



## Giatla house

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Addition of a new window layer (on the inside)



## Windows

### *What is the solution?*

The solution involves the installation of a new modern window on the inside of the historic window and therefore does not affect the appearance of the façade in any way. The window was installed on a log wall that was newly built inside. Between this "new" log wall and the old wooden log building a sheep wool insulation was installed. The old wall with original windows was left and the new window was integrated into the newly created airtight level.

### *Why does the solution work?*

By installing a modern window with a U-value for the glass of  $0.6 \text{ W}/(\text{m}^2\text{K})$  and for the frame of  $1.55 \text{ W}/(\text{m}^2\text{K})$ , the energy efficiency is significantly increased and lies energetically behind a window area in a passive house only due to the losses of the installation situation. However, this could still be optimised by placing the window in the insulation level. Since the window is slightly larger than the original window, the window opening looks almost like a picture that preserves the entire installation situation and appearance of the historical window. Furthermore, the incidence of light is optimized by the larger internal window. From the outside the original optics remains unchanged. To avoid condensation between the windows, it is important that the space between the windows is ventilated to remove the diffusing moisture. The old window therefore no longer has an energetic function, but acts as protection against driving rain for the construction behind it.

### *Description of the context:*

Especially with old rural buildings the topic of window openings is very delicate. If you follow the history of the development of timber construction, it quickly becomes clear that openings in the façade were difficult to integrate, especially in log construction. The main problem was the movable connections of windows to the wooden beams. Settlements and effects of shrinkage and swelling of the wood had to be compensated by these connections.

*Pros and cons of the solution:*

The main advantage of this solution is certainly the unrestricted original appearance of the façade as well as the energy-efficient renovation of the window opening. Also the complete comprehensive preservation of the window as well as the installation situation of the window, are a great solution. However, such a solution must fit into the overall concept of the renovation. If, for example, there are special paintings in the interior which must be preserved or there are other reasons which contradict an interior insulation, the solution cannot be realized.

*Available pictures or publications of the solution:*



New opened window with the original window behind, ©Pavel Sevela



View from the inside, ©Madritsch & Pfurtscheller



View from outside, ©Lukas Schaller



©Lukas Schaller

Facade cut of the window, ©Madritsch & Pfurtscheller

