

## Investigation of Solar Concentrator Prototypes under Tunisian Conditions

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**Abstract :** Concentrated solar power technology constitutes an interesting option to meet a part of future energy demand, especially when considering the high levels of solar radiation and clearness index that are available particularly in Tunisia. In this work, we present three experimental prototypes of solar concentrators installed in the research center of energy CRTEN in Tunisia. Two are medium temperature parabolic trough solar collector used to drive a cooling installation and for steam generation. The third is a parabolic dish concentrator used for hybrid generation of thermal and electric power. Optical and thermal evaluations were presented. Solutions and possibilities to construct locally the mirrors of the concentrator were discussed. In addition, the enhancement of the performances of the receivers by nano selective absorption coatings was studied. The improvement of heat transfer between the receiver and the heat transfer fluid was discussed for each application.

**Keywords :** solar concentrators, optical and thermal evaluations, cooling and process heat, hybrid thermal and electric generation

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