1. INTRODUCTION

Buildings in United States represents 40% of energy use in the country, this corresponds to about 10% of global energy use and contributes as much as 30% of a building operating cost (Stroupe, 2010). The importance of a green construction has become one of the greatest challenges for engineers who have to deal with energy efficiency measures, which means using less energy to achieve same results or use the same amount of energy to produce a better result. Here is where sustainability and environmental quality start a relationship that can be address as “Environmental Sustainability”, the balance between satisfy human needs while preserving the natural processes of the environment.
2. OBJECTIVES

2.1 General Objective

The purpose of this thesis is to show an actual energy analysis of a residential building located in New York City, implementing a simulation-based control approach to analyze the primary energy use and annual cost in a new residential building in order to achieve The Leadership in Energy & Environmental Design (LEED) certification.

2.2 Specific Objectives

2.2.1 Create a model that is able to act almost as the real building and track its physical behavior using DOE2-eQuest\(^1\)

2.2.2 Demonstrate a percentage improvement in the proposed building performance compared with the baseline building.

2.2.3 Utilize energy efficient measures to reduce electrical energy use and aims to achieve LEED certification

\(^1\) DOE-2 is a widely used and accepted freeware building energy analysis program that can predict the energy use and cost for all types of buildings. DOE-2 uses a description of the building layout, constructions, operating schedules, conditioning systems (lighting, HVAC, etc.) and utility rates provided by the user, along with weather data, to perform an hourly simulation of the building and to estimate utility bills. (Hirsch, 2012)