MARKET RESEARCH

AMONG FACILITY MANAGERS, PUBLIC BODIES AND FINANCING INSTITUTIONS REGARDING THE SCOPE OF EXISTING AND REQUIRED SKILLS OF BUILDING MANAGERS ON TOPICS RELATED TO MITIGATION OF CLIMATE CHANGE CAUSED BY BUILDINGS

IN LATVIA

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ABBREVIATIONS

°C — degree Celsius
ALTUM — development finance institution Altum
AMALH — Association of Management and Administration of Latvian Housing
CO_2 — carbon dioxide
CoM — Cabinet of Ministers
DH — district heating
ECS — electronic clearing system
EQF – European Qualifications Framework
ESCO — energy service company
EU — European Union
EUKI — The European Climate Initiative — Die Europäische Klimaschutzinitiative
EUR — euro
EURIBOR — Euro Interbank Offered Rate
EUROSTAT — European Statistical Office
GHG — greenhouse gases
GWh — gigawatt hour
HDCP — Housing Development Crediting Program
IDAL — Investment and Development Agency of Latvia
ISMA — ISMA University of Applied Sciences
JSC — joint stock company
ktoe — kiloton of oil equivalent
kWh — kilowatt hour
LCS — Latvian Construction Standard
LGESCO — Local government's energy service company
LLD — Limited Liability Company
LPQ – Level of Professional Qualification
LQF – Latvian Qualifications Framework
LQF — Latvian Qualification Framework
m^2 — square metre
MARB — multi-apartment residential building
MEPRD — Ministry of Environmental Protection and Regional Development
mm — millimetre
MoE — Ministry of Economics
MW — megawatt
NDP2027 — Latvia's National Development Plan for 2021–2027
NECP — National Energy and Climate Plan for 2021–2030
PJ — petajoule
PQR – Professional Qualification Requirements
RER — renewable energy resources
RISEBA — Riga International School of Economics and Business Administration
RoL — Republic of Latvia
RTU — Riga Technical University
S/A — state agency
SCCB — State Construction Control Bureau

SIPC IS — State Immovable Property Cadastre Information System
SJSC — state joint stock company
SQF – Sectoral Qualifications Framework
t — ton
UN — United Nations
USSR — Union of Soviet Socialist Republics
VQL — vocational qualification level

INTRODUCTION

The Latvia's National Development Plan for 2021–202 stipulates that: energy savings and sustainable use of resources is a responsible behaviour of the society in formation of sustainable living and provision of circular economy. Therefore, further on the principle of "energy efficiency first" should be a priority when taking decisions on policies and investment in infrastructure. Significant energy savings can be reached by introducing measures that reduce greenhouse gas (GHG) emissions for improvement of energy efficiency of the buildings and manufacturing processes and for improvement of thermal insulation, as well as by transferring to low-emission or zero emission transport.

Issues of managing and administering multi-apartment residential buildings are a complex problem related to residents and owners of the multi-apartment residential buildings (MARBs), certain regions, as well as overall interest of the country.

In 2017, Latvia took the 1st place in Europe[1] by the number of inhabitants that lives in apartments (66.4% of Latvian population, according to Eurostat data[2]), thus the activities of housing management and administration are required and important in order to keep the amount of available housing unchanged (to the possible extent), and this is directly related to topicality of solving the issues of managing and administering the MARBs. Sustainable planning of MARB management and administration is considered to be a significant and topical issue both at the national level and at the level of local governments.

Currently, only a small part of residential buildings corresponds to modern energy efficiency requirements, therefore, renovation of these buildings should be enhanced.

To improve the situation of managing and administering the MARBs and reduce their negative impact on climate change, within the European Climate Initiative (Die Europäische Klimaschutzinitiative EUKI), project "CLI-MA — From Housing Manager to CLImate MAnager" is being implemented from October 2020 to March 2023. The EUKI is a project financing instrument by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

Project participants:

- Energy Conservation Foundation (FPE) — the lead partner;
- Housing Initiative for Eastern Europe (IWO) — a project partner;
- Riga Technical University (RTU) — a project partner.

Stakeholders of the project in Latvia:

- State institutions (Ministry of Economics, Ministry of Environmental Protection and Regional Development, State Construction Control Bureau);
- Housing managers and administrators (Association of Management and Administration of Latvian Housing);
- Financial institutions (ALTUM).

The stakeholders in Latvia are aware of the necessity of faster renovation of multi-apartment residential buildings by implementing a set of measures for energy efficiency increasing that is one of the key parts of the policy for climate change. Therefore, the project is aimed at promotion of introduction of EU directives regarding the renovation of residential buildings by

[1] *Distribution of population by dwelling type, 2017* (2017) [online]. Eurostat [accessed 10 March 2019]. Available at: *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Housing_statistics/lv#M.C4.81jok.C4.BCa_veids*

[2] *Distribution of population by dwelling type, 2017* (2017) [online]. Eurostat [accessed 10 March 2019]. Available at: *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Housing_statistics/lv#M.C4.81jok.C4.BCa_veids*

developing and improving a study program for housing managers that are competent in climate change.

More attention, support, and knowledge are needed for speeding up the renovation of multi-apartment buildings. This can be reached by involvement of the housing managers that are responsible for building management and administration. However, housing managers often lack the knowledge and skills to initiate and implement such projects. To eliminate these shortcomings in Germany, EUKI has already financed the KLIMAVERWALTER project, within the framework of which, an innovative training scheme was developed and introduced for the managers of residential buildings so that they could acquire the necessary competence. The CLI-MA project foresees a new approach to knowledge transfer from Germany by adapting it to a Latvian situation.

To identify the required competence and establish a study program, a research of six chapters has been performed. The research describes the available housing in Latvia (Chapter 1), analyses principles and activities of administering the multi-apartment residential buildings (Chapter 2), as well as identifies and describes the parties involved in housing policy making (Chapter 3). Special attention is paid to the issues of energy efficiency of the buildings —a Latvian potential of diminishing the climate change is described, energy consumption in relation to energy efficiency requirements is analysed, and medium-term and long-term objectives of building renovation in Latvia, as well as the obstacles thereof are assessed (Chapter 4).

To specify the competences of the housing managers to successfully implement the renovation of residential buildings, a survey for the project's stakeholders has been elaborated. The survey results are analysed in detail in Chapter 5 of the research.

The research includes development of methods to determine the competences of the housing managers as for the renovation of residential buildings with an aim of reducing the climate change. By using these methods, the required measures, tasks, and a set of skills, attitudes, resources, and knowledge are defined in Chapter 6 of the research.

1. AVAILABLE HOUSING IN LATVIA

The available housing in Latvia is rapidly depreciating. After restoration of independence of Latvia, only about 10% of all residential buildings have been constructed after 2003, but only 3% of the total share of multi-apartment buildings have been constructed after 2003 (4% from 1993) when the relevant construction standard entered into force, i.e., Latvian Construction Standard 002-001 "Thermotechnics of Building Envelopes" that determined significantly higher thermotechnical requirements for the building envelopes.[3]

Table 1-1 Number and area of residential and non-residential buildings, engineering structures[4]

No.	Code	Main type of use	Number of buildings	Area, million sq.m.	% of the total number of buildings	% of the total area	Not existing in nature
1	1110	One-dwelling buildings	309,929	36.50	22.091%	17.666%	655
2	1121	Two-dwelling buildings	13,938	2.20	0.993%	1.066%	13
3	1122	Three- and more dwelling buildings	39,477	51.55	2.814%	24.953%	30
4	1130	Residences for communities	647	0.83	0.046%	0.404%	1
Residential buildings, total			**363,991**	**91.08**	**25.945%**	**44.089%**	**699**
Non-residential buildings, total			1,006,847	115.50	71.766%	55.911%	8829
	Engineering structures, total		32116		2.289%		240
Total			**1,402,954**	**206.58**	**100.000%**	**100.000%**	**9768**

According to Table 1-1, there is 1.4 million buildings registered in the State Immovable Property Cadastre Information System (SIPC IS) with the total area of 206.58 million sq.m., incl. auxiliary buildings of different types with their average area not exceeding 40 sq.m.

The residential buildings constitute almost 26% of the total number of buildings and their area cover slightly more than 44% of the total area of the state. 363.9 thousand buildings with their total area of 91.08 million sq.m. are residential buildings. The highest number of buildings, i.e., 22% is constituted by one-dwelling buildings (309.9 thousand), while the share of them by their area is only 17.6%, but the largest share, 24.9%, is constituted by multi-apartment (three- or more dwelling) buildings (51.55 million sq.m.), although their number constitutes only 2.81% (39.4 thousand) of the total number of residential and non-residential buildings.

Table 1.2 shows that Riga and, Pierīga region form 44% of the total number of multi-apartment buildings in Latvia. At the same time, it should be noted that the number of one-dwelling buildings in Latgale is even slightly higher than the one in Pierīga region and exceeds the number of one-dwelling buildings in Zemgale more than 2.5 times.

[3] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

[4] Data from State Immovable Property Cadastre Information System provided by the State Land Service on 1 January 2019. [Accessed 2 December 2020]. Available: https://www.vzd.gov.lv/lv/registreto-buvju-skaits-sadalijuma-pa-galvenajiem-lietosanas-veidiem

Table 1-2 Division of the number of residential buildings by territories (Latvia, regions, cities*)[5]

Location	Total number of residential buildings	One-dwelling buildings	Two-dwelling buildings	Three- and more dwelling buildings	Residences for communities
Latvia					
	363,991	309,929	13,938	39,477	647
Regions					
Riga	28,768	14,786	2204	11,710	68
Pierīga	89,629	81,114	2886	5513	116
Vidzeme	70,707	62,748	1930	5860	169
Kurzeme	50,607	40,989	2445	7075	98
Zemgale	33,212	29,047	693	3388	84
Latgale	91,068	81,245	3780	5931	112
Cities					
Riga	28,768	14,786	2204	11,710	68
Daugavpils	9836	7072	1233	1525	6
Jelgava	8115	7331	69	695	20
Jēkabpils	3044	2491	168	377	8
Jūrmala	9859	8069	714	1047	29
Liepāja	5268	2788	399	2070	11
Rēzekne	3050	2119	432	491	8
Valmiera	2683	2120	114	431	18
Ventspils	4822	3358	631	830	3

The available housing in Latvia is mainly formed by multi-apartment buildings that have been built during the Soviet years. To demonstrate the intense nature of their construction, Table 1-3 summarises the available housing indicators by 1998. The useful life of communications and structures of these buildings has already passed. Therefore, special attention should be paid to their renovation and reconstruction, so that the available housing indicators would not reduce rapidly.

Table 1-3 Composition of the available housing by construction period (number of buildings)[6]

[5] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

[6] Conventional dwellings and occupants thereof in statistical regions, cities under state jurisdiction and counties by building type and period of construction, Available at: https://data1.csb.gov.lv/pxweb/en/iedz/iedz__tautassk__majokli__tsk2011/TSG11-41.px/

Years	By 1918	1918 – 1940	1941 – 1950	1951 – 1960	1961 – 1970	1971 – 1980	1981 – 1988
Total	*6935*	*7913*	*1448*	*4049*	*7821*	*10,253*	*8574*
Cities and towns	4757	2809	698	2794	6066	7765	5903
Rural territories	2178	5104	750	1255	1755	2487	2671

Data of the Central Statistical Bureau show that the total area of the available housing in 1980 was 43.1 million sq.m., that increased to 52.9 million sq.m. in 1999 and included both the housing of the Russian Army and one-dwelling and multi-apartment buildings inhabited by their owners, while in 2017, the area reached 75.3 million sq.m. Table 1-4 summarises the statistics on available housing indicators and changes to the number of population from 1980 to 2018.

Table 1-4 Changes to the available housing from 1980 to 2017[7, 8, 9, 10]

Year	Total available housing, sq.m.	Number of population	Total residential area per one permanent resident, sq.m.
1980	43,100,000	2,514,640	17.1
1985	48400000	2,587,716	18.7
1990	52,921,900	2,668,140	19.9
1995	52722700	2500580	21.3
2000	53,450,000	2,377,383	22.6
2005	56959300	2249724	24.8
2010	67,926,000	2,120,504	32.0
2015	74670000	1986096	37.6
2017	75,324,000	1,950,116	38.6
2018	76,002,000	1,934,379	40.0

Information summarised in Table 1-4 allows concluding that the total area of the available housing has gradually increased. Considering that calculations of the available housing also include the buildings in damage or fully deteriorated condition, the actual available housing

[7] *The available housing in statistical regions, cities, and districts at the end of year, 1990–2009* (2009) [online]. Central Statistical Bureau [accessed on 2 December 2020] Available: http://data.csb.gov.lv/pxweb/lv/arhivs/arhivs__a_nek_ip/A_MA0070.px/table/tableViewLayout2/?rxid=cdcb978c-22b0-416a-aacc-aa650d3e2ce0

[8] The available housing in statistical regions at the end of the year (2017) [online]. Central Statistical Bureau [accessed on 26 July 2017] Available: http://data.csb.gov.lv/pxweb/lv/rupnbuvn/rupnbuvn__ikgad__nek_ip/NE0010.px/table/tableViewLayout2/?rxid=562c2205-ba57-4130-b63a-6991f49ab6fe

[9] *Number of permanent residents by their place of residence at the beginning of the year* (2017) [online]. Central Statistical Bureau [accessed on 2 December 2020] Available: http://data.csb.gov.lv/pxweb/lv/Sociala/Sociala__ikgad__iedz__iedzskaits/IS0020.px/table/tableViewLayout2/?rxid=cd

[10] *Demography 2016*. (2016) [online] Statistical Data Collection Central Statistical Bureau. [accessed on 2 December 2020] Available: http://www.csb.gov.lv/sites/default/files/publikacijas/2016/Nr%2011%20Demografija%202016%20%2816_00%29%20LV_EN.pdf

indicators may significantly differ and in certain regions of Latvia be assessed even as critical.[11, 12]

Table 1-5 clearly shows that an important period for construction of multi-apartment buildings was by 1941 when 44.5% of the total number of them were constructed, while even greater share is the buildings constructed during the Soviet (by 1992) amounting to 51%. It is evident that only 4.4% were constructed after the restoration of independence, thus demonstrating a significant drop.

Table 1-5 Types of multi-apartment buildings and start of operation by years

Code of type	Description of type	**By 1941**	**1941–1960**	**1961–1979**	**1980–1992**	**1993–2002**	**2003–2014**	**2015–2019**	**Total**
11220101	Multi-apartment buildings with wooden external walls	8622	1472	472	77	20	34	7	**10,704**
11220102	1- and 2-storey multi-apartment buildings	5257	2833	3057	638	91	226	26	**12,128**
11220103	3- and 5-storey multi-apartment buildings	2644	918	5350	3385	243	597	63	**13,200**
11220104	6- and 9-storey multi-apartment buildings	674	32	361	657	52	195	36	**2007**
11220105	10- and more storey multi-apartment buildings	0	0	172	264	23	72	9	**540**

When analysing the constructed housing by the material of their external walls, the majority is brick wall buildings (53.4%). Wood has been used for external walls for 27.8% of the housing.

[11] *Concept of State Policy for Housing Issues. Draft.* (1995) [online]. *Latvijas vēstnesis*. 23.03.1995, No. 45 (328) [accessed on 2 December 2020]. Available: https://www.vestnesis.lv/ta/id/26962

[12] Valainis, V. (15 June 2018). *Dzīvojamo māju tiesiskā regulējuma attīstība (Development of Legal Framework of Residential Buildings)*. Conference "Housing Management Experience and Development" organised by SIA "Jelgavas nekustamā īpašuma pārvalde".

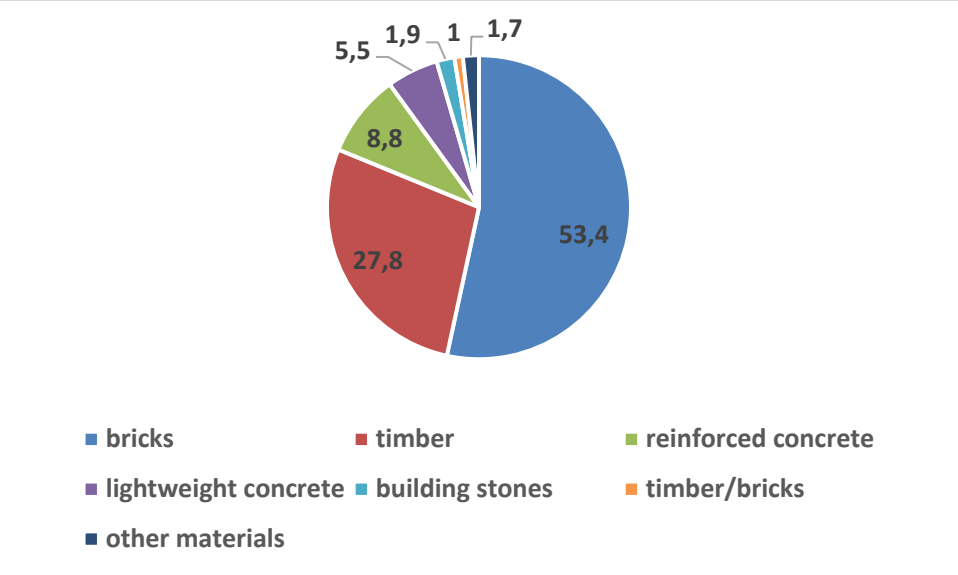

Figure 1.1 Materials for external walls of buildings[13]

[13] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

2. MANAGEMENT OF MULTI-APARTMENT RESIDENTIAL BUILDINGS

2.1. Management Principles and Activities

Administration, maintenance, and management must be stipulated for every residential building to reach the following ***objectives***:

- Provision of operation and maintenance of buildings (physical preservation throughout their life cycle) according to requirements of laws and regulations of each state;
- Promotion of building improvements during their operation;
- Provision of a continuous management process for every building;
- Keeping and development of buildings as aesthetic values of an environmental object and thus the relevant aesthetic environmental values;
- Prevention of risks in relation to safety of the society and environment during the operation;
- Improvement of qualification of the persons involved in building management to enhance the organisation and effectiveness thereof.

Principles for management of residential buildings are as follows:

1. Continuousness of the management process ensures keeping the use characteristics (quality) of a residential building throughout its life cycle;
2. Selection of optimal management methods, including formation of optimal costs for residential building management that is compatible with solvency of the owner of a building;
3. Content and quality of the provided services ensure keeping the usage characteristics (quality) of the managed residential buildings throughout their operation;
4. Inadmissibility of violating safety and health of an individual during the management process;
5. Keeping the quality of environment and provision of improvement thereof during the management process.

Management of a residential building includes: 1) mandatory management activities; 2) other management activities.

Mandatory Management Activities

The mandatory management activities are as follows:

1) The maintenance (physical preservation) of a residential house in accordance with the requirements of laws and regulations:
   a) The sanitary servicing of the residential house;
   b) The supply of thermal energy, also natural gas, provision of water supply and sewerage, removal of household waste by entering into a respective contract with the service provider;
   c) The provision of electricity to the part of the residential house in joint ownership (also for the provision of operation of the facilities in joint ownership);
   d) The survey, technical servicing, and current repair of the residential house, the facilities and communications located therein;
   e) The provision of the requirements set out for the residential house as an environmental object;
   f) The provision of the fulfilment of the minimum energy efficiency requirements set out for the residential house;

2) The planning, organisation, and supervision of the management work, including:
   a) The preparation of a management work plan, including a plan of maintenance measures;
   b) The preparation of the relevant annual draft budget;
   c) The organisation of financial accounting;
3) Keeping of the file of the residential building;
4) Entering into a contract with the owner of the land parcel regarding the use of the land attached to a residential house;
5) The provision of information to state authorities and institutions of local governments.

Maintenance of a Residential House: Sanitary Maintenance of Buildings

The manager of a residential house should ensure implementation of the *sanitary maintenance* requirements at the object in order to prevent the risk of threat.

Servicing the territory of the residential house (of the land belonging or attached to the buildings and structures)

Cleanup work of the territory is to be performed according to the procedure stipulated in binding provisions of the relevant local government.

The following cleanup work of the territory is performed regularly:

- Cleaning of sidewalks, paths and driveways;
- Lawn mowing in the territory;
- Gathering of fallen leaves, withered plants and branches;
- Tending of greenery.

The following additional cleanup work of the territory is regularly performed in the winter season:

- Clearing of sidewalks, paths and driveways, also, where necessary, other parts of the territory of snow and ice, scattering of anti-slip materials on sidewalks, paths and driveways;
- Clearing of snow and ice (including icicles) from the facade and roof of the building in order to prevent falling of the ice and snow from the roof, cornices, drainpipes, loggias and balconies of the building;
- Cordoning-off of areas endangering the safety of pedestrians and vehicles. Measures for the prevention of threats are performed in a timely manner, using all possible safety resources.

Various environmental pollutants and waste harmful to health and construction waste which causes the risk of poisoning, injury and spread of infectious diseases or are related to dispersion of smells are removed from the territory of the residential house, including from premises for common use of the residential house in a timely manner. Other measures required to prevent an increase in the rodent and insect population are ensured in a timely manner.

Waste management is performed in accordance with the regulatory enactments regulating the field of waste management. Waste containers cannot be placed beneath the outdoor air intake sites of the ventilation system. It is recommended that waste containers be situated not closer than 10 metres from the windows of the residential house.

If a cesspool, sewage tank intended for taking out or individual wastewater treatment unit is installed in a building, the manager of the residential house has a duty to monitor the condition thereof, ensuring the maintenance of the structures in appropriate technical order and timely removal of the necessary tanks to wastewater treatment units.

Cleaning of downpipes, drainpipes and drainage wells is regularly performed.

Cleaning equipment of a residential house, as well as disinfectant products are stored in a specially designated locked place. The manager of a residential house provides the person who performs the sanitary maintenance of the residential house with a water supply point.

Maintenance of Premises for Common Use

Wet cleaning of stairwells is performed at least once a week. In poor weather conditions (for example, increased amount of rainfall) wet cleaning is performed more regularly in accordance with the time periods specified by the manager of the residential house.

Windows are washed at least once a year.

If the manager of a residential house establishes that the performance of disinfection, disinsectisation or deratisation of the premises for common use of a residential house is required, he or she, at least five working days in advance, informs owners of the residential house and other persons living in the house in writing regarding the relevant activities to be performed for prevention of the risk detected.

Sanitary Maintenance of Water Supply System

The manager of a residential house has an obligation to ensure continuous hot water exit temperature from heat exchanger which is not less than +55 °C.

The manager of a residential house has an obligation, at least once a quarter, to distribute to the owners of the residential house and other persons living in the house the informative material available on the website of the Centre for Disease Prevention and Control about individual preventive measures to be taken in apartment properties.

Building Maintenance: Supply of Thermal Energy, Natural Gas

Heating and hot water supply to the buildings are provided and paid based on a contract concluded between the owner of the object or a person authorised thereof with a supplier of thermal energy.

Tenants of non-residential premises in residential buildings sign direct contracts on heating and hot water supply by mutually agreeing with the supplier of thermal energy in cases when the owner of the building does not want to sign the relevant contracts.

For instance, a thermal energy supplier in Latvia who supply the relevant building with thermal energy in the previous heating season is not entitled to refuse signing a contract if the owner of the building has fully covered the received thermal energy or agreed with the supplier on a term of paying a debt and fulfils their agreement, as well as if the owner of the building agrees to pay for the supplied thermal energy within the set term and according to the set tariff. The contract on heat supply should foresee that the payment for thermal energy received in the previous month must be paid not later than by the 20th day of the next month. If it is impossible to make the payment within the set term due to certain reasons, the building owner, by the 25th day of the current month, should agree with the supplier of thermal energy on settlement of the debt and further heating regime. Producers of thermal energy must buy fuel under conditions of competition — as cheap as possible, thus ensuring cheaper production of thermal energy.

Supply of natural gas takes place automatically, and the heating regime should be set for consumption purposes only depending on an hour of the day, outside temperature, and desired comfort level. The natural gas heating system is compact, and there is no need for premises to store the fuel. Natural gas can be used also for water heating, cooking, for a fire-place, and other needs. When adjusting the tariffs according to the actual heat capacity of natural gas, a customer does not lose anything compared to firewood quality risks. Making balanced payments for the consumed

natural gas allows ensuring an equal monthly payment for a year. For a more convenient use, it is recommended to use electronic payment options, but as for safety, one should use an emergency service. Although natural gas is not renewable energy resource, among various types of fuel it creates the lowest emissions of CO_2, ashes, soot, smell, and other elements.

Building Maintenance: Provision of Water Supply and Sewerage Services

The water supply and sewerage services are provided to ensure availability of quality water management services that comply with environment requirements to provide the users with continuous and safe services by balancing interests of environment protection, sustainable use of natural resources, and economic interest of the society.

The services of water supply and sewerage must comply with the requirements of national laws that stipulate:

- Competence of public institutions in provision of availability of water management services;
- General requirements and a procedure for provision and use of the water management services;
- Rights and duties of the service provider and service user.

Building Maintenance: Removal of Household Waste

Each state has certain requirements for collection, transportation, reloading, and storage of household waste in the administrative territory of a local government. There must be a regulation for management of sorted household waste, certain requirements for waste containers and their placement, as well as a certain control system for generating and managing the waste. There should also be a procedure for defining a fee and making payments for the household waste management, as well as responsibility for not observing the waste management requirements.

Building Maintenance: Provision of Electric Energy

Energy is one of the main elements of development of the society, and it directly contributes to the economic growth. The energy sector in the region and worldwide is now facing changes that are determined by always new technologies and user requirements. Thus, the energy companies expand and reconsider the limits of the operation by offering new approaches and services. This provides the building and housing managers with a wide range of opportunities to ensure quality, safe, and environment-friendly energy supply for building maintenance in cooperation with energy companies.

Building Maintenance: Survey, Technical Servicing, and Current Repair of Buildings, the Facilities and Communications Located therein

The survey, technical servicing, and current repair of the building, facilities and communications located therein are performed to ensure the maintenance (physical preservation) of the inspection objects throughout their operation and to prevent the occurrence of threats.

Technical condition of the buildings and structures, their constructions, and also all facilities and engineering networks therein are established in the visual inspection. The constructions, parts of facilities, and engineering networks of the building which cannot be accessed due to the technical solution of the structure are not visually inspected. The fact of visual inspection is registered in the building survey registration log which is a part of the house maintenance file (documentation).

Constructions of the buildings and structures, their communal facilities and parts of engineering networks located in the groups of residential and non-residential premises are visually inspected once per year in a random order if the building owner has provided such possibility. If the building owner does not ensure the manager the possibility to perform visual inspection, this fact is recorded in the building survey registration log.

The repairs are made to ensure continuous operation of the buildings, the facilities and engineering networks therein. The repairs may be:

- An emergency repair — timely elimination of damage;
- A planned repair — the elimination of damage within the time period specified by the manager of the building.

The proprietary border of the building, the facilities and the engineering networks located therein is determined by laws or regulations or the contracts entered into by the manager of the residential house and the relevant service provider.

Technical Servicing Intervals and Surveys of the Building, the Facilities and the Engineering Networks Located Therein

The manager of the building ensures the technical servicing, visual inspection, technical survey and elimination of the damages of the building, the facilities and the engineering networks located therein.

If the facilities and engineering networks belonging to other persons are located in the building, its manager cannot prevent the owner of the respective engineering network from ensuring the technical servicing, visual inspection and technical survey thereof.

The manufacturer or laws and regulations determine the technical servicing intervals and technical servicing operations of the building, the facilities and the engineering networks located therein. If the manufacturer's instructions are not available or the abovementioned intervals and operations are not determined by laws and regulations, these are determined by the manager of the building.

In order to use heating more effectively, and also to reduce payments, the manager of the building monitors and regulates the heating regime depending on the time of day and the summer or winter season.

Building Maintenance: Provision of Fulfilment of the Requirements set for the Buildings as Environmental Objects

The provision of fulfilment of the requirements set for a building as an environmental object is aimed at keeping and restoring the environment quality, as well as sustainably using the natural resources.

Building Maintenance: Provision of Fulfilment of the Minimum Energy Efficiency Requirements for the Buildings

This chapter describes the requirements for provision of energy efficiency of the buildings and structures.

The manager of the building organises the installation of a meter for measuring the amount of thermal energy consumed if such has not been installed in the building to which thermal energy is supplied by a person other than an energy supply merchant.

The manager of the building plans measures for energy efficiency improvement, including the changing of deteriorated elements or constructions, if the average consumption of thermal energy of the building in which thermal energy is used for the heating and preparation of hot water,

within the last three calendar years exceeds 200 kWh/m^2 per year or 150 kWh/m^2 per year provided that the thermal energy is used only for heating the building. When calculating the average consumption of thermal energy within the last three calendar years, the useful area to be heated in the building is considered.

If the building has undergone the certification of the energy performance or the inspection of heating or air conditioning system, the manager takes into account, when planning measures for increasing the energy performance, the recommendations of an independent expert provided in the energy performance certificate or the relevant inspection report.

When planning the renovation of the building, its manager implements energy efficiency measures which:

1) Ensure that the thermal energy consumption of the building is lower than the abovementioned level of the thermal energy consumption;
2) Ensure higher savings of thermal energy in relation to the funds required for the implementation of the measures.

If conditions which facilitate the escaping of heat into the surrounding environment are established, the manager implements the following measures to improve energy efficiency:

1) Fit the exterior door with a closing mechanism;
2) Provide thermal insulation for the heating system pipes and hot water pipes which are located in unheated premises;
3) Provide sealing to windows and doors or replace them.

The manager may decide on the performance of energy certification of the building for the planning of energy efficiency improvement measures.

Other management activities are the activities related to building management and performed according to will and solvency of the owner of the buildings and structures. They include building improvement and development and the activities in relation to preparation of a long-term plan of the required measures.

Building Maintenance File (Documentation)

The information to be incorporated in the building maintenance file is compiled in the following sections:

1) Basic documents of the buildings and structures — documents confirming immovable property rights, the cadastral survey file of the building, the boundary plan of the attached land, and the contract regarding the usage of the attached land;
2) The building owner (owners), the holder of state buildings and structures (a list);
3) Technical documentation — technical passport of the buildings (plans, diagrams), design documentation, energy passport and energy plan, opinions of the technical survey of the building, etc.;
4) Documents related to the maintenance and management of the building — management contract, the decisions taken by the owner (owners) of the buildings, including the decisions taken at general meetings of apartment owners, the contracts related to the management activities, management work plans, budget reports, etc.

The building maintenance file is retained by the owner of the building, but, if the object has several owners, — by the manager, unless otherwise specified in the management contract.

Accountability of a Building Owner

A building owner is accountable, in accordance with the procedures laid down by law, for the management of the building, including the failure or improper fulfilment of the mandatory management activities.

Accountability of a Building Manager

A manager is accountable to the building owner for the fulfilment of the management tasks assigned to him or her in accordance with the laws and regulations and the provisions of the management contract entered into. The manager is accountable, in accordance with the procedures laid down in this Law, for failure to comply with the requirements of the Law, while performing the management task. The accountability of the manager of the building enters into effect at the time specified in the management contract.

2.2. Education and Vocational Qualification of Housing Managers

Education and vocational qualification requirements for housing managers are stipulated in the Law on Administration of Residential Buildings.[14]

A person is entitled to perform the management task in a multi-apartment building if he or she has acquired the vocational education necessary for the management of residential houses and a document certifying at least a fourth level vocational qualification. If the manager is a legal person, it is necessary for such employee of the legal person, who performs the management task assigned in the management contract in the relevant house, to have a document certifying the vocational education necessary for the management of residential houses and at least a fourth level vocational qualification.

If the total area of an apartment house exceeds 1500 sq.m., it is necessary for the following persons to have a document certifying the vocational education necessary for the management of residential houses and at least a third level vocational qualification:

- An owner, who is personally managing a residential house belonging to him or her;
- An owner, who has been authorised to perform management activities by the other residential house owners on the basis of a mutual contract entered into in accordance with the procedures laid down in the Civil Law;
- An employee of a residential house management society or association established by the owners, as well as a member of a management society or association, who performs the relevant management activities and is a residential house owner himself or herself.

If such residential house owner is a legal person, it is necessary for the employee of the legal person, who performs the management task, to have a document certifying the vocational education necessary for the management of such house and at least a third level vocational qualification.

A document certifying a vocational qualification is not necessary for the manager of a single dwelling, as well as in cases when the total area of the apartment house is less than 1500 sq.m. and is managed by:

- The owner of the residential house himself or herself;

[14] *Residential House Management Law*. (2009) [online]. Cabinet of Ministers of the RoL, adopted in Riga on 4 June 2009, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 9 December 2020]. Available: https://likumi.lv/ta/id/193573-dzivojamo-maju-parvaldisanas-likums

- An owner of the residential house, who has been authorised to perform management activities by the other residential house owners on the basis of a mutual contract entered into in accordance with the procedures laid down in the Civil Law;
- A residential house management society or association established by the residential house owners.

The amount of the management task assigned to a manager, the provisions and procedures for the performance thereof are determined by the management contract. In performing the management task, the manager has a duty to comply with the requirements of the laws regulating residential house management and other laws and regulations, as well as the principles for the management of a residential house.

The manager has a duty to present the residential house owner with current, unambiguous and complete information regarding the laws and regulations binding to the residential house owner and the obligations arising therefrom, regarding the obligations of the manager arising from the management task, as well as — upon the request of the residential house owner — regarding matters, which relate to the management task.

The manager has a duty to warn the residential house owner in writing regarding urgent measures needed to be taken to prevent ruination, collapse or destruction of the residential house, as well as calculate the estimated costs of these measures.

The manager has a duty to inform residential house owners in due time regarding actions or failure to act of an individual residential house owner (including the non-fulfilment of the liabilities acquired on the basis of the management task), which affect or may affect the interests of other residential house owners, as well as to present unambiguous and complete information regarding these matters upon an individual request of the residential house owner.

The manager has a duty to control payments of the residential house owner for the management activities assigned to the manager, including for the services necessary for the maintenance of the residential house. Control of payments includes the duty of:

- Preparing statement regarding payments of the residential house owner;
- Preparing a report on existence of a debt;
- Bringing a claim to the court in the interests of other residential house owners regarding non-fulfilment or inadequate fulfilment of the payment obligations.

If the settlement of payments for the services necessary for the maintenance of the residential house is performed with the intermediation of the manager, the manager has a duty to transfer the payment received from the residential house owner to the service provider without delay in the exact amount paid by the residential house owner.

The manager has a duty to organise a written survey in the residential house in accordance with the procedures laid down in law if a written request of a joint owner of the residential house or in an apartment property house — a written request of the apartment owner has been received and the issue to be decided concerns management activities of the residential house.

Qualification levels[15]:

Assistant manager (VQL 3/LQF 4)[16] — an assistant manager, under guidance of the housing manager, ensures management and physical preservation of buildings and other structures and physical preservation and technical maintenance of adjoining territories, functionally necessary plots of land, and environmental objects.

[15] *Qualifications Structure of Construction Sector.* (2019) [online]. Registri.visc.gov.lv [Accessed on 17 December 2020]. Available: https://registri.visc.gov.lv/profizglitiba/dokumenti/nozkval/NKS_buvnieciba.pdf

[16] VQL — vocational qualification level; LQF — Latvian Qualification Framework

Housing manager (VQL 4/LQF 5) — a housing manager plans, organises, and leads operation work, renovation, reconstruction, and restoration of the housing and adjoining territory, as well as prevents damage according to the specific features of the object and ensures record-keeping of the real estate.

To provide the services of a residential building's manager, he or she must be recorded in the Register of Managers of Residential Buildings.

Real estate manager (VQL 5/LQF 6) — a real estate manager plans, leads, and controls a technical survey of the real estate, technical servicing of the real estate and the territory adjoining it, and prevention of damage, as well as organises, leads, and controls development of financial accounting, administration budget, renovation (repair) estimates, and related documents, and organises work with cooperation partners and customers.

The educational institutions where vocational education and qualification for managing the residential buildings can be obtained, are indicated in Table 2-1.

Table 2-1 Educational institutions and education programs[17]

Educational institution	Education program
Assistant manager	
SIA "BUTS"	"Trade and Management of Real Estate" (30T 431 03)
SIA "Juridiskā koledža"	"Trade and Management of Real Estate" (30T 431 03)
"Komplekss Citadele" SIA Vocational Study School "Citadele"	"Trade and Management of Real Estate" (30T 431 03)
Riga International School of Economics and Business Administration (RISEBA)	"Trade and Management of Real Estate" (30T 431 03)
Housing manager	
Riga Technical University (RTU)	"Real Estate Management" (41818)
SIA "Juridiskā koledža"	"Real Estate Management and Administration" (41345)
Jēkabpils Agribusiness College	"Housing Management" (41345)
Information System Management University of Applied Sciences (ISMA)	"Real Estate Entrepreneurship" (41345)
Real estate manager	
Riga Technical University	"Real Estate Management" (42818) — professional bachelor
Riga Technical University	"Civil Construction and Real Estate Management" (47818) — professional master

The Register of Managers of Residential Buildings is an informative register with the task of providing updated information about the persons that are managing or want to manage residential buildings and comply with the criteria for the management work defined in the Law on Administration of Residential Houses. The Law on Administration of Residential Buildings foresees a duty for the manager, who has concluded a management contract with the residential building's owner and obtained the required qualification, to register with the Register of Managers of Residential Buildings, and a person who offers management services, has the required qualification but has not yet concluded a management contract is also entitled to register.

[17] *Educational institutions where it is possible to obtain the professional education and qualification required for the management of residential houses*. (2020) [online]. Construction Information System [Accessed on 19 December 2020]. Available: https://bis.gov.lv/registri/dzivojamo-maju-parvaldnieku-registrs--2/izglitibas-iestades-kuras-iespejams-iegut-dzivojamo-maju-parvaldisanai-nepieciesamo-profesionalo-izglitibu-un-kvalifikaciju

Information about the persons that must register with the Register of Managers, and the qualification level required for the manager, are summarised in Table 2-2.

Table 2-2 Registration requirement and qualification level[18]

Category	Registration requirement of a manager	Qualification level, experience
An owner, who has been authorised to perform management activities by the other residential house owners on the basis of a mutual contract entered into in accordance with the procedures laid down in the Civil Law	**Must register**, if the total area of the multi-apartment building exceeds 1500 sq.m.	3 or 3 + practical experience in management of residential buildings obtained by 01.01.2010.
	Must register, if the total area of the multi-apartment building does not exceed 1500 sq.m.	A document testifying the vocational education is not needed
A residential house management society or association established by the owners	**Must register**, if the total area of the multi-apartment building exceeds 1500 sq.m.	3 or 3 + practical experience in management of residential buildings obtained by 01.01.2010.
	Must register, if the total area of the multi-apartment building does not exceed 1500 sq.m.	A document testifying the vocational education is not needed
Natural and legal persons that manage multi-apartment buildings in which they do not own apartment properties and in which the natural persons are not employees of a society or association of the apartment owners	**Must register**	4 or 3 + practical experience in management of residential buildings obtained by 01.01.2010.
The persons who offer the management services	**Are entitled to register**	4 or 3 + practical experience in management of residential buildings obtained by 01.01.2010.
A manager (owner or manager) of a one-dwelling house	**Is not obliged to register**	A document testifying the vocational education is not needed
An owner, who is personally managing a multi-apartment house belonging to him or her	**Is not obliged to register**	If the total area of the multi-apartment building exceeds 1500 sq.m., the housing manager must obtain the 3rd vocational qualification level. In case of not exceeding the indicated area, a document testifying the vocational education is not needed.

[18] *Persons required to register in the register of managers and qualifications required of the manager.* (2020) [online]. Construction Information System [Accessed on 19 December 2020]. Available: https://bis.gov.lv/registri/dzivojamo-maju-parvaldnieku-registrs--2/personas-kuram-jaregistrejas-parvaldnieku-registra-un-parvaldniekam-nepieciesama-kvalifikacija

3. HOUSING POLICY AND STAKEHOLDERS

The management and administration of multi-apartment buildings are closely related to preserving the available housing which is one of the key aspects of a housing policy. The scheme of the institutions involved in national development planning and implementation of plans is shown in Figure 3.1.

State	Region	Local regions
Cabinet of Ministers Ministries	Planning regions	Local governments Building and structure management and administration companies

Figure 3.1 Scheme of information flow for development of planning documents at hierarchic levels of different responsible institutions[19, 20, 21]

The housing policy, as well as issues of managing MARBs in Latvia at the highest level falls within the competence of the Ministry of Economics. Tasks of Division of Housing Policy under Department of Construction and Housing of MoE[22] include development and preparation of laws and Cabinet regulations regarding requirements of sanitary cleanup of the residential houses, building maintenance, technical servicing, current repair, renovation, and reconstruction of the residential buildings[23] to promote housing availability, improvement, and maintenance, as well as implementation of corresponding energy saving measures in the residential buildings.[24]

To improve the life quality of population, planning of a stable and sustainable national development and implementation of such plans are a key principle of the state administration system.[25, 26]

[19] Sustainable Development Strategy of Latvia until 2030 (2010) Ministry of Environmental Protection and Regional Development [Accessed on 18 December 2020]. Available: http://www.pkc.gov.lv/sites/default/files/inline-files/LIAS_2030_parluks_lv_0.pdf

[20] Actiņa, G. (2015). Energoefektīvo procesu vadības sistēmas attīstība Latvijā (*Development of Management System of Energy Efficiency Process in Latvia*). Rīga: RTU Izdevniecība. pp. 88.

[21] Management Board (2016) [online]. Riga City Council, Housing and Environment Department [Accessed on 18 December 2020] Available: http://mvd.riga.lv/parvaldes/apsaimniekosanas-parvalde/pasvaldibas-dzivojama-fonda-parvaldisanas-uzraudziba

[22] MoE structure [online]. Ministry of Economics. [Accessed on 16 December 2020] Available: https://www.em.gov.lv/en/structure

[23] MoE Provisions (2010) [online]. Likumi.lv [Accessed on 15 December 2020] Available: https://likumi.lv/doc.php?id=207119

[24] Mājokļu tirgus pārskats Rīga un reģioni. (*Housing Market Overview: Riga and Regions*). First six months of 2017. (2016) [online]. Latio. [Accessed on 17 December 2020] Available: http://latio.lv/lv/pakalpojumi/tirgus-analize/majoklu-tirgus/147/latio-majoklu-tirgus-parskats-2017-1-pusgads.pdf

[25] *Sustainable Building in the World and Latvia.* (2012) [online]. Sustainable Building Council. [Accessed on 17 December 2020]. Available: *http://www.ibp.lv/lv/lasitava/publikacijas/*

[26] Kauškale, L., Geipele, I. (2015). The Real Estate Market Development Impact on Life Quality — Main Aspects, Tendencies and Important Regulations. *In: Proceedings of the 8th International Scientific Conference "Rural Environment. Education. Personality" (REEP-2015), Latvia, Jelgava, 15–16 May, 2015.* Jelgava: Latvia University of Agriculture, pp. 213 –221. ISBN 978-9984-48-178-4. ISSN 2255-8071.

To perform the tasks that have been set in the housing policy concept, on 13 June 2000, Housing Development Crediting Program[27] (HDCP) was adopted. The document approved that promotion of renovation and modernisation of MARBs has been of critical importance already 20 years ago. To improve the situation, additions to the program were elaborated as for the crediting system of housing reconstruction, renovation, repair, and construction foreseeing the granting of long-term credits.[28], [29]

During the first stage of the HDCP, implemented in 2000, the measures in relation to improvement of restoration and modernisation of the MARBs were set as priorities.[30] During the implementation of the first stage of the program, significant factors that hindered renovation of MARBs were discovered, and some of them are still topical:[31]

- Owners of apartments in MARBs lack information in relation to management and administration of their joint property, thus they are inactive as for involving in establishment of management societies;
- The financial instruments that would provide the state guarantee to housing loans is not yet developed and do not operate in the market of Latvia;
- Population solvency is low since there are neither national nor local support instruments that would help improving opportunities of purchasing and managing a housing.

To provide solvency, developers of the HDCP suggested obtaining a financing for restoration of the MARBs with bank credits, by using a house pledging as a guarantee (during the Stage II of the HDCP, the management and administration fee collected from apartment owners served as a guarantee to credit payment)[32], implemented by a community of apartment owners or an authorised administrator (*manager*).[33] In this case, the apartment owners make payments to the administrator (*manager*) who in his or her turn settles payments with the creditors. An administering and managing (*management*) company must have a right of claim against the

[27] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27 20.§, adopted in Riga on 13 June 2020, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020]. Available: *https://likumi.lv/doc.php?id=10094*

[28] Informative report on implementation of Housing Development Crediting Program (Stage II) and operation of state joint stock company "Latvijas Hipotēku un zemes banka" when issuing guarantees to housing credit. (2006) [online]. Informative report of the Cabinet of Ministers of the RoL, RAPLMzino_010606, issued in Riga, on 20 June 2006 [Accessed on 17 December 2020]. Available: *https://www.em.gov.lv/lv/nozares_politika/majokli/informativie_zinojumi/*

[29] Marana, I., Zaiminа, A., Zaķis, V., Luksa, M., Krauze, I., Innusa, R., Puķīte, I. (2004) [online]. *Mājoklis Latvijā (Housing in Latvia)*. VA Mājokļu aģentūra [Accessed on 17 December 2020]. Available: *http://petijumi.mk.gov.lv/sites/default/files/file/2004_Gramata_majoklis_Latvija.pdf*

[30] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27 20.§, adopted in Riga on 13 June 2020, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020]. Available: *https://likumi.lv/doc.php?id=10094*

[31] On State Support Program to Enhance Renovation of Multi-Apartment Residential Houses for 2007–2010. (2007) [online]. Cabinet Order No. 305 in Riga, 25 May 2007. *Latvijas Vēstnesis*, Likumi.lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/157804-par-daudzdzivoklu-dzivojamo-maju-renovacijas-veicinasanas-valsts-atbalsta-programmu-2007-2010-gadam

[32] *Informative report on implementation of Housing Development Crediting Program (Stage II) and operation of state joint stock company "Latvijas Hipotēku un zemes banka" when issuing guarantees to housing credit.* (2006) [online]. Informative report of the Cabinet of Ministers of the RoL, RAPLMzino_010606, issued in Riga, on 20 June 2006 [Accessed on 17 December 2020]. Available: *https://www.em.gov.lv/lv/nozares_politika/majokli/informativie_zinojumi/*

[33] *Housing Development Crediting Program. Stage One* (2000) [online] "Latvijas Vēstnesis",01.09.2000., No. 307/309 (2218/2220) [Accessed on 17 December 2020]. Available: *https://www.vestnesis.lv/ta/id/10293*

apartment owners and also a right of recovery, thus the apartment owners are jointly and severally responsible for the credit.[34] At the moment of developing the HDCP in 2000, such mechanisms failed to work, therefore, banks had limited opportunities of issuing credits to management and administration companies. The laws and regulations, effective at the moment, and judicial system still do not foresee a sufficiently fast and effective procedure to fight non-payers which encumbers attraction of funding.

Promotion of renovation and modernisation of MARBs was the key part of the Housing Development Crediting Program adopted in 2000.[35] To implement the Program, there were two solutions selected:[36]

- Establishment of creditworthy societies for housing management;
- Financing of the state or local governments.

However, wide use of such solution was unlikely since the financing from relevant budgets was required. The HDCP lists potential factors that hindered the establishment of societies for housing management and administration — a difference of material welfare of the society and scepticism towards efficiency of jointly funded measures.[37]

During development of Stage I of the HDCP, it was concluded that, to activate arrangement of residential buildings, the state should distribute assets for implementation of projects of partial housing improvement. For the state co-funding to provide an incentive, it should cover 25% of the loan. Implementation of the above measures would allow starting the improvement of MARBs.[38]

The pilot program of Stage I of the HDCP was initiated in 2001. The total implementation duration was depending on the term of money assets attracted with the state guarantee. The optimal term is 15–20 years.[39] The pilot projects were implemented in three years with an aim of issuing the following loans from the paid loans.

To improve the Housing Development Crediting Program, the Stage II of HDCP was elaborated and approved by the Cabinet Order No. 576 of 25 August 2005 "On Updating of the Housing Development Crediting Program (Stage II). It was aimed at improvement of the housing crediting system by providing the state support to make the credits more accessible to certain categories of population (families with children and tenants of denationalised buildings) so that they could purchase and build a housing. It was also aimed at renovation and reconstruction of multi-apartment houses. When implementing the program, it was planned to increase the share of the population who has access to a loan thus improving their housing situation, as well as to

[34] *Housing Development Crediting Program. Stage One* (2000) [online] "Latvijas Vēstnesis",01.09.2000., No. 307/309 (2218/2220) [Accessed on 17 December 2020]. Available: https://www.vestnesis.lv/ta/id/10293

[35] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27 20.§, adopted in Riga on 13 June 2020, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020]. Available: https://likumi.lv/doc.php?id=10094

[36] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27 20.§, adopted in Riga on 13 June 2020, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 18 December 2020]. Available: https://likumi.lv/doc.php?id=10094

[37] *Housing Development Crediting Program. Stage One* (2000) [online]. "Latvijas Vēstnesis", 01.09.2000, No. 307/309 (2218/2220) [Accessed on 17 December 2020]. Available: https://www.vestnesis.lv/ta/id/10293

[38] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27, extract, adopted in Riga on 13 June 2000, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020] Available: https://www.vestnesis.lv/ta/id/10094-majoklu-attistibas-kreditesanas-programma

[39] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27, extract, adopted in Riga on 13 June 2000, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 15 December 2020] Available: https://www.vestnesis.lv/ta/id/10094-majoklu-attistibas-kreditesanas-programma

enhance the crediting system to ensure renovation, reconstruction, and better energy efficiency of MARBs at the same time suspending too rapid depreciation of the buildings.

Concurrently with the main task of the housing policy — to form a crediting system and mechanism for housing reconstruction, renovation, repair, building, purchase by foreseeing long-term credits — several policy planning documents and laws were developed with an aim of improving the housing situation.

When assessing the project, it must be concluded that such support for renovation of MARBs is considered positive and should be continued, at the same time noting that the operational program which refers to energy efficiency improvement in residential buildings has been developed by 2023, therefore, it is necessary to develop various energy efficiency improvement instruments and to include them in the housing policy document that clearly defines an action of the state, regions, and local governments, taking into account that after successful implementation of the program, 5–10% of the MARBs that must be renovated are partially or completely depreciated.[40]

When researching historical development of the housing policy, it was concluded that already in the first half of the 20th century, public authorities were established and involved in housing matters in Latvia. The local government of Riga was commissioned to perform the tasks that have not lost their topicality these days:[41], [42]

- To perform a housing supply and demand analysis;
- To specify the types and materials of the houses to be built;
- To develop plots of land suitable for construction;
- To perform preparation work for construction of new housing;
- To develop construction plans and issue them for moderate prices;
- To organise cheap supply of construction materials for the houses to be built;
- To support cooperative societies of city workers and tenant dwellings by assigning them plots of land and issuing the construction materials under simplified provisions;
- To coordinate direction of budget income to construct new housing.

The institution with similar duties after restoration of independence was "*Mājokļu aģentūra*". According to the Section 8, Paragraph one of the Public Agency Law, as of 1 October 2002, it was decided to establish a state agency, "*Mājokļu aģentūra*" (hereinafter — Agency). The Agency was supervised by a public institution that was established for implementation of a single state policy as for the housing and acted under the Ministry of Environmental Protection and Regional Development. The Agency had the following key functions:[43]

- To manage state support programs of housing;
- To provide methodology management of housing management;

[40] Pittini, A., Ghekière, L., Dijol, J., Kiss, I. (2015). The state of housing in EU 2015. A Housing Europe Review. Housing Europe. The European Federation for Public, Cooperative and Social Housing Brussels. p. 106

[41] *Housing Development Crediting Program.* (2000) [online]. Cabinet of Ministers of the RoL, Meeting Minutes No. 27, extract, adopted in Riga on 13 June 2000, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020] Available: https://www.vestnesis.lv/ta/id/10094-majoklu-attistibas-kreditesanas-programma

[42] Bērzkalns, P. (1927). Dzīvokļu problēma.//Tautas tiesības (*Dwelling Issue.//Rights of the Nation*), 1927. No. 6 pp. 175.

[43] *Par valsts aģentūru "Mājokļu aģentūra" (On State Agency for Housing)* (2002) [online]. Cabinet Order No. 531, Riga, 25 September 2002, *Latvijas Vēstnesis*, Likumi.lv [Accessed on 17 December 2020]. Available: https://likumi.lv/doc.php?id=66849

- To ensure housing monitoring;
  - ✓ To perform other functions set for in laws and regulations.

"*Mājokļu aģentūra*" was liquidated on 31 December 2009. Since then, the Ministry of Economics has taken over the relevant functions. However, an equal institution with equal functions is neither established nor kept.

The function of V/A "Mājokļu aģentūra" to "*methodically manage the activities of local governments in relation to housing*" was not delegated (taken over), indicating that there is no systematic and well-planed cooperation in the field of the housing policy. Most of the functions of V/A "Mājokļu aģentūra" has been taken over by the Ministry of Economics and its subordinated institutions. From 1 July 2009, VAS "Privatizācijas aģentūra" is responsible for the privatisation process. From 1 July 2010, responsibility for increasing energy efficiency in residential buildings was taken over by V/A LIAA and from 2016 — by the state development financial institution ALTUM[44], which ensures funding for the supported fields, as stipulated by the state, where amount of the financing provided by credit institutions is not sufficiently available, and ALTUM uses the financial instruments such as loans, guarantees, investment, venture capital fund, etc.

3.1. Public Administration Institutions

3.1.1. Ministry of Economics and State Construction Control Bureau

The Ministry of Economics is the leading national regulatory authority in the field of industry and service policy, business policy, and tourism policy. The Ministry of Economics elaborates, organises, and coordinates the following policies: external economy, construction, energy, domestic market, innovation development, business development, competition development, housing, consumer rights' protection, privatisation, manufacturing, standardisation, and tourism, as well as structural policy of economics and other policies within its competence as determined in laws and regulations.

The aim of the housing policy[45] is to promote housing quality and accessibility, ensuring legal framework for the effective management of residential houses, promoting the establishment of available housing for rent in the territories of local governments and supporting energy-saving activities in residential houses.

To ensure quality administration and management of the residential buildings, in 2009, the Law on Administration of Residential Buildings was adopted, and it is based on the following principles:

- Continuity of the management process;
- Selection of optimal management methods;
- Preservation and improvement of the surrounding environment of a residential building;
- Inadmissibility of violating safety and health of an individual;
- Preservation of the quality of a residential house.

To improve the management of residential buildings, the Housing Policy Department has elaborated Cabinet regulations regarding requirements of sanitary cleanup of a residential house, keeping and updating a house file, the steps to be taken within the technical survey, current repair, renovation, and reconstruction of the residential house, keeping and updating the Register of

[44] *About ALTUM Loan*. (2018) [online]. [Accessed on 17 December 2020]. Available: https://www.altum.lv/lv/pakalpojumi/energoefektivitate/programmas-atbalsts-altum-aizdevums/par-aizdevumu/

[45] *Housing*. (2020) [online]. Ministry of Economics Republic of Latvia [Accessed on 17 December 2020]. Available: https://www.em.gov.lv/en/housing

Managers of Residential Buildings, as well as minimum requirements for provision of energy efficiency of the residential house.

To introduce more effective state support system control, starting from 1 January 2020, supervision and control as for energetics, including administration of energy efficiency issues are performed by State Construction Control Bureau (SCCB).

Starting from 2020, the SCCB performs:

- Monitoring and control of a mechanism of mandatory procurement of electricity, by significantly strengthening the monitoring of an operation of power plants implemented by now, incl. by making systematic inspections on spot;
- Provision of a protected user trade service;
- Function of administering the energy efficiency issues;
- Monitoring and control of fulfilment of transport energy conditions;
- Administration of oil product issues.

Starting from 1 January 2020, the State Construction Control Bureau, as for the energy efficiency:

- Provides the energy efficiency monitoring, maintains the energy efficiency monitoring system, as well as registers energy savings;
- Administers the energy efficiency obligation scheme;
- Develops and maintains a catalogue of energy savings;
- Supervises implementation of an energy management system at public institutions and local governments;
- Concludes voluntary agreements with the organisations representing merchants, the merchants, and local governments on improvement of energy efficiency and monitors the fulfilment thereof;
- Maintains a register of energy audit reports of companies and administers the submitted reports;
- Develops and maintains a register of energy efficiency service providers;
- Ensures a mandatory energy audit of large electricity consumers and large companies and controls fulfilment of their energy management obligations, as well as summarises their reports of the measures implemented;
- Administers an energy efficiency duty;
- Determines the average energy efficiency indicator for heating consumption in Latvia;
- Prepares a list of state buildings.

3.1.2. Ministry of Environmental Protection and Regional Development

The Ministry of Environmental Protection and Regional Development (MEPRD) forms a field policy in protection of environment and nature, regional development, and digital transformation management[46].

MEPRD shapes the field policy and organises and coordinates its implementation in protection of environment and nature, including in improvement of environmental quality, nature protection, preserving and sustainable use of natural resources, climate policy, environment investment, hydro-meteorology, use of underground resources, as well as regional development, development of a local government system, territorial development planning (including landscape

[46] *Global Climate Change*. (2020) [online]. Ministry of Environmental Protection and Regional Development Republic of Latvia [Accessed on 17 December 2020]. Available: https://www.varam.gov.lv/en/global-climate-change

planning), land management, availability of public services and services of local governments, introduction of a one-stop-shop principle, information society, electronic administration, and administration of state information and communication technologies. MEPRD monitors lawfulness of local government activities, as well as fulfilment of the tasks set to the local governments in laws and other regulations, according to the competence provided for in the local government laws.

Climate change is one of the scopes of the practice of MEPRD.

To help Latvian population and economy to better adopt to the current climate change and therefore to reduce the loss caused by the climate change, on 17 July 2019, the Cabinet of Ministers approved Latvian Plan for Adaptation to Climate Change until 2030.[47]

The Plan foresees introducing more than 80 adaptation measures comprising both saving human life, health, and welfare from the adverse effects of climate change and enhancing adaptation ability of the economy.

3.2. Association of Management and Administration of Latvian Housing

The Association of Management and Administration of Latvian Housing (AMALH)[48] is a public organisation that unites natural and legal persons in all Republic of Latvia having interest in reaching joint objectives as for management and administration of real estate.

The Association of Management and Administration of Latvian Housing is the largest and most experienced public organisation in Latvia dealing with management of real estate.

The task of the AMALH — to promote professional preparedness, exchange of experience, and growth of the field professionals. The housing management is now a very complicated and dynamic field; therefore, the leading specialists must accurately follow its development. The AMALH maintains close cooperation with public institutions and experts of the related fields.

The Association's objectives:

1) To unite the companies, institutions, and specialists that work in the field of and are related to real estate management and administration in order to implement a targeted operation with an aim of improving, in interests of the Latvian society, quality of managing and administering the real estate owned by the state, local governments, and natural persons so that it would comply with the standards set by countries of the European Union;
2) To unite the Association's members for joint objectives, tasks, and measures;
3) To represent and protect interests of the Association's members in entire territory of the Republic of Latvia in all institutions of the state, local governments, judicial, and any other administrative institutions and those of different type, if needed;
4) The aim of the Association's members is to form this organisation as the most authoritative organisation that identifies and evaluates opinions of the management and administration of Latvian real estate and, if necessary, actively solves problems by engaging in legislation of the Republic of Latvia — prepares and submits proposal on solving topical issues to the public administration institution and public authorities.

[47] *On Latvian adaptation to climate change plan for the period until 2030*. (2019) [online]. Cabinet Order No. 380 in Riga , 17 July 2019. *Latvijas Vēstnesis*, Likumi.lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/308330-par-latvijas-pielagosanas-klimata-parmainam-planu-laika-posmam-lidz-2030-gadam

[48] *AMALH*. (2020) [online]. Lnpaa.lv [Accessed on 7 January 2021]. Available: http://www.lnpaa.lv/en/

5) The Association's members have a right to gather within their regional territories by establishing regional offices of the Association;

The tasks of the Association to reach its objectives:

1) To optimise the general meetings of its members and measures to negotiate and solve different management and administration issues of real estate, to prepare and explain proposals;
2) To facilitate exchange of experience of its members and provide consultations;
3) To create a technical library for exchange of experience;
4) To participate in elaboration of laws and regulations and facilitate solving of the current issues during the legislative process;
5) To provide a methodical help to Association's members and all Latvian and foreign society regarding management and administration of Latvian real estate;
6) To enhance regular and targeted qualification development and systematic exchange of experience of specialists, issue qualification conformity certificates under the procedure set by the Association or nationally;
7) To preserve and rise prestige of the real estate management;
8) To attract new companies and natural persons, operating in this field, to the Association;
9) To represent joint opinion of the Association's members, introduce with it and Association's operation other public organisations and institutions of the state and local governments;
10) To strengthen mutual understanding and trust of the Association's members, represent and protect their professional, social, and legal interests, help solving them according to the laws of the RoL and in cooperation with legal and natural persons;
11) To maintain contact with other Latvian public organisations, incl. Latvian Local Government Union, etc.
12) To establish and maintain contacts with related international, national, and professional organisations and other partners abroad.

To achieve the objective and perform the tasks, the Association:

1) Organises working groups, commissions, and committees;
2) Organises meetings, symposia, seminars, training courses, conferences, thematic arrangements, clubs, technical excursions, exhibitions, libraries, contests, lotteries, and other similar events;
3) Promotes transfer of the best technologies and other achievements to develop the field;
4) Engages its members in an active operation;
5) Organises sports and recreational events for the members;
6) To the possible extent, involves its members in the events in relation to environment protection and preservation;
7) Purchases and maintains the required movable and immovable property;
8) Cooperates with other institutions and organisations;
9) Facilitates mutual solving of problems by the Association's members, protection of their honour, and establishes an Association's court of honour and arbitration;
10) Awards and provides a bonus to the members that are professionally and socially most active, prepares proposals for Government awards;
11) Performs an economic activity;

12) Performs other activities as allowed by laws and the articles of association.[49]

3.3. Financial Institution ALTUM

In implementation of state support programs, ALTUM uses financing of Latvian and EU funds. ALTUM was established on 27 December 2013 as AS "Attīstības finanšu institūcija" (AFI) based on a decision of the Cabinet of Ministers of the Republic of Latvia. AS "Attīstības finanšu institūcija Altum" (ALTUM) took over all rights and liabilities of VAS "Latvijas Attīstības finanšu institūcija ALTUM " (by 1 January 2014 — SJSC "Latvijas Hipotēku un zemes banka"), LLD "Latvijas Garantiju aģentūra", and SJSC "Lauku attīstības fonds", including the contractual liabilities arising from current contracts with customers and cooperation partners. All its voting shares belong to the Latvian state, with the shareholders being the Ministry of Finance (40%), Ministry of Economics (30%), and Ministry of Agriculture (30%).[50] Servicing of ALTUM customers is ensured in the entire territory of Latvia by 7 regional centres and 14 consultation offices.

To increase energy efficiency and use of smart energy management and renewable energy resources in multi-apartment residential buildings, according to the operational program "Growth and Employment", specific support objective 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", specific support objective measure 4.2.1.1, in spring, the functions of a project applicant, financing recipient, and implementer of the financial instruments were delegated to the company "ALTUM" (AS "Attīstības finanšu institūcija Altum").

An ALTUM loan can be attracted for renovation of multi-apartment residential houses if a bank loan is not available for the project implementation. ALTUM loan provisions:[51]

- Interest rate — 1.75% + a loan rate of the State Treasury;
- Term — up to 20 years;
- Amount — not exceeding the amount of the eligible costs of the project.

A community of apartment owners can apply for a loan by using their authorised person and submitting a written consent of the bank that have entered into a cooperation agreement with ALTUM.[52]

The aim of support program "Growth and Employment", sub-program 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", measure 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings", is to enhance the energy efficiency and use of smart energy management and renewable energy resources in MARBs, and apartment owners are the eventual beneficial parties.

Within the program, the supervisory indicators to be reached and their values are as follows:[53]

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[49] *AMALH.* (2020) [online]. Lnpaa.lv [Accessed on 7 January 2021]. Available: http://www.lnpaa.lv/en/

[50] *ALTUM History Board.* (2018) [online]. Altum.lv [Accessed on 7 January 2021]. Available: https://www.altum.lv/en/about-altum/history/

[51] *About ALTUM Loan.* (2018) [online]. Altum.lv [Accessed on 7 January 2021]. Available: https://www.altum.lv/lv/pakalpojumi/energoefektivitate/programmas-atbalsts-altum-aizdevums/par-aizdevumu/

[52] *About ALTUM Loan.* (2018) [online]. Altum.lv [Accessed on 7 January 2021]. Available: https://www.altum.lv/lv/pakalpojumi/energoefektivitate/programmas-atbalsts-altum-aizdevums/par-aizdevumu/

[53] *Provisions for implementation of the operational program "Growth and Employment", specific support objective 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", specific support objective measure 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings", Cabinet Regulation No. 160, Riga, 15.03.2016. (minutes No. 13, 37 §)* (2016) [online]. Likumi.lv [Accessed on 7 January 2021]. Available:

- By 31 December 2023 — 14,286 households with an increased classification of energy consumption;
- The average thermal energy consumption to heat MARBs after the implementation of the measures for increasing the energy efficiency for a calendar year does not exceed 90 kWh/m2;
- The additional power generated from renewable energy resources — 2.74 MW;
- The estimated annual reduction of GHG emissions — 12,582 CO2 equivalent tons;
- At least 115 loans issued by "Altum" to implement the measures of increasing energy efficiency of the buildings;
- At least 450 guarantees issued by "Altum" to attract funding from other financiers to implement the measures of increasing energy efficiency of the buildings;
- 70 contracts, concluded by 31 December 2018, on implementation of the measures of increasing energy efficiency;
- Outcome indicator: by 31 December 2023, the average thermal energy consumption to heat the buildings is 120 kWh/m2 per year;
- Financial indicator: by 31 December 208, certified expenditure in the amount of 39,705,882 EUR.

The Ministry of Economics is the institution responsible for implementation of this measure. In implementation of the project "Altum", the company ALTUM performs a delegated public administration task. ALTUM performs the delegated public administration task under a functional supervision of the Ministry of Economics.

Apartment owners through their authorised person may apply for support within the program "Growth and Employment", specific support objective 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings", if all of the following requirements are met:[54]

- One apartment owner owns a maximum of 20% of the total number of apartment properties (in a divided MARB) or 20% of the undivided share of a joint property (in an undivided MARB); this restriction does not apply to the apartments owned by the state or local government;
- The planned consumption of thermal energy for a MARB after implementing the energy efficiency increasing measures, based on the estimates in a building's energy certificate or construction work foreseen in technical documentation of the energy efficiency increasing measures, does not exceed 90 kWh/m² per year.

A funding within the "ALTUM" project is granted to support the implementation of the energy efficiency increasing measures of MARBs in the form of grants. The "ALTUM" funding can be granted to support implementation of management and advisory aid:[55]

https://likumi.lv/ta/id/281323-darbibas-programmas-izaugsme-un-nodarbinatiba-4-2-1-specifiska-atbalsta-merka-veicinat-energoefektivitates-paaugstinasanu

[54] *Provisions for implementation of the operational program "Growth and Employment", specific support objective 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", specific support objective measure 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings", Cabinet Regulation No. 160, Riga, 15.03.2016. (minutes No. 13, 37 §)* (2016) [online]. Likumi. lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/281323-darbibas-programmas-izaugsme-un-nodarbinatiba-4-2-1-specifiska-atbalsta-merka-veicinat-energoefektivitates-paaugstinasanu

[55] *Provisions for implementation of the operational program "Growth and Employment", specific support objective 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", specific support objective measure 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings", Cabinet Regulation No. 160, Riga, 15.03.2016. (minutes No. 13, 37 §)* (2016) [online]. Likumi. lv [Accessed on 7 January 2021]. Available:

- Provision of consultations to apartment owners through their authorised person;
- Evaluation of technical documents of the energy efficiency increasing measures;
- Provision of information to the society;
- Acquisition and accumulation of data and information, and acquisition and keeping of documentation;
- Acceptance of grant applications, their assessment and assignment, issue, accounting, as well as supervision of the granted aid and implementation of the activities in relation to administration of the grants.

ALTUM financial instrument may cover the following expenditure items as defined in Cabinet Regulation No. 160 "Provisions for Implementation of the Operational Program "Growth and Employment", Specific Support Objective 4.2.1 "Promotion of Energy Efficiency in State Buildings and Residential Buildings", Specific Support Objective Measure 4.2.1.1 "Promotion of Energy Efficiency in Residential Buildings"":

- ALTUM grants, issued for implementation of the energy efficiency increasing measures of MARBs according to the Regulations;
- project management costs, including for remuneration of the project management personnel not exceeding 56,580 EUR per year. Personnel engagement in the project is to be ensured according to a full-time or part-time eligibility; eligible load is at least 30%;
- Remuneration costs to the project implementation staff. Personnel engagement in the project is to be ensured according to a full-time or part-time eligibility; eligible load is at least 30%;
- Personnel costs, including the mandatory duty fulfilment costs and health insurance costs of the employers foreseen in laws and regulations and joint agreement of the company "Altum";
- Service (company contract) costs;
- Training costs and costs of business visits and business trips;
- Transport, its operation and service costs, including a fee for an examination, preparation and reservation of a leasing (operating lease), as well as interest payment;
- Archive costs;
- Work place equipment (office furniture and technical equipment, software and licenses) costs not exceeding 3000 EUR per a work place during the entire implementation of the project "Altum";
- A fee for receipt and storage of information from data bases;
- Recovery costs and costs in relation to organising and ensuring the recovery process;
- Costs of financial auditing;
- Costs of information and publicity activities and materials (information seminars, conferences, discussions, contests, etc.), printed and electronic informative materials (posters, booklets, brochures, info graphics, internet banners, environment banners, applications, etc.), audio visual materials (video and audio stories, interviews, etc.), creation and distribution of advertising, representation materials, PR activities (media relationship, communication on social platforms, work with influencers, educational games, etc.), SEO;

https://likumi.lv/ta/id/281323-darbibas-programmas-izaugsme-un-nodarbinatiba-4-2-1-specifiska-atbalsta-merka-veicinat-energoefektivitates-paaugstinasanu

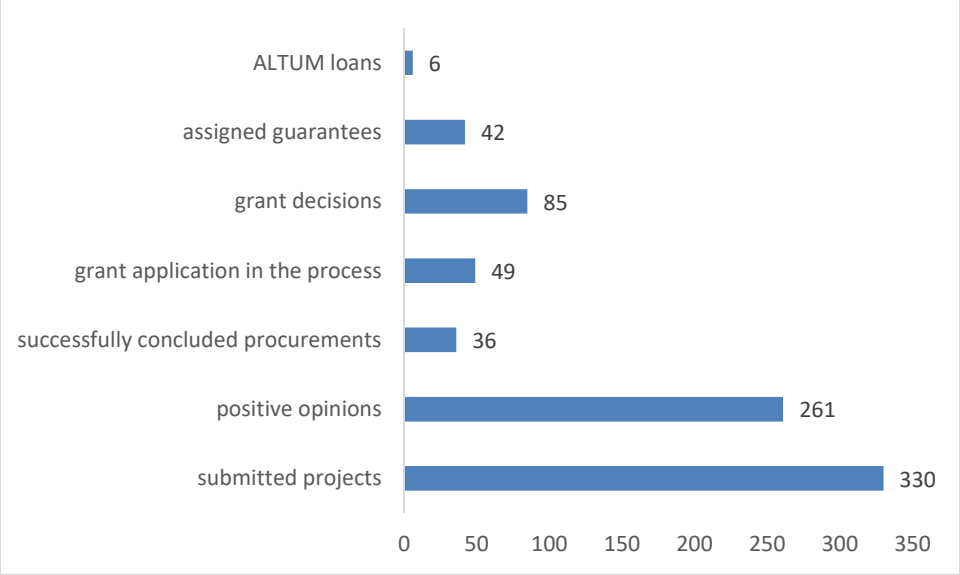
- Unexpected costs not exceeding a total of 5% of the costs for implementation of the supported activities as set for in Clause 20.2 of this Regulation;
- Costs of other goods required for the project implementation.

For a community of apartment owners to receive ALTUM support, the apartment owners must vote on the following decisions with 50% +1 vote:

- On an authorised person who is entitled to submit a support application for implementation of the energy efficiency increasing measures, as well as to take other activities in relation to increasing energy efficiency of the residential building, incl. to receipt of a loan and grant and organisation of payments (also for payments to the authorised person if the apartment owners decide so), and provision of cooperation with an energy efficiency service provider (if applicable);
- On the costs of the residential building's energy efficiency increasing measures — construction works and related services — according to offers of the providers;
- On renovation or reconstruction of the MARB;
- On the costs of managers of the energy efficiency increasing measures;
- On provisions of paying the funding set by an other financier (if applicable);
- On an energy efficiency service provider and its provisions for financing of the implementation of the energy efficiency increasing measures and development of technical documentation, and provider selection (if applicable).

To cover the above costs, the apartment owners through their authorised person may receive a grant or loan from ALTUM or a guarantee for receipt of a funding from another financier.[56]

A summary of the ALTUM support financing issued by now is indicated in Figure 3.2.



[56] Beikmanis, Ģ. (2013) *Siltinām (Let's Insulate)* [online]. Ministry of Economics of the RoL [Accessed on 2 December 2020]. Available: - *http://www.slideshare.net/siltinam/*

Figure 3.2 Information on implementation of ERDF program "Promotion of Energy Efficiency in Residential Buildings"[57]

To ensure both requirements of laws and regulations and corresponding comfort in apartments, insulation activities are needed for the greatest part of the MARBs since thermotechnical development norms of the buildings that have been constructed during the Soviet time are formed with an aim of reaching higher immediate economy of the assets for construction, thus achieving lower costs of thermal energy.[58]

Renovation of MARBs is topical both from a point of view of thermal insulation and general depreciation. The solving of this issue is hindered by acquisition of a funding and its payment procedure that must be decided upon by a community of apartment owners.

The key factors that hinder renovation of the MARBs:[59]

- Sceptical attitude of population against jointly financed activities;
- Significant differences of solvency of the residents[60].

From 2009 to September 2019, a total of 235.27 million EUR has been invested in renovation of multi-apartment buildings, incl. the financing of EU structural funds in the amount of 106.45 million EUR, renovating 838 buildings and providing the average consumption of thermal energy for heating 95.61 kWh/m^2 per year.

Within the above period, 15 buildings owned, possessed, or used by public authorities were renovated for the total financing of 7.42 million EUR, incl. the financing of EU structural funds in the amount of 6.09 million EUR and state budget funding in the amount of 1.08 million EUR, thus ensuring the average consumption of thermal energy for heating 66 kWh/m^2 per year. And energy efficiency improvement measures were implemented in 12 manufacturing buildings for the total financing of 4.73 million EUR, incl. the financing of EU structural funds in the amount of 1.32 million EUR, and the consumption of thermal energy for heating after the project implementation fluctuates from 22.92 kWh/m^2 up to 161.34 kWh/m^2 per year providing the average consumption of thermal energy 96.72 kWh/m^2 per year.

[57] *Statistics of renovated buildings.* (2018) [online]. Ministry of Economics [Accessed on 16 December 2020]. Available: https://em.gov.lv/lv/es_fondi/dzivo_siltak/renoveto_eku_statistika/

[58] Geipele, I., Beikmanis, Ģ., Geipele, S., Stāmure, I.(2013). Energy Efficiency Measures in Latvia: Characteristics, Problems and Solutions. In: Abstracts of the Riga Technical University 54th International Scientific Conference. Section: Real Estate Economics and Construction Entrepreneurship, Latvia, Riga, 26–29 September, 2013. Rīga: Institute of the Civil Engineering and Real Estate Economics, pp. 15–15

[59] On State Support Program to Enhance Renovation of Multi-Apartment Residential Houses for 2007–2010. (2007) [online]. Cabinet Order No. 305 in Riga, 25 May 2007. *Latvijas Vēstnesis*, Likumi.lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/157804-par-daudzdzivoklu-dzivojamo-maju-renovacijas-veicinasanas-valsts-atbalsta-programmu-2007-2010-gadam

[60] *Unemployment situation in the state, February 2015* (2015) [online]. Ministry of Welfare of the RoL. [Accessed on 16 December 2020] Available: *http://www.lm.gov.lv/upload/darba_tirgus/darba_tirgus/petijumi/2015_gada_feb.pdf*

4. ENERGY EFFICIENCY OF BUILDINGS AND IMPACT ON CLIMATE CHANGE

4.1. Climate Change in Latvia and Potential of Reduction thereof

During the last decades, the most rapid changes to climate parameters in the history of instrumental meteorological observations have been established. It is expected that temperature in the 21st century will grow faster than ever in case of all assessed scenarios of greenhouse gas (hereinafter — GHG) emissions. This will affect both the society in general and different fields and sectors of the economy.

The climate change, which is currently characterised by an increasing average air temperature, extremely high and low air temperature, increasing sea level, and more often cases of heavy rain, etc. in all regions of the world are directly related to impact made by men. Higher density of GHG emissions in atmosphere has caused the current climate change. Furthermore, if density of the GHG emissions continues growing, the global air temperature will continue rising and climate will change even more. This will create long-standing changes to all parts of the climate system and increase probability of a severe and permanent impact on people and ecosystems.

The member states of the United Nations (hereinafter — the UN) Framework Convention on Climate Change (hereinafter — the Convention), including Latvia, within the Paris agreement of the Convention have agreed to limit the global average temperature rising within 2°C, compared to the pre-industrial age and aim at limiting the temperature rising within 1.5°C since this will significantly reduce the risks and impact caused by climate change. The current actions for reduction of density of the GHG emissions in atmosphere and limiting the rising average air temperature in the world are not effective enough, and therefore, the world's average temperature is continuing to grow. Thus, the states must introduce the measures to improve their ability of adapting and strengthening resistance to climate change and its consequences, as well as to use the opportunities provided by the climate change.[61]

The climate parameter observations in the world have been performed for more than 100 years showing that the climate is changing. Both worldwide and in Latvia, the long period has allowed establishing changes to climate conditions that have been demonstrated by the changes to the average values of meteorological parameters and their extreme values. From 1961 to 2010, in Latvia similarly to other places in the world, an even rise of air temperature both in average and maximum and minimum values has been observed. The average air temperature values have increased by 0.7°C (1981–2010 compared to 1961–1990), while the minimum annual air temperature has increased by 1.9°C and the maximum annual air temperature in Latvia has increased by 0.7°C.

In the territory of Latvia, also the total amount of precipitation has increased. The number of days with heavy and very heavy precipitation has grown since 1961 by an average of two and one day respectively. It is expected that the amount of precipitation, as well as the days with heavy and very heavy rain will continue increasing. By the end of the 21st century, the total amount of precipitation is expected to increase by 10 to 21% (approximately 80–100 mm). At a seasonal breakdown, the largest rise in precipitation is predicted in winters and springs.

[61] *On Latvian adaptation to climate change plan for the period until 2030.* (2019) [online]. Cabinet Order No. 380 in Riga , 17 July 2019. *Latvijas Vēstnesis*, Likumi.lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/308330-par-latvijas-pielagosanas-klimata-parmainam-planu-laika-posmam-lidz-2030-gadam

An analysis of the current climate conditions and future scenarios of climate change clearly show that the tendencies of climate change will continue through this century. Furthermore, the most significant changes will be related to extreme values of the climate parameters; in future, we will face atypical for Latvia and extreme weather more often. The changes to the climate parameters and indices affect not only the capital of nature (species, habitats, ecosystems) but also health, wellness, safety, and economic activities of people. The most important risks identified for Latvia: seasonal changes, including the changes of a vegetation period; fire; pest and pathogen breeding, tree diseases, elimination of domestic species, entry of new species; spread of diseases of the respiratory system; infectious diseases, sun strokes; flooding caused by precipitation, wind surges; malfunction of electricity supply; increasing run-off, hydropower fluctuations; reduction of freeze, black frost, drying; eutrophication; damage to infrastructure, overheating of equipment; reduction of water run-off during summers.

To limit the climate change, various action policies — international, EU, and national — include the objectives and measures for reduction of the GHG emissions. The reduction of the GHG emissions allows diminishing the climate change and its negative impact in a longer term. More extensive and timely implementation of the GHG emission reduction measures leads to a smaller negative impact of the climate change that the states need to adapt to.[62]

It is suggested using a Tobin tax as a tool for obtaining funds in order to finance activities, which could promote the transition to climate-neutral economy.[63]

Considerable reduction of the GHG emissions can be obtained in several sectors of the economy. One of the recent studies shows that circular economy car sharing strategy applied to the European Union countries (excluding Bulgaria, Cyprus, and Malta) has a potential to cut emissions by 358.6 $MtCO_2$ eq. and save 7.64 billion EUR annually. [64] A promising concept which can have a positive impact on mitigation of climate change is circular economy, which contains such characteristic elements as '4R+7R' (reduce, reuse, recycle, remanufacture (4R); refuse, refill, repeat, repair, remediate, reclaim, return (7R)) principle, waste, closed-loops, design, business models, systems thinking, life cycle thinking, resource efficiency, consumption, value preservation, sharing, renewable energy, behaviour and industrial symbiosis.[65] One of the key elements of the circular economy is consumption and its reduction that is indicated also in the sustainable development concept.[66] The consumption includes a resource (incl. energy resources) consumption to ensure the functioning of the modern economic system at micro-, mezzo-, and macro levels.

A rapid development of studies related to environmental issues is witnessed in recent years due to the substantial environmental burdens associated with the building industry. Main impacts

[62] *On Latvian adaptation to climate change plan for the period until 2030.* (2019) [online]. Cabinet Order No. 380 in Riga , 17 July 2019. *Latvijas Vēstnesis*, Likumi.lv [Accessed on 7 January 2021]. Available: https://likumi.lv/ta/id/308330-par-latvijas-pielagosanas-klimata-parmainam-planu-laika-posmam-lidz-2030-gadam

[63] Zvirgzdiņš, J., Plotka, K., Geipele, S. Eco-Economics in Cities and Rural Areas. *Baltic Journal of Real Estate Economics and Construction Management*. Vol.6, 2018, pp. 88–99. e-ISSN 2255-9671. Available from: doi:10.2478/bjreecm-2018-0007

[64] Zvirgzdins, J., Plotka, K., & Geipele, I. (2020). *The Usage of Circular Economy Strategies to Mitigate the Impacts of Climate Change in Northern Europe. In Climate Change, Hazards and Adaptation Options* (pp. 853–873). Springer, Cham.

[65] Zvirgzdiņš, J., Geipele, S. Breaking Down the Concept of Circular Economy: Qualitative Content Analysis. In: *17th RSEP International Economics & Social Sciences Conference*: Conference Proceedings, Spain, Madrid, 6 April, 2020. Ankara: BC Publishing House, 2020, pp.24-35. ISBN 978-605-06961-2-7.

[66] Zvirgzdiņš, J., Vanags, J. Sustainable Development System — Reality or Necessity. *Journal of Critical Reviews*, 2020, Vol. 7, No. 19, pp. 9815–9824. ISSN 2394-5125. Available from: doi:10.31838/jcr.07.19.1084

are linked to energy consumption patterns and carbon dioxide emissions. Buildings produce CO_2 emissions in two ways: 1) during their exploitation through heating etc. (approximately 35% of the total EU CO_2 emissions); 2) during the construction and manufacture of the building materials (approximately 5% of the total EU CO_2 emissions).[67]

Since the construction is responsible for a great share of CO_2 emissions, attention should be paid to energy consumption and diminishing thereof in the sector of buildings.

4.2. Energy Consumption in Buildings

The final consumption of energy resources in 2018 was 174.55 PJ, which is by 9.1% more than in 2016.

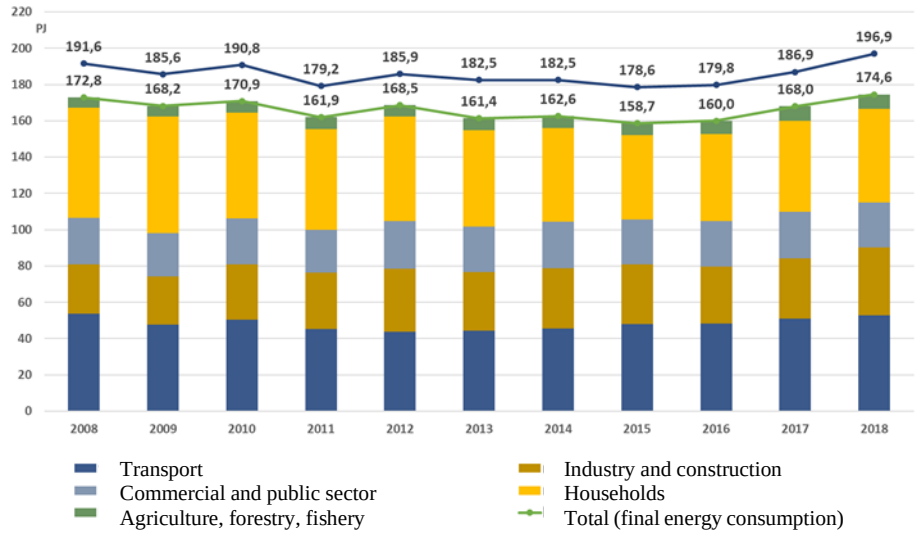


Figure 4.1 Dynamics of Final Consumption of Energy Resources[68]

Transport (31%), households (28.8%), and industry (22.8%) were the largest consumers of energy resources in 2018. Compares to 2017, in 2018, the final consumption of energy resources increased in transport (+3.3%), industry (+13.3%), and households (+2.9%), while consumption of energy resources decreased in agriculture and forestry (-3.6%) and commercial and public sector (-2.7%).

The structure of consumption of energy resources in households in last years is not significantly changing — wood fuel is mainly used. Compared to 2017, consumption of natural gas in households has considerably increased (+9.3%), while coal consumption has decreased (-32.7%).

[67] Zvirgzdiņš, J., Plotka, K., Geipele, S. Circular Economy in Built Environment and Real Estate Industry. In: *The 13th International Conference "Modern Building Materials, Structures and Techniques MBMST 2019*": Selected Papers, Lithuania, Vilnius, 16-17 May, 2019. Vilnius: VGTU Press "Technika", 2019, pp.704–713. e-ISBN 978-609-476-197-3. e-ISSN 2029-9915. Available from: doi:10.3846/mbmst.2019.046

[68] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

In the sector of buildings (households), the consumed energy constitutes approximately 30% of all final consumption of the energy resources, thus the building sector includes high potential of reaching the overall energy efficiency objectives. Majority of the buildings has high consumption of energy resources and significantly lower thermotechnical features than those that could be ensured by the currently available technologies.

Most of these buildings will still be used for a considerable period of time, thus, their renovation by improving energy efficiency is topical. However, current depreciation of residential and non-residential buildings must be considered. According to the data provided by the State Land Service, the total depreciation for residential buildings is 38.9% and for non-residential buildings — 41%.[69]

4.3. Current Situation of Energy Efficiency of Buildings

Timely and optimal building maintenance challenges are faced by the state, local governments, and population. Along with building obsolescence and comparatively weak technical condition, also energy efficiency of the available housing is diminishing. According to estimates of the Ministry of Economics, currently more than 23,000 buildings (in the sector of multi-apartment buildings) need to be renovated, however, it is predicted that the currently available financing of the EU funds within the planning period will allow renovating approximately 1700 MARBs.

EU funds, as well as assets from the state budget are mainly used for building renovation in Latvia. Taking into account the required reaching of the set energy efficiency and climate objectives, involvement of the private sector (more active involvement of investors, commercial banks, provision of favourable loans, creation of corresponding financial instruments, development of ESCO services) should be enhanced.

Age of residential and non-residential buildings can be divided in periods according to their thermotechnical features. A description of different construction periods is summarised in Table 4-1[70].

Table 4-1. Construction period and thermotechnical description

Construction period	Thermotechnical description
By 1940	Pre-war construction, mainly from wood in rural territories, brick wall buildings in cities and towns. The majority of buildings has one or two storeys.
1941 –1960	Post-war construction, good quality, buildings are mainly made of bricks, the residential sector is characterised by a typical Stalinist projects — built brick buildings.
1961 –1979	Extensive construction of standardised buildings, launch of constructing the residential buildings of series 316 and 318 (so-called "Khrushchyovka"), 464, also 467, 103, and 104 was launched, and at the end of the period — series 602. For external walls, clay bricks, aerated concrete, and expanded clay concrete were widely used.

[69] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

[70] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

Construction period	Thermotechnical description
1980 –1991	New development requirements stipulated in construction standard of the USSR "Thermotechnics of Building Envelopes"[71] Construction of series 119 was started, and also a range of special projects were implemented; construction of large-panel buildings of reinforced concrete and expanded clay concrete were started.
1992 –2002.	Construction of standardised buildings were practically terminated. Order No. 68 of Ministry of Architecture and Construction of the Republic of Latvia, dated 12 September 1991, significantly increased requirements for building envelopes.
2003 –2014	LNB 002-01 Thermotechnics of Building Envelopes enters into force, and its determines the thermotechnical requirements for building envelopes. During this period, buildings with large glass surfaces are being built and they usually do not correspond to the LBN requirements. However, in the sector of residential buildings, the use of glass surfaces in architecture is not a characteristic feature.
From 2015	LBN 002-15 (amendments LBN 002-01) enters into force. Amendments stipulate stricter thermotechnical requirements for building envelopes. On 11 November 2015, Cabinet Regulation No. 383 of 9 July 2013 "Regulations Regarding Energy Certification of Buildings" is amended stipulating the minimum allowed level for heating of a new building or a building to be reconstructed or renovated, as well as stipulating requirements for a gradual transition to nearly zero-energy buildings.
From 2019	From 2019, all new buildings that are a property of the state or local governments must be nearly zero-energy buildings; the same refers to all new buildings from 2021.

Starting from 2014, according to Cabinet Regulation No. 383 of 9 July 2013 "Regulations Regarding Energy Certification of Buildings", Paragraph 16, the Ministry of Economics (from 2017 — State Construction Control Bureau) once in a year by 1 March provides definition of heating consumption of statistically determined average energy efficiency indicators (see Figure 4.2) and publishing thereof on a website for at least the following types of buildings:

- For multi-apartment buildings;
- For office buildings;
- For buildings of educational institutions.

[71] "СНиП II-3-79 Строительная теплотехника" (construction thermotechnics), СНиП II-3-79 2. Теплоустойчивость ограждающих конструкций (Part 2 — Thermotechnics of Building Envelopes).

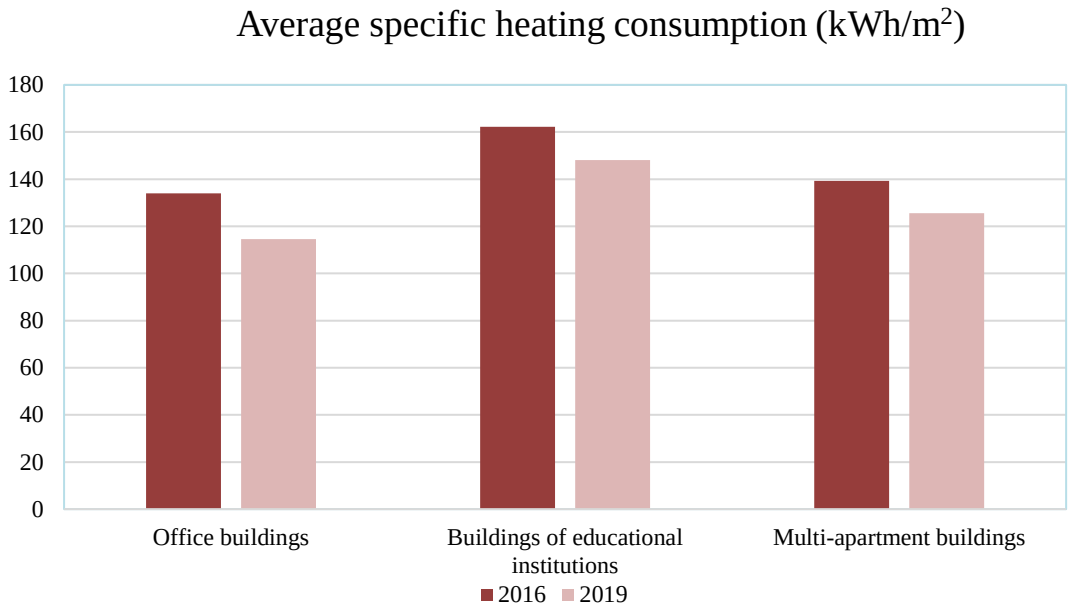


Figure 4.2 Heating Consumption in Buildings[72]

The figure 4.2. allows establishing that, compared to 2016, the average specific heating consumption has declined. For instance, the reduction in multi-apartment buildings from 2016 is 13.8 kWh/m^2. The average energy consumption for heating for buildings of all types is 138–139 kWh/m^2 per year: various types of one-dwelling buildings — 139 kWh/m^2 per year; multi-apartment buildings — 137 kWh/m^2 per year; office buildings — 145 kWh/m^2 per year; buildings of educational institutions — 147 kWh/m^2 per year; buildings of medical institutions — 154 kWh/m^2 per year; hotel and restaurant buildings — 116 kWh/m^2 per year; sports buildings — 132 kWh/m^2 per year; wholesale and retail sale buildings — 102 kWh/m^2 per year; other building types — 185 kWh/m^2 per year.

These summarised data are used in energy certificates of the buildings as reference indicators. As a result, building owners, recipients of the energy certificate can evaluate not only a building's assessment, but also differences of the particular building against the average building consumption in the state.

Since 2016, there is a Construction Information System introduced in Latvia with two new registers: a register of energy certificates of buildings and a register of independent experts that can store statistical data on assessment of energy efficiency of the buildings.

[72] *Informative report "Long-term Strategy for Building Renovation"*. (2020) [online]. Ministry of Economics of Republic of Latvia [Accessed 2 December 2020]. Available: http://tap.mk.gov.lv/mk/tap/?pid=40487380

4.4. Energy Efficiency Requirements

In the table below, there are energy consumption amounts calculated according to definitions provided for in Directive 2012/27/EU (and Directive 2018/2002)[73]:

- primary energy consumption — gross inland consumption of energy resources, excluding non-energy uses;
- final energy consumption — all energy supplied to industry, transport, households, services and agriculture, excluding deliveries to the energy transformation sector and the energy industries themselves;
- energy savings — an amount of saved energy determined by measuring and/or estimating consumption before and after implementation of an energy efficiency improvement measure, whilst ensuring normalisation for external conditions that affect energy consumption.

Table4-2 Objectives of Latvian energy efficiency improvement policy and their performance indicators[74]

Energy efficiency policy result	Actual value[75]	Target value	
	2017	2020	2030
Non-mandatory objective — primary energy consumption			
PJ	187.41	*225*	*165–170*
GWh	52,056.9	*62,500*	*45,833–47,222*
ktoe	4331	*5374.03*	*3940.96–4060.38*
Non-mandatory objective — final energy consumption			
PJ	168.01	*187*	*145–149*
GWh	46,668.06	*51,944.44*	*40,277.8–41,388.9*
ktoe	4012.73	*4466.4*	*3463.27–3558.8*
State mandatory objective — cumulative final energy consumption savings[76]			
PJ	18.8	*35.6*	***73.7***
GWh	5227.0	*9898.89*	***20,472.02***
ktoe	449.44	*850.9*	***1760.28***

Currently, according to Directive 2012/27/EU, the objective for Latvia in 2020 is annual objective of renovating 3% of area of the central government buildings, and Latvia offers continuing this objective also by 2030. Latvia has not yet calculated the maximum forecast for the total area of the renovated buildings.

By 2030, Latvia offers ensuring a reduced average specific thermal energy consumption for heating by 120 kWh/m^2 per year.

[73] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

[74] The regular font indicates the current objectives that have been determined in binding EU laws, other Latvian policy planning documents or laws and regulations, while italic font shows the indicative objectives to be defined in the plan and bold font shows the binding objectives to be defined in the plan

[75] ENG020. Energy balance, TJ, thsd toe, Available at: http://data1.csb.gov.lv/pxweb/en/vide/vide__energetika__ikgad/ENG020.px/

[76] Calculated based on EUROSTAT Gross available energy by product, Available at: https://ec.europa.eu/eurostat/databrowser/view/ten00121/default/table?lang=en

Table4-3 Objectives of energy efficiency policy for Latvian buildings and their performance indicators[77]

Policy result as for energy efficiency of buildings	Actual value	Target value[78]	
	2017	2020	2030
Each year, 3% of the area of direct administration buildings are renovated (the total renovated area, m^2)	398,707[79]	678,460[80]	**500,000**[81]
Specific thermal energy consumption for heating in the buildings (kwh/m^2)	-	150	*120*

In Latvia, for a part of the buildings and structural elements, the minimum energy efficiency requirements were increased already in 2014. From 1 January 2020, changes and clarifications to the construction standard entered into force, and they are oriented towards quality improvement and thus also to improvement of structurally physical elements of a building.

[77] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

[78] The regular font indicates the current objectives that have been determined in binding EU laws, other Latvian policy planning documents or laws and regulations, while italic font shows the indicative objectives to be defined in the plan and bold font shows the binding objectives to be defined in the plan

[79] *Report on progress towards the national energy efficiency target 2020 for 2017 in accordance with the requirements of Article 24 (1) and Part 1 of Annex XIV of Directive 2012/27 / EU.* (2018) [online]. Ec.europa.eu [Accessed on 7 January 2021]. Available:https://ec.europa.eu/energy/sites/ener/files/documents/lv_annual_report_2019_lv.zip

[80] Maximum forecast for 2014 to 2020, since the objective changes every year. The total objective by the end of 2017 was 392,010 m^2.

[81] Maximum forecast for 2020 to 2030.

Table 4-4 The minimum allowed level of energy efficiency for new buildings and renovation and reconstruction of buildings[82]

Acceptance period of construction intention documentation of a building	for residential buildings		for non-residential buildings[83]	
	multi-apartment buildings	one-apartment or two-apartment buildings	buildings owned or possessed by the state or local government where institutions of the state or local government are located	other non-residential buildings
The minimum allowed level of energy efficiency for new buildings[84]				
By 31 December 2016	≤70 kWh/m^2 per year	≤80 kWh/m^2 per year	≤100 kWh/m^2 per year	≤100 kWh/m^2 per year
From 1 January 2017 to 31 December 2017	≤60 kWh/m^2 per year	≤70 kWh/m^2 per year	≤90 kWh/m^2 per year	≤90 kWh/m^2 per year
From 1 January 2018 to 31 December 2018	≤60 kWh/m^2 per year	≤70 kWh/m^2 per year	≤65 kWh/m^2 per year	≤90 kWh/m^2 per year
From 1 January 2019 to 31 December 2019	≤50 kWh/m^2 per year	≤60 kWh/m^2 per year	nearly-zero energy building	≤65 kWh/m^2 per year
From 1 January 2021	nearly-zero energy building	nearly-zero energy building	nearly-zero energy building	nearly-zero energy building
The minimum allowed level of energy efficiency for renovation and reconstruction of buildings[85]				
From 21 November 2015 to 31 December 2020	≤90 kWh/m^2 per year	≤100 kWh/m^2 per year	≤110 kWh/m^2 per year	≤110 kWh/m^2 per year
From 1 January 2021	≤80 kWh/m^2 per year	≤90 kWh/m^2 per year	≤90 kWh/m^2 per year	≤100 kWh/m^2 per year

The construction standard defines a procedure of energy efficiency development for elements of external building envelopes and their connections for new buildings and buildings that are to be reconstructed or renovated, as well as a procedure for new heated premises in the current buildings where the temperature of 8°C and higher is maintained during the heating season. To avoid restricting various structural solutions and architecture forms or wishes of a construction intention initiator in building reconstruction, the regulatory heat permeability values have been deleted from the current construction standard. It is important to reach the set kWh/m^2 heating consumption values and maximum allowed U values. The maximum allowed U values in the regulation have been indicated with an aim of restricting construction of very weak and unsafe

[82] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

[83] Cabinet Regulation No. 383 of 9 July 2013 "Regulations Regarding Energy Certification of Buildings" (types of buildings indicated in Sub-Paragraphs 6.1.3., 6.1.4., 6.1.5., 6.1.6., 6.1.7., 6.1.8., and 6.1.9.)

[84] The minimum allowed level of energy efficiency of buildings, an energy efficiency assessment for heating of new buildings. The minimum allowed level (a class) of energy efficiency of buildings for new buildings is not applied if such application is technically or functionally impossible or if a cost-benefit analysis of the relevant service life of the building indicates losses.

[85] The minimum allowed level of energy efficiency of buildings, an energy efficiency assessment for heating of the buildings that are to be renovated or reconstructed.

structures as for the thermotechnics that may lead to various types of problems during operation. As for the maximum values, the use of k ratio is not as critical as it was, since kWh/m^2 is defined and the maximum U values are just for keeping a certain safety of the structures. The allowed U value for windows and balcony doors is reduced.

Stricter requirements are determined for the minimum allowed level of energy efficiency of buildings, an assessment of energy efficiency for heating in terms of renovation and reconstruction from 2021, since:

1) Directive 2010/31/EU foresees that the state facilitates the process of renovation so that the buildings become nearly-zero energy buildings;

2) By 2050, building decarbonisation objectives should be reached;

3) The former reconstruction and renovation requirement of kWh/m^2 could be achieved much easier than H_{TR} (as for the buildings with the area of at least 1000 m^2 and achievable indicator up to 60 kWh/m^2 per year (the minimum allowed level of heating consumption)).

Thus, by attracting the field experts, it is necessary to assess efficacy of the indicators and their compliance with different types of buildings, and regulation of the construction standard should be improved, if required.

Table 4-5 The maximum allowed values of an element and linear thermal bridge heat permeability ratios URM W/(m^2 × K) and ψRM W/(m × K)[86]

Structure	Residential buildings, care homes, hospitals, and nurseries	Non-residential buildings	Manufacturing buildings
	U_{RM} value, W/(m^{2}K)	U_{RM} value, W/(m^{2}K)	U_{RM} value, W/(m^{2}K)
Floor:			
floors and walls in contact with ground	0.2	0.25	0.35
floor with an unheated basement or a floor with a ventilated space under the floor	0.3	0.35	0.40
External walls:			
external walls	0.23	0.25	0.30
walls in traditional log builds without building a thermal insulation layer in the wall	0.65	0.65	0.65
Roofs and ceilings in contact with outdoor air	0.20	0.23	0.25
External doors and gates	1.80	2.00	2.20
Windows and balcony doors	1.10	1.10	1.30
Thermal bridges, ψ_{RM}	0.20	0.20	0.35

[86] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

4.5. Building Renovation Objectives

Objectives of a long-term strategy of building renovation in Latvia:

- Renovation of the current available housing;
- Construction of new available housing by attracting private investment;
- An appropriate housing for every inhabitant;
- Improvement of energy efficiency by moving towards climate-neutral buildings.

The preferential situation in 2030:

- The buildings' average thermal energy consumption for heating is by >30% less than in 2020;
- At least 2000 MARBs and at least 5000 private houses are renovated, non-emission AER technologies are installed therein, or they are connected to DH;
- Increasing energy efficiency of the buildings owned by the state and local governments are ensured;
- A complex long-term solution of increasing energy efficiency of available housing is being elaborated and implemented.

Benefits for the society and economy:

- Smaller consumption of energy resources in the buildings provides smaller utility bills, thus improving the solvency of inhabitants;
- Renovation and reconstruction of buildings allow improving the building environment, increasing the life of the buildings, enhancing a comfort level of the buildings, and increasing the real estate value;
- Renovation and reconstruction of buildings provide new work places in the construction sector thus increasing revenue of the state budget, as well as promoting innovation and technology development.

It should be considered that NDP2027 plans to improve energy efficiency in 40,000 apartment properties, i.e., approximately 800 multi-apartment buildings (provided that an apartment property covers an average of 50 sq.m.). Thus, a total of 2 million sq.m. would be renovated. The above plan includes 10,000 new apartment properties to be built by 2027.

To reach the aim — to renovate 30% of the multi-apartment buildings by 2030 — a total of 8100 multi-apartment buildings should be renovated. If considering potentially interested building owners who are ready to implement energy efficiency measures, 4860 multi-apartment buildings should be renovated to reach the aim. Thus, 4860 multi-apartment buildings are defined as the primary objective.

4.6. Issues of Renovating and Increasing Energy Efficiency of Residential Buildings

Issues of managing and administering the MARBs are a complex problem related to residents and owners of the MARBs, certain regions, as well as general interest of the state.

The Main Issues [87]

1) Deprecated buildings with a particularly low energy efficiency level

A majority of non-renovated buildings according to the building classification requirements currently achieves the requirements set for Class E and Class F, thus their gradual renovation by improving energy efficiency is topical. ~10% of all residential buildings have been built after 2003, while only 3% of the total multi-apartment buildings have been built after 2003 when the new construction standard requirements as for the building envelopes entered into force, i.e., Construction Standard 002-001 "Thermotechnics of Building Envelopes" defining significantly higher thermotechnical requirements for the building envelopes. Thus, all buildings that are built after 2003, must correspond to high thermotechnical requirements.

Within the energy efficiency increasing measures, not only issues of implementing the current building renovation/insulation should be considered, but also construction of new residential buildings and their compliance with the high energy efficiency requirements should be ensured. Also, by considering the size of the Latvian economy and population, already now it is difficult to ensure the required capacity of the construction sector and ensure that the costs are not continuously increasing.

2) Inactive interest of the society to implement the energy efficiency increasing measures

Unfortunately, the interest of the society to engage in energy efficiency increasing measures and ensure insulation or complex renovation of their property is low, albeit being considerably promoted, for instance within the campaign "Let's Live Warmer". Often, residents do not want to involve due to bureaucratic and administrative burden — to receive financing of the EU structural funds, a large amount of documentation should be prepared, and many people need to be engaged. Also, consent of a majority of the building residents must be obtained and meetings, educational and explanatory events must be organised. Therefore, in many cases, implementation of the energy efficiency measures is terminated due to low interest, unawareness, and unwillingness of the residents to engage.

Unwillingness of the residents to engage in energy efficiency measures is related to their low solvency, high utility, incl. for thermal energy, payment debts, long period of paying for the energy efficiency measures, high financing interest rates — which significantly lowers cost effectiveness of the energy efficiency measures.

3) Insufficient attraction of private investment and obstacles to promote ESCO/LGESCO

Although after 2021 work on the state support program in industry will be improved and implemented, to achieve the adopted energy efficiency objectives for the state, also private investment in introduction of energy efficiency solutions both in processing industry and other sectors is needed.

An obstacle for promotion of ESCO (LGESCO) and implementation of ESCO (LGESCO) projects in the private sector — provisions for recording long-term credit obligations (also those undertaken within an energy efficiency contract), since obligations of local governments, incl.

[87] Latvia's National Energy and Climate Plan 2021-2030, Available from: https://ec.europa.eu/energy/sites/ener/files/documents/lv_final_necp_main_en.pdf

those undertaken within an energy efficiency contract, are recorded in a balance sheet of the local government affecting the budgetary and fiscal area of the state. If an institutional unit in the sector of general government concludes an energy efficiency contract without complying with the ECS statistical accounting provisions, such contract affects both the budget balance of the general government where the capital investment of a private partner is registered as expenditure of the general government budget and the debt of the general government sector. It should also be considered that energy efficiency projects and their contracts must be developed according to the ECS provisions and be fiscally neutral. The public sector has no experience in preparing and implementing ESCO procurements and has no access to guidelines for elaboration and arrangement of procurements of the ESCO projects. For companies in Latvia to develop a commercial activity of ESCO and offer energy efficiency services to the building sector, it is important to have long-term financial resources (for at least 20 years), incl. a mechanism to repurchase the ESCO money flow. Provisions of the attracted financing to the ESCOs should foresee loan-related costs, since owners of the buildings pay a fixed rate for the service throughout the validity of the contract undertaking only the EURIBOR index fluctuations. It should also be indicated that refinancing of the obligations of ESCOs is an issue for ESCO development in the field of a greater availability of energy efficiency increasing for multi-apartment houses.

The Main Activities and Measures

1) Promotion of reduced consumption of energy resources in the state buildings, residential buildings, buildings of local governments, and public buildings, as well as in manufacturing buildings

According to requirements of Directive 2012/27/EU, Article 5, paragraph 1, a member state is obliged to renovate 3% of the total area of direct administration buildings each year. The plan foresees that after 2021, the current program of energy efficiency increasing will be continued since support to the energy efficiency measures for multi-apartment buildings is being successfully provided from 2009 already. The plan also foresees attracting private investment to energy efficiency increasing projects (a well-developed ESCO market) that will allow growing the available financing for building renovation. It is important to support the energy efficiency measures also in the sector of local government buildings, and the plan foresees implementation of renovation or reconstruction of the current buildings also after 2021 within the public funding, incl. renovation of individual or local heat supply systems and purchase and installation of the equipment that generate thermal energy and electric power by using RER (renewable energy resources).

The plan does not foresee that the energy efficiency measures in the buildings must take place mandatory, thus the owners of the buildings or parts thereof should voluntarily agree and decide on the measures and undertake financial obligations (if applicable) for their implementation.

The plan foresees also further implementation of energy efficiency increasing measures and promotion activities of using RER in industry and companies by expecting modernisation of the industrial manufacturing capacity, installing better energy efficient manufacturing equipment and equipment for additional processes in manufacturing, as well as improving the manufacturing buildings and territories, incl. by replacement of internal and external engineering networks and engineering systems with more energy efficient solutions.

2) Provision of implementation of the energy efficiency increasing measures in private houses or in groups of several numbers of buildings

By now, the state has provided minimum support to private houses and individual groups of buildings. However, since private houses in Latvia are much less effective than multi-apartment residential buildings, after 2021, it is required to provide support also to the energy efficiency increasing measures, at the same time offering a certain mandatory provision of installing non-emission RER technologies in these buildings using the implementation of the energy efficiency increasing measures. Since the above measures are implemented by private persons, the support application procedure should be as simple as possible with an option of applying on a website and on a first-come first-served basis by providing cost approving documents, unless otherwise specified in Latvian laws and regulations. The potential support recipients should also have an option to use energy advisers of a local government or one-stop shops of RER to receive administrative help. Also, co-payment diversification provisions should be developed considering the property where the measures are implemented, values, and resident solvency, as well as the air quality in the territory as for a replacement of heating equipment.

3) Provision of long-term solutions for reduction of energy consumption in available housing in Latvia and attraction of the required additional investment

The plan foresees establishment of long-term solutions for the available housing with a certain objective by 2050. The plan includes relevant studies and development of a complex long-term solution for energy efficiency increasing of the available housing, and in 2023 the plan would be supplemented/updated with the found solution.

Considering that the public sector has no experience in development and implementation of ESCO procurements, it is required to elaborate guidelines for ESCO project development and organisation of procurements. Also, publicly available guidelines for making energy efficiency service contracts and organisation of the procurements are expected to be developed. It is also planned to develop a fiscally neutral sample contract (on impact of the developed draft contract on the debt and budget balance of the general government in consultation with EUROSTAT by receiving an approval that the draft contract is to be registered in a balance sheet of the private partner), which ensures that the private investment in ESCO projects is not registered as a public debt. At the same time, it is required to ensure that local governments and public authorities can undertake long-term obligations (up to 20 years) in case of implementing the ESCO project. However, to establish practical experience with ESCO projects in the public sector and raise awareness on usefulness of the relevant projects, both public and private investment should be combined. ALTUM will continue developing financial instruments to fund the energy efficiency projects, including a loan program for companies. It is foreseen to develop the ESCO market by eliminating its shortcomings, since commercial banks do not offer long-term financing on long-term provisions to the energy efficiency service providers. ESCO markets could also be developed by providing an opportunity of implementing the energy efficiency improvement projects directly with the ESCOs.

5. SURVEY OF CURRENT AND FUTURE HOUSING MANAGERS FOR IDENTIFYING THE REQUIRED SKILLS AND COMPETENCIES

There is a lack of specialists correspondingly educated in building management, therefore, it is necessary to raise knowledge and skills of property managers in the fields of energy efficiency and climate.

In order to solicit the opinions of present and potential specialists in the field, a survey has been conducted on what skills in the areas of increasing energy efficiency and mitigating climate change are required for Housing Managers/Climate Managers.

The survey focuses on the following aspects:

- experience and plans of the respondents related to the implementation of measures for increasing energy efficiency of buildings;
- respondents' self-evaluation in regard to their competencies in the implementation of measures for increasing energy efficiency of buildings;
- respondents' thoughts on the complex approach to the implementation of measures for increasing energy efficiency of buildings that is connected to the interaction of various aspects of real estate management (technical, legal, financial, organisational, social, communicative, etc.);
- the necessity of certain skills and competencies in technical, legal, financial, organisational, social, communicative, and other aspects of planning and implementing measures for increasing energy efficiency of buildings.

5.1. The Contents of the Survey on the Skills Required for Increasing Energy Efficiency and Mitigating Climate Change

The required skills related to increasing energy efficiency of the buildings and climate change with an aim of increasing a share of renovated multi-apartment buildings and thus reducing an impact on the process of climate change.

Questions:

1. To what extent do you believe that in future you will have to implement measures for increasing energy efficiency of the buildings?
    i. Very likely
    ii. Likely
    iii. Unlikely
    iv. I don't know
2. Have you participated in implementation of the measures for increasing energy efficiency of the buildings?
    i. Yes, on a regular basis
    ii. Yes, a few times
    iii. Yes, once
    iv. No, never
3. How would you evaluate your competence/qualification in implementation of the following measures for increasing energy efficiency of the buildings:
    a. Development of a financial plan
    b. Selection of optimal technical solutions for energy efficiency

c. Solving of legal issues in relation to increasing energy efficiency of the buildings
d. Organisation and coordination of the measures for increasing energy efficiency
e. Promotion of the measures for increasing energy efficiency to residents of the buildings (holding of meetings, management, educational activities)
    i. High qualification
    ii. Sufficient qualification
    iii. Partial qualification
    iv. Insufficient qualification
    v. I don't know

4. To successfully implement the measures for increasing energy efficiency of the buildings, an interaction of various aspects (technical, legal, financial, organisational, social, information exchange) of the real estate management is required.
    i. Agree
    ii. Partially agree
    iii. Do not agree
    iv. I don't know
5. To successfully implement the measures for increasing energy efficiency of the buildings, the following technical knowledge and skills are required:
    a. Micro-climate of the buildings
    b. Structural physics of the building constructions (types of heat distribution and moisture processes)
    c. Energy-efficient enclosing structures of buildings
    d. Energy-efficient building engineering communications
    e. Energy-efficient construction materials
        i. Agree
        ii. Partially agree
        iii. Disagree
        iv. I don't know
6. To successfully implement the measures for increasing energy efficiency of the buildings, the following financial and economic knowledge is required:
    a. Investment in the measures for increasing energy efficiency
    b. Financial support instruments for the measures of energy efficiency
    c. Economic assessment of projects for increasing energy efficiency
    d. Key principles of service tariff formation
        i. Agree
        ii. Partially agree
        iii. Disagree
        iv. I don't know
7. To successfully implement the measures for increasing energy efficiency of the buildings, the following legal knowledge is required:
    a. Legal framework of energy efficiency and renewable energy resources
    b. Legal framework of construction processes
    c. Legal framework of building management
    d. Construction agreements
    e. Service (heat supply, water supply, electricity supply, etc.) agreements
        i. Agree

ii. Partially agree
iii. Disagree
iv. I don't know

8. To successfully implement the measures for increasing energy efficiency of the buildings, the following organisational and management skills are required:
    a. Project management
    b. Risk management
    c. Planning of the measures for increasing energy efficiency and using renewable energy resources
        i. Agree
        ii. Partially agree
        iii. Disagree
        iv. I don't know
9. During implementation of the measures for increasing energy efficiency, the following communication skills are required when working with the building residents:
    a. Skills for conducting discussions and meetings
    b. Conflict solving skills
    c. Cooperation skills
    d. Consultation skills
    e. Rhetorical and presentation skills
        i. Agree
        ii. Partially agree
        iii. Disagree
        iv. I don't know
10. Your suggestions and recommendations as for the competences in the field of increasing energy efficiency of buildings and climate change

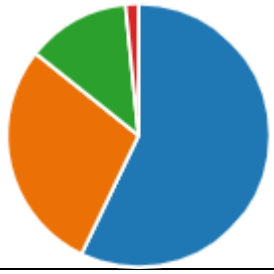
5.2. The Analysis of the Survey on the Skills Required for Increasing Energy Efficiency and Mitigating Climate Change

A total of 63 respondents participated in the survey, including:

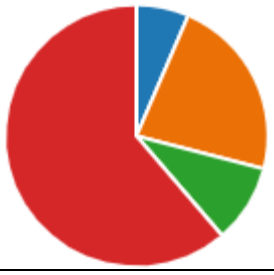
- Association of Management and Administration of Latvian Housing
- Future Housing Managers/Climate Managers

The analysis of the answers is provided in Table 5-1.

Table 5-1 Survey Questions and Results

Questions	Results			
1. To what extent do you believe that in future you will have to implement measures for increasing energy efficiency of the buildings?	very likely	36	57%	
	likely	18	29%	
	unlikely	8	13%	
	I don't know	1	1%	

Questions	Results		
2. Have you participated in implementation of the measures for increasing energy efficiency of the buildings?	Yes, on a regular basis Yes, a few times Yes, once No, never	4 14 6 38	6% 23% 10% 61%
3. How would you evaluate your competence/qualification in implementation of the following measures for increasing energy efficiency of the buildings:			
Development of a financial plan	High qualification Sufficient qualification Partial qualification Insufficient qualification I don't know		4,8% 15,9% 28,6% 41,3% 9,5%
Selection of optimal technical solutions for energy efficiency	High qualification Sufficient qualification Partial qualification Insufficient qualification I don't know		7,9% 14,3% 23,8% 42,9% 11.1%
Solving of legal issues in relation to increasing energy efficiency of the buildings	High qualification Sufficient qualification Partial qualification Insufficient qualification I don't know		4,8% 11,1% 23,8% 47,6% 12,7%
Organisation and coordination of the measures for increasing energy efficiency	High qualification Sufficient qualification Partial qualification Insufficient qualification I don't know		11,1% 17,5% 28,6% 33,3% 9,5%
Promotion of the measures for increasing energy efficiency to residents of the buildings (holding of meetings, management, educational activities)	High qualification Sufficient qualification Partial qualification Insufficient qualification I don't know		9,5% 20,6% 27,0% 23,8% 19,0%
4. To successfully implement the measures for increasing energy efficiency of the buildings, an interaction of various aspects (technical, legal, financial, organisational, social, information exchange) of the real estate management is required	agree partially agree disagree I do not know	59 3 0 0	95% 5% 0% 0%
5. To successfully implement the measures for increasing energy efficiency of the buildings, the following technical knowledge and skills are required:			
Micro-climate of the buildings	Agree Partially agree Disagree I don't know		82,5% 15,9% 0% 1,6%
Structural physics of the building constructions (types of heat distribution and moisture processes)	Agree Partially agree		92,1% 6,3%



Questions	Results	
	Disagree	0%
	I don't know	1,6%
Energy-efficient enclosing structures of buildings	Agree	85,7%
	Partially agree	11,1%
	Disagree	1,6%
	I don't know	1,6%
Energy-efficient building engineering systems	Agree	85,7%
	Partially agree	11,1%
	Disagree	0%
	I don't know	3,2%
Energy-efficient construction materials	Agree	88,9%
	Partially agree	9,5%
	Disagree	0%
	I don't know	1,6%
6. To successfully implement the measures for increasing energy efficiency of the buildings, the following financial and economic knowledge is required:		
Investment in the measures for increasing energy efficiency	Agree	75,8%
	Partially agree	17,7%
	Disagree	0%
	I don't know	6,5%
Financial support instruments for the measures of energy efficiency	Agree	69,4%
	Partially agree	27,4%
	Disagree	0%
	I don't know	3,2%
Economic assessment of projects for increasing energy efficiency	Agree	80,6%
	Partially agree	16,1%
	Disagree	0%
	I don't know	3,2%
Key principles of service tariff formation	Agree	72,6%
	Partially agree	25,8%
	Disagree	0%
	I don't know	1,6%
7. To successfully implement the measures for increasing energy efficiency of the buildings, the following legal knowledge is required:		
Legal framework of energy efficiency and renewable energy resources	Agree	80,6%
	Partially agree	17,7%
	Disagree	1,6%
	I don't know	0%
Legal framework of construction processes	Agree	79,0%
	Partially agree	21,0%
	Disagree	0%
	I don't know	0%
Legal framework of building management	Agree	72,6%
	Partially agree	24,2%
	Disagree	3,2%
	I don't know	0%
Construction agreements	Agree	72,6%
	Partially agree	25,8%
	Disagree	1,6%
	I don't know	0%
Service (heat supply, water supply, electricity supply, etc.) agreements	Agree	69,4%
	Partially agree	29,0%
	Disagree	1,6%
	I don't know	0%

Questions	Results	
8. To successfully implement the measures for increasing energy efficiency of the buildings, the following organisational and management skills are required:		
Project management	Agree Partially agree Disagree I don't know	93,7% 4,8% 0% 1,6%
Risk management	Agree Partially agree Disagree I don't know	79,4% 17,5% 0% 3,2%
Planning of the measures for increasing energy efficiency and using renewable energy resources	Agree Partially agree Disagree I don't know	79,4% 19,0% 0% 1,6%
9. During implementation of the measures for increasing energy efficiency, the following communication skills are required when working with the building residents:		
Skills for conducting discussions and meetings	Agree Partially agree Disagree I don't know	87,1% 12,9% 0% 0%
Conflict solving skills	Agree Partially agree Disagree I don't know	87,1% 12,9% 0% 0%
Cooperation skills	Agree Partially agree Disagree I don't know	87,1% 12,9% 0% 0%
Consultation skills	Agree Partially agree Disagree I don't know	87,1% 12,9% 0% 0%
Rhetorical and presentation skills	Agree Partially agree Disagree I don't know	87,1% 12,9% 0% 0%

The majority (86%) of respondents consider that there is a high probability that their work will be connected to the implementation of measures for increasing energy efficiency of buildings. 39% of respondents have already participated in implementation of measures for increasing energy efficiency of buildings at least once. However, more than 60% have never dealt with that.

When evaluating their own competencies in financial, technical, legal, organisational, and communicative aspects of the implementation of measures for increasing energy efficiency of buildings, 15–30% of respondents believe that their qualification is sufficient, whereas 50–70% consider their knowledge to be partial or insufficient. 10–20% of respondents are undecided. The lowest level of self-evaluation is in the legal sphere as well as in finding technical and financial solutions.

All of respondents (95% fully and 5% partially) agree with the thesis that interaction in various aspects of real estate management (technical, legal, financial, organisational, social, communicative, etc.) is necessary for successful implementation of measures for increasing energy efficiency of buildings.

An overwhelming majority of respondents (82–92% fully and about 6–16% partially; 98% in total) consider the knowledge and skills in the following aspects to be necessary for the successful implementation of measures for increasing energy efficiency of buildings:

- Building micro-climate
- Structural physics of building constructions (types of heat distribution and humidification processes)
- Energy efficiency of enclosing structures of buildings
- Energy efficiency of building engineering communications
- Energy-efficient construction materials

In regard to the field of finance and economics, 70–80% of respondents fully agree and 16–27% partially agree that the following knowledge is necessary for successful implementation of measures for increasing energy efficiency of buildings:

- Investment in the measures for increasing energy efficiency
- Financial support instruments for the measures of energy efficiency
- Economic assessment of projects for increasing energy efficiency
- Key principles of service tariff formation

70–80% of respondents fully agree and 18–29% partially agree that the following knowledge in the legal field is necessary for successful implementation of measures for increasing energy efficiency of buildings:

- Legal framework of energy efficiency and renewable energy resources
- Legal framework of construction processes
- Legal framework of building management
- Construction agreements
- Service (heat supply, water supply, electricity supply, etc.) agreements

80–94% of respondents fully agree and 5–19% partially agree that the following managerial and organisational skills are necessary for successful implementation of measures for increasing energy efficiency of buildings:

- Project management
- Risk management
- Planning of the measures for increasing energy efficiency and using renewable energy resources

83% of respondents fully agree and 17% partially agree that the following communicative skills are necessary:

- Skills for conducting discussions and meetings
- Conflict solving skills
- Cooperation skills
- Consultation skills
- Rhetorical and presentation skills

The most important proposals and suggestions of the respondents regarding competencies required for implementation of measures for increasing energy efficiency of buildings are summarised below.

- It would be beneficial to create educational programmes or multi-level seminars for every aspect mentioned above (technical, financial, organisational, social, communicative, etc.).
- I think that the necessary competencies are listed in the questionnaire. It should be added that recent and up-to-date information should be shared during seminars and training.

- ... new technologies; many things change with the development of new technologies and knowledge.
- The population should be educated more.
- More information on support programmes should be available and functioning mechanisms for the support of workers should be developed.
- Open sources of information should be available for viewing.
- A system of encouragement should be created so that additional courses or seminars attended by specialists are reflected in their salary.
- More involvement and control of the state, because if there is no control of the state, then there is only bureaucracy, projects are not implemented in the reality, and no one is interested if proper technological processes are followed and proper materials are used.
- One should be closely familiar with technical solutions; either not enough attention is paid to ventilation solutions, or wrong solutions are used, and the final result is not the same as desired.
- Project management is the most important skill.

Summarising all the collected data, the following conclusion can be drawn:

1. the qualification of the current and future specialists is insufficient and additional knowledge has to be acquired;
2. interaction of different aspects of real estate management (technical, legal, financial, organisational, social, communicative, etc.) is necessary for successful implementation of measures for increasing energy efficiency of buildings, so an educational programme that includes all these aspects has to be developed.

6. REQUIRED SKILLS AND COMPETENCES OF HOUSING MANAGERS/CLIMATE MANAGERS

In order to a create a high-quality comprehensive study programme, a professional standard of Housing Managers/Climate Managers, which includes the description, main duties and tasks as well as necessary skills, attitudes and resources, has to be drafted.

After the aforementioned issues are clarified, it will be possible to determine the knowledge and competences that are required for carrying out the professional duties and tasks as well as for developing necessary skills.

6.1. Levels of Qualification and the Qualifications Framework of the Latvian Education System

Five levels of professional qualification (LPQ) are defined in the Latvian education system[88], whereas the Latvian Qualifications Framework (LQF) consists of eight levels and comprises all levels and types of education.

The Latvian Qualifications Framework (LQF) is a state-level referencing system where all qualifications awarded in the Latvian education system are arranged in levels. The structure and functions of LQF were developed on the basis of the European Qualifications Framework (EQF) and taking into account the context and traditions in Latvian education, as well as stakeholders' interests.[89]

The Latvian Qualifications Framework is a system of eight levels comprising all education levels (basic, secondary and higher education) and all types of education (general, vocational (professional), and academic education), as well as professional qualifications acquired outside of formal education. The Latvian Qualifications Framework is referenced to the European Qualifications Framework.

LQF levels are described by the learning outcomes to be attained on each level. Each level comprises the knowledge, skills and competences of the previous levels.

Section 5 of the Vocational Education Law[90] states how the five professional qualification levels correspond to the Latvian Qualifications Framework levels.

Levels of vocational qualification

The first level of vocational qualification – theoretical and practical training, which provides an opportunity to perform simple tasks in a specific sphere of practical operation (corresponds to the level 2 of the Latvian Qualifications Framework).

The second level of vocational qualification –theoretical and practical training, which provides an opportunity to perform independently qualified artisan work (corresponds to the level 3 of the Latvian Qualifications Framework).

The third level of vocational qualification – higher theoretical preparedness and professional skill, which provides an opportunity to perform specific artisan duties, which also include planning and organising of the work to be implemented (corresponds to the level 4 of the Latvian Qualifications Framework).

[88] National Educational Opportunities Database (NIID.LV), *What do levels of professional qualification mean?*, http://www.niid.lv/prof_kval

[89] National Coordination Point for referencing the Latvian Qualifications Framework to European Qualifications Framework, *on LQF*, http://www.nki-latvija.lv/par-lki

[90] Vocational Education Law, https://likumi.lv/ta/en/en/id/20244-vocational-education-law

The fourth level of vocational qualification – theoretical and practical training, which provides an opportunity to perform complicated artisan work, as well as to organise and manage the work of other specialists (corresponds to the level 5 of the Latvian Qualifications Framework).

The fifth level of vocational qualification – higher qualification of a specific sector, which provides an opportunity to plan and also perform scientific research work in the relevant sector (corresponds to the levels 6 and 7 of the Latvian Qualifications Framework).

The LQF level descriptors are based on learning outcomes that are expressed in three dimensions:

1. knowledge (knowledge and comprehension);
2. skills (ability to apply knowledge, communication, general skills);
3. competences (analysis, synthesis and assessment).

Certificates of Latvian formal education and their corresponding LQF levels can be found in **Error! Reference source not found.**

Table 6-1 Education Documents and LQF Level[91]

Education documents (qualifications)	LQF Level
Certificate of general basic education (special education programmes for learners with (severe) mental development disorders or multiple severe developmental disorders)	1
Certificate of general basic education Certificate of vocational basic education Certificate of professional qualification (at basic education level)	2
Certificate of vocational education Certificate of professional qualification (at vocational education level)	3
Certificate of general secondary education Diploma of vocational secondary education Certificate of professional qualification (at secondary education level)	4
Diploma of first level professional higher education (college education, length of full-time studies, 2 to 3 years)	5
Bachelor's diploma Professional Bachelor's diploma Diploma of professional higher education, diploma of higher professional qualification (length of full-time studies is at least 4 years)	6
Master's diploma Professional Master's diploma Diploma of professional higher education, diploma of higher professional qualification (total length of full-time studies is at least 5 years)	7
Doctor's diploma Professional Doctor's diploma in arts	8

[91] National Coordination Point for referencing the Latvian Qualifications Framework to the European Qualifications Framework, *On LQF*, http://www.nki-latvija.lv/par-lki

6.2. Methodology of Formulating the Competences of Housing/Climate Managers[92]

Methodology for describing the profession of Housing Manager/Climate Manager is based on the Sectoral Qualifications Framework, which is a systematic summary developed in the course of research.

Housing Managers/Climate Managers profession description contains the following sections:

1. The name and short description of the profession.
2. Qualification requirements.
3. Core tasks and duties.
4. Skills, attitudes, knowledge (general and professional), and competences necessary for the performance of the core tasks and duties.

The process of formulating the competences of Housing Managers/Climate Managers is schematically shown in **Figure 6.1**.

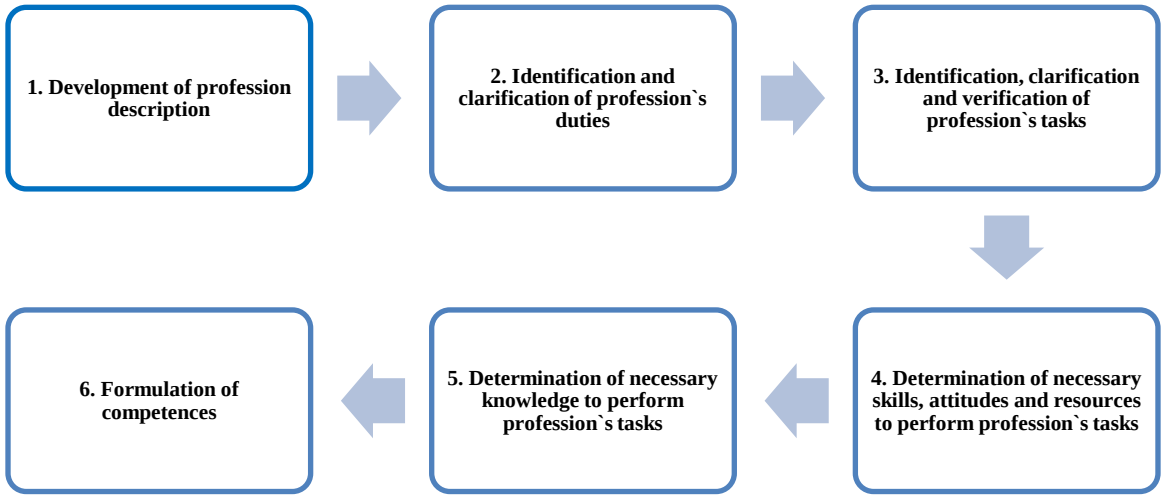


Figure 6.1 Scheme on Formulating the Competences for Housing Managers/Climate Managers

The detailed process of formulating the competences for Housing Managers/Climate Managers can be found in the following sections.

6.2.1. Development of Profession Description

The description of a profession is developed by improving and supplementing the information on the profession acquired while researching the sector. If a sector study has not yet been conducted, then the description is created from scratch.

[92] The methodology is based on *Methodology for Determining Professional Standards/Qualification Requirements*, National Centre for Education, 2017

The description contains the core tasks that are performed by the representatives of the profession. The description of the profession includes information on:

- professional mission;
- main duties;
- work environment;
- level of responsibility.

6.2.2. Identification and Clarification of Duties

The objective of this step is to identify and define the duties of the profession. In order to identify the duties, tasks need to formulated. Duties also serve for determining the goals of further educational programmes.

Duty is work performed over a long period of time, which has no clear beginning or end and is hard to measure. A profession is usually associated with 6–12 tasks. The formulation of duties does not include names of resources/instruments, necessary attitudes and knowledge. The respective tasks for each duty are formulated later.

6.2.3. Identification and Clarification of Tasks

The tasks corresponding to each duty are named in this section based on the duties identified in the previous section.

A task is a finished and evaluable unit of work which is performed independently of other units of work, but which together with other tasks constitutes a duty. A duty usually comprises 6–20 tasks. A number of skills are necessary for the performance of a task.

The objective of the identification of duties and tasks is to create a complete and systematic set of duties and tasks associated with a profession, which can later be used for educational purposes, for creating a job description, for formulating the requirements for candidates for the job, for conducting an audit of jobs and functions, for evaluating jobs, for developing a system of remuneration and evaluation of workers, etc.

The clarification of duties and tasks is necessary, because:

Every profession should be analysed from various perspectives.

The required tasks depend on the size and specialisation of a particular company or institution.

The specific use of technical equipment in certain companies/institution has to be considered.

In order to ensure that relevant duties and tasks are included in the professional competence identification scheme, industry experts and representatives of other professions have to take part in the identification process.

Finally, the comments and suggestions of industry experts and representatives of other professions are analysed. Then, they are compared with the duties and tasks that have already been defined. This way, the duties and tasks associated with the profession are clarified.

6.2.4. Determination of the Skills, Attitudes and Resources Necessary for the Performance of the Profession`s Tasks

When the professional tasks are clarified, the skills, attitudes, and resources necessary for the performance of the tasks are determined.

A skill is the ability to perform an activity with due quality and and in due scope in accordance with conditions set for the task. A skill comprises the techniques that are required for the performance of a task. Several skills are usually required to perform a task.

When determining the necessary skills, it must be notes that there are professional and general skills:

Professional skills are specific, because they are connected to a particular field/sector and a particular profession. Training (through either formal or non-formal education) is necessary for acquiring professional skills, which is easy to evaluate and measure.

General skills are non-specific, hard to measure and evaluate, but they are necessary for personal growth, civic activity, social integration and employment in the knowledge society. General skills are the basis for acquiring professional skills.

Attitude is the expression of a person's qualities (feelings, opinions, values) that influence their choice of actions in regard to a thing, person, or event.

Attitudes characterise the efficiency and quality of a performance of a task. It is crucial to determine the attitudes that are necessary for high-quality performance of duties and tasks of a particular profession. It is possible to develop attitudes in the process of education and during professional activity.

Resources are tools (instruments, equipment, materials, etc.) that are necessary for performing tasks. The following resources may be required to perform a task: instruments, equipment, professional software, facilities, mechanisms, materials. Laws and regulations are also resources.

6.2.5. Determination of Necessary Knowledge to Perform Profession`s Tasks

The next step defines knowledge that is necessary for developing skills and successfully performing work duties and tasks.

Knowledge is a set of systematic objective notions that a person acquires through study, work experience, research, etc. It can be divided into:

Professional knowledge, which is the knowledge, skills, and experience a person has acquired in a particular professional field, which allow them to perform work tasks with a high standard of quality. Professional knowledge is essential in acquiring professional skills that are necessary to perform duties and tasks of a profession. They are specific and closely connected to a particular field/sector and a particular profession.

General knowledge, which is a systematic set of objective notions that are essential for personal growth, civic activity, social integration, and employment in the knowledge society. General knowledge allows an individual to be be able to adapt to the changing situation in the labour market as well as to be able to take responsibility and to act in emergency situations.

The knowledge necessary for performance of professional tasks is organised in levels from the most basic to the most complex:

Awareness is the level at which a person demonstrates basic competence in particular issues, is able to understand and reproduce particular information, to remember and recognise facts, terms, basic concepts and solutions, definitions, laws, concrete information;

Comprehension is the level at which a person demonstrates the ability to understand facts and ideas, process information, formulate and clarify their opinion and their understanding of information by comparing, interpreting, and summarising.

Usage is the level at which a person is able to use their knowledge, facts, skills, and laws in new situations in different ways, apply their knowledge to particular circumstances, analyse a situation and independently perform practical tasks.

6.2.6. Formulation of Competences

In the conclusion, the competences are formulated using the previously compiled and arranged information.

Competence is a proven ability to use knowledge, skills, personal, social, and/or methodological capacities in work and study situations or for professional and personal development. Competences are described in the European Qualifications Framework in relation to their level of responsibility and autonomy. Competences include:

- Professional and personal qualities.
- Acquired knowledge and experience.
- Skills.
- Attitudes.
- Values.

Competences are formulated for specific tasks or sets of tasks. The corresponding LQF levels are mentioned for each competence by using the SQF levels that contain systematic descriptions comprising responsibility, autonomy, importance, and complexity. The LQF level of separate competences can differ from the LQF level of the profession as a whole. They are defined by the complexity and the level of responsibility of a particular task.

6.3. Required Knowledge of Housing Manager/Climate Manager

The knowledge that is necessary for the performance of duties and tasks of a Housing Manager/Climate Manager is divided into following categories:

- Technical knowledge
- Knowledge in the fields of finance and economy
- Legal knowledge
- Knowledge in the fields of organisation and planning
- Communicative knowledge
- General knowledge

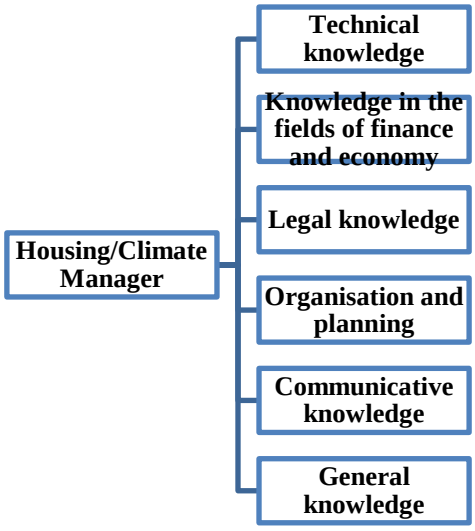


Figure 6.2 Knowledge Categories

SUMMARY AND CONCLUSIONS

Statistics of residential houses in Latvia:

- According to the data of the State Land Service, at the beginning of the year 2019, there were 363,991 residential houses with a total area of 91.08 million m2.
- The total area of apartment houses is 51.55 million m2 or 56.6% and their number is 39,477 or 10.8% of the total number of residential houses.
- 44% of the total number of apartment houses are situated in Rīga and the Pierīga region.
- Only 4.3% of apartment houses were built after the restoration of independence of Latvia in 1990 and only 3.2% since 2003 (considerably higher thermal requirements were set for enclosure structures in 2003).

Management of residential houses

- Management, maintenance and administration should be provided for every residential house in accordance with laws and regulations.
- The manager of a house should devise measures for increasing the energy efficiency, such as replacing worn-out elements and constructions, if the average heat consumption of the house where thermal energy is used for space and water heating in the last three calendar years has exceeded 200 kWh/m2 per year or 150 kWh/m2 per year.
- A person is entitled to perform the managerial task in an apartment house, if they have received the vocational education necessary for the management of residential houses and possess the appropriate level of vocational qualification (at least level four; level three in some cases). The necessary education if offered by a number of educational institutions (p. 24). Administrators are required to register in the Register of Administrators.

Housing policy and the institution involved in the management of houses

- The Ministry of Economics is in charge of the housing policy and the issues concerning management of residential apartment houses. The goal of the housing policy is to promote the quality and accessibility of housing by providing the regulatory framework for efficient management of residential houses, promoting the creation of rental property funds on municipal territories, and supporting energy-saving measures in residential houses. State Construction Control Bureau of Latvia (BVKB) has been in charge of the supervision and control in the field of energy, including the administration of issues concerning energy efficiency, since 1 January 2020.
- Ministry of Environmental Protection and Regional Development (VARAM) develops sectoral policy in the fields of protection of environment and nature, regional development, and management of digital transformation.
- The Association of Management and Administration of Latvian Housing (LNPAA) is a civic organisation that brings together natural and legal persons that are interested in achieving common goals in management and administration of real estate property across the Republic of Latvia.
- The financial institution ALTUM uses Latvian and EU funding to promote increased energy efficiency, smart energy management, and the use of energy from renewable sources in residential apartment houses.

- In the period from 2009 to September of 2019, a total of EUR 235.27 million was invested in the renovation of apartment houses, including EUR 106.45 million provided by EU structural funding, and 838 buildings were renovated to ensure that the average rate of thermal energy consumption for heating is 95,61 kWh/m2 per year.

Energy efficiency of buildings

- The share of energy used by buildings (households) constitutes approximately 30% of final energy consumption, therefore the building sector has a considerable potential in achieving common energy efficiency goals. The majority of existing buildings display a high level of energy consumption and lower thermal qualities than it is possible to achieve with modern technologies.
- The average specific energy consumption for heating in apartment houses was 124 kWh/m2 per year in 2020 and 125 kWh/m2 per year in 2019.
- Starting with 2021, the minimal permitted level of energy efficiency in new buildings has to be nearly equal to requirements set forth for net zero energy buildings (the average specific energy consumption for heating in residential houses does not exceed 40 kWh/m2 per year); the level of specific energy consumption for heating in renovated and converted apartment houses should not exceed 80 kWh/m2 per year.
- Latvia is committed to lowering the average specific energy consumption for heating to 120 kWh/m2 per year until 2030.
- According to the estimations of the Ministry of Economics, there are currently 23,000 buildings (in the apartment building sector) that need to be renovated, with less than 4% of these buildings already renovated.

Main problems

- Old building stock with a particularly low level of energy efficiency.
- Lack of involvement and interest of the society in increasing energy efficiency of buildings (bureaucratic procedures, low solvency).
- Lack of information and insufficient level of education on organising and taking measures for increasing energy efficiency of buildings.
- Insufficient promotion of private investment.

In order to achieve the building energy efficiency objectives specified in development planning documents of Latvia (NAP 2027, NEKP 2030, and the Strategy for Building Renovation), adequately educated house administrators skilled in the field of energy efficiency are required to implement measures for increasing energy efficiency and to ensure proper maintenance of buildings following the implementation of said measures.

Summarising all the collected data, the following conclusion can be drawn:

1. the qualification of the current and future specialists is insufficient and additional knowledge has to be acquired;
2. interaction of different aspects of real estate management (technical, legal, financial, organisational, social, communicative, etc.) is necessary for successful implementation of measures for increasing energy efficiency of buildings, so an educational programme that includes all these aspects has to be developed.

The knowledge that is necessary for the performance of duties and tasks of a Housing Manager/Climate Manager is divided into following categories:

- Technical knowledge
- Knowledge in the fields of finance and economy
- Legal knowledge
- Knowledge in the fields of organisation and planning
- Communicative knowledge
- General knowledge

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