

LOWESTENERGYAPARTEMENT LEA PN 605 PN 606

TA conversion costs reduced by approx. 30 %. Operating costs reduced by approx. 50%.

The 3-storey residential building Mechtildisstr. 8 in Cologne, Altstadt Süd, was built in 1965.

The apartment in the attic originated in 1985. The apartments are heated via hot water heaters with gas boiler. The hot water for the bathroom and WC is provided via the gas boiler or electric continuous flow heater. The gas boiler and pumps for carrying the hot water to the radiators are operated electrically. The outer walls of the old building are made from pumice masonry 30 cm thick. The roof truss, with clay tiling, has a mineral fibre insulation 12 cm thick. The replaced windows have U_w 3.0. The row of houses means that only the north and south facades and the basement ceilings of the ground floor apartments are affected by heat loss. Heat recovery by east and west extensions and story ceilings. The optimum thickness of the heat insulation of a free-standing new commercial building was determined with dynamic simulation (DyS), for the Lohmar location, climate region 5. It was demonstrated that the optimum thickness of the heat insulation in new buildings has to be designed significantly lower than specified according to EnEV (Energy Saving Ordinance). In case of improved U valued due to more heat insulation, the transmission heat loss (H'r) via the components decreases. The heat in the living spaces, which arises due to solar radiation and internal loads, cannot be dissipated adequately. Thermos flask effect.

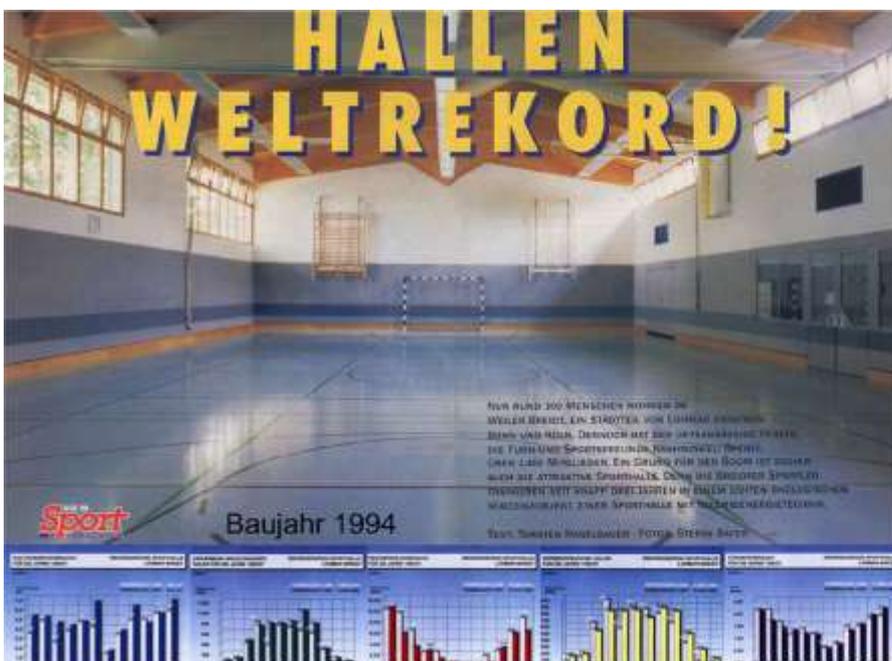
For the above reasons, the expensive, additional heat insulation of the facades can be dispensed with in old buildings. The dynamic simulation for surveying the heat insulation is not necessary. As a rule, the energy requirement kWh is characterised by the air circulation with heat and cold recovery from the outgoing air of approx. 90 %. The active LEA has sufficient heat insulation for the house and location and the lowest possible annual primary energy requirement (Q_p).

Planned renovation to LOWESTENERGYAPARTMENT PN 605 and PN 606: The GAS hot water heaters present in apartments PN 605 and PN 606 are removed. The electricity consumption for operation of the hot water heaters no longer applies. The windows are replaced with better sound and heat insulation. Electrically powered air circulation systems (BELA) are installed, with up to 90 % heat / cold recovery from the outgoing air, for heating and cooling. According to device approval DIBt heat recovery efficiency: max. = 0.91, min. = 0.87. Electrically powered heaters in the ventilation system equalise the heat loss of approx. 10%.

The same principle applies for the cooling. The electrically powered heaters and coolers are additional devices that are installed in the central unit or on a room basis in the ventilation pipe network. Control of the BELA fully automatic. Electric continuous-flow heaters provide hot water for the kitchen, bathroom and WC. The service charges settlement is simplified greatly for tenants and landlords. Costs for gas no longer apply.

The LEA renovation of old buildings could resolve the investment backlog, owing to lower construction, operation and ancillary costs. The LEA concept offers the apartment owner the option of renovating the apartments according to their own decision. The construction and operating costs are reduced to the lowest possible level.

The energy consumption of the LEA is also low owing to 90 % heat / cold recovery, also at if the heat insulation is not optimal. The LEA has the **lowestenergyapartment standard**.



ERSTES AKTIV NIEDRIGENERGIEHAUS
 PASTORATSWEG 11A/11B 53797 LOHMAR
 AUSZEICHNUNG 1. ENERGIESPARGER NRW
 DR. MICHAEL VESPER 20. JUNI 2005
 MINISTER FÜR STÄDTEBAU UND WOHNEN, KULTUR UND SPORT

