SHOULD WE CONSIDER CLIMATE CHANGE FOR BRAZILIAN SOCIAL HOUSING?
ASSESSMENT OF ENERGY EFFICIENCY ADAPTATION MEASURES
Maria Andrea Trianaa*, Roberto Lamberts, Paola Sassi

a Laboratory for Energy Efficiency in Buildings (LabEEE), Department of Civil Engineering, Federal University of Santa Catarina, Florianópolis, SC 88040-900, Brazil
b School of the Built Environment, Department of Architecture, Oxford Brookes University, Gypsy Lane, Oxford OX3 0BP, United Kingdom

*Corresponding author. Tel.: +55 48 3721-5184. E-mail address: mandreat@hotmail.com (M.A.Triana)

Highlights
- Assessment of energy efficiency measures for adaptation to climate change.
- A representative building typology for social housing was assessed.
- Evaluation in two Brazilian cities in view of climate change.
- Indicators: energy efficiency, and cooling and heating degree-hours for analysis.

Abstract
Social housing sector is very important in Brazil, due to the necessity of expansion and investments being placed through a substantial government program. Residential buildings are expected to last at least 50 years according to Brazilian standards. Many residential projects in the sector already perform medium or poorly in terms of energy efficiency and thermal comfort today, and their designs are not analysed considering climate change. Therefore, the aim of this paper is to investigate the result of analysing the thermal and energy performance of social housing projects considering climate change, and to assess the impact on the operational phase of introducing energy efficiency measures in the sector, and exploring methods of adaptation to climate change. A representative project of the lower income sector housing was used as case study with the evaluation of measures through thermal and energy simulation with current and future weather files for the cities of São Paulo and Salvador. Results were compared using predicted energy consumption and cooling and heating degree-hours as indicators. The results highlighted some differences related to the climate scenarios and indicator analysed, and showed that the incorporation of energy efficiency measures in current social housing projects is of fundamental importance to minimize the effects of climate change in the coming decades.

Keywords: social housing; energy efficiency; adaptation measures; climate change; thermal performance.

1. Introduction
The construction industry is associated with a high environmental impact due to its use of natural resources coupled with rising demand in line with rapid population growth. A major impact is the energy consumption and associated emissions of greenhouse gases that influence climate change through global warming [1]. Due to the long life in use of buildings, changes in climate can influence energy demand for heating and cooling and consequently the emissions of greenhouse gases from buildings [2]. However, in Brazil most studies of the energy performance of buildings that use thermal and energy simulations to predict building performance only make use of past weather files.

In Brazil, the housing deficit is around 5.8 million, 85.7% is urban and 82.5% affects families with incomes up to a maximum of three times the minimum wage [3]. In 2009 the Brazilian government launched the “My house, My Life” Program, as a strategy to address the deficit [4]. Housing Companies and Public Agents linked to States and Municipalities are the main agencies to deliver housing projects in the lower income sector, and they tend to prioritize...
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات