

Object name

Residential house in Limbuš**Slovenia**

Object photo

**Object description**

The house is prefabricated house with wooden skeleton and totally vapour-permeable. It has classical architecture style of Pohorje. It has 113 m² of residential area, 330 m² of area towards air and volume of 260 m³. Outer walls are 41 cm thick, with cellulose insulation, into which skeleton is founded. Calculated effective thermal transmittance is 0.104 W/ (m² K). The ridge is oriented in the direction east–west and is inclined by 40°. Windows are triple-glazed with two low emissive coatings and krypton between glasses, and have thermal transmittance of 0.8 W/ (m² K). On the south side windows are shaded with permanent jutting roof and on the east and west side with motor-run movable blinds. Tightness of the house enabled onetime exchange of air at 50 Pa. Air flow of the ventilation system is 80 m³/ h. Recuperator works with 83 % efficiency. It has two heaters, with 300 W and 350 W of power, respectively. Internal temperature is set to 22 °C. House is heated with floor heating system with maximal temperature of 29 °C and power of 1800 W. Floor heating system can be supplied from primary solar system and water storage tank or with electrical heaters. There is a separate storage tank for hot water with volume of 100 l, capacity of 8 kW h, time constant of 2–3 days, electric heater with 2 kW power and heat exchanger, which is connected to the primary solar system and seasonal storage tank. Active solar system consists of flat plate collectors of 28 m² area, oriented in the direction 183° azimuth, and seasonal water storage system underground built in a concrete basement. Storage system has the energy capacity of 5.5 MW h, and time constant of 500 days and a system for stratification of water. Heat from the storage system is transferred through linear heat exchangers. All mechanical engineering systems are controlled by sensory-control system, which consists of 43 sensors (28 of them are in water storage tank). Control is performed with the USB microcontroller. Computer collects annually 750 MB of data.

Fact sheet

Residential house in Limbuš

Treated Floor Area	113 m ²
Number of apartments	1
Completion date	2006

Energy standard [PHPP]

Heat requirement / year	13 kWh/m ² a
Heat load	9.5 W/m ²
Primary energy requ.	74 kWh/m ² a
Air-tightness (n ₅₀ -value)	1 1/h
Building type	wood construction

U-value

Exterior wall	0.086 W/m ² K
Roof	0.082 W/m ² K
Basement floor /	0.157 W/m ² K
Floor slab	
Windows / average	0.74 W/m ² K

Specification ventilation system

Central system

Heating installation

Primary solar system and water storage tank or electrical heaters

Construction costs 1600 Euro/m²**Building owner**

Private

Architect/Planner

Mag. Janez Lajovic, AB biro, d.o.o.

Photo credits

Mirko Škvorc, Eko produkt d.o.o.