EMERGING ECONOMIES
BOOK OF ABSTRACTS

SÃO PAULO – SP, BRAZIL, JUNE 28TH TO 29TH, 2012

SASBE2012

4TH CIB INTERNATIONAL CONFERENCE ON
SMART AND SUSTAINABLE BUILT ENVIRONMENTS

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BOOK OF ABSTRACTS

1st. Edition

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THE CONFERENCE: FOCUS AND THEMES

SASBE2012 is the fourth in a global conferences series, being the previous editions organized in Australia (2003), China (2006) and The Netherlands (2009). At global level, organization is hosted by CIB (International Council for Research and Innovation in Building and Construction) Work Commission 116, which shares the conference name. The Brazilian edition is a collaboration between UNICAMP, UFES and SindusCon-SP, chaired by Assoc. Prof. Dr. Vanessa Gomes (UNICAMP, CIB, iiSBE).

SASBE2012 takes on the batten from previous events and moves forward from sustainable development theories to professional practice with tangible outcomes, particularly in emerging economies contexts. In the past decade, strong efforts in developing countries have focused on leveling the playing field, on envisioning a more sustainable future, and on exploring management and innovation for sustainable building. SASBE2012 also takes in the challenge of helping to instrument such transition.

A post-conference book will include invited contributions. The Smart and Sustainable Built Environment (SASBE) journal, to be published by Emerald Group Publishing Limited, will be launched during the conference. Revised versions of SASBE2012 best papers will be encouraged for publication in a special 2013 number of the SASBE Journal.

The conference will focus on Emerging economies, which creates a very fertile opportunity to also build upon discussions developed in the week before during the United Nations Conference on Sustainable Development | Rio+20, scheduled for June 20th and 22nd in Rio de Janeiro. Rio+20 Conference will focus on two themes: (a) agreen economy in the context of sustainable development and poverty eradication; and (b) the institutional framework for sustainable development.

The concept of green economy focuses primarily on the intersection between environment and economy. The UNEP report "Towards a green economy: pathways to sustainable development and poverty erradication" demonstrates that the greening of economies is not generally a drag on growth but rather a new engine of growth; that it is a net generator of decent jobs, and that it is also a vital strategy for the elimination of persistent poverty. In the report's Part II (Investing in energy and resource efficiency), two chapters were dedicated to sustainability of the built environment, namely to buildings and cities. The report also aimed at motivating policy makers to create the enabling conditions for increased investments in a transition to a green economy.

The discussion on Institutional Framework for Sustainable Development (IFSD) responds to the need addressed in Chapter XI of the 2002 Johannesburg Plan of Implementation (JPOI), and encompasses the role of institutions comprising the economic and social pillars, how to step up efforts to bridge the gap between the international financial institutions (IFIs) and the multilateral development banks (MDBs), and the UN agencies, programmes and funds, and enhance the integration of sustainable development in their activities.

Under the scientific coordination of Prof. Dr. Maristela G. Silva (UFES, CIB), SASBE2012 invited contributions and case studies to push forward implementation and demonstration of advances on, among other subjects:

1. Design, development and operation of smart and healthy workplace and living environments;
2. New systems, innovative technologies and high performance products responding to emerging challenges such as climate change, closed materials loops, security, alternative energy, passive design, life-cycle assessment, and integration with natural systems;
3. Evaluation on the methods and techniques of smart and sustainable design, construction, and operation of new built facilities and regeneration of existing ones;
4. Improvement of sustainability deliverables in projects through management processes, regulations, governance and community engagement;
5. Management of knowledge on innovation and sustainability for the built environment; and
6. Communication, education and training of sustainable development principles and professional skills.
7. Smart and sustainable buildings, infrastructure, districts, cities and the community

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DEFINITION OF THE ENERGY PERFORMANCE REQUIREMENTS IN REHABILITATION PROJECT

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Summary

Building rehabilitation is essential to achieve the targets defined by the EPBD-recast regarding energy efficiency, reduction of carbon emissions and use of on-site renewable energy sources.

To propose an effective building rehabilitation it is necessary to study the best combination of available options in terms of construction solutions, technical building systems (hot water, ventilation, heating, cooling and lighting), their cost, but also their impact on the thermal and acoustic comfort and indoor air quality of the building. Also, the definition of the cost-optimal level is essential, which is the minimum lifecycle cost (including investment costs, maintenance and operating costs, energy costs, earnings from energy produced and disposal costs) of each individual measure.

In this work the multi-criteria decision analysis method ELECTRE III will be applied to balance all these aspects, during the design phase of a refurbishment project, in order to assist the design team on the selection of construction solutions and technical building systems.

A simple case study is presented to demonstrate the feasibility of this approach in what concerns the definition of the energy performance requirements (e.g. thickness of insulation and efficiency of the heating system/air-conditioning system etc.), of a rehabilitation project. In this example several retrofit alternatives were studied, their implementation could lead to the reduction of the energy needs of the building from 13% to 83%. With this approach it was also possible to identify the alternative with the best global performance considering the investment costs, energy needs, indoor air quality, thermal comfort, and CO_2 emissions.

Keywords: rehabilitation, cost-optimal, EPBD-recast, building energy efficiency, life-cycle cost