

Campaign for rehabilitation of traditional Windows in Norway

Thank you for the invitation. This seminar is a splendid initiative. Budapest have a lot of facades that are more or less intact with original beautiful windows. The situation here is much better than in most other towns I know. So the city of Budapest has a unique possibility to save a very important part of the cultural heritage that other cities in Europe lost twenty years ago.

”Housewife window” with thermopanel-glasses, double glazing, destroyed extremely many building facades in Norway in the 1960–1970. For many house owners they represented the modern time. They removed the old windows which were divided in three or four frames, and installed windows with one big frame. Actually the new windows were colder than the old ones.

”Housewife window” was a clever name. They were easy to wash, That is the only good thing to say about them. After 30 years many of these windows have broken, and we have now discovered that a large number of these windows were produced with PCB-glycol between the glasses and the frame. So the windows that created such problems for the facades and town landscape, now have become a waste problem. That is not a win-win situation.

I work for the directorate for Cultural Heritage in Norway. The main task for the Directorate is to preserve and take care of a representative selection of our buildings as a heritage for future generations.

In Norway around 4000 buildings are listed as historical monuments. For these buildings the cultural heritage authorities have control. The owners can not change parts of the building without permission. So the windows in those buildings will be maintained and have a long life. And if windows in a listed building really is in such a bad condition that it cannot be saved, the owner must put in a exact copy of the original window.

But four hundred thousands buildings are more than hundred years. They don't have any legal protection, but they are more important for the building environment and the landscape of the towns than the few listed buildings. Old windows in existing buildings represent an important part of this heritage.

A normal owner of a normal building. Who are his advisers? First of all Commercial and Building markets. Craftsmen? Perhaps, but I believe that the owner of the house has made up his mind when he contacts the craftsman. Local building authority? Perhaps. Architects? I am afraid not. Cultural heritage authorities? No, not for the majority.

The reason for commercials in media is to sell more, they don't promote maintenance. They promote new elements because that is what they are selling.

The durability of windows depends on material used, construction, maintenance and how exposed the windows are to weather. But the most common reasons for people to change their windows is to achieve better thermal insulation, easier

service and maintenance or reduction of traffic noise. It is rarely the condition of the window that matters.

Modern marketing appeals to our feelings. Barefoot children shall sell modern windows. But the commercial also give information. Some of this information is wrong, but it is repeated so often that it has become truth. "Often more than 40 % of the heat loss in a Norwegian building is due to old windows." This sounds wrong and so it is.

The truth is that 50% of the energy in an average building goes to cooking, warm water, washing machines and ventilation. The other 50% keep the house warm during winter. These 50% is shared by heat loss through ceiling, walls, floor and windows. Roughly it means that for an average house – let us say from the 1970s – 15 % of the energy consumption is through the windows. And this can be reduced to 10% by improving the existing windows.

Actually at the moment with the to day's energy cost in Norway, you don't save money by changing the windows.

Example: traditional double 2 square meters window (outer and inner frame) and energy price 10 cent/kWh, over 30 years, which is the expected lifetime for a modern window, which is impossible to maintain.

Change to new window: Saved energy 27 Euro/year. Over 30 years this is 810 Euro. But the change itself will cost more. Its the price for the super insulating window, tearing away the old one, and putting the new one in, then it is the work around the new window, because this will always have some effect on the interior, so its some woodwork, painting also. Entrepreneurs have estimated the cost to 1800 Euro. And paying 1800 Euro to save 800 is no good deal. And it has serious impact on the facade.

On the other hand, by keeping the old window, but changing the glass in the inner frame to a so called Low Emission glass, you can improve the insulation quite a bit and you can save 15 Euro/year. During 30 years this is 450 Euro. And this will balance the cost of putting the Low E glass in the inner frame. And it doesn't change the exterior or the interior of the building.

It is important to do this calculation, and use it strategic where we have the possibility. Because who is our "enemy"? It is the producers of new plastic windows and their commercials.

Ordinary people might not understand the meaning and consequence of R or U which is $W/m^2 \text{ } ^\circ C$. But they understand prices.

To get a better understanding of how products influences the environment throughout their lifetimes a life cycle assessment on windows was carried out twelve years ago, by the Norwegian Building Research Institute, ordered by the Directorate for Cultural Heritage. The life cycle assessment was carried out with reference to an existing block of flats from 1887. The different types of windows were new coupled windows with double glazing, new windows with energy

saving glass and old windows supplied with an inner frame with single and double glazing. It was assumed that the building was heated with electricity and that electricity was produced from hydroelectric power, with no emissions to the air. The chosen functional period of time was 90 years.

The result showed the smallest environmental impact if the old windows are supplied with an inner frame with single glass followed by old windows supplied with an inner frame with double glazing. This is with respect to all the environmental categories (global warming potential, acidification, photo-oxidant formation, eutrophication and consumption of fossil fuel) over a period of 90 years.

The total energy consumption for a period of 90 years however is higher for the old windows supplied with both inner frame with single and double glazing, than with new windows with energy glass. For the chosen building the calculations show approximately 5% higher total energy consumption in the user phase for the building with inner frame with single glazing but only 1 % higher for both old windows with inner frame with double glazing compared to new windows with energy glass. The calculations have been carried out for the climatic conditions in Oslo.

In Oslo we had a seminar just like this in February. We had hoped that 50 people would come. But windows interests people. So we too had to move the seminar, because 140 people wanted to participate in the seminar.

Before the seminar we had the environmental impact research upgraded. The conclusion is almost the same. The differences are small. But we see that if the energy price increase, this will benefit a new window and not the old one.

There is a need for good copies of traditional windows. In buildings, where the original windows are gone and the present windows are in such a condition that there is a wish to restore the facade.

Our benefit: Environmental impact, impact on wall, beauty, nostalgia, life cycle.

Our challenge: cost, maintenance, craftsmen.

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