

ENERGY EFFICIENCY IMPROVEMENT SUPPORT PROGRAMMES FOR PRIVATE BUILDINGS IN LATVIA

Gunita Mazure

Latvia University of Life Sciences and Technologies, Latvia
gunita.mazure@lbtu.lv

Abstract. Energy efficiency improvement is one of the major priorities for the economic development worldwide, especially if it coincides with the increase of energy resources. Measures to lower energy demand in buildings require financial resources; though, support instruments prioritarily have included the EU funds targeted for the renovation of apartment and public buildings. Only from 2021, grants, technical assistance and guarantees in the form of state support tools are offered to the owners of private houses. Hence, the research aim is to evaluate the results of energy efficiency support programmes for the owners of private buildings in Latvia. The research employs content analysis, the method of analysis and synthesis and the graphical method. The support is allocated through three institutions: the Ministry of Climate and Energy (MoCE), the Ministry of Economics and the Ministry of Environmental Protection and Regional Development. Total financing is slightly below EUR 60 mln. The state support measures are targeted for the implementation of two activities: increase of energy efficiency and installation of electricity generation equipment. An increase of energy class of the building (not lower than C) and reduction of heat energy consumption at least by 20% are mandatory requirements to apply for the technical assistance at the state-owned development finance institution ALTUM that for now has approved almost EUR 5 mln of which 48.81% have been approved for the installation of energy generation equipment and 51.19% for the improvement of energy efficiency. All beneficiaries have achieved the set requirements: the average reduction of thermal energy consumption is 35-40% and the increase of energy classes A and B are also reported. The Ministry of Climate and Energy has granted 85.45% of financing available through this institution. Owners of private houses located in Pierīga statistical region have been the most active applying for the grants.

Keywords: energy efficiency, state support, grants, energy consumption.

Introduction

Energy efficiency improvement has been one of the major priorities for the economic development worldwide for several years. Latvia's National Energy and Climate Plan 2021-2030 being a long-term policy planning document prescribes the aims to be achieved by Latvia in the field of energy efficiency and climate neutral economy [1]. Consistent with the EU Energy Performance of Buildings Directive (2010/31/EU) Member States have adopted their national long-term renovation strategies prescribing initiatives, activities and financial instruments to promote energy efficiency targets in buildings [2]. Trotta et al. [3] emphasise that improvement of energy efficiency is acknowledged as a forceful tool to reduce demand for energy; thus, mitigating negative consequences caused by the climate changes and helping increase security related to the energy supply. The rational use of energy resources is critically significant due to the development of geopolitical situation, rise of inflation and consequent increase of energy prices. Measures to lower the energy demand in buildings require financial resources; though, support instruments have prioritarily included the EU funds targeted for the renovation of three or more apartment buildings, while financing was not available for the improvement of energy efficiency measures in smaller apartment or individual buildings. A similar problem is demonstrated also in other Baltic States (Estonia and Lithuania), where public grant and loan programmes have been envisaged for energy efficiency improvement in apartment and public buildings. The problem is also indicated in Latvia's National Energy and Climate Plan 2021-2030 envisaging financial support for these buildings after 2021 [1]. Therefore, the owners of private buildings may apply for the state support from 2021 to install solar panels, small wind generators or undertake any activities to increase energy efficiency at their houses and to reduce monthly expenses for heating of buildings.

Literature [4-6] suggests various financial instruments for financing energy efficiency improvement measures such as debt financing, equity financing, mezzanine finance, project finance and other financial tools. Alongside with commonly known types of financing, there are some innovative ones as well. Crowdfunding is a new financial tool the application of which in the energy sector started only from 2012, while ESCO (Energy Service Company) financing operates like a guarantee allowing to save on an energy bill. ESCO develops and implements energy saving projects and a client repays a loan through energy savings. Mezzanine loans, in turn, are a complicated financial instrument which includes characteristic features of both debt and equity financing. Hence, as an Italian word "mezzano" (middle,

between) suggests it is a middle way between a bank and a borrower. So, a mezzanine loan is either a loan additional to an existing bank loan or loan to a borrower whom the bank has rejected loan. However, most types of financing are repayable sources. The choice of the most suitable source of financing depends on several factors: availability of sources, stage of energy efficiency improvement project, energy and climate neutrality policy implemented by the government, creditworthiness and financial viability of the owners of buildings and others. The latter two factors are mainly related to high costs of utility services and growing prices for energy (electric and heat); hence, it becomes more and more difficult to allocate money for energy improvement measures at private buildings.

Public finance mechanisms are widely used to support energy efficiency by means of public funds such as grants, subsidies or tax rewards. Energy tax incentives may serve as a tool to stimulate investing in energy efficiency improvement projects and receive either tax exemptions or tax allowances [4]. Grants, in the form of investments or interest rate subsidies, are frequently provided to cover the initial costs of energy efficiency improvement projects [4]. Bertoldi et al. [5] have concluded that grants and subsidies as financial instruments for residential sector in the EU have high adoption rate and they directly address initial (upfront) costs. Moreover, they are non-repayable financial means.

In Latvia, energy efficiency improvement support programmes are targeted at the provision of grants, guarantees and technical assistance. The financial assistance is intended for the renovation of residential buildings (insulation, replacement of roofs, doors, windows etc.) and the installation of electricity or heat generation equipment to increase energy efficiency. Therefore, the research aim is to evaluate the results of energy efficiency support programmes for the owners of private buildings. Two tasks are subjected to the advanced research aim: 1) to describe and compare financial support programmes available for energy efficiency improvement measures in Latvia and 2) to analyse and evaluate the results of these programmes. The present research focuses only on public finance mechanisms and excludes bank loans and other types of financial instruments.

Materials and methods

The present research is based on the analysis of the information provided by the Ministry of Climate and Energy (MoCE), the state-owned development finance institution ALTUM and the Central Finance and Contracting Agency, since the support for energy efficiency improvement measures is allocated through these three institutions. The Cabinet Regulations on the provision of financial support for the owners of private buildings were adopted in 2021 and the first disbursements were done only in 2022; thus, the data analysis basically includes two years (2022 and 2023). In some cases the analysis covers also the first two months of 2024, while there are no data for the measures coordinated by the Central Finance and Contracting Agency, as the deadline for evaluation of submitted support applications was February 2024, so no results were available for the analysis at the research moment. The research employs several methods: content analysis was used to obtain a detailed description of the support programmes themselves, activities to be supported and requirements for granting the support; the method of analysis and synthesis was used to analyse the data on the project results both in terms of energy efficiency improvement achievements and disbursed funds; the graphical method was used to display the research results in a more perceptible way.

Results and discussion

Financial support for the improvement of energy efficiency in one or two apartment residential buildings is provided through three support programmes (Table 1): 1) reduction of greenhouse gas emissions in households – support for the use of renewable energy resources implemented by the Ministry of Climate and Energy, where the funding is disbursed by means of the Emission Allowance Auction Instrument; 2) renovation of one-apartment residential houses and increasing energy efficiency (the Ministry of Economics and ALTUM) and 3) implementation of measures to reduce air pollution by improving household heat supply systems (the Ministry of Environmental Protection and Regional Development and the Central Finance and Contracting Agency). The overall target of the programmes is to provide financing to improve energy efficiency in households by supporting the purchase of heat or electricity generation equipment, the renovation of buildings or the establishment of household connections to the centralised heat supply system. Reduction of greenhouse gas emissions in households

– support for the use of renewable energy resources envisages the largest amount of total financing and the largest maximum amount for one project, i.e. EUR 40 mln and EUR 15000, respectively.

Table 1

Financial support programmes for the improvement of energy efficiency in Latvia [7-10]

Support programme	Reduction of greenhouse gas emissions in households - support for the use of renewable energy resources	Renovation of one-apartment residential houses and increasing energy efficiency	Implementation of measures to reduce air pollution by improving household heat supply systems
Total financing	EUR 40 mln	EUR 5.15 mln	EUR 14.60 mln
Type of financing	Grant (lump-sum payment)		
Maximum amount for one project	EUR 15000	EUR 5000 (increase of energy efficiency) EUR 4000 (solar plants and wind farms)	95% of eligible costs (connection to the centralised heating system) 85% of eligible costs (heat pumps) 70% of eligible costs (pellet boilers) 50% of eligible costs (open call)
Beneficiaries	Owners of residential houses being aware what equipment they want to install in their house	Families with dependent children willing to improve energy efficiency	Owners of residential houses willing to replace heating equipment (wood is used as fuel)
Activities to be supported	<ul style="list-style-type: none"> • purchase of new heat energy production equipment; • purchase of new electricity production equipment (solar and wind power plants); • designing of the household connection to the centralised HSS and creating a heating unit. 	<ul style="list-style-type: none"> • purchase of new electricity production equipment (solar and wind power plants); • increase of energy efficiency. 	<ul style="list-style-type: none"> • designing of the household connection to the centralised HSS and creating a heating unit; • purchase of a heat pump (G-W, W-W or A-W); • purchase of a biomass heating boiler suitable for pellet fuel; • purchase and installation of thermal energy sources of the electric HSS.

Note: HSS – heat supply system; G-W – ground-water; W-W – water-water; A-W – air-water

Implementation of measures to reduce air pollution is the only project that envisages support in certain percentage of eligible costs. Owners of the buildings have to pre-finance the project, i.e. they have to implement the activities at their own expense. The financial support is allocated and disbursed after complete implementation of the project activities.

Financing disbursed by means of the Emission Allowance Auction Instrument encompasses funding related to the installation of pellet-fired wood biomass boilers, heat pumps of different types, solar panels and connections to the centralised heat supply system (Fig. 1).

Total financing disbursed under the project “Reduction of greenhouse gas emissions in households - support for the use of renewable energy resources” equals to EUR 35.50 mln supporting more than 10 thou. projects. The average financing is EUR 3519.85 per project. The first disbursements amounting to EUR 63.93 thou. were made in March 2022 to cover the needs of 22 applications. The largest amount of EUR 2.65 mln was disbursed in October 2022 to support 742 projects. However, the largest average financing per project was achieved in March 2023 equalling to EUR 3801. In general, 54% on average of project eligible expenses have been covered under the mentioned project. Unfortunately, no data are available on specific measures undertaken during the analysed period. Yet, Figure 1 demonstrates the highest activity of project participants in the 2nd half of 2022, which could be explained by the necessity to increase energy efficiency to reduce the bills for utility services arisen due to the escalation of geopolitical circumstances and rocketing of inflation.

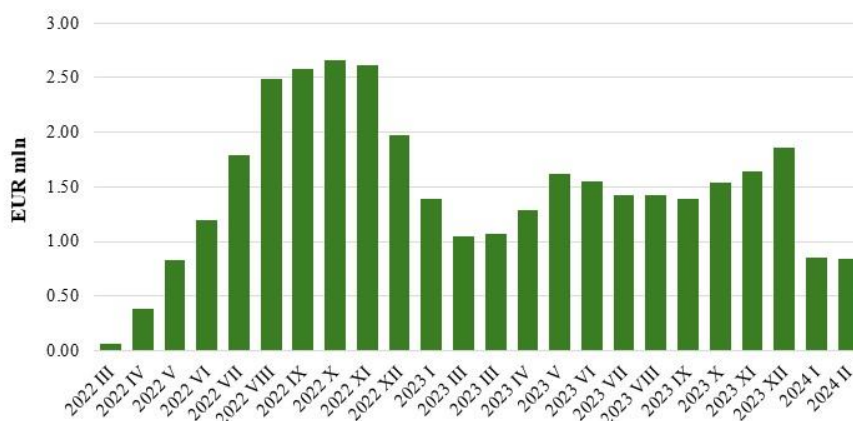


Fig. 1. **Financing disbursed through the Emission Allowance Auction Instrument from March 2022 to February 2024 [11]**

The Emission Allowance Auction Instrument envisages financial support for various measures to be undertaken for the increase of energy efficiency by using renewable energy resources (Fig. 2).

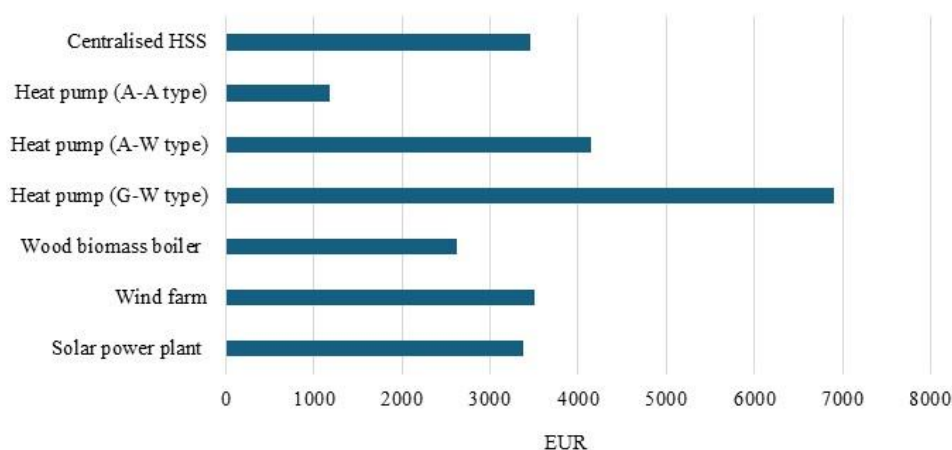


Fig. 2. **Average financing of the supported activities under the project "Reduction of greenhouse gas emissions in households - support for the use of renewable energy resources", March 2022-February 2024 [11]**

Nevertheless, the largest amount of financing was disbursed for the installation of solar collector systems with storage tanks (EUR 31.34 mln for 9295 projects of total capacity 73520 kW), the installation of heat pumps (ground-water type) required the largest average financing (EUR 6901). In total, EUR 3.14 mln were disbursed for the installation of air-water type heat pumps (EUR 4142 per project on average). The smallest average amount per project (EUR 1176) was disbursed for the installation of air-air type heat pumps. Only 18 connections to the centralised heat supply systems have been designed and made; though, the support from the Emission Allowance Auction Instrument accounted for 69% of eligible expenses. Therefore, this activity is being supported most extensively.

The breakdown of activities by regions demonstrates that Riga and Pierīga regions have been the most active in almost all project activities ranging from 52.94% to 67.94% of total supported projects (solar power plants and air-water type heat pumps, respectively). The largest number of solar power plant projects have been implemented in Mārupe municipality (989 projects or 20.10% of total projects implemented in Riga and Pierīga regions) with the average capacity of 8.65 kW. Yet, the most powerful air-water type heat pump with the capacity of 16 kW has been installed in Ķekava municipality. Kurzeme region was the most active in implementing connections to the centralised heat supply systems.

The state-owned development finance institution ALTUM allocates financing for the increase of energy efficiency (EUR 1000 as technical assistance and EUR 5000 as grant) and the installation of electric energy generation equipment (the support varies from EUR 700 to EUR 4000 depending on the

equipment capacity – 0.99-11.1 kW). ALTUM financing for energy efficiency improvement in private buildings equals to EUR 5.15 mln, of which EUR 4.90 mln for 1130 applications or 95.15% have been approved by January 2024 (Fig. 3). EUR 2.39 mln (712 applications) were approved for the installation of electricity generation equipment and EUR 2.51 mln (418 applications) were allocated for energy efficiency improvement projects. Moreover, EUR 4.20 mln have been disbursed to 1009 beneficiaries.

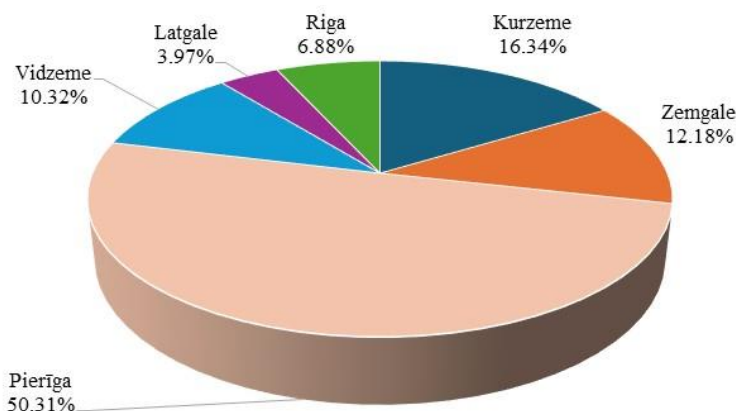


Fig. 3. Total financing allocated under the project “Renovation of one-apartment residential houses and increasing energy efficiency” by regions as of January 2024 [12]

The largest amount of financing has been allocated for the projects in Pierīga region (EUR 2.47 mln for 592 projects), while the owners of private buildings in Latgale have been the most passive in applying for the support. The average amount of grant allocated for a project is EUR 4420. Portfolio guarantees were not used and allocated within the framework of this programme. Funding, which was originally intended for portfolio guarantees, was retransformed as grants and technical assistance.

As of 24 January 2024, the ALTUM has disbursed financial support for 1014 projects, of which 325 projects fall under the category of energy efficiency improvement projects (Fig. 4).

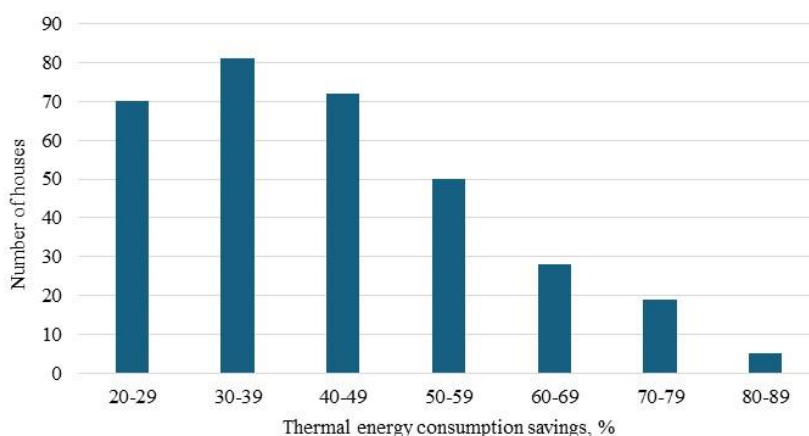


Fig. 4. Thermal energy consumption savings within the energy efficiency support programme [12]

The project results show that 28 houses (8.62%) have reached energy efficiency class A, 65 houses – energy class B (20%) and 232 houses (71.38%) – energy class C. The achievement of a higher energy class means higher savings on thermal energy consumption. Thereby, savings of thermal energy consumption up to 50% have been reached in 273 houses or 84%, while 5 houses or 1.54% of project participants have achieved energy savings more than 80%. The average savings are 35-40%. According to the ALTUM, grant recipients under the programme related to the increase of energy efficiency always achieve the goals set in the programme, since energy efficiency class of the house is increased to at least class C [12]. In 95% of cases, project participants carry out construction works in the boundary structures of their houses and/or purchase, renovate or reconstruct engineering systems.

The regulations related to the financial support administered by the Central Finance and Contracts Agency were announced on 7 April 2023 and Call 1 for the selection of project submissions was announced on 26 May 2023. At the research moment, no data were available on the results of the support measure due to two main factors: time of passing the regulations and deadlines set for the evaluation of project applications and deviations found in the received project applications. Hence, just two agreements on the financial support have been signed in 2023.

Conclusions

1. Financial support for the improvement of energy efficiency in one or two apartment residential buildings is provided through three support programmes and the basic requirement sets that the owners of the buildings have to pre-finance the project. The project “Reduction of greenhouse gas emissions in households – support for the use of renewable energy resources” envisages the largest financial support. The installation of solar collector systems with storage tanks and the installation of heat pumps have been the most widely supported activities.
2. An increase of energy class of the building (not lower than C) and reduction of heat energy consumption at least by 20% are mandatory requirements to apply for the support under the project “Renovation of one-apartment residential houses and increasing energy efficiency”. All beneficiaries have achieved the set requirements: the average reduction of thermal energy consumption is 35-40% and the increase of energy classes A and B are also reported.
3. At the research moment, no data were available on the results of support administered by the Central Finance and Contracts Agency due to two main factors: time of passing the regulations and deadlines set for the evaluation of project applications and deviations found in the received project applications.

References

- [1] Latvia's National Energy and Climate Plan 2021-2030. [online] [04.02.2022]. Available at: https://energy.ec.europa.eu/system/files/2020-04/lv_final_necp_main_en_0.pdf.
- [2] Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings [online] [04.01.2024.]. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:en:PDF>.
- [3] Trotta G., Spangenberg J., Lorek S. Energy efficiency in the residential sector: identification of promising policy instruments and private initiatives among selected European countries. *Energy Efficiency*, 11, 2018, pp. 2111-2135.
- [4] Rezessy S., Bertoldi P. Financing energy efficiency: forging the link between financing and project implementation. European Commission, 2010. [online] [06.03.2024.]. Available at: https://e3p.jrc.ec.europa.eu/sites/default/files/documents/publications/jrc59126_jrc59126_financing_energy_efficiency_report_final11062010-1.pdf.
- [5] Bertoldi P., Economidou M., Palermo V., Boza-Kiss B., Todschi V. How to finance energy renovation of residential buildings: review of current and emerging financing instruments in the EU. *WIREs Energy and Environment*, 10(1), 2020. [online] [06.03.2024.]. Available at: <https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wene.384>.
- [6] Economidou M., Bertoldi P. Financing building energy renovations. Publications Office of the European Union, 2014. [online] [10.03.2024.] Available at: <http://publications.jrc.ec.europa.eu/reposito>.
- [7] Comparison of support programmes for households). (In Latvian). [online] [10.02.2024.]. Available at: <https://ekii.lv/index.php?page=programmu-salidzinajums>.
- [8] Regulations on the support programme for renovation of one-apartment residential houses and two-apartment residential houses and increasing energy efficiency. (In Latvian). [online] [04.02.2024.]. Available at: <https://likumi.lv/ta/id/321021-noteikumi-par-atbalsta-programmu-viena-dzivotaja-dzivojamo-maju-atjaunosanai-un-energoefektivitates-paaugstinasanai>.
- [9] Regulations of the open competition “Reduction of greenhouse gas emissions in households - support for the use of renewable energy resources” of the project financed by the emission allowance auction instrument. (In Latvian). [online] [04.02.2024.]. Available at: <https://likumi.lv/ta/id/330568-emisijas-kvotu-izsolisanas-instrumenta-finanseto-projektu-atklata-konkursa-siltumnieciska-gazu-emisiju-samazinanas-majsaimniecibas>.

- [10] Regulations for the implementation of measure 2.2.3.6. “Implementation of Air Pollution Mitigation Measures by Improving Household Heat Supply Systems” of the of the specific support objective No 2.2.3. “Improve nature protection and biological diversity, “green” infrastructure, especially in the urban environment, and reduce pollution” under the Cohesion Policy Programme of the European Union for 2021-2027. (In Latvian). [online] [04.02.2024.]. Available at: <https://likumi.lv/ta/id/340874-eiropas-savienibas-kohezijas-politikas-programmas-2021-2027-gadam-2-2-3-specifiska-atbalsta-merka-uzlabot-dabas-aizsardzibu>.
- [11] Emission Allowance Auction Instrument. Support to households. [online] [07.01.2024.]. Available at: <https://ekii.lv/index.php?page=atbalsts-majsaimniecibam>.
- [12] ALTUM. Unpublished information.