

GREEN LANDMARKS: POSSIBLE WAYS OF DECREASING THE ENERGETIC DEMANDS OF HISTORICALLY VALUABLE BUILDINGS

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Summary

Green Landmarks project was created based on a governmental contract of the State Environment Fund of the Czech Republic. The aim of the project is to find examples documenting the ways how to decrease energetic demands of historically valuable buildings while preserving or enhancing their value. The method of the project is to collect best practice examples and to present them to the professional as well as to the general public in order to raise awareness of this issue and to contribute to the debate concerning decreasing energy efficiency and historic buildings.

Keywords: historical landmarks, environment, renewable energy, renovation

1 Project frame

The Green Landmarks project was created based on a governmental contract of the State Environment Fund of the Czech Republic. The aim of the project is to find ways to decrease energetic demands of historically valuable buildings. The object of the contract was to offer: “An array of activities in order to increase the awareness of the public about possible ways to lower energy standards of historically valuable monuments and to inform about available energy efficiency technologies”. The project was started in the fall of 2009 and will run until the end of the year 2010. Throughout the course of the project discussions and seminars dealing with the subject of green landmarks will be held, professional suggestions will be offered to public administration authorities and developers, and a publication including examples of good practice in architecture preservation will be presented. All the outcomes of our project will be continuously posted on our web page www.zelenepamatky.cz.

The GREEN LANDMARKS project was conceived and is run by the non-profit organization Slavonická renesanční, o.p.s., which is broadly experienced in environmental education and in activities regarding sustainable development. Slavonická renesanční, o.p.s is also the owner of a historical building, the former German Community House that is part of the Slavonice Historical Town Preserve. Following the principles of GREEN LANDMARKS the company plans to modify the building into a low-energy construction in cooperation with the Opočenský Valouch Architects studio. The building will serve as a multifunctional center for environmental education under the name Source (Zdroj).

The target group of the project is the general public, clients of the State Environmental Fund, public administration employees (especially those dealing with construction and development permits) and professionals (architects, monument preservation experts, energy efficiency experts and others).

2 Project concept

The project includes three main phases. During the first phase we decided that our project will be based upon professionally documented examples of „good practice“ and we stated the criteria for their selection.

In the following phase we searched for examples. We have been selecting buildings that show an architect's or developers' sensitive approach in the process of preservation. We are interested in the energetic parameters that can be attained in view of the entire adaptation process. Preservation of the historical value of an adapted building is nevertheless the key condition to our selection. We also believe that by introducing contemporary adaptations can increase the overall value of the landmarks.

We addressed re-known as well as less familiar Czech architects to see how experienced they are with the subject of green preservation and what is their approach to the issue.

The principle questions that have been emphasized from the beginning are: „How can we decrease the energetic demands of historically valuable buildings and at the same time preserve their historical quality?“ „Can we find an approach to our architectural heritage so that it can be used according to our present-day needs and concurrently remain preserved for future generations to come?“ „How can we combine cultural heritage preservation and environmental protection?“

During the third phase we will concentrate on utilizing the governmental programme Green Savings in the process of preservation or in possible ways of further modifying the programme. Lowering energetic demands is an up-to-date issue in an international as well as in a regional context. The cost of energy produced from fossil fuel is increasing on a worldwide basis and so is the tendency to treat such resources thriftily and to make a greater use of renewable sources of energy. In the more regional context, we would like to mention the on-going governmental programme Green Savings as well as a general drift to improve legislature regarding energetic demands. In the Czech Republic, decreasing energetic demands in historically valuable buildings is a largely regional issue among others because most of our cities and towns have a historic center, which is their inseparable heart but also presents an important source of heating dissipation and energy consumption. We cannot set them aside in the discussion regarding an environmentally regardful approach to energy resources but on the other hand we must restore and preserve them for future generations as well.

3 Examples

Among examples chosen according to the above-mentioned criteria we have selected registered landmarks including national cultural monuments as well as examples of architectural heritage in general. They include: renovated buildings as well as those under way, buildings of all types and originating in different times – from medieval ones to modern ones, simple village homes to fancy city apartment buildings, great industrial complexes as well as castles and cloisters, national monuments or „ordinary“ houses, buildings meeting a passive energetic standard or those in which only a partial energetic decrease was attained.

The pilot example of our project is the Community House in Slavonice and its adaptation into a low-energy building. The following text is a documentation of our

example as it will appear in the official project publication. At this point in the project we have not yet completed all the data, we are adding them on continuously.

3.1 Community House, Slavonice

The former German Community House stands on the main town square of Slavonice, a Renaissance town near Jindřichův Hradec in the region of South Bohemia. The building, owned by Slavonická renesanční, o.p.s, is currently under substantial reconstruction and is planned to serve as a multifunctional public center for education, culture and environmental awareness in the future.

3.1.1 Basic information about the building

Name, address: Community House/Cinema (Kino), Na potoku 131, 378 81 Slavonice
Stage: project in process

Original status: primary use: German Community House, Cinema
built: 1932 original energy consumption: unknown

Present/Architected status:

Owner: Slavonická renesanční, o.p.s.

Year of planned reconstruction: 2012

Form of historical monument preservation: the building stands in the town historic district

Attained energetic standard/total consumption: low-energy building

Heating consumption 48 kWh /m²/year, total energy consumption 112, 61 kWh/m²/year

Architect: ov-a architects (Štěpán Valouch, Jiří Opočenský)

Builder: Slavonická renesanční o.p.s

3.1.2 Author statements

Architects Opočenský and Valouch: *„We are architecting the reconstruction of the original German Community House into a low-energy environmental center in the unique historical town of Slavonice. The low-energy standard was a requirement given by the client. Despite the complexity of the situation in the town's historic district we have been able to attain ultimate energy savings by introducing up-to-date technologies. The building was erected in 1932 on the ground plan of a medieval wall. During the 80s in the 20th century an attempt was made to transform the building into a cinema. The reconstruction was never finished and during its course the entire interior from the 30's was destroyed. Many annexed structures had been built around, all of them are in a hazardous state. The outer wall from the original building still exists and we plan to preserve it. The walling is kept in its visual state- it is a witness to the 20th century, a new sgrafitti. To ensure red-integration and protection it has been supported by lime painting. The form of the new structure is concise, the shape is self-evident and it is typical for its region. It pacifies its surroundings and lines the building up with the other great barns that stand on the perimeter of the old town. At the same time it is compact and it meets the requirements for low-energy consumption.*

In order to preserve the original parts of the building (especially the external walls) and regarding the proposed use of the building we chose heating insulation form the interior.

In our reconstruction proposal we have tried to be ultimately respectful to the locality and its history. We used local materials (heating by wood, pellets), the windows were made by Slavona, a local manufacturer.“

Concept of the technical resolution (based on consultations with prof. Jan Tywoniak) The aim of the reconstruction of the Community House is to create a smart, respectful and economical building which will serve as a didactic institution. We have utilized the maximum of possible technologies and building procedures that support the use renewable sources of energy and allow low-energy operation. An accumulation vessel that is heated by independent sources of heat and which retroactively heats up the heating water has been placed in the attic. The accumulation vessel is heated by a combined cauldron driven by wood, pellets and alternatively by gas. The vessel accumulates outlet heat from the bottom level fire place and from cables that run beneath the roof tiling. These cables provide hot utility water in the summer. There are also two recuperation air conditioners in the attic that are connected to two independent circuits – one operating in the main hall and in the public part of the lobby.

Enumeration of interventions, used constructions, details, materials: heat insulation from the interior (polyuretan panel, 150-200 mm), 400-600mm of circumferential walling insulation of the ceiling above the top level and of the floor beneath the bottom level, attic insulated separately (picture 1) new windows (wooden with isolating three-layered glass) solar heat gains (passive gain - heating of concrete floors through windows turned to the South) floor convectors on bottom level (hydrothermal) new armoured concrete ceilings inhibiting heat bridges recuperation of hot air.

Each example will be further completed with independent commentaries given by monument preservation experts, professionals in the field of construction physics, energy savings and possibly others according to the range of each individual reconstruction.

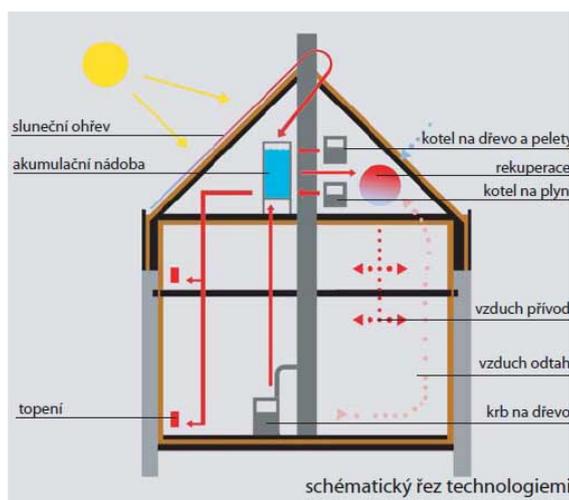


Fig. 1 Community House, Slavonice - Energy concept



Fig. 2 Community House, Slavonice - visualisation

4 Conclusions

The basic and continuous message with which our project aims to conclude its mission is that each historically valuable building represents a unique structure that must be approached with individual care. In the next phase of our project we would like identify measures which we could recommend on a general basis and specify those which should be followed strictly individually.

Our project certainly cannot cover all the issues involving green preservation of monuments, and this has never been its goal, rather it aims to contribute to this issue with interesting examples and to bring up new questions.

References

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