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Study on Electrification of Remote and Isolated Tropical Islands Using OTEC

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Abstract: *Apart from solar and wind energy as a form of renewable energy, ocean can also be considered one as approximately 2 to 3 billion MW power can be gained from it. Covering 71% of earth's surface the ocean is the largest solar energy collector absorbing about 70% of day's solar energy. On an average day the amount of heat energy absorbed by 60 million square kilometers of the tropical sea surfaces commensurate burning of 250 billion barrels of oil and when converted to electrical energy it can limit the demand of electricity for 260 million people per day. In this study we emphasized on converting this thermal energy from the sea to electrical energy in order to provide electricity to the isolated tropical islands. This can be practically done where there is at least 20 degrees' Celsius temperature difference exists between the upper and lower surface of the ocean. The conversion process involves evaporating an intermediate fluid like ammonia or direct evaporation of the sea water of upper surface and in both case cold water from lower surface performs the condensing task. Though the converted electrical energy is not sufficient for a large power plant but it can be an alternate source for the remote isolated islands where power from central grid cannot be reached. Apart from this, byproducts like pure desalinated water that can be used for pure drinking water and in agriculture sector of those islands; salt and cold water from the lower sea surface and this water can be used as industrial cooling of those islands.*