

**How do we make climate renovation attractive, affordable and replicable in social housing? An explorative paper in 6 chapters.**

Introduction

Thanks to EU energy targets and widespread energy poverty (i.e. necessary heating considered too expensive), energy saving remains a key driver for social housing renovations.

Still, indoor air quality is essential to maintain good health. As Dr. Susanne Deoux puts it: "We pay attention to our food, and not to what we are breathing - whereas we breathe 15 kg of air per day!"

Fortunately, key findings from the RenovActive concept suggest that a more balanced approach in terms of climate renovation is possible. The project is tested in a strategic partnership between the VELUX Group and the social housing company Le Foyer Anderlechtois in Belgium. The key message appears to be: *Keep it simple.*

Innovation should be viewed in terms of system use rather than system complexity. In the case of the RenovActive concept, the construction of a central stairwell generated a clear perceived benefit in terms of daylight distribution, thorough ventilation and natural cooling.

This system approach is adaptive to the users' needs AND comprises simple and proven solutions that make the concept replicable and affordable. Once users begin to perceive energy solutions as healthy and comfortable, the demand for climate renovation will take off.

### How do we approach the subject?

Research shows that we need a holistic approach to future building design. Most importantly we need to consider, what drives the inhabitants sense of wellbeing in their homes.

The sensation can differ across countries and climate zones, but what remains is that people prefer houses with a clear sense of comfort. This is important, since we build houses for people – not to save energy.

Several issues must be taken into consideration, if inhabitants are to support healthy design solutions:

- Social aspects must be appreciated. For instance, closing off the kitchen might limit the spread of dangerous particles, but could also limit the interaction with family and guests.
- Education is not the answer. People react to immediate sensory input and seldom use educational advice to acquire new habits, e.g. air out frequently or dry clothes outdoors.
- Simple solutions are key. Users look for practical solutions that are instantly applicable. They want to live in their home – not go to work in it.

### What are the barriers and opportunities?

A number of challenges await in order to increase the number of healthy homes by climate renovation:

- Expected life cycle costs of buildings need close monitoring.
- Prejudices against alternative construction methods.
- Home behaviour and health depend on each other.
- Inhabitant education to achieve healthy living conditions.

To tackle the challenges, an array of tasks need to be solved:

- We need to introduce a new notion of building.
- We need to depart from pre-industrial building concepts.
- We need to embrace economic efficiency by repetition.
- We need to introduce pre-installation in building.
- We need to include inhabitants' requirements.

To achieve our goals in an affordable way, it is critical that we reduce the number of standards and simplify building processes. *Keep it simple.*

### Do we need an Active House label to drive the growth of healthy buildings?

Labelling could present a number of advantages.

To begin with there is the pull-factor, where people actively manage their purchase according to certain certified solutions. Of course, it requires as a prerequisite, a level of consumer education. Secondly, the push-factor could be interesting for developers and manufacturers – pushing the label to acquire a competitive edge. That would require the label to be valued above the existing array of labels – of which there are more than a few.

So, is it viable to introduce a new label – and how could it be done? Let's start with the latter:

- Start with the architects and continue to the niche developers – they could all use the label as a welcome differentiator.
- Investigate if sales website is receptive to the label and suggest manufacturers of prefabricated products to highlight their portfolio with an above-standard certification.
- Develop the label on the Active House concept and the processes involved in the concept, in order to keep the cost of evaluation low. Avoid setting up a costly certification body.

And then there is the question regarding viability:

- The label needs to perform. Whether you are a social housing company, a private developer or a hotel owner there must be a return on investment.
- Converting a sale relies on emotional aspects as well as rational. The importance of experiencing the solution in real life often surpasses the label's ability to convince, using ambitious words and tantalizing promises.
- The house needs to work without too much human interference. As mentioned before – it's a home, not a workshop.

### Is legislation the right way to promote healthy buildings?

Can new legislation help to promote healthy buildings in relation to an expected revision of EPBD (Energy Performance of Building Directives) and the national implementation of EPBD? The question has become relevant, since healthy buildings are not largely supported at the moment in national building legislation – and because an EPBD review is underway.

Daylight and indoor climate requirements are valued very little on a national level. In contrast, when setting energy performance requirements EPBD states that indoor climate and daylight must be included. National requirements mostly focus on the thermal characteristics of buildings.

A number of initiatives would help to push the agenda of healthy buildings on a legislative level:

- Clearer guidance and tools for setting daylight and indoor climate requirements. Also, tools such as Energy Performance Certificates (EPCs) must include daylight and indoor climate indicators, “building passports” and inclusion of daylight and indoor climate aspects in the cost optimality calculations (Annex I).
- National legislation, based on EPBD, needs to be enforced more rapidly and best practice on healthy buildings requirements must be shared. For instance, the new building regulation (BR15) in Denmark has introduced two low-energy renovation classes based on overall energy use. To get the highest class 1 certain indoor climate criteria based on thermal comfort, air quality, and daylight conditions must be met.
- Building professionals in the construction sector need to be educated about the benefits. Training and skill upgrading will help improve the quality of solutions, which have an impact on indoor air quality. Finally, we need to promote the benefits of daylight and indoor climate as well as translate technical terms into tangible benefits, e.g. xx ppm level.

#### Could user-centric tools help inhabitants improve indoor climate?

Finally, the ability to guide inhabitants on a day-to-day (or even moment-to-moment) basis reveals new opportunities to improve the indoor climate. The idea of supporting tenants with instant messaging or “nudging” could lead to a higher awareness and eventually a change in general behaviour.

Messaging via e.g. a smartphone app could be divided into short-, mid- and long-term guidance and go from “High humidity – open window now” to “Your energy consumption has increased. Please investigate”.

Of course, it is no substitute for building automation. However, automation could also be used to educate inhabitants by explaining the reason for different operations, e.g. why windows are closed or awning blinds activated during the day.

*The above statements and claims are based on seven round table sessions, performed during the 2<sup>nd</sup> Healthy Buildings Day in Brussels, with the participation of leading European experts and scientists, house builders, architects, planners, social housing association, policy makers and public servants. The sessions were organized around the overarching topics of affordable and healthy housing, posing questions:*

- *Social housing – can we expect affordability in renovation?  
Housing replicability – which solutions are here today?*
- *Healthy Homes and Buildings – what are the key research questions?*
- *What are the barriers and opportunities for healthy affordable homes?*
- *Active House Label – can it drive development of healthy buildings?*
- *How can legislation promote healthy buildings?*
- *Is user-centric innovation applicable in healthy homes & buildings?*