

Title of the measure:	LV41 Increasing Heat Energy Efficiency in Multi-Apartment Buildings (Measures to Improve the Thermal Stability of Apartment Blocks): EU programming period of 2007-2013 <i>(Daudzdzīvokļu māju siltumnoturības uzlabošanas pasākumi)</i>
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General description

The described measure had been included in both the Latvia's 1st NEEAP [1] and the 2nd NEEAP [2]. The implementation of the measure continued in years 2014-2016 as well, thus contributing in meeting national indicative energy efficiency targets in 2014-2016 and in achieving a cumulative end-use energy savings target of 1.5%, determined in accordance to the Article 7 of the Directive 2012/27/EU [3]. The energy end-use sector – buildings. The target audience - apartment owners of multi-apartment residential buildings.

The investments in energy efficient multi-apartment building renovation had been co-financed from the EU Regional Development Fund (ERDF) under the Latvia National Operational Programme „Infrastructure and Services 2007-2013” (activity No 3441 „Energy Efficiency in Multi-Apartment Housing”). The heavy energy consumption of residential buildings is the serious problem in the sphere of housing. The objective of the measure was to increase energy efficiency of multi-apartment residential buildings to provide sustainability of housing fund and effective use of energy resources. That, in turn, would foster the quality of environment and resource economy as well as increased employment in construction sector [4].

The implementation of the measure had been regulated by the Cabinet of Ministers (Governmental) Regulations [5,6,7] adopted in the period starting from February 2009. The open tenders were announced. Responsible ministry - the Ministry of Economics, the responsible institution supervising implementation – state agency „Latvian Investments and Development Agency” (*valsts aģentūra "Latvijas Investīciju un attīstības aģentūra"*, [8]). The submitting of renovations' applications was opened 14 April 2009 and continued up to 30 July 2013. The projects should be implemented during 2 years after signing the contract [7].

Financing of the measure is presented in the Table 1 below.

The following threshold criteria regarding energy efficiency after implementation of the project were stated:

1. at least saving of 20% of heat energy (basic criterion)
2. after reconstruction the annual heat energy consumption for heating shall not increase 120 kWh/1m²/year (for 1 and 2 storeys apartment houses) or 100 kWh/1m²/year (for 3 and more storeys multi-apartment houses)¹
3. the threshold criterion characterising efficiency of financial investments: after reconstruction the ratio of heat energy saving (MWh/year) to ERDF financing (in thousand EUR) shall be at least 1.405 and higher (if at least 10% of apartment owners have status of low income persons, than the threshold value shall be at least 1.125)²
4. the maximum of financial support per 1 m² of total area of building is defined not higher than 50 EUR.

By the basic Governmental Regulations [5] it was defined that the eligible for support were the buildings which were built and put into exploitation during years 1944-1993. The initial list of eligible buildings was widened by including old ones as well as those ones the construction of which started particularly in the years before the re-establishment of Latvia independence but putting into exploitation were delayed. Namely, the Governmental Regulations adopted in April 2011 [6] defined as the eligible the buildings if the construction of them had started before year 1993 (including) and the building was put into

¹ introduced by the Governmental Regulations, adopted in April 2011 [6]

exploitation up to 2002 (including). The functions of multi-apartment residential building, in which project activities have been implemented, shall not be changed at least 5 years after project completion as well as the building shall not be demolished.

Projects' applicants were apartment owners, which might be represented by authorised legal persons, e.g. apartment buildings management companies. The property of one owner should not exceed 20% of the total number of flats in a multi-apartment building (this criterion did not apply for state and municipalities owned flats). The share of non-living area in the multi-apartment building should not exceed 25% of the total area.

The financing was provided for the following activities promoting energy efficiency:

- **“soft” cost:** energy audit, preparation of renovation technical documentation/project and of cost estimates, cost of technical expertise, cost of supervision of construction works (shall not exceed 15% [5] or 10% [6,7] of the total eligible costs of the project),
- **insulation works:** insulation and replacement of the construction elements of a building's external envelopes, insulation of the basement and top floor ceilings, including the restoration or replacement of windows in the external walls of apartment properties
- **renovation of stairwells,** if energy efficiency works are carried out in the stairwell (shall not exceed 5% of the total eligible costs of the project),
- **renovation or reconstruction of heat supply and hot water distribution system** (installation or renovation of heat and hot water production boilers were stated non-eligible),
- **installation, renovation or reconstruction of ventilation system,**
- renovation of elements/structural parts that are functionally integral to the operation of the multi-apartment building, as provided for in the technical design/renovation documentation, if it ensures the sustainability of the energy efficiency measures or if heat savings are achieved following the implementation of the measures
- **installation of recuperation system** for the re-use of heat was eligible if at least one activity of energy efficient renovation works stated above had been implemented.

Insulation of building's elements should be done in accordance with the documentation of the technical project and energy audit recommendations. The simplified energy survey procedure might be applied for standard-type multi-apartment houses, built after 1957 and having at least 3 overground storeys, if the building has heat metering and has had for last 5 calendar years the average annual specific heat energy consumption for heating 105-165 kWh per 1 m² of heated area - in such a case at least insulation of building envelope, upper storey or roof covering, renovation/replacement of windows in commonly used premises and outer doors renovation should be foreseen in the project application [5].

Projects' quality evaluation criteria include (Annex 5 of [7], maximum score available -122 points):

- ratio “heat energy savings (MWh annually) / financing of the project provided by ERDF (in thousand EUR)” , *the maximum score (55 points) applicable if ratio value is 4.2 and higher, or is 3.5 and higher if at least 10% of apartment owners have status of low income persons*
- number of flats in multi-apartment buildings: *the maximum score (15 points) applicable if building has 100 flats and more,*
- percentage of dwellings owners of which have status of low-income persons, *the maximum score (42 points) applicable if the such owners constitute 15% and higher,*
- development index [15] of municipality in which project is implemented, *the additional scores for the municipalities with the development index below “1”, the maximum score (10 points) if the development index of municipality is “minus 2” and below.*

Financing of the measure is presented in the Table 1. One can see, no all *ex-ante* allocated funding was used. Including the private investments within the measure, the total eligible financial resources allocated for the measure constitute ~ 125 mill EUR².

² The maximum standard rate of financial support was stated 50% of total eligible costs of the project, this rate was increased by 10% if at least 10% of apartment owners have status of low income persons.

Table 1. Ex-ante and ex-post financing of the measure, in EUR [8]

Total allocated EU funding ex-ante , incl. overcommitments,	81299362
Contracted	63805460
Payments to the final beneficiaries minus recovered amount	62803903

Impact evaluation (methods and results)

The methods of impact evaluation – both “top-down” and “bottom-up” [2]. Monitoring requirement – report on heat consumption shall be submitted by the beneficiary for each of 3 years after project completion.

According [9,p.8], **740 multi-apartment buildings energy efficient renovation** projects was implemented.

The [10, p.30] indicate that the average thermal energy savings achieved as a result of the implementation of renovation measures is in the range of 30%, all the way up to 57%.

The 2nd NEEAP had envisaged ex-ante energy savings within the particular measure against financing 1.41 MWh/year/1000 LVL [2, Table 7 in p.49]. As 1EUR=0.702804 LVL, it corresponds to 1 MWh/year/1000 EUR. Taking into the volume of ERDF co-financing (62.8 MEUR), it can be calculated ~ 63 GWh (0.226 PJ) energy savings³.

The implementation of the programme shows that the ex-post savings are significantly higher and will reach ~ 0.45 PJ at least.

- **the information report (2013, [11, p.2]),** based on the experience of first part of implemented projects, stated the specific energy saving per 1000 EUR, invested by ERDF, constitutes ~ 2 MWh/year. Thus, based on the total value of investments by ERDF, it can be calculated the total energy savings of ~ **125.6 GWh (~ 0.452 PJ) annually at the end of the programme, in year 2017.**
- **the evaluation of energy savings by bottom-up method in 2015, presented in the Latvia 2017 Report** ([16], the Table 3, page 10) gives the value of **104 GWh (0.375 PJ)**. Taking into account, that in years 2016 and 2017 the evaluated annual savings has to be even higher (as 172 projects was finished in 2016 and 44 projects – in 2017), this evaluation by [16] is in line with the above indicated savings by [11].

To evaluate the CO₂ savings, the CO₂ emission average factor – 264 g/kWh – might be applied. This average emission factor was calculated pursuant to the total emissions in Latvia in the energy conversion sector (boiler houses and combined heat-power units), which were applied against the final consumption of the district heat energy – the average value during the time period from 2000 until 2007 – by correcting the indicator value by the amount of heating fuel used in CHP units and which had been consumed for the generation of electricity, i.e. not taking into account the CO₂ emissions that had occurred during electricity generation process [13]. The annual CO₂ savings thus may be evaluated ~ 33.16 thousand tons in 2017..

For comparison, the overall final energy consumption in Latvia residential sector in year 2009 (i.e., before the start-up of the impact of the measure) constituted ~ 65 PJ from which ~ 44.5 PJ (climate correction is taken into account) was used for heating [14]. Based on these considerations, the semi-quantitative impact evaluation may be attributed as “high”.

³ The 2nd NEEAP indicates in p.49 [2] savings of 240 GWh in 2016. Thus, these figures do not correspond with the anticipated energy savings against ERDF financing. Evidently, some method of cumulative savings calculations had been applied here in the 2nd NEEAP.



Interaction of measures

The described measure was closely supported by the information measure “Let’s Live Warmer!”, see MURE database Household sector, *the measure HOU-LV29*.

The described measure was also complementary with the measures aimed to increase energy efficiency in Latvia district heating sector, both in heat energy production and heat energy transmission-distribution. These measures to increase the efficiency of district heating systems were implemented within the Latvia National Operational Programme “Infrastructure and services 2007-2013”, chapter 3.5.2:“Energy”, and were co-financed by the EU Cohesion Fund. The measures were mutually complementary since within the framework of ERDF assistance was provided in the sphere of housing and the beneficiaries were end-consumers, but the measures within the framework of the Cohesion Fund, in turn, were oriented towards the service provider and the choice of energy resources on the side of service provider [4].

References

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