



**HIGHER TECHNICAL INSTITUTE**  
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**DIPLOMA PROJECT**  
**A SURVEY ON SOLAR**  
**AIR CONDITIONING OF BUILDINGS**

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# **A SURVEY ON SOLAR AIR CONDITIONING OF BUILDINGS**

By

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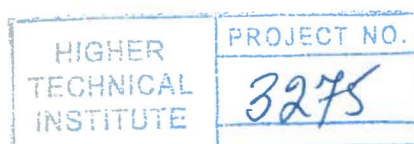
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# ABSTRACT

This project is intended to investigate the various Solar Air Conditioning systems that are available for installation with special reference to Cyprus. This situation is consisted to five Chapters.

Before that first there is an introduction concerning the use of such a System and an approach about Solar Cooling Systems that are used.

The first Chapter was to find literature concerning the components that are used for the collection and the store of Solar Radiation.

As for the next Chapter was to conduct a survey on the latest developments in the field of Solar Air Conditioning in buildings.

The third Chapter has to do with the economics of Solar Air Conditioning systems by depending the installation and cost of the components.

The next Chapter deals with the possibility of promoting Solar Air Conditioning in Cyprus depending the costs that are just mentioned from the previous Chapters.

Finally, the last Chapter presents the final conclusions of the project depending to the previous Chapters.

# Introduction

Solar Air Conditioning is defined as the system that can lower the temperature of a room by using solar radiation.

**Solar power and cooling** are a perfect match together. The more intense the sunshine, the more cooling energy is available. And, if there is "time of day" metering (higher rates during daytime peak demand) and lower rates at night, there will have even more opportunities to save on utility bill. The solar electric panel or battery supplies power. A 12 or 24-volt battery charger for triple redundancy could supply back-up power.

The energy of the sun, however, can be used to power a type of refrigeration system that can be used for space cooling. Since solar energy is a clean and renewable source of power that is abundant in many areas, it can be a reliable form of cooling.

The words "Solar" and "Cooling" might be an oxymoron they seemed to be impossible, but the sun can be a source of cooling in a number of ways. Solar Cooling has been a principal research target since the days of the energy crisis in the early seventies. Many developments have been made during years.

Some of them combine well with thermal solar energy. Ammonia-water-absorption cooling and water absorption cooling seems to be the most promising. However with water-absorption one cannot obtain refrigeration below 0°C. Crystallization energy



cooling as a system is extremely simple, but its refrigeration requires high temperatures, which result in expensive solar collectors and energy storage.

Another way to achieve that is by using Solar cells. They produce electricity, which is used to generate a power conventional Air Conditioning equipment day or night.

The simplest Evaporative Air Conditioning system, a pond of water on a flat roof, uses the sun to help evaporate the water. Evaporation of the water-cools the roof and the space below.

Many companies manufacture such systems like "Jade Mountain" who was played an important role for the project. Jade Mountain started as an "Access Company" in 1972.

An "Access Company" asks people what they need first and then helps them find it.

With this approach, the business stays more objectives. It manufactures many Solar Cooling systems like Solar Fridge, Solar Chillers, Attic fans. Polar Products was founded in 1979 based on the principal's expertise in DC and Solar Refrigeration. Later it changed its name to Polar Power to emphasize the energy portion of the company.

With those two companies and many others tried to change the future of Solar Cooling System.

The operation of Solar Cooling systems by experience suggests that the technology is rather more complicated and technically less developed than that for heating applications.