Improving the energy efficiency of social housing

In a nutshell

SUMMARY
It is best practice to improve the energy efficiency of social housing, both for existing buildings undergoing renovation and new buildings, as described above for public buildings. For social housing, it is best practice to involve local residents in the process of planning the renovation or designing the new building, in order to take into account their needs and engage them in the benefits of nearly zero energy buildings and how to use them.
Target group
Local authorities
Applicability
This best practice is applicable to public administrations that manage social housing. The amount of investment needed may prove a relevant barrier to its implementation. However, the relevant social benefits (improved welfare, reduced fuel poverty) and financial benefits (energy savings if energy costs are centrally paid, or a higher proportion of tenants paying their rent if they are responsible for their own energy costs) outweigh the investments.
Environmental performance indicators
• Total annual energy use per unit of floor area, expressed as final energy (kWh/m^2/year) • Total annual primary energy use per unit of floor area (kWh/m^2/year)
Benchmarks of excellence
• For newbuilds, the building is designed with a total primary energy use (including all uses) lower than 60 kWh/m^2/year • For existing buildings undergoing renovation, the building is designed with a total primary energy use (including all uses) lower than 100 kWh/m^2/year

Description

Social housing has not a common definition across Europe, it can refer to the rent regime (if the rents are at sub-market rates), the legal status of the landlord, the way the social housing is funded, however, in general, social housing targets low income population. In Europe, the Netherlands has got the highest portion (34%) of social housing compared to the total housing stock, followed by the UK (21%) and France (20%). In southern Europe, instead, the percentages of social housing portion are lower, around 5%. (Houard et al., 2012).

New buildings in European cities account annually for about 1-3% on the total building stock, therefore it is important to focus on the energy efficient refurbishment of buildings and not only on new constructions. Refurbishment of buildings dated from 60s-80s could reach energy consumption reduction of 50-60% but also for newer constructions energy savings can be significant (CASH, 2010). Therefore, it is essential when planning the refurbishment of social housing (not only for the ones built more than 20-30 years ago) to implement measures aimed at improving the energy efficiency.

The best practice on improving the energy efficiency of public buildings reports detailed description of measures for improving energy efficiency in buildings. The same measures/techniques can be adopted for improving the energy

efficiency of social housing both for refurbishment or new buildings. However, the design or refurbishment of the building must take into consideration the residential use, involving the availability of different sizes of flats with high accessibility (for people with disabilities) and the presence of shared premises (e.g. laundry and recreation rooms). Furthermore, engaging with local residents while planning the refurbishment or designing the new building is important, in order to understand their needs. Interaction with residents will also allow explaining the benefits of buildings with improved energy efficiency, increasing the awareness of tenants about environmental and social issues. A show apartment presenting how the refurbished/new flats will look like is a useful tool to engage with local tenants. Moreover, meetings where presenting the features, work plan and giving the opportunity to provide feedbacks and suggestion must be organised while planning the refurbishment or designing the new building.

Environmental benefits

The main environmental benefit achieved with very high energy performance public buildings is the reduction of the primary/useful/final energy demand, e.g. for space heating/cooling, water heating, air conditioning as well as a reduction in the consumption of electricity, as presented in the best practice on improving the energy efficiency of public buildings.

Side effects

Embodied energy of buildings is an aspect concerning the life cycle energy assessment. However, operating energy remains the main energy required (usually about 80-90%) while embodied energy is about 10-20%, as presented in the best practice on improving the energy efficiency of public buildings.

Applicability

Technical applicability for low energy refurbishment and construction of new buildings are reported in the best practice on Low energy refurbishment of social housing is recommended when major refurbishment of the old flats/buildings is required in order to improve the facilities (e.g. installation of new bathrooms and kitchens, water boilers etc.). Interventions to improve energy efficiency can be therefore coupled with the other works.

In the case of social housing, all tenants should agree for the refurbishment to be carried out, in fact it would not be successful to refurbish only a part of the flats of a building. This may be more difficult when refurbishing high-rise buildings rather than building with a limited number of flats or semi-detached houses. Depending on how social housing is managed in different EU countries, the municipality or the company should interact with the tenants, communicating the aims and benefits of such refurbishment. As presented in the description section, meetings and a show-apartment are valid tools which allow engaging with local residents. The work plan must reduce at a minimum the period when local residents should be moved to a different accommodation. When possible, flats can be divided in batches and they can be refurbished once at a time in a short period of time, before moving to the next batch. In order to improve the number of tenants agreeing with the refurbishment, municipalities can offer to local residents the opportunity to move to a different accommodation while carrying out the works and then decide if they prefer to move back to the refurbished flat or to stay in the new accommodation. This choice was given in the refurbishment of the high-rise buildings in Freiburg, when only about 50% of the initial tenants moved back to their refurbished flats.

Economics

In the best practice on improving the energy efficiency of public buildings upfront costs and paybacks times for low energy refurbishment and construction of new buildings are reported. Depending on how social housing is managed in different EU countries, the municipality can finance the entire/partial cost of the refurbishment or new construction. In some cases, instead, publicly/private owned companies in charge of social housing fully finance the works.

The energy savings achieved thanks to the improved energy efficiency benefit tenants, public administrations or companies managing the social housing, depending how the energy bills are shared. For instance, in the refurbishment of Brogården area, the main energy saving was achieved for heating (from 110 to 30 KWh/m^2yr) and the company managing the social housing (Alingsåshem) has been in charge of paying the heating bill. Therefore, the main energy saving has

economically benefitted Alingsåshem. In other cases, when tenants are in charge of paying their heating bill, the municipality will benefit reducing subsidies given against fuel poverty, since tenants will have to pay substantially lower energy bills. Another option for municipalities to economically benefit from the renewal is to increase the number of flats in the refurbished building raising the total income from the rents. In Freiburg, for example, the number of flats increased from 90 before renovation to 136 after renovation, since nowadays the average number of family members is lower compared to the '60s. In conclusion, when assessing the economics of the refurbishment or construction of new social housing, public administrations must consider all the direct (e.g. lower energy bills, higher income from rents) and indirect (e.g. lower subsidies) economic benefits.

Driving forces for implementation

Improve energy efficiency would reduce the energy bill of social housing which can be completely or only partially paid by the municipality or any company publicly owned managing the social housing building stock.

From social point of view, refurbishing or building new social housing with high energy standard improves the living environment. This leads to positive social and health effects for the low income tenants.

Reference organisations

Build up – the European portal for energy efficiency in buildings. A portal bringing together policy makers, building professionals and building occupants, reporting many examples and details of successful energy efficient buildings (new or renovated): http://www.buildup.eu/

Alingsåshem (Sweden). Swedish company managing social housing in the municipality of Alingsås: http://www.alingsashem.se/

City of Paris Real Estate (SIEMP): Public-private joint venture in charge of social housing in the municipality of Paris: http://www.siemp.fr/

Freiburg - Weingarten West Project: the aim is achieve a sustainable energy supply in the city district of Weingarten, refurbishing the buildings which were built between 1965 and 1969 : http://www.eneff-stadt.info/en/pilot-projects/project/details/model-city-district-refurbishment-weingarten-west-freiburg/

Literature

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Houard N., Waine O., 2012. Social housing in Europe: the end of an era? Available at: http://www.metropolitiques.eu/Social-housing-in-Europe-the-end.html Last access on July 2014