Interview Energy efficiency in Germany

1. According to a German government declaration the existing building sector should be refurbished by 2% to reduce the CO2 emission of the total building sector by 80% until 2050. What does the renovation and modernization program comprise?

The energy consumption of the building sector in Germany is approximately 58% of the total final energy consumption. The progress is driven by two factors. First the German law of the "Energy Saving Regulation (EnEV)" which requires characteristic values for building materials and building itself. The second are smart financial supporting programs of the German KfW bank. This could be low credit rates (approximately 1% per year) as well as direct grants. The conditions of the supports increase with the energetic requirements. (www.kfw.de/kfw/en)


The EU Energy Performance intends also a tremendous reduction of the energy consumption by 2020. The aim is to establish the so call "passivhouse standard" for new buildings which means to run new buildings with only 15 kwh per m² for heating and cooling cost. The EnEV is the German law to fulfil the European directive. Therefore the update of the EnEV in 2012 will reduce the energy requirements for new buildings by another 10%. In the refurbishment sector the reduction is only 2%. For windows we discuss for new buildings a required U-value of 0,95 W/m²K. Generally the focus in northern and middle Europe is on the thermal insulation and the reduction of heating costs. In southern Europe the focus is on reducing the heating costs by solar protection. The energy label of ift Rosenheim is facing this to aspects and give recommendations for both.
3. Is the energy label for windows commercially viable? What is the typical energy saving potential of a building under this exercise? Is there government intervention behind such a program or is it a market product?

The energy label is very well accepted by the industry because it helps to inform customers such as owners of residential buildings. Specially in the refurbishment sector this tool is helpful, because architects end engineers are not involved in small projects very often. A study of KfW bank shows that the economic energy saving potential for existing building is near to 80%, the typical rate is about 40%. EU Directive 2010/30/EU has extended the obligation to display an energy label to all energy consumption-relevant products. Windows, facades and their associated solar shading devices now therefore also need to be assessed. This means that all factors influencing the energy performance of a window now need to be summarised on a "consumer-friendly" energy label. Energy gain, energy loss and daylight utilisation must all be taken into account according to their respective importance. Currently it is a market program designed by ift Rosenheim, but we expect the introduction by the European commission for 2013.

(www.ift-service.de , currently only in German)

4. How different is labeling for windows than some of the other common energy labels?

The label for windows is quite different to others like washing machines because the energy related criteria’s depends very much from location, climate and size. Hence the products’ energy performance not just in winter (heating season) but also in summer (cooling season) needs to be evaluated. The label should take account of the following factors:

- Energy efficiency in winter and summer
- Any solar shading devices
- Daylight utilisation, comfort and health considerations
- Fitness for use and safety in use.

There is widespread consensus on the requirements forming the basis of the evaluation process: it should be based on simple, transparent, verifiable, scientifically determined input variables, should not present any barrier to trade or innovation, and should be uncomplicated and inexpensive. This will be particularly appropriate for the refurbishment of residential buildings, for which it is generally not worth carrying out a detailed analysis.

The evaluation procedure developed by the ift Rosenheim is based on ISO 18292 (Energy performance of fenestration systems for residential buildings — Calculation procedure). Here a reference building is used to determine heat losses and solar gains, and energy performance indices for the heating and cooling seasons are derived from these. The product is then rated according to energy efficiency classes.
The average effective solar radiation and average temperature difference can be determined via simulation calculations. Climatic conditions differ so greatly between summer and winter that a single value is not sufficient here; ISO 18292 thus specifies two values for energy performance (EP), one for the heating and one for the cooling season:

- EPₜₜ: energy performance of the heating season
- EPₜₛ: energy performance of the cooling season


5. What challenges, in your opinion, will energy labels for windows present for a country like India?

The problem posed by the different climatic conditions across across Europe is circumvented by defining an "average climate", based on the same idea as the "average orientation". This avoids the problem of needing to identify boundaries between climatic zones, and allows a simple product label to be produced based on just two categories: EP-H and EP-C. The label also includes a Daylight Potential value (as per ISO 18292). Recommendations for use can then be given to take account of real-life climatic and installation conditions, in order for the most economical option to be selected. D/A (EP-H/EP-C) might make sense for south-facing windows in Southern Italy, for example, whereas A/C would be more appropriate for northern Sweden. The Energy Label developed by the ift Rosenheim makes fast, consumer-friendly evaluation possible. The ift Rosenheim has also developed an online tool for ease of calculation. Therefore this concept could also be adapted to India, because Europe has also a wide range of climatic conditions. It is necessary to analyse typical climatic data.

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