Main Building of Vilnius Gediminas Technical University (VGTU)

The challenge in this project was to show how energy efficient solutions can be achieved in applying the methodology of multi-variant design and multiple criteria analysis of a building refurbishment by forming thousands of alternative versions. This methodology allowed to determine the strongest and weakest points of each the Main Building's VGTU refurbishment project and its constituent parts.

Main Building of VGTU before and after retrofit

The monitoring of the VGTU Main Building started in March 2006. Indoor environment quality instrument Metrel M16201 was selected for the monitoring. This device measures: internal microclimate parameters (volume flow, air velocity, air temperature, relative humidity, dew point temperature, amplitudes of vibration impulses). Monitoring is performed using a thermavisor Therma CAMB2 to assess the quality of insulation and to make thermal pictures of the surface of building's envelope for calculation of thermal transmittance. The level of allergens in the premises was measured as well.

The conclusions of an energy audit (performed in 2002) showed that 14-16 °C was the average temperature in premises during a heating season. The indoor air temperature increased by 2-4 degrees after replacement of windows, insulation of roof and renovation of the thermal unit. Now the indoor air temperature meets the specifications of HN 42:2004 requirements.

It was possible to compare the data on energy consumption before the renovation and during the renovation. In summer of 2004, the windows of the Main Building were replaced. In autumn of 2005, the roof and walls of the semi-basement were insulated. In 2003, the energy consumption was 920,000 kWh, and in 2005 already 532,000 kWh, i.e. it decreased by 42 %. In 2006, the energy consumption made up 547,000 kWh. Compared to 2003, the energy consumption decreased by 41 %. Comparisons were made irrespective of winter conditions. It is a rough estimation of renovation effectiveness. In 2005, electricity consumption decreased by about 16 % compared to 2003, and compared to 2004 by 26 %.

The level of pollution was measured in the environs of VGTU in 2006–2007: noise pollution (dB), CO pollution (ppm), particular mates pollution (particle pollution) (mg/m3). A forecast of pollution (noise pollution, dB; CO pollution, ppm) in the environs of VGTU for the year 2010 is provided.

Germany: Stuttgart

Nursing Home Filderhof

Great Britain: Plymouth

City College Plymouth

Norway: Asker

Borgen Community Centre

Norway: Hagafoss

Church Hol Commune

Denmark: Copenhagen

Cultural Centre Proeve-hallen

Greece: Athens

Evonymos Ecological Library

Czech Republic: Brno

Social Centre "Brewery"

Lithuania: Vilnius

Main Building Vilnius Gediminas University

eco buildings
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