



Passive House Retrofit Best practice example No 2 from Lithuania



**VILNIUS
(Lithuania)**

Maximal package of measures yields 46% energy savings

Living expenses after renovations almost remained the same

Problems solved, attractive new look of the building, indoor comfort, reduced bills for heating

Project data

Location, address:	Architektu str.184, Vilnius
Region:	Vilnius region
Surroundings:	East of the country, far from the Baltic sea region
Climate:	Mild
Heating degree days:	4005
Year of construction and renovation:	1986 (constructed); 2002 (renovated)
Typology:	Multifamily dwellings
No. of dwellings:	64 dwellings
Treated floor area:	4864m ² (total heating area)
Owner:	No 121 Home Owners Association (further HOA)
Architect and Builder:	-
Costs of (energy) saving measures:	217.463 €, - per house (incl. VAT) 44,7 € per m ²
Renovation financed by:	The owner, (governmental subsidy for energy saving measures (EPR) 49.904 €.)



Picture 1. Renovated façade of No.121 HOA dwelling.

Objectives and Results

Main objective: renovate the walls that used to leak under lateral rain. (according to energy audit: wall cracks causing leaks and blow-through, non-thickened ceramsit-concrete points in walls allowing water permeability)

After long discussions and talks the general meeting of association members decided and so far implemented the following energy efficiency measures: wall insulation, glazing of balconies, insulation of glass wall of the stairway, automation of the boiler house, replacement of apartment windows.

Key renovation features

- External insulation of façades
- Replacement of heating substation
- Replacement of windows, glazing of balconies
- renovation of staircase and entrance door.

Technical details

Before renovation

Constructions [U-values: W/m²K]

- Non-insulated roof (most of dwellings) [0.53]
- Concrete panels, non- insulated [1.09]
- Wooden window frames
- double glazing [2.5]

Installations

- Central heating, no individual regulation
- Old radiators

After renovation

Constructions [U-values: W/m²K]

- External insulation of roof [0.30]
- External insulation of cavity façades [0.3]
- New or adjusted insulation window frames
- New windows [1.9]

Installations

- installation of thermostatic valves and individual heat cost allocation system
- replacement of radiators
- renovation of heating system, balancing valves

Energy saving and monitoring

Energy consumption before renovation:

Delivered energy (space heating + Domestic Hot Water) 126 kWh/m²a

Energy consumption after renovation:

Delivered energy (space heating + Domestic Hot Water) 68 kWh/m²a

Saving on delivered energy: average 46%,
Energy consumption was monitored for one year after the renovation was finalised.

Additional information

- Although the building was built in 1986 and was relatively new, nearly all of its external barriers were causing problems.
- This project was implemented by Energy Efficiency Pilot Project (EEPP).
- The path from the identification of the problems until their resolving was not an easy one. The fact that the walls needed repairing was evident, the question was about the method to be chosen. Different options were under consideration, ranging from repair of the façade by fixing the micro-cracks and painting the building to façade insulation. Repair of the façade would have made only a partial contribution to the solving of wall permeability problems, whereas the investment would have been substantial (the quote provided in the energy audit was 78 000 €).

Lessons learned and conclusions

- Additional investment for the insulation of the external walls solved building problems and increased indoor comfort, reduced heating costs.

References

[1] www.bkagentura.lt