Seebeck and Peltier : Conceptualising Passive electrical energy generators for totalitarian space structures of the future

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Abstract
Electrical energy is the most efficient energy for human civilization, and especially useful when thermal expansion and space are considered together. The author of this paper, understanding the demon that thermal expansion is in space and the angel electrical form of energy is, have designed a passive modular space structure for future (hypothesised) spaceships to rest on while charging their ships.

Introduction
Seebek generator converts heat flux into electrical energy while peltier cooler transfers heat from one point to another with consumption of electrical energy. The authors of the paper Thermoelectric Power Generation Using Solar Energy [1] have already given the values of different amounts of energy/voltage generated, the end goal of this particular paper is to design a passive structure for energy generation in space which will serve as a scratch point on which further innovation such as integration of peltier cooler would be achievable.

Design
The seebeck generator has been depicted below in figure 1.

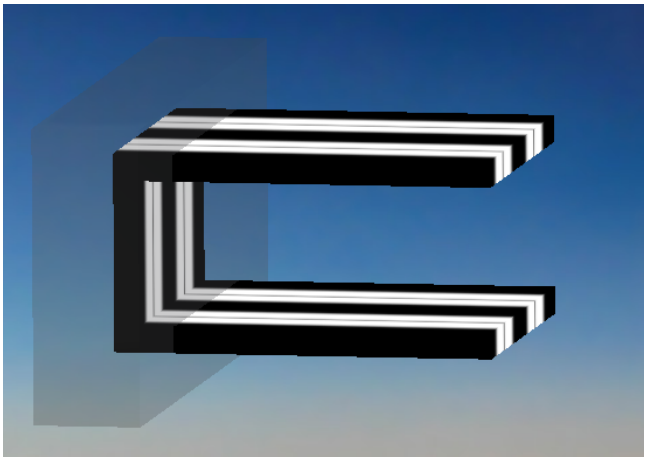

Figure 1

The stripes indicate a separated mixture of two elements and the figure having a heating chamber (almost transparent). The further development of the idea resides truly in the chamber in which greenhouse gas must be used with specific properties to be kept in mind such as, thermal expansion, expansion due to space, corrosive effects on the enclosure and heat absorption. Such modules can be combined to generate large enough voltage on a space hotel (hypothesised) and still be economically feasible as upfront cost and maintenance cost being as low as a power generator in near future can be.

The end product baseline while being flat still would be extremely productive (per unit value) when close to the sun has been illustrated in figure 2.

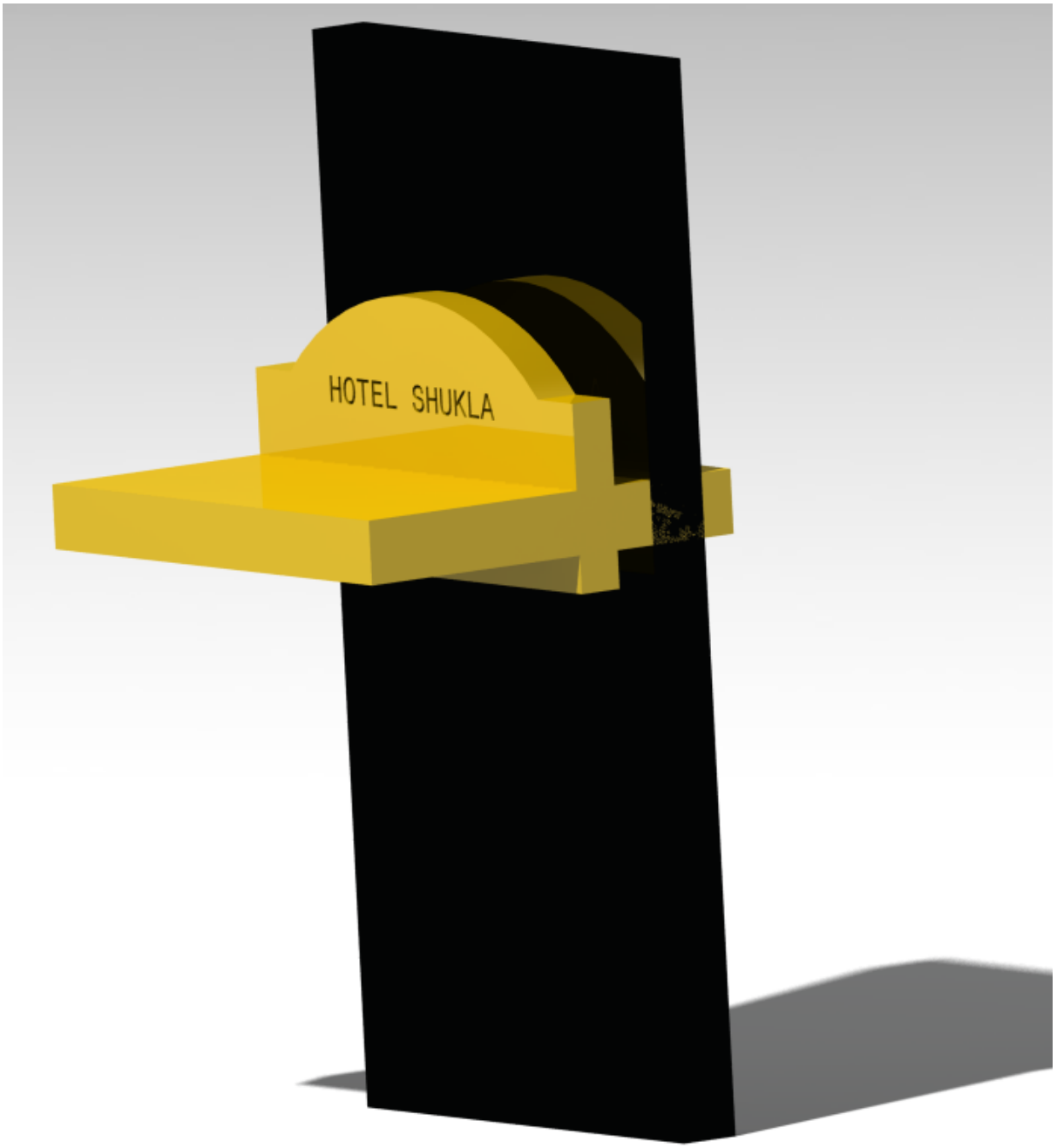

Figure 2

In figure two the black body is the one comprised of countless passive seebeck generator modules described above that theoretically would work for decades on end when designed by keeping thermal expansion and assembled module's topology optimization foremost priorities.

Conclusion

While the structure designed is comparatively cheaper than other alternatives, the economic feasibility heavily relies on then technology and the scaling down of these modules same as discussed in paper titled Macro to Nano: Scaling Effects of Bi2Te3 Thermoelectric Generators for Applications in Space [2] will also have a tremendous effect as generating electricity from methods such as nuclear and/or even industrial methods will generate a huge amount of heat while this design will be passive thus

eliminating the need to repair much often as any space structure needs to cool itself to reduce thermal expansion. The simplicite design will help in topology optimization and similar processes while for alternatives, upfront cost of resources will help in making this design something to consider and thus possibly becoming a benchmark for later generation's industrial (then) power generation complexes.

References

[1] Gayathri, Ms D. Binu1 Ms R., Mr Vijay Anand3 Ms R. Lavanya, and Ms R. Kanmani. "Thermoelectric Power Generation Using Solar Energy."

[2] Smith, Christopher James Wallace, James Sewell Cahill, and Altay Nuhoglu. "Macro to nano: scaling effects of Bi2Te3 thermoelectric generators for applications in space." *PAM Review Energy Science & Technology* 3 (2016): 86-99.