Available online at www.sciencedirect.com

ScienceDirect

Energy Procedia 96 (2016) 404 – 412

Energy Procedia

SBE16 Tallinn and Helsinki Conference; Build Green and Renovate Deep, 5-7 October 2016, Tallinn and Helsinki

Enabling the landscape for deep green renovations

Maija Krizmane[a,]*, Anatolijs Borodinecs[a], Egils Dzelzitis[a]

[a]*Riga Technical University, Kalku iela 1, Riga, LV-1658, Latvia*

Abstract

The benefits of deep green renovations speak for themselves. At the moment the number of deep green renovations has grown significantly and the results have shown a variety of benefits from deep renovations both from a health and wellbeing perspective as well as economical perspective. Yet when looking at the existing building landscape, the vast majority of buildings in Baltic countries as well as in Europe are not renovated deeply or renovated at all and have reached or are about to reach the end of their expected lifetime. The multi-apartment stock accounts for the largest share of the existing building stock both in terms of the number of inhabitants as well as square footage. For example, only in Riga, largest share of multi-apartment buildings – 40% (18.44 million square meters) were built 36 to 55 years ago. Taking into account that most multi-apartment buildings were built to last for 30 years or even less, complex renovations are crucial in order to continue the exploitation of the stock. The large scale renovations uptake, both using the EU's structural funds and private sector financing also opens a room for innovation and improvements both in the existing building stock and building sector in general. In order to attract investments, a logical building sector system is required. Deep green renovations help shaping the system and improving the existing practices.

The four key elements for implementation of deep green renovation practices on a national and regional levels are policy and regulation, finance and economics, skills and capacity building and overall awareness. This paper discusses the potential in each of these elements and looks at best existing practices. One of the key challenges of identifying the most successful practices is the impact data collection, meaning that for many of these initiatives only the expected impact is estimated, but no measures to evaluate actual results have been taken. Additionally, paper discusses the necessary connections between these elements in order to reach the quickest possible result and most rapid improvements in the existing building stock. The hypothesis states that the finance for deep green renovations will flow once the society asks for quality in renovations, enough skilled specialists are in place to carry out different works in the deep renovation process and legislation is progress driven and innovation enabling. However, the conclusions state that awareness of society is an umbrella process that needs a continuous improvement through various forums and continuous advocacy to ensure development on other processes related to it.

Peer-review under responsibility of the organizing committee of the SBE16 Tallinn and Helsinki Conference.

Keywords: deep renovation, energy efficiency, well being, green building, renovation strategy

* Corresponding author. Tel.: +371-2622-7672.
E-mail address: maija.krizmane@gmail.com

Peer-review under responsibility of the organizing committee of the SBE16 Tallinn and Helsinki Conference.
doi:10.1016/j.egypro.2016.09.168

1. Introduction

When considering the importance of deep renovations, multiple criteria need be considered. First of all, looking at the global trends in climate change mitigation and adaptation efforts, buildings and the energy consumption accounts for large percentage of global emissions. In 2010, buildings accounted for 6.4% of global emissions directly and 12% indirectly (considering their energy consumption) [1]. Therefore, recognizing the global effort, including the new Paris agreement, agreed in December 2015 and recently signed on the 22nd of April 2016, when planning new buildings and considering the existing building stock, the mitigation on emissions that are created in order to meet energy demand in buildings must be considered. Various measures can be implemented in order to contribute to this global effort and ensuring that the demand in buildings sector for emission intensive energy decreases.

Secondly, buildings are essential for meeting the basic needs of humans and therefore key to meet the social fairness goals. The housing policies have been a major concern for politicians throughout centuries. And the near past and historical heritage is the part of building stock that requires the most urgent attention because it is and will be where our homes are. For example, looking at the Baltic countries, the large number of Soviet block buildings were built during 1980s. And this kind of establishment of homes is not expected to happen in the near future with current circumstances. Even the ''housing boom'' in the period of 2004-2007 the number of homes build is not comparable to the number of soviet block buildings, nevertheless to the existing stock overall.

These two elements show the kind of positive impact deep renovations can have both environmentally and socially. That includes human health and well-being aspects and those are the ones that need urgent and specific attention when implementing deep renovations. This highly relates to the quality issue. Many case studies of recent renovations show two main concerns regarding quality. Firstly, the intended energy savings are not reached in many cases due to poor quality projects, materials or building works. Secondly, the indoor environmental quality is low due to insufficient ventilation solutions or inadequate quality material selection, as well as lack of user education.

In order to consider these and many other specific elements in terms or implementing deep renovations on a large scale, strategies need to be defined on various levels. The EU Energy Efficiency directive is an umbrella process for the EU-28 countries in terms of energy efficiency and is the main instrument for implementing EU's goals in terms of energy efficiency increasing by 20% up to year 2020. The Article 4 of the directive states that Member States shall establish a long-term strategy for mobilizing investment in the renovation of the national stock of residential and commercial buildings, both public and private. This strategy shall encompass: (a) an overview of the national building stock based, as appropriate, on statistical sampling; (b) identification of cost-effective approaches to renovations relevant to the building type and climatic zone; (c) policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations; (d) a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions; (e) an evidence-based estimate of expected energy savings and wider benefits. A first version of the strategy shall be published by 30 April 2014 and updated every three years thereafter and submitted to the Commission as part of the National Energy Efficiency Action Plans [2].

The strategy making enables space for conversations between various stakeholders involved – governments, financial institutions, energy providers, public agencies, non-governmental organizations, building users, construction businesses, research institutions, media and others. This debate is at the same time an opportunity and challenge. However, it allows considering different aspects. This paper considers the various aspects of this debate and their cross cutting relations. Those aspects fall under financial and economic considerations, policy and regulatory frameworks, raising of skills and capacity and overall awareness among stakeholders and broader society.