# Feasibilities and efficiencies of the solar-driven refrigeration system

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The International Institute of Refrigeration in Paris (IIF/IIR) has estimated that approximately 15% of all electricity produced worldwide is used for refrigeration and air-conditioning (including heat pump) processes of various kinds. Refrigeration and air-conditioning are mostly driven by electricity. Regional shortage of electricity forces the price of electricity to high levels. This hampers the possibilities for a widespread availability of electricity for households for basic needs such as light for reading or electric cooking. For this reason increasing attention has been paid in the field of research and development of renewable energy and low-energy applications since the energy crisis in the 1970s.

All heat, mechanical work and electricity can drive refrigeration systems. Solar energy can drive the refrigeration system by both thermal energy and electricity. The feasibility of these systems is high. Furthermore, the demand of cooling is generally "in phase" with the solar intensities; the cooling load is high when the solar radiation is high.

This paper will clarify the possibilities for solar cooling in various climates (dry, wet etc.) dependent on local possibilities and conditions. This is achieved by selecting the suitable technology from a sustainable perspective including technical, environmental and economical aspects. The study adapts a system perspective including analysis of demand, local conditions and possibilities and various technical solutions rather than a specific technology (the "technology looking for applications" syndrome).