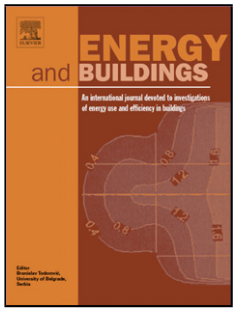
Accepted Manuscript



Title: Techno-economical analysis based on a parametric computational evaluation for decision process on envelope technologies and configurations evaluation for decision process of envelope technologies and configurations

Authors: Lavinia Chiara Tagliabue, Giuseppe Martino di Giuda, Valentina Villa, Enrico De Angelis, Angelo Luigi Camillo Ciribini

PII: S0378-7788(17)33292-9
DOI: https://doi.org/10.1016/j.enbuild.2017.10.004
Reference: ENB 8022

To appear in: *ENB*

Received date: 31-10-2016
Revised date: 19-9-2017
Accepted date: 1-10-2017

Please cite this article as: { https://doi.org/

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

<AT># Techno-economical Analysis based on a Parametric Computational Evaluation for decision process on envelope technologies and configurations evaluation for decision process of envelope technologies and configurations

<AU>Lavinia Chiara Tagliabue[a*] ##Email##chiara.tagliabue@polimi.it##/Email##, Giuseppe Martino di Giuda[b], Valentina Villa[c], Enrico De Angelis[b], Angelo Luigi Camillo Ciribini[d]
<AU>
<AFF>[a]Department of Inormation Engineering DII, University of Brescia,Via Branze 38, 25123 Brescia, Italy
<AFF>[b]Department of Architecture, Built environment and Construction Engineering ABC Politecnico di Milano, Via Ponzio 31, 20133 Milano, Italy
<AFF>[c]Department of Structural, geotechnical and Building Engineering DISEG, Politecnico di Torino, Corso Duca degli Abruzzi, 24, 10129 Torino, Italy
<AFF>[d]Department of Civil, Environmental, Architectural Engineering and Mathematics
<AFF>DICATAM, University of Brescia, Via Branze 43, 25123 Brescia, Italy

<PA>[*] Corresponding author: Tel.: +39 02 2399 6018; fax: +39 02 2399 6020.

<ABS-HEAD>Highlights► Envelope refurbishment can strongly influence the energy saving in existing buildings. ► Different technologies can provide suitable results by the energy point of view. ► A multi-criteria analysis allows to correlate energy, environmental and economic issues. ► Parametric analyses compare insulation levels and transparent envelope configurations. ► Synoptic diagrams synthetize embodied and running energy vs costs to define the most suitable technological solutions in representative climate contexts.

<ABS-HEAD>Abstract

<ABS-P>Energy saving is crucial for existing buildings which is present a huge potential of improvement by a strong energy retrofitting. Often, the existing envelope components are not adequately insulated and deep refurbishment is required to comply current regulations to improve energy efficiency and address Nearly Zero Energy Building (NZEB) goals. The strategies to enhance buildings energy performance involve heating and cooling demands strongly dependent by envelope quality (i.e. insulation, thermal mass, internal gain storage capacity and solar heat gains exploitation). Commonly, the suggested main retrofit interventions on envelope are glazed surfaces replacement, Solar Heat Gain Coefficient (SHGC) reduction and thermal transmittance (U value) improvement by additional insulation layers or even components replacement. However, it is worthy to note that the resulting thickness of the external envelope and the payback time of the interventions are important supports for decision-making. The environmental issue related to CO_2 emissions during the operational phase of the building is encompassed into the standard energy certification of the asset and the conversion factors to define fuels' impacts are available and updated. However, the calculation excludes the environmental impact due to energy used for materials' production and few official information sources provide accredited values, e.g. the Environmental Product Declaration (EPC). Going towards a Zero Energy Building, which reduces its environmental impact during the running phase, embodied energy claims an increasing weight. Thus, materials and components with low embodied energy should be favoured and endorsed. For this reason, the most influential rating systems worldwide available for building sustainability assessment (e.g. LEED, BREEAM, etc.)

Download English Version:

https://daneshyari.com/en/article/6729457

Download Persian Version:

https://daneshyari.com/article/6729457

Daneshyari.com