Energy Performance Contracting

How much will it costs to residents?

Ēku saglabāšanas un energotaupības birojs

2014

Numbers tell our story – a case study from Gaujas Street in Valmiera

Table of content

Introduction

Despite vigorous efforts in recent years, most of Latvia's building stock continues to deteriorate rapidly; externally due to the insufficient protection against the harsh climate conditions, and internally due to corrosion of the heating, water and sewer networks. Without an acceleration of the current pace of renovations we estimate 70% of the multi-family housing stock will likely become uninhabitable within 20 years.

Since timely replacement with new buildings is organizationally and financially beyond the available means of both the private and public sector (at today's prices the cost would exceed €28 billion), renovation of the building stock must become a national priority.

Comprehensive and deep renovation, followed by proper maintenance, protects buildings and extends the life of buildings by 30 years or more. Costing roughly one eight of new construction, renovation is a viable solution for most buildings.

Additionally, this building stock has significant financing capabilities; the value of the energy saved as a result of comprehensive renovations can be used to finance the costs of renovation and energy efficiency measures.

Investment in renovations brings social, economic, health and environmental benefits. The alternative is to continue spending an even larger amount of money on energy - mostly in the form of imported natural gas – as well as amounts of money for emergency replacement of existing homes in the medium term.

The quality and scope of current renovation practice needs to be improved to realize more durable buildings, larger energy savings and better comfort and living conditions.

Latvia cannot afford to lose recently developed institutional and implementation capacity by temporarily starting and stopping renovation support programs. Instead it must continue and accelerate its current efforts whereby maximizing the impact of public sector grant funding with private capitals.

The Bureau is striving to ensure that in 2020 at least 30% of the current multi-family building stock is comprehensively renovated, resulting in safe and comfortable living conditions for residents, as well as to reduce total heat energy consumption to less than 70 KWh/m^2 per year (currently it is ±200 KWh/m^2).

The Bureau is determined to stimulate the most effective use of resources by promoting, **transparency**, **accountability** and smart usage of **financial instruments**.

For this reason the Bureau is an advocate of Energy Performance Contracting **(EPC)**, where companies transparently guarantee energy savings and makes smart use of technologies and available financial instruments.

This report has a good story to tell about EPC; it gives a comparative analysis of three identical buildings, which are all located in Gaujas Street in Valmiera.

There is only one difference: **Gaujas Street 9** is not renovated, **Gaujas Street 11** was renovated using a bank loan organized by home owners, and **Gaujas Street 13** was renovated by an ESCO using Energy Performance Contracting.

All conclusions are left to the readers!

Nicholas Stancioff
Chairman of the Board

Location

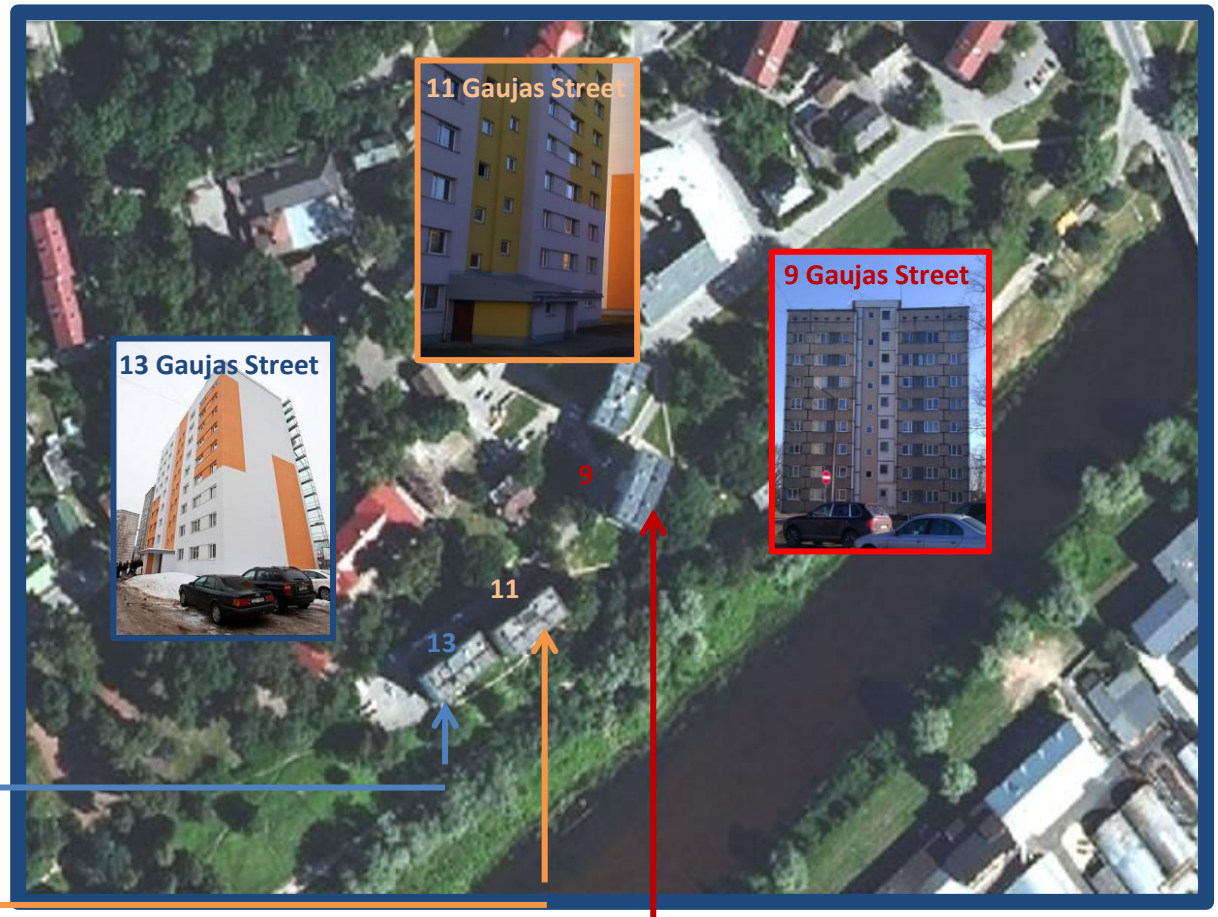
Valmiera is one of the oldest towns in Latvia. This romantic town is situated on the turns of one of the most beautiful Latvian rivers – Gauja River.

Valmiera is located about 120 km northeast from Riga and about 50 km from the border of Estonia.

At the same time Valmiera is an important industrial city and represents the business centre of Vidzeme region.

This report compares energy performance of three buildings located in Gaujas Street:

- **13 Gaujas Street**
- **11 Gaujas Street**
- **9 Gaujas Street**



General building data

These buildings belong to the very common 467th type building series made from pre-fabricated concrete slabs. The building in Gaujas street 13 entered into exploitation in 1980, Gaujas Street 11 in 1979 and Gaujas Street 9 in 1977.

They all are nine storey buildings with a single staircase. The average height of one storey is 2.5 m; the total surface area is about 2165m^2, of which ca 1860 m2 are heated in winter. All three buildings have 36 apartments.

Heat supply to the building is provided by the local district heating company.

Maintenance services are provided by the municipal house maintenance company.

An **ESCO** company, based on energy performance contracting (EPC), has performed deep retrofitting of **Gaujas 13**. Under this EPC, the ESCO guarantees building energy performance (energy savings) and the level of payments. All financial and technical risks are taken by the ESCO. The project was financed by the ESCO, with third party financing and a grant from the Latvian ERAF support programme.

The home owners of **Gaujas 11** organized the renovation works themselves with the support of the municipal housing maintenance company. They used the same contractors used by the ESCO in Gaujas 13 for construction and plumbing works. Gaujas 11 was financed with a loan from a commercial bank and a also received a grant from the Latvian ERAF support programme.

The home owners of **Gaujas 9** did not agree to implement any renovation project.

How much did renovation cost?

The renovation in **Gaujas 13**, which was organized by an ESCO under an Energy Performance Contract, cost ca. €170.000. With this investment the ESCO renovated the building envelope, the space heating system and installed a new domestic hot water system. Other important structural measures were implemented, like roof refurbishment.

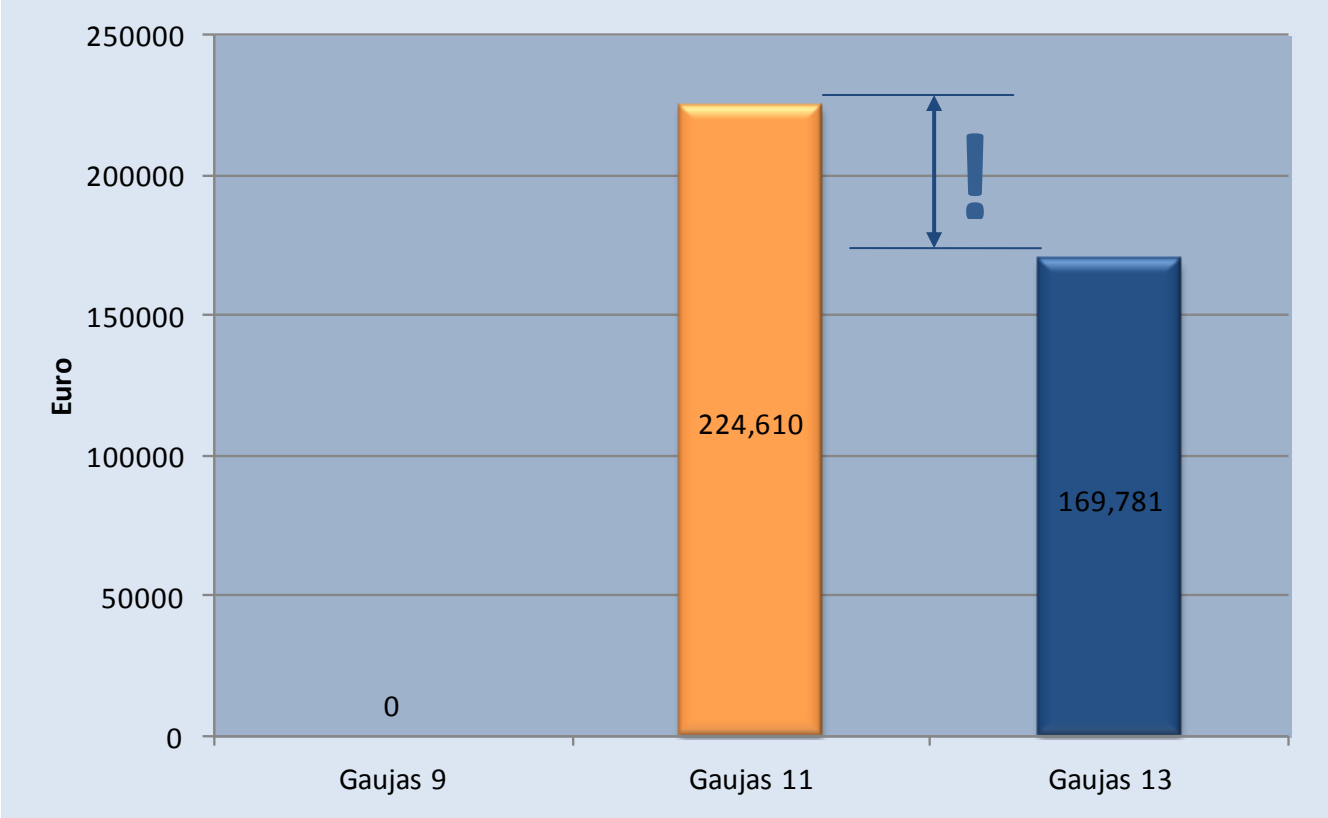
As part of the same renovation process staircase and balconies were renovated. The ESCO supervised all construction and installation works.

The renovation in **Gaujas 11**, which was organized by the home owners, cost about €225.000. The renovation plan was similar to the plan used by the ESCO in 13 Gaujas Street. However, some energy efficiency improvement measures were not implemented, for example the installation of a new domestic hot water system and the installation of thermostatic radiator valve.

The building in **Gaujas 9** was not renovated.

The renovation in Gaujas 11 was about 32% (approx. €55.000) more expensive than the renovation in Gaujas 13; although less energy efficiency improvement measures were implemented and the same contractors used.

Data provided by Valmiera Namsanieks, RenEsco and available from the ERAF programme.



How much energy do they save?

The district heating company of Valmiera supplies energy to these three buildings. Heat energy is metered at the building substation.

Energy performance of these three building is assessed by comparing the total energy consumption for 2013.

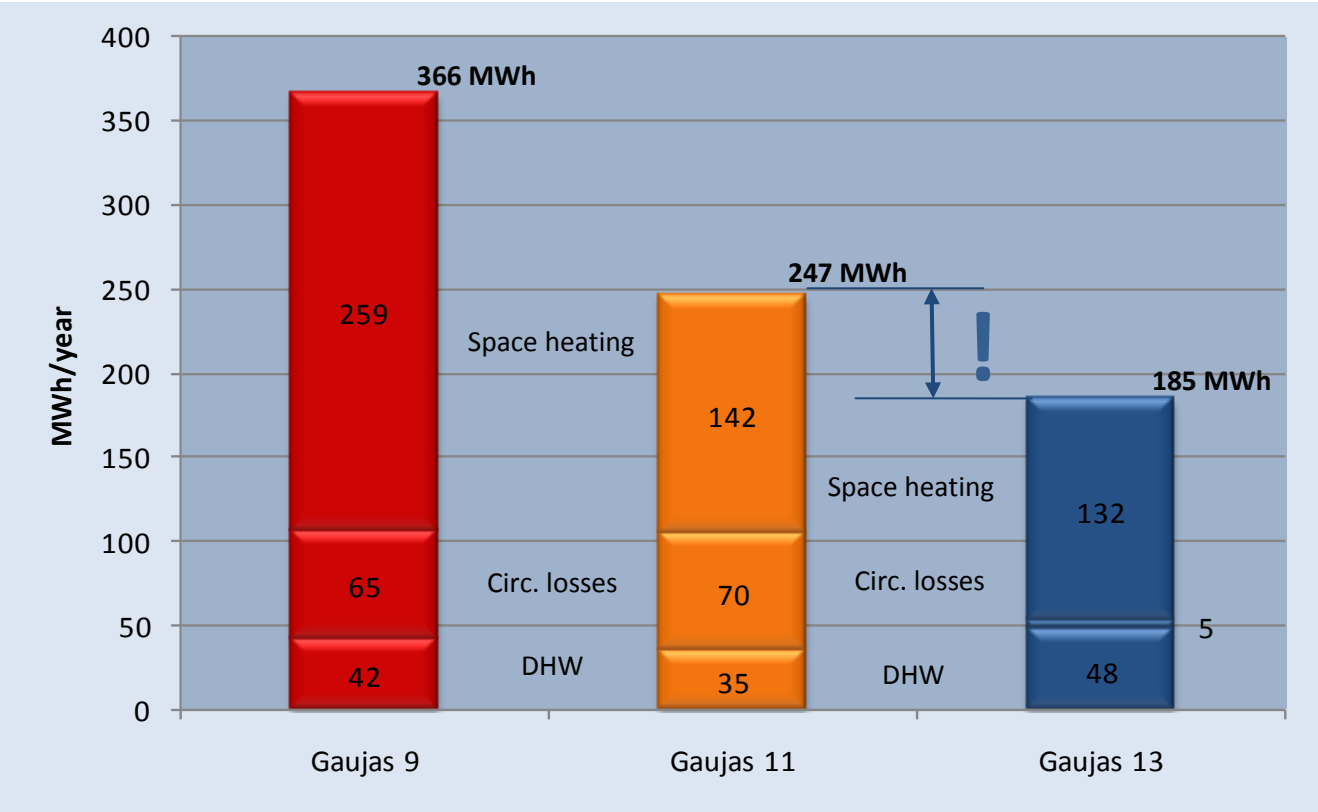
As expected **Gaujas 9**, which is not renovated, is the building consuming the most. Total yearly energy consumption is 366 MWh (**202 kWh/m^2 year**), of which about 42MWh for domestic hot water (DHW) preparation and 65MWh for circulation losses.

The building in **11 Gaujas Street**, which was renovated by home owners, has a total yearly energy consumption of 247 MWh (**134 kWh/m^2 year**), of which about 35MWh for DHW preparation and 70MWh for circulation losses.

The building in **Gaujas 13**, which was renovated based on EPC, has a total yearly energy consumption of 185 MWh (**96 kWh/m^2 year**), of which about 48 MWh for domestic hot water preparation and ca 5MWh for circulation losses.

Based on this figures, **Gaujas 13 is saving 38 kWh/m^2 year more** than Gaujas 11 while at the same time investment **costs were 32% less**.

Data provided by Valmiera Namsanieks.



How much the payments are?

Comprehensive and deep renovation, followed by proper maintenance, protects buildings and extends their life to 30 years or more. However, this must be financially affordable for residents, who will keep paying communal services, loans and utilities bills.

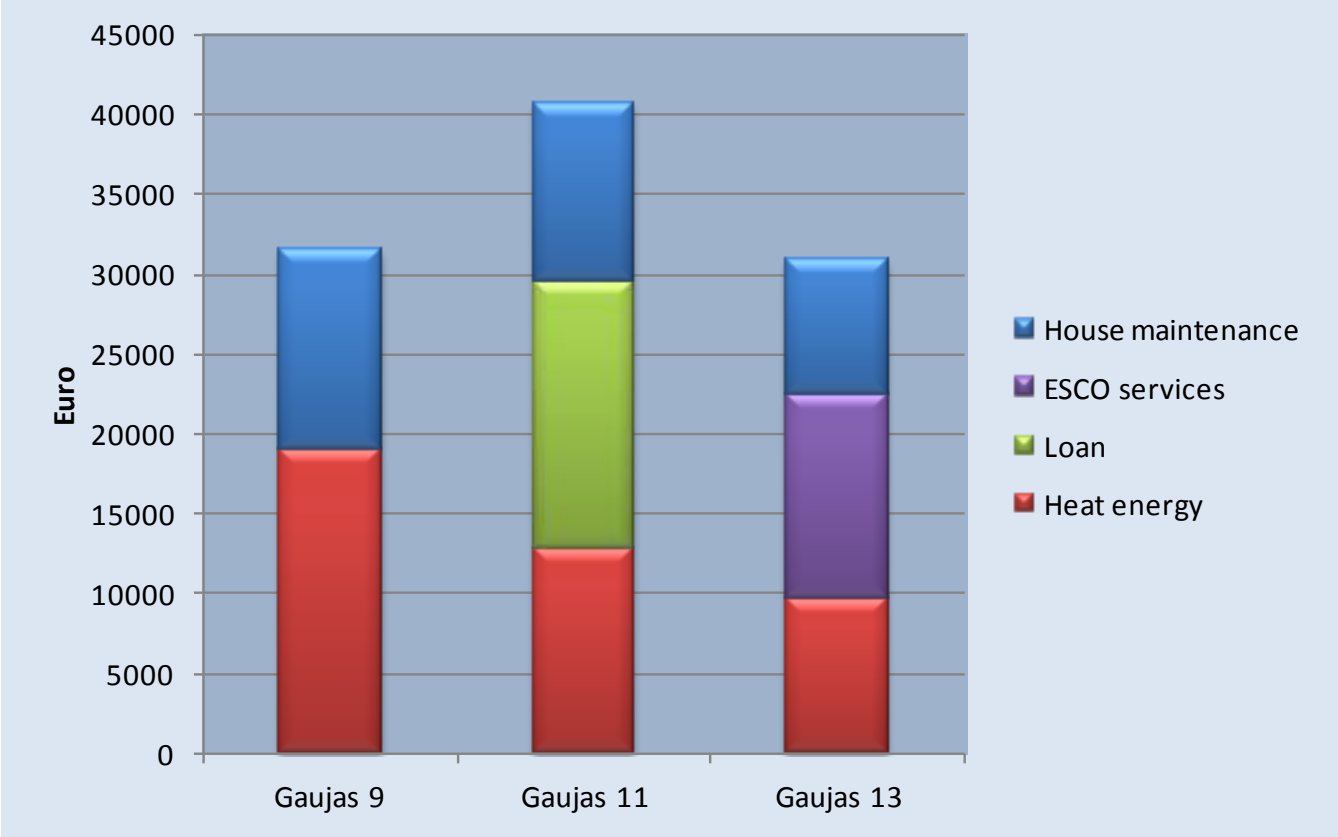
In Gaujas 13 the residents will not repay any loan back because financing was arranged by the ESCO; instead they will pay a fee, based on the EPC, which includes both heat energy costs and ESCO services. Indeed the ESCO will keep operating and maintaining all investment made in the building for the entire duration of the Energy Performance Contract (20 years). As the ESCO takes over part of the maintenance duties from the house maintenance company, the house maintenance fee is renegotiated and lowered.

In 2013, the residents of **Gaujas 13** paid a total bill of about **€30,850** for house maintenance and ESCO services including energy costs. A guaranteed temperature of 21.5°C was kept during all winter season.

In 2013, the residents of **11 Gaujas Street** paid a total bill of about **€40,600**; this for covering house maintenance costs, the loan and energy costs. The renovation was financed with a 15 years loan with interest rate of 4.5% + 3 months Euribor.

In 2013, the residents of **Gaujas 9** paid a total bill of about **€31,500**, just for house maintenance services and energy costs.

Data provided by Valmiera Namsanieks.



What in 30 years time?

The deep renovation of buildings will extend their life for at least 30 years. Therefore, residents' payments have to be evaluated in this time period. In particular, the net present value of all future payments is a good indicator for comparing the three buildings under evaluation.

The following data set and assumptions is used:

- Inflation 3%
- Discount rate: 6.5%
- Loan for 11 Gauajs Street:
  - Maturity15 years
  - Interest rate: 4.5%+Euribor
- EPC contract for 13 Gaujas Street:
  - 20 years,
  - Indexed to energy inflation
- For 9 Gaujas Street - without any further renovation - the building will probably be uninhabitable after 15-25 years. Residents will have to buy or rent other housing.

The residents of **Gaujas 13** for the next 30 years will pay for energy, house maintenance and ESCO services a cumulative bill of about €506,000 (present value). The residents of **Gaujas 11** will have to pay ca €83,000 more, meaning a cumulative bill of about €589,000 (present value).

The residents of **Gaujas 9**, without renovation, at a certain point in time will have to look for new housing, with major investment costs. In the mean time their comfort and quality level is significantly less and continues to deteriorate. Additionally they will face the costs and aggravation of ever more emergency repairs over the coming years.