

عنوان مقاله:

Feasibility study of extracting electrical energy from OTEC by thermoelectric phenomenon

محل انتشار:

سومین کنفرانس بین المللی رویکردهای نوین در نگهداشت انرژی (سال: 1392)

تعداد صفحات اصل مقاله: 11

نویسندگان:

,Elham Farahi - Assistant Professor, Faculty of new sciences, University of Tehran

,Fatemeh Razi Astarai - Assistant Professor, Faculty of new sciences, University of Tehran

,Milad Ashouri - MSc Student of Renewable Energies, Faculty of new sciences, University of Tehran

,Parvaneh Ashouri - PHD student of environment, agricultural and natural resources college, University of Tehran

خلاصه مقاله:

Temperature gradient in ocean water layers can be used for providing heat source and heat sink of thermoelectric effect. The thermoelectric OTEC is a system which replaces the vapor derived generators in OTEC plants with compact heat exchangers integrated with thermoelectric generators and therefore requires no pressure vessels, working fluid pumps and other equipment in a vapor OTEC power plant. This concept was introduced in 19th century and some studies were presented then. However, the new advances in thermoelectric technologies have enabled us to produce power with even small ΔT (1-10K) and since the thermal capacity of the water is high, it suggests that the temperature gradient between ocean layers would relatively stayed the same. This has led us to study the feasibility of using Thermoelectric OTEC plants to produce electricity. Findings suggest that using this technology in a large scale can be useful for electricity generation especially in local areas, far-a-way islands or offshore oil facilities. Areas where temperature difference between ocean layers is more than 20K (such as Caspian Sea in IRAN) could be a desired choice for Thermoelectric OTEC. In this study the maximum available power output and thermodynamic efficiency of the system is presented.

کلمات کلیدی:

Thermoelectric, OTEC, Ocean energy, Renewable Energy

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