

## ABSTRACT

The aim of this master thesis is to study and compare the energy efficiency of existing housing units in Cyprus, using different software's in order to find the differences in the calculation process of the energy balance.

As part of this work, six (6) dwelling units were studied using two software which have different energy balance calculation codes, with different boundary conditions as regarding to temperature, solar radiation, wind speed and relative humidity. The housing units selected are representative of the main building typologies in Cyprus (single family houses, terrace family houses and apartments) and the year of their construction is divided into two chronological periods, before and after 2007, due to launching of the legislation concerning energy efficiency in 2007.

A semi-steady state model with a monthly calculation step and a model with seasonal energy balance calculation step were used. All the necessary data regarding the construction and the structural components and electromechanical installations of the buildings was collected and subsequently the energy assessment was conducted in order to export the energy gains and losses from the energy balance of each residence. Following the investigation of the energy efficiency of each building and the calculations of the energy balances, the results from both software were compared and conclusions about the differences that appeared were reached.

Finally, all the results were evaluated and presented in conclusions concerning the differences which could result from the use of different software for exporting energy balances.

**Keywords:** Energy balance, energy efficiency, primary energy, heat losses, heat gains