



**THE PRACTICE OF SAVING ENERGY  
IN PUBLIC BUILDINGS  
IN RUSSIA**

**EU-Russia Project  
Workshop  
BUSINESS  
PARTNERSHIPS FOR  
MODERNIZATION**

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## The Project:



**Location:** Municipal school in Mokshino, Konakovo District, Tver region

**Year of construction:** 1964

**Surface area:** 5067m<sup>2</sup>

**Goal:** Energy reduction of at least 40%

## Goals:

1. Contribute to the overall objective of 40% energy saving in the Russian Federation by 2020.
2. Implement a showcase of successful energy efficiency measures in a public building.
3. Gain concrete experience in EE in public buildings under Russian circumstances.
4. To transfer expertise about energy efficiency audits and measures in public buildings to Russian professionals.
5. To disseminate project results.

## Project budget:

1. Total project budget is 1 225 500 €. 722 500 € from the Dutch side and 500 000 € from the Russian side.
2. The budget is divided as follows: 80% equipment and 20% technical assistance.
3. The required equipment will be purchased in Russia.

## Project funded by:

The Dutch Ministry of Housing, Spatial Planning and the Environment and the Administration of the Konakovo District (Tver).

## Project supported by:

The Ministry of Economic Development and Trade, The Governor of the Tver Oblast, The Presidential Commission on Modernization of the Economy and Technology.

**Period:** 24 months, starting 17 November 2009.

# Objectives

1. Audits in five pilot public buildings.
2. Concrete energy saving measures in one pilot building.
3. Establishing baseline and final situation in one pilot building.
4. Transfer of knowledge and training program.
5. Information dissemination.

# Audit results

<b>Building envelopes</b>	Moisture in outside walls. Poor state of windows: single & broken glass; no sealing of window frames. No insulation of outside doors.
<b>Heating</b>	Piping and radiators are worn-out. Loss of heat: pipes not insulated, running through unheated premises. No temperature regulation. No hydraulic balance in the heating system.
<b>Ventilation</b>	Defunct ventilation system.
<b>Electrical installation</b>	Poor state of electrical system (fuse boxes, electrical wiring, connections): out of date and not safe, in some cases open electrical connections.
<b>Lighting</b>	Predominantly fluorescent lighting + incandescent lighting luminaries. In some rooms more luminaries than necessary.
<b>Electrical equipment</b>	Classrooms: in good condition. Kitchen: outdated and inefficient.
<b>Domestic hot and cold water</b>	Old pipes. Toilets: recently renovated; no water saving measures including faucets. DHW: only in kitchen; no water saving instruments. Very high use of energy for hot water.

**Ventilator exhaust**



**Ice at the backdoor**



**Central Heating pipes**



**Outer walls**



**Electrical fuse box**

# Measurements

Meters for heating, warm and cold water were installed. Electricity meters were already present.



Meter for heating



Meter for hot water

Readings before and after the implementation of the energy saving measures will allow to calculate the achieved energy savings.

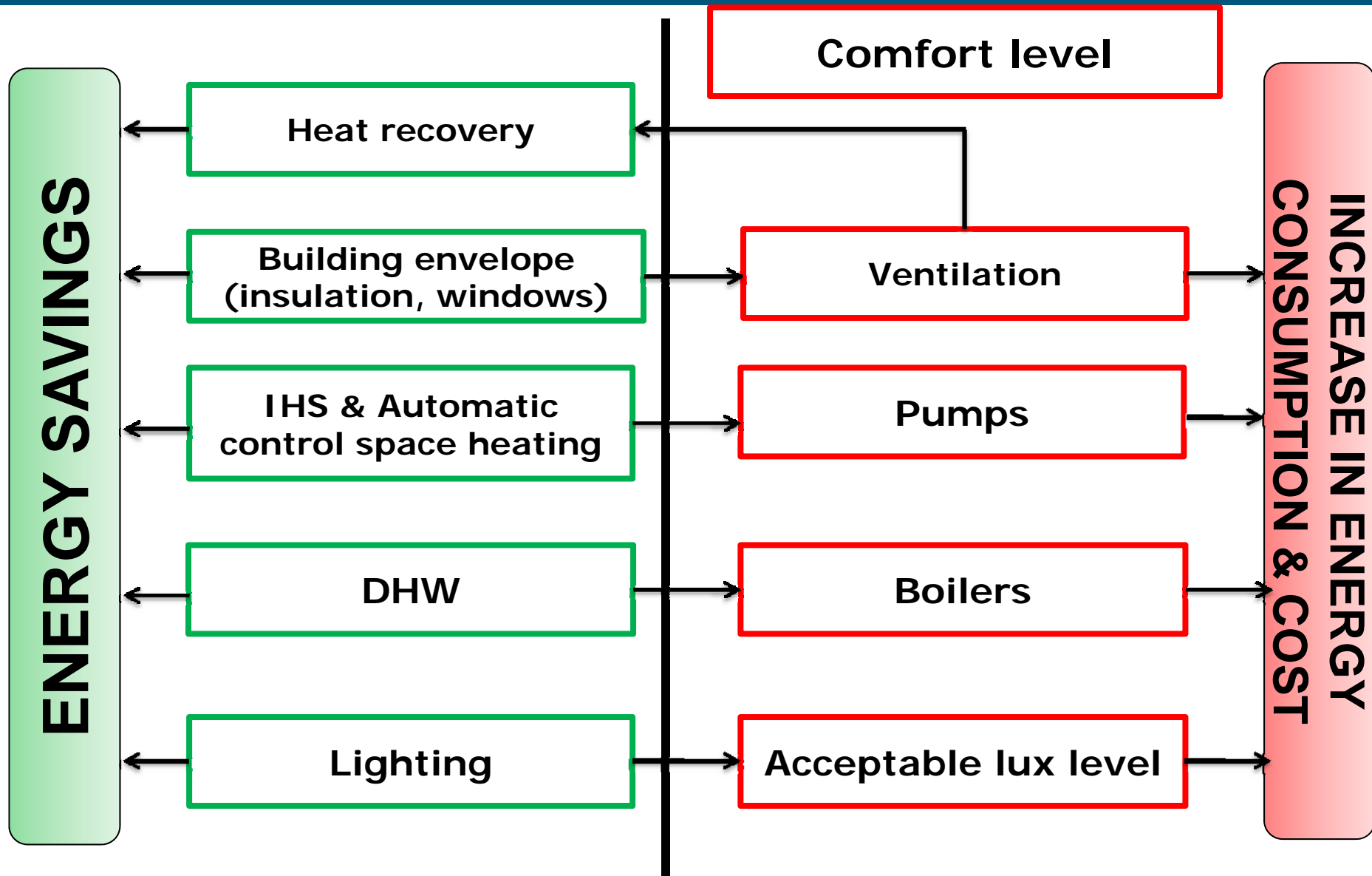
# Activities

<b>Building envelope</b>	Thermal insulation of roofs, outer walls, windows & window frames + thermal insulation of basement, ground floors.
<b>Heating</b>	Replacement of radiators, thermostatic radiator valves; insulation and relocation of main distribution pipes. Independent heat system. Hydraulic balancing of the heating system. Installation of night and weekend temperature setting.
<b>Ventilation</b>	Installation of proper ventilation.
<b>Lighting and electrical installation</b>	Energy efficient luminaries and light bulbs. Modular switchable. Renovation of electrical wiring.
<b>Electrical equipment</b>	Replacement of kitchen equipment.
<b>Domestic hot water</b>	Installation of electrical boilers.

**Preliminary estimation of energy savings:  
40-60%**

# Lessons learned

1. There is no such thing as “just Energy Efficiency”.
2. Bringing buildings to an acceptable comfort level may actually increase energy consumption.
3. It is very hard to save primary energy.
4. It is very hard to find engineers, projectors, builders, suppliers, authorities, building users that really understand EE.
5. Without a complete project cycle and competent project cycle management the result may be zero.
6. Payback may range from 3 to 20 years / average 12 years / low economic efficiency.
7. Operation of the building is key factor – factor 4.
8. Commitment and involvement of stakeholders is key.



# Recommendations

1. Energy efficiency projects require an integrated approach.
2. Consider the entire energy value chain in project selection & design.
3. Consider the primary savings factor and the comfort level in your project selection & design.
4. Get all the stakeholders onboard.
5. Establish baseline in order to evaluate the effectiveness of the project.
6. Create a competent project team of experienced engineers, projectors, builders, suppliers, authorities, building users who really understand EE.
7. Think through the entire project cycle and install proper project cycle management.
8. Think of EE as a long term investment.
9. Include post-project training and management in your project:
  - a. Correct operation of equipment;
  - b. Proper operation of automatic control systems;
  - c. Proper adjustment of space heating controllers;
10. Avoid "The Emperor's New Clothes".

Over the years, Lighthouse has build up a unique and strong track record in Energy Efficiency (EE) projects in Russia. These projects range from developing EE strategies and financing schemes to the actual implementation of EE measures and setting up of ESCO companies. Such projects often require the implementation of Western know-how and technology in the field of EE. However, the specific situation in Russia with regards to the EE needs to be accounted for in order to ensure the successful implementation of this know-how and technology. Lighthouse uses its extensive practical experience in EE projects in Russia to bridge the gap between the Western know-how and technology on the one side and the Russian reality on the other side.

See also: [http://www.thelighthousegroup.ru/gb/lighthouse\\_energy](http://www.thelighthousegroup.ru/gb/lighthouse_energy)

For further information you can contact us by using the coordinates below.

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