Politecnico di Torino

Honors Thesis

Master of Science in Sustainable Architecture

Abstract

ENERGY RENOVATION THROUGH SMART DEVICES TO ENHANCE CONTEMPORARY BUILDINGS:THE CASE STUDY OF THE "UNITÀ RESIDENZIALE OVEST" IN IVREA.

Tutor/Correlator

Tutor Carlo Micono
Correlator Rocco Antonio Curto

Candidate

Enrico Fucci

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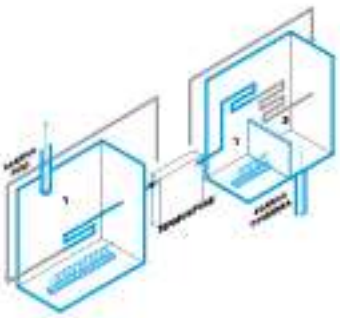
What has been influencing the last century in terms of demographic growth, tecnhnological improvement and energy demand, has put the actual system in a highly critical situation.
Nowadays society has to face issues due to the frenetic will, of earlier genereations, to increase their power the faster possibile, in spite of who, in the future, would have live the same places.
The reckless exploitation of any kind of asset which could have bring profit, made some of the such ressources unusable to this day, both beacause of their limited nature, or their quality, since they may have been discovered lately as dangerous, for the enviroment and human healt, or because the turned out to be outdated.
Learning how to manage wisely our ressources, may results as the key in order to limit past damages and to learn how to avoid any other in the future.
This thesis aim to define, in terms of quantity and quality, how the integration of building systems could be helpful, allowing the minimisation of system losses due to malfunctioning or such, and, in the same time, teaching users their impact on the energy demand and how to manage the enviroment in order to improve their comfort.
Since the residential sector is the heaviest as regards energy demand and pollutants emission, we decided to analyzed home automation systems.
Furthermore, learning something which your actions make you responsable for, improve the awarness around their consequences and helps to identify the better habits.
So, starting with a description of home automations through time, it has been hypotized the application of the system on a case study, in order to analyse then what this means in the matter of energy supply and related enviromental footprint.
Eventually, an economic sustainability evaluation has been conducted in order to identify, among several designing solutions, which was the most effective from an econimic, enviromental and social point of view.

SCENARIO UNO	SCENARIO DUE	SCENARIO TRE
		

INDICATORI DI FATTIBILITÀ

NPV	**NPV**	**NPV**
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SPB	**SPB**	**SPB**
21,65 ANNI	20,45 ANNI	27,16 ANNI
SIR	**SIR**	**SIR**
0,92	0,98	0,74

RISPARMIO ENERGETICO TOTALE

RISPARMIO EMISSIONI CO_2

> 15,3%

> 19,4%