

# ENPIRE Local Project Report for **CZECH REPUBLIC/STU-K**

Location of project: Havířov

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Version: 02

Date: 23/03/2009

## Proposed outline for the Report Summary:

### 1. Project context

#### a. Existing situation (building types, insulation, energy consumption and indoor climate of dwellings, energy infrastructure)

##### a1) Building types

The project partner MRA is charged with facility management of 7665 dwellings in Havířov. Most of the buildings have low energy efficiency, especially those that were built in the 50s and 60s. Those are known mainly as typologies T13, T16, T02B, T03B and G57. Some of the buildings with typological reference „T“ belong to so called SORELA architecture. Several SORELA buildings were chosen for the pilot project.

a2) Average energy consumption for heating is 0,64 GJ/ m<sup>2</sup>/ year

a3) The buildings are ventilated mainly naturally. The bathrooms and toilets are ventilated naturally or mechanically, the kitchens are ventilated naturally with the exception of individual technical upgrades.

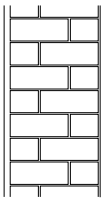
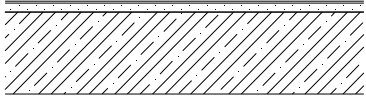
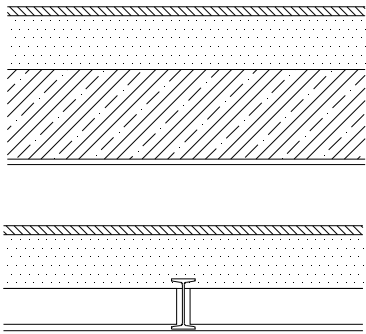
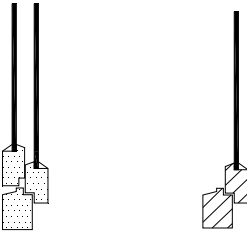
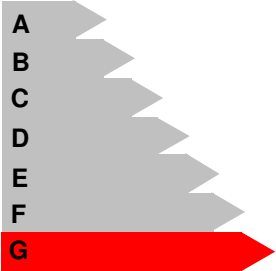
a4) U-values of various building parts

- walls: 1,2-1,4 W.m-2.K-1
- terrace roof: 0,9 W.m-2.K-1,
- pitched roof – no social requirement, last floor: 2,6 W.m-2.K-1
- floor above basement: 1,6 W.m-2.K-1
- windows: 2,7-2,9.m-2.K-1

a6) The buildings are heated with district heating system.

See below detailed example:

<b>Adress:</b> Tesařská street, Havířov		
<b>Type of house:</b> multi-family SORELA		
<b>Building age:</b> over 50 yrs		
<b>No. of floors:</b> 5 (1 + 4)		
<b>Sketch</b>	<b>Description (before refurbishment)</b>	<b>U-value W/(m<sup>2</sup>K)</b>

<b>External wall</b> 	Solid bricks, plastered	1,32																				
<b>Cellar ceiling</b> 	Reinforced concrete slab 225mm, cement screed 25mm, 5mm PVC flooring	2,19																				
<b>Top storey ceiling</b> 	Ceiling below unheated garret:  Reinforced concrete slab 250mm, cinder filling 150mm, wooden boards with cement 25mm  Hollow clay blocks (Hurdis) 100mm in I-beams, cinder filling 150mm, wooden boards with cement 25mm	0,85      0,85																				
<b>Window</b> 	Double window, wooden frames, each frame single glazed  Single glazing in metallic frame	2,80  6,50																				
<b>Heating technology</b>	<b>Description</b>	<b>Energy use %</b>																				
<b>Heating system and hot domestic water</b>	District heating: Delivery station in the basement,	118																				
<b>Building: <math>U_{em}</math> [W/m<sup>2</sup>K]</b>	Average heat transmission coefficient	<table border="1"> <tr> <td data-bbox="904 1509 1023 1568">1,44</td> <td data-bbox="1023 1509 1267 1568"><b>Requirement</b></td> <td data-bbox="1267 1509 1418 1568">0,71</td> </tr> <tr> <td data-bbox="904 1568 1023 1662"></td> <td data-bbox="1023 1568 1267 1662"><b>Level of energy performance</b></td> <td data-bbox="1267 1568 1418 1662">203</td> </tr> </table>	1,44	<b>Requirement</b>	0,71		<b>Level of energy performance</b>	203														
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**b. Stakeholders (parties involved, interests and ambitions of parties)**

The parties involved are the tenants, the City of Havirov as asset owner represented through MRA Agency, and Havířovská teplotárenská společnost a.s., the heat distributor and owner of secondary heat distribution systems. The ambition is to achieve 20-30% less heating energy consumption.

**c. Legislation, standards and policies (which local or nation regulation is important for energy ambition)**

*406/2000 Coll. Act on Energy Management* updated continuously through amendments

This Act transposes the applicable laws of the EU and sets out:

- Certain measures for increasing the energy efficiency and the obligations of natural and legal persons in energy use;
- Rules for the drafting of the National Energy Policy, Territorial Energy Policy, and the National Programme the Promotion of Energy Conservation and the Use of Renewable Sources of Energy;
- Requirements as to the eco-design of energy-using products.

*180/2005 Coll. Act on use of renewable sources of energy*

The purpose of the Act is to support the use of renewable sources of energy, i.e. wind energy, solar energy, geothermal energy, water energy, soil energy, air energy, biomass energy, landfill gas energy, sewage gas energy and biogas energy.

*State energy policy vision document approved by the Czech government in 2004*

The State Energy Policy's vision specifies the state's priorities and determines the objectives that the state wants to achieve in influencing the development of energy sector in the horizon of the next 30 years in the conditions of a market-oriented economy.

*Territorial energy policy vision document for the city of Havirov und surroundings approved by the Municipal Council in 2005*

The City of Havirov Energy Policy's vision specifies the area priorities and determines the objectives that the city wants to achieve in influencing the development of housing and energy distribution sector in the horizon of the next 15 years in the conditions of a market-oriented economy.

**d. Urban development plan;**

Urban development plan was approved in 1999. This plan is regularly updated through amendments. Strategic development plan and community development plan are also available.

## **2. Ambitions for energy/CO<sub>2</sub>**

### **a. Which stakeholders and which arguments played a role in formulating the ambitions of the project;**

The stakeholders are the Municipality of Havirov and MRA the agency . The main argument is that the energy efficiency and environmental issues are defined in the strategic development plan of the city and in the territorial energy vision document. Also higher energy efficiency and CO<sub>2</sub> reduction defined as project targets would facilitate the access to subsidies..

### **b. Did arguments of indoor climate and/or comfort of inhabitants play a role;**

From the position of the city yes, because it is one of the targets of the city development strategy.

### **c. What was the role of legal regulations;**

The legal regulations define the minimum requirements for renovation projects. The U-values are prescribed.

### **d. What was the role of the local authorities;**

SORELA buildings are considered to be a part of history and a sort of cultural heritage of the city. The facades of these building will have to respect certain rules that should be formulated by the authorities. Also the projects have to be submitted for approval of monuments protection authority.

### **e. Was there a role for inhabitants;**

MRA has an experience with tenants participation from other EU projects like SUREURO The tenants participation has been an issue in Sumbark renovation project. The municipality together with MRA would consider an agreement with tenants enabling them to be involved in planning, improving and monitoring the projects and clarifying

- what municipal council and tenants want to achieve locally through this agreement such as better ways of mutual co-operation, improving local services and quality of life;
- how tenants can get involved collectively in local decisions on housing matters which affect them;
- how the compact is implemented and checked to make sure it is working properly.

### **f. How was the final target determined and agreed on;**

The final target is based on technical and economical feasibility. One of the main environmental tasks is to reduce the emissions due to traffic and local heating technologies

### **g. Were specific tools and methods used to determine the target level;**

Information system developed in the project ESAM was used as a supporting tool.

**h. What kind of agreement has been prepared about the ambitions (legal contract, covenant, ...), between which parties;**

At the present time there is no legal contract, no agreement. This is a matter of discussion among the stakeholders.

**i. Does the agreement include a guarantee on actual realisation of targets, how is this checked.**

No, the project is not that far yet. There is not much experience in this field. It is assumed that a corresponding know how would be transferred from other EU countries and implementation guidelines will be elaborated.

### 3. Analysis of energy options

#### Option 1) improvement of constructions to U – values required by ČSN 73 0540-2

Example building – living space: **2237,76 m<sup>2</sup>**

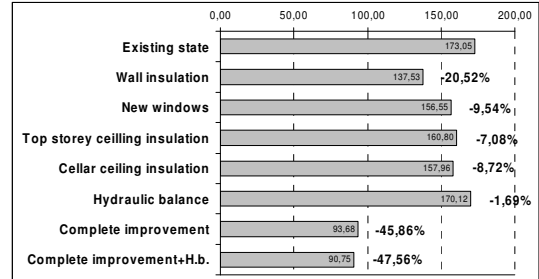
Measures potential:

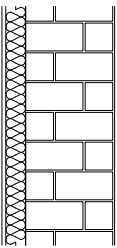
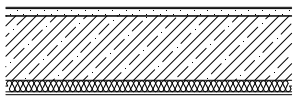
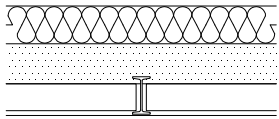

**Prior to modernising:**

final energy consumption: **387 248 kW/year**  
**173,05 kWh/m<sup>2</sup>a**

**After modernising:**

final energy consumption: **203 079 kW/year**  
**90,75 kWh/m<sup>2</sup>a**



Sketch of insulated construction	Description of improvement	New U-value W/(m <sup>2</sup> K)	Added costs compared to repairs €/m <sup>2</sup>	Saved energy consumption per year kwh/m <sup>2</sup>	Costs per saved kWh/m <sup>2</sup> per year €
<b>External wall</b> 	Heat insulation composite system 70mm	0,38	7,12;	35,52	0,20
<b>Cellar ceiling</b> 	Heat insulation – 40mm from bellow	0,60	3,12	15,09	0,21
<b>Top storey ceiling</b> 	Heat insulation – 90mm	0,30	3,57	12,25	0,29
<b>Window</b> 	New windows with double-glazed heat protection glazing (wooden frame!)	1,40	13,00	16,50	0,79

## Option 2) improvement of constructions to U – values recommended by ČSN 73 0540-2

Example building – living space: 2237,76 m<sup>2</sup>

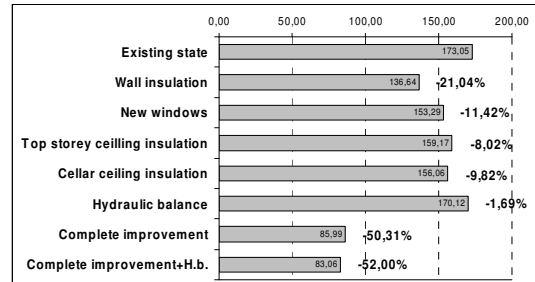
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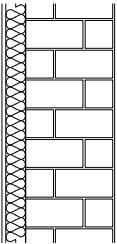
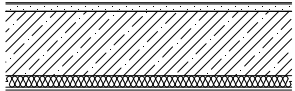
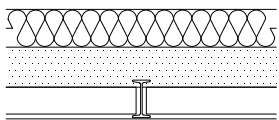

**Prior to modernising:**

final energy consumption: **387 248 kW/year**  
**173,05 kWh/m<sup>2</sup>a**

**After modernising:**

final energy consumption: **185 874 kW/year**  
**83,06 kWh/m<sup>2</sup>a**



Sketch of insulated construction	Description of improvement	New U-value W/(m <sup>2</sup> K)	Added costs compared to repairs €/m <sup>2</sup>	Saved energy consumption per year kWh/m <sup>2</sup>	Costs per saved kWh/m <sup>2</sup> per year €
<b>External wall</b> 	Heat insulation composite system 80mm	0,35	7,36	36,41	0,20
<b>Cellar ceiling</b> 	Heat insulation – 60mm from below	0,40	3,39	16,99	0,20
<b>Top storey ceiling</b> 	Heat insulation – 160mm	0,20	4,29	13,89	0,31
<b>Window</b> 	New windows with double-glazed heat protection glazing (wooden frame!)	1,10	14,53	19,77	0,73

\*Adjustment of hydraulic balance on the heating system for both options is assumed.

Describe **shortly** the method and results of the energy study. Identify most promising options, with corresponding reduction potentials and bottlenecks.

The most promising options, see above table. The choice will follow the allocation of available financial sources.

#### **4. Discussion of results of energy study**

Describe how the energy study results were discussed and received by the stakeholders, how possible conflicts were resolved and which options were finally selected for implementation.

The project is not that far to fill-in this part of the local report.

#### **5. Implementation and evaluation**

Discuss the following issues:

**a. To what extent have energy options been implemented in your project;**

The buildings themselves – envelope+ heating+HDW efficiency

**b. How are achieved reductions monitored;**

The achieved reductions will be monitored through MRA SW tool . Energy consumption data from the past years of all buildings chosen for the project are available. They will be exported from the database and compared with new data obtained after the energy efficiency upgrade of the buildings.

**c. How did the decision making process proceed after the agreement was made;**

The project is not that far to fill-in this part of the local project report

**d. were the CO<sub>2</sub>/energy ambitions modified later;**

???

**e. How did you use the draft guidelines on Process and on Embedding Agreement (see ENPIRE website, under Publications);**

The guidelines are followed . The vision document has not been finalised yet.

**f. What feedback can you give with respect to these guidelines;**

It is too early to judge upon these guidelines

**g. What other lessons were learned.;**

The project is not that far to fill-in this part of the local project report

**h. Was the planning process your project different from what is customary in your country? In which ways?**

The planning process is going to be different than usual. It is going to follow the guidelines, to involve all stakeholders and to make the project a real teamwork..

**i. Could the approach in your project be used on a wider scale, what changes would be necessary for this?**

The project is not that far to fill-in this part of the local project report. It is assumed that it will be possible however it is too early to judge upon this.

N.B.:

- 1) Your summary is a **very important input** for the further success of the overall ENPIRE project. A large part of the project lessons will have to come from these reports;
- 2) The English summary should be at least 5 pages *excluding pictures and graphs*. It will be helpful for us if you make it a bit longer than 5 pages.
- 3) Do not focus too much on the technical issues and results, but give good attention to organisational aspects as well;
- 4) Remember that your reader is not familiar with local situation and regulations, but also do not try to describe these regulations extensively;
- 5) Try to include lessons which provide an EU added value, for example approaches that can be used in other countries as well.
- 6) Send us your draft report first, we will follow up with questions and/or suggestions for the final version.