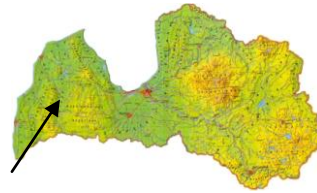




El-Education  
Best practice example No 2 from Latvia



## Latvia Mucenieku nams

**70% energy saving**

**Total living expenses lower than before renovation**

**Satisfied tenants**

### Project data

|                                      |  |
|--------------------------------------|--|
| Location, address:                   | Kuldiga                                      |
| Region:                              | Western Latvia                               |
| Surroundings:                        | City   |
| Climate:                             | Continental and cold                         |
| Heating degree days:                 | 4060   |
| Year of construction and renovation: | 1974 (constructed); 2001 (renovated)         |
| Typology:                            | Multi-dwelling building                      |
| No of dwellings:                     | 60   |
| Total floor area:                    | 2,896 m <sup>2</sup>                         |
| Owner:                               | Cooperative building                         |
| Costs of energy saving measures:     | 63 000 LVL (approx. 100 000 Euros)           |
| Renovation financed by:              | Loan from Latvian Mortgage bank for 12 years |



### Objectives and results

In summer 2001 cooperative decided to take a loan for energy efficiency measures and reconstruction of the building. The main reasons for taking the loan were:

- To increase the thermal comfort in the building;
- To decrease the costs for heat;
- To improve the appearance of the building.

The loan in amount of 63 000 LVL (approx. 100 000 EUR) was taken in Latvian Mortgage bank for 12 years with the annual interest rate of 10% (in 2002 the interest rate was decreased to 7.5%). The loan is paid back from the payments for maintenance, which was increased to 0.30 LVL/m<sup>2</sup>month (0.50 EUR/m<sup>2</sup>month).

Fig.1 Building after renovation

### Renovation concept

#### Key renovation features

- The attic was insulated with mineral wool (20cm)
- All external walls were insulated with polystyrol (8cm)
- The ceiling of the basement was insulated with polystyrol (5cm)
- Staircases were reconstructed
- Draught lobbies were rebuilt
- Aluminium electrical wires were changed with copper wires
- Windows were partially changed with double-glazed windows with PVC frames

## State-of-the-art

### Before renovation

#### Constructions [U-values: $W/m^2K$ ]

- Non-insulated roof
- Ground floor – reinforced concrete panels 3,808
- Façade walls - aeroconcrete 0,766
- Double-glazed windows with wooden frames
- End walls – bricks and reinforced concrete panels 0,869

#### Installations

- Heating supplied by district heating network
- Hot water prepared for each flat separately (electrical boilers)

### After renovation

#### Constructions [U-values: $W/m^2K$ ]

- Insulation of attic with mineral wool (20 cm)
- Insulation of ceiling of basement with polystyrol (5 cm)
- Insulation of external walls with polystyrol (8 cm)
- Partial change of windows with double-glazed with PVC frames
- Reconstruction of staircases and draught lobbies

#### Installations

- Aluminium wires were changed with copper wires

## Energy saving and monitoring

#### Energy consumption before renovation:

The cost for heating was 0,521 LVL/ $m^2$  month,  
This of maintenance amounted to 0,13 LVL/ $m^2$  month,

#### Energy consumption after renovation:

The cost for heating is 0,27 LVL/ $m^2$  month,  
This of maintenance amounted to 0,30 LVL/ $m^2$  month,

Percentage saving: 70%



Fig.2 Building before renovation

## Additional information

- After the implementation of energy efficiency measures the heat consumption in the heating season 2001/2002 was 213 MWh/year, i.e. the average payment for heat decreased to 0.27 LVL/ $m^2$ month (approx. 0.45 EUR/ $m^2$ month) (see Fig.1.), but in 2002/2003 it increased a little due to the colder and longer season – 0.33 LVL/ $m^2$ month (approx. 0.55 EUR/ $m^2$ month). The price for heat in season 2001/2002 increased to 24LVL/MWh (40 EUR/MWh).
- Statement of the building owner/user about the positive effects of the renovation: some inhabitants were willing to sell apartments before reconstruction of the building but as the value of the property has risen after reconstruction, they have changed their mind. Average room temperature after reconstruction increased from 15°C to 20°C and inhabitants of the building are satisfied and feel cozy and comfortable.

## Lessons learned and conclusions

- The implementation of usual energy efficiency measures as: insulation of the external envelope of the building and improvement of windows, lead to an increase of the comfort and decrease of costs for heating and maintenance.
- It is essential to have a good financing scheme.

## References

<http://www.media.lv/kv200109/010921/09.htm>

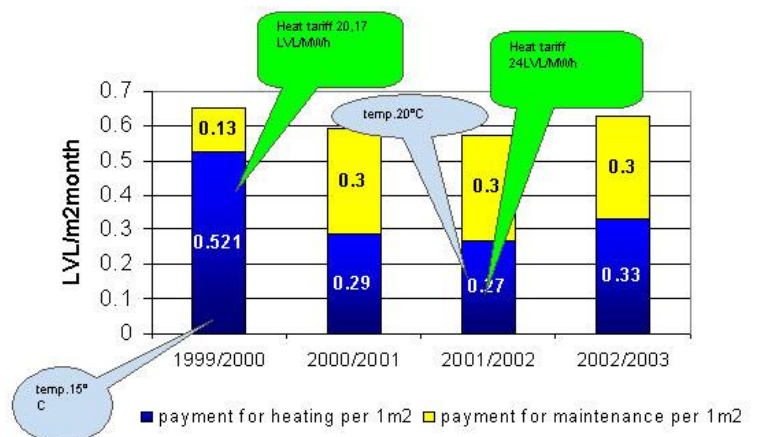


Fig. 3 Payment of heating and maintenance