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from idea to business

THE LIGHTHOUSE GROUP
Your Partner in Eastern Europe and Central Asia

THE REALITY OF ENERGY EFFICIENCY IN PUBLIC BUILDINGS IN RUSSIA

THE RUSSIAN - EUROPEAN BUSINESS FORUM
Successful Together

September 25th, 2010
Park Inn
Pribaltiyskaya Hotel
St. Petersburg

By: Jeroen Ketting, Managing Director of Lighthouse Russia BV

The Project:

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

Year of construction: 1964

Surface area: 5067m^2

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.

Objectives

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

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, The Governor of the Tver Oblast, The Presidential Commission on Modernization of the Economy and Technology.

Audit results

Building envelopes	Moisture in outside walls. Poor state of windows: single & broken glass; no sealing of window frames. No insulation of outside doors.
Heating	Piping and radiators are worn-out. Loss of heat: pipes not insolated, running through unheated premises. No temperature regulation. No hydraulic balance in the heating system.
Ventilation	Defunct ventilation system.
Electrical installation	Poor state of electrical system (fuse boxes, electrical wiring, connections): out of date and not safe, in some cases open electrical connections.
Lighting	Predominantly fluorescent lighting + incandescent lighting luminaries. In some rooms more luminaries than necessary.
Electrical equipment	Classrooms: in good condition. Kitchen: outdated and inefficient.
Domestic hot and cold water	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

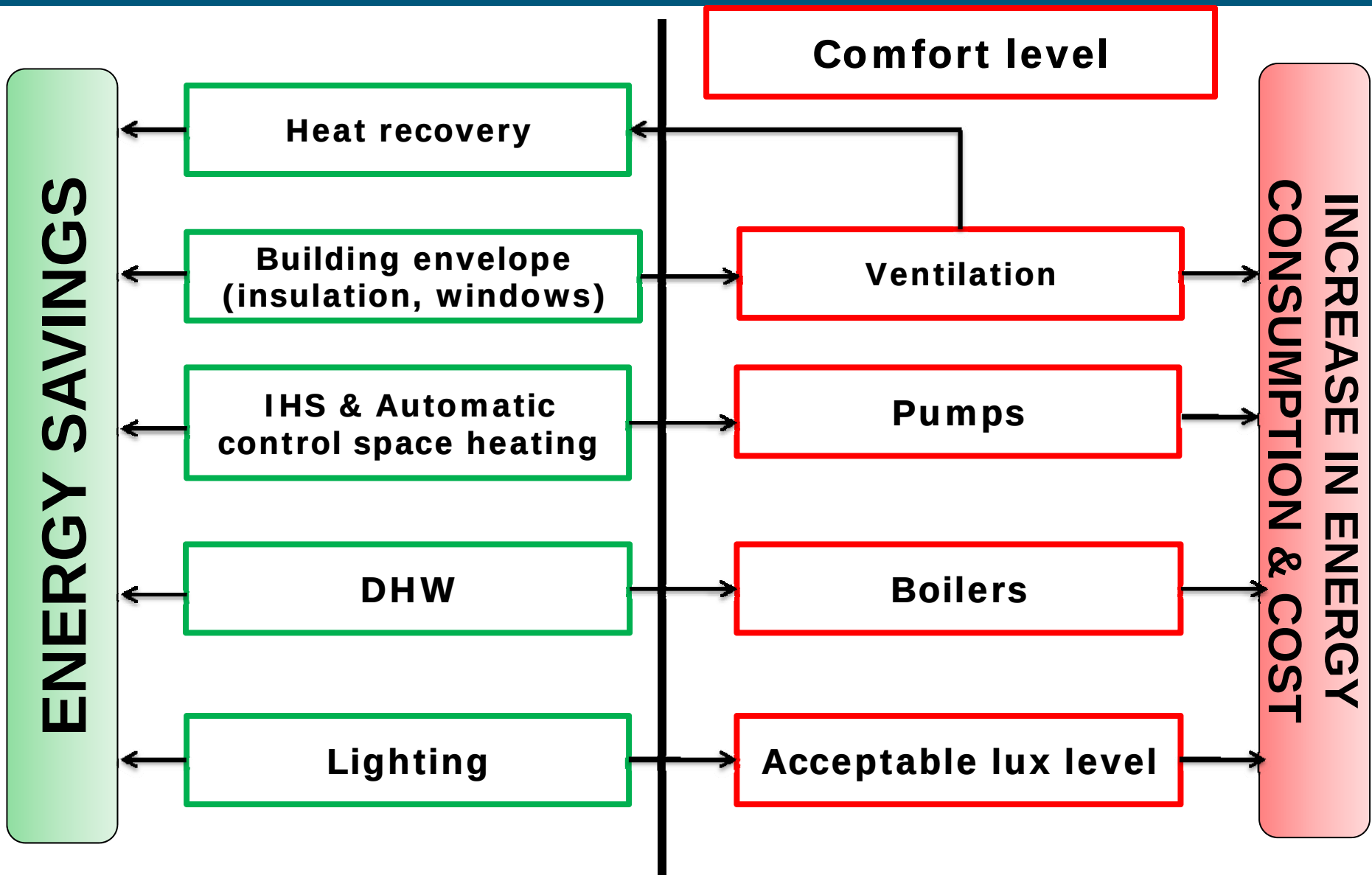
Meter for hot water

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

Activities

Building envelope	Thermal insulation of roofs, outer walls, windows & window frames + thermal insulation of basement, ground floors.
Heating	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.
Ventilation	Installation of proper ventilation.
Lighting and electrical installation	Energy efficient luminaries and light bulbs. Modular switchable. Renovation of electrical wiring.
Electrical equipment	Replacement of kitchen equipment.
Domestic hot water	Installation of electrical boilers.

Preliminary estimation of energy savings: 40-60%


Comfort level
ENERGY SAVINGS
Heat recovery
Building envelope (insulation, windows)
IHS & Automatic control space heating
DHW
Lighting
Ventilation
Pumps
Boilers
Acceptable lux level
INCREASE IN ENERGY CONSUMPTION & COST

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. Without a complete project cycle and competent project cycle management the result may be zero.
5. Operation of the building is key factor – factor 4.

Barriers to EE

There are barriers throughout the entire project cycle:

1. Project initiation.
2. Project design.
3. Project implementation.
4. Project replication.

Project initiation

1. **Finance**:
   1. Lack of governmental funding.
   2. Few private banks interested in EE projects.

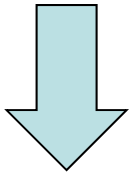
➔ Most EE projects in Russia are funded by IFIs and foreign governments.

2. Long **payback** times.

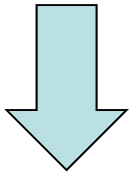
3. Difficult to find **committed project partners**.

Project design

1. Lack of **reliable information:**
    1. Energy consumption (e.g. lack of meters).
    2. Tariffs and relation between consumption and Payments (e.g. cross-subsidization).



2. Difficult to establish **baseline** energy consumption and costs.



3. Difficult to build a convincing **business case** for the project.

Project implementation

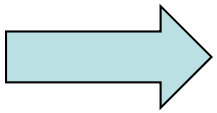
1. It is very hard to find engineers, projectors, builders and suppliers that **really understand EE**.

2. Foreign technical experts are often involved in the project implementation due to a lack of local knowledge on EE ➔ **difficulties** may arise in the cooperation between these experts and the local project counterparts.

2. Local counterparts (e.g. building users) often do not fully understand EE, yet play **a key role** in ensuring a successful project implementation (e.g. daily tracking of meter readings).

Project replication

1. Many EE projects are implemented through **subsidies / grants**



Such projects are rarely replicated through private/ public funding.

2. The success of an EE project depends to a large extent on creating a **competent and committed team** of technical experts, stakeholders and contractors.

3. The **local situation** varies from location to location making project replication difficult.

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

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

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