



Renovation impact on climate change and energy efficiency habits of residents



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Glossary

CSB – Central Statistics Bureau of Latvia

EPC/EPC+ – Energy Performance Contracting

ESCO – Energy Efficiency Service Company

ESEB – Non-governmental organization “Building and Energy Conservation Bureau

EU – European Union

GHG – Greenhouse Gas

House Elder – the informally chosen or appointed resident in a multi-family building that coordinates activities and represents the building externally.

HCA – Heat Cost Allocator. In the text also referred to as Heat Cost Distributor.

JSC – Joint-stock company.

LIAA – Investment and Development Agency of Latvia

MoE – Ministry of Economics

MFB – Multi-Family Building

Respondent – A person that was interviewed in the course of the survey.

Executive Summary

The lack of decision-making by owners in the residential building sector is assumed to be one of the main obstacles why multi-family building (MFB) renovation is not actively pursued in Latvia. This is important not only in the context of a growing housing crisis, or of increasing fuel poverty, but also because the renovations can make a significant contribution to climate change reduction: according to European Union (EU) sources 40% of the total energy consumption is related to households, the largest consumers of energy.

Renovation of the multi-family buildings is an effective solution to reduce greenhouse gas (GHG) emissions and it has a huge potential, but it is not used, because multi-family building renovation in Latvia has been a very slow process – less than 800 buildings of 38,000 during the last 10 years.

The aim of this study is to develop specific recommendations and provide evidence to policy makers, municipalities and project developers, to achieve active comprehensive multi-family building renovations in Latvia.

To achieve this, a comprehensive and in-depth study of multi-family buildings sector, combining social and environmental engineering research methods is necessary. The association "Building and Energy Conservation Bureau" (ESEB), together with their partners will seek answers to the following questions:

1. How to motivate Latvian people to renovate their homes so that they are comfortable, safe, sustainable and their exploitation creates the least possible impact on climate change?
2. Which business models are in the best interests of the residents, and what climate change-reducing (energy-saving) package of measures to introduce to multi-family buildings to achieve maximum GHG emission reductions?

To achieve this goal, the project's workflow can be summarized as follows: conducting interviews with residents, analyzing energy consumption monitoring data and data about implemented measures in the building, research report preparation and organizing local information events to collect feedback and integrate these in future research.

1 Introduction

This research project focuses on how to organize and implement renovation of Soviet Era multi-family buildings in Latvia more effectively. Towards this, and prior to implementing any actual large-scale renovation activities, it was deemed necessary to better understand the views and situation of the various relevant stakeholders, as located in public sector, private sector and in civil society. The most important of these stakeholders are the residents in multi-family buildings which were covered in the study, together with the in multi-family building informally elected House Elder.

This final scientific research report presents this research project in a logically constructed argument, divided in the following chapters: Chapter 2, "Methodology", presents the overall methodology, with a focus on a large-scale survey. Chapter 3, "Background", addresses an extensive literature review of relevant secondary sources, partly international and more context related, and partly Latvian sources. Chapter 4, "Theoretical/Analytical Framework", present the underlying theoretical and analytical approach. Chapter 5, "Analysis", the largest chapter in the report, analyses the data collected by means of the survey. Chapter 6, "Discussion", draws conclusions and lessons from the data and the analysis in Chapter 5. Chapter 7, "Conclusions", presents, in summary form, conclusions from the analysis, as they pertain how to organize and implement renovations. Chapter 8, "Recommendations", presents advice on how to do renovations. Finally, there is a list of literature consulted as well as several annexes.

2 Methodology

In the MFB sector there is a strong correlation between engineering (heating system, materials used in the building walls) and social factors (residents perception of the air quality, residents comfort criteria and habits). The energy consumption of a building depends on implemented energy efficiency measures, the behavioural patterns of residents and their education, understanding and awareness of the climate change, which all have direct impact on climate change. For example, if residents keep windows open after renovation for a long period of time and do not use the thermoregulators installed on radiators, then the building's heat consumption will be higher than initially planned. From this it can be seen that the interaction between residents and the building is deeply rooted in the daily routines (sleeping, cooking, etc.). To take into account these engineering and social factors the research was done by connecting two sciences - environmental engineering and social anthropology together.

Qualitative and quantitative methods were used in the research. The qualitative methods used were partially structured interviews and focus group discussions but the quantitative methods used were data gathering, analysis and literature review.

The research was carried out in the five planning regions of Latvia: Riga, Vidzeme, Latgale, Zemgale and Kurzeme. In each region one city was selected. Riga and Daugavpils were selected because these are two largest cities taking into account the number of residents. And Riga and Daugavpils have one of the worst renovation rates in the state. City of Ventspils was selected due to the fact that it is a leader and one of the most successful in MFB renovation sector. Dobele and Salaspils were selected because these are average size cities (10 000 – 18 000 residents) and they have slow rate regarding on MFB renovations.

In the selected cities renovated MFB and MFB in ongoing renovation process during research period were chosen. Non-renovated MFB also were selected and served as a control group so that the data are comparable and it is possible to ascertain their credibility. These data were also used to obtain an idea about efficiency of the measures in achieving the energy efficiency. Buildings were selected from different parts of the city, with different number of floors and apartments and other parameters, to ensure as high diversity as possible. Total of 50 buildings (25 renovated, and 25 non-renovated), 10 from each city (five renovated, and five non-renovated) were included in the research.

2.1 Social anthropology

The main method for obtaining qualitative data was partially structured interviews and focus group discussions. Two methods were used to increase the validity of the research (Bernard, 2006). Guidelines for interviews and discussions were developed based on the questions raised in the research, as well as from the analysis of the literature (see Annex 1). Besides that representatives from the engineering science were involved in development of the methodology in order to ensure reciprocity of the research and render common conclusions and recommendations possible. Researchers lived in each of the cities included in the research for a week, collecting required data and communicating with respondents.

Collection of the qualitative data was performed by meeting up with house elders or managers of the buildings in person, by phone, or via e-mail. The apartments and residents

for the interview were selected randomly and by taking into account various factors: whether the apartment has several external walls, etc. because it was presumed that such factors might have an impact on quality of life of the residents; and consequently, an opinion and decision-making process regarding renovation, and have an impact on energy efficiency habits. During the process of selection of respondents various demographical parameters were considered, such as age and gender, and other. Demographical parameters did not serve as grounds for analysis but they were considered for the purpose to ensure as high diversity of the respondents as possible, as well as to provide for equal opportunities. Anonymity of respondents was ensured during the research, as well as all records of interviews were destroyed at the end of the research. Furthermore, an option not to record the interview was offered.

For the qualitative analysis 25 persons from each city (consequently, 125 persons altogether) were interviewed – four interviews per one renovated building, one interview with the house elder of a non-renovated building; five renovated and five non-renovated buildings per one city. 53 house elders were present at 10 focus group discussions. Consequently, the overall number of respondents is 178. During the interviews the age of respondents was between 18 and 83, 57 years on average (median 56), division by gender – 69 women, 56 men were interviewed; and 23 women and 30 men took part in the focus groups. 98 interviews were conducted in Latvian, 27 in Russian, whereas the focus group discussions were conducted in Latvian or bilingually – in both Latvian and Russian.

Coding software Atlas (ATLAS.ti 2015) was used for analysis of the qualitative data – that is, transcripts of interviews and focus group discussions. All records of interviews and focus groups were transcribed, while in cases when respondents did not agree to recording of the interview, the researchers wrote detailed minutes of the interviews, which were included in the aggregate of data to be analysed afterwards. Brief minutes were written for all interviews.

Upon commencing the encoding process, a list of codes was made, and codes were disaggregated in 16 topics and subtopics, according to the objective of research and guidelines for interviews. For example, such codes as “information” (related to access to information) with sub-codes: before renovation, after renovation, individually by house elder, a neighbour to a neighbour, feels uninformed, contract available or not available, etc.; “renovation” with sub-codes: heat insulation, deep renovation, ventilation, initiative of the house elder or residents; each of the parties involved (“house elder”, “residents”, “local government”, “construction company”, etc.) had their own code allocated along with sub-codes. Each researcher encoded part of the data individually, afterwards exchanging of their already encoded data and reviewing another’s encoding. Thus, uniform use of codes was ensured, and it was possible to analyse the findings. As a result of work it was possible to form a separate document from each code and category of codes with all components of content where the particular topic was highlighted.

2.2 Environmental engineering

As part of the quantitative method a survey forms were developed to gather technical parameters of the building, identify which measures were implemented, collect heat and hot water consumption data and to review terms in the contracts (with construction company, with bank). Basic technical parameters such as series, number of apartments, number of

staircases and area of building envelope were compiled. Energy consumption for space heating and hot water consumption data at least for three years before renovation and at least a year after renovation were collected (for non-renovated buildings see Annex 2; for renovated buildings see Annex 3).

Distribution of the survey was done in two ways. Firstly, setting up a face to face meeting with a house elder and asking the questions from the survey, and making necessary measurements (doors, windows). Secondly, sending the survey with required explanations if necessary to the representative of the building by e-mail. If the representative of the building was unable to provide information, then the missing information was asked from maintenance and heating companies.

Data about measures implemented (insulation of walls, attic/roof and basement; replacement of windows, doors etc.) were analysed with statistical methods to find which structural and energy efficiency measures residents implemented the most and the least.

Total heat consumption was defined as consumption of heat (thermal energy) for space heating, preparation of hot water, and circulation losses of the hot water supply system. To make comparisons between the buildings and define energy savings, climate adjustment and calculation of energy consumption was carried out according to the Cabinet of Ministers Regulation No 348 “Method for Calculation of Energy Efficiency of the Building” (CoM Reg. No 348). The energy consumption data for space heating were normalized and expressed as energy consumption indicator (ECI) in kWh/m² year. Quantitative data were obtained from 33 out of the planned 50 MFB due to residents did not agree to fill out the survey or refused to provide the data defining them as confidential.

3 Background

One of the most complex processes happening in the multi-family building is the behavior of residents related to energy (Picon, et al. 2013). This is a recent phenomenon in the energy consumption and energy efficiency sector, because before this energy consumption and energy efficiency in buildings were traditionally researched, explained, and improved through focusing of technical parameters, seldom taking into account human behavioral patterns, motivations and habits (Ellsworth-Krebs, et al. 2015). In order to resolve issues related to climate change (including GHG emissions, energy efficiency, and depletion of resources) a multidisciplinary approach that integrates various fields of science should be employed – one that brings together the main stakeholders in order to achieve a common goal.

The behavior and habits of residents affect energy consumption and multi-family buildings' energy efficiency, thus impacting the environment negatively, and consequently contributing to climate change. The major impact on the climate change result from human activities.

The activities of persons in their homes centre around daily activities (sleeping, preparing meals, etc.). They also make decisions regarding heating, ventilation, lighting, etc. (Picon, et al. 2013). In Latvia researchers have found absence of comprehensive explanation about acts of a man, his behaviour, know-how management, and similar social-economic, and demographic factors relating to energy efficiency and energy consumption (Bariss, et al. 2015; Laicane, et al. 2013), which are to be resolved by statistically verified motivation models, using the *goal frame theory* (Bariss, et al. 2015). In Latvia energy consumption, energy efficiency and climate change has been rarely studied by qualitative methods, only as a case study (Bergmane & Laizāne 2014). Similar small-scale quality research has been conducted in neighbouring countries as well (Ojamae & Paadam 2015). No large scale research using qualitative methods (interviews, discussions) has so far been conducted in Latvia. Therefore authors of the research tried to combine social aspects (human behaviour, knowledge, habits, etc.) with environmental engineering aspects (energy consumption, energy efficiency measures, CO₂ emissions, etc.) within the framework of one research.

Decision-making, additional motivation of residents, perception, emotions, etc., is among the most crucial variables affecting the behaviour of residents in respect of consumption of energy (Picon, et al. 2013). Decision-making on the part of residents is important, when deciding what will be done, by whom and when in a multi-family building. The anthropologist Fredrik Barth argues that it is important to see changes as taking place through gradual and unfolding processes, where a position over time changes into another position (Barth 1966). For this reason the current report has been developed through analysing the course of decision-making: various parties involved, reasons for making decisions, as well as strategies used¹. Barth's idea is used describing findings of the research as well – perceiving the process of renovation and heat insulation of the buildings as a gradual process, where not only the building becomes more energy efficient, but its residents also go through the process either by deciding that the renovation and heat insulation of the building is necessary and which measures to implement and how to finance them, or by learning to live in the renovated building. It means that even if the most advance

¹ See Chapter 4 "Theoretical Framework"

available technologies are introduced in the building, but in the absence of knowledge and absence of new behavioural patterns obtained in the period of time, those technologies will be inefficient and their potential will not be used.

3.1 Social/Cultural Context of Inhabitants of Latvia

Social context or national and cultural characteristics may play a crucial role in the decision-making process throughout everyday activities of the residents. Therefore, in order to understand habits of Latvian residents it is necessary to understand these characteristics. The cultural dimensions theory developed by Geert Hofstede and his colleagues is one of the ways to understand these characteristics. National cultural characteristics have also been studied and summarized by other researchers, such as Shalom H. Schwartz (Schwartz 1992), however, the Hofstede's model is the most suitable for the scope of this research and simpler to use. Researcher Geert Hofstede and his colleagues have developed the cultural dimensions theory, which is a way to comprehensively describe cultures of different countries based on six dimensions: power distance, masculinity [-femininity], uncertainty avoidance, individualism-collectivism, long-term orientation, and indulgence [-self-restraint] (Hofstede 1980; Hofstede 1997).

The cultural dimensions proposed by Geert Hofstede are evaluated in a 100-point scale; their characteristics and presence in the Latvian society is as follows (The Hofstede centre 2015):

1. Power distance dimension shows the extent to which hierarchy, power roles and degree of inequality are observed by the particular culture. The Latvian society has a score 44, which implies that equality and decentralized power are preferred.
2. Individualism dimension – a culture with high individualism score is mutually unrelated, and everybody takes care only for himself and his immediate family. Conversely, manifested collectivism represents a culture where individuals are closely related and rely on each other because of prevailing mutual trust (Hofstede 1980). Consequently, concerns about oneself are perceived in contradistinction to the concern about community the person belongs to. Latvian culture is manifestly individualistic (70 points).
3. Masculinity dimension – in societies with high masculinity index achievements and the drive to be the best play crucial role. Conversely, the societies with low masculinity index, including Latvia (9 points) prioritize on quality of life and care about others. Characteristic for the Latvian culture is to avoid conflicts for the purpose not to jeopardize common wellbeing, opting for diplomatic communication that does not offend anybody.
4. Uncertainty avoidance dimension shows the extent to which society feels threatened by unknown and ambiguous situation. Express manifestation of this dimension is characteristic to those cultures with inherent bureaucracy, elaborate instructions, and people prefer clear orders and negotiated arrangements, unambiguous assignments (Hofstede 1983). Latvian society shows pronounced wish to avoid uncertainty (63 points). It manifests as an emotional need for rules (even if the rules do not quite work).

5. Long-term orientation dimension describes how the society preserves connection with its past, overcomes present challenges, and plans for future, and which of these stages are prioritized upon making decisions and setting goals. High score in long-term orientation implies an open, flexible society, where context and ability to continuously strive for a goal are crucial (Huettinger 2008). The national culture of Latvia with 69 points on the long-term dimension scale is a pragmatic one, and residents believe that truth very much depends on the situation and surrounding circumstances. Furthermore, people demonstrate an ability to adapt their traditions to the changing context with a strong tendency to save and preserve, as well as tenacity in achieving the objectives.
6. The indulgence dimension juxtapositions rest and reward – in cultures where self-restraint is highly valued whims are controlled and suppressed by social norms. Latvian culture has a low score in this dimension (13 points), which implies that whims are not indulged, and everyday life is rather characterized by self-restraint and reticence, as well as tendency for cynicism and pessimism (The Hofstede centre 2015).

Researcher Harry C. Triandis has come up with four criteria to describe the individualism dimensions (Triandis 1995):

1. *Self-definition*. In individualist cultures people define themselves as unique and independent. On the other hand, in collectivist cultures people identify themselves as interdependent within their own social group.
2. *Goal structure*. In individualist cultures goals of an individual are more important than the group goals, whereas goals of collectivists overlap with the goals of the group. Furthermore, in cases when a conflict occurs between goals of a group and those of the individual, the individualists mainly choose their personal goals.
3. *Behaviour*. In individualist cultures behaviour is motivated by personal needs, rights, and attitudes, whereas in collectivist societies behaviour is conditioned by cultural norms and duties.
4. *Comparison of costs and benefits of a relationship*. If benefits stemming from the relationship do not outweigh contribution, individualists most likely abandon the relationship, whereas collectivists preserve the relationship even if they are not pleasant (Triandis 1995).

Consequently, the Latvian society shows average *power distance*, high *individualism*, and *long-term orientation*, very low *masculinity*, high *uncertainty avoidance*, as well as low *indulgence*. Equality in a relationship and management styles is preferred. Individual's needs are put above the needs of group or community. People do not interfere with other people's business, and expect the same from others; however, relationship is not confronting – they are diplomatic. People in Latvia try to avoid uncertain situation and highly appreciate rules; therefore, they want a lot of information which would be explained and based on which one could act. It is combined with practical nature and a wish to see long-term benefit; as a result it is difficult to trust unclear processes without a clearly set goal.

3.2 Decision-Making in Groups

Behaviour associated with energy consumption, including decision-making regarding various processes related to energy consumption, is mainly studied from the aspect of individual's actions, and as a result developed and implemented course of action are aimed at influencing individual's energy consumption. Such approach is not optimal, because it ignores social network and community of the individual (Klein & Coffey 2016). Resolving on renovating the house is a decision that, even if made individually, may be affected during the decision-making process, which occurs collectively with other building residents. According to the model proposed by John Pijanowski, group decision-making can be divided into eight steps (Pijanowski 2009):

1. Formation of a community by creating relationship among members of the group and setting rules everybody agrees on;
2. Identification and recognition of the problem;
3. Explanation and interpretation of the problem (different explanations are possible);
4. Evaluation of possible solutions or responses;
5. Clarifying prevailing motivation (resolving on spending less time on something else, or changing priorities in order to resolve the problem);
6. Action implementing the decision taken during evaluation;
7. Reflecting upon the adopted actions;
8. Reflecting after completion of the adopted actions.

On the other hand, B. Aubrey Fisher criticizes the decision-making being categorized in such a way as it is not quite suitable for groups (Fisher 1970), because groups are not isolated from surrounding environment and context, and are capable of obtaining information from outside; therefore, in the opinion of Fisher, decision-making does not depend merely on intergroup relationship (or formation of communities). Therefore he proposes the following structure of decision-making process (Fisher 1970):

1. Orientation or adaptation, when explanation is provided and agreement is reached, and the key goal is to minimize uncertainty. At this stage group members most likely agree with each other for the purposes of proceeding with negotiations as means to find out more accurately the ideas of other group members;
2. Opinion polling of the previous stage leads to a conflict when it is possible to voice certain opinions, and object to opinions of others, as well as seek to convince others about one's own truth. Polarization increases at this stage, where group divides in two or more groups supporting the same opinion. Opinion leaders emerge. Some opinions decrease gradually (and in most cases slowly) to become a non-supported minority;
3. Creation – when it becomes clearer which opinion is supported by the majority, conflicts tend to diminish, and objections are expressed as quiet doubts. This usually

is the lengthiest phase, because the group needs to move from the highest peak of a conflict to a peaceful state of settlement in order to make a joint decision;

4. Consolidation is the briefest stage; however, it is commonly characterized by joint agreement on the decision made and a sense of unity amongst the group.

Fisher's model is suitable for groups, which make important decisions; moreover where variations are often possible – a good leader will be able to steer the group through all three phases, whereas in other cases one individual is enough who does not perceive change of atmosphere and remains, for example, in the conflict phase, while others are ready for the next stage already, and thus functions as a destructive anchor who pulls other back to that stage as well (Fisher 1970). The models are not mutually preclusive though, and in the context of renovation of buildings both are useful to understand the process of decision-making – by focusing both on the community forming aspect that is crucial for Pijanowski (Pijanowski 2009) and on the decision-making process from the aspect of conflict causing and mutual interaction supported by Fisher (Fisher 1970).

3.3 Forming of a Community

A community is not a simple notion, and social and humanitarian sciences have various concepts of it; however, in the studies of sustainable practices of societies Paul James and his colleagues distinguish three different types of communities: (1) “land” or location-based community relationship where the common sense of belonging to a territory is a key to community relationship and forming, maintenance of the community; (2) lifestyle community relationship which can be based on common values, interests, or physical proximity; (3) imaginary or projected community relationship which usually are a kind of a project and are created and recreated (James, et al. 2012).

The European Environmental Agency describes (EEA 2013) that community activities involve uniting of people in groups for the purpose to achieve a common goal – such as change of habits and attitudes in order to increase energy efficiency and diminish impact on climate change. Neighbours may be one of the ways how a group is formed. Since members are already interrelated, they meet on regular voluntary basis, jointly set specific tasks, and, if, for instance, they have credible information available regarding climate change (for example, a meeting with an expert or informative materials), then there is rather a high likelihood that social norms and habits are affected and new ones are formed. Formation of the norms and habits is also influenced by wish of people to fit in the community (EEA 2013). Researcher Katherine Ellsworth-Krebs and her colleagues criticize the view where building residents or even each household are homogenous groups. They point out that this specific perspective till now has prevented from fully understanding the ongoing processes of the building in relation to energy consumption, because disagreements and agreement on use of energy are not taken into account (Ellsworth-Krebs, et al. 2015).

3.4 Visions of Values and Future

Basic elements of successful decision-making process are common values and future plans (Evans, et al. 2012), because if there is faith that the community has common goals, people will most probably cooperate (Wong, et al. 2011). Values are concepts of desires driving

social beings to select behaviour, evaluate people and events, as well explaining their behaviour and assessments (Schwartz 1999). Values serve as a standard for behaviour and evaluation (Schwartz 1992) and penetrate all aspects of the decision-making process. Upon studying desires of a community to get involved in the energy processes (for example, develop a heating system in cooperation with neighbours) it is established and that social norms and trust are more important than financial considerations – higher income does not mean more pronounced wish. Furthermore, upon social norms changing and trust increasing, community's identity forms, which facilitates desire to collaborate with other members of the community (Kalkbrenner & Roosen 2016).

As mentioned before, in cultures with manifested individualism common vision of future might be difficult to achieve, because people are more concerned about their personal goals and benefits. Furthermore, doubts are possible whether others have similar values and future plans.

It is important to develop and set goals associated with energy efficiency and climate change jointly (Lunenborg 2011) – if each member of the group has involvement in the project, a higher likelihood to achieve such goals is procured. The best way is to have specific goals (Locke & Latham 2002), therefore measurable and allowing to understand what to strive for and what is accomplished. Moreover, the goal has to be challenging and achievable.

Since people have inherent aversion to delayed benefits, in case of long-term objectives, where benefits will occur later (in 15 – 25 years), people might question whether the award (in case of renovation of the building – cost saving) will be obtained at all (Patak & Reynolds 2007).

3.5 Information and Knowledge

Decision-making is affected by various aspects; however, the ones currently identified in Latvia in respect to energy efficiency improvement are availability of information, uncertainty, and overall benefits of the individual (Blumberga, et al. 2014). It is expected by various authorities that apartment owners will make a positive decision regarding the renovation project, and will be competent to do that; however, they often feel confused themselves, because they need to make a decision on something they have no specific expertise about (Ojamae & Paadam 2015). Availability or unavailability may affect sense of uncertainty (sufficient level of information might reduce the sense of uncertainty) and help individuals to understand and recognize possible benefits.

People better perceive information if it comes from someone who is perceived as one of their own (in contrast to strange, unfamiliar ones whose goals are unclear) and as an expert, because then this person can be trusted both personally and professionally (Burgess 2000). Taking into account the high level of individualism in the national culture of Latvia, several levels of trust (both professional and private) might be a key to successful cognition of information and further application. Information and knowledge (which brings authority), are often determinants of the level of trust. It has been established in Estonia that examples of good practice and information about renovation projects serve among one of the forming components of trust either in respect to the process itself, or authorities involved, or “collective strategies” or other residents of the building (Ojamae & Paadam 2015).

Isaksson and Ellegård mention that information campaigns are often vertical political instruments (from top to bottom) where information is provided about energy efficiency, and residents may become more informed; however, possession of information does not turn into specific actions (Isaksson & Ellegård 2014). They believe that information about energy efficiency is not related to everyday activities and needs of people, and often is delivered on the basis of the social-economic performance (Isaksson & Ellegård 2014); consequently, it is decided “from above”, which information about energy efficiency might be interesting for certain groups of residents based on their income, education and similar factors. If the preconception is that professionals and middle class are the ones who will, most probably, be the best informed about environmental issues (because this group has been able to find and understand the information on its own) and will acquire the respective products, or will implement relevant energy efficiency improvement measures, then the problem might be the overall poor communication regarding climate change (Boardman 2004).

3.6 The Role of the Leader (House Elder) in Decision-Making

Relationship in a community is crucial for decision-making, and it is usually managed and monitored by a leader. Leadership is ability of an individual to motivate, influence and provide others with opportunity for them to facilitate success and efficiency of one’s own community (House 2004).

Leadership may have different types, of which one is a *collaborative leadership* which insists on involvement of all group members in the decision-making process. A leader creates a common vision of future together with the group where crucial issues are integrally resolved paying much attention to consolidation of relationship. Collaborative decision-making is often democratic and based on opinion of a majority. However, such approach has its inherent risks – when people strive to collaborate in each and every issue, there is a possibility to create a situation where it is continuously impossible to reach consensus (Ibarra & Hansen 2011). Thus, insignificant conflicts may become decisive, lengthy and difficult to solve.

Upon studying organizations in Latvia it is found that collaborative leadership has a positive correlation with loyalty in an organization (Bulatova 2015). Emily Bianchi, Joel Brockner and other researchers believe that loyalty facilitates outcome and fairness of the procedures where transparent decision-making process and clear results enhance trust in the decision-maker (Bianchi, et al. 2015). Consequently, it can be presumed that collaborative leadership is based on loyalty and ensures fairness in decision-making procedures, as well as result understandable, obvious for all.

3.7 Attitude towards Climate Change

A survey conducted by Eurobarometer in Latvia shows that 76% of respondents perceive climate change as a serious problem. Only a small portion, 26% respondents, recognize that during last six months they have acted personally to prevent climate change (it should be noted that in the European Union the average score is 49%). Nevertheless, when respondents were presented with a list of practical environmental friendly activities, 94% of them noted that they personally have done something to prevent climate change. Upon

comparing data from 2015 with results of the survey conducted in 2013 a positive trend could be established – rates of several activities have grown. For example, people report that they purchase local and seasonal food products (the score has increased from 48% to 64%), as well as they opt for energy efficient household appliances (the score has increased from 24% to 50%) (EC 2015).

The society and community, and the social norms prevailing there have crucial role in energy efficient behaviour of an individual resident, because norms affect his consumption patterns in respect to the use of resources and environment. It can be presumed that, if climate change and energy efficiency were perceived as values among residents, behaviour and future plans pertaining to these values would be adjusted accordingly. In order to change behaviour of residents and understand their actions in respect to energy efficient habits, one should focus not only on an individual and his/her consumption, but to common social norms. For example, understanding of cleanliness prevailing in the society and existent infrastructure has facilitated the occurrence that today in the United States of America laundry is washed three times more often than in the 1950s (Shove 2003; as quoted in EEA 2013).

Research shows that in general people are worried about climate change; nevertheless, when it comes to their own actions they either consider that they have done enough or say that one person alone cannot change anything (Boardman 2004). In most cases residents do not specify concern about the environment as a significant aspect relating to use of heating system on a daily basis (Isaksson & Ellegård 2014); consequently, they do not relate their everyday practices and choices with the climate change. Not always there is an understanding about the direct link between individual's (own) actions relating to energy consumption and climate change, even though people often manifest wish to help environment in general (Boardman 2004). Since they do not like to waste money and do not think they do that, they believe that they have done the maximum. The older the person, the higher the likelihood is that such answer will be provided (Boardman 2004).

Isaksson and Ellegård (Isaksson & Ellegård 2014) mentions that if people believe that they have done everything possible by purchasing relevant technologies and do not pay attention to their activities anymore, it may lead to wasteful behaviour. Such conviction that everything is already done may result even energy efficient habits turning into energy inefficient ones in the course of time (so-called ricochet effect). The ricochet effect may be also indirect, when new products are purchased from savings or other energy services are requested in addition (EEA 2013). Therefore, it is crucial to inform about energy-saving behaviour upon promoting energy efficiency (Isaksson & Ellegård 2014).

3.8 Housing Stock in Latvia

According to the Central Statistics Bureau (CSB) data, in late 2009 there were 1.04 million households in Latvia. Conversely, in the information summarized by the Ministry of Economics for the year 2011, which is based on national census results, 988 thousand households were recorded (Zvaigznītis 2014).

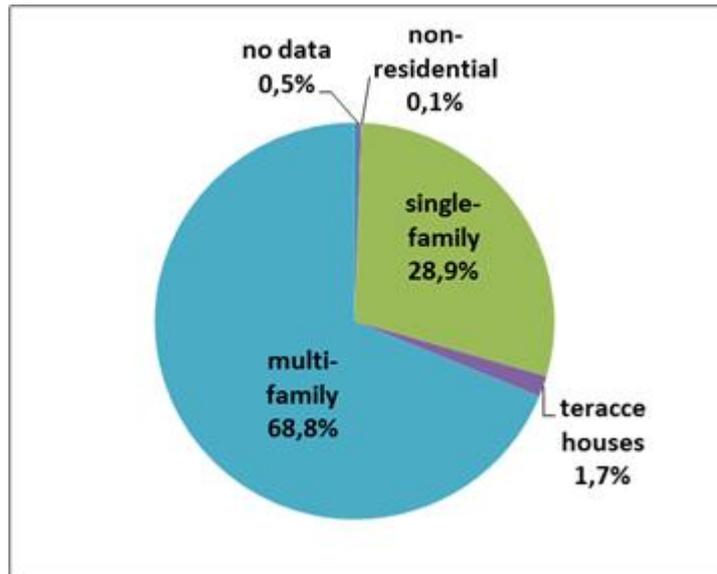


Figure 3.1 – Division of Housing According to Types of Buildings (MoE 2013)

Huge part or 68.8% of households are located in MFB (see Figure 3.1) (MoE 2013). Census of households in 2011 also showed that 68.2% of the residents live in MFB built during Soviet years and only 5% of them live in the multi-family buildings built in the last 10 years (CSB 2011). Statistics is harsh and proves how crucial the renovation of buildings is in order to preserve homes for people to live, because the rate of building new houses will, most probably, be unable to provide 68% of the residents in the country with new places to live.

Based on the heated floor area more than a half of the residential building stock in Latvia is comprised of MFB. In 2009 the total heated floor area of residential buildings was 87 million m², of which 54.5 million m² are multi-family buildings having three or more apartments (CSB 2011).

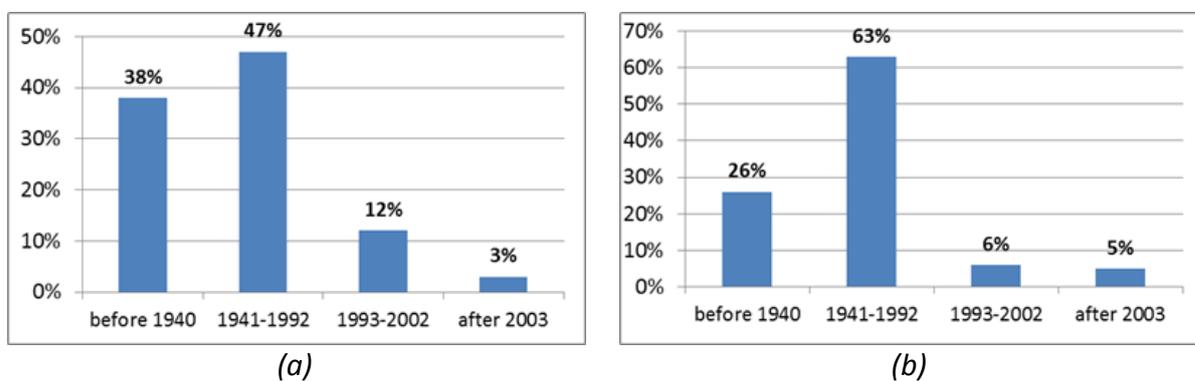


Figure 3.2 – Number (a) and Area (b) of MFB Built versus the Construction Period (MoE 2013)

In the breakdown of MFBs that is available in informative report “Financing solutions for building renovation” by Ministry of Economics (see Figure 3.2) it can be seen that MFB built before 1940 comprise only 26% of the total heated floor area, and in most cases they are subject to protection as cultural and historical heritage. The MFB built between 1940 and 1992, on the other hand, constitute 63% of the total heated floor area. Average energy

consumption for space heating in these buildings is 160 – 180 kWh/m² per year. This means that it is possible to achieve high energy savings by considerably reducing GHG emissions. By comprehensively renovating MFB, normalized specific energy consumption (under specific climate conditions) for space heating within limits of 50 – 70 kWh/m² per year can be reached (MoE 2013; Zvaigznītis 2014).

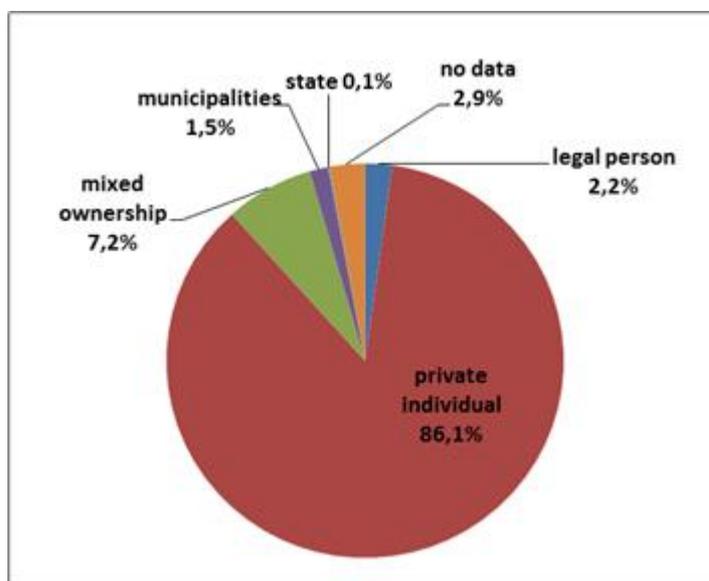


Figure 3.3 – Ownership of the Residential Buildings (MoE 2013)

In the division of all residential houses according to ownership that is available in the same report by Ministry of Economics it can be seen that majority or 86.1% of the housing stock is owned by private persons, whereas only a miniscule portion – by municipalities or government (see Figure 3.3) (MoE 2013). Consequently, all responsibility for the property lies on residents and their capacity to organize themselves.

Costs of maintenance of a MFB (sanitary cleaning, maintenance, fees of management and administrative staff, as well as depreciation payments for renovation of the building and mandatory payments set by the law) have increased in the course of time. If maintenance costs in 2000 were 0.15 €, till 2012 the costs increased to 0.42 € (Zvaigznītis 2014).

3.9 Rate of Renovation of Multi-Family Buildings

Until 2009 renovation of MFB was conducted only within a framework of pilot projects funded by the residents themselves or other EU Member States, such as Germany. After 2009 the rate of renovation of buildings increased due to the European Union funds available (Zvaigznītis 2014). 1.9% of the total number of MFB or 711 buildings have been renovated within European Regional Development Fund (ERDF) activity “Improvement of heat insulation of multi-family buildings” (MoE 2013). The biggest number of finished projects is in Kurzeme region (223 projects) and Vidzeme region (163 projects). Then Riga region follows with 156 finished projects, subsequently Zemgale (100 projects), Rīga (45 projects) and Latgale (30 projects) (MoE 2015).

3.10 Barriers to Renovation

Friege and Chappin point out that literature related to energy efficient renovation of buildings lacks in-depth understanding on the decision-making process of owners of the building. Nevertheless, it is clear that residents of the building opt for renovation only in those cases when several wishes and needs of residents are satisfied (Friege & Chappin 2014). T'Serclaes writes that consumer habits are hard to change, and at least 10 years are necessary to fully change habits of consumers. On the other hand, introduction of new technologies on the market usually requires three to four years (IEA 2007). That shows that technologies change faster than the habits of residents.

One of the obstacles in renovation of buildings is division of the building into individual apartments. For example, in Russia about 76% of apartments are privatized, and residents of a MFB most often do not know each other and may have different levels of income. Consequently, it can be inferred that each group of residents in the building has different, often even contradictory, wants in respect to renovation of the building. Nevertheless, apartment owner associations are very common in Russia, and they ensure management and maintenance of the building. It shows that different groups of residents of one building can reach a mutual agreement on management of the building that could alleviate involvement of residents in the renovation process (Paiho, et al. 2015). Also, in the research about situation in France Charlier and Risch points out that performance of renovation measures is not related to the aspect of ownership, but to the revenues gained from renovation of buildings (Charlier & Risch 2012). Consequently, it is necessary to prove that any group of residents and every private owner individually will have an economic gain.

Rented apartments pose a huge problem. One can define costs of energy efficiency measures as costs of maintenance of the building resulting in increased value of the property and comfort. However, improvement of environment leads to increased rental payments. Increase of rent creates a situation where tenants are not interested in performing energy efficiency measures (Williams 2004).

An additional obstacle in implementation of energy efficiency measures is the fact that residents of the building do not always immediately see benefits provided by the measure. The effect is even less obvious due to change of habits of residents (increase of the indoor temperature) and long period of the return of investments. Energy efficiency class of the building is often perceived as less important in comparison with the visual appearance of the property, when sold or leased. It is complicated to show energy efficiency improvements to potential buyers or tenants (Baek & Park 2012).

Experience of China shows that immediate benefits gained after performance of energy efficiency measures are important for residents. Increase of comfort is crucial benefit that might influence opinion of residents (Wang, et al. 2015).

Additional barrier deterring residents from renovation is the need of substantial financial resources to implement the project. Paiho with colleagues acknowledge that the fact of increased energy efficiency is not enough to substantiate why such an investment has to be made. Therefore, additional information about benefits from the renovation project has to be provided to the residents (Paiho, et al. 2015).

Low energy price may also considerably delay implementation of energy efficiency measures. If price of the energy in the country is low, investors have no motivation to invest in renovation of buildings, because there is no return on investment (ROI) when energy prices are low (Wang, et al. 2015). Another aspect is subsidies in energy production resulting in the reduced energy price. This distorts the market and hides the actual value of the energy. Therefore, on subsidized energy market the consumer does not have clear indications how much the energy actually costs.

If there is a wish to perform energy efficiency measures, lack of information prevents people from comprehensively understanding benefits from energy efficiency, as well as from acting upon it. Sometimes there is a belief in society that improvement of energy efficiency results in reduced level of comfort. There are two types of informational barriers – unequal access to information and lack of necessary information. It is not unusual that information presented to residents is presented in a complicated and unclear manner (IEA 2007).

Events organized for professionals of the industry are very useful for dissemination of information. Information of end-users or residents of the building may help to create demand; however, mass events cannot replace an individual approach. Consequently, information of residents at big events cannot provide the desirable outcome. Involvement of the local government in informative campaigns is very important; therefore, a large-scale renovation of MFB in a certain region is possible only where there is support from the local government (Paiho, et al. 2015).

Passivity of residents, lack of interest and responsibility are mentioned as issues preventing from launching the large scale renovation process of the buildings in Latvia. Residents are unaware that the building is their joint property for which they make the decisions. Hence, an immense obstacle with renovation is the decision-making process of owners requiring the votes of at least two thirds of all owners to validly pass a decision regarding the building. On the other hand, the growing number of tenants is yet another obstruction in attracting the necessary number of people. The usual practice is that no representatives are appointed to vote on behalf of the owners renting their apartments and therefore, their voice is excluded or not heard at all when resolutions concerning the building are adopted. Owners are often unaware of their income and believe that all burdens lays on the local government and the manager (Cimbale 2015).

3.11 Renovation Models

The model of energy efficiency service companies (ESCO) for increasing energy efficiency in the building is known in other countries, for example in Russia. In Russia this model is currently at its development stage. There EPC is not included in the ESCO model that is why it is not called and EPC model. Paiho with colleagues point out that the ESCO model may be the most suitable for the situation in Russia. The advantage of this model is the fact that one group of market participants undertakes full liability for the renovation process. However, in Russia the subsidized energy tariffs, mistrust of residents in banks, high interest rates on loans for energy efficiency projects, business and technological risks, and low awareness about possibilities provided by energy efficiency projects are among the greatest obstructions for the ESCO model. These factors are very significant obstacles to the successful introduction of the ESCO model on the Russian market; therefore, it is necessary to make improvements in order to use this model.

Paiho with colleagues have provided recommendations on the improvements needed to the ESCO model for it to operate in Russia on a larger scale. The ESCO model needs to incorporate a broader range of services. The set of services should offer not only consultations but also provide measures related to renovation: design, implementation, financing, obtaining of permits, as well as collection of signatures of apartment owners. As such, the relationship between business partners would play a crucial role for the successful implementation of the improved ESCO model. Such partners may be foreign companies as well, which would help to transfer expertise, finances, technologies, and risk management. Nevertheless, in order to create trust and ease communication with the stakeholders, local partners are necessary and have a crucial role (Paiho, et al. 2015).

In the MFB renovation projects it is necessary to focus not only on improvement of energy efficiency, but also provision of safe environment. Residents of the building often do not have financial resources and knowledge themselves to perform renovation of the multi-family building. Therefore, the EPC project ensures comprehensive renovation of the building. The comprehensive renovation of the building involves energy efficiency measures (insulation of walls, replacement of windows, renovation of heating system, etc.) and measures for improvement of the safety of the building (renovation of staircase, renovation of roof and balconies, implementation/adjustment of ventilation, etc.). EPC provides residents of the building with guaranteed energy savings and comfort, high quality of the performed work and reduced risks during development and implementation of the project.

If the project is implemented based on EPC principles, the energy efficiency service provider (EPC provider) performs evaluation of the building in order to identify the most rational renovation solution and the set of measures to be implemented. Afterwards the EPC provider enters into a contract with the apartment owners, for the term of which the company undertakes all liabilities and risks associated with planning, financing and implementing of the project. The EPC provider guarantees to achieve the amount of energy savings as promised in the contract and warrants the quality of the works for 15 – 20 years (depending on the term of the contract). Subsequently, the company performs the building renovation and ensures its maintenance in a manner that guarantees a certain level of comfort and that the promised energy savings are met. This model provides a long-term cooperation between the company and residents of the building to jointly achieve the best result.

In Denmark EPC projects by ESCO are rarely done in residential housing because it is difficult to predict and monitor activities of residents, as well as the size of buildings and amounts of bills are too low. In order to use the EPC model in smaller buildings, there is a recommendation to combine several projects into one; however, in this case the fact that 100% consent of the owners of the building is required poses a problem. However, building owners in the country, though not interested in the energy savings, could be motivated to implement energy efficiency measures when being provided with a warranty by the contractor that a defined indoor temperature (like 21° C) is ensured. To avoid instability in the residential housing sector, a recommendation is given to tie the EPC to a particular building or part of the building, and not the particular resident (Ástmarsson, et al. 2013).

Currently in Latvia three main options for implementation and financing renovation projects exist – apartment owners undertakes the loan; maintenance company undertakes the loan; usage of Energy Performance Contracting.

The first option is for apartment owners to undertake the loan from banks to implement the project. Banks frequently set strict requirements in respect to payment discipline, amounts of debts, and proportion of residents who have voted “in favour” at the general meeting. Since banks assess payment discipline of residents as an increased risk, interest rates on loans are high for apartment owners – ranging between 4% and 6%. But the project preparation duties are taken up by the house elder, a project manager is hired or it is assigned to the current building manager.

The second option put in practice is when a maintenance company owned by the local government undertakes the loan obligation and organizes preparation and implementation of the project. For the funding the municipal company announces a tender where banks apply by making their offers (bids). Since it is the municipal company which undertakes the obligations, and not the resident, terms of the loan are considerably more favourable. The municipal maintenance company has an opportunity to finance projects at a rate of even 2-4%. An alternative option is when the projects are implemented and financed by the district heating company. No such projects have been implemented in Latvia, even though “Salaspils Siltums” Ltd. plans to implement such projects in 2016/2017. When the district heating company plans and implements energy efficiency improvement in the housing sector, first, it can plan its investments in energy production, distribution and delivery wisely by reducing costs in the long run; secondly, the district heating company gains additional revenues from energy efficiency services, thus covering reduction of income resulting from reduction of energy consumption in the buildings.

Nevertheless, if the municipal company or any other business entity takes the loan, there is one significant obstacle – the company is unable to implement a large number of projects, because when having a lot of loans on the company’s balance sheet the banks would be resilient to give additional loans.

The third option to implement projects is a model including financing for the projects as well as renovating buildings under Energy Performance Contracting (EPC). EPC is a complex set of services, which can be provided by any company (maintenance, construction, or even district heating company, etc.) having experience in financing, planning and implementing projects. Such companies are called EPC providers. In this model the company takes a loan to implement comprehensive MFB renovation project. If it is private company then getting additional financial resources would be more expensive than in the case of the municipal company. Loan interest rates range between 5 – 6.5%. Maintenance company owned by the municipality or the district heating company has all preconditions to become the municipal EPC provider rendering energy services to MFB. The services provided by the municipality will be cheaper, because its primary purpose is not to gain profit, as it is with private companies. Thus, the municipality is able to offer competitive services to its residents (Zvaigznītis 2014; ESEB 2015). In the reports of the Ministry of Economics of the Republic of Latvia the EPC provider is called a municipal or public energy service company (PESCO). Such company can attract funding from municipal resources and other financial sources (MoE 2013).

3.12 Review of Regulation Regarding Climate Change

Europe 2020 Strategy prescribes that each Member State (also Latvia) must increase energy efficiency and the proportion of renewable energy sources in the gross final energy

consumption by 20% while reducing the volume of GHG emissions by 20% in comparison to 1990. Directive 2012/27/EU on energy efficiency is passed based on the above strategy, which stipulates that, beginning from 2014, 3% of the buildings owned by the government needs to be renovated each year. Besides, companies engaged in production, distribution and retail of energy have to achieve savings by 1.5% in the final energy consumption each year. The Directive also stipulates that it is necessary to develop a long-term strategy for renovation of buildings.

Building energy efficiency policy and objectives to be accomplished are set in several national level policy documents – “National Development Plan of Latvia for 2014-2020”, “National Reform Programme of Latvia for Implementation of Europe 2020 Strategy”, and “Long-Term Energy Strategy of Latvia 2030” (Zvaigznītis 2014).

Paragraph 192 of the National Development Plan of Latvia for 2014-2020 states: “Energy has to be used efficiently; therefore, the course of action prescribes measures for improvement of energy efficiency, which are a significant tool to enhance competitiveness. Improvement of energy efficiency is crucial for the production sector. Improvement of energy efficiency of public and residential buildings needs to be facilitated” (PKC 2012).

Under the National Reform Programme of Latvia for Implementation of Europe 2020 Strategy the government has undertaken to achieve increase in use of renewable energy sources in heating and ventilation by 37% or increase by 376 ktoe, in comparison with the year 2010. Emphasis on increase in energy generated by solar panels and heat pumps is made in the programme.

The Energy Strategy 2030 of Latvia sets a goal to reduce the average specific heat consumption for space heating by 50% until 2030. Currently, the normalized average specific heat consumption (under specific climate conditions) is 200 kWh/m² per year.

The Building Energy Efficiency Law is adopted based on Directive 2010/31/EU of the European Parliament and of the Council, and the requirements of the Directive are transposed in this document. The purpose of the Law is to facilitate rational use of energy sources along with improvement of energy efficiency of the buildings, and to inform the public about energy consumption in the buildings. The Building Energy Efficiency Law incorporates rules that have to be taken into account during energy certification and determination of energy efficiency level of the building, as well as during inspection of heating system and air conditioning system. This Law establishes minimum requirements for energy efficiency of buildings (Zvaigznītis 2014).

4 Theoretical Framework

Understanding cultures and societies is a serious and very complex endeavour. And this applies to all cultures and societies, from hunting and gathering cultures to modern societies and all cultures and societies in between. There are differences between cultures and societies, to be sure. As we progress from the hunting and gathering societies over to modern cultures and societies, two main variables change:

1. The division of labour increases, that is, there are more separate and mutually exclusive tasks and activities that have to be performed for the culture or society to function properly, and
2. The scale increases, that is, the number of members of the culture or society increase.

Both these variables increase dramatically, and continue to do so, including specifically in Western societies. Furthermore, there are a number of mutually causative relations between the two variables. A key positive feedback mechanism is that as population increases it paves the way for – in fact, necessitates – an increasing division of labour.

This division of labour, in turn, leads to the development of special interest groups, either in terms of jobs or groups of people that otherwise together have a special role or interest. In other words, we see an increasing complexity in terms of stakeholders. Such stakeholder groups can be understood as having both absolute and relative roles and functions in society. On the one hand they may separate completely groups with different and opposing interests. On the other hand they may also overlap, that is, members of two or more stakeholder groups may have partly similar interests. The latter hints at the fact that modern societies can be analysed and understood as complex networks of interests, goals and people.

Analysing modern societies, as Latvia is an example of, is accordingly exceedingly more complex than analysing so-called simple cultures. In fact, as everything seemingly is connected to everything else, it is actually difficult to know where to begin, that is, what to focus on in order to begin unravelling the society and understand it.

Adding substantially to the complexity is a situation where the purpose of understanding a society is not an end in itself, but to use that knowledge to impact it, and more concretely to change parts of it. This is the case in the present project, which aims to impact and change the values and behaviour of specific interest groups. In other words, the focus is on a society that is changing continually, and in which the project wants to influence this change in a specific direction.

The result of this, that is, an overwhelming societal complexity, coupled with the focus on impacting and changing specific aspects of Latvian society, is to simplify the perceived reality. This means in effect to model Latvian society. A model in this sense means to focus on only issues and variables that are directly relevant for, and connected with, the focus of the project. It can be argued that modelling, because they represent only a part of the reality, will only approximate the reality and be less predictive. However, this possible lesser predictability is what we have to pay in order to understand the aspects of society we are interested in the context of this project. In this case, the model chosen will likely not be less

predictive, as its focus can be fairly easily separated from the surrounding society. The chosen model should also have heuristic qualities and rationales, as it will be used to explain the project's process, logic and rationale to various interest groups as well as to outsiders.

When choosing a useful model of society, the point of departure should be sought in one or both of two aspects of a society:

1. Vertically – focus on societal levels from macro to micro, and
2. Horizontally – focus on the division of labour between, initially, the available societal sectors, which in Latvia means: the public sector, the private sector, and civil society. In a second step, once a societal sector has been chosen as being of primary relevance and interest, the focus would shift to a specific interest group or groups within that sector.

A traditional approach when deciding on how to model a society – rather parts of it – would be to focus on the structure itself. This involves, for the most part, starting at the macro-level, and taking the legal aspects of it – specifically formal laws and regulations, and use this to analyse and predict the behaviour of citizens, or whomever it is that one wants to focus on. This can be referred to as a formal or structuralist position. Individual behaviour is understood to follow and represent whatever formal rules apply to the situation under scrutiny. This formal approach and model does not manage to catch any of the things that goes on at the micro-level, variables that affect the rule-following behaviour of people.

An alternative approach is to focus at the micro-level itself, and on individual citizens, that is, the members of the chosen interest groups. While they, to some extent at least, are rule followers, there are at the same time concerned also with all manners of very localized and even person specific issues, concerns and considerations that continually enter into the equation that influences values and determines the final behaviour. It is at this micro-level that one best understands what actually influences and determines behaviour. And it is accordingly at this level that an appropriate modelling of individual behaviour should be located. This approach to analysing a society can be termed a functionalist approach. In contrast to the structuralist approach, it does not understand the workings of a society as a blue-print, but as a process where the goal(s) are continually reassessed in terms of how to achieve them, that is, the means of reaching the goals are continually under discussion.

The social anthropologist Fredrik Barth first focused attention on this (Barth 1966). He observed how social life is inherently complex, messy and unsystematic. There is order on the macro-level, while on a practical day-to-day basis this order is continually assessed against all manner of local, specific and idiosyncratic variables that are competing. In this situation people operate under a decision-making regime that emphasizes strategy and choice. Instead of focusing on the structural form (or the social structure) he advised a focus on the processes that produce structural form.

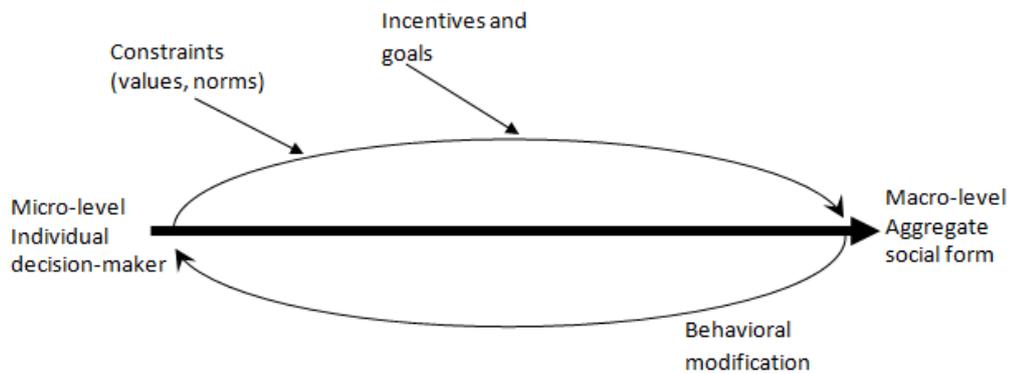


Figure 4.1 – A Generative Model of Social Processes

A key element is peoples' capacity to make choices (see Figure 4.1). These choices are constrained by existing values and norms. Furthermore these choices reflect the incentives and goals embraced by individuals. Finally, these choices are modified by the transactions that they enter into. The net outcome of these individual patterns of decision-making and choice are patterns of behaviour which are formed and reformed over time. Barth referred to this procedure as a search for generative models, because the researcher tries to generate the principles, conditioned by constraints and incentives, that result in structural form.

In this project this model of decision-making under constraints and incentives will be used, in particular, to analyse the situation of the residents in the multi-family buildings. The focus will be on understanding the constraints and incentives that they identify and experience, and, based on this, how it will be possible to work with them to achieve, within each multi-family building, collective agreement on the approach to do modernization and upgrading.

5 Analysis. The Renovation Process

The focus in this research is renovation process from the residents' point of view. In this chapter the data from the survey are analyzed and an attempt to go through the renovation process is made – from making the decision about renovation to implementing the renovation. This is done along two different but parallel and mutually supportive and reinforcing areas of foci. The first section focuses on the actual renovation process. The second section is concerned with various aspects of life in a renovated building.

At the beginning residents live in non-renovated house where probably first floor suffers from cold that is coming from basement but top floor – from cold and/or moisture coming from the attic/roof. Then research follow residents – their experience as they transform building from non-renovated to renovated and live there afterwards. It will be possible to see that the process from non-renovated to renovated building is not easy and sometimes too difficult to handle by residents themselves.

The terms *house elder* and *chairman of the board* (as well as *active residents* and the *board members*) were used interchangeably in the interviews as synonyms without discerning among duties, functions, and informal status. In the present report the terms *house elder* and *active residents* are used.

The term “*Renovation*” was used in a very broad sense. This was done because respondents used it this way.

5.1 To Renovate or Not to Renovate

Further in this chapter the obstacles which residents see or have faced during the renovation are shown. Renovation initiator, in most cases house elder, at the beginning has to face that residents do not understand that the house belongs to them together and also that the house has several problems because only part of the residents experience these problems. Also residents who are against renovation (saboteur) appear. Even if rest of the residents would agree to renovate there are many obstacles that need to be overcome (fears, mistrust). Also external obstacles exist (guarantee for a loan, complicated process, and rental apartments) and they are even more difficult to overcome. At the end of description of all obstacles the alternative to renovation is shown – implementing measures one at the time.

5.1.1 Everything Is Alright at My Home

It may seem for an onlooker that reconstruction and insulation of multi-family houses built during the Soviet era is a self-evident, logical process, especially taking into account the period of operation, as well as defects obvious from the outside. Not all residents of these buildings will support this opinion. Residents themselves have not “written off” a building where all-encompassing reconstruction and insulation works have not been carried out, because they mainly notice and see their own apartment on daily basis. When speaking about possible renovation of the building, the residents do not mention common areas such as critical condition of the stairwells. Also, fixing of leaking roofs is considered only when the defect manifests in some inhabitant's apartment. Improvements are perceived as necessary only in respect of one's own apartment, which is his or her home, often the place where children have grown up and place where many plan to grow old. The apartment in most

cases is taken care of and, if there are free financial resources, decorated. This is, most probably, the reason why previous strategies of government authorities and municipalities calling for “renovation” have achieved only partial success. When the residents of the Soviet era multi-family buildings think of their home, they think of their apartment, and functional deficiencies inherent for the whole building are of no concern for them, on an emotional level.

"As a matter of fact, the ones who lives on the fifth floor understands what a leaking roof is. On the other hand, the ones who lives on the ground floor do not care at all"

Respondent, Zemgale region²

A common obstacle is a subjective feeling about defects of the house. Therefore, in the Soviet era multi-family buildings those residents who were exposed to defects of the building on a daily basis were the first to think about renovation of the building. Residents of the upper floors were mostly concerned about leaking roofs, non-insulated attics and dangerous elevators. Inhabitants of external (or corner) apartments are those who first notice cracks in the walls. Residents of the ground floor feel the cold and mould spreading from the non-insulated basement, as well as cold coming from the stairwell as a result of poor or non-existent entrance door. If condition of the building does not affect the resident personally, he will, most probably, be uninterested in improving the situation in some way.

At the same time, in many Soviet era multi-family buildings part of the residents do not feel any direct threat and find the inconveniences experienced as insignificant. Those living in the middle apartments are warm, and people who have covered their walls with plaster boards during decoration do not see cracks appearing in them. Moreover, the residents are often not informed what is happening in other apartments or other parts of the house. In such situations it is difficult to take complaints of others (if such are heard at all) seriously enough to agree to such a major project as renovation of the entire building. Furthermore, if the resident does not encounter the problems on daily basis, the renovation cannot offer or solve anything, because there is nothing to solve. If the condition of the building does not affect the resident personally, he is comparatively less interested to do something.

Residents of the renovated buildings are comparatively more informed about the condition of their building before renovation than the residents of those buildings where no renovation has been carried out. Speaking about reasons of renovation, respondents in all renovated houses mention that the building had a wide spectrum of defects – leaking roof, extreme temperature differences in the building, damaged communication lines, sultry, humid air, and other defects. Also, majority of respondents share that their building was old, and the planned improvements would have to be carried out in any case – if not in a form of comprehensive renovation, then gradually. Quite a frequent reason for dissatisfaction with the building has been temperature differences specifically – apartments located on the corners/edges of the building are cold in the winter, whereas middle apartments

² Throughout this chapter quotes by residents from the survey – taken from interviews or from discussions – are presented. These quotes serve to highlight and underline arguments in the text.

(consequently those which are surrounded by other apartments from all sides) are too warm, and people spend winters with open windows there. Upon describing the outer-edge apartments, the heating season is often ushered in wearing mittens and outdoor clothes. Consequently, residents of the renovated buildings, irrespective of location of their apartment, are informed about the issues residents of other apartments have encountered, as well as, for the most part, informed about structural deficiencies that had to be resolved.

5.1.2 Why Not Renovate? (Subjective, Internal Barriers)

Even if one manages to inform all residents of the building about defects and unsatisfactory condition of the building, it does not mean at all that one has succeeded in convincing about necessity of renovation. Often residents recall being categorically against the renovation. After obtaining a full picture, the negative attitude is mostly replaced by other, more positive. Change of attitude most often manifests from negative to mild, which is characterized by the residents themselves as “it will not get worse/it cannot get worse”. The residents opposing renovation are usually convinced over time by the house elder, experts, other residents or their personal encounters with the defects of the building.

“There was a slight disagreement, but only because not everybody knew the rules.”

Respondent, Latgale region

Change of heart occurs, when the residents understand that there is no loss from renovation, therefore there is no reason not to try. On the other hand, those people who are against continuously and invariably often do not mention specific arguments for their position. Other residents repeatedly mention in the interviews that these opponents cannot resist protesting for the sake of protest.

“People almost everybody agreed to everything, only my neighbours downstairs did not agree to absolutely anything. Why so, I don’t know, they must be that sort of people.”

Respondent, Latgale region

One “resident-saboteur” is mentioned repeatedly, who is against the renovation (for example, believes it to be too expensive and does not accept explanation of the expert that there will be saving, while paying the same). These residents tend to be very active and individually approach other residents of the building and convince them to vote against the renovation. “Saboteurs” often succeed in, if not fully convincing, then at least causing enough doubt for people to choose not to actively sign for renovation “to be on the safe side”.

The most common reasons mentioned by the respondents why the building should not be renovated though even if it is in poor condition are various – fear of loans and payments,

negative attitude towards neighbours and mistrust in neighbours, mistrust in quality of construction works and supervision, and other.

The respondents confess that before the renovation objections to it mostly have been related to financial factors: fear of loans, reluctance to pay more, as well as lack of trust that the neighbours will be able to pay. Most house elders reveal that residents are frightened of the mere word “loan” and the fear is rooted in their own negative experience and those around in other crediting situations. Stories from the recession period are still told when level of income rapidly changed for people, and they were not able to repay loans anymore. There is preconception that cooperation with banks regarding loans was complicated and in vain. Residents are afraid that cooperation is still the same. Part of older people are worried that, upon borrowing a loan for renovation of the building their apartment will be mortgaged and thus, foreclosed. Consequently, borrowing and fear associated with it is a material obstacle to renovation.

Residents often know each other only by the face, less frequently by name or apartment number; hence, closer relationships between apartment owners are comparatively rare. Since residents do not know each other, they do quite trust each other (to be precise – mistrust). Often the only information about other residents of the building is related to debtors (for instance, seeing a list of apartment numbers and amounts of outstanding payments on the wall in the stairwell), which only aggravates mistrust and sceptical attitude towards joint involvement in such a financially voluminous and time-consuming project as renovation. Consequently, the residents of non-renovated buildings do not know each other and do not trust each other.

Mistrust of respondents in quality and supervision of construction works is frequently observed. Construction companies are perceived as such which cannot be trusted, because many have personal experience or heard stories where the companies carry out construction works in poor quality, use materials of insufficiently good quality or steal them, and therefore less materials than necessary are used in performance of the works, as well as they may simply disappear without performing the work – sometimes running away with all money. Another obstacle for renovation is the standard three-year warranty of the construction works. Residents consider it to be disproportionately short, especially in comparison with the period of loan (for example, the three-year warranty and the loan for 15 years). Consequently, the residents are concerned about quality, supervision of the construction works and are dissatisfied with duration of the warranty.

In small towns or rural regions, where more elderly people live, one of the reasons not to get involved in renovation is conviction that the apartment has no value – either financial or emotional. Arguments of the elderly people are mainly related to future prospects. Those who support renovation say that they want to leave a quality apartment to their children. On the other hand, those residents, who do not support the renovation, mention that they do not wish for the children to inherit their debts. Many other see the emotional value as the only value of the apartment – as a family home. If the children and grandchildren have said that they are not going to live in the small town, the apartment is of no value anymore; therefore, it is not worthwhile to invest either money or efforts in it. In such situations the apartment is a burden, and not a benefit or potential object of investments. Consequently, the older residents often do not see their apartment as a valuable.

5.1.3 Why Renovation Fails? (Objective, External Barriers)

Residents mention various external obstacles causing problems with launching renovation, even if residents of the building has reached or would be able to reach an agreement. The most frequently mentioned obstacles are a guarantee for a bank loan, complicated process of drafting a project, as well as rental apartments where landlords are not available to confirm necessity of the renovation, and municipal apartments, of which status and decision-making capacity are questioned by house elders, and the latter confess of being unaware of.

Guarantee is mentioned as a major problem during the planning stage of renovation. The municipalities are not providing guarantees of loans anymore, and maintenance companies not always assume this responsibility. There are a few cases when some of the building residents are able to make the first payment – then the guarantee is not necessary. Some house elders of non-renovated buildings do not see a way out of this situation, and due to lack of guarantee specifically are of the opinion that no renovation can occur in their building. Unavailability of the guarantee, in general, is mentioned as one of the biggest obstacles and issues during the renovation, because, even if everything else is already done – residents are convinced, the project is drafted – without the guarantee it is impossible to received funding and commence the renovation works.

Drafting of the renovation project and arranging of necessary papers are described as complicated and time-consuming. Usually, some expert is hired at this stage – usually a family member of the house elder or any other resident who has had experience with such kind of work (projects, European funds). It is characterized as a huge advantage, and the respondents emphasize that without the hired expert they probably would not have drafted the project. House elders of a couple of non-renovated buildings, who took part in the research, acknowledged that they have attempted to draft and submit projects; however, they have not been in sufficiently good quality; therefore, they failed to commence the renovation works. Some have gone through these processes several times, and admit during interviews that they will not proceed with it for some time, unless some other resident of the building takes over the initiative. The most common criticism towards Investment and Development Agency of Latvia (LIAA) during drafting of the project is related to the fact that they function only as a control mechanism after the project is drafted, while do not help in any other way. Consequently, development of the project is complicated, and many house elders are incapable of it; therefore, house elders and residents of those buildings, which do not attract support, face serious difficulties in attracting necessary financing for renovation of the building.

House elders also mention rental apartments as an obstacle which might pose problems during the renovation process because these residents of the building are not entitled to make a decision on renovation. On the other hand, the apartment owners might be both unavailable and invincible. If there are several such apartments in the building, then it is a real obstacle to the decision-making. Furthermore, municipal and/or social apartments are also problematic – it is crucial during the period before renovation that the particular municipality supports the idea, and votes in favour for renovation on behalf of these apartments. House elders usually do not understand how to act, if the municipal apartment has a debt – for example, nobody lives in the apartment anymore, it has huge outstanding bills, which impede obtaining a loan from the bank, whereas there is nobody to call to

account, if the municipality does not assume the commitments. In the good examples the municipalities tend to pay these debts, thus allowing to commence renovation in the building; however, such examples are too few and too far apart, and mostly found in highly motivated and interested municipalities of small towns. In the event of both rental and municipal apartments the residents are of an opinion that liability of the municipality is not clear.

5.1.4 What Residents Have Done Before Renovation?

Within the scope of research 14 non-renovated multi-family buildings were surveyed. Inquiries were made at these buildings about non-energy efficiency measures performed there. These measures include repair of the roof, repair and/or fixation of external walls and its elements, redecoration of stairwells, repair of balconies/loggias, new cold water/sewerage system, readjustment of rain water drainage system, and maintenance of ventilation system. In addition to these measures, window replacement in the apartments was considered.

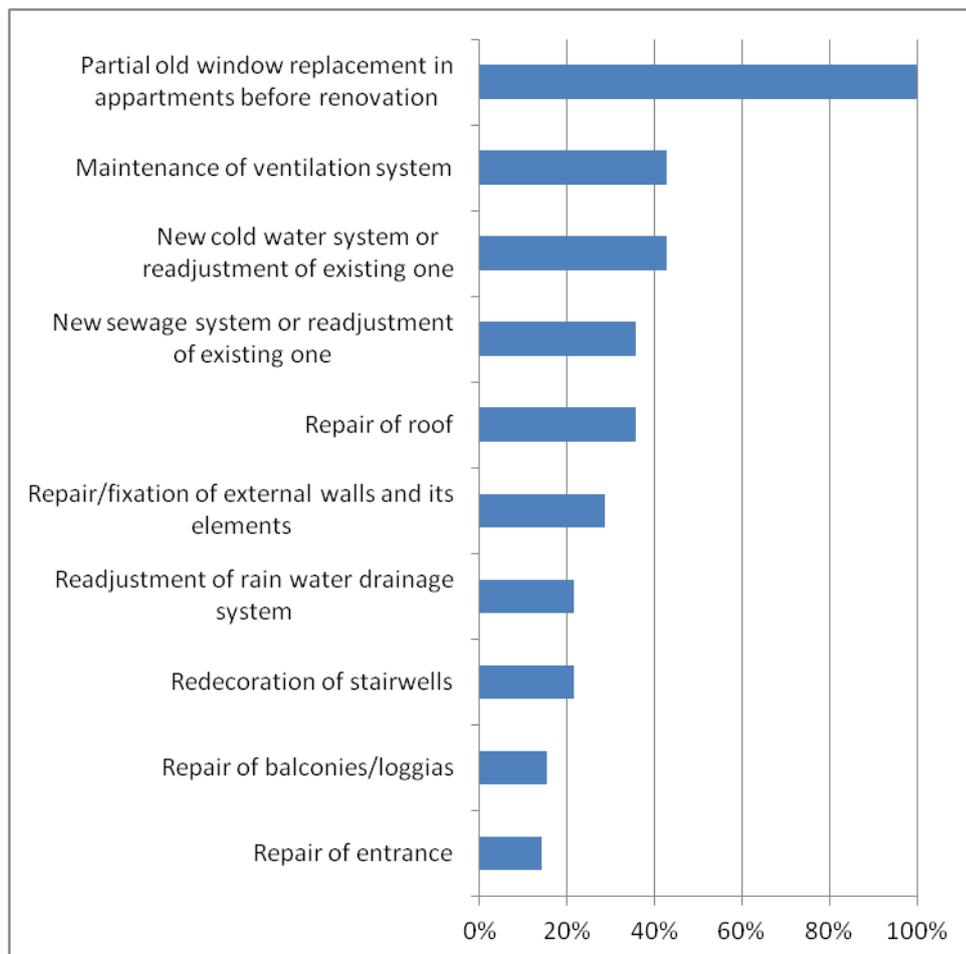


Figure 5.1 – Most Common Measures Performed Before Building Renovation

One of the most common measures introduced is partial window replacement in the apartments – new windows replacing old wooden windows (see Figure 5.1). Partial new

window instalment in the apartments had been performed in all surveyed buildings³. In most cases part of the windows of the whole building was replaced; however, there are cases when all windows of the building have been replaced, including windows of the stairwells. That is because there was a situation where the local government has supported replacement of all windows of the building. But in other cases it was done because building residents agreed to perform such a measure.

Widespread partial window replacement before renovation can be explained by the fact that this measure is the simplest one. Also, consent of other apartment owners is not necessary to change windows.

The second most commonly performed measure is maintenance of the ventilation system, which has been performed in 6 out of 14 cases or 43%. Nevertheless, when speaking about maintenance of ventilation, house elders are not quite sure how well it is performed, as well as it might have been merely an inspection of the ventilation system. There has been a case where maintenance of the ventilation system was performed by each apartment separately. The reason for unawareness of residents about maintenance of the ventilation system is the fact that this duty is performed by the maintenance company, and it is not a measure required by the residents. Results of this measure are also not that visible, because, in most cases, the ventilation does not work as well as it should work, and residents of the building have gotten used to it resolving the problem by opening windows. Also, the fact should be taken into account that this work is carried out by employees of the maintenance company who are not always interested in performing the work in good quality. Consequently, situations occur when residents are unaware of the quality of the work performed.

The next most frequent measure is installation of new cold water system or readjustment of the current one. This measure has been implemented in 43% of the surveyed buildings.

One of the least common measures is repair of the entrance unit (14% of cases). It could be explained by the fact that in most cases residents do not pay attention to appearance of the building, because their apartment is in the focus and not the building in general (also the reason why redecoration of stairwells are not performed more often). Another reason might be the fact that residents wish to resolve other more crucial issues of the building, such as roof and engineering communications of the building. A little more frequently (in 15% of buildings) repair of balconies/loggias has been carried out⁴. That could be explained by the fact that balconies/loggias belong to apartments, and owners perform repairs at their own expense, and consent of others is not necessary to carry out these measures. However, it has not been implemented in a lot of houses, because it is not the most crucial of measures, and residents are probably satisfied with the current condition of balconies/loggias, and are unaware of the threat posed by an unrepaired balcony.

In general, the most crucial and necessary measures have been gradually implemented in the non-renovated buildings. The reason might be the fact that residents of the building try to gain as much benefit as possible from their own resources accrued for repairs of the building – the one that could be enjoyed by all residents of the building, as well as to resolve

³ In respect of those buildings, which were not surveyed, but information was obtained in a different manner, such as using Google maps tool, and energy audits of the building, it was also observed that partial window replacement in the apartments has been performed.

⁴ Only those buildings are taken into account, which have balconies/loggias.

the most important issues inherent in the building. It has been observed that some of the measures (re-decoration of the stairwells) have been implemented in the building gradually and not all at once, which can be explained by available amount of resources that do not allow implementing the specific measure in the whole building at once.

Besides the abovementioned measures, other energy efficiency and non-energy efficiency measures have been implemented in the buildings. Specific areas can be mentioned as an example – insulation of the end walls, attic, pipelines, window replacement in the stairwells, or entrance door replacement. One of the non-energy efficiency measures is change of an elevator engine. Consequently, it can be safely said that residents try to maintain the building; however, they do not have enough resources to implement all measures at once. Therefore, only the most crucial and necessary ones are implemented to maintain the building in as good condition as possible.

5.2 Planning Renovation

When the change of heart has occurred and internal and external obstacles are overcome next stage is planning the renovation. Residents still have a lot of confusion what exactly is renovation – minor maintenance work, insulation of external walls, comprehensive renovation, or something else? This subchapter also shows the motivation of residents to go ahead with the renovation (the condition of the building, available co-funding, positive experience of others, concerns about the environment). Role of the house elder, maintenance company, municipality and government during the renovation process are described in more detail.

5.2.1 In General – Needs to Be Renovated

In all buildings where residents were interviewed or took part in discussions the residents approached told that, in general, they are informed about the possibility and the need to renovate the multi-family buildings built in the Soviet era. Information has allegedly been published in both national media and local newspapers, where majority of municipalities inform their residents about the opportunity to renovate the buildings and obtain co-funding of the European Union. One respondent says that she had heard about the idea to renovate the building for the first time 10 years ago already. Although the residents are informed, not always they agree with this information or trust it. If the information about renovation is obtained from media, the attitude is frequently negative, because media publish mostly scoops about failures.

*"Some say that it is not effective, it will not work,
after a while the mould appear again and so...
Have read somewhere online."*

Respondent, Zemgale region

Respondents say that they are at loss to understand whether some minor maintenance work on the building, insulation of external walls, comprehensive renovation, or something else is contemplated there. There is a lot of confusion in the buildings which were not yet

renovated during the research or which had applied for this process, because the surrounding examples of renovation of other buildings offer so many versions what exactly the renovation is. Even in the buildings where renovation is carried out the residents are not always certain whether what was done on the building can be called renovation. Subsequently, the residents are of an opinion that they are sufficiently informed about the general necessity to renovate the building; however, they confess about confusion what exactly it means.

5.2.2 Reasons for Renovating – Perspective of the Residents

Residents mention various reasons (along with understanding of the condition of the building), why they have began to seriously consider and finally agreed to renovation. Most common reasons are the available co-funding (both from the European Union and from the local government), positive experience of others, concerns about the environment, and other.

One of the most significant reasons why the residents consider the renovation possible (and why, in the opinion of the residents, it was performed in the renovated buildings) is the available co-funding. Both the residents and the house elders mention that attraction of the co-funding is a huge bonus. Its scope is also significant, it is mentioned that the co-funding of 25% is considered insufficient, and then the residents will not support the renovation. The residents are informed about the co-funding offered by the structural funds of the European Union, and consider it the main reason for renovation. Co-funding proposed by the local government is also highly appreciated, for instance, in performing preparatory works for renovation (such as energy audit, technical survey etc.). A couple of municipalities offer considerably higher co-funding; however, it is used comparatively less frequently. Consequently, the residents consider the main precondition and motivation for renovation to be the available co-funding of the European Union (and that of the local government in some places).

Positive experience of other buildings may encourage residents of the not yet renovated building to consider launching the initiative. For example, one of the residents of a corner apartment in a not yet renovated building, battling cold and seeing daughter's experience, has allegedly begun negotiations with other residents of the building about possible renovation. Residents of the renovated buildings tell that example of other buildings, especially if they are in a close vicinity, often serve as illustration of what can be done by renovating the building. Consequently, the already renovated buildings can motivate residents of other buildings to commence renovation of their own building.

A trend shows that the house elders in particular, unlike other residents, mention concern about the environment in the context of climate change as well, upon speaking about initiative of the renovation.

*"If we do not loose and do not win anything.
At least it will be better for people!"*

Respondent, Zemgale region

It does not mean though that there is no broader perspective to renovation among residents as well – an opinion repeatedly surfaces among the residents that the peers, neighbours and the whole city will gain after renovation of their building. Consequently, the higher benefit of renovation is not only benefit to the specific building, but also can be seen as a benefit on the local scale (block, city). But benefit of renovation is not perceived in terms of the climate change.

5.2.3 Role of the House Elder

In majority of cases the house elder or the resident elected to be the house elder after the idea of renovation is raised is the initiator of renovation. House elders are not only internal leaders of their building, but almost in all cases their regular occupation on daily basis requires leadership skills – they are people who are sales representatives, personality coaches, former army officers and similar. Residents repeatedly mention that the house elder has applied for the position voluntarily and until then they had not have house elder at all. In cities, where the position of a house elder is vacant, renovations occur relatively less frequently than in other cities. Furthermore, in the buildings, which are being renovated in these cities, somebody has assumed duties of the house elder. Consequently, the house elder is often a voluntary position, to which they appoint the resident with a high self-motivation and relevant skills, who is usually the main initiator of renovation as well.

Although the house elder mainly performs his duties alone, the house elder often has at least one more resident (oftentimes the spouse, friend) available or sometimes even a team of residents who support the house elder and assume part of the responsibility. Sometimes, upon establishing an association of the building and appointing a management board, the formal status of the house elder and its members evolves to house elder as the chairman of the management board, and other active residents become members of the management board. The house elder and the chairman of the management board (just like the active residents and board members) are used as synonyms of interviews without discerning differences in duties, functions, and informal status. Consequently, the house elder mainly acts alone; however, sometimes a couple other residents of the building help him.

One of the main duties of the house elder is to notify the residents. In resolving on renovation the awareness of the necessity to renovate one's own building and how it will happen plays much more crucial role than general awareness (through media etc.) of the "general necessity to renovate". Such information, for the most part, is supplied by house elders, who approach each resident and explains both individual and common necessity for renovation of the building. House elders of the renovated buildings say that it has been a voluminous and time-consuming process – to tell each and every resident what exactly is wrong with the building and how it can be resolved.

House elder is the one from whom the residents expect more information, and they trust the words of the house elder. If the house elder does not offer complete, detailed information to the residents during the planning period, then negative attitude towards renovation on the part of residents is observed. For example, one house elder did not procure residents access to the renovation contract – residents interpreted it as concealment of information, possibly fraud. The house elder explained his behaviour as being for the benefit of the residents or the process – to spare them from confusing and controversial information delaying the process. Even though the renovation process is completed some time ago, the feeling of mistrust lingers.

Majority of house elders provide residents with information at regular meetings. They are held both at the time when decisions are to be made and when residents need to be kept updated about the course of the process – current and pending. House elders often stick to two most common strategies: both organize meetings and try to convince the residents individually. The residents are individually informed about potential benefits of renovation topical for them. It is usually done during the state before voting for renovation. Several house elders also use e-mail for communication with the residents; however, it is allegedly not possible with all residents.

In the buildings where there is no house elder (it happens only in buildings which are not renovated), this function is partially performed by the maintenance company. However, since the maintenance company mainly use surveys for communication with the residents and do not meet with them in real life, the decisions are made based on the collected data. In case of complicated and crucial decisions (for example, the decision on renovation) the residents assess this approach as failure.

Although management of the building might be completely entrusted to and assigned to the maintenance company, the buildings with an active house elder closely follow costs of the maintenance company, requesting estimates, and sometimes requesting explanation of expenses. The respondents tell that service fees are often not correspondent to the work, non-performed works and/or non-existent debts appear in the bills. The fee for management services may vary depending on the service provider, and quality of the services may be just as different. One respondent said that relationship with the manager reminds of a market and haggling takes place to reduce the price and expand the range of services. Often insignificant works in maintaining the building (such as replacement of light bulbs) are performed by the house elder or residents themselves knowing that it is cheaper and simpler. In part of the buildings maintenance of the building is carried out without the maintenance company, by hiring instead individual service providers required. For example, a cleaner and/or street sweeper is often hired, as well as an electrician, if necessary, and other handymen. It allows procuring the costs to be conformant to the service received. There are cases when before the renovation house elders' act with support of the maintenance company or other service provider, who informs them, and then the house elder, in their turn, communicate to other residents of the building. Consequently, house elders monitor quality and costs of maintenance work, sometimes carrying such works themselves in order to avoid surcharges or opting to hire independent service providers.

5.2.4 Role of the Municipality and the Government

Administration of the local government may have serious impact on attitude of people towards necessity of renovation or condition of buildings. Occasionally, respondents mentioned that meetings or seminars for house elders are not organized; moreover people are not informed about possibilities of co-funding of the European Union. In such municipalities house elders note that they lack resources and knowledge for development of renovation projects and raising of the co-funding, as well as it is difficult to convince the residents, because there are no responses to their queries. Furthermore, they tell that other municipalities are much more accommodating and active which makes one realize passivity of one's own municipality even clearer. Actions of the local government in its own interests and not in the interests of residents are repeatedly mentioned as an obstacle to the renovation in various regions.

"We have had a situation when the new house elder took over, he wanted to look at the balance sheet of the year where some 6,000 appear that repairs of the staircase have been carried out, whereas the staircase is the same what as it was; when he began investigating he discovered that some gentleman from the maintenance company had decoration of his own apartment done."

Respondent, Zemgale region

Residents mention incidents when the municipality denies guarantee (at time when it still could have done) or otherwise impedes the renovation, thus securing revenues for themselves or companies (for example, maintenance or heat supply companies), which belong to the municipality or their affiliated individuals.

Seminars organized by the municipalities and the LIAA have garnered positive feedback where information is provided about management, renovation of the building and possibilities to raise funding. House elders appreciate both the provided information in general and, specifically, various examples provided by LIAA about experience with renovation elsewhere. Often these events organized by LIAA and municipalities are the first place where the house elders have come across information about renovation. The only criticism is that the seminars are allegedly held on weekdays and during working hours; therefore, those house elders who are not pensioners or unemployed often are not able to join them at all or as they consider necessary. In general, support of the agencies, information, and practical examples provided by them regarding the renovation process are highly appreciated.

Most respondents maintain that they are concerned about the climate change that has occurred as a result of global warming; nevertheless, they subsequently elaborate that prevention is in the hands of the government, European Union, or "big countries". Part of the respondents notes that even on the national level Latvia does not leave negative footprint on the environment, because it allegedly is a small country, and therefore this issue is not the one to be focused on. On the individual level most respondents state that their own action have insignificant impact on the environment and do not damage the overall situation. On the other hand, energy efficient and other environmental-friendly activities are implemented if they can result in saving money. Consequently, although the respondents are of the opinion that the issue of climate change is important, they do not consider themselves able to have some impact on it, and implement the energy efficiency practice for the sake of saving money.

5.3 Implementing Renovation

When renovation has been designed (works planned, the project has been submitted) then house proceeds to the next stage in the renovation process – implementing. Here residents face construction processes and bank terms. Both the positive and negative experiences are mentioned.

5.3.1 What is Renovation?

Residents have different definitions of the renovation – they define both mere insulation and window replacement, and comprehensive renovation as such. Those residents whose houses have actually been comprehensively renovated often are aware and emphasize that series of serious repairs have been performed.

Interviewer: "Were people accommodating?"

Respondent: "Yes, but only at the time when you explain to them what the renovation means because majority of people thought that it is simply insulating the façade."

Respondent, Vidzeme region

5.3.2 House Elder

Majority of house elders assume unofficial role of a construction supervisor during the renovation, because they quickly understand that the employees are not qualified, the actual construction supervisor is virtually not present and/or works negligently.

"I came to observe and see that railings are not painted.

I asked the girls why it has not been done, and they replied that nobody had given orders, and it is not included in the project either. I said, wait, the repair of the stairway is included in the project, and you want to tell me that it is not included in the repairs?"

Respondent, Vidzeme region

Thus, renovation of the building becomes a full-time job for the house elder, because only by constantly watching over the workers one can ensure that the promised works are performed, moreover – in good quality.

Trust of residents in the course of renovation is won by availability of information during the renovation. One respondent mentions that during the renovation she could not influence flow of information – she did not receive responses to her queries, furthermore, neither contracts nor estimates were available, and the house elder did not take her opinion into account and did not refute her concerns. Sometimes it was impossible to find accurate information in the reports about the process of renovation and works performed.

5.3.3 Construction Companies

Nonqualified employees are the most common problem during the renovation works. Residents repeatedly mention that the construction company, upon subcontracting, hire people without any qualification in construction. Sometimes because the subcontractor is unable to find builders, other times – because the subcontractors have not been paid, and they refuse to proceed with works, the renovation process drags significantly longer.

Also, during interviews and discussion use of poor quality building materials are mentioned. Sometimes the house elder discovers that upon supervising the construction, other times it is noticed by the residents.

"The craziest for us was a firm which laid tin on windowsills and roof, once, when they repaired our balcony specifically I simply exploded because I simply could not stand the quality of work."

Respondent, Zemgale region

Sometimes there are situations when the construction companies begin to work, receive remuneration and then disappear without completing the work. For example, at one renovated building the construction company disappeared right after receiving money, without completing the works. As a result, the residents were forced to take another loan. These residents look back at the renovation as a complicated and heavy experience.

"That firm of ours disappeared. It allegedly went bankrupt. [Another firm] from Jelgava completed for us. The overall process was very, very difficult."

Respondent, Zemgale region

Often in such cases there is nobody responsible afterwards, because the companies are either not found or have gone bankrupt, and owners have already incorporated new companies. Residents mention that much distress is also caused by the fact that in such situations LIAA claims liability from the residents. In some building the residents were cheated several times; however, to avoid sanctions of LIAA, during the research, they were trying to complete the construction works all by themselves.

5.3.4 Construction

During the renovation works residents face inconveniences; however, everybody characterizes them as minor. Sometimes residents of the building mention pollution of the surrounding environment with construction waste as an obstruction. On the other hand, in cases when construction companies have operated cleanly, residents remember that and evaluate positively.

There are times when residents who have already done repairs in their apartments face problems. For example, in case risers are changed interference of builders in some apartments is more serious than in others, because the shafts of risers may be covered with tiles or changed in a different way upon decorating the bathroom. Even though the damage can be remedied, the process may inconvenience. Furthermore, sometimes windows of an apartment are replaced rather recently; however, since they have not been conformant to building standards or have been installed in poor quality they had to be changed as well.

Residents are dissatisfied with that because they think that they are forced to spend extra money on repeated window replacement which, in their opinion, were still good.

5.3.5 Implemented Measures

A total of 19 renovated buildings were surveyed during the research. Questions have been asked to representatives (mostly house elders) of the building about energy efficiency measures implemented and structural measures of the building. The set of measures, which were a subject of inquiries for representatives, involved both well-known measures such as insulation of external walls, window replacement, repair of the roof, and less known measures, such as development of an energy monitoring system, use of renewable energy sources, and complete change of radiators.

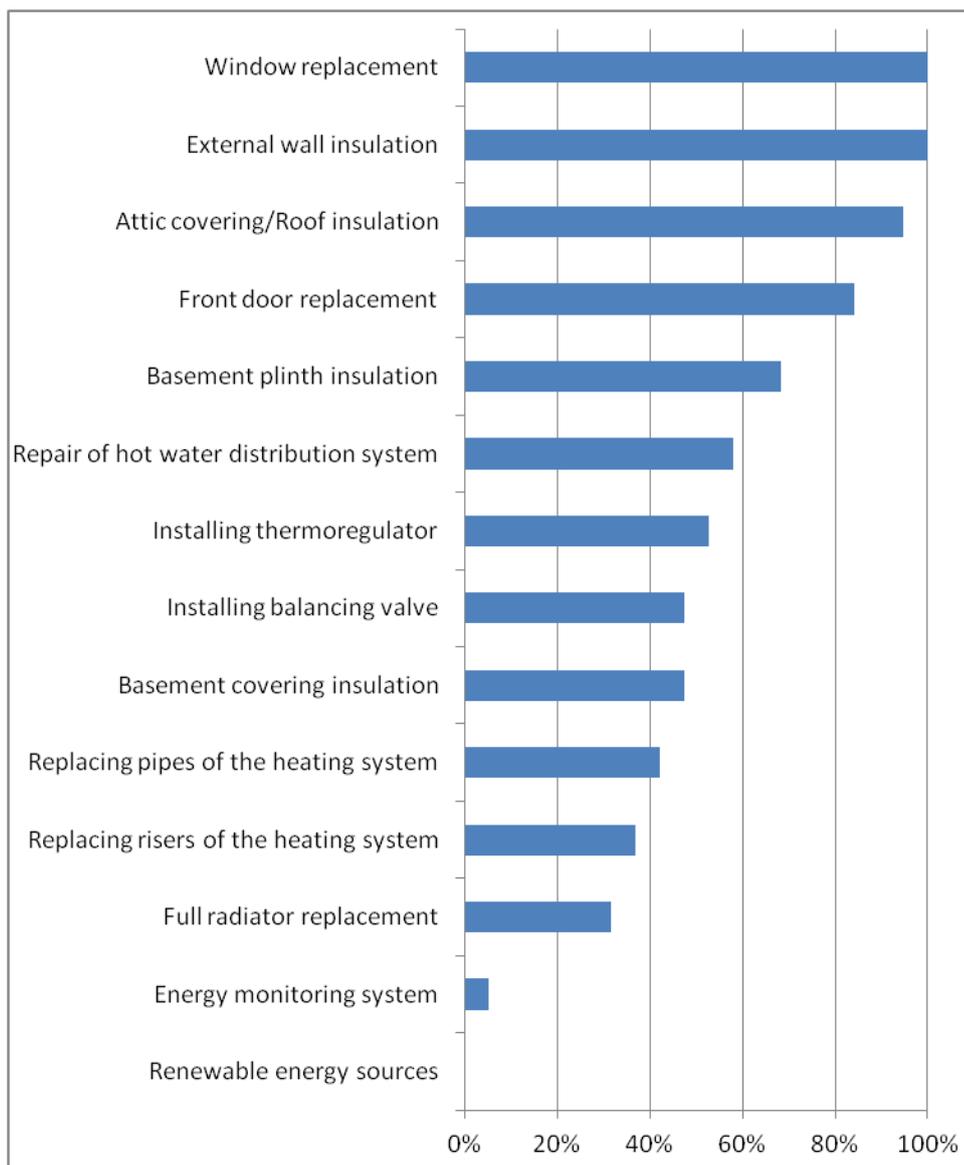


Figure 5.2 – Energy Efficiency Measures Implemented in Surveyed Buildings

Most common measures implemented in the renovated buildings are insulation of external walls and window replacement (in all surveyed buildings) (see Figure 5.2). The second most

frequent measure is insulation of attic covering/roof (95% of the buildings surveyed during the research). These are among the most widespread energy efficiency measures performed at the buildings. Upon comparing these data with data of the non-renovated buildings, it may be said that part of the windows has been replaced in the building before renovation; however, since there are cases when these windows may not conform to the current standards, they can be changed once more during renovation. Consequently, it can be concluded that windows of the buildings have been replaced during renovation – both the old wooden windows for new plastic windows, and previously installed plastic windows for new more energy efficient plastic windows. Before renovation there are buildings, where only the end walls are insulated; however, upon comparing these data with data of renovated buildings, it is evident that all external walls are insulated during the renovation, thus reducing loss of heat in the building. There are buildings where attic has been insulated before renovation; nevertheless, most of the buildings have implemented this measure during the renovation. Consequently, it can be concluded that all three measures are implemented during the renovation.

Renewable energy sources (RES) are not used in any of the surveyed buildings, and only in 5% of the surveyed buildings energy monitoring system has been installed. Full radiator replacement has been performed in a higher number or 32% of the buildings. The low frequency of implementation of these measures can be explained by the fact that the residents carry out renovation for the purpose to improve the current condition of the building, and not to mitigate impact of the building on the environment. This goes in hand with the findings described before – concern about the environment is not the main motivation to renovate the MFB. Another reason could be that energy monitoring system and renewable energy sources, are not a common solution, and therefore are not introduced in many buildings. Besides that installation of renewable energy sources requires space, which most buildings may not have. It can also be explained by the fact that people, probably, do not see necessity for these systems.

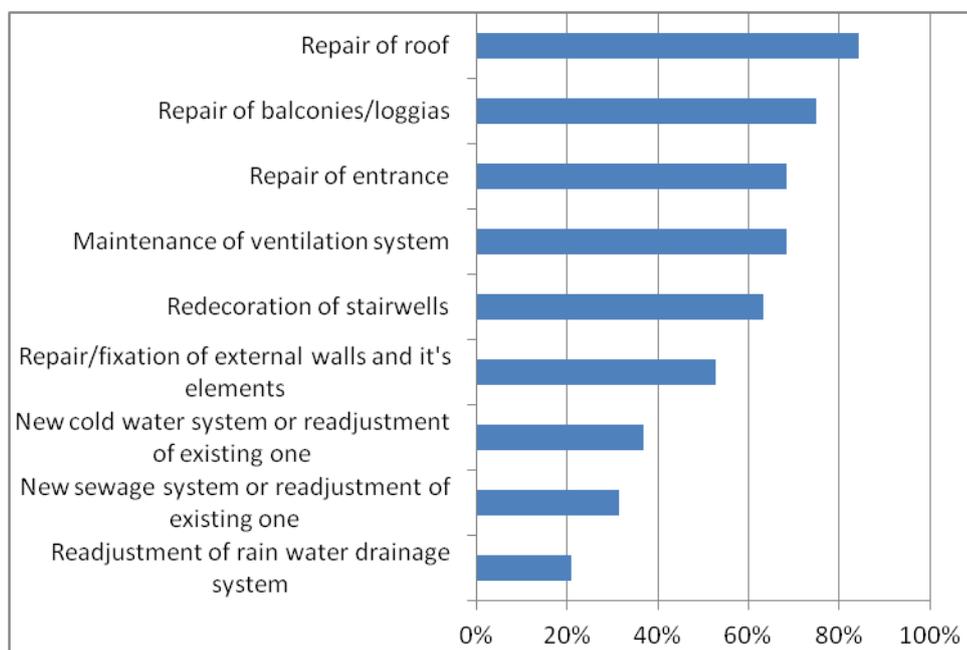


Figure 5.3 – Structural Measures Implemented in the Surveyed Buildings

Upon reviewing structural measures implemented at the renovated buildings, it can be seen that the most common measure is repair of the roof (84% of the surveyed buildings) and repair of balconies/loggias (75% of the surveyed buildings) (see Figure 5.3).

Repair of the roof and repair of balconies/loggias were also common measures before renovation of the building; consequently, it can be inferred that part of the renovated buildings had already carried out these measures before renovation. But in most cases both measures could have been implemented during the renovation because before renovation these measures have been implemented less frequently. It should be noted that repair of balconies/loggias before renovation, might be implemented only partly but during the renovation project this measure is implemented completely.

A specific situation is seen with the maintenance of the ventilation system. Residents of the renovated buildings point out that measure has been implemented during the renovation project but residents of non-renovated houses have pointed out that this measure has been implemented there as well. In part of the buildings maintenance of the ventilation was done also after the renovation; one respondent even noted that maintenance of the ventilation is performed on annual basis. It can be concluded that maintenance of the ventilation system is performed more than once; however, this is not the case in all buildings (renovated or non-renovated).

Repair of entrance unit is one of the most common measure in the renovated houses and upon comparing this situation with the situation in non-renovated buildings, it can be inferred that repairs of the entrance units have in most cases been implemented during renovation. However, there is also a case where this measure has been implemented after renovation of the building, and such situation might be common in other buildings as well. It shows that even after renovation residents continue to improve their building by implementing small additional measures.

The least common measures are readjustment of rain water drainage system (21% of the surveyed buildings) and installation of a new sewerage system, or readjustment of the current sewerage system (32% of the surveyed buildings). Both these measures are implemented less frequently also before renovation. Consequently, it can be inferred that these measures are not implemented in the buildings during the renovation, or are implemented very rarely. The reason might be the fact that these systems usually operate at a satisfactory level and it is not necessary to include them in the renovation project. Another reason might be saving the money by implementing only the most necessary and crucial measures within the scope of the project.

5.3.6 Banking Rules

Loans for renovation of a building have been granted by three prominent banks in Latvia: JSC "SEB Banka", JSC "Swedbank", and JSC „DNB Banka”. There have been cases, when residents of the building or maintenance companies have funded renovation project themselves. Out of 17 surveyed buildings⁵, this has been done in 29% or 5 buildings. However, in all these cases the heated floor area of these 5 buildings has been less than 800 m² ⁶. That might imply that in the buildings with bigger heated floor area residents are unable to provide

⁵ At two of the surveyed buildings no information about bank contracts was available.

⁶ There is also a case where a building with area less than 800m² used a bank loan.

financing on their own, and other means of financing are to be used. Another probability is that banks often refuse to provide funding for renovation of small buildings, because they consider it a high risk or not feasible. Out of the remaining buildings, which received bank loans, 8 buildings (67% of the buildings who borrowed from the banks) had a guarantee of the maintenance company or a security for the loan. The maintenance company is deemed to be a stable and trustworthy client, and therefore the maintenance company receives a loan for renovation at lower interest rates. Also, the maintenance company may help reduce unfavourable conditions for residents of the buildings, such as penalties for early repayment of the loan.

As regards the number of owners, who had to make a positive decision regarding renovation or increase of the management fee to repay loan facilities, two scenarios are observed. In 75% of cases this number of owners had to be equal or more than 70% of the total number of apartment owners of the building. Nevertheless, in three cases this required number of owners has been less (from 50% + 1 vote to 55%). In majority of cases it can be explained by the fact that the banks wish to cover against non-payment risk; consequently, instead of the number established by law (50% + 1 vote), they require a higher proportion. The banks or the maintenance company may also establish payment discipline to be followed by residents of the building. In two of the studied cases it is established that a debt for utility services may not exceed a certain level (from 12% to 15%). In other cases (6 buildings) it is stipulated that compliance with the payment discipline has to be 85%. Through such requirement both the maintenance company and the bank ensure that the granted loan will be repaid, and only the buildings that can afford to assume loan commitments receive the loan. Another condition set by the bank may be an advance payment, through which it ensures that the bank will recover the funds in case of default. However, it is established only in 25% of the surveyed buildings. In two out of three cases it has been for the buildings where there was no maintenance companies' guarantee. Consequently, the bank ensures additional security for the loan granted.

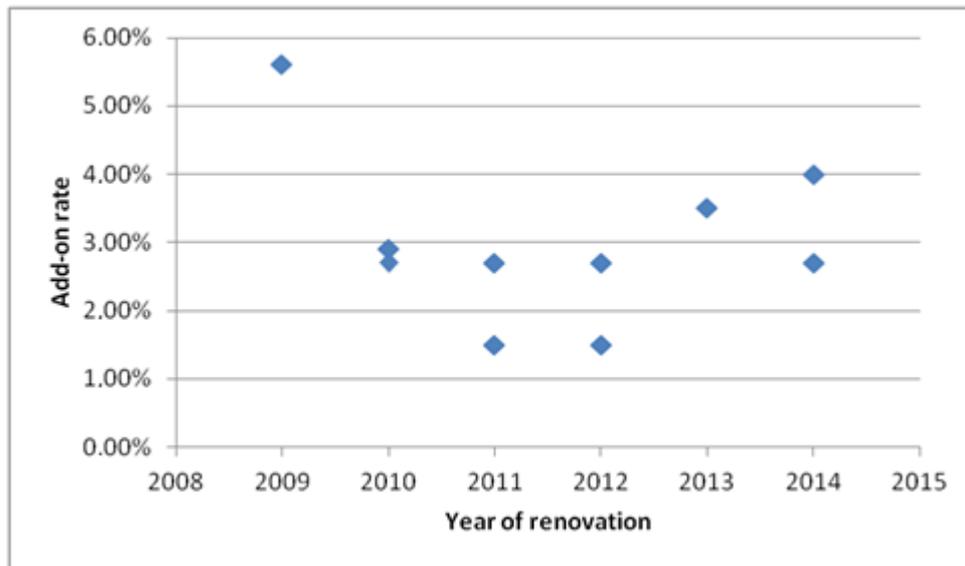


Figure 5.4 – Fluctuations of the Add-on Rates on the Loans in Time⁷

In the majority or 91% of cases⁸ the loan is granted with variable interest rate. Base rate is usually 12-months' RIGIBOR or 3-6 months' EURIBOR. On the other hand, the add-on rate ranges between 1.5 and 5.6% (see Figure 5.4). One of the first buildings in Latvia and the first renovated building out of all buildings surveyed during the research has a steep rate – 5.6%. However, thanks to a higher demand for renovation projects the add-on interest rate of the loans is gradually dropping, and has reached between 1.5 and 2.7%. However, in recent years the loan interest rates are slowly rising again. This situation can be explained by lack of clarity about the terms for use of subsequent resources of the European Union structural funds and possible timeline when these resources can be appropriated at that time. Consequently, a higher risk occurs, and the banks increase this rate. It also should be noted that research reflects the overall situation and cannot be used to explain the situation in great detail.

Banks prescribe contractual penalties in their contracts. One of them is default interest on overdue payments, whereas the other is related to early repayment of the loan. In 42% of the surveyed buildings a contractual penalty is set forth for overdue payments. This contractual penalty ranges between 5% and 36% of the outstanding payment or amount of the loan. On the other hand, in 33% of cases there are conditions in the event that the loan is repaid before the maturity date. In such cases the default interest ranges between 0.5% and 2% of the amount repaid earlier, whereas in one of the surveyed cases there was a default interest of 2% if the amount is repaid by a loan granted by another bank. Both these clauses show that the bank has a certain maturity date when its loan has to be repaid, though it is not always favorable for the residents.

⁷ It also should be noted that research reflects the overall situation and cannot be used to explain the situation in great detail.

⁸ In one of the surveyed buildings representatives did not want to disclose amount of the interest rate on the loan.

5.4 Life in a Renovated Building

Finally after implementation stage residents live in their renovated building. In this subchapter benefits and drawbacks that residents notice while living in the renovated building are described. Emphasis is also put on the habits of the residents and how they are adapting to energy efficient life, and what energy savings they have achieved.

5.4.1 Benefits

The majority of respondents, in general, are satisfied with the result of renovation. Respondents tell that the biggest gain from renovation is a warmer house and reduced costs. Furthermore, improved ventilation system and aesthetic appearance of the building and improvement of social environment are most often mentioned among benefits.

Community of the Building

Part of the residents also name shared care about the building as a benefit. Often, the renovation project specifically brings people together and makes them think of the building as a shared responsibility. Many respondents in the renovated buildings, speaking of the house, use such words as “we” and “us” in their speech. Active residents also show initiative in subsequent works on improvement of the joint property – the building.

Heating

Heat as a benefit of renovation is mentioned both individually and when speaking about benefits of the whole building and neighbours. On the individual level residents appreciate the possibility to regulate radiators. After renovation the building without heating is warm even in late autumn. Likewise, the residents mention that in spring, upon switching off the heating, they have not felt discomfort or cold, as was the issue before renovation. Speaking of neighbours, the most commonly mentioned are benefits felt by people in the apartments, which were problematic before the renovation – apartments on the ground and upper floors of the building, as well as corner apartments.

"In the beginning only basement ceiling was insulated, which is the floor of the ground floor: Before the New Year's Eve telephone started ringing, people were saying thank you, that they had never been so warm in their apartment, even though the façade was not even insulated yet. Afterwards, when we insulated the wall and the technical floor of the building, then the fifth floor also started saying it is warmer for them."

Respondent, Vidzeme region

Residents of apartments in the middle either mention that heat penetrates through the walls and see an individual benefit in it – possibility not to switch on radiators – or tell that they do not feel any particular difference, because it was rather warm before as well. Such opinion is especially common in cases when improvements had already been performed in the apartment before renovation, such as windows have been replaced.

Aesthetics

First impressions of many residents about the building after renovation are related out appearance of the building. Respondents name the building fitting in the environment, external decoration of the building, colour and decorated attic, basement and stairwell among the benefits.

“Aesthetic culture improves in the city where houses are so beautifully restored [..]”

Respondent, Latgale region

It serves as one of the main reasons why residents are satisfied with renovation. Furthermore, the residents mention that the building has become comfortable in terms of access – either entrances are fitted for disabled people, or it is more convenient to access with a pram or a bicycle.

Value of the apartment

In response of the queries whether they consider the value of the renovated buildings higher, all respondents respond affirmatively, that it is definitely higher. Some respondents also themselves mentioned increase in the value of the apartment as an individual gain. Some state that people are more interested in buying apartments in renovated buildings. Majority of respondents are of an opinion that value of the apartment and interest of others has increased due to several factors. The improved heat supply system and the opportunity of saving, as well as window replacement, decorated common areas (stairwells, basements etc.) and improvements in appearance of the building are mainly mentioned.

Payments

Possibility of economy is one of the key positive aspects and individual benefits of the renovation. Residents report that they are satisfied, if economy is obvious in the monthly bills. Sometimes respondents mention that initially they have been against the renovation, whereas the result (warmth of the building and economy) has made them to change mind. For majority of residents the loan amount was included in the monthly payments. Majority of residents tell that heat consumption has diminished; however, since the loan needs to be repaid, they currently do not feel the financial economy. The opportunity to repay the loan earlier provided by the banks is valued positively; some residents have used it by investing their savings. Consequently, lower payments are the main benefit of the renovation, which may change opinion of more negatively disposed residents in favour of the renovation.

5.4.2 Negative Aspects

Experience with the renovation and outcomes are not only positive in a big portion of buildings. Alongside benefits respondents in the research speak about defects that have occurred during renovation and have not been successfully eliminated. Insufficient support from the government and municipality is also mentioned. Although in majority of cases the whole building has physical defects, nevertheless after the renovation residents often attribute these problems to themselves individually as well.

Division of Responsibility

A majority of the house elders mentioned their disappointment in the abysmal little involvement of the government and municipality in the renovation process. They mention that liability of residents for the renovation is disproportionately high, whereas that of the government and municipality – insufficient. Lack of shared responsibility is often felt in the buildings, where problems have occurred in the course of renovation and people were at loss how to proceed further.

"I think that the government should assume responsibility [for renovation]. [...] However, in reality everything is placed on the shoulders of ordinary people. And I for one now battle the consequences as the house elder and chair of the association."

Respondent, Zemgale region

Quality of the Construction Works

In many buildings respondents disclose that physical defects are present after the renovation – for example, walls falling to ruin, windows installed in poor quality, smells and poor ventilation, as well as still existing temperature differences between apartments in the middle and outer apartments. Respondents believe that for the most part the construction companies are to blame for the defects, because they had hired unqualified workforce or used materials of poor quality in their work. Furthermore, poor performance of the works is attributed to negligence on the part of the construction supervisor – most of the house elders tell that the construction supervisor had rarely supervised the process during the works.

Ventilation and Humidity

In cases when the ventilation system is installed, majority of respondents say that it is inconvenient in operation (the project is not always planned so as to be conveniently operable by the residents) and/or does not operate sufficiently well.

"Before that there was a special material there – if the humidity was too high, it opens, if less – closes, if I wish, during the winter season I can close or open myself at my own discretion. However; now; imagine, for me to open I have to get on a chair to reach each window and open it [...]."

Respondent, Latgale region

One resident of the middle apartment mentions that after insulation of the building it is too hot in her apartment and there is no fresh air even when the radiators are switched off.

In majority of cases ventilation is not installed in the course of renovation, and it causes problems in the building. Respondents mention that the building “does not breathe” and they allegedly have to fight humidity, noise and in some cases even mould. Part of respondents, upon relaying experience of neighbours, mentions that residents do no open windows, and therefore the rooms are insufficiently ventilated.

5.4.3 Energy Efficient Life

It is repeatedly mentioned that residents are unaware right after the renovation how to live in an insulated, renovated building, and go on living according to previous habits. Therefore there have been cases when bills are considerably higher than it was estimated before the renovation – in such cases adjustment takes time. As one of the respondents put it:

*“In the beginning [it is difficult].
However, one adjust in the end”*

Respondent, Zemgale region

Another resident called it “*learning*” (respondent, Zemgale region) when habits are changed based on the trial and error method, while the house elder of one building described it as a process of learning he had to undergo:

“while these people are adjusted”

Respondent, Kurzeme region

For example, in several of the surveyed buildings allocators have been installed; nevertheless, their use often causes problems on day-to-day basis. Since information is missing about correct operation of the system occasionally bills of residents of a single building radically differ.

Attitude towards climate changes after renovation does not change, because the renovation is not perceived as tool for mitigation of the climate change. Energy savings achieved as a result of the renovation are mentioned only in terms of monetary savings. Speaking about saving habits of other residents, respondents often mention pensioners whose financial situation is more difficult; therefore, saving is more inherent in them. Consequently, energy efficient life is mainly related to financial gain.

*“Yes, of course, I save, I also save water.
I also remind my son. For me it is difficult
to pour money into sewerage.”*

Respondent, Vidzeme region

Majority of residents tell that they try to save electricity. For example, by buying energy efficient appliances, not using specific devices (TV, radio, etc.) or unplugging wires of electrical appliances to prevent them from consuming electricity in the stand-by regime. Part of the residents point out that on daily basis they follow electricity consumption on the meters. Another method how residents are saving electricity is lighting and economical or LED bulbs. However, opinions also surface that only a miniscule amount of funds can be saved by the bulbs. In the common areas of the building lighting operating based on sensors is used. Furthermore, house elders mention that when there were no sensors they had to regularly check whether the light is switched off in the common areas (stairwells and basements). Transit to sensor-based lighting is evaluated as an easy solution that allows saving. Consequently, attempts are made to save electricity both individually in the apartment and in the common areas, and strategies of saving are different.

Respondents tell about window replacement as an effective measure to reduce heat consumption. However, in most cases regret is voiced about faulty or non-existent ventilation system. Residents say that since rooms have to be ventilated by opening windows, it becomes an obstacle to reduce heat consumption. Part of respondents voices concerns that other residents do not open windows, and as a result the building “does not breathe” (which allegedly might lead to accrual of moisture and forming of mould), whereas others, who open windows regularly, tell that neighbours reproach for letting the heat out. In the buildings, where the ventilation system is installed, residents are not always certain about its efficiency and say that they open windows to ventilate the rooms anyway. Consequently, window replacement is perceived as an effective measure to reduce heat consumption; however, the reduction is frequently adversely affected or outweighed by non-existent or poorly functioning ventilation system.

Feeling of comfort and also financial capacities are individual for everybody; therefore, residents appreciate an opportunity making it easier to follow calculations and adjust temperature. Part of the residents have a possibility to regulate individual heat consumption by the heat cost distributor or allocator (HCA), which is mostly used actively. In the renovated buildings where heat cost allocators are not installed, one of the ways how to assess heat consumption is to compare one’s own showings and showings of the overall heat consumption of the building. In some cases saving strategies result in those residents who chose to save and not switch the radiators on (applies to empty apartments as well) receive small bills, whereas those who heat are forced to pay more, because other apartments in the building are indirectly heated as well. Irrespective of whether there are heat cost allocators in the building, the overall consumption in the building affects final payments for the most part.

Saving is not always the decisive factor for residents in selecting temperature; subjective sense of comfort is just as important. Sense of comfort is individually different. For example, families with small children often say that they maintain a higher temperature in the apartment than their neighbours do, whereas pensioners are more often those who disregard the personal sense of comfort for the sake of other heating strategy to make monthly payments lower.

"But I, for example, very diligently compare my individual heating bill with the average consumption of the building,

and it is always higher for me, which means that somebody is not heating at all. [...] See, the average of the building is 0.60, I have 0.931, well, I am not going to live in a cold home, but I would not say that I am living in some insane heat. This means that people go to other extremes, they do not heat at all, because that insulation makes some difference then."

Respondent, Zemgale region

"Neighbours have less space, and they are as if squeezed from both sides, it is warmer for them. Our apartment is larger, therefore, initially we set the temperature to almost maximum, and it was still rather cool here. [...] We do not have a corner apartment, if we, roughly estimating, pay 50 euro for heating, then others paid 200 euro. When the common temperature level was raised, other seemed to have more gain as well."

Respondent, Latgale region

5.4.4 Achieved Energy Savings

Heat consumption at 18 buildings has been compared⁹. The average specific heat consumption before renovation is 158 kWh/m² per year in surveyed renovated buildings. After renovation the average specific heat consumption is 83.9 kWh/m² per year in surveyed renovated buildings.

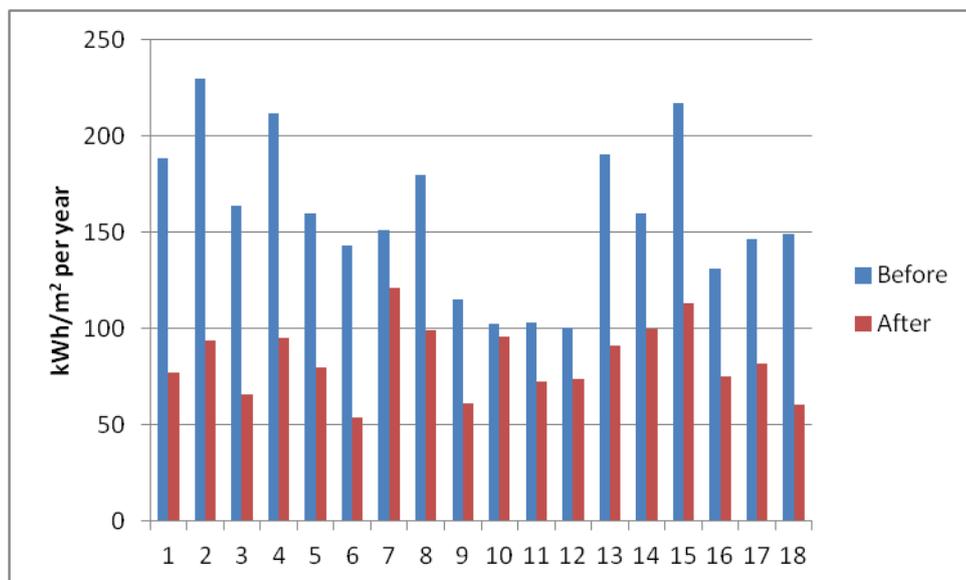


Figure 5.5 – Average Specific Heat Consumption in Renovated Buildings

⁹ It was not possible to obtain heat consumption data about one of the surveyed buildings.

Only 67% of the renovated buildings surveyed achieved consumption less than 90 kWh/m² per year which is the minimum in the current multi-family energy efficiency improvement program by EU funds and is close to the average value (see Figure 5.5).

The difference is not in the measures implemented because there is not a measure that is implemented in buildings with small energy consumption and not in other buildings. So the difference could be in the way how they are implemented. For example, the insulation was not so thick or bad quality works or materials used. Another reason for this could be habits of the building residents; for example, not decreasing the heat and leaving the windows open for long period of time. Yet another reason for this could be the unadjusted heating system. All of these explanations are also noted before.

6 Discussion

During the discussion main findings of the research are summed up. In this chapter the various stages during the renovation process and involved stakeholders are briefly described from the residents point of view. The findings are connected with information from literature.

Discussions moves from one topic to another as it happens with the residents during renovation process. At the beginning there is decision-making – decision-making and community, (rest of the) residents, residents and climate change, and house elders. After that the next stage is planning – planning and preparation, and support (subvention) mechanisms. After planning residents face themselves with processes of a rather difficult implementation stage – construction, implemented measures and financing renovation. The final stage is living in the renovated building – living in a renovated building and achieved energy savings.

6.1 Decision-Making and Community

Even though, in general renovation is perceived as necessary, stories of the house elders how it took months for them to convince the residents imply that at the action level the renovation is not accepted at once. It can be explained by combination of two Latvian cultures: *express orientation towards sustainability* and the abovementioned *uncertainty avoidance*. *Orientation towards sustainability* is characterized by focus on future, dedication, as well as ability to adjust to changes. On the other hand, *uncertainty avoidance* is characterized by necessity to prevent anxiety caused by unclear, insecure situations (The Hofstede Centre 2015). Consequently, even though the renovation, pragmatically speaking, is acknowledged as of great value; nevertheless, it involves uncertainty and insecurity, which makes decision-making very complicated for residents, and therefore may drag for quite a while. Even when the more heated discussions are past, approval of the majority is almost obtained and there is progress to the next stage of decision-making (Fisher 1970), several house elders mention one “resident-saboteur” as an obstacle to reach a common decision. Saboteur’s arguments are mainly emotional, and, when the house elder or experts attempt to refute them, this resident usually chooses not to believe the counterarguments. Furthermore, such resident not only opposes the renovation himself, but also actively tries to convince other residents of the building against it. It often causes enough doubt for part of the residents “to be on the safe side” and not to sign in favour of renovation actively, taking the time. As a result, the decision-making process of the whole building is delayed. Decision-making theories imply that decision-making starts with formation of a community (Pijanowski 2009), which is an opinion promoted by the European Environment Agency in respect to neighbours and their energy efficiency habits (EEA 2013); however, the example of renovation in Latvia shows that formation of a community is rather consequences of common decision-making in case of renovation.

The renovation process mainly begins with identifying and recognizing of common problems among a group of strangers, and not the formation of the community. Differences between residents of renovated and (for the time being) non-renovated buildings should rather not be perceived as “natural”, or that residents of the renovated building were making common

decisions easier and had a tendency to see the big picture of their activities or similar. No objective differences between groups of buildings or communities were identified during the research that would allow somehow weigh them against each other. Difference currently observed between residents of the renovated buildings and residents of the non-renovated buildings should be more specifically explained as consequences of the renovation process, when common goals were set and joint activity was carried out leading to a relatively closer team and formation of community. Consequently, the renovation process serves as a training experience for residents where they learn how to collaborate at the level of their house. That does not mean that no differences definitely exist between various buildings during the pre-renovation stage already; however, the major differences identified in this research are not among the residents. Presence of the house elder, his status, expertise and skills makes all the difference along with availability of support which may manifest in a form of support from the municipality, maintenance company, or another service provider.

Upon applying the community relationship criteria proposed by Paul James and his colleagues (James et al. 2012), before the renovation residents of the building gradually become an “imaginary community” during the decision-making process, which collaborates within the scope of a certain project, trying to achieve a common goal, and only then, upon implementing the renovation and thus successfully accomplishing the task, possibly, become a more stable community, for example, based on interest in preservation of the joint property. At the same time in most cases it is definitely not possible to speak about “natural” community of the residents of a multi-family building which has occurred only because people live in the same building, or, according to the idea of James and his colleagues, residents of the multi-family building are not part of a community rooted in the “land” or territorial reference.

In non-renovated buildings it is difficult to talk about residents of the building as a community, because the residents often do not know each other. Since the residents do not know each other, they also do not believe in others having the same values and future plans as them (Evans et al. 2012), which means that any joint decision-making also is impossible or extremely burdensome. There is no trust in existence of a shared goal; therefore, as Wong and colleagues (Wong, et al. 2011) write, the collaboration fails as well. On the other hand, the residents of renovated houses have already collaborated on a major project before, during which, even if have not gotten acquainted with their neighbours, at least they have verified in practice that everybody has common goals, and reaching of these common goals is possible.

6.2 Residents

The residents not only are strangers to each other, but also they “do not know” their own building – are completely oblivious about its defects or scope. Furthermore, it is frequently complicated to perceive something that does not affect them on daily basis as a pressing problem. Technical-economic research papers used the notions “house” and “home” interchangeably as synonyms; however, researcher Katherine Ellsworth-Krebs and her peers point out that it does preclude from perceiving social aspects and developing social-economic or social-technical strategies for improvement of energy consumption (Ellsworth-Krebs, et al 2015). The same is true in Latvia – when residents of the multi-family buildings built during the Soviet era think about their home, they think about their apartment, and

functional deficiencies inherent in the whole building (house) are not attributable to them on the emotional level.

Results show that the most significant consideration for the residents in resolving about renovation is personal benefit. The residents, who directly suffer from defects of the building before renovation, support the renovation. On the other hand, those residents, who are not personally affected by the defects of the building, do not agree to the renovation or need lengthy persuasion. It is observed that arguments about benefits of the house as a community have less impact. It relates to the cultural context – express individualism in the Latvian society (The Hofstede Centre 2015). It is characterized by caring about one's own goals and those next of kin of his, and not concern about reaching common goals of the group (a house community in the particular case) (Triandis 1995). If the resident and his next of kin do not experience discomfort, then motivation to support the renovation is negligible or non-existent, and benefits of other residents from the renovation is insignificant. Furthermore, in situation when disparagement has occurred between the individual and common goals of the building, the priority in the culture of individualism is always given to one's own goals (Triandi 1995). Consequently, in most cases residents make a decision on renovation irrespective of others. To mitigate this it is crucial to make issues of broader scale and goals more specific (Locke & Latham 2002) and personal – outlining that resolution of the biggest problem will improve the individual's routine life and what specific benefits would be.

Difference between the buildings, where renovation has already occurred, or pending, and the non-renovated buildings, where (at least for the time being) no renovation will be carried out, lies in the fact that the general necessity to renovate the buildings is internalized or attributed to oneself and one's own building. An outstanding difference between residents of renovated buildings and residents of non-renovated buildings lies in the level of information about condition of the building, where residents of the renovated buildings are mainly much more knowledgeable. Consequently, it can be inferred that to renovated the building one of the most crucial steps is to give information about the condition of the building to residents; moreover, accomplishing that the general, large-scale information becomes comprehensible and personalized. That means that it is necessary not only to show the cracks in the walls, for example, but also to explain how this specific defect will affect individual's quality of life.

The largest scale where residents see their actions in respect of the building is a block and sometimes the city. Thus, for example, residents of renovated buildings tend to believe that renovation of their building is a benefit not only for themselves or other residents of the building, but also for the whole block or city (mainly in terms of aesthetics). In order to successfully launch the renovation and encourage more energy efficient life, it is crucial to create understanding that the scale of the problem does not dictate scale of solution. Thus, small-scale actions of an individual or a building may be significant on a large scale. This subsequently facilitates adoption of such decisions, which serve for the whole system in general, and not only symptomatically – individual aspects of the problem. For example, upon shared setting of goals, there is higher chance to reach them (Lunenburg 2011). Thus, the problem with disbelief in existence of shared goals and values is being cured (Triandis 1995), and it no longer hinders the decision-making and collaboration. Setting common goals, which are approved as goals by all residents of the building, allows to believe in possibility of collaboration, and therefore, concurrently make a step towards a community of

the residents of the building and towards introducing more significant changes, where activities of one resident fall short (such as the comprehensive renovation).

6.3 Residents and Climate Change

Climate change reduction is not mentioned as an advantage of renovation, because the renovation is not perceived as a tool for prevention of climate change. Since climate change is a large-scale problem, people automatically tend to think about large-scale solutions. Prevention of climate change as a goal may often seem too high and unsolvable either on the individual level or even on the national level. Although the general public, in general, believes that the climate change is vital problem (EC 2015), while thinking of their own lifestyle, the residents mention that their contribution is sufficient and/or impact of one man on the climate is insignificant (Boardman 2004). The residents do not associate their energy efficiency activities with the climate change, and implement them only as a way to save money. Values of energy efficiency and climate change motivate the related behavior (Schwartz 1999; Shove 2003, quoted by EEA 2013), whereas in the context of Latvia, the climate change is not a value per se. If values of residents included the climate change, it would be possible to introduce and promote energy efficient lifestyle more successfully¹⁰.

6.4 House Elders

House elder is often an initiator of the renovation and able to motivate other residents; furthermore, the role of the house elder is so crucial that without the house elder no renovation is virtually performed. As a leader of his own building the house elder is both an expert and one of their own. This procures that the provided information is perceived better (Burgess 2000).

The house elder is a leader in the renovated buildings; moreover, a collaboration-oriented leadership can be observed, where relationship is built and cooperation is encouraged (Ibarra & Hansen 2011). House elders of renovated buildings cooperate with residents on the basis of mutual trust, making common decisions democratically. In order to convince majority of residents, the house elder has to alleviate even seemingly insignificant concerns of residents, and has to repeatedly explain all contemplated and on-going processes. In cases where the house elder disregards this type of leadership, the residents are dissatisfied not only during the renovation process but also afterwards will most probably mistrust the house elder. Consequently, the cooperation-based leadership provides for fairness in decision-making procedures and it is common knowledge (Bianchi et al. 2015; Bulatova 2015), such model facilitates trust. Such model of leadership and cooperation is often very time-consuming, because it involves an attempt to reach a consensus of at least the majority (Ibarra & Hansen 2011), which is pronounced in making a decision on renovation, where the house elder time and again tries to convince the residents, and the process, for the most part, is complicated and long.

¹⁰ One of the tools to promote the renovation and energy efficient lifestyle could be a social marketing strategy (see Annex 4).

6.5 Renovation Process – Planning and Preparation

Several authors (Isaksson & Ellegard 2014; Bordman 2004), write that awareness about energy consumption issues and climate changes does not evolve into action, for the most part, because it is not clearly communicated by the competent authorities. Subsequently, residents of Latvia also believe that they are informed about the renovation in general and the necessity to renovate the buildings. At the same time, the residents are often confused about contents of the notion “renovation”, which implies lack of a body of criteria of the renovation process that would help the residents to make a better, more informed decision in respect to renovation of the building, and feel more secure both during the renovation and afterwards, while living in a renovated building.

Before the residents face the idea of renovation in their own building, they had usually heard about renovation of building stock in the media. Residents tell that the information available there about renovations is frequently negative. It should be mentioned though that negative information has more power to it, and is remembered better (Ito et al. 1998). On the other hand, the information provided to the residents by the initiator of renovation (usually house elder) and hired experts afterwards, is positive. Difference between this available information consolidate attitude towards renovation as insecure and unclear project. Furthermore, it should be taken into account that, from the cultural perspective, there is a tendency in Latvia to avoid uncertainty (The Hofstede Centre 2015), which means that security is highly valued, whereas it is crucial to prevent unclear and unknown situations. In general, renovated buildings are examples of good practice, where house elders have provided the residents with information honestly and in great detail about the on-going and contemplated processes at all stages of renovation. During the pre-renovation stage it is crucial do to financial commitments, whereas at later stages residents find it important to be informed about the course of construction and outcome. Furthermore, these buildings serve as examples of good practice to other buildings of the same block or city as well, and sometimes motivate residents of other buildings to make a positive decision about renovation. Knowledge of the concerned parties may secure a successful renovation process (Picon et al. 2013), and availability of information or lack of information may both affect the sense of uncertainty (sufficient level of information may mitigate the sense of uncertainty) and help the individuals to understand and recognize possible benefits¹¹. As also demonstrated by researches carried out in Estonia (Ojamae & Paadam 2015), examples of good practice and information about renovation serve as a groundwork of trust in both the process itself and parties involved, as well as in other residents of the building.

6.6 Support (Subvention) Mechanisms

Both the renovated and non-renovated buildings have various support mechanisms – subventions – available and used, which influence feasibility and course of the renovation process. Availability of support is sometimes territory-based, whether the municipality provides any support in performance of renovation in a form of co-funding, guarantee, or information. Sometimes the support is implemented from the resources of the residents of

¹¹ An approach that can be used to find out involved parties is stakeholder analysis (see Annex 5). It finds out the interested parties, their power to influence and how parties interact.

the building themselves, for example, if they know employees of the bank, who offer quicker and more favourable terms of financing, or project managers, who assist with arranging documents. Residents are also of an opinion that sometimes they allegedly have been simply lucky, for example, because they met an accommodating bank clerk. Consequently, possible forms of support are various and related to the location where the particular building is located, as well as social resources of the residents themselves; furthermore, a certain factor of good fortune exists.

The support is very important also at the stage of preparation of the project, which is identified by the house elders as a complicated process. Several strategies are used in implementation: sometimes some personally known project manager (for example, a resident of the building whose professional competences involve project development) has helped, in other case the maintenance company or another renovation service provider assumes this role. However, a hired employee is often contracted, or the house elder is forced to learn, by way of self-education, and apply skills necessary in project development. House elders of the non-renovated buildings, who have tried to implement renovation, while have failed due to complexities in project developed, have almost always tried to do that all on their own. Consequently, the support during the project development stage is a crucial factor for successful launch of the process.

The main form of financial support identified by the residents is the co-funding of the European Union. It is mentioned as a crucial precondition for renovation, because it is allegedly impossible to finance the renovation all by themselves. A guarantee of a loan and its unavailability are mentioned as a significant obstacle of renovation, which has been overcome in the majority of renovated buildings by cooperating with the maintenance company. The residents mention that provision of the guarantee or withdrawal is carried out upon assignment of the municipality; therefore, it also depends on decisions and position of the municipality towards renovation of the buildings.

6.7 Renovation Process – Construction

Respondents often show mistrust in quality and supervision of the construction works, and complaints have been voiced about insufficiently long warranty period. In case when the hired construction supervisor performs his duties negligently, the house elder attempts to supervise quality of the renovation works on his own. However, it is a time-consuming process and not always effective, because the house elder does not possess professional expertise, and it is difficult to notice all omissions. Since construction works performed in a timely manner are one of the preconditions to receive the co-funding, furthermore, the liability for that is placed on the residents themselves, performance of the works in a timely manner and good quality is very important. Underperformance of construction companies (for example, failure to complete the works, delay in performance, deficient performance or even bankruptcy of the company) does not release the residents from the liability to meet the renovation plan. There are known cases when fearing of sanctions of LIAA the residents try to complete the construction works by their own efforts. Furthermore, disproportionately short warranty period after completion of the works is a cause of concern: it is described as insufficient and makes one question the decision about renovation. It can be inferred that the construction works lack consistent, professional supervision and quality criteria.

6.8 Implemented measures

Residents do not have a common view what exactly renovation means. Consequently, it is not quite clear, which measures should be included in the renovation. The measures most commonly implemented in the renovated buildings are insulation of external walls and window replacement, which are performed in all surveyed buildings. The next most commonly implemented measure is insulation of the attic covering/roof. These are one of the most common energy efficiency measures, because more information has been available about these measures and information about these measures has been provided more. Consequently, these measures have been implemented more frequently.

Renewable energy sources are not used in any of the surveyed buildings, and only in very rare cases the energy monitoring system has been installed. Full radiator replacement has been conducted more frequently. The low incidence in implementation of these measures might be explained by the fact that residents perform renovation for the purpose to improve the current condition of the building, and not for the purpose to reduce impact of the building on the environment. Another reason might be the fact that space is necessary to install the renewable energy sources, which the building often lacks. The energy monitoring system is not a common solution, and therefore is not introduced in many buildings. This, conversely, might be due to the fact people, possibly, do not see necessity for such systems. Not all surveyed buildings implemented full radiator replacement because the residents may have not considered it necessary, or have refused to introduce such measure for the sake of saving money, to have enough money for other more necessary measures.

6.9 Financing renovation

A renovation project is usually too expensive to be funded by residents of the building themselves. It has been done only by those buildings, where the heated floor area is less than 800 m². It might imply that in buildings with bigger heated floor area residents are unable to provide funding on their own, and other means of financing need to be used. Another probability is that banks often decline financing of renovation measures in small buildings, because they consider it high risk or unfeasible.

In most cases, the number of owners who have voted positively needs to be equal or higher than 70% of the total number of owners of the building. This condition could be explained by the banks' wish to secure against the risk of non-payment, consequently, instead of the number established by law (50% + 1 vote) the bank sets higher requirements.

Banks or the maintenance company, if the latter has granted a guarantee, may also establish payment discipline to be followed by the residents of the building. In two of the surveyed cases it is established that the debt for utility services may not exceed a certain degree (between 12% and 15%). In other cases it is prescribed that the payment discipline has to be 85%. Through such requirement both the maintenance company and the bank ensure that the granted loan will be repaid, and loans are granted only to the buildings, which can afford to assume debt commitments.

The buildings, which were renovated in the first years, when resources of the EU funds were available, had high add-on interest rate. Nevertheless, thanks to higher demand of renovation projects the add-on rate of the loans were gradually dropping. However, in

recent years the interest rates on loans were slowly rising. Change of the add-on interest rate on the loans can be explained by perspective of the bank to the ongoing processes and risk assessment. Consequently, in the situations, where the bank is not sure, the interest rate on loans is higher, which in case of renovation is unfeasible for residents.

The banks stipulate contractual penalties in the contracts as well. One of them is for overdue payments, whereas the other is related to early repayment of the loan. Both these terms show that the bank has a certain maturity date when its loan has to be repaid. However, it is not always in favour of the residents.

6.10 Living in a Renovated Building

It is observed that there is no unambiguous idea how to live in a renovated building. For example, when speaking about ventilation, some of the residents mention that neighbours are allegedly insufficiently ventilating, whereas somebody else tells that family members and neighbours reprimand when windows are being opened, because they “let the heat out”. Since no effective ventilation system are installed in the majority of buildings, then in order to procure that humidity does not build up in the rooms, thus contributing to mould, residents are forced to open windows and ventilate often. This, conversely, increases heat consumption. It can be inferred that by introducing one solution of energy efficiency (replacing windows to those better insulated), while ignoring others (failing to install ventilation), it is impossible to achieve an optimum outcome.

At the same time, it is possible that the ventilation system is installed and operating in the buildings; however, ventilation habits of the residents and the sense of fresh air have not always changed. Even if the system operates and it can be presumed, from the engineering perspective, that the necessary circulation of air is provided, the habit of residents, for example, to ventilate the rooms once a day may be stronger.

It has to be taken into count that the so called rebound effect may occur after the renovation, which results from belief that everything possible has been done, and therefore it is not worthwhile to pay attention to one’s own actions anymore (Isaksson & Ellegard 2014; EEA 2013). Since energy efficiency without the possibility of saving is not valuable, the conviction that maximum saving has been achieved as a result of renovation may lead to wasteful behaviour, because energy efficiency habits are lost. Therefore, it is necessary to train residents about behaviour aimed at energy saving and preservation (Isaksson & Ellegard 2014) in order to sustain and facilitate the energy efficiency achieved as result of renovation.

6.11 Achieved energy savings

As varied as views of the residents are about meaning of the renovation and what measures it involves, just as varied are savings of energy consumption. It should be taken into account that the saving depends on indoor temperature level, habits of occupiers of the building (how often occupiers open windows, whether radiators are regulated). There are situations (56% of surveyed renovated buildings) where buildings specific heat consumption bellow 90 kWh/m² per year are achieved, whereas there are also situations (17% of surveyed renovated buildings), where after the renovation this consumption is still above 100 kWh/m² per year.

Conclusions

1. It is difficult to speak about residents of non-renovated buildings as a community, which means that any joint decision-making in respect of the building is not possible or is very complicated. On the other hand, residents of renovated buildings have already collaborated in a major project and thus ascertained that they all have shared goals, and achievement of these goals is possible. Consequently, the renovation process may serve as an experience for residents where they learn how to collaborate on the level of the house.
2. The prevailing mistrust in shared goals and values can be alleviated by jointly setting the goals of renovation and energy efficiency. It allows the residents to collaborate and take the first steps towards developing a community.
3. In decision-making about renovation, residents consider first short term personal gains versus the long term financial risks. If the resident and his family do not feel discomfort at their apartment, then motivation to support the renovation is insignificant or non-existent. On the other hand, residents who encounter defects of the building on daily basis are able to identify benefits of renovation, and support the renovation more eagerly.
4. Initially, a renovation project is often perceived confusing and risky, because the information received about it varies depending on the source of information. Renovated buildings are examples of good practice, where the house elder provided the residents with information on a regular basis and shared the processes required honestly and in great detail. This is important both before renovation because of the size of financial commitments, potential risks, whereas at later stages it is important for the residents to be informed about the course of construction and other developments as these impact their everyday life.
5. The most commonplace confusion is about the notion *renovation* – what does it include? Therefore, it is necessary to develop an aggregate of criteria, which would create understanding and sense of security among the residents in respect of the renovation.
6. In order to successfully launch renovation and facilitate energy efficient lifestyle it is crucial to imbue understanding that the scale of the problem does not dictate the scale of solution. Consequently, small-scale actions of the individual or the building might be significant on bigger scale as well. Subsequently, it facilitates decision-making that serves for the whole system in general, and not just symptomatically – for individual aspects of the problem at hand. An approach like social marketing can be used to inform society about the link between actions and the problem.
7. The most crucial differences between renovated and non-renovated buildings is presence of a house elder, his status, expertise and skills, as well as availability of support, which may be provided by the municipality, maintenance company, or another service provider.

8. The house elder is often the initiator of renovation and able to motivate other residents; furthermore, the house elder plays such a crucial role that buildings without a house elder usually do not undergo renovation. The house elder of the renovated building is a leader, who collaborates with the residents on the basis of mutual trust, making joint decisions in a democratic manner.
9. Project development is described as a complicated process, during the course of which the residents need support. The maintenance company or another renovation service provider sometimes takes part in development of the project, whereas other times voluntary or hired people are engaged who have experience and relevant skills. Furthermore, the house elder is frequently forced to learn and implement important aspects of project development on his own. This not only delays the process but also becomes a real obstacle for launching renovation.
10. Co-funding provided by the European Union is mentioned as a crucial form of support in renovation – residents consider it a precondition without which it is not possible to carry out the renovation. Guarantees provided for the loan are also considered a significant support; furthermore, granting of a guarantee is mentioned when speaking about position of the particular municipality towards the renovation.
11. To obtain the remaining funds residents usually use a bank loan. However, the banks set conditions for the loans, which sometimes might be unfeasible for the apartment owners, who want to renovate their building.
12. Complications of construction are serious and widespread problem. During the pre-renovation stage residents are concerned about the disproportionately short warranty period of construction works against the period of the bank loan. Also, they are indignant that underperformance of the construction companies does not release the residents for fulfilment of the renovation plan before the competent authorities. Furthermore, the construction works are often actually supervised by the house elder himself, even though he lacks necessary skills and expertise. Consequently, it can be inferred that consistent, professional supervision of construction works is missing, there is no shared burden of liability, and quality criteria.
13. Residents most often include those measures in the renovation project, about which the most information is available. However, not always the measures, about which the most extensive information is provided, are the ones that can help to achieve the objectives necessary for the residents (health, safety).
14. After the renovation residents do not have an unambiguous idea how to live in a renovated building. New energy efficiency habits are often not introduced at home, or the old habits prevail. Furthermore, there are often cases when, from the engineering perspective, the renovation is not carried out in such a way to procure an energy efficient lifestyle for the residents of the building.
15. Since the energy efficiency without the possibility to save is not a value in itself, then certainty that maximum savings has been accomplished as a result of renovation may lead to wasteful behaviour, because energy efficiency habits are lost. Therefore, it is necessary to teach residents about behaviour aimed to save energy, in order to

maintain and promote the energy efficiency obtained as a result of the renovation. One of the method to do this could be social marketing.

16. The achieved consumption of thermal energy for heating depends on various factors: implemented energy efficiency measures, their quality, and habits of residents. Specific heat consumption below 90 kWh/m² per year is not always accomplished.
17. It was also confirmed that that residents do not have the necessary organizational, financial, technical and legal knowledge to draft and implement good quality projects.
18. The data (energy consumption, project costs, loan rates, implemented measures etc.) are difficult to access and they are very badly organized.

Recommendations

1. Owners need to be organized in housing associations and need to have access to advice on how to organize themselves. This will help to solve both the social and organizational problems as well as alleviate the legal burden.
2. To accomplish renovation of the building it is important to inform the residents in a form comprehensible to them about its defects and explain to them how each of the defect and its elimination may influence quality of life of the individual.
3. Residents know about climate change and the need to implement renovation projects. But they are not doing it because there is a lot of uncertainty about renovation. One of the approaches that could be used is social marketing strategy about renovation. This will help to give clear information to residents as well as to understand the necessary infrastructure that is needed so residents could be able to implement renovation in their homes.
4. It is necessary to develop clear forms of support during the stage of project development.
5. During the allocation of the EU structural funds and after them there has to be an institution that could help residents and give information what is renovation, and what measures it includes. Also this institution could help residents who wish to renovate their house.
6. It is necessary to develop clear set of measures which can be called a renovation and the criteria, demonstrating achievement of the measures. There could be a comprehensive set of solutions for buildings: standardized packages of measures. Residents could then with security understand what they are “buying”.
7. In multi-family building renovations Measurement and Verification should be standardized and obligatory, ideally in the form of an energy certificate as with televisions or refrigerators today.
8. A registry of construction companies is needed where owners and board of the company are shown as well as implemented projects by this company. Through the registry, residents can be confirming that the construction company will implement project in good quality.
9. It is necessary to create a financial instrument, which would be available for renovation of buildings specifically. It will provide for a possibility to renovate those buildings as well, which the banks consider unfeasible due to their location or other related factors.
10. One possible approach is for housing associations to work within an Energy Performance Contracting (EPC+) framework. The EPC+ ensures that the warranty for implemented measures matches the payback period of the investments and that the service provider guarantees the quality of works by outlining a clear and legal agreement which will describe the steps to prepare, implement the project and measure the results.

11. To understand the motivations of the involved parties a tool such as stakeholder analysis can be used. It can also help to find a ways how these parties can work together as well as how to effectively manage stakeholders when there is a conflict.
12. A unified methodology what to show in heat consumption data – if circulation losses are shown together with space heating, with hot water consumption or separately, needs to be made. This will help to provide more useful data that could be compared with each other especially from different cities.

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Annexes

Interview Guidelines

The main goal of these interviews is to find out residents opinions, attitudes and experiences regarding house renovation. Interviews are anonymous and will only be used for research purposes. You have the right not to answer any question that seems too private or makes you uncomfortable. Do you mind the conversation being recorded?

A. Household Characteristics

1. How long have you lived here? Why here?
 - a. Is this your apartment? (Ownership, renting, renting from relatives, etc.)
 - b. What were the main criteria for choosing this apartment? Please tell more about each one.
 - c. What do you like in your house? What don't you like? Why?
2. Have you moved in previous years? What was the reason? Do you plan to move in the near future? Why?
3. Please tell about the people living in this apartment. (Number, children, family ties, gender, occupation)

B. Home and neighborhood characteristics

4. Tell me about your neighbors.
 - a. Are you familiar with your neighbors?
 - b. How long have your neighbors lived here?
5. How would you evaluate your house – is it friendly, are your neighbors friendly?
6. Do you have house meetings? Who organizes them?
7. Do you attend the meetings? Why? Did you attend the last meeting? Tell me about these meetings/last meeting.
8. Do you know the house elder well?
 - a. Why was this person chosen to be the house elder? How do you assess his performance?
 - b. If any other person has been a good home [house] elder, what made them good at it?
 - c. Who usually knows the most of what is going on in the house? Which people's opinions do you trust about what is happening in the house?
9. Who owns the stairwells? Who owns the house? Who owns the area around the house? Who takes care of it? Who do you think should take care of it?

C. Home renovation process (do not ask in non-renovated houses)

10. Tell me about the first time you heard of the idea to insulate the house and renovate it? Who began to talk about it?
 - a. What was your initial opinion? What persuaded you to carry out the renovation? Which were the strongest arguments?

- b. Who in your apartment made the decision that renovation is needed?
 - c. How did the neighbors react? Did any neighbors have a very definite opinion about the issue? What was it?
11. Tell me, what information was available before the start of the project.
- a. Did you know what exactly is going to happen?
 - b. Was all of the information easy to understand?
 - c. Was there some issue/topic you wished was covered better?
12. Did you read the contract? Who read it from your apartment? Was it easy to understand what is going to happen and the commitments you have taken on?
13. How long was the renovation process? What was it like?
14. What were the first impressions after the renovation?
15. What did the neighbors think about the renovation process?
16. How do you rate your maintenance companies' role in this process? How do you rate the cooperation with the builders? What was good, what wasn't?
17. What do you think is the biggest benefit of the renovation? Why?
18. What benefit do you think your neighbors rated the highest? Why?
19. Would you have done something to your apartment if the renovation never happened? (insulation, window replacement)

D. The current situation

20. Please tell me about your payments – whether and how they differ from the time before the renovation. Is it more or less as before the renovation? Are you happy with it? (Heat, maintenance, electricity)
21. Are other people in the house good with payments? Who are the best, the worst payers? Why is that?
22. Do you feel that the apartment and the whole house are warmer? Is it as warm as you expected? How is it in winter? How is it in summer?
23. If you could change something in the house, what would you change? Why?
24. Have you carried out any repairs in the apartment on your own? Do you intend to?

E. Street and neighboring houses

25. Would you say that you live in a good neighborhood? What makes it a good/bad area?
26. How do you evaluate the houses that were renovated next to yours? What is good, what not?
27. Have you heard something about how did they do?
28. Why do you think some houses chose the renovation and some didn't?
29. Do you think that if you would sell your apartment, its value would be greater than before the renovation? And what about the neighbor houses?

F. Values

30. What is your opinion about climate change? Can we impact climate change? How? (Why not?)
31. Do you think that in general it is important to save energy? Why?

- a. How do you save energy? When buying new appliances, do you pay attention to how economical/energy efficient they are? For example what did you buy with this intention? Do you adjust the radiators heat? (Is there such an option?) How many degrees it usually is? Why?
- b. Is there something that you did before the renovation and now do not do anymore? What?

G. State and municipality

32. Have you received some support for an apartment or house from the state or municipality? What type? (Housing allowances, the EU funds, low-income status, etc.).
33. Should state or municipality be involved in the renovation of houses? How? Who should do it?
34. Do you feel that you can directly influence/change what's going on in the house/area/city?

Finally: Would you recommend others to renovate their home? What would you say to them, to encourage them? Is there something that I did not ask, but is important to add?

Would you be interested in receiving research conclusions/research reports? Please write your email. Who else I should send research results?

Questionnaire Form for Non-Renovated Buildings

Address: _____

House elder/representative: _____

Contact information (mob. no. e-mail): _____

Necessary data from house elder/representative: *in italic*

Data which are gathered by ESEB team: in regular

Basic data:

Building type/series

Number of apartments

Number of floors

Number of stairwells

Total area, m²

Heated area, m²

Building dimensions:

Height, m

Width, m

Length, m

Basement walls h, m:

- Below the ground
- Above the ground

Building envelope:

Attic area, m²

Roof area, m²

Basement covering area, m²

Window area, m² (one window and size of the door of balconies/loggias):

- *Apartments*
- *Stairwells*

Number of new windows, %

Number of old windows, %

Number of doors and area, m²:

- Front door
- Basement door

End wall area (different constructions/walls shown separately), m²

Front wall area (different constructions/walls shown separately), m²

Heat consumption:

*Energy consumption for space heating for the last three full years, MWh/month
Consumption of hot water for the same years, MWh/year OR/AND hot water consumption,
m³/year
plus Outdoor temperatures -*

Roof type/shape:

- *Is there an attic -*
- Flat
- Inclined

Heating and hot water distribution system:

*Type of the heating unit – dependent or independent
Hot water distribution system – with or without circulation
Towel dryer in bathroom (mark corresponding):*

- *Connected to heating (operates only in heating season)*
- *Connected to hot water system (operates all year)*

Additional questions:

*Does the house have balconies or loggias -
Is it necessary to readjust cold water system –
Is it necessary to readjust sewage system –
Is it necessary to readjust rain water drainage system -
Is it necessary to perform redecoration of stairwells -
When was the last time the maintenance of the ventilation system was done -*

Implemented measures (If measure is implemented, mark with X)

	Name of the measure	Implemented
Non-Energy efficiency measures	Repair of the roof	
	Repair/fixation of external walls and its elements	
	Redecoration of stairwells	
	Repair of entrance	
	Repair of balconies/loggias	
	New cold water system	
	New sewage system	
	Readjustment of rain water drainage system	

Questionnaire Form for Renovated Buildings

Address: _____

House elder/representative: _____

Contact information (mob. no. e-mail): _____

Necessary data from house elder/representative: *in italic*

Data which are gathered by ESEB team: *in regular*

Year of the renovation: _____

Basic data:

Building type/series

Number of apartments

Number of floors

Number of stairwells

Total area, m²

Heated area, m²

Building envelope:

Number of new windows, %

Number of old windows, %

Heat consumption:

Energy consumption for space heating three years before and after the project, MWh/month

Consumption of hot water for the same years, MWh/year AND/OR hot water consumption, m³/year

plus Outdoor temperatures -

Heating and hot water distribution system:

Type of the heating unit – dependent or independent

Hot water distribution system – with or without circulation

Towel dryer in bathroom (mark corresponding):

- *Connected to heating (operates only in heating season)*
- *Connected to hot water system (operates all year)*

Additional questions:

Is it necessary to readjust cold water system –

Is it necessary to readjust sewage system –

Is it necessary to readjust rain water drainage system -

Is it necessary to perform redecoration of stairwells -

When was the last time the maintenance of the ventilation system was done -

Implemented measures (If measure is implemented, mark with X)

	Name of the measure	Implemented
Energy efficiency measures	External wall insulation	
	Basement covering insulation	
	Basement plinth insulation	
	Attic covering/Roof insulation	
	Window replacement	
	Front door replacement	
	Replacing pipes of heating system	
	Replacing risers of the heating system	
	Installing balancing valve	
	Full radiator replacement	
	Installing thermoregulator	
	Repair of hot water distribution system	
	Energy monitoring system	
	Renewable energy sources	
Non-Energy efficiency measures	Repair of the roof	
	Repair/fixation of external walls and its elements	
	Redecoration of stairwells	
	Repair of entrance	
	Repair of balconies/loggias	
	New cold water system	
	New sewage system	
	Readjustment of rain water drainage system	
Additional measures		

Contract with the bank

1. Which bank gave the loan?
2. Did maintenance company gave guarantee to the loan?
3. What was the necessary percentage of apartment owners who had to vote for the building renovation to get the loan? Or what was the percentage of apartment owners who had had to accept the rise in maintenance fee and diversion of money to repay the credit?
4. What is the total amount of debt for space heating, water and maintenance fee that cannot be exceeded in the year?
5. Is there a term when bank adjust decrease of the interest rate?
6. Is recalculation of interest rate applied? If yes, after how many years?
7. Terms of up-front payment?
8. Base rate (Euribor, Rigibor..)? Add-on rate?
9. Penalty which is applied when payment term is delayed?
10. Penalty when payment has been done before the term?

Contract with the builder

1. Warranty of the works done? Terms?

Social marketing

Social marketing is an interdisciplinary cross-section approach (University of Kansas) or a tool that develops and integrates marketing concepts with other approaches. This tool is used to influence kind of behavior that will *benefit individuals and communities for the greater social good* (iSMA 2013) by *achieving positive impacts on the lives of individuals and communities and sustaining them* (French, et al. 2010). Social marketing connects the knowledge and the socially useful implementation. By using marketing skills it helps to make social action efforts into programs which are designed and communicated to get the desired response from the audience (Kotler and Zaltman 1971). It differs from commercial marketing because in commercial marketing the goal is to change the behavior so that the benefit comes to the marketer but in the social marketing behavior is changed so that the benefit is to the consumer or society (University of Kansas). In other words the primary focus is social good and is guided by *ethical principles*. French et al has gathered the core aspects of the social marketing by different authors (French, et al. 2010):

1. Social good;
2. Behavior;
3. Harnessing power of marketing (in all its forms);
4. The importance of target audience- or customer-defined value (French, et al. 2010).

Social marketing is not only a tool or approach but it also helps to develop understanding about what makes people to choose to behave in the way that will benefit them and society (French, et al. 2010). It integrates research, theory and best practice as well as audience and partnership insight. This all helps to deliver competition sensitive and segmented social change programs that are effective, equitable and sustainable (iSMA 2013).

Kotler and Zaltman find the four factors that define the effectiveness of social marketing (Kotler and Zaltman 1971):

1. Product (“product and service that meets the demand of the client or a social idea in the manner which their target audiences find desirable and are willing to purchase”);
2. Promotion (“communication-persuasion strategy and tactics that will make the product familiar, acceptable, and even desirable to the audience”);
3. Place (“providing adequate and compatible distribution and response channels” in the way that the motivated persons knows “where the product can be obtained”);
4. Price (“costs that the buyer must accept in order to obtain the product” like money, energy and psychic costs as well as opportunity costs) (Kotler and Zaltman 1971).

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Chapter 45. Social Marketing of Successful Components of the Initiative | Section 1. Understanding Social Marketing: Encouraging Adoption and Use of Valued Products and Practices | Main Section | Community Tool Box. University of Kansas. <http://ctb.ku.edu/en/sustain/social-marketing/overview/main> (accessed May 3, 2016)

Stakeholder analysis

The word “stakeholder” and necessity to work together are described in a very simple and understandable way by Reed et al. in the following example. “Imagine a group of people putting up a tent (the phenomenon of interest) on a hill-side, each with a different kind of peg or stake (metal ones, different colored plastic ones, wooden ones, angled ones etc.). Each person is holding a different stake (their interest), and trying to drive their points home as they push their stakes into the ground. But stakeholders who have mallets have the power to drive their points home more effectively than others. Working alone, the tent might take on the shape determined by the guy-ropes secured by the mallet-holders, and is likely to collapse in the first wind. But knowing who they are working with, the mallet-holders can work together to position their stakes so the tent stays up. They may even be able to help some of the other stakeholders who do not have mallets to secure their stakes. By working together in this way, it is far more likely that the tent will withstand the storm.” (Reed et al. 2009).

All sides which can or are “affected by the outcomes of an environmental management decision are likely to have interest, and hence hold a stake,” in the decision making process. But the decision can only be affected by those who possess two qualities – interest and power. It is also important to note that the side, which have the power but with or without the interest, also should be considered stakeholder. To find an information about the interested and power possessing parties a stakeholder analysis is used. It asks “who these interested parties are, who has the power to influence what happens, how these parties interact?” And with this information the understanding can be gained “how they might be able to work more effectively together” (Reed et al. 2009).

The goal of the stakeholder analysis is to inform and consider the alternatives in early stages of the project or proposal. During the project or proposal implementation stage this analysis helps to effectively manage stakeholders and conflicts (Grimble and Chan 1995; Grimble and Wellard 1997). It is necessary to take into account that stakeholders can interact and change over time (Johnson et al. 2004). Stakeholder analysis usually are an expert-driven processes and do not include broad-based social surveys (Brown et al. 2016). The stakeholder analysis process (Reed et al. 2009):

1. First “defines aspects of a social and natural phenomenon affected by a decision or action”;
2. Second it “identifies individuals, groups and organizations who are affected by or can affect those parts of the phenomenon (this may include nonhuman and non-living entities and future generations)”;
3. And third “prioritizes these individuals and groups for involvement in the decision-making process” (Reed et al. 2009).

There is normative approach and instrumental approach for stakeholder analysis. Instrumental approach is pragmatic and is used to understand how to identify, explain and manage the behavior of stakeholders in order to achieve the desired outcomes (Reed et al. 2009). Also third approach exists – descriptive stakeholder analysis but it is rarely used on its

own, because “it has no purpose beyond describing the relationship between a particular phenomenon and its stakeholders” (Donaldson and Preston 1995). It is used together with normative and instrumental analyses because the later two requires “an understanding of the current state of affairs”.

There are various methods how to do the stakeholder analysis. For example in environmental planning and management one method includes stakeholder identification, stakeholder differentiation and categorizing and investigation of relationships between stakeholders (Reed et al. 2009). The steps of another method are as follows (Grimble and Chan 1995):

4. “Identify the purpose of analysis (goals)”;
5. “Develop an understanding of the system, decision makers, and drivers of decisions”;
6. “Identify principal stakeholders”;
7. “Investigate stakeholder interests, characteristics and circumstances”;
8. “Identify patterns and contexts of interaction between stakeholders” (Grimble and Chan 1995).

Third method consists of making an inventory of interested parties, judging their importance by their level of influence and interest for a particular outcome, mapping the relationships between the involved actors and understanding their potential for developing alliances (Lindenberg and Crosby 1981).

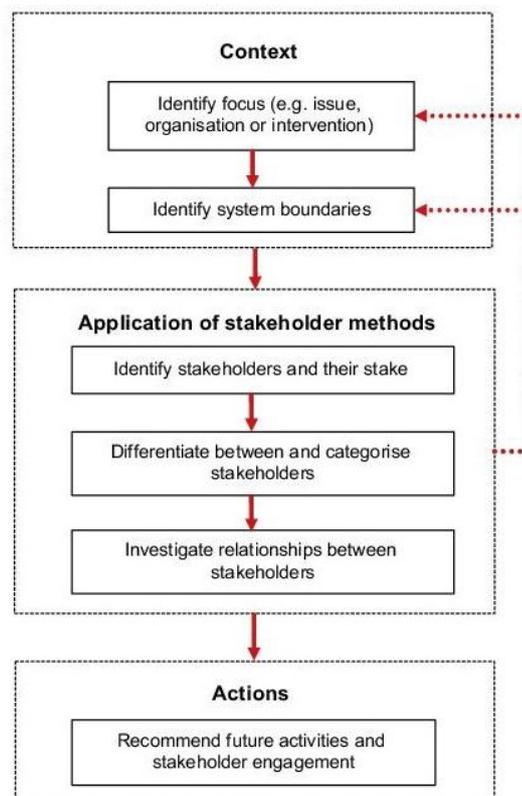


Figure A.1 – Steps for performing stakeholder analysis (Reed et al. 2009)

Reed et al. has developed a steps how to do stakeholder analysis (see Figure A.1). They suggest that the first thing to do in stakeholder analysis is to start out by understanding the context in which stakeholder analysis is to be conducted and to identify them. The stakeholder analysis is interactive process and stakeholders could be added during the process. Sometimes the boundaries are already clearly defined. The defined boundaries help to identify stakeholders easier (Reed et al. 2009) because it is not possible to include all the stakeholders and there should be some criteria which one to include (Clarke and Clegg 1998). Criteria could be geographical area (boundary of a National Park) or demographic criteria (nationality, age). These criteria depend on the focus of the analysis and are defined by research analyst (Reed et al. 2009). But by defining boundaries the risk is that some stakeholders may be omitted and all stakeholders of the phenomenon may not be known (Clarkson 1995).

The approach to analyze stakeholders is used in fields such as business management, policy research and political science. In business management it is necessary to understand stakeholder's interest, influence and how they can support or threaten performance of the firm but in policy management it is necessary to understand the involved parties behavior, interests, agendas and their influence on decision-making process. In political science analysis is used to work more effectively, make implementation of decision transparent and to assess the feasibility of future policy options (Brugha and Varvasovsky 2000). Stakeholder analysis is also useful in environmental issues because it "involves multiple uses and user groups, contains externalities and trade-offs, and affect future availability or productivity of resources" (Brown et al. 2016).

Positive aspects of stakeholder analysis is that it empowers marginal groups like women, those without access to well established social networks, the under-privileged, or the socially disadvantaged, and "those who are not easily accessible, because for example they live far away from main roads" (Johnson et al. 2004). Potential problems can include generation of conflicts, non objectivity, lack of knowledge, skills or resources, possibility to manipulate, and ethical concerns when views of the people are represented (Reed et al. 2009).

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