Energy-Conscious Utilization of the Meter House Building at the Óbuda Gasworks, Hungary

Reconstruction and modernization of historic buildings always conflicts with the fundamental value-perception problem, which exalts the outermost shell of these monuments, ranking any other fair values and even usabiltiy underneath. This rigid preserving of the facades and roof-forms undermines all visible interventions, so general attention at the energy-efficient renovations is always turning to integrated engineering systems instead of advanced building materials. The Meter house in the Gasworks of Budapest also has similar problems as by maintaining it's protected industrial hall character we cannot implement really usefull outside interventions. None of the passive components - which are generally incorporated into the newly built houses- as exterior shading, solar panels, heat insulation of outer walls or insulated doors and windows can be used at refurbishment of similar monuments due to value-protection reasons.

Protection of historic buildings in Hungary is always a personal affair of the appointed employee of the Heritage Office. Thich can be achieved, since there are no specific requirements for this type of building either by building law or by general building structure standars. In addition all EU regulations governing the mechanical systems are very general, the degree of building energy efficiency cannot really be compared to anything as even functional classification, or the layers of structure are unknown factors in the standards of today.

From the energy-efficiency point of view our early expectations were to half the energy use and to cut CO2 volumes to one third. Defining the solutions that fit this criteria we came to the surprising conclusion that the biggest energy saving technique from the economic point of view is the simple external insulation. This otherwise easy to use and universally accessible structure is only partially applicable on the historic buildings so to the present case the roof insulation is the biggest energy-saving factor. All energy-saving solution will remain in the system of commonly used tools, no technical innovation novelties are used. However, the reasons for this are simple: researching suitable forums, online databases and previous studies, we did not find any suitable technology, which would generate adequate savings calculated in Hungary's rational financial framework. Starting from the simple fact that, that while the use of buildings are very limited in time, maintainance still needs continuous mechanical operation. Primarily we wanted to expand the timing of potential uses thus reducing the energy usage peaks. This was solved by a multi-function space, whereas two additional functions are installed next to each other. These functions make a much more even occupancy of the building both in short and long time sequences.

The functional subdivision was driven by the fact that the air-exchange standards of spaces varies by the number of users and the function of rooms. The more extreme demands in temperature difference and air exchange of the closed rooms of the educational function, plus the lower ventilation and cooling-heating demand of the open exhibition areas were dissolved in a common system in such a way that the air flow direction is from the more extreme needs of enclosed spaces towards the more moderate demand of open spaces. The total flow of air is aspirated from the exhibition space, then stir back through heat exchangers. Based on this, the two complementary functions are designed into the building, served through a common mechanical system according to their somewhat different use of modes.

Project:	*Case study for ReFoMo project*
Location:	*Meter House at the Gasworks of Budapest*
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