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Title: Cost Effective Energy and Carbon Emissions Optimization in Building Renovation (Annex 56)

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Title**Cost Effective Energy and Carbon Emissions Optimization in Building Renovation
(Annex 56)****Authors and Affiliations**

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Highlights

- A new methodology is proposed for energy related building renovation.
- Cost-effective balance between energy consumption, carbon emissions and overall added value.
- Co-benefits achieved by the renovation process are considered.
- Residential and non-residential buildings without complex HVAC technologies are investigated.
- Recommendations are delivered for policy makers and professional owners.

Abstract

The construction sector has become an important target for reducing carbon emissions and energy consumption and for curbing resource depletion, because of its relevance in all these important areas. Many of the current energy related policies have their focus on new buildings but, due to the low rates of replacement of the existing building stock, it is crucial that the low energy performances of these buildings is improved. Most of these buildings, due to design and construction constraints, may not be able to reach the new energy efficiency standards, which many times involve complex construction works. Nevertheless, the achievement of significant reductions in energy consumption and carbon emissions may not always require a highly efficient solution for the envelope. Other solutions, combining energy efficiency measures and the use of renewable energy, are also possible.

In this context, the key research problem addressed in Annex 56 was to understand how far it is possible to go with energy conservation and efficiency measures and from which point the measures to foster renewable energy use become more economical taking into account the local context and the many restrictions the existing buildings face. Thus, a new methodology was developed to be used in the decision making process for energy related building renovation, allowing to find a cost-effective balance between energy consumption, carbon emissions and overall added value achieved in the renovation process.

The methodology developed within IEA EBC Annex 56 project aims at defining, assessing and comparing energy renovation activities in a cost-effective way, optimizing the energy use and the carbon emissions reduction, mainly in residential buildings but also in non-residential buildings without complex HVAC technologies. The methodology explores the full range of cost-effective reduction of carbon emissions and energy use and takes into account also the additional benefits and the overall added value achieved by the building within the renovation process.

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