

Case Study 12

Modernization Multi-apartment programme

Lithuania



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Energy behavioral changes



Changing Behaviour



Work package 2

Development of the conceptual model: Analysis of success factors,
underlying models and methods in target group interaction

Case Study 12:

Modernization Multi-apartment programme, Lithuania

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Summary of the case

The 'Modernization of multi-apartment buildings' programme covers one type of buildings: multi-apartment buildings (block of flats). This type of buildings amounts to a major share of the energy consumption and have high energy saving potential.

Saving potential takes significant meaning after energy prices became unpredictable. Apartment buildings in Lithuania, compared with countries in the European Union, use much more energy for heating. For this reason the renovation programme aimed at lowering energy consumption in buildings was introduced.

Furthermore, the renovation programme and its environment in administrative, economical, transactional, social and national aspects are analysed. Administrative and transactional links between participants have a huge influence on the effectiveness of the programme. Activities of different participants are researched in this case.

This case also describes the main instruments applied in the renovation programme as well as the main financial resources. Based on the results of the analysis the main barriers to the modernization programme are indicated.

Step 1: Context of programme

National context in general

Lithuania is one of the Baltic Sea region countries that are defined as part of Eastern or Northern Europe. It is situated along the south-eastern shore of the Baltic Sea, sharing borders with Latvia, Belarus, Poland, and the Kaliningrad Region (Russian enclave). Lithuania, with a population of 3.4 million, is a member of NATO and of the European Union. The largest city and capital is Vilnius. In present period Lithuania has one of the fastest growing economies in the European Union. Lithuania became a full member of the Schengen Agreement on 21 December 2007.

Location of Republic of Lithuania in Europe is shown in Figure.1.



Figure 1. Location of Lithuania

Source: http://en.wikipedia.org/wiki/Image:EU_location_LIT.png.

Lithuania contains around 99 kilometres of coastline. According to one geographical computation method, Lithuania's capital, Vilnius, lies only a few kilometres south of the geographical centre of Europe. The climate of Lithuania is transitional between maritime and continental. Average temperature in July is 23°C, and average temperature in January is -4.9°C.

Some 84.6% of the Lithuanian population are ethnic Lithuanians who speak the Lithuanian language (one of the two surviving members of the Baltic language group), which is the official language of the country.

In 2004 Lithuania became a member of the European Union. Lithuania had the highest economic growth rate amongst all candidate and member countries, reaching 7.3% in 2004; 2005 - 7.9%; 2006 - 7.7%; 2007 - 8.8%, 2008 Q1 - 6.9% growth in GDP reflects the impressive economic development (data by the Lithuanian Department of Statistics, <http://www.stat.gov.lt/lt/pages/view/?id=2519>). Most of the trade Lithuania conducts is within the European Union.

The main document drawing the guidelines for the energy sector is National Energy Strategy. Present National Energy Strategy was approved by Lithuanian Parliament in 2007.

Starting from the 1990's energy consumption in Lithuania has decreased dramatically due to the closure of a number of industrial companies and factories. At present energy consumption in Lithuania is growing continuously, but the consumption figures are still far from the average energy consumption in the EU. While the efficiency of energy consumption has significantly increased in the industry and trade and services sector, the situation improved only slightly in the public sector (schools, universities, hospitals, etc.) and old residential buildings. Relative energy consumption for the heating of buildings in Lithuania is double the amount of developed European countries.

Heat generation in district heating companies amounts to 50% of the total heat production. Over 60 district heating companies are operational in Lithuania. Up until the year 2000 heat production and distribution has decreased due to closure of large heat consumers (industry companies, factors) and due to disconnection of inhabitants. While in the recent years heat demand from district heating has become more stable. Natural gas amounts to approximately 80% of the fuel balance in district heating companies. Due to the rising price of natural gas imported from Russia, the price for district heating became relatively high compared to average household incomes. For example, the price for heating delivered through district heating was about 0,22 LTL/kWh (0,06 EUR/kWh) in 2007-2008. Compared with average monthly gross earnings in 2007, which was 1813 LTL (518 EUR), the referred price for energy is high. For example, heating for an old flat of 50 m² costed about 350-500 LTL (100-143 EUR) a month in 2007-2008. This amounts to 19-27 % of monthly earnings.

In this context the main target of the Modernization of multi-apartment building programme is to increase efficiency of heat consumption. The energy saving potential is large in multi-apartment buildings. Subsequently the programme helps towards the renewal of building facades.

The Government of the Republic of Lithuania supports the programme by financing part of the renovation expenditures. Due to the rising energy price, more information and examples of success as the number of applicants is growing. For this reason a need for additional funding emerged.

The Housing and Urban Development Agency is responsible for implementation and administration of the programme. Intermediaries like banks, consultants, insurance agencies and municipalities are involved in the programme.

The local attitude towards the programme and technology instruments is positive, because after the increase of energy prices people feel showy changes in their outcomes. Participation in the programme allows reduction of direct expenses related to heating. Additionally, an added value is the increased value of buildings.

The intensity of the development of the programme is shown below:

[Data of Housing and Urban Development Agency]

	2005	2006	2007	2008 August
Number of implemented projects	1	75	152	74
Number of projects, granted for support	54	177	346	143

Step 2: Focus of the programme

General issues

In January 2004, the Lithuanian Government approved the Lithuanian Housing Strategy. The same year the Lithuanian Housing Strategy was implemented, the Government of the Republic of Lithuania approved the 'Multi-Apartment Buildings Modernisation' Programme.

The programme is based on two factors. One of them is the growing energy price, which caused for people to reduce the consumption of energy resources and expenditures. Equally, participation in the programme implies improvement of residential conditions. The other factor is the policy of the Republic of Lithuania, which is aimed at increasing energy independence.

The main target of the programme is to stimulate the modernization of multi-apartment buildings. The idea is that implemented projects and related activities will show the advantages of modernization and result in a more positive attitude of owners towards modernization.

In the scope of the programme, part of the expenses related to modernization is subsidized. Subsidy is directed towards increasing the efficiency of energy consumption. E.g. a project with high potential for energy efficiency improvement will receive a considerable amount of subsidy. The programme is becoming increasingly attractive, as in recent years the district heating price increased dramatically.

The increase of average district heating prices from 1996 is shown in the graph below (data from District Heating Association, <http://www.lsta.lt/files/statistika/ST-2007apWEB.pdf>):

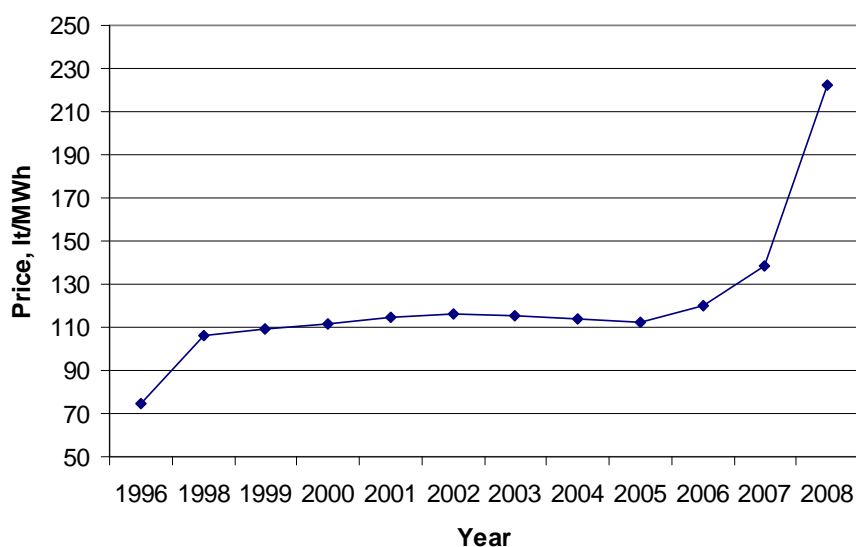


Figure 2: The growth of district heating price

The programme was drafted based on the results of a demonstration project implemented in Vilnius. 50% of modernization investments were subsidized by the Municipality of Vilnius. This demonstration project was the incentive for the programme and regulation arrangement (Energy Efficiency Housing Pilot project, short description included in the examples of Lithuania for WP1).

Initiator and partners

The main partners within the programme are:

- Ministry of Environment of the Republic of Lithuania;
- Housing and Urban Development Agency;
- Insurance company;
- Bank or other creditor;
- Building owners or their community;
- Consultants;
- Construction Company.

Ministry of Environment of the Republic of Lithuania

This institution is responsible for supervision and development of the programme. Main activities related to the programme:

- Preparation and approval of rules (rules of funding and project energy effectiveness);
- Involvement of the programme in strategic plan of activities, by planning financial resources and instruments to develop the programme;
- Delegation of the administration of financial resources to the Housing and Urban Development Agency;
- Supervision of the development of the programme;
- Monitoring the utilization of financial resources.

Housing and Urban Development Agency

The Housing and Urban Development Agency is an executive institution. Main activities:

- Preparation of a methodology for documents required in the development of the programme;
- Drafting contracts with creditors and insurers;
- Consulting owners or their community about technical, economical, organizational aspects, also about feasibility of participation in the programme;
- Managing investment project by regulation;
- Reporting the review conclusions to insurance company and creditors;
- Administration of subsidy from Ministry of Environment of the Republic of Lithuania
- Auditing factual and planned construction activities;
- Monitoring development of the programme and reporting to Ministry of Environment of the Republic of Lithuania;
- Preparing and developing public information measures about the programme;
- Other activities related to the programme.

Insurance company

Main activities:

- Accepting applications for credit insurance;
- Checking investment projects and paying reliability of recipient;
- Providing the insurance for credit.

Banks or other creditors

The main activity of creditors is to finance part of the investments towards the programme.

Credit is granted to the building owners. Some specifications for credit apply:

- The equity of the benefit should not exceed 2,9 %;
- The credit amount should not exceed 95 % of all investments.

Building owners or their community

Owners or their community administrate preparation of investment projects and also work as team members in programme management.

Consultants

'Consultants' usually refer to the companies represented by consulting engineers, who are able and qualified for energy auditing and technical consultancy. Activities of consultants:

- Energy auditing;
- Technical survey and consultation;
- Investment project.

Construction Company

Renovation measures assessed in energy auditing and investment projects and related works are implemented by a building Construction Company. Permission to start building activities is granted after a declaration is signed regarding a credit injection by the creditor.

Problem definition

There are a number of bottlenecks related with implementation of the programme; one of which is compatibility and capacity of participant's activities. The leaders and initiators of the modernization project are the building owners or their communities. Usually they are not sufficiently qualified to manage the modernization project and coordinate participants' activities.

Also, obstacles such as lack of agreement between building owners (owners of the apartments in multi-apartment buildings), different background and financial potential of the owners play an important role towards the programme's success.

Goals and objectives

Objectives of the programme are:

- to increase the efficiency of energy consumption in buildings; thermal energy and fuel consumption in the present housing sector will decrease by 30%;
- to decrease expenses related to district heating;
- to improve building conditions;
- to prolong buildings' life cycles;
- to aid in reaching political energy targets;
- to enhance behavioural change of energy consumers.

By reaching the objectives, the following quantifiable outcomes are expected: modernization of about 70% of multi-apartment buildings that were constructed before 1993 and a 30% decrease of thermal energy and fuel consumption in the present housing sector.

Goals of the programme are:

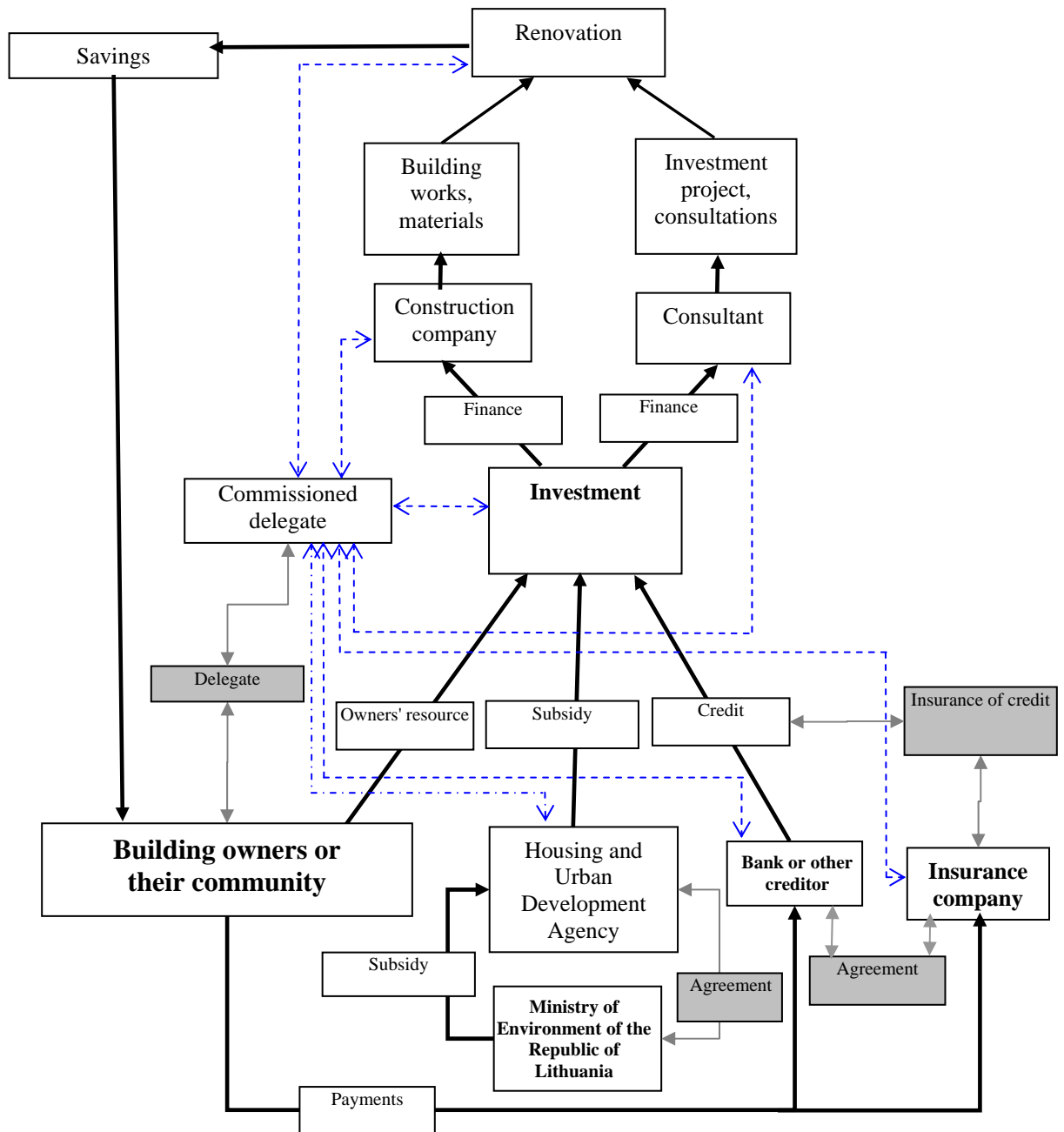
- to create the system which credits the modernization projects;
- to facilitate cooperation among creditors and related participants, making credits available for building owners;
- to subsidize part of the investments and support owners with low incomes;
- to ensure provision of modernization project;
- to ensure juridical, financial, technical and organizational support for owners.

Targets and target group

The target group are the owners of multi-apartment buildings. Main benefits for them are: by increasing the efficiency of energy use, reducing heating expenses, ensuring favourable con-

ditions for owners of multi-apartment buildings and for the low income population as well as single persons, in facilitating modernization of their apartments in the multi-apartment buildings.

Step 3: Design of the programme



Scheme 1. The mechanism of the programme

The mechanism of the programme is shown in Scheme 1. Black arrows show the finance flows between institutions. Blue arrows show organizational links within the programme. There is one participant, who is responsible for implementation of the programme – the com-

missioned delegate of the building owners. His activities are the crucial factor for successful renovation.

All financing towards implementation of the programme is constructed from:

- Financing from building owners (5%);
- Subsidy from the Ministry of Environment of the Republic of Lithuania (from 0 to 50%);
- Credit from Bank or other creditor (from 0 to 95%).

Subsidy from the Ministry of Environment of the Republic of Lithuania depends on planned renovation instruments defined in the investment project. If planned instruments provide a high increase of energy efficiency, the subsidy will take up a more significant part of all finances. For example, 50% of investment is subsidized when the most effective instrument - insulation of outside walls - is implemented.

Instruments of renovation

Main instruments towards increasing energy efficiency are:

- Reducing waste of heat through outside panels of building (insulating outside walls and roof, changing windows and doors);
- Changing / renewing systems that consume energy (heating, hot water, cooling, ventilation, lightening systems);
- Automating systems (heating, hot water, cooling, ventilation, lighting systems);
- Installing new technologies or units (installation of new boiler, pump, elevator, ventilation or cooling systems).

Substantially, instruments of renovation that are subsidized by the programme apply to heat savings, however not to energy (electricity, fuel) savings in general.

Research conducted on target group

This programme is the major existing programme in Lithuania at the moment. Behavioural change of energy consumers can be monitored from the start of the programme in 2004 till present. Some turning points occur, which influence people's attitude towards energy saving in multi-apartment buildings. These were criterions crucial to the selection for this programme and its mechanism for this research.

The main barriers for implementation of the programme are:

- **Lack of knowledge of implementing party on the investment plan**
Usually, building owners appoint one of their own to assume responsibility for the implementation of the investment plan. The appointed party often is not sufficiently skilled in managing the programme and technical aspects. Additionally, there is no official salary for the responsible delegate throughout the implementation period of the programme.
- **Lack of finance from Government of the Republic of Lithuania**
52 million litas (about 15 million euros) were assigned for 2008, but this entire amount was used for renovation projects. For this reason, the government has made corrections within the programme in March (2008), deciding not to subsidize modernization instruments such as elevator renovation, lighting systems and landing areas. The main corrections idea was to concentrate the subsidy to instruments, which entail the most significant potential in heating energy saving.
- **Attitude towards energy efficiency**
Many people do not understand the purpose of efficiency of energy consumption, saving potential and real possible savings due to energy saving. The renovation programme is a

great example and excellent educational tool to improve the common attitude towards efficiency of energy consumption.

The intervention methods/instruments and activities used

One of the interventions of the Government of the Republic of Lithuania was taken in March 2008. Due to lack of funding, the government has decided not to finance some instruments in the renovation programme. This includes elevator renovations, landing areas or lighting systems. Result is that the renovation programme is currently mainly aimed at increasing the efficiency of energy consumption for heating. These changes had an impact on people's confidence in the reliability of the programme's stability.

Link to other programmes and policy

The programme corresponds with the main provisions of Lithuanian strategic documents of the energy sector, such as National Energy Strategy, National Energy Efficiency programme, National Housing Strategy and similar documentation.

Step 4: Process of the programme

Interaction between the different participants

Interaction between participants of the programme is closely interlinked, because institutions are directly or indirectly linked with each other. As shown in Scheme 1, each participant has an organizational link with a delegate of building owners. All interactions among participants pass through the delegate.

The existing mechanism of the programme runs from 2004, when the renovation programme commenced.

Step 5: Outcome of process

Objectives/goals/outcomes

From the programme's commencement in 2004 a considerable change in behaviour can be detected. Previous projects that were implemented in neighbourhoods stimulate other real estate owners to implement renovation projects in their buildings as well. This becomes evident from the increasing number of applications. Moreover, implemented projects are excellent educational tools for demonstrating the benefits of the programme.

Effectiveness

In the context of efficiency in energy consumption, implemented projects have resulted in significant savings - from 20% to 60% (according to energy audits made by "COWI Baltic"). Unfortunately, at present the projects are only cost-effective based on subsidies.

Despite mentioned barriers, it appears that the (ongoing) programme can be finished successfully. People have become interested in renovation independently, even without the outlook on subsidy (changed thinking). The number of applications and implemented projects has increased.

The Housing and Urban Development Agency collects and publishes data on the number of applications, signed construction contracts, implemented projects, and investment amounts. However, the agency does not collect data on efficiency, e.g. the amount of actual energy savings, etc. Therefore it will be quite difficult to define whether the goal to reduce thermal energy and fuel consumption in the present housing sector by 30% has been achieved.

Step 6: Analysis and conclusion

Some conclusions can be drawn after analysis of the programme:

- The implementation of the programme is a slow process, because important activities are delegated to non-qualified participants.
- The regulation of the programme is not flexible and effective for quick implementation.
- Implemented renovation projects are useful economically, because expenditures for heat decrease.
- Implemented renovation projects are useful visually, because the view of the city becomes more attractive and presentable.
- Implemented renovation projects are useful socially, because the living conditions become better and more comfortable.
- Implemented renovation projects are useful on the national scale, because the modernization programme helps to reach national energy policy targets.
- Implemented renovation projects provide educational tools for changing the common attitude towards effectiveness of energy consumption.
- Implemented projects and related information prove to be the best educational measures for changing behaviour of energy consumption.