

1. INTRODUCTION

This Study is the result of Master Thesis Degree at the Royal Institute of Technology in Stockholm (KTH) in the Division of Building of Building Technology, over Erasmus programme. The objective of this project is to develop a low energy/exergy industrial building: a supermarket, which has an intensive energy need, was considered. Particular attention was paid to cold needs in warm climates and for this reason the supermarket is located in Valencia (Spain), representing a Mediterranean Climate.

The idea of the project is to study exergy consumption in the different steps of the energy production chain. Some studies have already been done with reference to the energy needs in houses using solar airborne collectors and energy heat storage [Noguera, 2007]. In this way, this study is focused in this area but in the opposite side, using a cold collector in order to accumulate low-temperature energy during winter time in a ground storage and to use it and in warm seasons in order to reduce the energy/exergy needs.

One of the organizations which promote researches and tools to improve the exergy efficiency in buildings is the International Energy Agency, which also receives the support of others organizations in many studies. One of them studies is the IEA ECBCS Annex 37 “Low Exergy Systems for Heating and Cooling of Buildings). The Guidebook of Annex 37 has a lot of information about systems that reduce the exergy consumption in buildings. However there is still a great potential for improving.

Figure 1 represents a comparison of the different ways to improve aspects in a building with the purpose of reducing the exergy needs. The extension of the exergy losses in each subsystem can be inferred from the figure. .