

Fig 2
EnEV 2009

2 Thermal insulation in Europe

Energy conservation must be a global task even though currently 80% of energy is consumed by the industrial states and 80% of CO₂ emissions produced by these states.

When assessing the opportunities for exporting energy-efficient products, an important factor is the mandatory limit value prescribed by the export

countries. In this context we have to recognise that Germany serves as an example. With respect to required characteristic values and procedures for providing evidence, our neighbours have often followed our example. We can expect that they will continue to adopt quickly the new requirements, which have become statutory in Germany. This gives industry a technological edge and provides optimum export opportunities in these markets.

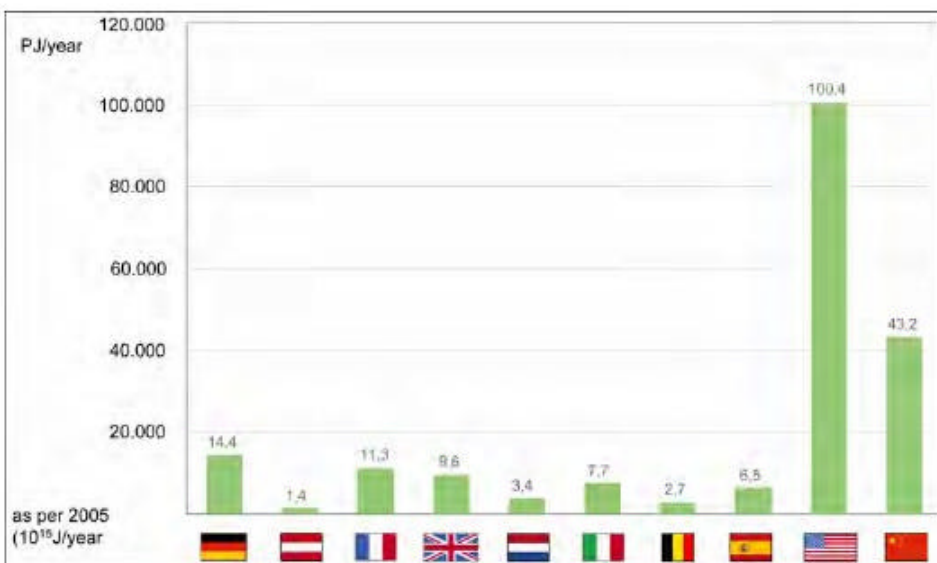


Fig. 3
Overview: primary energy demand in Europe



3 Current window, door and facade developments

The market share of thermally optimised window designs and improved glass types has increased significantly following new statements and marketing strategies by glass manufacturers and others. For example, the market share of triple insulating glass units has already reached 20% – and further improvements are being worked on, in particular the overall energy transmittance g but also the light transmission of glass. For example, glass types with U -values of $0.5 \text{ W}/(\text{m}^2\text{K})$, g -values of up to 0.57 and light transmission values of up to 0.75 are already now commercially available. These are g -values, which up to now could only be expected to be achieved by double insulating glass units. From these trends we may draw the conclusion that high-quality glazing with highly improved physical properties will become a regular occurrence.

tems with thermally improved reinforcements or profiles without any reinforcement, the continuing development of sandwich designs for timber windows and the optimisation of thermal break zones of metal windows. The U_i -values achieved are around $1.0 \text{ W}/(\text{m}^2\text{K})$ or better, depending on the type of material.

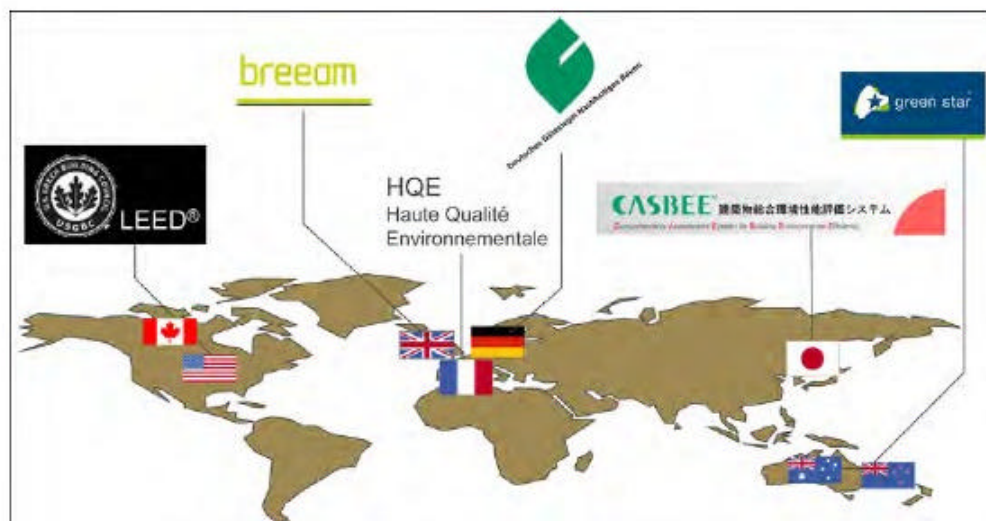
Many system houses follow the trend of integrating building services into building components. The available range of drives for automatic operating functions as well as the integration of additional functions, such as solar screening and ventilation devices, is increasing continually. Facades in particular follow this trend in a consistent manner by integrating components designed for building services into the outer skin of the building, such as cooling, ventilation, light control and lighting as well as energy generation based on solar technology.

Frame manufacturers have also contributed to this development: developments have been pushed forward for all framing materials. These include optimised profile geometries, the reduction of radiation processes in profiles as well as materials with good insulation properties. Examples are the development of plastic window systems

4 Development and sustainability

The topic of sustainability is of increasing importance generally and in the field of windows and facades in particular. One perceived risk is the promotion of competing systems with different

Fig. 4
Worldwide approaches for certification of sustainable technology for buildings: Overview of certificates





approaches. For example, countries such as Great Britain, USA as well as France have certification systems that push into the market.

Developments in Germany have also progressed. For example the Ministry in charge, the BMVBS (Federal Ministry of Transport, Building and Urban Affairs), has issued a guideline for the certification of the sustainability of buildings, which was introduced by Minister Tiefensee in May of this year. The first certificates bearing the Deutsches Gütesiegel Nachhaltiges Bauen (German Quality Mark for Sustainable Building) will be awarded at the Bau 2009 exhibition in Munich.

5 Future tasks for window and facade manufacturers

Of course, the discussions around scarce resources and higher energy costs motivate researchers to look more deeply into building concepts. Standards such as the Passivhaus (passive house), KfW-40 and 'low energy house' are well established in the market; the discussion for the future focuses on active houses and houses

with net energy gains. These concepts are based on the idea that technology in buildings can be used to gain more resources and energy than is consumed.

In this context there are demands for windows on the north-side of buildings, facing away from the sun, that exceed the future thermal insulation standard of EnEV 2012. On the other hand, on the sides with stronger irradiation glasses with optimised g-values, facade surfaces with integrated photovoltaic and solar screening as well as light control systems are in demand. The integration of these systems into the technical building services, using simple but effective concepts, is the prerequisite – and the challenge to manufacturers – for controlling buildings to meet demands as well as conserving energy.

In view of the rich crop of ideas, the speed of innovation and the vigour with which these ideas were implemented during the last year we can be sure that the right solutions will be found. In this way, windows, facade elements and doors make a more valuable contribution because with the help of sensors and drive technology they can now react to changes in ambient conditions as well as user requirements.

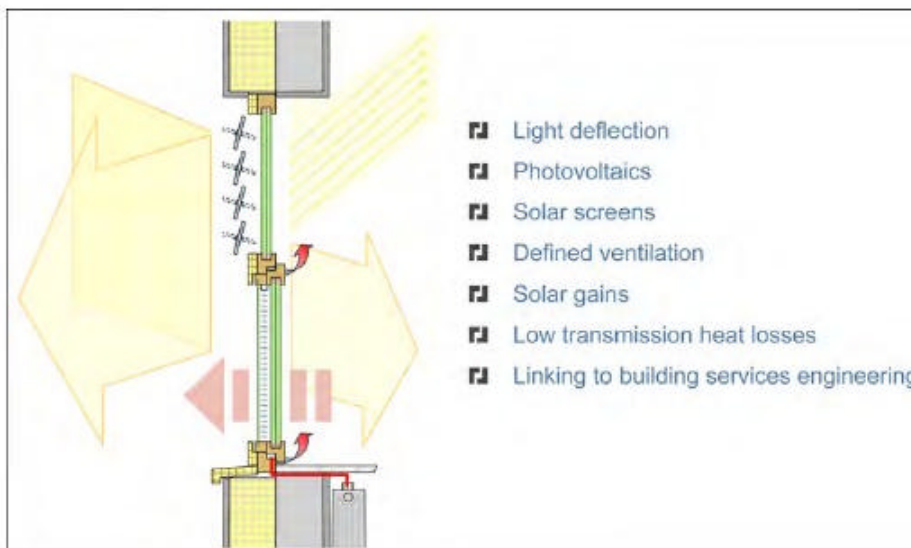


Fig. 5
Energy manager



6 State of play of standardisation and rules and regulations

As products become increasingly better, the accuracy of the relevant assessment procedures is important. One particular point of concern with regard to energy is the much discussed discrepancy between the calculated and the measured U-values of profiles and windows. To address this issue, the standard DIN EN 10077-2 is currently being revised. The main objective is to adjust the process so that the calculated results are closer to the actual measured values. A detailed analysis revealed that modifications of the calculation algorithm, different ways of interpreting the relevant standard as well as big discrepancies in the thermal conductivities of the used materials are a common occurrence. To avoid such problems, the ift Rosenheim maintains its own in-house quality assurance concept, involving a special validation of the calculation programme, the maintenance of tested material lists as well as a quality certification of in-house and also external evaluators. This concept, called 'Certified Evaluator', has already been presented in the past.

New is also the discussion of what in the European context is known as 'Energy Labelling System for Windows'. Work on this system has progressed well and a fairly complex procedure has been worked out. However, the required parameters need to be determined at the national levels. As a result, the systems known in Denmark, Great Britain and Finland will still not be comparable with each other. In Germany, the authorities do not see the need for a certification of the specific energy aspects of windows. Instead, the characteristic values, such as U-value, G-value and light transmission are determined by a common European method and entered into the overall life cycle assessment of the window.

7 DIN EN 14351 – product standard for windows

The discussion around the product standard for windows has reached a new level – a new amend-

ment to the product standard has been completed. It contains a more precise instruction for the application of the standard as well as simplified methods, for example for determining the air permeability of windows without testing. This amendment is currently in the 'formal vote' phase. We can expect this to come legally into force before the expiry of the coexistence period, i.e. the date from which CE marking of windows and external pedestrian doors becomes mandatory.

This also excludes power-operated doors. In the past, German manufacturers of automatic doors in particular have criticized that the criteria for safety in use as set out by EN 12650 part 1 and part 2 are not adequate. The German foreword makes reference to this and suggests the application of DIN 18650 for Germany. Of course this also means that with respect to the other characteristics, such as air permeability, thermal insulation and wind resistance national regulations have to be complied with. These will then require CE marking to comply with the Machinery Directive and an additional Ü-mark to confirm conformity with the Bauregelliste (Construction Products List) A.

There is currently some uncertainty because of the possible extension of the coexistence period by one year, i.e. from 2/2009 to 2/2010. An application for such an extension has been received by the Technical Committee. It is likely that the experts in TC33 would like such an extension, but that does not mean that the coexistence phase will be extended automatically. An extension requires a resolution by the Standing Committee, which cannot be expected before December. That means that a definitive statement cannot be expected before January of next year at the earliest. Therefore, and in order to be safe, the recommendation to manufacturers must be:

Complete your preparations for the introduction of CE marking by February 2009. In that way you will be sure to be able to CE mark your products correctly from February 2009 in case the application for an extension of the coexistence period is not successful.



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