

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 m<sup>2</sup> of residential area, 330 m<sup>2</sup> of area towards air and volume of 260 m<sup>3</sup>. Outer walls are 41 cm thick, with cellulose insulation, into which skeleton is founded. Calculated effective thermal transmittance is 0.104 W/ (m<sup>2</sup> 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/ (m<sup>2</sup> 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 m<sup>3</sup>/ 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 m<sup>2</sup> 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 <sup>2</sup>
Number of apartments	1
Completion date	2006

**Energy standard [PHPP]**

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

**U-value**

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

**Specification ventilation system**

Central system

**Heating installation**

Primary solar system and water storage tank or electrical heaters

Construction costs 1600 Euro/m<sup>2</sup>**Building owner**

Private

**Architect/Planner**

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

**Photo credits**

Mirko Škvorc, Eko produkt d.o.o.