

Resum de Tesi Doctoral



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH

Escola de Doctorat

DNI/NIE/Passaport	<input type="text"/>
Nom i cognoms	<input type="text" value="Montserrat Bosch González"/>
Títol de la tesi	<input type="text" value="Energy efficiency in school buildings in the Mediterranean city. A case study of Barcelona"/>
Unitat estructural	<input type="text" value="Institut de Sostenibilitat - 480"/>
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(Mínim 1 i màxim 4, podeu veure els codis a <http://doctorat.upc.edu/gestio-academica/impresos/tesi-matricula-i-diposit/codis-unesco>)

Resum de la tesi de 4000 caràcters màxim (si supera els 4000 es tallarà automàticament)

Based on the experience gained during more than 10 years working on energy efficiency in public buildings of various uses, this thesis develops a methodology for intervention in school buildings. The aims were to define the key indicators for identifying opportunities for savings; to assess possible measures for reducing consumption by limiting demand and improving the efficiency of the systems; to analyse and highlight the role played by each of the actors involved in the strategies of use and management of school buildings; and to establish the key criteria for carrying out future energy rehabilitation projects.

Chapter 1, Prologue, presents the principles on which the thesis is based.

Chapter 2, Presentation of the research, defines the overall objectives: to establish a methodology for analysing the stock of built schools; to identify the tools for making key decisions on energy; and to propose and validate a methodology for intervention regarding energy. It also defines the specific objectives: to identify and define indicators of energy efficiency; to characterise the stock of built schools and consider opportunities for improvement; to consider energy rehabilitation as a priority; to assess school buildings in terms of energy; to establish the strategic lines of action; to promote the objective of reducing consumption; and to identify and demonstrate opportunities for improvement. Finally, the hypothesis is put forward.

Chapter 3, Background, frames the thesis within the map of strategies developed by the various government entities and public authorities; it identifies the organisations and regulatory documents and the EU directives; it studies the energy situation in Catalonia and in Barcelona in particular; it analyses the various plans for improving energy; and, finally, it identifies strategies aimed at public buildings and in particular at schools.

Chapter 4, State of the art, presents the references of large-scale European experiences consulted, divided into themes: how the stock of schools is analysed using different strategies and methods, and how these are characterised; which parameters are considered; which factors are inevitable; who manages school buildings and how; and how the lines of intervention are established and evaluated economically and environmentally.

Chapter 5, Research methodology, presents the work done prior to the writing of the thesis and presents the methodology of analysis used to evaluate the school buildings under study. It specifies how the sample was identified, how the problems were diagnosed, how the buildings were assessed in terms of energy, the parameters of comfort and the resource management. Finally, it identifies the key indicators used to obtain the research results.

Chapter 6, Results, presents the exploratory analysis of general data and of the buildings, which were subjected to a detailed study and a multivariate analysis using the indicators identified in the methodology, and a multiple regression analysis of the results which validated the research arguments.

Finally, Chapter 7, Conclusions, first states that the general and specific objectives stated at the beginning of the research project have been fulfilled and argues that the hypothesis is valid. It then presents the final results of the research, which could and should be used by authorities responsible for school building management to design intervention strategies for existing buildings regarding energy and environment. Finally, it suggests future lines of research that should be implemented to solve some of the current sustainability challenges related to construction and the associated energy consumption.

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