
UMR-MEC Conference on Energy

26 Apr 1974

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Eckert, E. R. G., "Solar-Thermal Energy Conversion" (1974). *UMR-MEC Conference on Energy*. 13.
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SOLAR-THERMAL ENERGY CONVERSION

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ABSTRACT

The fact that our conventional fuel resources are finite and will be exhausted some time in the future gives impetus to a consideration of solar radiation for conversion into heat or electric power. The characteristics of the solar radiation - that the energy flux density is small and that it arrives intermittently on the ground of our globe has to be considered in any system utilizing this energy source. For home heating parts of the roof offer a sufficiently large area, for electric power production areas of some km^2 are required to collect a sufficient amount of energy. Optical concentration, thermal collection by a fluid and electric collection are generally used in series. A crucial element in any scheme is the design of the solar collector. The conditions imposed by the specific application and the possibilities to obtain high collection efficiencies are investigated. Recent developments in thin film technology have provided means for improvement of the absorber and the glass envelope of the collector, and have brought solar thermal plants closer to a condition where it is competitive with other energy sources.