snowless latitudes or no sunlight, lots of cloud cover or tree cover areas, dusty deserts, forests etc.
- Genome Global Power Technologies (GPT) already has a mixed solution for male PVG, also known as Global Thermoelectric (Canada). When the male panel is low, it dries up in a deep discharge. Then the TEG sensor starts up as an energy store until the light comes on. The heat from the TEG can be caused by a low pressure fire powered by propane or natural gas.
- The thermoelectric generator has also been approved as an independent solar cell. Integration of a thermoelectric generator with direct solar heating with an efficiency of 4.6%.
- In addition to cars, waste heat is also generated in many other places, for example in industrial processes and during heating (wood-burning fireplaces, outdoor boilers, kitchens, oil and gas fields, pipes and communication towers with distance).

VI. ADVANTAGES OF TEG:

- Thermoelectric generators are semiconductor devices. If the moving parts don't break or tire, they are very reliable. Thermoelectric generators can last a long time. Voyager 1 space thermoelectric generator, used for 41 years since this publication. It has traveled more than 13 billion kilometers without maintenance or repair.
- Electric generators can be made completely silently.
- Thermoelectric generators do not require any greenhouse gases to operate. Some energy conversion technologies do.
- Thermoelectric generators do not have restrictions on fuels that can be used to generate the needed heat. Many other energy conversion technologies do.

- The temperature generator is designed for higher microwave and kilowatt energy levels.
- Thermoelectric generators work in any orientation. Some power conversion technologies are sensitive to their gravity orientation.
- Fall generators convert heat directly into electricity. Many energy conversion technologies require indirect steps when converting to electricity. For example, the fuel energy for the turbine is converted to mechanical energy, and then the mechanical energy in the generator is converted to electricity. Any change of energy includes waste in the form of waste. This makes generators more mechanical than other energy transfer technologies.

VII. DISADVANTAGES OF TIG:

- The efficiency of electro thermal generators is not as good as some other energy transfer technologies. This means that in generators with the same thermal energy (heat), this less heat is converted into electrical energy. For applications such as heat recovery without heat, this is not a big problem.
- It reminds us of a bright comedy and a friendly day with a student who integrates language and language skills without shouting after a junior officer.

VIII. CONCLUSION:

Solar generators are an interesting way to generate renewable energy from direct heat loss. However, their thermal and electrical properties are interdependent and their effectiveness is limited. However, line semiconductor technology makes it more attractive and efficient in special applications. Using a heat generator in a car storage tank will help reduce fuel consumption while preserving the world's natural resources and reducing carbon emissions.

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