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to energy labels in buildings



Deliverable 4.2

A qualitative study of home energy-related renovation in five European countries: homeowners' practices and opinions

Edited by
Françoise Bartiaux

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Per row from top to bottom: Belgium, Bulgaria, Czech republic, Portugal and Latvia

Summary

This qualitative survey in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal has been realised with 117 interviewed home owners who are undertaking energy-related renovations. There are many similarities in these five countries when it comes to energy-related renovations done by their citizens, despite different historical and geographical contexts.

Energy-related renovations are also a social issue

This survey in the five countries shows that doing energy-related renovations is not only a technical issue but obviously also a social issue, as a topic of conversation, as a matter of trust and friendship, as a giving or exchange of advice or services, and with Internet, as a new source of information namely on contractors' reputation. Social support from friends and relatives is a major condition before and during energy-related renovation and nearly all informants acknowledge it. Our 117 informants appear to be inserted in social networks that are quite significant in helping them make energy-related renovations and that are often connected to the labour force in the construction or energy sectors. When contradictory advice arises, friendship appears to be more valued than technical criteria on (further) energy savings.

Home owners who are undertaking energy-related renovations are thus not isolated 'consumers'.

Market and labour force

Despite building stocks varying in their age and characteristics, the renovation most often done is to change windows and frames, except in the Portuguese sample, where this renovation is also often done.

Informants are generally satisfied with the work done on their dwelling by professionals in the construction and energy sectors *but* there is also dissatisfaction everywhere; furthermore, mainly but not only in Belgium and Portugal, many informants are (much) more concerned with energy savings and some are more knowledgeable on related techniques and materials than (many of) the professionals they met.

The minor role of energy performance certificates

Only 34 informants (29%) of the 117 informants in the five countries had labels or energy certificates at the time of the in-depth interviews, and few (about one third) of these 34 interviewees are in the situation focused on by the EPBD, namely recent home buyers. So the results obtained in the 5 countries and summarized here are only indicative but can still give some insights.

For these few informants in the 5 countries, the labels and energy certificates do not play a major role for conducting energy renovations. If they did play a role in raising the attention at the possibility of insulating external walls, the floor and/or the cellar ceiling, as it seems to be the case for several informants in Wallonia, most of these informants are reluctant to recognise this role and prefer to present themselves as the sole master of their renovations. This result is confirmed by all 4 informants in Portugal who had an energy certificate.

This minor role played by the energy certificates is maybe related to the slower implementation of the EPBD in the five countries and to the fact that the energy certificates are not well known. But if they are known by some interviewees, like one surveyed in Bulgaria and two in Portugal, (part of) the methodology used is criticized, respectively for the lack of clarity in the methodology used and for the focus on appliances rather than on the envelope of the building.

Energy-related subsidies and programmes

In general, the informants have a rather favourable opinion on existing programmes (whether pilot or not) or subsidies if the informants have heard about them but criticisms converge: these instruments are not well known (except in Wallonia), they require everywhere money availability, time-consuming access to information, too much paper work and administrative competences (including on Internet). Furthermore, whereas these subsidies should “normally [be] accessible to everyone”, they are (also) used by “people [who] do not have particular need for incentives” (Belgian and then Portuguese informants). In so doing, these subsidies increase social inequalities.

In Bulgaria, the tax exemption for buildings with energy certificates (classes A and B) is said to be an attractive stimulus for renovation. In Portugal, the subsidy for solar panels is said by one informant to be effective for the others, not for herself. In Wallonia, a list of customized but mandatory energy-related works is provided to the low-income families benefiting of an advantageous loan or to owners having a special subsidy for the rehabilitation of their old house: therefore, the mandatory aspect of the energy-related works surpasses the financial lever provided by the loan or subsidy. And in the multi-apartment buildings of Bulgaria, Latvia, and possibly of other European countries, a main factor is an organisational one to reach the necessary quorum of dwellers.

Social and technical factors in combination

In 2009-2010, feelings of coldness or thermal discomfort, often related to old building stocks, as well as need or wish to reduce energy bills are, among other factors such as a concern for global warming in the Belgian and Portuguese samples, (quite) efficient means for triggering energy-related renovations. All these factors are never isolated, they always act in combination. Comfort is also associated with space, especially so in Belgium, Bulgaria and Portugal. This association is a main driver for roof insulation in Wallonia.

This connection between comfort and space raises the question of the method for calculating the labels and EPC – either per m² or for the whole dwelling. It has been shown that some energy-related renovations are not always causing energy savings.

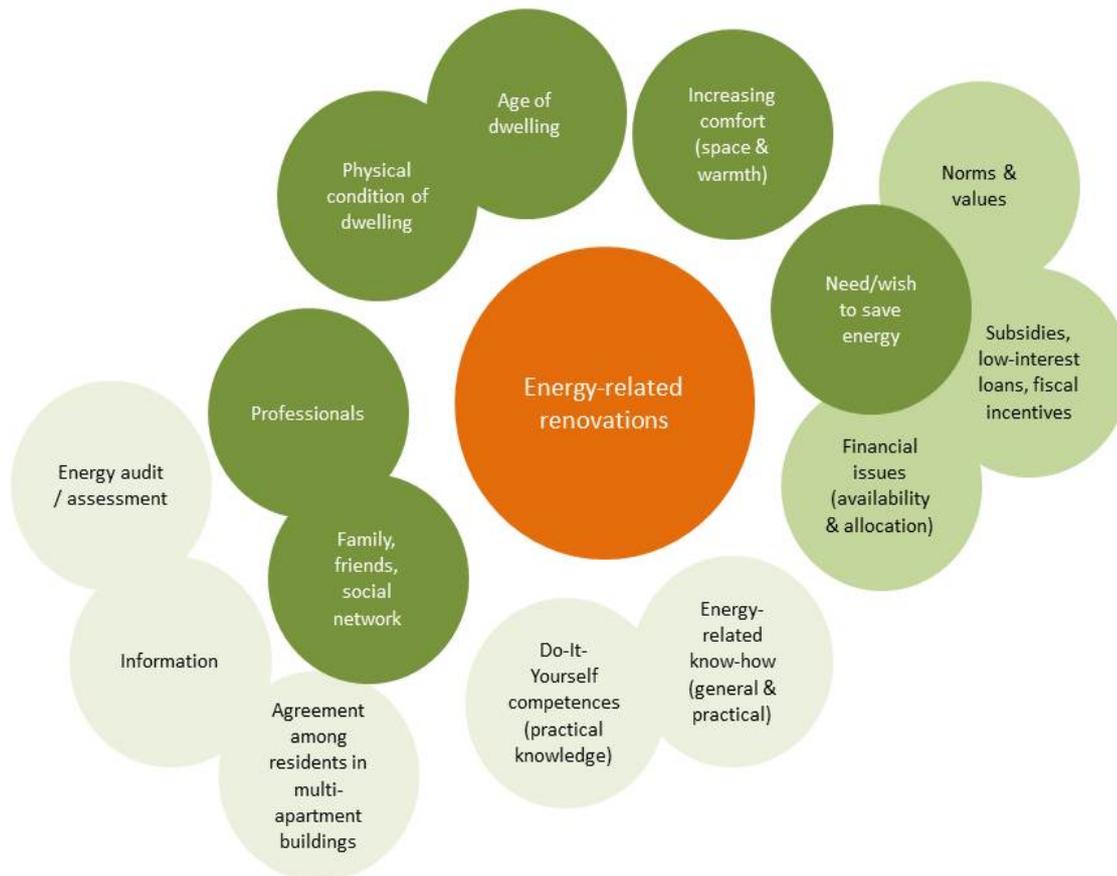
Like the factors driving energy-related renovations, the factors hampering them are interrelated and may act in both directions: favouring or not energy-related renovations. In the 5 countries, the informants have pointed at the following factors impeding them to make some or further energy-related renovations: lack of necessity, lack of money and lack of support. It has been shown that these obstacles have different meanings and are also related to aesthetical criteria, lack of know-how, lack of interest – especially so if the dwelling is expected to be a temporary one – or other priorities. In all countries but Latvia and Portugal, some informants prefer to invoke the lack of necessity rather than their financial limitations. In addition, lack of time is cited in Bulgaria, Belgium and Portugal. In these two last countries and in Prague, the necessity to comply with regulations protecting historic centres and other town-planning rules can hamper façade insulation and change of frames and windows. In multi-apartment buildings in Bulgaria and Latvia, the necessity to reach an agreement between a high quorum of co-owners is also a factor impeding buildings renovation.

Indications on other policy areas to strengthen the further implementation of the EPBD

This qualitative survey in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal also suggests other areas of policies that could complement energy policies and strengthen the further implementation of the EPBD: the training of the labour force in the construction sector on

energy-related issues, and an attention to link climate and energy policies to social cohesion policies. These indications will be further worked on in the next steps of this research project.

Factors playing a relevant role in the why and how of energy-related renovations



The above figure summarises several factors that play a role in homeowners' energy-related renovation practices. The following report lays out in detail the complexity of the issue, the multitude of factors involved and important differences within and across the countries where homeowners were interviewed: Belgium (Wallonia), Bulgaria, Czech Republic, Latvia and Portugal.

It is important to note that the in-depth interviews with 23-24 informants in each country cannot provide a representative basis for general conclusions on the relative importance and strength of influence each factor has on the why and how people implement energy efficiency renovations in each country. Furthermore, the factors involved and their strength of influence varies significantly across people, also within one country, e.g. due to different socio-economic backgrounds.

However, the above visual captures some intriguing parallels that were found in many of the in-depth interviews across countries. The report elaborates the role these factors play, how they may relate and how they can facilitate or hamper energy-related renovations. In addition, the report discusses several other relevant factors that were found to have a less clear-cut but certainly relevant influence.

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APPENDIX A: BRIEF ANALYSIS OF 5 INTERVIEWS IN DENMARK, FINLAND, GERMANY, THE NETHERLANDS AND THE UNITED KINGDOM

APPENDIX B: METHODOLOGY FOR IN-DEPTH INTERVIEWS INVESTIGATING EU DWELLING OWNERS’ PRACTICES ON (ENERGY-RELATED) RENOVATION WORKS) - D.4.1

Chapter 1

Synthesis and comparison of findings from home owners in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal

Françoise Bartiaux

Université catholique de Louvain, Belgium

1.1 Introduction

IDEAL-EPBD is a European research project on consumers' response to energy labels in dwellings.¹ IDEAL-EPBD is a project co-funded by the European Union under the Intelligent Energy Europe Programme. The project is running from October 1st, 2008 until September 30th, 2011 and has project partners in 10 European countries.

The European Union has indeed committed itself to increase energy efficiency with 20% up to the year 2020. A main instrument for reaching this target in the residential sector is the Energy Performance of Buildings Directive (EPBD), originally introduced in 2002 and recently recast by Directive 2010/31/EU. This European directive proposes, among others, the introduction of energy performance labels for dwellings in all European Member States. Such an energy performance label would have to be handed over when a dwelling is built, reconstructed, sold or rented out. This label shows the current energy performance status of the dwelling divided over energy efficiency classes A to G. In most Member States, this label comes with tailor-made advice for dwelling improvement measures that would reduce energy use.

In countries where the directive has been implemented for a while, the energy label hardly seems to motivate people to improve the energy performance of their dwelling. At the same time, however, improving the dwelling based on the label and the advice given can save the new owner large amounts of money in the long term. The IDEAL-EPBD thus investigates why the response of households towards the energy label is limited so far.

During the IDEAL-EPBD research project, two waves of interviews have been realised (Work Package 4). The first one, with five interviews in each of the ten countries of the consortium was realised around mid 2009. This first wave had two aims: to test the methodology in order to prepare the 2nd wave of interviews conducted in 5 Member States (Belgium, Bulgaria, the Czech Republic, Latvia and Portugal) and to gain insights on energy-related renovations done, factors influencing them, knowledge and effective use of the labels in order to prepare the survey questionnaire conducted later in the other 5 Member States of the consortium (Work Package 5, Denmark, Finland, Germany, the Netherlands, the United Kingdom). The interviews results obtained by these last 5 countries are summarised in the appendix A of this deliverable and these findings are only indicative, given the small sample size. The second wave is made of 18 or 19 in-depth interviews and took place during the spring and the summer of 2010 in 5 countries (Belgium, Bulgaria, the Czech Republic, Latvia and Portugal). In the mean time, a detailed methodological working paper was written to explain all the steps involved in the realisation and the analysis of in-depth interviews, including for each step, the lessons learned from the 1st wave (Gosselain & Bartiaux, 2010, see appendix B of this deliverable). For each of these five countries (Belgium, Bulgaria, the Czech Republic, Latvia and Portugal), the findings of all in-depth interviews (1st and 2nd waves) are presented in detail after this synthesis in the following chapters.

In the next step of the IDEAL EPBD research project, these findings and others will be used to formulate policy-oriented recommendations, both at the European level and for each country (Work Package 6).

This synthesis aims at assembling and comparing the findings of these five countries: Portugal, Latvia, the Czech Republic, Bulgaria and Belgium – in fact one of its three Regions: Wallonia, the Southern and French-speaking region, because in Belgium, most energy matters, namely energy performance certificates and labels, are a regional competence. In this synthesis of interview outcomes, we use for brevity and clarity the term “country” also for this Region.

¹ Cfr www.ideal-epbd.eu, from which the project's presentation in these first three paragraphs is drawn.

The findings of these five countries are presented in detail in the following chapters of this deliverable, and they are often used and referred to in this synthesis, so the reader interested can find further analyses in the corresponding chapter.

The outline of this first chapter is the following: First, the samples in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal are described. Second, the housing stocks in these five countries and the renovations made by the interviewed home owners are briefly presented. The third and fourth sections deal with the roles of energy labels, incentives or renovation programmes, and policy in general for motivating home owners to do energy-related renovations. Five, the roles of other actors (professionals, relatives, friends and acquaintance) are reviewed and discussed. The last two sections discuss the other factors influencing energy-related renovations. Each of these seven sections ends with a summary that highlights the similarities between some or all countries studied, for the specificities of each country are shown in the text. Finally, the conclusions wrap up the main findings of these qualitative surveys with 117 home owners in 5 countries (Belgium, Bulgaria, the Czech Republic, Latvia and Portugal).

1.2 Informants and their home: A qualitative survey in 5 countries

1.2.1 Common features in the 5 qualitative surveys

In all 5 countries, in-depth interviews were realised in 2009-10, using the same grid of questions. Topics about home renovations come first, whether they are related to energy savings or not. The informants are asked to give details about the renovations done, their justifications thereof, the planning and the types of help and advice received and searched for, if any. Environmental knowledge and concern are dealt with at the end of the interview, to avoid the possibility of influencing the informants' explanations on renovating their home. All in-depth interviews were recorded and fully transcribed. They lasted between 45 minutes and 2 hours. Nearly all were conducted at the home of the informants, some with both spouses if they were both interested and available.²

The way of constituting the five samples takes into account both the distribution of dwellings between houses and apartments and the steps of EPBD implementation in each country – details for each country may be found in Gosselain & Bartiaux (2010, see appendix B of this deliverable). In qualitative surveys, statistical representativeness cannot be achieved, as Gosselain and Bartiaux put it: “There is no agreement in the literature about the number of interviews to be realised to reach ‘data saturation’, “that is, [when] no new or significant data emerge”³. In the Mental Models Approach, 16 interviews are usually realized⁴. Bryman⁵ cites Warren⁶ for whom “for a qualitative interview study to be published, the minimum number of interviews required seem to be between twenty and thirty.” But “by no means all practitioners would agree with Warren’s figure.”⁷ However, the more comparisons between groups (age groups, socio-economic groups...) “in the sample will be required, the more interviews will need to be carried out”⁸.” A sample size of 23 or 24 informants was thus decided. It was asked for varying the socio-economic backgrounds of the informants.

² This presentation of the method is similar to the one in Bartiaux et al. (in prep.).

³ Strauss & Corbin (1998), p. 215.

⁴ Young I. (2008).

⁵ Bryman (2004), p. 335.

⁶ Warren (2002), p. 99.

⁷ Bryman (2004), p. 335.

⁸ Bryman, 2004, p. 334.

In the absence of data bases to contact recent home buyers, part of the samples were found with colleagues as intermediary, which may cause samples of persons more informed on energy renovations and savings than in the average population. However, it is known that information on these matters is not enough to bring about change neither in energy-related behaviours nor in energy-related renovation works (for a synthesis, see Abrahamse *et al.*, 2005; for a case study in Belgium, see Bartiaux, 2008).

Finally, the samples in these five countries/region probably overestimate dwellers involved in (possibly extensive) renovating practices as other people may potentially be interested in the interview but then declined the invitation as they had done no renovation. This point is important to remember: our samples are *not* made of home owners *considering* doing energy-related renovations but of informants *having done or doing such renovations*.

The summary of this section gives the number of informants according to various housing and socio-economic characteristics and the locations of these informants are shown on maps at the end of this chapter (Appendix).

1.2.2 Per country

Belgium (Wallonia)

Two subsamples were constituted, both of them in the Walloon region of Belgium. In Wallonia, the EPBD is fully implemented since May 2010, but since 2006, homeowners can pay for a full energy assessment of their house and receive labels. Half of the respondents were thus found among people having done this and are rather well-off. The other half of the sample (12 informants) bought their house between 2005 and 2009 and includes several low-income households. These 12 informants were found with the help of at least one intermediary person. The variety of socio-economic background, housing type, marital status and living arrangements was actively sought out to represent the diversity of situations involved when buying a house. The in-depth interviews were done by working students.

As shown later, most of the Belgian informants have profited from subsidies or loans for energy-saving works given by the Walloon Region, especially, but not only, the informants having paid for an energy assessment. Information about them is kept in data banks and these informants may be thus recognised. Therefore, only the relevant characteristics, or an assumed first name, will be given when quoting an informant to protect the anonymity of all these persons.

Bulgaria

A variety in the socio-economic backgrounds of the informants is well attained in Bulgaria (see Table 1 below). In this country, by far the largest one of the five under study, the sample was concentrated in the Sofia area and in a remote area closer to the Black Sea (see map in Appendix, at the end of this chapter). Three informants live in dwellings having an Energy Performance Certificate. All other interviews were realized with owners who have purchased and moved into their dwellings a couple of years ago.

The in-depth interviews were realised by the first two authors of the Bulgarian report (see chapter 3 of this deliverable). This third chapter also describes the dwellings, living arrangements and socio-economic backgrounds of each informant (Stamova *et al.*, chapter 3: 3.2).

The Czech Republic

23 in-depth interviews were conducted in the Czech Republic in the framework of IDEAL-EPBD project. The interviews were carried out across the country (see map in Appendix, at the

end of this chapter) but for practical and time reasons, interviews were not carried out more than 100 km from Prague. Of the 23 interviews that have been carried out in the Czech Republic, 8 were carried out in Prague (part in apartments, part in houses). The other interviews were held outside Prague, 10 in rural areas (villages), the other 5 in small towns. In total, there were 3 apartments and 20 houses.

All interviews were realised with the owners or with the family of the owners living in the same dwelling. The in-depth interviews were realised by four members of the Czech team, including the author of the Czech report (see chapter 4 of this deliverable).

Latvia

In Latvia, 24 interviews were carried out across the country, with different types of households of varied socio-economic backgrounds (see Table 1 below). The majority of the informant homes were located in urban areas, either in the capital city or in other cities. Of all interviews, 18 were carried out with people living in multi-apartment buildings and 6 in private houses. The chosen proportion was based on the situation in the household sector in Latvia.

Currently there are no households with an energy label in Latvia. Therefore, informants were mainly chosen from buildings where energy audits have been done, and where the informants recently moved in. Furthermore, informants from buildings where no energy audit had been made were chosen in order to obtain different opinions from informants on energy related renovations done in the households. The interviews were conducted by the Latvian authors of the fifth chapter.

Portugal

The Portuguese sample is composed of 23 informants and is concentrated in the Coimbra area (a city of importance in Portugal) and has a high proportion of informants holding at least a master degree, many of them being related in one way or another with the University of Coimbra. So this sample should be seen as representing the cultural elite of a provincial town and its surroundings. These persons, rich in cultural capital, may show the way in case of “vertical diffusion of symbolic consumption (from upper social classes to the lower social classes)”, which “has until now few applications when it comes to energy savings at the household level, except maybe for solar panels (Keirstead, 2005).”⁹

Only informants who “had made renovations” (Fonseca and de Almeida, chapter 6: 6.1) were searched for, although the common practice “in Portugal (...) is to buy a second hand house/apartment in the best condition as possible so they do not spend more money renovating it.” (*Ibidem*).

In Portugal, the energy certificate is mandatory for all residential buildings, to be sold or rented, since January 2009. It was possible to have 3 houses and one apartment that obtained a certificate. All the interviews were conducted by two members of the Portuguese team.

1.2.3 Summary: Socio-economic characteristics of the 117 interviewed home owners

Table 1 shows several socio-economic characteristics of the samples of informants assembled in the 5 countries/region. It also shows that 34 informants live in a dwelling with a label or an

⁹ Translated from Bartiaux, forth., p. 8.

Energy Performance Certificate. The findings of the interviews with these informants are given below, in section 1.3.1.

Table 1. Samples characteristics in 5 countries/Region

	BE (Wal)	BG	CZ	LV	PT
Geographical characteristics					
Urban (capital or very large cities)	5	14	8	9	10
Small town	8	3	5	10	5
Rural area	10	7	10	5	8
Total	23	24	23	24	23
Socio-economic characteristics (household total income quartile: estimation)					
Low	3	2	1	8	0
Low-medium	5	11	7	8	2
Medium-high	5	8	11	7	8
High	10	3	4	1	13
Total	23	24	23	24	23
Socio-economic characteristics (highest diploma)					
None	1	0	0	0	0
Primary (around 5-6 years of schooling)	0	0	0	0	0
Medium (around 9 years of schooling)	0	1	0	3	2
Medium-high (around 12 years of schooling)	3	6	11	7	1
2-3 years after the secondary school or college (Bachelor degree)	5	2		7	0
University diploma (4-5 years after the secondary school or college, Master degree)	11	12	9 ^(a)	7	16
PhD	3	3	3	0	4
Total	23	24	23	24	23
Living arrangements					
Alone	4	6	3	4	3
1 adult + child(ren)	4	0	1	2	0
Couple	4	6	6	9	9
Couple + child(ren)	11	9	11	7	11
Other: living with at least one parent	0	3	2	2	0
Total	23	24	23	24	23
Housing and labels characteristics					
Apartment, no audit	0	10	3	4	6
Apartment, with audit & labels	0	3	0	0	1
Apartment, only with audit	0	0	0	14	0
House, no audit	9	11	18	6	13
House, with audit & labels	11	0	2	0	3
House: loan if mandatory works	3	0	0	0	0
Total	23	24	23	24	23

^(a) Until about the year 2000, there was no bachelor/master system and therefore, a single group is made.

1.3 Renovations carried out by dwellers

1.3.1 Housing stocks

Table 2 gives some characteristics of the material structure in the countries/region studied: the buildings stocks are old everywhere but in Portugal as the most dwellings were built before 1970-1980. The proportion of houses ranges from 27.6% in Latvia to 87% in Wallonia.

Table 2. Characteristics of the building stocks in 5 countries/Region

Country /Region	BE (W)	BG	CZ	LV	PT
Housing stock	1.2 million	3.8 million	4.3 million	1.04 million	5.6 million
% houses	87%	54%	43%	28%	65%
Main materials	Bricks, concrete, schist, stones	Bricks, steel/concrete	Bricks, steel, concrete	Bricks, stones, concrete, wood	Bricks, concrete, iron
% apartments	13%	46%	57%	72%	35%
% built before 1970/1980	74% (houses)	67% (dwellings)	57% (houses) 49% (apartm.)	63% (houses) 42% (apartm.)	35% (dwellings) ^a
% owners	68% ^b	96%	±50% (all dwellings)	89%	76%

^a Before 1970 (2001 figures).

^b 68% of the adults (18-79 years) own their dwelling.

1.3.2 Energy-related renovations

The energy-related renovation that is most often done in all 5 countries but in Portugal is the change of frames and windows. In Wallonia, roof insulation comes next. In Bulgaria, half of the 24 informants made a full renovation of their dwelling. In the Czech Republic, “Remodelling the space (...) was often done when respondents bought an old house as there was space needed for extending the kitchen or bathroom. Often there were no rooms in the attic and that had to be done by the respondents.” In addition, “Some older houses had a bad roof and had to be reconstructed. This was often (but not always) combined with insulation.” (ten Donkelaar, chapter 4: 4.8). In Latvia, the second energy-related renovation that was most often carried out by the informants is wall insulation. In the sample from Portugal, boiler replacement and heating system replacement are more often seen than changing frames and windows (Fonseca & de Almeida, chapter 6: 6.8). But this may happen just by chance, given the too small sample size in each country to observe the frequency of different types of renovation.

Although special attention was given in the presentation of the interviews for non insisting on their energy aspects (Gosselain and Bartiaux, 2010), many informants in all 5 countries were inclined to answer to the question concerning the main renovation they have done by mentioning an energy-related renovation. In so doing, they forgot to mention or underestimated other works, such as painting, decorating, and so forth. In addition the question concerning the main renovation was often not clear for the respondents and triggered the question on what was meant by ‘the main renovation’. So there is no reliable and sufficient information to put energy-related renovations in perspective with other renovations.

1.3.3 Summary

Housing stocks are (rather) old in all countries except in Portugal. It is therefore not surprising that changing frames and windows is the energy-related renovation that is most often done by the informants in these 4 countries.

1.4 Roles of energy labels

1.4.1 Informants in a labelled dwelling

The five samples all include a subsample varying in size and made of home owners whose house or apartment had recently received an energy-performance certificate and/or a label, as explained in detail in Gosselain & Bartiaux (2010, pp. 7-15). In these five countries, the implementation of the EPBD was in 2009-2010 at an early stage, so few interviews could be done with home owners whose house or apartment had recently received energy certificates or labels:

- 11 in Wallonia (labels not yet mandatory in 2007 when the home owners had requested and paid for an energy assessment of their house).
- 3 in Bulgaria
- 2 in the Czech Republic
- 14 in Latvia, all living in multi-apartment buildings that had an energy assessment
- 4 in Portugal, 3 houses and one flat with an Energy Performance Certificate.

These rather small figures call for caution in interpreting the results: only 29% of our 117 informants had an Energy Performance Certificate or labels at the time of their interview, and among these 29%, nearly one third (32%) are in Wallonia and requested and paid *themselves* the energy assessment of their house. Among these 11 Walloon informants, only 2 had the energy assessment *before* beginning the renovations of their house and are thus in the situation focused on by the EPBD. The other 9 informants were in the process of renovating their house, some since more than 10 years. In addition, the Latvian subsample of 14 informants is also peculiar: they all live in apartments and the whole buildings were assessed for their energy consumption but as shown below, these energy assessments are made only if 51% of co-owners of the building apartments agree to do so. These informants are thus not representative of daily-life Latvian home owners.

The data collected on these 34 informants give interesting results that can be summarised as it follows. They first confirm earlier results (Gram-Hanssen *et al.*, 2007): energy expert advice for home renovation is always interpreted (or discarded or forgotten) by owners from their daily life perspective. “If following the advice is in line with the identity of the interviewees, or in keep with the household’s plans for the house, it may induce the activity.” (Gram-Hanssen *et al.*, 2007: 2885). However, several informants in Belgium and in Portugal are reluctant to recognise the (possible) influence of the energy assessment.

Indeed in Wallonia, “among the 11 informants who paid for an energy assessment of their house, few (two women, one man and one couple) spoke by themselves about this audit as a major guideline when describing the renovations they did. The following quote (from a loquacious lawyer who was however hesitating at this moment of the interview) is representative of this apparent difficulty of the 7 others to confess a need for assistance in these technical matters, even though our interviews indicate that the energy assessment appears useful to raise attention to

unknown insulation possibilities, specially for the external walls, the floor and/or the cellar ceiling:

“So I think that I have now done nearly all of what was to be done. The only thing that one could possibly still do, (hesitation) – because I had a ... an energy assessment of the house done, that is how I learned that what was interesting was the insulation of the walls, (hesitation) and the boiler – is to possibly insulate the... the the ceiling of the cellar.” (l. 994 et sq.)” And later: “I prefer to use my money to play golf”.

Like this man, all these informants interested enough in energy savings and paying for an energy assessment speak more freely about the energy assessment when they are asked by the interviewer about energy-related renovations they had *not* done, rather than about to the renovations they did carry out.” (See Bartiaux, chapter 2: 2.8).

And in Portugal, “4 out of 23 households have an Energy Performance Certificate (...). Although they recognize the usefulness of the EPC, they were not influenced by the recommendations given in the certificate. None has considered the EPC for planning the renovations. Not because they do not trust the certificate but because they had already decided about the renovations to carry out, either energy related or not. The Certificate was ordered just because it is mandatory for the notary when asking the municipality for the permission to live in the house (municipal licences).

“For me the energetic part makes a lot of sense, but the acoustic part did not make any sense, especially because this house is located in the top of a mountain, without any neighbours, only the nature around...”; 1130-1134: Of course I have the certificate, it is stored in a drawer... I need it to show it in the municipality ... It is there, waiting to be shown to the municipality.” (AB, 1139-1142)” (Fonseca and de Almeida, chapter 6: 6.5).

In the Czech Republic, “the impact of the energy label has been very limited among the inhabitants. (...) [because] the label has been fully introduced from January 2009 onwards, but only for new houses and reconstructed houses. As a result, only 2 of the respondents had an energy label, one (Roman) because he had his house reconstructed in the framework of an energy incentive programme and an audit was required for the application, the others (Adam/Eva) because they had a new house built recently.” (ten Donkelaar, chapter 4: 4.6).

The same situation prevails in Latvia, as reported by the Latvian team: “Practically, energy labels and audits have no impact on energy related renovation works conducted in the dwellings. The main reason for carrying out an energy audit is the participation in the national energy efficiency support programs or is related to the wish to take a loan from banks for building renovations. (...) Despite the fact that the main part of the in-depth interviews was made in apartments where an energy audit was done, almost nobody could explain what kind of information is covered by the energy audit. The informants who had implemented or were implementing energy saving practices admitted that it would be important to have an energy label, but some informants had no interest in it. Some informants considered that the audit did not give any new information that they did not already know, thus making the energy audit needless.” (Ozoliņa & Garā, chapter 5: 5). The following quote is from a man living in an energy-audited multi-apartments building (‘I’ is for the interviewer):

- I: “Were you informed on the results of the energy audit?”
- Mr: “This was already clear without knowing the results.”
- I: “And what was clear for you?”
- Mr: “That it was needed (laugh)” (Ozoliņa & Garā, chapter 5: 5.5)

Both in Portugal and in Bulgaria, some well informed interviewees had strong criticisms about the methods used in the energy assessment and therefore in its value. These negative comments echo others reported elsewhere in Europe (Steiß et al., 2009). In Portugal, “Informants who know well the Certification of buildings process (...) were quite critical about the methodology used for giving the efficiency range of the houses, because it was not giving importance to the building envelop and was directed at end-use appliances.” (Fonseca and de Almeida, chapter 6: 6.5). In Bulgaria, some “respondents are more skeptical and are questioning the methodology used to come up with the labels. For example, Iliyana, lines 758-765:

“Besides, hardly someone is going to explain the methods they use to calculate this energy efficiency: “This is the methodology we have used. However, there is another methodology and this is how it is used.” So this would be for me very much like taking the data for the heating where representatives of companies, contracted for reading the energy consumption for heating purposes, do some calculations and give you this long list”.” (Stamova et al., chapter 3: 3.7)

These findings on the role and opinions on the labels or energy certificates for the informants whose dwelling had such information are summarised below (this page).

1.4.2 Informants in dwelling with no energy certificate

The majority of our informants (71%) did not have an energy certificate. In Latvia, “half of the informants had no information and almost nobody knew what an energy label or a certificate was. The informants who had heard about an energy audit could not give an explanation or explain it in more detail.” (Ozoliņa & Garā, chapter 5: 5.5). In Bulgaria, “The knowledge about energy labels and labelling system of the rest of the respondents [whose dwelling was not assessed] varies. Most of them have had no or very scarce information and only two respondents were well acquainted with the energy audit procedure and with the idea behind the energy labels. Most of the respondents shared the opinion that the energy labels should be promoted and advertised. Most of them think that the tax exemption for buildings with energy certificates (classes A and B) is an attractive stimulus for renovation. Some of the respondents are inclined to trust such a label. For example, Boryana, lines 669 - 674:

“It would be nice to have it; if I would trust it (pause) I would consider it, well... because it is nice to know, even if it is not very specific, well, I would not trust it a 100%, but it would be nice to have it.” (Stamova et al., chapter 3: 3.7).

In Wallonia, in the subsample of informants who did not pay for an energy assessment of their house, several had for free a kind of ‘light’ assessment when they got a special loan or a subsidy (‘for rehabilitation’ of old houses). All the others had heard about an energy audit and “no one was wishing to have such an assessment, either because they claimed knowing enough by themselves or because they preferred not knowing more.

“No because the house, as it is, I don’t see really what I can change (...) I can’t imagine sacrificing the stones to find myself with a wooden façade.” (Eléonore, l. 1073 et sq.). (See Bartiaux, chapter 2: 2.8)

1.4.3 Summary

Only 29% of the 117 informants in the five countries had labels or energy certificates at the time of the in-depth interviews, of whom nearly one third are from Wallonia and requested themselves the energy assessment of their house. Among these 11 Walloon informants, only 2 had the

energy assessment *before* beginning the renovations of their house and are thus in the situation focused on by the EPBD. The other 9 informants were in the process of renovating their house, some since more than 10 years. In addition, 14 Latvian informants living all in apartments had their building assessed for its energy consumption but as shown below, these energy assessments are made only if 51% of co-owners of the building apartments agree to do so. These informants are thus not representative of daily-life Latvian home owners.

So the results obtained in the 5 countries and summarized here are only indicative but still, they give some insights.

For these few informants in the 5 countries, the labels and energy certificates do not appear to play a major role for conducting energy renovations. For several informants in Wallonia and one (of four) in Portugal, it seems that the labels and the associated recommendations did play a role in raising the attention at the possibility of insulating external walls, the floor and/or the cellar ceiling: *but* most of these informants are reluctant to recognise this role of the energy assessment that they asked *themselves* and prefer to show themselves as the master of their renovations. This result is confirmed by all 4 informants in Portugal who had an energy certificate.

This minor role played by the energy certificates is maybe explained by the fact that the implementation of the EPBD is slow, the energy certificates are not well known, and if they are known by some well informed interviewees, like one surveyed in Bulgaria and two in Portugal, (part of) the methodology used is criticized, respectively for the lack of clarity in the methodology used and for the focus on appliances rather than on the envelope of the building. These negative comments echo others reported elsewhere in Europe, e.g. on the methodology for calculating the payback time of any energy-related renovation (Steiß et al., 2009).

In Bulgaria, the tax exemption for buildings with energy certificates (classes A and B) is said to be an attractive stimulus for renovation. In Wallonia, a list of customized but mandatory energy-related works is provided to the low-income families benefiting of an advantageous loan or to owners having a special subsidy for the rehabilitation of their old house. In Portugal, the subsidy for solar panels is said by one informant to be effective for the others, not for herself.

Other levers for doing energy-related renovations than the information given by the energy performance certificate appear to be more influential, as shown below (sections 4, 5 and 6).

1.5 Roles of incentives or renovation programmes, and policy in general

All the informants were given the opportunity during the interview to express their opinions and possible criticisms about the (non) existing programmes and subsidies of their country. These opinions are a basis for drawing policy recommendations, which will be elaborated in the next step of the research.

1.5.1 Existing programmes and knowledge thereof by the informants

In Wallonia,¹⁰ there are many different subsidies, and all respondents have heard about them mainly through several media of communicating about regional subsidies and fiscal (federal) rebates for energy-saving works or investments, or for an energy assessment. Indeed, for all the persons interested in energy and/or money saving, their search of information rapidly leads them either to the Internet website on energy matters of the Walloon Region or to one of the energy offices (also managed and paid for by the Region) where they can receive free advise. These last

¹⁰ From Bartiaux, chapter 2: 2.6, 2.8.

years, there were also a lot of advertisements on the regional subsidies, and more generally on these issues, TV broadcasts (“you cannot escape them”, as put by Arnaud, l. 873) and press releases. Nearly all informants refer to these mass media:

“Of course I knew that there are subsidies from the Walloon region or something...
Yes I have heard, I have quickly visited their website.” (Coralie, l. 350 et sq.).

Many informants got at least one subsidy and a fiscal rebate (most often for energy-efficient frames and windows, several for boilers and/or roof insulation, and more rarely for photovoltaic panels and outside walls insulation¹¹) and at least eight of them did benefit either from a low-interest loan or a special subsidy (for the ‘rehabilitation’ of an old house) that are granted to the condition of doing energy-saving renovations.

As there are many types of subsidies (per type of energy-related renovation, per m²...), the search of information and the calculations on the most advantageous one is long (9 months for Laura for example, see below) and complicated:

“You must be a keen calculating person and this is not our specialty” (couple where both have a BA degree)

“Both of us have a university degree [a Master] and we already had [problems] to sort out the papers. So for someone who has not such a background, I don’t know how he does. So, I tell myself, it’s stupid because these subsidies are normally accessible to everyone: are they really accessible?” (Laura, 551 et sq., Belgium).

Even so, she mixes up the regional subsidies (granted by the Walloon Region) and the federal tax rebates that are applicable everywhere in Belgium.

In Bulgaria, and according to Stamova et al. (chapter 3: 3.8), more than half of the respondents were informed about the existence of incentives and programs, provided by the government and banks, and about available financial instruments. The most popular loan available is the Energy efficiency loan. But no one has applied for it, as the respondents (all in houses) think that conditions for the loan are not reasonable.

One of the respondents, a house owner, was familiar with a governmental program which provides incentives for people who install solar systems. He shared his intention to apply when he would have enough money.

In sum, the effects of these programs are minimal for all respondents in Bulgaria. Only three of the respondents from the first wave (all in apartments) have taken part in a demonstration project which promotes the energy audits of buildings and their renovation. The other respondents did not use any bonuses or incentives.

In the Czech Republic, “many respondents answered that they knew about an incentive programme, some considered applying for a grant, or already did it, others did not. The most often mentioned (or practically only mentioned) programme was the so-called Green Light for Savings programme) that was introduced in the Czech Republic in spring 2009. During late 2009 and early 2010 a large information campaign was started in the Czech Republic, so that at the time of the second wave of interviews, a large number of respondents knew about this

¹¹ Since 2010, the subsidy for photovoltaic panels is suppressed and the one for outside walls insulation has been reduced of more than half.

programme and had considered its using. At the time of the first wave of interviews, respondents did not know the programme yet. (...) Another type of support often mentioned was the current support for renewable electricity production (and mainly photovoltaic power production). Some people had negative feelings about that, others felt that it was a good idea and even considered putting photovoltaic cells on their roof (although no one had done this), mainly for the reason that you could get a subsidy for that (and that it could be financially attractive). Some other people also mentioned subsidies, e.g. Kaja mentioned that he had received a low-interest loan for insulation some years ago (but forgot about the name of the programme). In the past (1990s) there was support for electric heating systems, that some people made use of, e.g. Marta told that she has installed electric heaters in their house because:

“... at that time they were made attractive, eh, electric heaters, so this meant that we actually did that, because at that time there was no gas network in the village” (ten Donkelaar, chapter 4: 4.7).

In Latvia, the energy audits were mainly done in the framework of a state program. Within the program people could get the some founding from the European Union foundation. This was more like a voluntary step. It was somehow linked to the EPBD, but at the same time the law on EPBD in Latvia was adopted only later, in 2009. In the framework of the European Union foundation, the Latvian Ministry of Economics has developed two activities. One is for multi-apartment building energy efficiency renovation works, where the co-financing is up to 50%. The second one is for the energy-audit report and the technical report preparation of multi-apartment building: the co-financing is up to 80% for each report.¹²

According to Ozoliņa & Garā (chapter 5: 5.7), the majority of informants have heard something about the support program for building renovations, but they have no full view of it. The informants who live in private houses said that they were not interested either because this was only for multi-apartment buildings or because of their unwillingness to take a bank loan:

“Do you know about any incentives or subsidies regarding renovations?” “I have heard something from mass media that the discussion is going on about the multi-apartment buildings, especially about the outside wall insulation.” (Ervinš).

“In terms of initiatives and grants in relation to various renovation works, have you heard anything about those tools and what is your opinion on this issue?” “(Thinking) Mmmm, well, if there would be a stable economic situation, then I could think about subsidies and loans for something, but for now, no, this is quite a risky option to take some kind of credits” (Billijs).

The residents of multi-apartment buildings are not interested either because of the neighbours' disagreements or because they have already made the renovation works. Some bitterness is then perceptible:

“Are you interested in incentives or maybe you have heard something?” “I do not need any [support]. I see that other houses in K are renovated and soon all houses in K will be insulated. So I see that the process is going on. (...) I also talked to Inārs who lives in the building that is currently renovated. And now, I am pissed off and I think that it is injustice that, because currently I do not understand what kind of European money it is and whether they have to give [us] back the money which was used for renovation works, because it comes out that we were totally stupid that five years ago we had to

¹² Ozoliņa (2010), personal communication.

pay the full sum of the renovation works. This is not clear for me and I consider it as a great injustice if somebody would get this like a present. We are paying the credit very conscientiously” (Neo).

There is no funding available for single family houses, whereas it seems that private house owners could be more interested in such programs than dwellers in multi-apartment buildings.

Finally, in Portugal, and according to Fonseca & de Almeida (chapter 6: 6.7), incentives are generally more related to renewable energies, in particular for the installation of solar panels and micro generation, than for energy renovations or energy efficiency. The feeling of the informants with the renewable incentives is quite positive, but some informants looked puzzled at the interviewer because they do not seem to know anything about it:

M&M - 223-224, “No, we didn’t look for it, I didn’t even know I could have financial incentives”.

Mil – 423: “Who is giving this type of... [laughs]...No, I did not...”; 410: “No, I think there are no incentives”.

While for few informants incentives are important drivers for carrying out energy related renovation works, for most informants, incentives are helpful but are not determinant, meaning that they would carry the works independently of having or not incentives. However these informants are well informed and they understand the importance of the energy renovation works for the performance of the house.

AC, 419-424: “I would have installed it anyway. For me, it was gold on the blue, because it was in the exact time I thought... well, I was about to think about this because I was in the point to start thinking about the house, I would had installed it anyway, but I think.... Of course it would be harder because I would have to spend more money and for whom ...For many people it was an excellent idea, because this enable them to install solar panels, otherwise they would never be able to do so, I think”.

Still in Portugal and as seen above in Belgium, one informant has also a concern on the social injustice created by the subsidies and thinks they are not distributed among those who really need the incentives. They are going to rich people who do not need them, but have better access to information:

MCM, 704 et sq. “At the first sight incentives are great. Unfortunately I know some abuses.... especially when it comes to guest houses..... There are situations that benefit from the incentives but they did not transform the house in a guest house (...) And the problem is that those people do not have particular need for incentives...while there are many inner places in Portugal where the houses are falling down, places where these incentives are necessary.”

1.5.2 Too much paper work

There are criticisms concerning time-consuming forms, long waiting time and bureaucratic work of the programmes that are often heard in all 5 countries under study.¹³ As already pointed by at least two informants, one in Belgium and another one in Portugal, this administrative work, seen as too long and too difficult especially for less educated persons, raises again the question of social (in)justice of these subsidies.

¹³ The following findings come from chapters 2 to 6.

In Belgium/Wallonia, contrary to most informants, two did not apply: one who found that it was too much paper work, and another one, whose installer deducted the amount of the subsidy from the bill, so both parts were happy to have less paper work.

In Bulgaria, besides the lack of money, another reason to decide not to apply for the specialized loans related to energy renovations is the heavy bureaucratic procedure which respondents consider as waste of time and effort. For example, Eva, lines 265 – 267:

“I believe they require a million documents and data, which a person cannot produce, to get these subsidies and aids for making insulations, so this is just a waste of time”.

In the Czech Republic, there was also some criticism regarding the Green Light for Savings programme: some respondents felt that the application process was far too complex. Others complained to have to combine too many measures at once, which makes it too expensive (see below).

In Latvia, the same criticisms on time-consuming and bureaucratic forms apply:

“There was no luck for us. Despite 100% agreed, yes the residents agreed (...). Because we submitted the project application on 14th of May, but forgive me - I am signing the documents only on 25th of October and I did not delay it myself, not a single day. So no one will have a return in the winter [the energy savings in the winter provided by possible renovation of the building]. And now we are sitting and thinking what we will do if we must pay the high percentage [price increase for natural gas by 38%] (Santa, Latvia).

In Portugal also, it is a heavy bureaucratic process to apply for incentives, leading many homeowners to give up. Furthermore, there are heavy charges to be paid in order to get the necessary licences to carry out renovations in a house. One informant said that the available incentives are a shame and that one ends up paying more!

AB, 946-957, “I think it is absolutely stupid, the huge amount of money I had to spent to carry out works in my property, do you understand? I think it is stupid the money I had to pay to the municipality, the time I spent there, it is absolutely... to carry out works in my own property, with the care that I have, and I had to pay a lot of money!.... Of course, this was a disincentive... this is not an incentive... It's a disincentive ... and most of all, because they cause many delays in the works, if I wanted to live there, do you imagine how long I am involved in this process? Absolutely incredible!”

M, 287-288, “I've heard they end-up charging us twice the price, which the houses... and therefore, it doesn't correspond to what is announced”

1.5.3 Financial issues

Financial issues are a topic dealt with in many interviews!¹⁴

In Wallonia, one can summarise as follows the opinions of our informants about the subsidies granted by the Walloon Region: they are appreciated and interesting on a financial point of view, but less so than the tax rebates, they raise the attention on energy-saving works, but they are “only for some people” (Bénédicte, l. 666).

Indeed, a criticism against the Regional subsidies relates to this financial issue and was heard several times: “the subsidies are for the rich!” The applicant has to have money available to make energy-related renovations and advance the money for paying the work, before receiving the subsidy, possibly the next year, and with the tax rebates, a probable tax reimbursement still the year after. The next two quotes, from two informants with quite different income, illustrate this point, which is a main issue (also shown for the Brussels Region by Maréchal, 2009):

[Right at the beginning of the interview] “I have accepted [the interview] because I told myself that I probably had a non-typical profile.” “Why?” “Because I have bought [the house] four years ago, I have no money and at the same time, I have in practice no access to the subsidies. (...) To have access to the subsidies, money is needed because to be able to invest is needed.” (Full-time employee, BA degree, living alone).

[After financial calculations quickly made during the interview, about PV panels] “a 23% annual [yield], if you know other [so fruitful investments], I am quite interested.”

However, beneficiaries of the loan for low-income family do not pay the renovation works themselves, the Fund does it for them and it is also in charge of asking (and receiving) the corresponding subsidies, which are then deducted from the amount remaining to pay.

Another aspect of the financial issues is the amount of the subsidies (given by the Walloon Region), which is much smaller than the tax rebate (from the Federal Belgian Government). Most informants received both, under certain conditions.

In Bulgaria, the lack of money is a reason to decide to not apply for the specialized loans related to energy renovations and all respondents prefer to operate with their own money. And when they do not have the money needed to do the renovations, they prefer to take a general loan.

In the Czech Republic, there was some complain that the Green Light for Savings programme requires to combine too many measures at once, which makes it too expensive (see above). The programme was indeed considered to be unattractive by many people when starting in 2009 as at least 3 measures related to energy efficiency had to be combined to be eligible for a subsidy. This relatively strict requirement has been loosened gradually during 2010 (but this was not known by many informants).¹⁵

According to some Latvian informants, in Latvia, the subsidy is granted only when a bank agrees for a loan:

¹⁴ The following findings come from chapters 2 to 6.

¹⁵ M. ten Donkelaar, personal communication.

There was no reason to submit the papers, if no one accepts them in case if we will not have the bank loan. I think it was the most stupid thing and I think it works also today. No one accepts it if you do not have the bank loan. We had the application from the first bank that they grant the money and this letter was a guaranty in the project. But than they put such a high interest rate and they changed it almost every day. We just refused them and changed the banks. (Santa).

1.5.4 Dealing with cost estimates

Searching for and sorting up the cost estimates from several professionals may appear as a negligible issue as compared to the administrative and financial problems mentioned above, but still these tasks are another type of difficulty faced by some home owners.

In Wallonia (see chapter 2: 2.8) for example, an engineer with a PhD tells that he found himself “somewhat powerless when one must compare because one finds quite different cost estimates” (l. 812-3) ... even he is probably the best educated informant to deal with this situation. At the other end of the range of educational backgrounds, the poorest informant (no diploma) tells this “no luck” (as they said) story:

“An expert also came for the works and gave us a certain amount [of allowed but still virtual money] to do each work, so with this amount that he had proposed, we didn’t have such a large choice (...), we took the least expensive.” (l. 364 et sq.). Just earlier: “they have nicely worked except that they have forgotten some little things, as there, below the door, you see that there is some air passing though”. I: “Indeed!” [The interviewer was quite surprised as there was a 2 cm difference between the floor and the main door.] “And the door handle, you open the door a little too abruptly, and you get the door handle in your hands. So we have contacted them, so they already came and fix it 2 or 4 times, but according to what we just heard, they are bankrupt” (l. 344 et sq.).

In Bulgaria, most informants asked several professionals for financial offers, unless they know one they trust. It is a common belief that more expensive works are of a better quality, so many selected more costly options even when they were not sure about the results. Several informants shared that they prefer to have choice concerning the renovation cost, e.g.:

“When I have searched information about companies which offer outside walls insulation, I have noticed that the cost of their service is almost the same, there were slight differences. I wonder why their prices are almost equal, it seems strange to me. I think a lack of difference in prices limited consumers’ choice.” (Marieta)

Two Bulgarian informants mentioned that they relied on the professionals to take the best renovation decision for them and both were unpleasantly surprised by the high cost they had to pay at the end.¹⁶

The Czech interviews are not mentioning problems with cost estimates but do often mention lack of professionalism among contractors (see also section 1.6.1).

¹⁶ Nikolaev, personal communication.

In Latvia¹⁷, the building management company generally takes care of the necessary documentation and other things to prepare the renovation works. The responsibility of flat owners is only to make the decision on renovation works.

One informant reported that she was involved in the administrative task (calculations, preparation of the reports to the Ministry of Economics to get the money paid) and this task was very complicated, despite that she is an accountant by profession.

In Portugal, most informants selected the contractors based on a cost/quality ratio, but people tend to prefer contractors they trust to avoid any kind of problems, related both to the renovation works themselves and to the budget estimates. No significant problems have been mentioned related to cost estimates.

1.5.5 Too restrictive subsidies

A few informants complain that the subsidies do not cover some works they were wishing or considering to do, e.g.: in Wallonia, traditional but energy-efficient walls building techniques (with mud and straw), staircases in Latvia:

“Nothing has been fortunate, there was no luck for us. Despite 100% agreed, yes the residents agreed, but about this project, the staircases are not finished, because we were the first ones who made it and the requirements for submission now with all (...) Yes, right now they do not need that and that...and the other thing is that no one will return back to the previous year, that changed the whole project.” (Santa)

In addition, one of the Walloon DIY informants regrets that there are no subsidies for DIY dwellers who make energy-related renovations (such as wall insulation), even if he understands that:

“there is a kind of policy to boost employment – not only to encourage energy savings – but in addition to have perhaps a less skilled labour force back on the labour market (...) but still, I find that the difference is too important between the two scenarios and I find that there should be instead a subsidy, maybe lower, for people doing it themselves, and then the higher one for people asking to a contractor.” (l. 1806 et sq.)

1.5.6 General energy policy issues and informants’ suggestions for other policy instruments

In addition to all criticisms reported above that can also be positively seen like as much indirect policy recommendations, most informants in Belgium and a few in Portugal made direct policy recommendations. This results maybe from the samples’ construction, or from a higher awareness on energy and environmental issues: this “culture on energy”, as put by a Belgian informant is also an indirect result of the various media speaking about or promoting regional subsidies in French-speaking Belgium. There are also some suggestions, whether direct or indirect, coming from the Eastern European countries.

¹⁷ L. Ozoliņa, personal communication.

In Wallonia, the following suggestions were made by informants (Bartiaux, chapter 2: 2.8 – 2.9). They can give ideas for all countries involved in this research project:

- For persons lacking of either money, time or competences, free energy assessment done by a team with both technical and social competences, the last one being presented as follows: “Someone who accompanies you and who takes your point of view, that is lacking I think. And I see that for everything: I am a social worker and I see well that this is lacking and people expect that, an accompaniment, not everything being done for them, but an accompaniment, an advice as if one were in their position, by letting freedom and everything, but by taking their point of view.” (Social worker, l. 392 et sq.) ;
- Something similar to the “Housing Fund” or a broadened access to it, also for low-income households but with no or only one child, for example elderly persons living alone or in pair;
- The actual beneficiaries of this “Housing Fund” would like to have the opportunity to seek advice from the Fund for requesting and choosing between insulating techniques and materials, as well as for cost estimates and maybe so also *before* buying the house (help for understanding “what is written in small letters” in the contract). [There are only 3 such beneficiaries in the sample, and their stories on the help and advice during their renovations received from the Fund are quite different.]
- A subsidy for updating the electrical system [necessary in most old houses not yet renovated with actual standards of electricity consumption];
- Energy auditors who would be better educated and not “turning crazy” if they are received by a young woman, to whom an auditor gave “no trust”.

In Bulgaria,¹⁸ the main policy comments were related to the grant programme for home renovation. Although most respondents were familiar with it, they were not willing to take a bank loan (which is a requirement of the programme). For example:

“Ten years ago, I was injured. For a short period of time I couldn’t work and I was not capable to pay my monthly instalment to the bank. There was a real danger to lose my apartment. It was very unpleasant experience. From this moment I promised myself to avoid any loans, credits, and even leasing schemes. ” (Nikolay)

According to one of the Bulgarian informants with the best experience in energy renovations, Slava Mihajlova, the state should consider the benefits more for the end customer, the citizen, rather than the benefits for the companies providing the energy audit services. She is convinced that the current chaotic state of the affairs only stimulates high prices, uncertainty about the quality of the service and a lot of troubles for anyone who attempts it. Additionally, she shared:

“In the meantime, the documents and acts adopted seem to aim at discouraging people to implement the requirements of the EU.” (L. 122-123)

“These constant [legal] changes, [that are] in favour of the energy auditors, not the citizens, are in my opinion unacceptable, unacceptable. These documents should be improved. They should be clear, precise, and more specific. And they should not be changed all the time...” (L. 417-419)

¹⁸ Nikolaev, personal communication.

The only policy suggestions in the Czech Republic were related to the subsidy programme. E.g. Katka mentioned that these programmes should be targeted at more sectors, she mentioned public buildings as an example. She thinks that in these buildings, there are quite high possible savings, because there are a huge number of these buildings, such as post offices, schools etc.¹⁹

There was no direct suggestion made by Latvian informants who seemed to be not interested in this topic. Either they answered very shortly or they did not have any information. However, it is possible to get some suggestions from the interview with Santa, because she is the only informant who has done the renovation works of the building in the framework of the state programme. For instance, she said that it was not easy to find the information. She also reported that she did not do the technical part of the project application that was done by her husband. Maybe, this can be seen as a suggestion that the process of money acquisition for building renovation is too complicated for an ordinary person.²⁰

In Portugal, two respondents very well informed on energy policy issues made additional comments on their country's energy policy. One mentioned the fact that some incentives are announced but in practice they are not running properly, or nobody seems to know how to apply for them. One example is the windows replacement programme in the scope of the NEEAP, which was enacted by law but is not being applied, and is not well disseminated.

“I already listen about several things that are foreseen, but in practice are not working. (...) I have consciousness there are incentives but I am going to look for them and I realize they are not real, or the cabinets do not have specific information about the procedures to apply for the incentives.”

Another one is very critic about the policies in Portugal because there are too many decrees, about the several certification processes needed, everything has to be certified, and about the urgent need to simplify the system, by delivering simple notes with simple messages to the population.

824-840:the legislation exists but to comply with the legislation is missing. I think we have too many legislation and then.... There are so many decrees that nobody reads all the laws....and the many norms and decrees should be simplified. This is the only way to make people to comply with.... The system is failing ... the paradox is that government announces bureaucracy to be reduced, but this is not happening indeed. The only difference is that bureaucracy is different but still exists”.

1.5.7 Summary

Besides these last policy recommendations done by a few informants, unexpectedly, the results from all 5 countries converge to what some informants see as a negative aspect of energy-related subsidies: “subsidies are for the rich” “who do not have particular need for incentives” because of complicate and time-consuming access to information (often requiring access to and competence for Internet) and paperwork, as well as necessary availability of money.

The free energy offices organised since the 1990's by and in the Walloon Region, like in Sweden since longer act as an institutionalised (but small) counterbalance, according to some informants.

¹⁹ M. ten Donkelaar, personal communication.

²⁰ L. Ozoliņa, personal communication.

The need for such coordinating entities, whether public or private, when disseminating social change on energy issues in houses, has already been illustrated by Ornetzeder and Rohrer (2009) for the case of passive houses.

1.6 Market and social networks: roles of professionals, friends and relatives

As shown below, these other actors than the home owners play a major role in helping, advising and so on home owners to make energy-related renovations. The separation between on one hand professionals and on the other hand, friends, relatives and acquaintances is arbitrary, for many informants in all 5 countries knew at least one professional before beginning their renovations and/or are professionals themselves. However these two types of actors are separated in the following presentation to help draw probably different policy recommendations.

1.6.1 Professionals in the construction sector

The stories and (dis-)satisfaction told by the informants about professionals in the construction sector do vary both within and between countries as presented below.

In Wallonia, according to Bartiaux (chapter 2: 2.5), many informants report their difficulties in finding professionals with good and up-to-date competences on energy savings in their specialty (whether windows, boilers and so on). This opinion/complain comes both from the informants interested enough in energy savings for ordering an energy assessment of their house *and* from the other informants. The two newt quotes illustrates both situations (in that order):

“The clown [a carpenter] I called to do the work should have advised me, as a professional, to do it [insulate the gable from outside]” (l. 746-7), [and later, he expresses his opinion on the lack of know-how among professionals] “No professional, no professional is interested at the problem of insulation. For them, it is ... it is a chore. And in general, anything related to energy has no interest for the professionals. They really focus on the aspects [related to] installations, mechanics, and the aesthetics of the result. But insulation, no, not at all. Furthermore, in general, they rather don't care about regulations.” (Engineer, l. 854 et sq.)

[About 4-5 quite different cost estimates for loft insulation] “there are still many who do not know [insulation with cellulose] and “the others who came were specialists of this type of insulation, so cellulose, and then, the issue was on the number of centimetres, so some were saying that the norm was “X centimetres”, and others that with that number, one did not get the reduction, the subsidy from the Walloon Region” (Teacher, l. 453 et sq.).

However we also interviewed a young heating installer (whose father and father-in-law “are both manual workers”) who did a comprehensive renovation of his old house with special attention to energy efficiency and insulation, and an executive who is ready to promote a small enterprise installing photovoltaic panels. And many informants are satisfied with at least one professional they hired. But to find trustworthy professionals appears difficult, especially when it comes to walls insulation, and to a lesser extent, to roof insulation.

Precisely on roof insulation, four informants report to have done it themselves with some help of friends or relatives. Another one did it by himself after having heard advice from a salesman he

knew and trusted and other acquaintances, but the energy adviser showed him that the work was not done correctly and should be redone, which was not yet the case at the time of the interview.

So the general picture is contrasted. Indeed, several informants, again from both sub-samples, appear to be better informed than the professionals, possibly thanks to their friends (as in the above quote, this teacher has a friend who is specialised in roof insulation with cellulose), or thanks to their own research, namely but not only on Internet. Other informants also report the opposite situation: one frames' installer (also a friend of these informants) found triple-glass windows "exaggerated" and "not worthwhile for our house" and they follow his advice. Trust and friendship here overcome the opportunity of further energy savings.

In Bulgaria, according to Stamova et al. (chapter 3: 3.7), all respondents have hired at least one professional. Some of the respondents have hired professionals for all renovations (for example Peter has had a team work in his apartment and he was not involved); others have hired them for specific renovation activities (Like Ivan who has done most of the work on his house alone and has had professional help with very few tasks). Most respondents are satisfied with services they had: "I would definitely recommend both the architect and the technical director. He is a bit expensive, but his work is good" (Peter, l. 214-5). Three respondents are not so satisfied, as they had to redo some or most of the renovations:

"But in the end we had to take the company, which really was not the best option because actually the renovation they did, then we had to redo parts of it several times".
(Tea, l. 231-4).

Another important point is made by Stamova et al. (chapter 3: 3.4-3.5) and concerns the difference in the availability of professionals in the capital area and the settlements nearby (Petarch, Kremikovtsi) and in other areas of the country, as illustrated by the following and opposite quotes:

"All renovations were implemented by local people. There is a big group of skilled workers in constructions and renovations. They called themselves a "brigade" (Anton, lines 125-9) and later (lines 225-6) "There is a big choice of companies which install new windows".

[In the smaller towns and villages away from bigger cities, for example Karnobat]
"There are few companies which offer replacement of windows in the town. We hired a company from another city nearby - Aytos" (Vanya and Ivaylo, lines 207-210). And Marina, line 227: "...actually in our town we have only a few companies".

In the Czech Republic, and according to M. ten Donkelaar (chapter 4: 4.6-4.7), often technical professionals were asked to do complete reconstructions, and the respondents relied on their judgement in doing the work. Informants also have asked advice to other technical professionals they knew. Some respondents also mentioned that they received contradictory advice, as Kaja, mentioning that he wanted to insulate his house with 16 cm of polystyrene (advised by his brother who is working in Austria), but a lot of construction experts in the Czech Republic felt that this was exaggerated.

About construction professionals and craftsmen doing the (re)construction work, the respondents were often critical. Some craftsmen did their work well and the people were satisfied, others were not and could recall the things that went wrong, as Radek:

“Because they made mistakes and were also quite expensive. ... and big mistakes. When they laid the foundations and we measured it, we realised that part was missing, so that had to be redone. There were simply a lot of problems so we rather took another firm”.

In Latvia, and according to Ozoliņa & Garā (chapter 5: 5.6), beside the professionals of the construction sector, commented on below, a special actor has a major role in stimulating or not energy-related renovations for the informants living in multi-apartment buildings: the Building Management Company. Its role is very important for making the building renovation works and its influence can be either positive or negative. The positive aspect is when a company participates actively and motivates residents to make the renovation works. The company also conducts the renovation works after collecting the money from the residents. The negative aspect is when the Building Management Company defines requirements that are not accepted by the residents (e.g., installation of an individual heating metering system). In a specific case, an inactive attitude of the Building Management Company motivated the residents to make building renovation, but this can be considered as an exceptional case due to very active actions of the residents.

“So, you were the initiator?” “No, no it is not so dramatic. The initiator is the building management company, basically everything depended on them, everything, yes. There is the time for decision making, the work with necessary partners, or individual debates with each owner of the apartment...” (Neo).

About the construction workers and professionals, all Latvian informants admitted that they had consultations with them on how to make the renovation works better. The advices were mainly given by professionals, and the renovation works were made by construction workers. The advice from construction workers was also considered in the process of renovations. The professionals had only positive influence.

The role of professionals was important for 5 informants living in apartments, such as Gunita:

“Did you decide yourself on what kind of renovation works to do, or you asked for an advice from others?” “No, no, no, well of course that we decided ourselves that we needed it. No, we did not have any advice. Well, we found people who would make the renovation works through..... Well, he was a very good one, but we found him through an advertisement in a newspaper” (Gunita, living in a multi-apartments building).

For informants in private house, the role of construction workers and professionals is even more important than for informants living in apartments, because the renovations area is larger, and it is almost impossible for the informants in private house to make all the renovation works themselves without any support from construction workers or professionals. The advices from professionals were given on specific field like windows, roof materials, heating system, etc. The role of professionals was important for almost all informants from private houses:

“Have you had any assistants providing information support?” “Yes, I talked to various trade organizations asking for information, I gathered information before I started doing something” (Billijs).

And in Portugal, informants tend to choose contractors based on the trust and on their previous experience, as well as on the guarantees they offer for the long term. As in the other countries, many times the friends help identifying good contractors:

A L - 169: “We contracted a builder that we knew already”

AM, 302-314: “Only people that I know, people in whom I trust, because they are going to work on my house and this is something very intimate... the human factor is very important for me, more than the brand of materials, I trust in what these people say to me, their experience”.

Mil, 344: “Yes... the builder has helped us!”, 233-234: the builder did suggest us to install insulation in the attic because it was better for comfort, it was better for winter to avoid cold coming inside the house, and I think this was a good thing.”

A few informants mentioned the lack of professionalism among some contractors:

AL: “the only problem was the carpenter, that was a big problem ... the works were not done according to our specifications, and he took much longer than ever expected... it was a big delay.... He promised to come and he didn’t, he installed the wrong wood, etc....”.

However, in many situations reported in the Portuguese survey, it is not clear if the contractors have professional skills related to energy efficiency renovations. Professionals were pointed at as responsible for bad works in some situations because they did not have the know how to do well the renovations or, as also noted for Belgium, because they do not have sufficient and up-to-date knowledge on energy-savings techniques or renewable energy (PV in the 3rd quote):

M, 400-401, “I had days like this, I went there 4 times a day, to see what they were doing. And then I would say ‘This isn’t what we have arranged’.

I & C, 196-198: “Contractors do not have the necessary background to be able to advise people. Their knowledge and know how was transmitted from father to son, generally speaking; line 565: “and the contractor tells me that he does not know how to apply this material!”

M, 195-202 “Regarding energy, we would like to consider, and my husband has been insisting on it, and, at the time, I suggested to the engineer, to install solar panels. But he talked me out of it. He said that it wasn’t a good idea, because... I don’t know... He explained it to me at the time, but it’s not something I understand and I can’t remember what he said, but he said that in this house it would be very complicated; because of something ... He gave several reasons. I insisted more than once, because I believed it was time to think about it.”

However well informed persons, informants who were involved with the works, trust more on their own knowledge, or their friends’ knowledge, than on contractors’ advice:

LA, 138: “I bought some literature to understand about renovations”; line 180: “I asked for advice to some friends but I also studied, I looked at the available literature!”; lines 321-322: “Studying and learning is what we do best, right? ... Hum, it is nice to learn new things!”

In sum in the 5 countries, professionals play a major role in energy-related home renovations, not always in the direction of further energy savings though: lack of competence in these matters has been mentioned by informants of Belgium, Czech Republic and Portugal. In addition, in Bulgaria, there are not enough professionals in some parts of the country away from the capital area and in Latvia, for multi-apartment buildings, the role of the Building Management

companies is quite significant, again in favouring or not energy-related renovations of the whole building.

1.6.2 Friends, relatives and acquaintances

In the five countries studied, there is a unanimous agreement to acknowledge the advice and help given by friends, relatives, colleagues and acquaintances whether to find good contractors, as just seen above, or during the works. In addition, many informants of all countries have at least one friend or relative, acquaintance or client, working in the construction sector or in energy-related areas: these professionals helped in commenting cost estimates or in bypassing this procedure by proposing to do the work themselves. A third similarity between the five countries is that many informants mentioned that they find a lot of information on the Internet.

Furthermore, in Belgium and in Latvia, informants living in pairs often acknowledge the help of their spouse, especially so if he (rarely she) is a DIY practitioner:

“[My husband] bought two or three tools to do the necessary slots etc. I'm not going to give you the details, I don't know them (laughs). (...) He is pretty handy and he is doing well.” (Belgian teacher, l. 230-3)

“I consider, for example, that I was looking after the project and realized it. Also when Santa was coming home, she saw it (...) and she was not unsatisfied... I was the main building supervisor.” (Santa's husband).

Given these similarities, the next paragraphs on each country will just mention some “local specialty”, if any.

For Wallonia, a few more unexpected examples of help are mentioned (in Bartiaux, chapter 2: 2.7): neighbours in the same street renovated their roof at the same time with the same contractor, so they got a cost reduction²¹; four different informants were helped by their relatives or friends to insulate the roof of their house and for two of them, this is the only energy-related renovation that they entirely made without a contractor; friends working in the construction sector made for free energy-related renovations as an exchange of services, and by so doing, were also updated with environmentally-friendlier techniques searched for and found by the informant; an architect offered for free her help and her address book to ask for and sort out cost estimates; a friend of another informant made a thermography to complement the energy assessment, done by a professional; new friends were found during participatory renovation projects announced on Internet forums on alternative construction techniques; virtual ‘acquaintances’ on Internet websites were consulted about the reputation of a first selection of professionals before each energy-related renovation by the wife of a couple (who did many works!).”

In Bulgaria, family support, either financial or practical, appears to be even more important, and decisive for as much as 7 informants, as the following quotes indicate; in other cases, the relatives

²¹ This way of doing is much more widespread in villages having no gas access, for a grouped delivery of oil, hence a better price.

did not participate in the renovations and the reasons were different – relatives live in another city, are too old, too busy, etc. (Stamova et al., chapter 3: 3.4 & 3.7)

“Our daughter and her husband could afford to pay a skilled worker do all the work. We cannot afford to do this.” (Anton & Elena, lines 208-209).

“Our daughters and their husbands helped us in all renovations. I mean they helped us physically, not financially. Without their help it would have been difficult for us to manage with all renovations” (Sonya, lines 262-4).

Sometimes, family members have a negative influence on energy-saving renovation:

“My mother absolutely disagrees to insulate outside walls. My sister insulated outside walls in her apartment in Sofia. Mould appeared in the dwelling after insulation”. (Anton, lines 179-185).

In the Czech Republic, ten Donkelaar (chapter 4: 4.5) reports that family members give advise but also wishes on how the house should look like. Acquaintances or neighbours who carried out similar reconstructions or constructions were taken as an example and/or provided good references for construction firms. A lot of respondents also mentioned that they find a lot of information on the Internet, probably as a first set of information.

In Latvia too, the role of friends and relatives is important and acknowledged by the informants, except maybe if they are/were themselves in the construction sector, as illustrated by the following quotes (among many others, see Ozoliņa & Garā, chapter 5: 5.3 & 5.6-5.7)

“I called some of my friends and asked how much they had usually [on the bill for electricity], just to compare.” (Diana).

“(…) the boss of the company’s PAROC [a well-known manufacturer of heat insulation materials in Latvia] is my relative. I simply called him and he gave me a 3 hour lesson [on] how and what I had to do. Positive aspects and benefits... Yes, and why I have to choose PAROC. So there was no other option” (Andrejs).

“Who is the initiator of the renovation works at home?” “Definitely me, me (laughing), definitely me.” “Did you get some help from friends, relatives?” “No. It is simple. It comes in mind that nothing has been done for a long time and it starts to look not very good anymore, than definitely something must be done.” “How did you choose who would do the works?” “We did it ourselves.” “Yourselves?” “Yes, my husband, he understands something from construction works and he himself was a carpenter. Actually, this is not a problem for us, we do not invite people from outside, no.” (Rasma).

In the Portuguese sample of persons generally well informed on environmental or energy issues, relatives and friends have also an important role. In some cases, family members were pushing the informants for carrying out energy-related renovation works: one respondent was pushed by his sons who own an energy consulting company; another one was influenced by his wife who has a strong environmental consciousness. Another couple also gave importance to a cousin who works on energy efficiency. When it comes to the supervision of the works, it is usually a task seen as a masculine one but two informants reported that the wife did control the works:

“Did you have any help, any advice...?” “My wife.” (Ln, 106).

1.6.3 Summary

Let's repeat three important similarities between the five countries:

- A unanimous agreement to acknowledge the advice and help given by friends, relatives, colleagues and acquaintances whether to find good contractors or during the works.
- The fact that many informants have at least one friend or relative, acquaintance or client, or themselves, working in the construction sector or in energy-related areas
- The use of Internet reported by many informants.

So, our informants appear to be inserted in social networks that are quite significant in helping them make energy-related renovations and that are often connected to the labour force in the construction or energy sectors. Therefore, our informants are not lonely consumers on the market who would just need information (such as the one given by the energy performance certificates) to make the best choice, a view of the consumer maybe implied in classical theory in economics. These surveys in the five countries show instead that doing energy-related renovations is obviously also a social issue, as a topic of conversation, as a matter of trust and friendship, as a giving or exchange of advice or services, and with Internet, as a new source of information namely on contractors' reputation.

1.7 Other factors facilitating energy-related renovations

1.7.1 Overview

Several levers in combination

The reasons to conduct energy-related renovation work are quite varied and always in combination (as already noted in Bartiaux et al., 2006: 139). As exemplified above for Portugal, information and awareness to energy and/or environment issues are not enough to bring about energy-related renovations, even for (very) highly educated persons. In the same way, energy subsidies or tax benefits are not sufficient drivers by themselves, were they alone, as shown also below.

The reasons given by the informants are often the same in all 5 countries with differences in their respective weight both within and between countries: poor condition of the dwelling and thus cold, wish to increase the comfort of the dwelling (or access to ‘normal’ and nowadays standards, as said in Bulgaria, Latvia, the Czech Republic and also in Belgium by less rich informants), wish or necessity to save energy, most often to reduce energy bills, and for informants in Belgium and Portugal to help the environment, availability of subsidies and their associated requirements, if any. The three following quotes, from the Czech Republic, Belgium and Portugal illustrate these combinations in which the role of subsidies appear to be more preminent if they are associated to mandatory energy-related renovations:

[In Roman’s house, three renovations were done, because for grant applications, three measures had to be taken.] “Yes, a large renovation took place last year, in the framework of the Green light for savings programme, when we replaced all windows, insulated the floor, that was not well insulated and we installed a heat pump” (lines 67-69)”. (ten Donkelaar, chapter 4: 4.3)

- I: “Why did you insulate then, where did you insulate?”
- Mr: “Because we fit up the attic, so we do insulate the roof for...”
- Mrs: “Yes and then for the subsidies of the Walloon region, we also have to insulate, it’s part of [the requirements]
- Mr: “Yes and at worst, it’s always better to insulate because otherwise, your heating, well its consumption is enormous”
- Mrs: “Energy, we have insulated everywhere, here, it’s wholly insulated”. (Laurent, l. 506-511). (Bartiaux, chapter 2: 2.5)

“I would have installed it [solar panels] anyway. For me, it was gold on the blue, because it was in the exact time I thought... well, I was about to think about this because I was in the point to start thinking about the house, I would had installed it anyway, but I think...” (Portuguese informant, Fonseca & de Almeida, chapter 6: 6. 7)

As already commented on in the 5th section on market and social networks, another often mentioned reason for carrying out energy-related renovations is the advice either from professionals (architect, installer etc.) or from the informants’ social networks, with obvious connections between these two groups.

“Did you specify yourself the thermal insulation for the roof?” “(...) It was specified by the architect! (...) The solar panels were suggested by the installer.” (Portuguese informant)

[About a seller of environmentally friendly products for construction and decoration]
 “We sympathised and now I buy only there.” (Belgian DIY informant)

Increase of comfort and likely increase of energy consumption

Beside the reason related to the environment (which is discussed below), the levers cited above – poor condition of the dwelling and thus cold, wish to increase the comfort of the dwelling or to access to such a comfort, wish or necessity to save energy, availability of subsidies and their associated requirements, if any – all these motivations seem thus linked to a notion of “energy-related comfort”. However, it must be highlighted that energy-related renovations driven by a wish for (more) thermal comfort do not necessarily bring about energy-savings: Shove (2003) has demonstrated it in general, Boardman (2010) for the households in energy poverty in the United Kingdom and the following quotes²² from our five qualitative surveys also imply or mention it:

“So globally, one can say that... we are going to insulate [the roof and the Northern wall] to... to consume always the same [quantity] but to enable to heat a little more.” (Arnaud from Wallonia, l. 686-7)

“It must be warm!” said Anton and Elena, like all Bulgarian informants when defining comfort.

“The priorities had been not to ... so that we ... just not to freeze in the house. So that it would be possible to live there, to make conditions of living easier than before the reconstruction, when there had been only a coil and wood stove”. (Marta from the Czech Republic)

“I am saying I did not live here then. My ex wife’s mother lived here at that time. Probably, it was cold here, you know, [how] the outside walls [are], and there is also an outside wall. Probably it was more expensive [then], but now we pay the same as in other buildings that have no heat insulation on the walls. So they agreed and did the works and it became much warmer” (Vjaceslavs from Latvia).

“The temperature is also important for me. As I told you, the air conditioning with inverter was very important for me ... I do not like very hot environment neither very cold. But I like to be comfortable....” (AB from Portugal, 998-1001)

In respect to thermal comfort, this study has also shown that in Bulgaria, air conditioning is used to heat dwellings for it is the least expensive solution (Bartiaux et al., 2010: 3).

Another dimension often associated to comfort is related to space, especially so in Wallonia and Bulgaria: “To have a personal space for everyone” say both Eva in Bulgaria and Eléonore in Wallonia. Redesigning the space is therefore another renovation – there are many such cases in the Portugal sample – that is otherwise associated with an old building stock and has energy-related consequences. In Portugal, the existing divisions of the dwelling, either apartment or house, are more often seen as too small than as too large and the interior space was described as a maze by 2 informants, of whom this one:

“The most important renovation was to create the open space in the living room, it was the best thing we have done; 502-505: the space is much better now, without those walls ... The house is cosier and more pleasant, less maze now!”

²² These quotes are respectively from chapters 2 to 6, p. 2.9, 3.18, 4.9, 5.8 and 6.32.

In terms of energy certificates and labels, this wish for more space raises again the question of calculating the labels per m² (which favours the larger dwellings) or for the whole dwelling (which would favour the smaller dwellings) (Bartiaux et al., 2006: 121).

The role of environmental concern

About environment concern and/or knowledge, a comparison between Bulgaria and Latvia made during this research concludes the following: “Bad condition of old buildings and a feeling of coldness or discomfort are sufficient levers driving energy-related renovations in private dwellings. Environmental concerns are never expressed as a reason for renovation works, either in Bulgaria or in Latvia, all the more because there is some scepticism and misunderstanding concerning climate change. Building green citizenship in East/Central Europe seems thus to be disconnected from energy-related renovations of the dwelling of Bulgarians and Latvians.” (Bartiaux et al., 2010, p. 18).

In the Czech Republic, no informant gave an environmental motivation as a first reason to do renovation, whereas many have such a motivation, among others, in Belgium and Portugal:

“Well, everything that contributes to reduce our energy bills and at the same time to improve the environment, we are really keen on it”. (Portuguese informant)

Positive and/or negative influence

Another important result to be underlined is that a same factor – e.g. money or lack thereof, time or also lack thereof, technical characteristics, advice of professional or acquaintances – may either facilitate or counteract energy-related renovations. Without taking this double influence into account, there are many situations that could be seen at first glance as paradoxical, but they are not so for the informants. The next story illustrates these interactions and seemingly contradictions and it is given by a Belgian informant, who transformed a village house into 3 apartments (of which two to rent), one per level. As there is no gas infrastructure there, he opted for electricity as a source of heating, for the convenience of having separate meters and bills. For in Belgium, electricity comes mainly from nuclear power, this choice may be seen as the least environmental friendly one. But as it is also the most expensive choice, the informant had an energy assessment made by his architect and did fully insulate the building, including the outside walls, which is not (yet?) common in Belgium. However, he regrets to have not completely followed the advice on the insulating products that was given by the architect whom he found “too green” for him. (From Bartiaux, chapter 2: 2.4).

1.7.2 Frames and windows

The most often reason for renovation cited in all countries but Portugal is the poor condition of the frames that “needed to be changed”. This poor condition gives unpleasant sensations of coldness and/or dampness and also the desire for (more) comfort, to possibly alleviate children’s asthma, as added by two mothers with low income in Wallonia (Bartiaux, chapter 2: 2.4). In Latvia, according to Ozoliņa & Garā (chapter 5: 5.4), cold is the main often cited reason by dwellers in apartments:

“We changed the window in the kitchen because it was very cold, very cold. A smaller window was installed in the window and there were a lot of chinks and it was very-very cold. And now when they put the new window, now it is better, but we would not

change the other windows, because we do not have money and they are also good. (Zigrida)”

In Wallonia (Bartiaux, chapter 2: 2.4), another “secondary benefit” (Bartiaux, 2002 & 2007) of changing frames and windows cited is phonic insulation, and furthermore, often, this change is also the opportunity to make the windows larger for “Light! For light!” a mother exclaims, or as said by a teacher to enjoy “the charm of having an old house and making it modern”.

The poor condition of the frames and windows is obviously related to old building stocks in these four countries.

In Portugal, windows have been changed also by many informants, who motivate this change by a wish for more thermal comfort (Fonseca & de Almeida, chapter 6 : 6.8).

1.7.3 Roof insulation

For roof insulation however, the other benefits than saving energy have to be first (and not secondary) to bring about insulation, and the reason always invoked is the need for more living space, usually for the children’s bedrooms (Bartiaux, chapter 2: 2.4).

- Mr: “Security for electricity; issues of economy and ecology for the [roof] insulation.”
- Mrs: “And for comfort.”
- Mr: “And for comfort, yes.” (Belgian couple)

1.7.4 Summary

A main conclusion of this section is that in all 5 countries surveyed, but maybe less so in the Portuguese sample, influencing factors are always in combination and are related to old building stocks and poor conditions of the dwelling, aspiration for (more) comfort, wish or need for saving energy, often but not always to reduce energy bills. The old building stocks causes the feelings of coldness and discomfort and the aspiration for (more) comfort is associated with temperature in all 5 countries; therefore, these two factors are obviously interconnected, and thus often referred to as socio-technical factors, although their causes are different (past policies, traditions, norms on comfort, etc.).

It is thus important to underline that energy-related renovations do not necessarily bring about energy savings. These two interconnected socio-technical factors – old building and aspiration for (more) thermal comfort – appear to be the most important levers in all 5 countries, provided that they are corroborated by the social network of the informants. Information, either general on the environment (e.g. climate change) or specific to the dwelling through EPC, or even energy-specific subsidies, are not sufficient by themselves and alone to bring about energy-related renovations.

Comfort is also associated with space, especially so in Belgium and in Bulgaria. This association is a main driver for roof insulation in Wallonia. On the other hand, this connection between comfort and space raises the question of the method of calculating the labels and EPC – either per m² or for the whole dwelling.

Finally, a same factor – e.g. money or lack thereof, time or also lack thereof, technical characteristics, advice of professional or acquaintances – may either facilitate or counteract energy-related renovations, as it is also shown in the following section.

1.8 Other factors counteracting energy-related renovations

Reporting on the factors that the informants describe as having a negative influence on their willingness/possibility to make energy-related works is a more delicate task than reporting on the “positive” factors. Indeed, it should be necessary to interpret the data to sort out the likely motivations from self-excuses and justifications given by the respondents to not engage themselves in such practices. This sorting is all the more difficult that for the informants themselves, this separation (if any?) is not clear at all. A thorough discourse analysis (in five languages!) is of course out of scope of this research.

A second important warning is, as already said in the above section, that a same factor – e.g. money or lack of thereof, time or also lack of thereof, technical characteristics, advice of professional or acquaintances – may either facilitate or be an obstacle to energy-related renovations.

After these two important disclaimers, the next paragraphs summarise the factors said as having a negative influence on the informants’ willingness or possibility to make energy-related renovations. These factors are presented below by an order trying to reflect the relevance of the factor for a maximum of countries, and *not* by their frequency (it would be not scientifically sound to make statistics in small samples that were constructed for a qualitative survey, not for a quantitative one, as explained above in the first section on methods).

1.8.1 “Not needed”

As stated in the Czech Republic report, “Respondents often decide whether a reconstruction is needed based on the technical state. A usual argument is that people still feel that the technical state of the given components is sufficient. E.g. Mirka mentioned: “No, no, that is not necessary, those wooden windows are quite good, I like old things”.” (ten Donkelaar, chapter 4: 4.4). This “not necessary” answer may be associated to aesthetical criteria, such in the above quote, or with renovations already done (possibly 20 years ago with less efficient windows for example), or with a lack of interest or awareness, either among the population or among the professionals. As pointed out by the survey in Portugal, a lack of interest is also related to the duration expected to spend in the dwelling: if it is seen as a temporary one, no important energy-related works is made, for most of them are costly. In all countries, the “not necessary” answer may also be referred to the weakness of both know-how and practical knowledge. The following quotes from all 5 countries unpack this “not necessary” answer in various ways:

“I can’t imagine sacrificing the stones to find myself with a wooden façade.” (Belgian informant, already quoted)

“We didn’t renovate the roof, because it was in a good condition. When I bought a house, I asked about the condition of the roof, because the renovation is very expensive.” (Bulgarian informant)

“The insulation of the floor was not made because I presumed that the floor was already insulated.” (Czech informant)

“The insulation is not needed when there is very low temperature [outside], it is needed when the temperature is 0°C degree, plus or minus 2 degrees.” And: “The heat insulation on the outside facade already was installed. (Hum). We have not changed the windows. We do not want so desperately to put new plastic windows and to do something here, because anyway [in the apartment] it is warm enough in winter.” (Two different Latvian informants)

“110 years old... and we look and realise that it is a good and solid construction, it seems more recent! Well there is a small problem... the walls are very large...but this is also an advantage...keeps the house fresh in summer and mild temperature in winter.” (Portuguese informant)

1.8.2 “No money [for that]”

This reason is often expressed in all 5 countries and again, the same expression (in English) hides very different financial situations: from lack of money, namely but not only in the Eastern European countries, to the situation of a rich Belgian already quoted saying: “I prefer to use my money to play golf” rather than paying for insulating the cellar ceiling of his villa.

This financial reason is used either for justifying that such energy renovation was not carried out (or implemented for those who had an energy certificate) or is delayed: “one step at a time, as one says”, as put by a few Belgian informants.

Furthermore, in Wallonia and in Bulgaria, some informants prefer to invoke the “not necessary” justification rather than the “no money available” one, whereas other informants, maybe with a smaller income, do not hesitate to pointing at the lack of money. Still others prefer to use the “no time” reason.

For the Czech Republic, informants who (apparently) lacked of money did not have a problem to admit this. The same holds true in the samples from Latvia and Portugal.

1.8.3 “No support”

As said twice above, the support factor is either a lever or an obstacle in energy renovations. The absence of support from professionals or from relatives or friends is also linked to the “not necessary” reason, and to the distribution of know-how in the population. Several Walloon informants, as well as some Czech and Portuguese respondents but only one in Latvia also mentioned that they received contradictory advice, which make things even more difficult.

Related to this lack of support, the limited choice of professionals who provide special services in the smaller towns and villages away from bigger cities is pointed out in Bulgaria, as mentioned before.

1.8.4 “No time”

Lack of time is another brake, especially, but not only, for those who are self-employed. This reason is not mentioned in the interviews from the Czech Republic and Latvia.

“Do you plan other works for the future?” “Well, I’d like, yes, namely..., there are many things in a house that are not finished.” (Belgian Professor, l. 281-3)

“I can do all renovations at home, I am a builder, but I don’t have the time to do it.”
(Self-employed Bulgarian informant, Nikolay, l. 83-85).

I will keep all the windows obviously, and I am not doing more because this would modify the façade... and at the end, this would delay the process and I am dying to move in, of course [laughs].” (Portuguese informant).

1.8.5 ‘Community factor’ in multi-apartment buildings in Bulgaria and Latvia

In multi-apartment buildings in Bulgaria and Latvia, the necessity to reach an agreement between all co-owners (in Bulgaria²³) or between 51% of them (in Latvia) is also a factor impeding buildings renovations. This is what our partners in Bulgaria and Latvia call the ‘community factor’. The following is drawn a comparison between these two countries prepared during this research project (Gosselain et al., in preparation).

In both countries, informants are mainly concerned about their own dwellings, and consensus among residents for renovation of whole multi-apartment buildings are hard to obtain. Renovations are carried out on whole apartment buildings and are decided on when their condition is seen as very bad or utility bills are very high. This problem is even harder when an agreement has to be reached between all the dwellers to allow works to be done, as is the case in Bulgaria. In such cases, renovations are eventually conducted when the roof is leaking or old water pipes are not functioning properly. And even in these cases the renovations are organized with extreme difficulty as the people living in the buildings cannot easily reach consensus on what should be done... how and how much should be paid for the work.

“The roof hasn’t been replaced. It has only been repaired. And we were discussing whether or not to totally replace the roof, but who can collect such an amount? It would probably cost about 15 000 BGN! We are here with these old women. We can’t do it. It will probably not be done this year.” (Antonia, Bulgaria)

In case of agreement between all owners, the participation in the Demonstration Project of Dwelling Renovations results in full renovation of the building. Nevertheless only dwellers who are already well informed about energy-related renovations apply to such a program.

In Latvia, Building Management companies play an important role in the initiation of such renovation projects. The main - and the first energy-related renovations in buildings -, when done, are roof replacement, installation of new windows and doors in staircases, pipeline system installation with insulation in basements, and also wall insulation. There are normally only discussions about full building renovation, which is why complainers do not want to initiate anything – for full renovation costs are very high. Nevertheless, when the quorum of 51% of the residents is reached, residents generally agree on the renovation to be done.

“Before, nothing (...). Then the central [building management company] did something. They repaired the central heating in the basement. We collected money from the flats, somehow, (silence); then they repaired the central heating, they put new heating in the basement, but only to the basement not to the flats, no.” (Janina, Latvia)

Initiators can also be owners or group of owners, but such kinds of decision-making processes are mainly possible for small buildings.

²³ At the moment, the law requires 2/3 of owners to agree. This change happened in mid 2009, although still many informants do not know about it (Nikolaev, personal communication).

“Well, in general, they [the apartment owners] all wanted to have outside wall insulation. So, you were lucky in that everyone wanted it? Somehow everyone was convinced of it. How strange it is, it happened. Well, it’s not that big a building.” (Eva, Bulgaria).

1.8.6 “Not allowed” in historic centres and other cities’ centres

The regulations on protection of historic centres or monuments prevent external wall insulation. Several informants in Portugal owning an old house, and/or a house located in the historic centres are not authorized to make changes on the façade of the house and the same applies to houses belonging to historic monuments. Some measures related to wall insulation are therefore not carried out, because those houses typically have very large walls.

“(…) normal insulation against humidity, but I would like to install thermal insulation, but the existing walls did not enable to install it because of the stone work in the windows”. (Lino, 268-272)

A few informants in Wallonia reported on similar regulations, or also on more basic ones, as dwellers living in two-façade houses on the requirement to have a uniform alignment of the façades and thus equally wide sidewalks.

“And for the front façade, even Mr [name of the energy advisor] has told: “Come on, you have a nice façade, we won’t destroy it.” So we have a façade on which we may not really touch and our next project is the backward façade.” (Marie, l. 435 et sq.)

Most of the informants in these situations, both in Portugal and in Belgium, have heard about installing some insulation from inside: this would mean losing space (and taking down all the radiators, a Belgian informant adds) and many of them are not interested in what they see as an inconvenient.

One informant in the Czech Republic lives in the centre of Prague and also mentioned that he could not insulate the outer walls (as the street façade is protected) and replace the windows (those on the street side cannot be changed for modern ones for the same reason).

1.8.7 Summary

In the 5 countries, the informants have pointed at the following factors impeding them to make some or further energy-related renovations: lack of necessity, lack of money and lack of support. It has been shown above that these obstacles have different meanings and are also related to aesthetical criteria, lack of know-how, lack of interest – especially so if the dwelling is expected to be a temporary one – or other priorities. In Wallonia and in Bulgaria, some informants prefer to invoke the lack of necessity rather than their financial limitations.

In addition, lack of time is cited in Bulgaria, Belgium and Portugal, and in these two last countries, the necessity to comply with regulations protecting historic centres and other town-planning rules, which can hamper façade insulation and change of frames and windows. In multi-apartment buildings in Bulgaria and Latvia, the necessity to reach an agreement between all co-owners (in Bulgaria, please see the footnote on the preceding page) or between 51% of them (in Latvia) is also a factor impeding buildings renovations.

Like the factors driving energy-related renovations, the factors hampering them are interrelated and may act in both directions: favouring or not energy-related renovations.

1.9 Conclusion

This conclusion first summarises the main findings on labels and the EPBD, then shows the similarities found in the in-depth interviews that were realised in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal. Finally, this qualitative research indicates further areas for additional policies complementing energy labels and the EPBD.

These 117 interviewed home owners who are undertaking energy-related renovations across Europe are neither isolated nor non-knowledgeable consumers whose first need would be information provided to them with labels and energy certificates: in 2009-2010, feelings of coldness or thermal discomfort, often related to old building stocks, as well as need or wish to reduce energy bills are, among other factors such as a concern for global warming in the Belgian and Portuguese samples, (quite) efficient means for triggering energy-related renovations. However, these energy-related renovations are not always causing energy savings.

Comfort is also associated with space, especially so in Belgium, Bulgaria and Portugal. This association is a main driver for roof insulation in Wallonia. On the other hand, this connection between comfort and space raises the question of the method for calculating the labels and EPC – either per m² or for the whole dwelling.

Furthermore, our informants appear to be inserted in social networks that are quite significant in helping them make energy-related renovations and that are often connected to the labour force in the construction or energy sectors. Therefore, our informants are not lonely consumers on the market who would just need information (such as the one given by the energy performance certificates) to make the best choice, a view of the consumer implied in the classical theory in economics. These surveys in the five countries show instead that doing energy-related renovations is obviously also a social issue, as a topic of conversation, as a matter of trust and friendship, as a giving or exchange of advice or services, and with Internet, as a new source of information namely on contractors' reputation.

Only 34 informants (29%) of the 117 informants in the five countries had labels or energy certificates at the time of the in-depth interviews, and about one third of these 34 interviewees are in the situation focused on by the EPBD, namely recent home buyers. Indeed, 14 Latvian informants living all in apartments had their building assessed for its energy consumption but as shown above, these energy assessments are realised only if 51% of the co-owners agree to do so. These informants are thus not representative of daily-life Latvian home owners. In addition, 11 informants from Wallonia requested themselves the energy assessment of their house and among them, only 2 had the energy assessment *before* beginning the renovations of their house and are thus in the situation focused on by the EPBD. The other 9 informants were in the process of renovating their house, some since more than 10 years. So the results obtained in the 5 countries and summarized here are only indicative but can still give some insights.

For these few informants in the 5 countries, the labels and energy certificates do not play a major role for conducting energy renovations. If they did play a role in raising the attention at the possibility of insulating external walls, the floor and/or the cellar ceiling, as it seems to be the case for several informants in Wallonia, most of these informants are reluctant to recognise this role of the labels and recommendations that they asked *themselves* and prefer to present themselves as the sole master of their renovations. This result is confirmed by all 4 informants in Portugal who had an energy certificate.

This minor role played by the energy certificates may be probably related to the fact that in these five countries, the implementation of the EPBD is slow and the energy certificates are not well known. And if they are known by some well informed interviewees, like one surveyed in Bulgaria

and two in Portugal, (part of) the methodology used may be criticized, respectively for the lack of clarity in the methodology used and for the focus on appliances rather than on the envelope of the building. These negative comments echo others reported elsewhere in Europe, e.g. on the methodology for calculating the payback time of any energy-related renovation (Steiß et al., 2009).

Despite a slower pace in these 5 countries for implementing the EPBD (which was already known at the time of proposal's writing), criticisms about associated and existing programmes, whether pilot or not, or subsidies converge: these instruments are not well known (except in Wallonia), they require everywhere money availability, time-consuming access to information, too much paper work, and administrative competences, including on Internet. Furthermore, whereas these subsidies should “normally [be] accessible to everyone”, they are also granted to “people [who] do not have particular need for incentives” (Belgian and then Portuguese informants). In so doing, these subsidies increase social inequalities.

In Bulgaria, the tax exemption for buildings with energy certificates of classes A and B is said to be an attractive stimulus for renovation. In Portugal, the subsidy for solar panels is said by one informant to be effective for the others, not for herself. In Wallonia, a list of customized but mandatory energy-related works is provided to the low-income families benefiting of an advantageous loan or to owners having a special subsidy for the rehabilitation of their old house: therefore, the mandatory aspect of the energy-related works surpasses the financial lever provided by the loan or subsidy. And in the multi-apartment buildings of Bulgaria, Latvia, and possibly of other European countries, a main factor is an organisational one to reach the necessary quorum of dwellers.

This detailed comparison between five quite different countries (Belgium, Bulgaria, the Czech Republic, Latvia and Portugal) has shed light on many similarities in these five countries when it comes to energy-related renovations done by their citizens, despite different historical and geographical contexts.

- Despite building stocks varying in their age and characteristics, the renovation most often done is to change windows and frames, except in the Portuguese sample (maybe by chance) where this change is also quite often done;
- Social support from friends and relatives is a major condition before and when carrying energy-related renovations and nearly all informants acknowledge it, while many of them have at least one acquaintance (or friends, relatives, or themselves) working in the construction sector or in energy-related areas;
- Social networks and labour force in the construction and energy sectors are interconnected, and when contradictory advice arises, friendship appears to be more valued than technical criteria on energy savings;
- Informants are generally satisfied with the work done on their dwelling by professionals in the construction and energy sectors *but* there is also dissatisfaction everywhere; furthermore, mainly but not only in Belgium and Portugal, many informants are (much) more concerned with energy savings and some better knowledgeable on related techniques and materials than (many of) the professionals they met;
- Other factors than subsidies and awareness or information on energy issues *also* motivate home owners to make energy-related renovations and these factors are never isolated, they always act in combination. Two interconnected socio-technical factors – old buildings and aspiration for (more) thermal comfort – appear to be the most important levers in all 5 countries, provided that they are corroborated by the social network of the informants;

- Like the factors driving energy-related renovations, the factors hampering them are interrelated and may act in both directions: favouring or not energy-related renovations;
- In the 5 countries, the informants have pointed at the following factors impeding them to make some or further energy-related renovations: lack of necessity, lack of money and lack of support. It has been shown above that these obstacles have different meanings and are also related to aesthetic criteria, lack of know-how, lack of interest – especially so if the dwelling is expected to be a temporary one – or other priorities. In Wallonia and in Bulgaria, some informants prefer to invoke the lack of necessity rather than their financial limitations. In addition, lack of time is cited in Bulgaria, Belgium and Portugal, and in these two last countries, as well as in Prague, the necessity to comply with regulations protecting historic centres and other town-planning rules can hamper façade insulation and change of frames and windows. In multi-apartment buildings in Bulgaria and Latvia, the necessity to reach an agreement between all co-owners (or now two thirds of them in Bulgaria) or between 51% of them (in Latvia) is also a factor impeding buildings renovations.
- The use of Internet to find information is reported by many informants.

This qualitative survey in Belgium, Bulgaria, the Czech Republic, Latvia and Portugal also shows that to trigger (additional and) real energy-saving renovations, it will be first necessary to take into account the opinions and criticisms expressed by our informants on labels, energy performance certificates and actual related subsidies. Furthermore, these surveys indicate three major other areas of policies for complementing and supporting these energy policies and to strengthen the further implementation of the EPBD:

- A first and major policy recommendation is to increase the skills and knowledge on energy-savings techniques and materials for all professionals of the construction sector, both during schooling and after with continuous education.
- Spreading the word of energy savings namely through attractive subsidies that would decrease social inequalities is another important area of potential policy action.
- A third one would be to build up on the effectiveness of social networks and solidarities acknowledged by most informants to develop new policy instruments that would consider home dwellers as inserted in these networks (e. g. an increased subsidy if several neighbours make the same energy-related renovation at the same time with the same contractor and complete the documents). The call for coordinating entities whether public or private, when disseminating social change on energy issues in houses, already expressed at the end of section 4, goes in the same direction.

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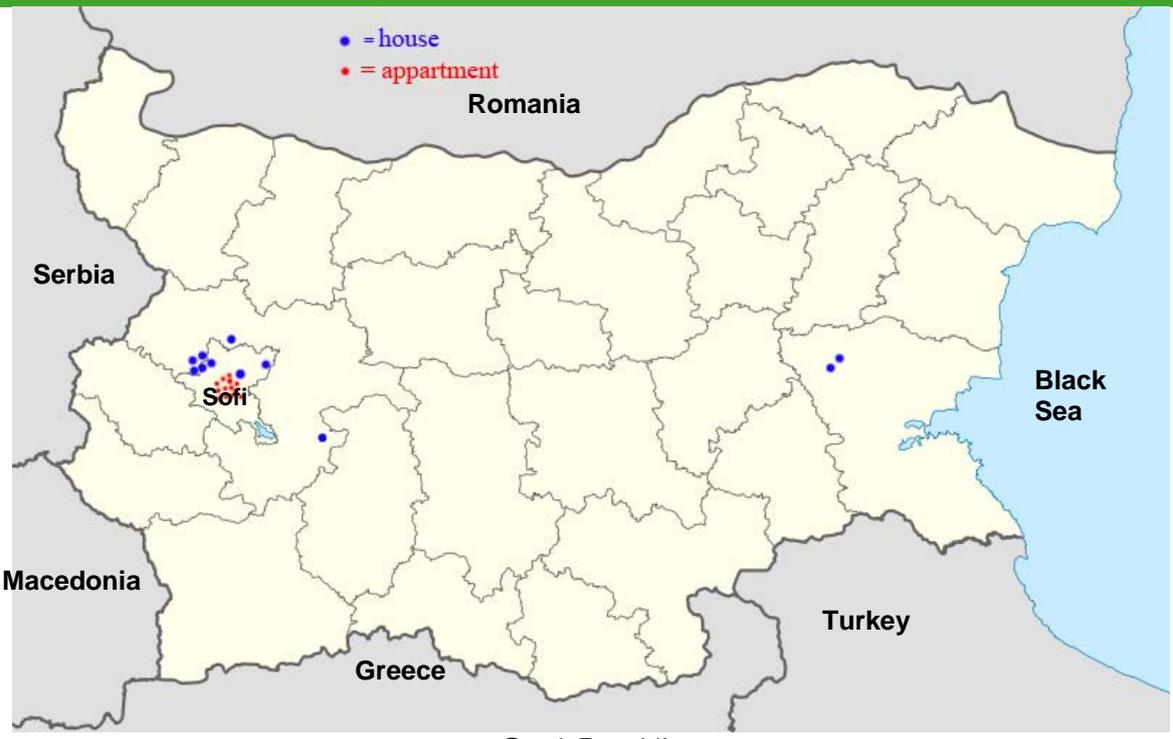
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1.11 Appendix: Informants locations and characteristics

Belgium (Wallonia)



Bulgaria



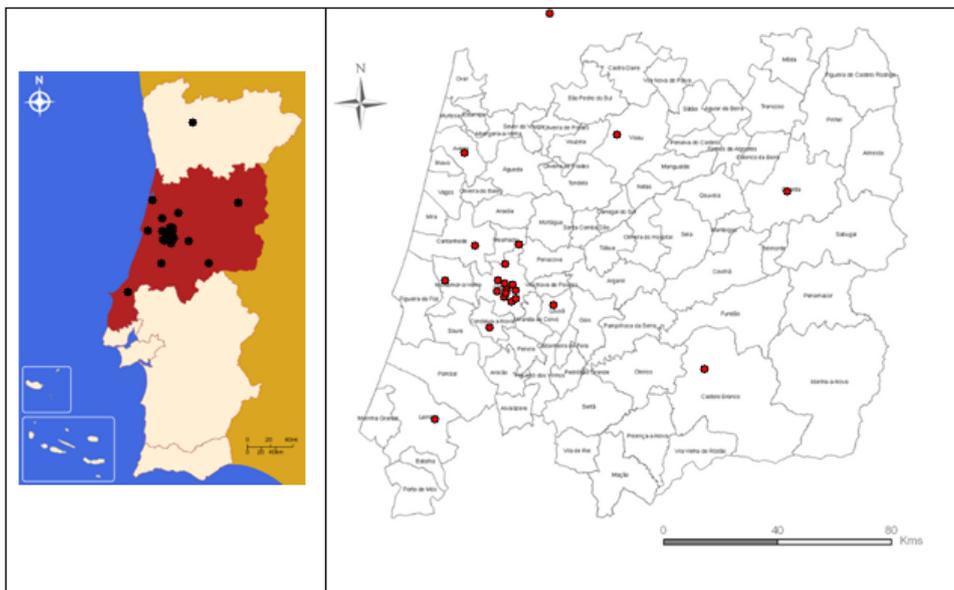
Czech Republic



Latvia



Portugal



Chapter 2

Homeowners and energy-related renovations in Belgium (Wallonia)

An analysis of 23 interviews

Françoise Bartiaux

with the collaboration of
Véronique Gosselain, Julie Stil and Hélène Eraly

Université catholique de Louvain, Belgium

2.1 Introduction

In Belgium, most of the competences related to energy are attributed to the three Regions of the country. The Regions are namely responsible for the implementation of the European Directive on the Energy Performance of Buildings (The Energy Performance of Buildings Directive, EPBD). Wallonia, the Southern and French-speaking Region of Belgium, is one of the ten Regions/countries studied in the IDEAL EPBD research project (Improving Dwellings by Enhancing Actions on Labelling for the Energy Performance in Buildings Directive, see www.ideal-epbd.eu).

The purpose of the research with in-depth interviews is to contribute to the “*improvement of the understanding of consumer behaviour, the role of other actors and the effect of policy in general*”²⁴. The WP4 (in-depth interviews) overview of the grant agreement of the IDEAL EPBD project stated that “*in-depth interviews will be realised and used to analyse which of the recommended energy saving measures have been realised by recently-moved dwelling owners*”, and should “*include questions on the barriers they face(d) and decision making processes*”²⁵, in order to identify brakes for a successful EPBD application.

According to Bartiaux (forth.²⁶), “factors against behavioural change in energy consumption are indeed generally referred to as “barriers” but this way of thinking is criticised by sociologists. Some of them (Shove *et al.*, 1998; Guy and Shove, 2000; Moezzi and Bartiaux, 2007) have told how and why research and policies on energy end users have been governed by a technological appraisal – energy efficiency being prominent – with visions and policy tools from economics. But this “techno-economic perspective suggests that the market penetration of well-established or successfully demonstrated technologies is frequently impeded by non-technical barriers. (...) Repeated calls for ‘additional research to understand barriers (...) reinforce the belief, first, that such barriers are real and, second, that governments have a legitimate part to play in supporting efforts to correct these and other market imperfections.” (Guy and Shove, 2000, p. 131). So, the term ‘barriers’ carries along an individualistic view of action (Shove *et al.*, 1998, p. 301) that is to be reoriented with a top-down approach (Jensen, 2005). (...) Therefore, several authors propose alternatives: the ‘inertia model’ (Jensen, 2005), the term ‘brakes’ (Bartiaux *et al.*, 2006) and more generally, a broader view of the socio-technical context in which energy-related practices and changes take place”.

This sociological approach, and more specifically the social theory of practice as summarised by Warde (2005), give the theoretical framework of this synthesis of the results obtained in Wallonia thanks to 23 in-depth interviews on the practices and factors influencing home renovations in Wallonia. The main concepts of the social theory of practice will be referred to later in this text, in the relevant sections.

This chapter aims at providing the results of 23 in-depth interviews that were realised and analysed in 2009 and 2010 in Wallonia (a first wave of 5 in-depth interviews during the summer of 2009, and a second wave of 18 in-depth interviews during the spring and summer of 2010. These in-depth interviews are part of the IDEAL EPBD project (Work Package 4) and follow a methodology described in details by Gosselain and Bartiaux (2010; Deliverable 4.1, also in Appendix B of this deliverable). In Wallonia, these interviews were done by working students²⁷ – who had never met the interviewee in order to ensure anonymousness and a ‘fresh hear’ – and

²⁴ IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, Specific objectives, p. 3.

²⁵ IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, WP4, Work package overview, p. 19.

²⁶ My own translation.

²⁷ I am very grateful to Julie Stil, Sophie Maerckx, Marc Reydams, Hélène Eraly and Guillaume Léonard for the quality of their work in conducting and transcribing these in-depth interviews. Mathieu Bourgeois and Boris Ghislain also contributed for the transcriptions.

were lasting between 45 minutes and 2 hours. Nearly all were conducted at the home of the informants, some with both spouses if they were both interested and available. All in-depth interviews were recorded and transcribed and all first names have been changed.

The outline of this chapter is the following. After a brief presentation of the interviewed persons/families (later called the ‘informants’) and their home, an overview of important results is given by an in-depth analysis of recurrent repetitions and contradictions. The reason(s) for conducting energy-related renovation works (called the ‘levers’) and for not conducting them (‘brakes’) are then reported on. Later, a special focus is given on the impact of the energy labels of the house (or audit), if any, then on the roles of different types of actors (professionals, relatives, acquaintances ...), and finally on the roles of incentives or renovation programmes, and policy in general. The next section summarises the energy-related renovations done and the owners’ relationship to comfort. The conclusion summarises the main results and bring them in the socio-technical perspective briefly evoked in this introduction.

2.2 Informants and their home

This section first gives an overview of the sample’s characteristics and then explains how two sub-samples were constituted in this qualitative survey. As stated in the methodological guidelines of this research, “The in-depth interviews’ approach aims to understand processes, mechanisms, paradoxes, i.e. “how the studied phenomenon works”. In this method, each informant (the interviewed person) is thus a key person for the research” (Gosselain & Bartiaux, 2010: 6; Deliverable 4.1, also in Appendix B of this deliverable).

Sub-sample of owners having requested an energy assessment of their house

In Wallonia, issuing a certificate on the energy performance of a dwelling to be rented or sold is mandatory for the owner(s) only since May 2010. But since 2006, home owners can pay for a full energy assessment (or ‘energy audit’), receive labels and advice, which is customised for their dwelling, and have later the price of the energy audit partly reimbursed through fiscal rebates. Therefore, these home owners who took the initiative to have the energy performance of their house assessed can be seen as frontrunners of the full implementation of the EPBD and it was thought useful to realise half of the in-depth interviews with such home owners. The objectives of these interviews were to study whether this audit was an important factor for driving energy-related renovations of the house and whether these home owners have implemented the advice received. In this respect, the 5 in-depth interviews of the first wave during the summer of 2009, and 6 additional in-depth interviews were realised with such home owners during the spring and summer of 2010 (the second wave).

All these informants have been first contacted by a mail sent by the Walloon Administration of Energy. Among those who agreed to participate, we selected the owners of houses with varied geographical locations and house’s characteristics (namely the number of façades) as well as with the highest potential of improving the labels received for the envelope and the heating system (that means with the ‘worst’ labels on these two aspects). In general, these home owners are (rather to quite) well-off and nearly all live in pairs with children of various ages, including young adults. The majority of these 11 informants are in the 40-54 age groups, 3 are in their thirties and 2 in their sixties.

Subsample of recent house-buyers

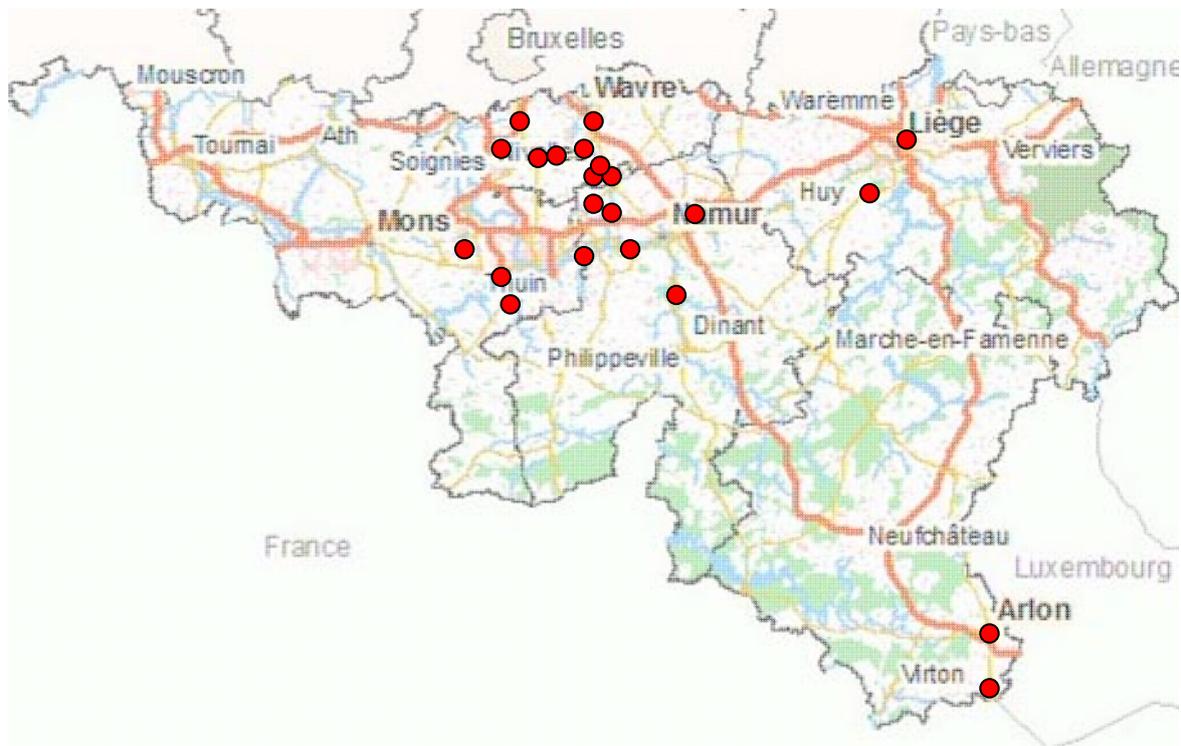
The other half of the sample (12 informants) bought their house around 2007 and most of them live in their house since 2 or 3 years, one since 5 years and 3 since less than one year – 2 of them having spent a cold winter in their new house. These informants were found by the UCL team

members with the help of at least one different intermediary person for nearly each informant. The variety of socio-economic backgrounds, housing types, marital status and living arrangements was actively searched for to represent the diversity of situations involved when buying a house. When they bought their house, the informants' age ranges between the mid twenties and mid forties, and one was nearly 60. Besides couples with young kids, this subsample is also made of mono-parental families and persons living alone. Furthermore, all marital statuses are represented: single, married or in pair, widow, and separated or divorced. A separated wife bought her ex-husband half of their house, which raises the question of the applicability of the EPBD in such a situation.

Informants' location and other socio-economic characteristics

Figure 1 shows the location of our informants. These locations are well distributed in the Region, including in its Southern and Eastern parts where many houses are built in schist or in stones, whereas bricks, with or without concrete, are dominant in the other parts of the Region.

Figure 1: 23 informants in Wallonia



In general in Wallonia, the housing stock is made of 87% of houses and 13% of apartments. The houses are rather old: 31% of them were built before 1900, 16% only after 1981.

Our informants live in houses of various types and sizes, which have 2, 3 or 4 façades (or even more: one owns a modern U-shaped villa). There are several old farms. In the Western part of Wallonia, many houses are built in bricks, and the few built in the seventies or after have also walls of concrete blocks whereas in its Southern and Eastern parts, many houses are built in schist or in stones.

Table 1 summarizes various characteristics of our informants.

Table 1: Sample characteristics

Geographical characteristics	
Urban (capital or very large cities)	3
Small town	7
Rural or residential area	13
Total	23
Household total income quartile: estimation	
Low	3
Low-medium	5
Medium-high	5
High	10
Total	23
Highest diploma of the respondents*	
None	1
Primary (around 5-6 years of schooling)	0
Medium (around 9 years of schooling)	0
Medium-high (around 12 years of schooling)	3
2-3 years after the secondary school (Bachelor degree)	5
University diploma (4-5 years after the secondary school, Master degree)	11
PhD	3
Total	23
Living arrangements	
Alone	4
1 adult + child(ren)	4
Couple	4
Couple + child(ren)	11
Total	23
Housing and labels characteristics	
Apartment, no audit	0
Apartment, with audit & labels	0
Apartment, else (please specify) – only with audit	0
House, no audit	9
House, with audit & labels	11
House: loan if mandatory works	3
Total	23

* When the in-depth interview was made with a couple, the diploma of the spouse who spoke the most is taken into consideration in this Table.

These characteristics of our 23 informants are related to their location type, socio-economic characteristics, living arrangements and the attribution of energy labels to their house or not. Even though a variety of socio-economic backgrounds and living arrangements was searched for, the sample of informants is too small to be a representative sample in the statistical sense. To the contrary, several informants are/were living in (very) poor housing conditions and two were recruited thanks to the help of an employee (who is a member of our steering committee) of a special Housing Fund for families with (very) low income.

We estimated that all the informants who paid for an energy assessment of their house apparently have a higher household income than the median one in Belgium and all but one have a university diploma (at least 4 years, or a PhD).

Anonymity of informants

As shown later, most of our informants have profited from subsidies or loans for energy-saving works granted by the Walloon Region, especially, but not only, the informants having paid for an energy assessment. Information about them is kept in data banks and these informants may be

thus recognised. Therefore, only the relevant characteristics, or an assumed first name, will be given when quoting an informant to protect the anonymity of all these persons.

2.3 In-depth analysis

Recurrent use of indirect style and contradiction: an interpretation

In several interviews, the same sentences' structure appears: the pronoun 'I' is followed by a verb in the negative, then a 'but' shows an opposition (sometimes in a softer form with "well"), and finally an indefinite pronoun is followed by a verb in the affirmative. (So: "I don't (or I am not, or I cannot)" but one does ...", or the reverse form "one (or another non personal pronoun, such as 'that' or another form of indirect style) does ... but I don't ... (or I am not, or I cannot)". These oppositions often occur at the end of the in-depth interview, when a good conversation style has been established by the interviewer and enables the informant elaborate his/her thoughts in lengthier sentences. Let's first give several quotes (where 'I' stands for the interviewer, and with my underlining), before proposing an interpretation.

I: "I will now ask you a few questions about the environment. For you, is there a link between energy consumption and environmental issues? Do you relate them?"

Mr: "No. I don't, I have never been sensitised to that and... no."

I: "Do you hear about it?"

Mr: "Well, one hears about it, one looks at TV news and so on." (Man in his sixties, l. 601 et sq.)

When explaining all she knows about climate change, a mother says: "it's impressive because that implies modifications at all levels (...), that will require adaptations... but I don't know about it." (Woman in her forties, l. 1255 et sq.)

Mr: "One could [save more energy] by diminishing the use of the car. Or by organizing some car-sharing with that car. This is clear."

Mrs: "But yes, but I don't see too much..." (Couple in their thirties, l. 1193 et sq.)

"(...) there are many people who do not care²⁸ about it [pollution] because it is something that ones doesn't see or experience and from the moment that ones knows it, well one cannot pretend anymore not knowing it. Well, I don't succeed in it." (Man in his thirties, l. 2049 et sq.)

The first two persons quoted are, respectively, informed and very well informed about climate change (and the first one uses the indefinite pronoun 'one' to refer to this group of informed persons) but earlier in the interview, they both admitted that most (if not all) of the renovations they did in their respective house aimed at enhancing their comfort or their property's value, not at reducing its energy consumption. The third quote illustrates the situation where the husband has deeper ecological convictions than his wife and leads her in always more numerous environmentally-friendlier practices... but car-sharing seems unimaginable for her. And the last quote is from the deepest ecologist of our sample who is "far in the move to tell oneself that of course, there are many alternative solutions".

As indicated, these informants represent different groups of generations but all share the same differentiation process from what they see as a common practice or a common knowledge (on climate change in all four examples): "the others do or think this, but I don't". These oppositions – and even a contradiction in the first quote – seem to indicate the hesitations and the shilly-

²⁸ The verb is the affirmative in French.

shallying when faced to questions about global warming and personal practices ('An inconvenient truth' in Al Gore's worlds).

In environment-related consumption, two ways of handling contradictions between daily routines involving high energy consumption and environmental knowledge or concern have been identified by Bartiaux (2008): practices' compartmentalisation (having 'green' practices in some areas of daily life – such as in daily mobility or energy consumption at home – but not in all these areas) and “moods”, an approximate translation of what French sociologist Martuccelli calls “états d'âme” (a “socialised way” of “feeling a disengaged implication” that “in rendering the moral experience of heartbreaking choices commonplace, makes further choices easier” (Martuccelli, 2002: 548-550, as translated in Bartiaux, 2008: 1172). The three first quotes above are examples of such moods and illustrate how moods counteract (further) energy-savings whereas the last one shows the contrary situation (a clear distance of a disengaged implication seen as common).

These subtle processes of engagement/disengagement set out the stage for a more complex analysis of apparent paradoxes.

Apparent contradictions and paradoxes

At first glance, many situations can be seen as paradoxical, but they are not so for the informants. The next story illustrates these interactions and seemingly contradictions and is given by an informant, who transformed a village house into 3 apartments (of which two to rent), one per level. As there is no gas infrastructure there, he opted for electricity as a source of heating, for the convenience of having separate meters and bills. For in Belgium, electricity is mainly produced with nuclear power, this choice may be seen as the least environmental friendly one. But as it is also the most expensive choice, the informant had an energy assessment made by his architect and did fully insulate the building, including the outside walls, which is not (yet?) common in Belgium. However, he regrets to have not completely followed the advice on the insulating products that was given by the architect whom he found “too green” for him.

Thus, these apparent contradictions and paradoxes show that a same factor – e.g. money or lack thereof, time or also lack thereof, technical characteristics, advice of professional or acquaintances – may either facilitate or counteract energy-related renovations. However, for the clarity of their description, these factors will be distinguished into 'levers' and 'brakes or obstacles' in the next two sections.

2.4 Levers to conduct energy-related renovation works

Social and technical factors in combination

The reasons to conduct energy-related renovation work are varied and always in combination (as already noted in Bartiaux et al., 2006: 139). For example, many informants changed the windows and frames of their house, and one, the boiler: for all, an obvious reason was the bad and old condition of these components of the house, and thus a feeling of coldness and discomfort. This combination between social and technical factors holds true for renovating the electricity system, a renovation that was carried out by several informants, also to update the electricity system of their house with nowadays requirements of daily life. These requirements are quite related to daily life practices and to social norms on comfort and convenience as well demonstrated by Shove (2003).

Even though social and technical factors are in interaction, they are separated in the following paragraphs for the clarity of their description.

An old housing stock

In Belgium and especially so in Wallonia, the housing stock²⁹ is very old on average: two informants said that they have recently bought “a ruin”, two others did not dare to use that word (appropriate though) and a fifth one reported that her house dates “from the 16th or 17th century”. Another one said that their house was “good and not too old since it was built around 1954”. In general, for most of the candidates to house ownership, there is usually a trade-off between the price of a house and the amount of work to be done, except if the house has already been renovated. A third element taken into consideration by the recent home buyers interviewed is the location and the proximity of highways and railways. As put by the youngest home buyer among our informants:

“Yes, we did ask ourselves: “Is it the right location? Is it the right house?” Well, I must say that we both start our life [as adults] and to buy a house is not easy: we got this one at a good price, there was enormously to do inside, well everything was to be redone inside.” (Laurent, l. 86-89).

Comfort: heat, space, light and more

Comfort is a polysemic notion that is associated with heat, space, light, and for some, silence³⁰. All these representations of comfort have implications in energy-related renovations.

Women often speak about comfort and associate comfort with heat:

“In winter, I like it nicely warm and I need... I'm also accustomed to heat” (Annette, 479 et sq)

Several women admit that they are “more sensitive to coldness” than their husband, and one husband tells how they will solve this issue:

“So globally, one can say that... we are going to insulate [the roof and the Northern wall] to... to consume always the same [quantity] but to enable to heat a little more.” (Arnaud, l. 686-7)

The above quote also raises the attention to the fact that energy-efficient measures do not always bring about energy savings. In addition, it may well be a difference between groups of generations when it comes to the preference on a uniform (or not) temperature in all rooms (including the bedrooms), but the sample is not adequate to make such a comparison, for buying a house after 50 years is not at all a common practice in Wallonia.

As said above, an obvious reason to change windows and frames is their bad condition, the sensation of coldness and/or dampness and also the desire for (more) comfort, and possibly the influence on one child's asthma, as added by two mothers with low income. Still another “secondary benefit” (Bartiaux, 2002 & 2007) cited is acoustic insulation, and often, this change is also the opportunity to make the windows larger for “Light! For light!” a mother exclaims, or as said by a teacher to enjoy “the charm of having an old house and to make it modern”.

For roof insulation however, these benefits have to be first (and not secondary) to bring about insulation, and the reason always invoked is the need for more living space, usually for the children's bedrooms. Otherwise, a finding from an earlier study done in all three Belgian Regions holds true: “at the time of the energy assessments (2004) and for existing dwellings, insulation appeared to be largely optional.” (Bartiaux, 2008: 1177).

²⁹ The building stock would be referred to as the material structure in the social theory of practice.

³⁰ The norms, ends, motivations and projects that sustain a practice are called ‘the teleo-affective structures’ in the social theory of practice.

“Saving energy”

Among home-renovating practitioners, saving energy was sometimes given as a motivation but it is never an end in itself for two reasons. First, if it is mentioned, it has several meanings: even between spouses, ‘to save energy’ may mean to be ‘greener’ for one spouse and ‘to save money’ and/or to make fruitful investments for the other one. Second, the reasons to conduct energy-saving renovation work are varied and always in combination, as said earlier in this section.

The next quotes from two couples illustrate the former and the latter explanations why saving energy is never an end in itself, and even so among owners who paid for an energy assessment of their house; in the first quote, the husband presents himself as the greener spouse, whereas the wife does so in the second quote:

- Mr: “Security for electricity; issues of economy and ecology for the insulation [of the roof].”
- Mrs: “And for comfort.”
- Mr: “And for comfort, yes.” (Fanny, l. 187 et sq).

“Well, he pays a lot of attention because he thinks to the economical value and so on; and then (hesitation), I have also a [political] (hesitation) environmentalist conviction, thus I also try to be in that kind of spirit. But I'm not even pedaling yet [to produce electricity] to watch TV! (Laughs.) I do not deprive myself of comfort, though.” (Marie, l. 600 et sq.)

Among the informants who bought a house a few years ago, only one could afford a large and old house that was already renovated, in the late nineties, with double-glass windows and some roof insulation with rock wool. So this respondent does not consider any further energy-related renovation but still wants to lower the temperature and save energy “for an economical concern, for a concern (hesitation) of health (...) so health, economy and environment (smile)”: this psychologist has understood some hypothesis underlining the interview (an environmental concern may lead to energy savings, see below) and shows a good example of the “social desirability” (as said in psychology) of answers collected by interviews; a further indication of this latter process is the reordering of the motivations, with health seeming more appropriate than money saving in this quite well off household.

This example is interesting as further in the interview, the informant acknowledges that the energy performance of the house is not that good and rates it to a D were there 5 categories (A to E). Without a sensation of discomfort caused by old components of an old house, energy-related renovations are not considered here.

Increasing tacit knowledge on energy-saving issues

As shown in the next section, an obstacle for carrying out (further) energy-related renovations is the still rather low level of practical knowledge and know-how on energy efficiency, both among the population and the professionals. However, tacit knowledge on energy-saving issues is quickly increasing in the population, mainly thanks to several media of communicating explicit and institutionalised rules about regional subsidies and fiscal (federal) rebates for energy-saving works or investments, or for an energy assessment.³¹ Indeed, all the informants interested in energy and/or money saving report that their search of information rapidly leads them either to the Internet website on energy matters of the Walloon Region or to one of the energy offices (also managed and paid for by the Region) where they can receive free advice. These last years, there were also a lot of advertisements on the regional subsidies, and more generally, TV

³¹ In the social theory of practice, institutionalised and explicit rules are also a component that sustains a practice.

broadcasts (“you cannot escape them”, as put by Arnaud, l. 873) and press releases on these issues. Nearly all informants refer to these mass media:

“Of course I knew that there are subsidies from the Walloon region or something...
Yes I have heard, I have quickly visited their website.” (Coralie, l. 350 et sq.).

Several informants also mention alternative sources of knowledge on sustainability and environmental issues that are institutionalised since longer, before the Internet, through alternative media and networks of information, ranging from a specific magazine (called ‘Imagine’), to free information, namely on alternative techniques for building, insulating and so on, which can be found for example in shops for organic food (many of these shops have a DIY section, with environmentally-friendlier paintings and so on). One informant also reports on participatory renovation projects, Internet websites and forums on alternative construction techniques.

Concern for the environment, the planet, and other ethical motivations

In the Walloon sample, all informants, possibly by chance, have a generally good knowledge on climate change and many of them share an environmental concern. The informants are knowledgeable about the link between energy and environment/climate. But as seen in the third section on discourse analysis, there are examples of ambivalences and contradictions between the practices and the awareness on energy and environment.

Several informants want to underline that their environmental motivation is stronger than the financial one. For a few of them, their environmental concern is extended to “a way of life” and related to a voluntary reduction of consumption and/or another type of consumption, such as fair-trade products. For all these persons, their environmental concern is a main driver of their energy renovations:

“The choices that one does for the technical solutions are also related to a way of life that one tries to follow by saying: “Do we need this, do we need that, do we need 21° in the bathroom?” (David, l. 652 et sq.)

« (...) so for me, yes, if I can contribute with my small means to have a planet that is more egalitarian, more ... respectful of the environment, yes I do it [buy fair-trade products] (...) My way of consuming has an impact on the way people live here and also in the South (...) And environment [protection] often goes hand in hand with egalitarian exchanges between the different parts of the world.” (Nadine, l. 501-561).

Other factors

The impact of energy labels on energy-related renovations is discussed in section 6 below and the role of social networks and of the professionals in section 7. The influence of subsidies is analysed in section 8.

It must be underlined that these other factors may all have either a positive or a negative influence in the process of decision making about carrying out energy-related renovations.

Summary

The next quote summarises well the interaction of factors positively influencing energy-related renovations (‘I’ is for the interviewer):

- I: “Why did you insulate then, where did you insulate?”
- Mr: “Because we fit up the attic, so we do insulate the roof for...”
- Mrs: “Yes and then for the subsidies of the Walloon region, we also have to insulate, it’s part of [the requirements]

- Mr: “Yes and at worst, it’s always better to insulate because otherwise, your heating, well its consumption is enormous”
- Mrs: “Energy, we have insulated everywhere, here, it’s wholly insulated”. (Laurent, l. 506-511).

To sum up: when carrying out energy-related measures, to win on several fronts seems to have become a new social norm, maybe because the sole injunction to energy savings is not strong enough for the majority of the informants.

2.5 Brakes to conduct energy-related renovation works

Weak know-how and practical knowledge

Among the population

For an informant (MBA, 29 years), elderly people have not “the culture of energy” because “since maybe 10 years, one speaks about all of that. Whereas they are at the end of their life and they say to themselves “well, this is something for young people”.” (l. 679). However, this “culture” is not yet turned into know-how and practical knowledge on insulation, which are “generally low, if present at all”, as already observed in interviews realised in 2005 (Bartiaux, 2008: 1177). Furthermore, this new “culture” is probably more developing for roof insulation than for external walls insulation and for energy-efficient boilers, as exemplified by the same young man: he does not belong to “those people who don’t have the intellectual competences to master the topic [the energy assessment of a house]” (l. 914-5), but he finds that the boiler of their house “is not an old boiler (...), it’s a boiler from the seventies” (l. 930-2).

When buying a (usually rather old) house, an exception to this weak know-how is the widespread ‘mental routine’ of knowing that frames and windows should be changed, as illustrated by this woman who tells her first visit to her future house: “just by seeing the old frames with single glass windows, at this moment I knew that they had to be changed” (Viviane, l. 74-75).

So people heavily rely on Internet (“Google is your friend as one says” says an engineer, l. 2426), on professionals and/or on their social network, which often includes at least one person evaluated as knowledgeable, possibly a professional. Section 7 discusses in detail the roles of networks of friends, relatives and so on before and when carrying out energy renovations.

Among the professionals

The just quoted man became a do-it-yourself practitioner after a problematic situation with a carpenter (“the clown I called to do the work should have advised me, as a professional, to do it [insulate the gable from outside]” l. 746 et sq.), and he expresses his opinion on the lack of know-how among professionals:

“No professional, no professional is interested at the problem of insulation. For them, it is ... it is a chore. And in general, anything related to energy has no interest for the professionals. They really focus on the aspects [related to] installations, mechanics, and the aesthetics of the result. But insulation, no, not at all. Furthermore, in general, they rather don’t care about regulations.” (l. 854 et sq.)

This opinion appears to be valid for many professionals as our interviewees spoke about one frames’ installer (a friend of theirs) who found triple-glass windows “exaggerated” and “not worthwhile for our house” (and they follow his advice); another one interested in new technologies chose “by elimination” with her neighbour, a heating installer:

“a low-condensing boiler, an old thing (laughs), not as one does now” [because for the other solutions she thought of] “it was by far too complicated and he didn’t want to go into that” (Flore, l. 604 et sq.).

In these two cases, trust and friendship overcome the opportunity of further energy savings. This finding gains credibility for it goes in the same direction as a previous one: “To be followed by the householder and translated into practice or into home renovation works, energy expert advice and customised information need to be corroborated and supported by previous conversations with familiars or with other persons whose opinion is valued by the householder(s) as most significant in that matter. Without the support of these social interactions, customised information appears to be quickly forgotten or disregarded.” (Bartiaux, 2008: 1178).

Several informants also reported contradictory advice on material and techniques for roof insulation:

“For the insulation material, there are many opinions on the matter. Many opinions... here I have more conflicting opinions than for the frames. On (hesitation) glass wool, hemp, (hesitation) extruded polystyrene, (hesitation) and so on and so on.” (Arnaud, 450-3).

Still another informant told a long story on 4-5 quite different cost estimates for loft insulation:

“There are still many who do not know [insulation with cellulose] and “the others who came were specialists of this type of insulation, so cellulose, and then, the issue was on the number of centimetres, so some were saying that the norm was “X centimetres”, and others that with that number, one did not get the reduction, the subsidy from the Walloon Region” (Bénédicte, l. 453 et sq.).

However we also interviewed a young heating installer (whose father and father-in-law “are both manual workers”) who did a comprehensive renovation of his old house with special attention to energy efficiency and insulation, and an executive who is ready to promote a small enterprise installing photovoltaic panels. And many informants are satisfied with at least one professional they hired. But to find trustworthy professionals appears difficult, especially when it comes to walls insulation, and to a lesser extent, to roof insulation.

So the general picture is contrasted. Indeed, several informants, from both sub-samples, appear to be better informed than some professionals, possibly thanks to their friends (as in the above quote, Bénédicte has a friend who is specialised in roof insulation with cellulose), or thanks to their own research, namely but not only on Internet.

Dealing with contradictions

In this context of contradictory advice, potential energy-saving projects for the house appear to be also socially and affectively structured by the ways developed for handling contradictions with previous beliefs and projects. And as shown above (section 3), our in-depth interviews also include contradictions from the informants themselves and these contradictions may negatively influence (further) energy-saving renovations.

By chance, the Walloon sample is made of several teachers and several engineers, two professions hypothesised to prepare to integrate novelty and sort out contradictory advice, in general for the former ones and about energy for the latter ones. In these two sub-groups though, some install thick roof insulation with a high priority and others do not. Thus, other factors than these professions should play a role and the hypothesis should be further worked on or replaced.

Lack of time

Lack of time is another brake:

“Do you plan other works for the future?” “Well, I’d like, yes, namely..., there are many things in a house that are not finished.” (Belgian Professor, lines 281-3)

Regulations in cities centres

The regulations protecting cities centres may prevent external wall insulation, namely but not only for dwellers living in two-façade houses, with the requirement to have a uniform alignment of the façades and thus equally wide sidewalks.

“And for the front façade, even Mr [name of the energy advisor] has told: “Come on, you have a nice façade, we won’t destroy it.” So we have a façade on which we may not really touch and our next project is the backward façade.” (Teacher, l. 435 et sq.)

The informants in this situation have heard about installing some insulation from inside but this would mean losing space (and taking down all the radiators as added by one respondent): so they are not interested in that type of renovation.

Other factors

As said at the end of the preceding section, other factors may influence the decision process on home improvements and they are dealt with in the next three sections.

2.6 Impact of the house’s energy labels

For the informants who voluntarily acquired energy labels

An unexpected result is that the majority of the informants who paid for an energy assessment of their house are reluctant to recognise the (possible) influence of the energy assessment.

Indeed, among the 11 informants, few (two women, one man and one couple) spoke by themselves about this audit as a major guideline when describing the renovations they did. The next quote (from a loquacious lawyer who was however hesitating at this moment of the interview) is more representative of this apparent difficulty of the 7 others to confess a need for assistance in these technical matters, even though our interviews indicate that the energy assessment appears useful to raise the attention on unknown insulation possibilities, specially for the external walls, the floor and/or the cellar ceiling, as the next quote also indicates it:

“So I think that I have now done nearly all of what was to be done. The only thing that one could possibly still do, (hesitation) – because I had a ... an energy assessment of the house done, that is how I learned that what was interesting was the insulation of the walls, (hesitation) and the boiler – is to possibly insulate the... the the ceiling of the cellar.” (l. 994 et sq.)” And later: “I prefer to use my money to play golf”.

Like this man, all these informants interested enough in energy savings and paying for an energy assessment speak more freely about the energy assessment when they are asked by the interviewer about energy-related renovations they had not done, rather than for the renovations they did carry out. One informant even said that no energy assessment was ever done for the house! But consistency checks proved the contrary.

Another counterexample further explains this identity factor. One informant did insulate the roof of his house by himself, after having taken advice from a salesman he knew and trusted, and from other acquaintances. But the energy adviser showed him that the work was not done correctly and should be redone, which was not yet the case at the time of the interview (2-3 years after).

These reluctances are consistent with earlier results (Gram-Hanssen *et al.*, 2007): energy expert advice for home renovation is always interpreted (or discarded or forgotten) by owners from

their daily life perspective. “If following the advice is in line with the identity of the interviewees, or in keep with the household’s plans for the house, it may induce the activity.” (Gram-Hanssen *et al.*, 2007: 2885).

One engineer concludes so about the interest of the energy assessment:

“The results of the assessment? It has rather (hesitation) given me a more rigorous calculation method for my own recalculations after each ... after each small work I do.” (l. 2852).

Summing up, the energy assessment appears useful both to raise the attention on unknown insulation possibilities, especially for the external walls, the floor and/or the cellar ceiling, and to provide a calculation method, *but* the identity factor has to be taken into account: home owners are reluctant to recognise the influence of this assessment on their energy-related renovations and do want to show themselves as the master of these works.

For other house owners (no energy assessment of their newly bought house)

In the subsample of informants who did not pay for an energy assessment of their house, several had for free a kind of ‘light’ assessment when applying for a special loan or a subsidy (‘for rehabilitation’ of old houses). All the others had heard about an energy audit and no one was wishing to have such an assessment, either because they claimed knowing enough by themselves or because they preferred not knowing more:

“No because the house, as it is, I don’t see really what I can change (...) I can not imagine sacrificing the stones to find myself with a wooden façade. Here it is. And I do not suffer from cold or heat during the summer.” (Eléonore, l. 1063 et sq).

To the question whether she knows about energy assessment, Bénédicte answers: “Yes, but we have not done it. No... No... No! (Hesitation) Because we told ourselves... well, no, we didn’t think to that. But he [the energy advisor] will find many small things, many small holes everywhere and we will have to make further renovation works, so... We don’t see... we don’t really see the necessity because we do not plan to carry out further works.” (l. 1514 et sq).

As mentioned earlier (when she was dealing with contradictory advice on insulation by cellulose, p. 2.13), Bénédicte has given a lot of time, conviction and money to renovate her house in an ecologically-sound way and she modestly says: “We did what we could.” (l. 1530). This identity factor should be taken into account in the energy assessment procedure.

2.7 Roles of the actors (professionals, relatives, acquaintances ...)

Actors, whether professionals, relatives or friends, or of both categories, have a very significant role in energy-related renovations: during the process of decision making, during the work and even after. (It is worth mentioning that from a smaller-scale study on DIY in a major town of Wallonia, this seems to hold true for any DIY activity, whether energy related or not: Puraye, 2006.)

Friends, relatives, acquaintances, neighbours

All informants (but one) refer to friends, relatives, acquaintances, neighbours or colleagues who helped in various ways: advice, whether on professionals or on renovations, practical help during the works, namely for insulating the roof by themselves, support (for example in conversations during parties of friends renovating their house). And before these renovations, the parents,

especially so for of the youngest informants, helped for the choice of the house (and maybe also for financial aspects, but this topic was not investigated during the interviews).

In addition, many informants have at least one friend or relative, acquaintance or client, or themselves, working in the construction sector or in energy-related areas: these professionals helped in commenting cost estimates or in bypassing this procedure by proposing to do the work themselves or in giving general advice. For example, one DIY informant “sympathised” with a seller of environmentally friendly products for construction and decoration “and now buy[s] only there” to have his advice.

The examples of help are so numerous that only a few more unexpected ones can be cited here: neighbours in the same street renovated their roof at the same time with the same contractor, so they got a cost reduction³²; friends working in the construction sector made for free energy-related renovations as an exchange of services, and by so doing, were updated with environmentally-friendlier techniques searched for and found by the informant; an architect offered for free her help and her address book to ask for and sort out cost estimates; virtual ‘acquaintances’ on Internet websites were consulted about the reputation of a first selection of professionals before each energy-related renovation by a couple of informants (who did many renovations!); new friends were found during participatory renovation projects announced on Internet forums on alternative construction techniques:

“We were told: “But yes, try to do that!” So we met, we met lots of people that we didn’t know.” (Alain, l. 172 et sq.)

In addition, informants living in pairs often acknowledge the help of their spouse, especially so if he (more rarely she) is a DIY practitioner.

“[My husband] bought two or three tools to do the necessary slots etc. I'm not going to give you the details, I don’t know them (laughs). (...) He is pretty handy and he is doing well.” (Florence, l. 230-3)

Professionals

This aspect is already evoked in section 5 above, p. 2.13. Summarising the point made, in both sub-samples (daily-life home buyers, or persons being interested enough in energy issues to pay for an energy assessment of their house), some informants appear to be better informed than some professionals, possibly thanks to their friends and acquaintances or thanks to their own research, namely but not only on Internet.

In addition, it may be difficult for some informants to acknowledge in front of the interviewer that they are not satisfied with some professionals, whom they carefully choose or with whom they were maybe acquainted before the work. The next quote illustrates the most regrettable situation as it happened to our poorest informant:

- Mrs: [About the men who worked on the front door of a house in very bad condition], “they have nicely worked except that they have forgotten some little things, as there, below the door: you see that there is some air passing though”.
- I: “Indeed!” [The interviewer was quite surprised as there was a 2 cm difference between the floor and the main door.]
- “And the door handle, you open the door a little too abruptly, and you get the door handle in your hands. So we have contacted them, so they already came and fix it 2 or 4 times, but according to what we just heard, they are bankrupt” (l. 344 et sq.).

³² This way of doing is much more widespread in villages having no gas access, for a grouped delivery of oil, hence a better price.

Thus, home owners carrying out energy-related renovations are not comparable to consumers on a market that would work properly provided that the consumers would be better informed, one by one, namely by the energy labels of their house. On the contrary, our survey shows that home owners are inserted in social networks that provide them with advice and information on energy-related issues and that some professionals are less knowledgeable on energy issues than some home owners.

2.8 Roles of incentives or renovation programmes, and policy in general

Existing programmes and knowledge thereof by the informants

There are many different programmes: regional subsidies and fiscal (federal) rebates for energy-saving works or investments, or for an energy assessment. All respondents have heard about them mainly through several media; as already quoted (p. 2.11):

“Of course I knew that there are subsidies from the Walloon region or something...
Yes I have heard, I have quickly visited their website.” (Coralie, l. 350 et sq.).

But contrary to nearly all informants, she did not apply for any subsidy as she found that it was too much paper work. Indeed, nearly all informants got at least one subsidy and one fiscal rebate (most often for energy-efficient frames and windows, several for boilers, roof insulation, and more rarely for photovoltaic panels and outside walls insulation³³) and at least eight of them did benefit either from a low-interest loan or a special subsidy (for the ‘rehabilitation’ of an old house) that are granted to the condition of doing energy-saving renovations.

As there are many types of subsidies (per type of energy-related renovation, per m²...), the search of information and the calculations on the most advantageous one is long (9 months for Laura for example, see below) and complicated:

“You must be a keen calculating person and this is not our specialty” (couple where both have a BA degree)

“Both of us have a university degree [a Master] and we already had [problems] to sort out the papers. So for someone who has not such a background, I don’t know how he does. So, I tell myself, it’s stupid because these subsidies are normally accessible to everyone: are they really accessible?” (Laura, 551 et sq.).

Even so, she mixes up the subsidies granted by the Region and the federal tax rebates. But her point on potential social inequalities is interesting and made again in the next quote.

Too much administrative work

Two informants did not apply for any subsidy: one who found that it was too much paper work, and another one, whose installer deducted the amount of the subsidy from the bill, so both parts were happy to have less paper work.

Indeed, there are criticism on time-consuming forms and bureaucratic work of the programmes. This administrative work, seen as huge especially for less educated people, raises again the question of the potential social (in)justice of these subsidies.

“[About the subsidies] I find it’s good, but sometimes (hesitation) a little (hesitation) the forms are a little complex. So I tell myself – well for me, it’s not a problem – but (hesitation) they are however for persons ... with less means... who are not likely...

³³ Since 2010, the subsidy for photovoltaic panels is suppressed and the one for outside walls insulation has been reduced of more than half.

who have not always (hesitation) an education level that enables them to fill in easily these [forms] (hesitation), it may discourage them, I find.” (Fanny, 641 et sq.).

The numerous hesitations as well as the indirect style may signal that she speaks also for herself (she has a lower level of education than all other informants but one).

Financial issues

The next quote summarises well the opinions of our informants about the subsidies granted by the Walloon Region: they are appreciated and interesting on a financial point of view, but less so than the tax rebates, they raise the attention on energy-saving works, but they are “only for some people”:

- I: “What is your opinion on the premiums and subsidies granted by the Walloon Region?”
- (Hesitation) Well that’s great. For those who receive them! (Laughs) (Hesitation) Now it’s not that ... yes, yes it can perhaps be a little motivating, calls the attention ... well, it opens the eye on the kind of work that can be done in homes. But otherwise it’s not really that ... helpful. Well, it’s a small gift, we saw it more as a small ... a small reward: “ah, it’s nice, you’ve done some work, well, you get a little gift!” rather than a real ... [financial] support. For taxes however, here we had one good reduction. So there, it’s worthwhile. Finally I ... I do not know very well ... how it will be the years that follow, but this first year, we ... we recovered well, so there, it is true that it's worthwhile. Now, as always, it must be ... well, you must first have money to do the work. (hesitation) ... So again, it is only for some people ... somehow. (Bénédicte, l. 644-666)

Indeed, a criticism against the Regional subsidies relates to this financial issue and was heard several times: “the subsidies are for the rich!” The applicant has to have money available to make energy-related renovations and advance the money for paying the work, before receiving the subsidy, possibly the next year, and with the tax rebates, a probable tax reimbursement still the year after. The next two quotes, from two informants with quite different income, illustrate this point, which is a main issue (also shown for the Brussels Region by Maréchal, 2009):

[Right at the beginning of the interview] “I have accepted [the interview] because I told myself that I probably had a non-typical profile.” “Why?” “Because I have bought [the house] four years ago, I have no money and at the same time, I have in practice no access to the subsidies. (...) To have access to the subsidies, money is needed because to be able to invest is needed.” (Full-time employee, BA degree, living alone).

[After financial calculations quickly made during the interview, about PV panels] “a 23% annual [yield], if you know other [so fruitful investments], I am quite interested.”³⁴

However, beneficiaries of the loan for low-income family do not pay the renovation works themselves, the Fund does it for them and is also in charge of asking (and receiving) the corresponding subsidies, which are then deducted from the amount remaining to pay.

Dealing with cost estimates

Asking for and sorting up the cost estimates from several professionals may appear as a negligible issue as compared to the administrative and financial problems mentioned above, but still it is another type of difficulty faced by home owners.

³⁴ This subsidy for PV is now suppressed. See note 9, p. 16.

For example, an engineer with a PhD tells that he found himself “somewhat powerless when one must compare because one finds quite different cost estimates” (l. 812-3) ... even he is probably the best educated informant to deal with this situation. At the other end of the range of educational backgrounds, the poorest informant (no diploma) tells this “no luck” (as they said) story:

“An expert also came for the works and gave us a certain amount [of allowed but still virtual money] to do each work, so with this amount that he had proposed, we didn’t have such a large choice (...), we took the least expensive.” (l. 364 et sq.). And later on, this contractor was bankrupt.

As mentioned earlier (p. 2.16), an informant was helped to ask and sort out cost estimates by a friend who is architect and another one consulted the forums on the websites of each potential contractor before choosing one.

Too restrictive subsidies

A few informants complain that the subsidies do not cover some works they were wishing or considering to do, for example for replacing old double-glass windows some years ago or for walls built with traditional but energy-efficient techniques (with mud and straw).

In addition, one of the DIY informants regret that there are no subsidies for DIY home owners who make energy-related renovations (such as walls’ insulation), even if he understands that:

“there is a kind of policy to boost employment – not only to encourage energy savings – but in addition to have perhaps a less skilled labour force back on the labour market (...) but still, I find that the difference is too important between the two scenarios and I find that there should be instead a subsidy, maybe lower, for people doing it themselves, and then the higher one for people asking to a contractor.” (l. 1806 et sq.)

Recommendation provided by the informants

Several informants made the following suggestions on new or existing policy instruments:

- For persons lacking of either money, time or competences, free energy assessment done by a team with both technical and social competences, the last one being presented as follows: “Someone who accompanies you and who takes your point of view, that is lacking I think. And I see that for everything: I am a social worker and I see well that this is lacking and people expect that, an accompaniment, not that everything being done for them, but an accompaniment, an advice as if one were in their position, by letting freedom and everything, but by taking their point of view.” (Social worker, l. 392 et sq.) ;
- Something similar to the “Housing Fund” or a broadened access to it, also for low-income households but with no or only one child, for example elderly persons living alone or in pair;
- The actual beneficiaries of this “Housing Fund” would like to have the opportunity to seek advice from the Fund for requesting and choosing between insulating techniques and materials, as well as for cost estimates and maybe so also *before* buying the house (help for understanding “what is written in small letters” in the contract). [There are only 3 such beneficiaries in the sample, and their stories on the help and advice received during their renovations are quite different.]
- A subsidy for updating the electrical system [necessary in most old houses not yet renovated with actual standards of electricity consumption];

- Energy auditors who would be better educated and not “turning crazy” if they are received by a young woman, to whom an auditor gave “no trust”.

2.9 Renovations done

The range of renovations done is large, from just painting to complete remodelling:

“My idea was to destroy everything inside. So I wanted to make a new interior masonry. Completely. There were wooden floors, I did not want wooden floors. I wanted concrete floors. Rearrange the pieces as I wanted to do.” (Man living alone).

Among energy-related renovations, the most often cited is to change frames and windows and roof insulation comes next. But this order is maybe caused by chance, given the too small sample size to observe the frequency of different types of renovation.

The informants having acquired energy labels have made more varied energy-related renovations than the other home buyers, such as the installation of photovoltaic and/or thermal solar panels and external walls insulation. But this finding should not be interpreted too rapidly as a result of the energy assessment, for the former informants live in their home since longer, are better off and own a house generally in better condition than the latter respondents. Furthermore, they are more interested at energy-related issues. Still, the energy assessment did play a role, even if most informants are reluctant to recognise it.

The question concerning the main renovation was often not clear for many respondents and triggered the question on what was meant by ‘the main renovation’. In addition, for several respondents like the man quoted above who made a comprehensive renovation, it was difficult or irrelevant to choose only one step of a whole process.

2.10 Owner’s relationship to comfort

Home owners’ representations on comfort are related to heat, space, light, and for some, silence, as seen above, in section 4 (see pp. 2.9-2.10 for more detail).

2.11 Conclusions

In Belgium, most competences related to energy are attributed to the three Regions of the country. The Regions are namely responsible for the implementation of the EPBD, the European Directive on the Energy Performance of Buildings. Wallonia, the Southern and French-speaking Region of Belgium, is one of the ten Regions/countries studied in the IDEAL EPBD research project. In Wallonia, the EPBD is fully implemented since May 2010.

The purpose of the IDEAL EPBD research project with in-depth interviews is (as stated in the Grant Agreement) to contribute to the “improvement of the understanding of consumer behaviour, the role of other actors and the effect of policy in general”, as well as “the barriers they face(d) and decision making processes”. Factors against behavioural change in energy consumption are indeed generally referred to as “barriers” but this representation is criticised by sociologists, for it implies a techno-economic perspective, a market that would correctly function in the absence of non-technical ‘barriers’, a role of public authorities to correct these market imperfections, usually with a top-down approach, and an individualistic view of action. Instead of this ‘barrier-oriented’ approach, sociologists prefer to study energy-related practices with a broader view of the socio-technical context in which energy-related practices and changes take place. This chapter uses this approach and more specifically the social theory of practice as a theoretical framework.

In this qualitative survey, 23 in-depth interviews were realised with home owners, during 45 minutes to 2 hours. The sample is made of two sub-samples. A first one is made of 11 informants who voluntarily acquired energy labels for their house in 2007; they are rather well off, have all but one a university degree and their age ranges between 30 and 65 years. The second sub-sample groups 12 other house owners who bought their house in the last years before the interview and who represent a variety of socio-economic backgrounds, housing types, marital status and living arrangements; their age range is less broad than in the first subsample – all but one have less than 50 years for it is not common to buy a house after this age.

All informants are in the process of renovating their house, except two: one carried out the renovations years ago and another one bought a newly renovated house.

The main result of this qualitative survey is that energy-related renovations should be framed in a socio-technical perspective rather than in a techno-economic one. Several empirical findings account for the former type of contextualisation.

1. The characteristics of the housing stock are important and in Wallonia, the houses are in general old to very old: this situation often requires energy-related renovations and opens the way to important energy-savings in the residential sector. This survey though has shown several situations where energy-related renovations have *not* brought about energy-savings.
2. Energy-related renovations are rooted in social practices as a giving or an exchange of advice or services, as a topic of conversations (also on Internet websites), as a matter of trust and friendship that overpass technical considerations on further energy savings in the house.
3. Energy-related renovations are oriented by social norms on comfort that was found to be associated with heat, space, light and for some, silence. These representations motivate energy-related renovations when they are in conjunction with other factors, most often the old condition of some components of the house. Other norms valued by many informants in relation to energy-related renovations include convenience (especially for remodelling the space), and autonomy – which leads the majority of the informants who paid for an energy assessment of their house to minimise its influence on “their” energy-related renovations. Security (for old boilers and electricity systems), and good or better health were also mentioned, less often though. In addition, in our sample, an environmental concern appears to be more often a major motivation to carry out energy-related renovations than the wish to save money, although at least three informants see these renovations as a fruitful investment.
4. Energy-related renovations are sustained by the level of practical know-how on energy-saving issues, in the population in general and among the professionals in the construction sectors, both being interconnected. This practical know-how is still rather low in 2009-2010, but tacit knowledge on these energy-saving issues is increasing, namely but not only by mass media communication on subsidies granted by the Walloon Region. However, several informants regret that the search of information on these subsidies requires time, administrative and financial competences. These subsidies and the energy assessments asked by half of our informants raised their attention to (still?) less known energy-saving renovations, such as wall insulation.
5. For these four reasons, ‘barriers’ and the idea of a market that would correctly work in their absence appear to be more like a fiction. The Belgian ‘market’ related to energy-related renovations has shown imperfections that are not related to the homeowners. Indeed, the latter are sometimes more concerned and more knowledgeable on energy-saving issues, techniques and materials than some professionals they met. Furthermore, homeowners are neither passive – the majority of our informants are actively engaged in energy-related renovations – nor isolated ‘consumers’ but they are inserted in many social networks (friends,

relatives, colleagues, acquaintances...) that help them finding information and advice. However, for the low-income households that do not meet the conditions to have a loan of the Housing Fund, lack of money is a reason given by some for not carrying out (further) energy-related renovations. Subsidies granted by the Walloon Region are not appropriate for these low-income households because these homeowners have not enough money to first carry out the works and then get the subsidy and the tax rebate.

Nearly all informants have given ideas and opinions on energy-policy issues. The subsidies granted by the Region are well appreciated. But according to the informants, they should be affordable for all homeowners, even the low-income ones, be less time consuming for the search of information, involve less administrative and calculation work and competence, and be also available for DIY persons who do the works themselves. All these wishes may also be seen with the 'lenses' of a social justice paradigm.

In addition, some informants propose the following: a subsidy for renewing the electrical installation in old houses, a free energy assessment done by a team with both technical *and social* competences for persons being short either of money, time or competences, and for low-income households with no or only one child, a Fund similar to the "Housing Fund" or a broadened access to it.

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Chapter 3

Home owners and energy-related renovations in Bulgaria

An analysis of 24 interviews

**Grozdanka Stamova, Dobrina Tosheva
& Angel Nikolaev**

Black Sea Regional Energy Centre (BSREC)



3.1 Introduction

3.1.1 Background information

The current report is based on the results of the in-depth interviews carried out in Bulgaria. Altogether, **24 interviews** have been done, of which initially 5 pilot interviews (first wave) and later 19 interviews (second wave). After the first wave interviews, a comprehensive methodology for the 2nd wave interviews was developed by the WP4 leader and followed in Bulgaria.

The information and the structure of this “horizontal” analysis of the 24 interviews are based on the ones of the “vertical” analyses of individual interviews.

3.1.2 Building stock in Bulgaria

According to the National Statistical Institute³⁵, the number of residential buildings in the country is about 2.1 million, while the number of dwellings – about 3.8 million. Nearly 64% of all dwellings are located in towns. The average number of persons per dwelling is 2 (2.3 in towns and 1.6 in villages) and the average useful floor space per dwelling is 63.8 m².

The building stock in Bulgaria is quite old - 67% of the residential buildings have been constructed by 1970 and only 1% - since 2001.

About 96% of the dwellings are owned by physical persons, 1% - by private companies and 3% are State/municipal.

The construction of 74% of the buildings is based on bricks, 5% on steel-concrete, and 21% - others. On the other hand, in towns 49% of the dwellings are in steel-concrete buildings and 47% - in brick buildings, while in villages 70% of the dwellings are in brick buildings.

According to the requirements of the Bulgarian Energy Efficiency Act³⁶ certification is mandatory for all buildings in operation with surface area larger than 1000 m². Despite of that, in the residential sector, there are only few examples of audit and certification of existing residential buildings. One of the main problems is the limited financial stimuli offered to building owners. Another one, particularly related to the multifamily buildings, is the fragmented ownership of the buildings (normally each family owns its apartment) combined with poorly regulated procedure to take a common decision.

The legislation requires that for each rented or sold building (or a part of it) an energy certificate should be made available to the new tenant / owner. However, the compliance with this requirement is still negligible.

3.2 Respondents and their home

3.2.1 Respondents taking decisions about apartments

Below we provide short information about the informants who take decisions about their apartments. Most of these respondents live in Sofia and it is further indicated in which part of Sofia they live. Those who live in the downtown of the city (where the apartment price is higher) The status of these Usually those who live in the downtown or in luxurious neigh

³⁵ National Statistical Institute, Housing Fund 2009 (data as of 31.12.2009), www.nsi.bg

³⁶ Energy Efficiency Act, enforced on 14th November 2008, last update 15th February 2010

(First wave) Lyubina is 35 years old woman, single, working as a lawyer. The owner of the dwelling is her mother, but Lyubina makes all decisions about major renovations. The dwelling is located in an apartment building in Yavorov district, Sofia, and it consists of three bedrooms, a living room, kitchen and two bathrooms. Lyubina is the home manager of the building chosen by her neighbours and she initiated the renovations in the building. The respondent was recruited through ENA OPTIMA Company.

(First wave) Miroslava is a 39-year old woman, graphic designer, married and with two daughters ages 9 and 3. Miroslava and her husband own their dwelling and decide together about renovations. The dwelling is located in the Reduta district, Sofia, and it consists of two bedrooms, a living room, a kitchen and two bathrooms. This respondent was recruited through “New estate Bulgaria”.

(First wave) Teodor is a 33-year old chemist, married, with a little daughter. His family shares the flat with his parents. The flat is located in a panel building in Mladost district, Sofia. The respondent was recruited through ENA OPTIMA Company.

(First wave) Slava is a woman in her late 60s, early 70s, who lives with her husband in the flat that used to belong to her parents. Slava is a retired electrical engineer, currently – manager of the apartment building she lives in, located in downtown Sofia. Slava’s apartment consists of two bedrooms, a kitchen, a living room with an entrance hall. The respondent was recruited through ENA OPTIMA Company.

Elena and Anton are an elderly couple living in an apartment in one of the most central Sofia neighborhoods, Poduene. The apartment is on the 4th and last floor of an apartment building, surrounded by other apartments and it faces south. The floor area is 66 m². The respondents were contacted through a BSREC employee.

Antonia is a woman in her early 40s, currently working as a HR manager, living in an apartment of 54 m² in downtown Sofia, near the Central railway station. She lives alone. The apartment is on the 4th floor of an apartment brick building (of 6 floors), surrounded by other apartments. This respondent was contacted through a BSREC employee.

Marieta is 41-year old woman, working as a Sales operation expert in a telecommunication company. She is single and lives alone in her apartment (45 m²) located in the Nadezhda district of Sofia. Marieta was recruited through “Sofia Yard Company”.

Zhoro is 30-year old man, an economist, working in a trade company. He owns his apartment of 75 m² located in the Mladost district, Sofia. He lives in it with his girlfriend. The respondent was recruited with the help of an acquaintance of a member of the interviewing team.

Boryana is a 30-year old woman, working as a project manager, living in a panel apartment in one of Sofia neighborhoods, Dianabad, with a floor area of 55 m². She used to live alone, but about half a year ago her father moved in with her as he got a job in Sofia (he came from a different town). She was contacted through the brother of a friend of the interviewer.

Eva is 63-year old woman, civil engineer, who is a co-worker of one of the interviewer’s relatives. Eva and her husband have been living in their apartment of 90 m² in one of the most luxurious Sofia neighborhoods, Lozenets. They have lived alone in this apartment for almost two years and hope that they will not have to move to another apartment in their life.

Iliyana is a woman in her late 40s, school psychologist, living in an apartment in one of Sofia neighborhoods. She lives alone. The apartment of 60 m² is on the 5th floor of an apartment building (of 6 floors), surrounded by other apartments. She was contacted through a former colleague of the interviewer.

Peter is male, in his early 30s, researcher. He lives in an apartment of 75 m² in downtown Sofia with his wife and newborn daughter. They have lived in this apartment for about half a year. The apartment is on the last, 5th floor of an apartment building, surrounded by other apartments. Peter was contacted through the husband of the interviewer.

Tea is a female, in her early 40s, economist, working as a consultant, living in a panel apartment of 94 m² in the downtown area of Sofia. She lives with her daughter and parents. The apartment is a corner one on the 8th, last floor of an apartment building. She was contacted through another respondent who did not fit the selection requirements.

All of the respondents living in apartments, except for Eva, use central heating. Eva uses air conditioning for heating (based on electricity), as the general assembly of her building has decided not to have central heating as it is too expensive.

3.2.2 Respondents taking decisions about houses

(First wave) Svetla is woman at 33, working as a business development manager, who bought a house about two years ago for her mother. Even though the house formally belongs to the mother and the mother lives in it alone, the daughter is the one making all decisions about major renovations. She was recruited with the help of an acquaintance of one of the interviewing team members.

Marina, 33 years old, is a young woman, working as a waitress and a pastry-cook, who lives in a house in Karnobat (a small town in SE Bulgaria) owned by her and by her husband. They have a daughter, age 5. The house was built in 1950 and its floor area is about 120 m². Marina was recruited with the help of a local real estate broker.

Marta is a 47-year old woman, teacher in a kindergarten, married, living with her husband in a single family house they both own. The house's floor area is about 70 m² and it is located in the Suha reka district, Sofia. The respondent was recruited with the help of a real estate agent from Sofia Yard.

Nikolay is a 47-year old man who is owner of a small construction company. He has a two-storey house with a floor area of 150 m² in the village of Petarch, near Sofia. He lives there with his wife and two children, ages 11 and 5. Nikolay was contacted through the mayor of the village who knew the new arrivals and asked him to participate in the research.

Vanya, 28 years old, shop assistant, **and Ivaylo**, 30 years old, water supply and sewage specialist, are a young couple with a 4-year old daughter. They own and live in a single family house of about 100 m² with big garden in Karnobat and were contacted through a local real estate broker.

Anton is a 54-year old man, technician. He lives with his mother in a two-storey house of 200 m² in the village of Petarch and together they own it. Anton was contacted through the mayor of the village.

Sonya, 65 years old, is an elderly woman, retired. She and her husband are owners of a two-storey house of 120 m² in Kremikovtsi, a village near Sofia. Sonya was recruited with the help of an acquaintance of one of the interviewing team members.

Radoslav is a 35-year old man, manager of a private transport company, who lives with his wife and two children, ages 12 and 7 in a house in Petarch. The respondent and his parents are the co-owners of the three-storey house, each floor's area about 100 m². This interviewee was contacted through the mayor of Petarch.

Bogdan is a 55-year old man, hydro geological engineer, who lives with his wife in their house in Selyanin, a village near Sofia. The two-storey house was built in 1980, the total floor area is about

100 – 110 m². The respondent was recruited with the help of an acquaintance of a member of the interviewing team.

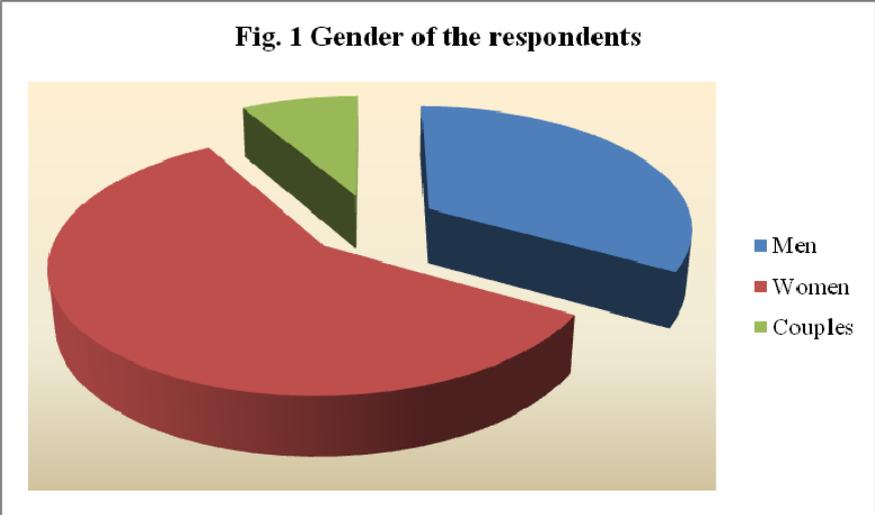
Yoanna is a female, in her late 30s, a policewoman. She is living alone in a semidetached house in Petarch, a village near Sofia. It is a three-storey house with a total floor area of 150 m². This interviewee was contacted through the mayor of the village.

Ivan is a male, in his mid 30s, owner of a small construction company. He, his wife and their small boy live in a one-storey house of 60 m² with a very big yard. The house is located in Petarch, a village near Sofia. The respondent was contacted through the mayor of the village.

Summary of Objective Data on Respondents:

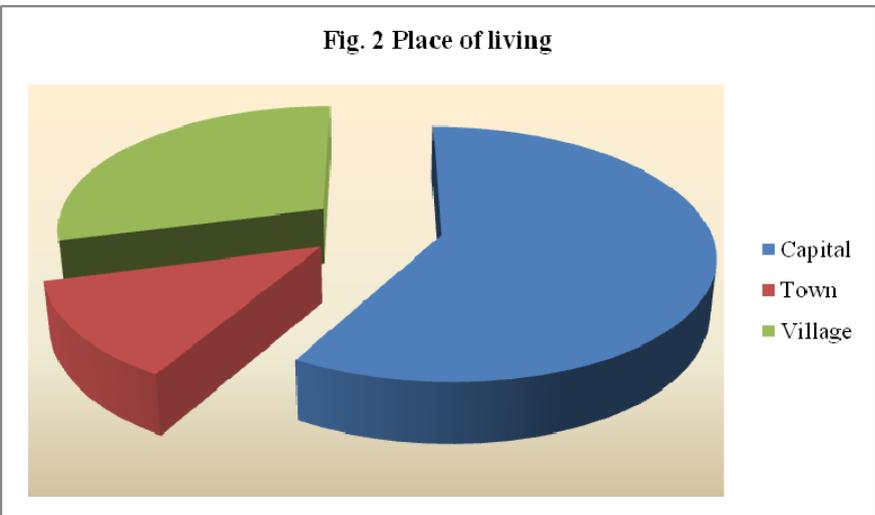
A: Demographics:

Gender of Respondents



The majority of the respondents (14) are women. There are 2 couples and 8 men.

Place of Living

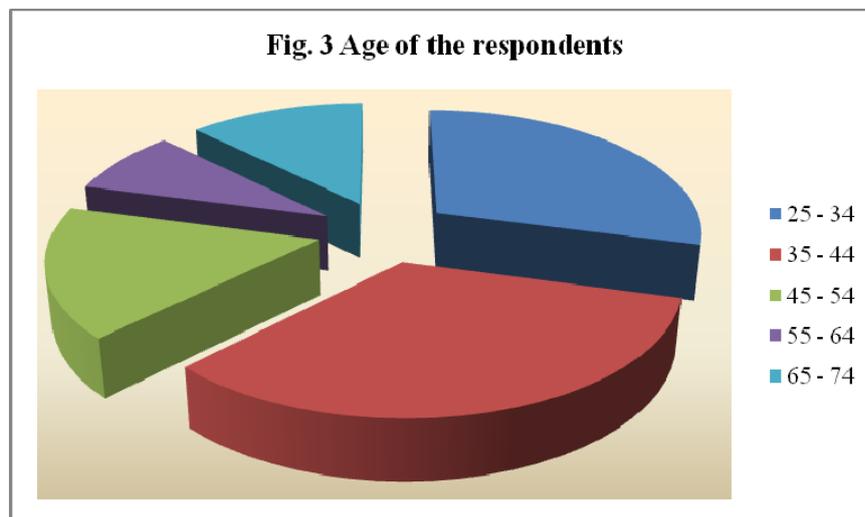


Most of the informants (14) live in Sofia. On one hand, considering that only about 20% of the Bulgarian population live in Sofia-city region, the distribution of informants seem unequal. On

the other hand, a wide variety of social groups live in Sofia, so these informants may be (to some extent) representative for all Bulgarian cities. Seven informants live in villages. Three live in smaller towns or suburban areas of up to 20 000 inhabitants.



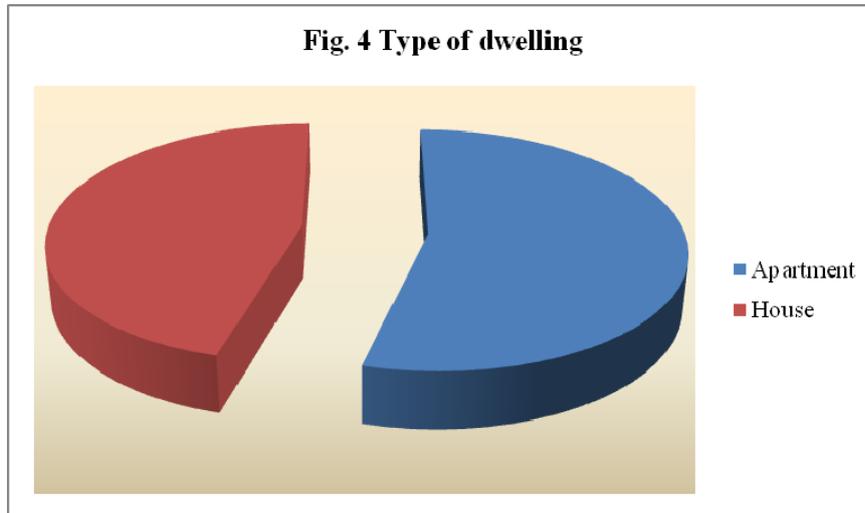
Age of the Respondents



Age boundaries are between 28 and 70. The average age is 44 years. The major group of 8 individuals are 35 – 44 years old and the second biggest group of 7 persons is 25-34 years old. Unfortunately the informants within the range 55-64 years are not well represented (only 2). The low number (3) of persons over 65 years old can be justified, because only rarely these people take decisions about their homes.

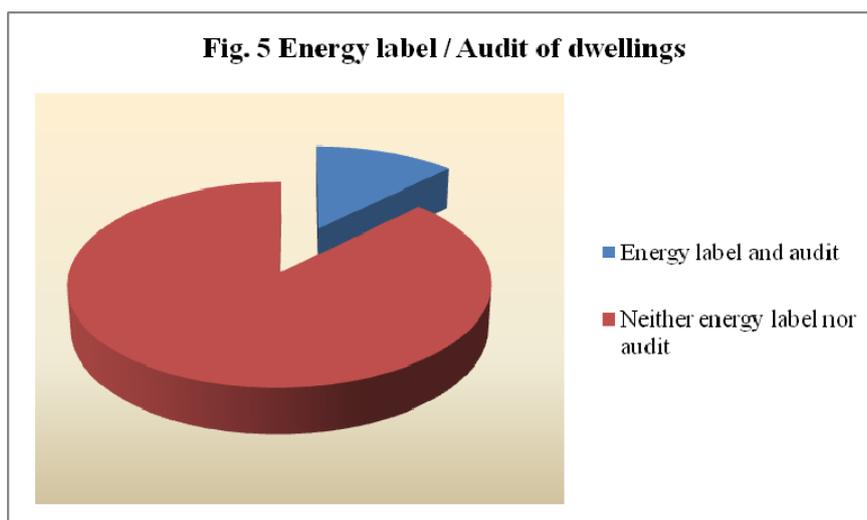
B: Information about the Respondents' Dwellings:

Type of Dwelling



Among the respondents 13 are decision-makers about the renovation works in apartments and 11 - in houses.

Energy Label / Audit of Dwellings



Only 3 out of the 24 dwellings have been audited and/or have energy labels. These dwellings have been a part of a pilot energy renovation project. Apart of this project, almost no existing buildings have received an energy label.

3.3 In-depth analysis

3.3.1 Recurrent repetitions

Role of relatives (Apartments: Boryana, Marieta, Anton and Elena, Iliana, Tea; houses: Sonya, Ivan, Marina, Radoslav, Vanya, and Ivaylo). They all pointed how important the role of their relatives is for organizing and doing the renovations. For example, Marieta, lines 146 – 147: “I would say my father and my brother did eighty percent of all renovations”. Anton and Elena: The daughter and her husband are important, as they are the ones paying for the renovations. Iliyana: her brother is helping her with the more effort requiring jobs. Ivan feels his wife supports his enthusiasm, contributes ideas about the house and in general is a very strong positive

influence on him, something without which everything would not be possible. Marina: Relatives were included in all renovation activities; relatives gave advice and helped them physically; parents supported them financially. Radoslav: Relatives play active role, they are actively included in choice of companies. Tea: Her parents are those who support her in everything she does for the apartment — from sharing opinions to putting inside insulation with her father, to caring for the child when work has to be done. Vanya and Ivaylo: Relatives were included in all renovation activities. Relatives gave advice and helped them physically.

3.3.2 Recurrent hesitations

The understanding of comfort (Peter, Tea). They both hesitated when answering this question, probably because they had not thought about this and it was difficult to define the concept. For example, Tea, lines 854 – 859: *(pause) “For me comfort is having space. I don’t like narrow spaces”*.

3.3.3 Recurrent contradictions

Environmental issues: (Apartments: Anton and Elena; houses: Marina, Anton). For example, Marina, lines 525 – 526: *“There are small things that everyone can do – save electricity, save water”*; and lines 537 – 538: *“We try to save more energy and water”*. But when we talked about the temperature in the house during the winter she explained that they keep a high temperature in all rooms: 24 - 25°C. Keeping this temperature is connected to the use of more energy, which contradicts the desire to save resources.

Related to the previous one is the contradiction which Antonia made: she said she cares about nature, yet she does not really do anything to take care of it.

Comfortable living and making economies (Apartments: Anton and Elena). Anton and Elena consider that to be comfortable, one should not think of how to save.

3.4 Levers

Both for owners of apartments and houses:

The lever applicable to most respondents is the desire to have and maintain **normal and comfortable living conditions**. All respondents said that increasing their own comfort at home has motivated them to begin the renovations. For example, Radoslav, lines 149-150: *“We want to have normal life conditions, this was the reason to realize all renovation. We want to have a comfortable home”*. According to Zhoro, lines 228-229: *“My understanding for comfort is free space without unnecessary things or furniture; easy for keeping and cleaning”*. According to Vanya, line 322-324, line 326-327: *“nice atmosphere, good and convenient furniture”*. According to Ivaylo, line 328 -330: *“...Relationship, the way people communicate each other at home...”*. Comfort for Tea is mainly associated with enough space to be able to be alone if one needs it, and it is connected with the indoor temperature as well.

Another important lever for almost all respondents is the **reduction of energy consumption**. For example, Slava, lines 283 -286: *“We would like to reduce energy consumption as much as possible and to live a life which conserves energy sources”*.

The reduction of utility bills is another very important stimulus, applicable to all respondents. Teodor, lines 23 -24: *“After outside walls insulation and putting new windows our utility bills decreased”*. For Vanya and Ivaylo, who pay every month a big payment for their loan, it is very important to keep strictly their family budget. Bills are a big part of the family budget, so they are ready to invest money in long-term safe energy renovations - solar collector or battery.

Family support – both as financial backing for the renovations and/or physical involvement in the work done. For some respondents the renovations would be impossible if this was not the case. (Apartments: Marieta, Teodor, Iliana, Anton & Elena; houses: Vania and Ivaylo, Marina, Sonya) For example, Anton & Elena, lines 208-209: *“Our daughter and her husband could afford to pay a skilled worker do all the work. We cannot afford to do this”*.

Previous or present work experience: some of the respondents (Apartments: Zhoro, Slava, Eva; houses: Nikolay, Ivaylo, Bogdan, Ivan) are in some way associated with the engineering or construction businesses and their professional expertise, experience and connections have been very helpful in choosing the materials and technologies used, and the people who would carry out the renovations. For example, Zhoro, lines 196-200: *“I have worked in a company which installs new windows and I have good knowledge about different window frames - plastic or aluminium. The most important and decisive thing about the quality is the painting of glass. Also the technical characteristics are important”*.

Money – for many respondents the renovations have been realized only after they have secured the finances needed. All respondents are aiming at some balance between quality work and lower price, so the discounts or payments by the installments offered by the professionals also function as lever for the renovations. (Apartments: Marieta, Miroslava; houses: Yoanna, Marta) Miroslava, lines 113-116: *“...It will be perfect to do outside walls insulation of whole building, but I am not sure about my neighbours, it will be easier to persuade them if we pay by instalments”*.

Involvement of friends, neighbors, acquaintances – the role of the social network of the respondents is crucial on all stages of the renovations: from the planning, to recommendations about professionals and materials, to the involvement in the renovations themselves. (Apartments: Teodor, Lyubina; houses: Bogdan, Nikolay, Svetla) For example, Lyubina, lines 88 - 89: *“The most important condition to realize such a big renovation is the consensus within the neighbor community”*.

Apartments only: (Iliana) Health consideration - sometimes the poor conditions of the dwellings are hazardous to the health of the respondents and that has motivated them to renovate them. Iliana, lines 602-604: *“Renovations were important for the condition of the dwelling and for my health”*.

Houses only: (Sonya, Anton, Radoslav, Yoanna) Wide choice of skilled workers and professionals: respondents from the capital and the settlements nearby (Petarch, Kremikovtsi) have the advantage to choose from many professionals and services: Anton, lines 125 – 129: *“All renovations were implemented by local people. There is a big group of skilled workers in constructions and renovations. They called themselves a “brigade”*; lines 225 – 226: *“There is a big choice of companies which install new windows”*.

3.5 Brakes

Both for owners of apartments and houses:

Money is the main brake for doing energy related renovations. The respondents are trying to do the most with the limited resources they have. Many are skeptical of loans, so they operate with what they have saved. (almost all respondents). For example, Antonia, lines 201 – 202: *“Well, we don’t have much money, right, we are poor. This is the only shortcoming (laugh)”*.

Lack of time is another brake, especially for those who are self-employed (Nikolay, Zhoro). Nikolay, lines 83-85: *“I can do all renovations at home, I am a builder, but I don’t have the time to do it”*.

High cost of the services offered by the construction companies – some respondents think that the construction companies keep the prices for implementing renovations high (Apartments: Marieta; houses: Marina) For example, Marina, lines 133 – 135 and 139 – 140: *“We didn’t use the*

service of one construction company for two reasons: it is more expensive than to hire different experts for different renovations. Another reason is that I know one or two companies in our town – the choice is limited”. (This also explains why some respondents go with hiring many handymen instead of one company to carry out all renovations)

Houses only:

Limited choice of professionals who provide special services in the smaller towns and villages away from bigger cities, for example Karnobat. (Marina, Vanya and Ivaylo) For example, Vanya and Ivaylo, lines 207-210: *“There are few companies which offer replacement of windows in the town. We hired a company from another city nearby- Aytos”*. Marina, line 227: *“...actually in our town we have only a few companies”*.

Good condition of the dwelling (no need to do renovations) - when the dwellings or part of them are still in a good condition, the respondents do not engage in energy related renovations as they see them unnecessary. (Bogdan, Radoslav, Anton, Svetla, Yoanna) For example, Svetla, lines 42 – 45: *“We didn’t renovate the roof, because it was in a good condition. When I bought a house I asked about the condition of the roof, because the renovation is very expensive”*.

Relatives’ or friends’ influence and/or their bad experience from their own renovations – friends’ and relatives’ negative opinion about materials or renovations, or professionals is a serious brake. (Marta, Anton) For example, Anton, lines 179 – 185: *“My mother absolutely disagrees to insulate outside walls. My sister insulated outside walls in her apartment in Sofia. Mould appeared in the dwelling after insulation”*.

3.6 Impact of energy label

Totally, 24 interviews were held in two waves. The first wave took place in April and May 2009. Five respondents were contacted during this period. The second wave took place since April to September 2010 and 19 respondents were interviewed. Three of the respondents’ dwellings, interviewed during the first wave of interviews were audited. Their owners were waiting for the final evaluation of their auditing companies.

The other respondents have different knowledge about the energy labels and the labeling system. Most of them have had no or very limited information, and only two respondents were well acquainted with the procedure of getting an energy audit and the idea behind the energy labels.

Most of the respondents shared the opinion that this idea needs promotion and advertisement. Most of them think that the tax exemption for buildings with energy certificates (classes A and B) is an attractive stimulus for renovation. Some of the respondents are inclined to trust such a label. For example, Boryana, lines 669 - 674: *“It would be nice to have it; if I would trust it (pause) I would consider it, well... because it is nice to know, even if it is not very specific, well, I would not trust it a 100%, but it would be nice to have it”*. Other respondents are more skeptical and are questioning the methodology used to come up with the labels. For example, Iliyana, lines 758 – 765: *“Besides, hardly someone is going to explain the methods they use to calculate this energy efficiency: “This is the methodology we have used. However, there is another methodology and this is how it is used.” So this would be for me very much like taking the data for the heating where representatives of companies, contracted for reading the energy consumption for heating purposes, do some calculations and give you this long list”*.

3.7 Roles of the actors

Professionals: All respondents have hired at least one professional. Some of the respondents have hired professionals for all renovations (for example Peter has had a team work in his

apartment and he was not involved); others have hired them for specific renovation activities (Like Ivan who has done most of the work on his house alone and has had professional help with very few tasks). Most of the respondents are satisfied with services they had (Apartments: Marieta, Iliyana, Peter; houses: Marina, Sonya, Yoanna, Anton). For example, Peter, lines 214 – 215: *“I would definitely recommend both the architect and the technical director. He is a bit expensive, but his work is good”*. Some respondents are not so satisfied, as they had to redo some or most of the renovations (Apartments: Tea; houses: Vanya and Ivaylo). For example, Tea, lines 231 – 234: *“But in the end we had to take the company, which really was not the best option because actually the renovation they did then we had to redo parts of it several times”*.

Family members and relatives. In some cases relatives and family members play an active role in doing renovations. For example, Sonya, lines 262 - 264: *“Our daughters and their husbands helped us in all renovations. I mean they helped us physically, not financially. Without their help it would have been difficult for us to manage with all renovations”*. In other cases the relatives did not participate in the renovations and the reasons are different – relatives live in another city, are too old, too busy, etc.

Friends. They are actively involved by giving recommendations or advice (Apartments: Iliyana; houses: Marta, Bogdan, Yoanna) - for example, Marta, lines 132 – 134: *“Our friends were interested, but they didn’t practically participate in renovations. They recommended professionals”*; by doing actual work on the renovations (Apartments: Iliyana; houses: Marina, Vanya and Ivaylo, Ivan, Yoanna) - for example, Ivan, lines 229 – 231: *“Well, the building of a house, well, even the reconstruction of a house, to do that by yourself is simply inconvenient. There is always a friend to give you hand”*; or by discussing topics about energy savings (Boryana). Very often some friends offer advice and others help with the renovations themselves.

Acquaintances, neighbors, colleagues, clients: they act as a source of information about new technologies or materials (Apartments: Antonia; houses: Nikolay); they recommend professionals and companies (Houses: Marta, Sonya).

3.8 Roles of incentives or renovation programs

The effects of these programs are minimal for all respondents.

Only three of the respondents from the first wave have taken part in a demonstration project which promotes the energy audits of buildings and their renovations (Apartments: Teodor, Slava, Lyubina). The other respondents did not use any bonuses or incentives.

More than a half of the respondents (Antonia, Bogdan, Eva, Iliyana, Ivan, Yoanna, Lyubina, Marieta, Marina, Marta, Peter, Radoslav, Slava, Tea, Teodor, Vanya and Ivaylo) were informed about the existence of incentives and programs, provided by the government and banks, and about available financial instruments. The most popular loan available is the Energy efficiency loan. But no one has applied for it, as the respondents think that conditions for the loan are not reasonable (Houses: Marta, Bogdan, Marina).

One of the respondents, Ivaylo, house owner, was familiar with a governmental program which provides incentives for people who install solar systems. He shared his intention to apply when he has enough money.

Another reason to decide not to apply for the specialized loans related to energy renovations is the heavy bureaucratic procedure which requires a lot of time and effort, which the respondents see as resources wastes (Apartments: Zhoro, Eva; houses: Radoslav). For example, Eva, lines 265 – 267: *“I believe they require a million documents and data, which a person cannot produce, to get these subsidies and aids for making insulations, so this is just a waste of time”*.

All respondents prefer to operate with their own money. And when they do not have the money needed to do the renovations, they prefer to take a general loan.

3.9 First and main renovation done /even if not energy-related/ and reasons

One big renovation which includes different activities (Apartments: Peter, Iliyana, Eva, Zhoro, Lyubina). These respondents talked about one big renovation which includes different activities, such as replacing windows, changing pipes, repainting, fixing the walls, etc. Some of these activities are energy related - replacing old windows, outside walls insulation, floor insulation, etc.

Replacement of old windows (Apartments: Tea, Boryana; houses: Nikolay). For example, Tea, lines 145 – 146: *“The major thing was to change all the windows as the old ones were not, not good”*. The quote explains the reason for doing the renovation. The same reason shared Nikolay, owner of a house, and Boryana, owner of an apartment.

Floor repairing and floor insulation (Houses: Marina, Sonya, Vanya and Ivaylo, Svetla). The renovation was urgent for these respondents because of damage of the floor and appearance of moisture. For example, Marina, lines 64 – 68: *“It was absolutely necessary to repair the floor because it was damaged. First time when we visited the house the washing machine was switched on and the floor waded”*.

Replacing old electrical installation with new one (Apartments: Miroslava, Slava; houses: Ivan, Vanya and Ivaylo). Without replacing old electrical installation these respondents cannot continue other renovations. For example, Miroslava pointed out that the old installation was not renovated since the building was built and it was not appropriate for modern energy saving electrical appliances. Ivan, lines 109 – 117: *“..when I looked at it more carefully I realized that the house had an old electricity installation with one big fuse for the whole house. There was no way for that to accommodate all the electrical appliances I wanted to have. So I had to throw the old installation away and replace it with a new one, with a new distribution board..”*.

Reshaping and redesigning of the inner space (Apartments: Marieta; houses: Yoanna). They both wanted to reshape the inner space to make it more convenient and functional. For example, Marieta, lines 87 – 90: *“First I wanted to reshape the dwelling. I divided the big room in two separate small rooms – a bedroom and a living room. Then I continued with next renovation”*.

Outside walls insulation (Apartments: Teodor; houses: Bogdan). The renovation was done in order to save energy and to increase the temperature at home. For example, Bogdan: line 29: *“When I bought the house my first work was to insulate the outside walls”*; and Lines 93 – 94: *“I definitely wanted to do this renovation – in order to save energy. And I think I achieved my goal”*.

Renovation of the bathroom (Houses: Marta). The bathroom was unusable and it was necessary to renovate it. Marta, lines 51 – 53: *“The first very important work was the renovation of the bathroom. The bathroom was absolutely unusable and we started with it”*.

Roof insulation (Houses: Radoslav). The renovation was urgent because of the leakage of the roof.

Changing pipes for hot and cold water (Apartments: Antonia). There was a leaking pipe when she moved in the apartment.

Make the house safe – putting fence, bars (Houses: Anton). The respondent explained that it was important for their safety.

3.10 Owner's relationship to comfort and indoor temperature

The respondents have different ideas of comfort — some talk about having the needed electrical appliances (for example Yoanna, Nikolay — both house owners), others talk about functionality of the space (Apartments: Iliyana, Boryana, Marieta), but the common understanding seems to be that there should be enough space for all the members of the household (almost all respondents mention having enough space — for example, Eva puts it clearly and provides a reason, line 319: *“To have a personal space for everyone”*; and line 321: *“We have lived with many people in a small space all my life, so enough space”*).

Another common theme is that all respondents find a connection between temperature and comfort, as Anton and Elena, apartment owners, put it, line 517: *“It must be warm”*. The preferred temperature during the winter varies from 17 – 18°C (Apartments: Teodor, Iliyana; houses: Ivaylo) to 24 – 25°C (Apartments: Lyubina; houses: Marina, Anton). The actual achieved temperature after renovations is almost the same.

For most of the respondents the temperature in the different rooms slightly varies — the place where they sleep is slightly cooler than the rest of the dwelling.

Some of the interviewees have the intention to buy air conditioners for cooling (Houses: Marina, Anton, Ivaylo) and others have already bought air conditioners, and are even considering buying some more, as this form of controlling the temperature allows following the consumption and, hence, controlling the electricity bills (Apartments: Boryana, Tea).

3.11 Environmental knowledge

People in general are familiar with the concepts of “global warming” and “climate change”, as these concepts are discussed a lot in the media. However, the respondents are not united in their attitude towards the link between these environmental issues and the consumption of energy and water.

Most of the informants of our study believe there is a link between climate change and the use of energy. The connection they see is that the greater the consumption of energy, the more damage people incur on nature, which leads to climate change. This change in climate is perceived as negative, as it leads to less resources and resources of poorer quality. Marieta: ***“In your opinion has energy (and water) consumption something to do with environmental issues? The link exists, of course. The higher the energy consumption is, the worse the situation of preserving the environment is. I think all people should save energy, not waste it.”***

Many respondents, when discussing the connection between environmental issues and the consumption of energy, also declare the need to engage in energy saving practices. The interviewed Bulgarians believe that they can individually contribute to using fewer resources, but they think that the more important share of saving should be initiated and done by their government.

Marina: *“There are some small things that everyone can do – save electricity, save water. We should think about our children to preserve nature for them.”*

Zhoro: *“One of the important things is to prevent the waste of energy or water, or other natural resources. Actually during the winter I consume electrical energy probably more than before – because I use air-conditioner.³⁷ But I really try to save energy and water; I really try to not waste resources – at home, at the office, in the car.”*

³⁷ Air conditioning is the cheapest way of heating in Bulgaria.

Bogdan: *“This link is absolutely natural. The less energy and water we use the more we preserve the nature. The quantity of fresh water in the world is limited; even though some people think it is unlimited.”*

Boryana: *“**In your opinion has energy (and water) consumption something to do with environmental issues?** Mmm, definitely, and oil is released in the ocean, every such thing damages, well, not only that which happened lately with this oil next to the States (pause) which was spilt, meaning ships regularly leak oil in the sea, this is part of their procedure... This too contributes to climate change and definitely, we are responsible, there is no one else — cutting forests (pause) without (pause). Meaning, I haven’t seen anyone reforest recently in Bulgaria... This worries me a lot and I believe that apart from every person being responsible, these are some government policies on which this depends.”*

Some respondents, however, believe that we are already slowly moving towards a more eco-friendly manner of generating energy because alternative energy sources are used more and more frequently. This is especially true for people in villages, as these people are also farmers, who depend on nature for their subsistence and who have learned not to deplete nature’s resources.

Ivan: *“I prefer whatever comes from nature... Now, for the rest, what can I tell you, for the power, like the sun, like this, these things should be used. To be used rationally. If you use these rationally, there would be no problem; I think people are beginning to think a bit more rationally; not all as usual. This can not happen, for all to think, but (pause) for me (pause) well, the things that change around us like the ban on plastic bags, the plastic cups becoming paper cups; you get these from nature itself, well, you take this from the sun, this thing. You don’t use some atoms and stuff, to use this energy and this garbage goes to the atmosphere, right, there it degrades because... All things harm, well in this field. So, I think it is early (pause) to say that most people think rationally, but it is there, right, a movement in this direction.”*

On the other hand, a few respondents do not believe that there is a clear link between environmental issues and the consumption of energy and water. In some of the interviews the people talk about naturally occurring cycles of climate change which can not be influenced by human activity, and others differentiate between the use of electricity and the use of coal and wood, saying that the use of the so-called clean energy (i.e. electricity) does not harm nature and therefore does not contribute to climate change, while the use of coal and wood does indeed lead to more pollution.

Eva: *“**What do you think about global warming? What can you tell me about this phenomenon?** Well, as for my personal opinion... I have read different things, different articles, and I think that... all these defenders of nature, all these words that have been written about global warming, I don’t know how much of it is true. We are talking about carbon dioxide, about the harmful compounds... This global warming... This winter was colder than the others. I don’t know if this global warming is a fact... Personally, I am... a sceptic in this regard.”*

Sonya: *“I can not find connection between energy and climate change. The electrical energy is pure energy; it can not pollute nature. Using coal or wood during the winter is much more harmful, but it is cheap and people use coal and wood because it is expensive to use electricity to heat the house.”*

Peter: *“No, no, no, I am not saying that there is no global warming. I am saying that I do not believe in such media writings. I am not saying what exists or doesn’t exist. **And what exactly do you not believe in?** The short answer is that all such forecasts are based on computer models, and (pause), it is rather obvious that such models are very unrealistic.”*

3.12 Environmental knowledge and practices

All interviewed Bulgarians shared their concern for nature and the unwise use of natural resources. Even if they did not care about climate change or global environmental issues, they stated that they were trying to organize their new dwelling in a way that would not only ensure

their comfort, but also contribute to low energy consumption and cause minimal harm to the environment.

Examples of how the respondents' behaviour matches these stated beliefs are numerous. Some of the respondents share their intention to use new alternative sources for energy, i.e. solar installations (Houses: Ivaylo, Nikolay, Marina, Radoslav, Marta). They hope it would decrease the electricity consumption and would help them to reduce their energy bills.

Most of the respondents, when buying new electrical appliances, pay attention to their energy parameters trying to get the most efficient ones (Apartments: Iliyana, Lyubina, Miroslava; houses: Radoslav, Yoanna, Bogdan, Marina).

It is interesting to note that for many respondents (Houses: Nikolay, Anton, Yoanna) the idea of a comfortable home coincides with the concept of having all the needed electrical appliances, but they are energy efficient, thus allowing for a reasonable energy bill. For example, Yoanna, lines 363 – 376: *“Well, to tell you about the electricity, I don't know how much does a household in Sofia have to pay for electricity, but I pay 70 leva, and I don't have a few appliances... in the kitchen, I have (pause) arranged it so I have all comforts of an apartment — laundry machine, dishwashing machine, stove, microwave, coffee machine... I even have an on-demand heater in the kitchen so that I wouldn't lose heat from the bathroom; if I had a pipe from there, that would be a couple of meters where the water would cool down and that would be more water consumed. And I pay 70 leva per month”.*

There are other environmentally friendly actions: the respondents are buying new appliances that use less energy. They are engaging in energy-related renovations, use energysaving bulbs, try to not waste water when washing or cleaning, avoid having the lights on when not needed, etc. Many are also teaching their children and grandchildren to save energy in their everyday lives.

Anton and Elena: *“**What do you teach the young?** They are a different generation now. Yes, a different generation. Economies (laugh). We teach them that it should be lit everywhere. She is even telling me, when we are with them, “Grandpa, should I turn it off? There are two lamps, should I turn one off?” And I tell her, “What do you think?” “Well, I should turn it off.” “If you say so.””*

Eva: *“Yes, my husband researches very thoroughly and buys only appliances... what characteristics they have, how much energy they use, what this or that. And they are all of class A, A+ and so on.”*

Iliyana: *“Yes, this has always been important, but it seems a bit more important since I got this dwelling, I try everything that I use to be, from the washing powder, the cleaning compounds, to (pause) really the electricity, to be as much as possible, well, I try not to waste. Especially, this is especially true for water. I hate to waste water and I, I never use it like that.”*

However, very often informants' behaviour differs from what they have stated. This is especially important for practices regarding the management of energy consumption at home, as the contradictions between knowledge and practices can offer insights into ways of influencing people and promoting a more eco-friendly lifestyle.

The interviews in Bulgaria did not reveal many contradictions, as people were careful when speaking to strangers and the interviewers did not have the opportunity to directly observe the respondents over longer periods of time. Nevertheless a few interesting contradictions have been noted.

The most common contradiction comes from informants' declaration of support for saving energy, yet they spent considerable resources to ensure that their home was warm and comfortable when the weather outside was found as not good. A similar case is the respondent who wants to save energy, yet buys many electrical appliances to make sure his or her home is comfortable. This discrepancy between behaviour and beliefs is linked to a mentality clearly stated by an elderly couple to the effect that people who have enough do not need to save; saving

is done when you can not afford the comfort you desire. Anton and Elena: *“Economies breed misery.”*

Another interesting contradiction, one which appeared only once, is a contradiction in beliefs. One of the respondents, a woman co-owning an apartment with her husband, when talking about specific characteristics of their dwellings, seemed on one hand to be convinced that energy-related renovations do indeed make a difference while stating that heat is trapped to a larger degree in their dwelling.

Eva: *“In my opinion the energy consumption of a dwelling depends on how it is insulated.”*

Eva: *“...it was obvious that it can not have good energy characteristics ... without any insulation and with these wooden windows where your finger could go between the wall and the window.”*

On the other hand, when discussing environmental issues in general and the role of energy and water consumption, she was sceptical about the effect that these renovations have on the environment, probably meaning it in a global sense (ecosystem):

Eva: *“A lot was said about and this is why we did this insulation thing, to trap heat inside the home and not let it on the street. Does this somehow influence the environment? I don't know. I am not competent to say.”*

What can be seen as a contradiction, even if it is not recurrent, is interesting and significant, as it points to a mentality sometimes considered characteristic of Bulgarian. Even if their personal experience has convinced them that a certain practice is good, when this practice is discussed and promoted widely, as is the case with insulating dwellings and replacing old windows, people become suspicious. They expect further motivations and wonder who benefits from the media campaign and in the end tend to reject the practice. There is indeed a different perception of the private and the public spheres of life. Whenever the private sphere is concerned, people have greater control over their actions and they seem to trust their experience, their friends, and family members. On the other hand, when the public sphere is concerned and global issues are discussed, there is a lot of scepticism. Thus this respondent, and probably others, is suspicious of the effect wall insulation has in general, and is convinced of the positive effect when her own dwelling is concerned.

3.13 Other comments on financial aspects

It seems that the respondents in general talk about energy efficient homes and call it common sense in doing renovations. What they mean by this is to have all appliances they are used to having and associating with comfort and still not pay big bills. Almost no one talks about reduced energy consumption (only Iliyana and Boryana do, both owners of houses), and almost no one admits that the lack of money is the reason for this (only Antonia and Anton and Elena make this clear, all owners of apartments). So, as far as motivation goes, there is a much entangled web of financial motives and a desire for efficiency of the home.

Actually Ivan is the only respondent who clearly talks about this aspect of motivation, lines 659 – 664: *“So, the idea is not to save something like (pause) in the past. We, Bulgarians are a bit, a bit not thinking in such cases. For example, there is a crisis, right, and everyone wants to cut his expenses. Well, I always try to increase my income, not to cut expenses. Because these expenses you have accomplished them, you need these things. You want to maintain them (pause)”*.

3.14 Conclusion

3.14.1 Similarities

Attitude towards renovations: It seems that renovations of old dwellings from new owners are often seen as necessary and even mandatory to improve the comfort of the dwelling. In terms of methods for doing the renovations, it seems that the apartment owners prefer to have someone do the work for them, if possible have everything completed quickly and at once. The house owners are more into doing the renovations works themselves, and realize that they can do things one by one and that there will always be something to do about the house.

Attitudes towards financial incentives and loans in general: All respondents are quite skeptical of the financial incentives currently available here. The procedure to get these specialized loans is very burdensome and people prefer not to engage in it. Those of the respondents, who do not have enough money to afford a new dwelling and its renovation, prefer to get a general loan from a bank, a loan that is meant to cover both the purchase of the dwelling and its most urgent renovations.

Attitudes towards the use of energy and water, link to environmental issues: It seems that the respondents as a whole are not very concerned about the environment and into saving water and energy for the sake of preserving our natural resources. Some of the women are motivated by this (Iliyana, Boryana), but as a whole the respondents try to use water and electricity wisely so that their bills are smaller. In their mind the state of the environment can be improved with more far-reaching governmental policies concerning deforestation, waste management from the industry, etc. the contribution of the individual households, they believe, is made more efficient through economic means, such as the high prices of these utilities.

Attitudes towards energy labels: Those respondents who have direct experience with the system are relatively familiar with it and their attitude is rather positive: the audit allows people to know more about their dwellings and how to make them more efficient. Again, there are complaints of the burdened procedures. However, most respondents have not heard of this idea and when the interviewers presented it, they were curious and believed it could be an additional source of information about the dwelling. Most would not fully trust such a label, but would nevertheless consider the information and recommendations.

Others:

- The heating systems: Most inhabitants of houses have an individual heating system (Marina, Vanya and Ivaylo, Sonya, Anton) or will install it (Nikolay). Usually they use coal or wood.
- Many owners of houses have plans to use new energy sources, i.e. solar energy, for example, Nikolay, Vanya and Ivaylo, Ivan, Marina, Marta.

3.14.2 Innovative findings

There are not many recurrent repetitions, hesitations, or contradictions across all interviews. It seems that the respondents were repetitive, or contradicting themselves, but there is no overall pattern to these repetitions, hesitations, or contradictions.

There is a desire for independence of the state or municipality and the utilities provided by the state or municipality that surprised the interviewers. Both Bogdan and Ivan, and to some extent Yoanna are examples in this respect: they enjoy having their own water supply, electricity, etc.

Chapter 4

Home owners and energy-related renovations in the Czech Republic: An analysis of 23 interviews

Michael ten Donkelaar
ENVIROS, the Czech Republic

4.1 Informants and their home

23 in-depth interviews were conducted in the Czech Republic in the time period from June, 2009 to June, 2010 in the framework of IDEAL-EPBD project. Five interviews took place in June and July 2009 (the 1st wave) and the other 18 were done in May and June 2010 (the 2nd wave).

The interviews were carried out all across the country (Figure 1) in order to obtain different opinions from informants on energy related renovations done in the households. For practical and time reasons, interviews were not carried out more than 100 km from Prague.

Figure 1 – location of the interviews in the Czech Republic



Of the 23 interviews that have been carried out in the Czech Republic 8 were carried out in Prague (part in apartments, part in houses). The other interviews were held outside Prague, 10 in rural areas (villages), the other 5 in small towns.

In total, there were 3 apartments and 20 houses (of which 4 detached and the remaining 16 single standing). All interviews were held with the owners or with family of the owners (living in the same dwelling).

The age group division is shown in the table below. Most people are in the age from 30 to 39 years old, 10 in total. 5 are younger and another 8 are almost evenly distributed in the age groups above 40.

Table 1 Age distribution of respondents

Age group	No of respondents
20 – 29 years	5
30 – 39 years	10
40 – 49 years	1
50 – 59 years	3
60 – 69 years	2
> 70 years	2

More specific information about the informants is shown in Table 1 on the next page. The informants are arranged by the age groups.

Table 2 Overview of respondents in the first wave (2009) and second wave of the interviews (2010)

Nickname	Age group	Gender	Type of dwelling	Type of Place	Location	Energy audit	People in the household	Main reconstruction done
Radana (2009)	30-39	F	Detached house	Small town	Milovice	N	3	Remodelling the space
Andrej (2009)	20-29	M + F	House	Rural	Mečeříž	N	3	New house
Kaja (2009)	30-39	M	House	Small town	Milovice	N	5	Frames and windows, insulation
Sara (2009)	30-39	F + M	House	Rural	Spořice	N	4	Frames and windows, heating system
Radek (2009)	30-39	M + F	House	Rural	Louňovice	N	4	Heating system
Katka	30-39	F	Detached house	Rural	Zákolany	N	1	Remodelling the space
Marta	30-39	F	Detached house	Rural	Kováry	N	4	Heating system
Pavel	20-29	M	Apartment	Urban	Praha	N	2	Frames and windows, doors
Adam/Eva	30-39	M + F	Detached house	Rural	Praha	Y	4	Windows, heating system
Jan	40-49	F	Apartment	Urban	Praha	N	4	Roof reconstruction and renovation
Petr	50-59	M	House	Small town	Turnov	N	2	Windows and frames
Slavek	20-29	M	House	Suburban	Praha	N	5	Windows and frames, remodelling the space, attaching buildings
Milada	50-59	F	House	Suburban	Praha	N	4	Windows and frames
Jana	60-69	F	House	Urban	Praha	N	4	Wall insulation, windows and frames
Hana	60-69	F	Apartment	Small town	Turnov	N	2	Heating system, windows
Roman	> 70	M	House	Rural	Louňovice	Y	1	Heating system, windows, floor ins.
Natalie	20-29	F	House	Rural	Hostice	N	4	Frames and windows
Mirka	> 70	F	House	Rural	Zákolany	N	2	Heating system



Matej	20-29	M	House	Urban	Praha	N	1	Frames and windows, remodelling the space
Jitka	30-39	F	House	Suburban	Praha	N	4	Remodelling the space, kitchen, windows, electricity
Kuba	30-39	M	House	Rural	Kováry	N	2	Electricity, bathroom
Tom	30-39	M	House	Small town	Mlázovice	N	2	Remodelling the space, windows
Jarek	50-59	M	House	Rural	Lázně Bělohrad	N	2	Remodelling the space, windows

Ways of contacting people

The respondents were contacted through different channels. As there was no single channel available through which people could be contacted and having a representative sample of the population, respondents were selected in three ways:

- Clients / partners of ENVIROS (e.g. two mayors of small towns were asked to assist with contacting possible respondents)
- People coming for advice regarding the Green Light for Savings Programme (grant programme for housing renovation) were asked for an interview
- Colleagues from ENVIROS were asked to provide some contacts, here about half of the respondents were taken, friends, acquaintances of colleagues.

4.2 In-depth analysis

Recurrent repetitions in several interviews and interpretations

- Renovations are often done because they are “needed” in the view of the respondents. E.g. windows / roof is in bad shape so it has to be done
- As mentioned earlier, a number of houses (five) had to be reconstructed, as they were in bad shape at the moment the respondent acquired the house.
- Reason for not doing renovations were often “not necessary”, no money available

Recurrent hesitations in several interviews and interpretations

- Some respondents were hesitant when talking about some renovations, e.g. they did not do it, but felt during the interview that they should have done it, or did not have a clear answer why not doing it. E.g. here some people start with : Eh.. well “or there are pauses in the answers.
- Some people had problems in expressing their own feelings, answers on questions related to how they felt in their new house were often answered very shortly or with hesitation.
- The climate change issue, some people did not know how to answer, they were thinking out loud.

Recurrent contradictions in several interviews and interpretations

- People saying that they were interested in saving energy, but not doing any energy related renovations. When talking about energy savings, they were relating it more to behavioural issues (turning the lights of and saving water)
- Then people doing renovations often mentioned that they had other reasons for doing this renovation than energy savings (although mentioning the importance in general). Energy savings and renovations are often considered two separate issues in the household.
- People interested in energy/environmental issues but not considering the climate change issue as a real problem.

4.3 Levers to conduct energy-related renovation work

- Renovation needed

This is by far the most mentioned reason for doing reconstructions. A lot of reconstructions doing for this reason were very basic things like (re)constructing the kitchen, the bathroom, doing repairs on electricity and heating system. Replacement of windows, for new ones were also often done because they were just needed.

- Part of general renovation

Energy related renovations like windows and insulation were often part of a general reconstruction of the house and were done because reconstruction was taking place, e.g. the owner wanted to do it well the first time (and not to have to do additional reconstructions later on).

- Part of construction

People who recently constructed their house (e.g. mainly from the 1st wave of interviews mentioned that they considered a lot of things also related to having the house as energy efficient as possible, plus that construction (or reconstruction) is the ideal situation to do energy renovated work.

An interesting quote from Sara, saying that “Because windows are part of the house, you cannot just easily replace them, so we wanted them to be of high quality. The windows were important for us.”

- Making the house more comfortable to live in

Mainly people who reconstructed an old house felt the need that they had to insulate or replace the windows mainly because of comfort (but logically also saving energy). E.g. a quote by Marta: “the priorities had been not to ... so that we ... just not to freeze in the house. So that it would be possible to live there, to make conditions of living easier than before the reconstruction when there had been only a coil and wood stove”.

- Wish to extend the house

In some cases, the original house was extended and there the respondent thought about energy related components as well (e.g. Slavek).

- Energy savings

Energy savings were mentioned quite often as a reason to do some things, e.g. insulation or replacement of windows. Here interest in energy and environmental issues, but mainly saving money played a role. One example is the house of Adam/Eva, mentioning that they had constructed a wooden house because: “Well, so that ... well that the costs for living would be as low as possible, you know. Even if the cost of construction was higher, the costs after that should be lower”

Slavek also mentioned energy savings as most important for doing renovations: “Because of energy savings, the windows also because of draft, but mainly energy savings”

- Possibility to get subsidy (something they always wanted to do, but had no money for it).

Therefore the subsidy played a role. Also because the subsidy programme had certain requirements that had to be fulfilled. E.g. in the house of Roman, three things were done, because for grant applications three measures had to be taken. “Yes, a large renovation took place last year, in the framework of the green light for savings programme, when we replaced all windows, insulated the floor, that was not well insulated and we installed a heat pump” (lines 67-69)”. At the same time, there were people announcing that they considered to apply for a subsidy.

- Other external factors - Especially in villages issues like the available infrastructure played a role when e.g. choosing or replacing the heating system.

A good example was Mirka, living in a village where there was originally no gas network. When the village received gas supply, they decided to heat the house with a gas boiler.

4.4 Brakes to conduct energy-related renovation work

- Renovation not needed

Respondents often decide whether a reconstruction is needed based on the technical state. A usual argument is that people still feel that the technical state of the given components is sufficient. E.g. Mirka mentioned: “No, no, that is not necessary, those wooden windows are quite good, I like old things”.

- No money for renovation

This has also been mentioned quite often. A number of people carried out the necessary renovations, but no money was left for any additional renovation work. E.g. Hana mentioned: “I have had plenty of ideas but no money, I have big loan so I can not afford any other investments right now”

- Complex subsidy scheme / subsidy scheme not attractive

A lot of people knew about the national subsidy scheme, but complaint that it was too complex. At the same time there were also people saying that they had informed themselves about the subsidy scheme, but that it was not attractive to them: you had to do too much renovations at once, and that made it expensive again.

- No interest (see no reason for doing so)

This has not been mentioned explicitly in the interviews, but sometimes it seemed that some respondents had less interest in carrying out energy related renovations. They saw no reason to do so. A typical answer is from Matej: “The insulation of the floor was not made because I presumed that the floor was already insulated”

- Limited knowledge of energy savings

Also here, this has not been directly mentioned by any of the respondents, but it often happened that people knew that they should save energy or water, but that it was not noticeable on the way they decided about energy related renovations. Most renovations were related to the necessity to replace certain components of the house.

4.5 Impact of Energy label of the house (or audit)

The impact of the energy label has been very limited among the inhabitants. There are two major reasons for this, first, the label has been fully introduced from January 2009 onwards, but only for new houses and reconstructed houses. As a result, only 2 of the respondents had an energy label, one (Roman) because he had his house reconstructed in the framework of an energy incentive programme and an audit was required for the application, the others (Adam/Eva) because they had a new house built recently.

4.6 Roles of the actors (professionals, relatives, acquaintances)

For each type of actors, explain the role they played in doing or not doing energy-related renovation works.

Actors generally involved are the following:

- Technical professionals doing reconstruction work or advising with reconstruction work. Often technical professionals were asked to do complete reconstructions, and the respondents relied on their judgement in doing the work. Here a difference can be made in:
 - Architects, assisting in/doing the design of the house
 - Construction professionals / craftsmen, doing the (re)construction work – here the respondents were often critical. Some craftsmen did their work well and the people were satisfied, others were not and could recall the things that went wrong.
 - Other technical professionals people know, and have asked them for advice
- Family, advise but also wishes as how the house should look like.
- Acquaintances / neighbours who carried out similar reconstructions / constructions and were taken as an example (or provided good references for construction firms)
- A lot of people also mentioned that they find a lot of information on the internet. Here it is difficult to say in what way this helps them, but most likely the internet gives people the first set of information.
- Some respondents also mentioned that they received contradictory advice. One concrete example is from Kaja (1st wave), mentioning that he wanted to insulate his house with 16 cm of polystyrene (advised by his brother who is working in Austria), but a lot of construction experts in the Czech Republic felt that this was exaggerated.
- Not all respondents were satisfied with the work of craftsmen / construction companies. E.g. Radek (1st wave) mentioned that they replaced the construction firm for their house by another one “Because they made mistakes and were also quite expensive. ... and big mistakes. When they laid the foundations and we measured it, we realised that part was missing, so that had to be redone. There were simply a lot of problems so we rather took another firm”.

4.7 Roles of incentives or renovation programmes, and policy in general

Many respondents answered that they knew about an incentive programme, some considered applying for a grant, or already did it, others did not. The most often mentioned (or practically only mentioned) programme was the so-called Green Light for Savings programme that was introduced in the Czech Republic in spring 2009. During late 2009 and early 2010 a large information campaign was started in the Czech Republic, so that at the time of the second wave of interviews, a large number of respondents knew about this programme and had considered its using. At the time of the first wave of interviews, respondents did not know the programme yet.

There was, however, also some criticism regarding the programme, some respondents felt that the application process was far too complex. Others complained that you had to combine too much measures at once.

Another type of support often mentioned was the current support for renewable electricity production (and mainly photovoltaic power production). Some people had negative feelings about that, others felt that it was a good idea and even considered putting photovoltaic cells on their roof (although no one had done this), mainly for the reason that you could get a subsidy for that (and that it could be financially attractive).

Some other people also mentioned subsidies, e.g. Kaja mentioned that he had received a low-interest loan for insulation some years ago (but forgot about the name of the programme). In the past (1990s) there was support for electric heating systems, that some people made use of, e.g. Marta told that she has installed electric heaters in their house because: "... at that time they were made attractive, eh, electric heaters, so this meant that we actually did that, because at that time there was no gas network in the village".

4.8 First and main renovations done (even if not energy-related) and reasons

Main renovations done in the house were the following:

- Replacement of windows

This was among the most mentioned renovations done. People generally feel that this is part of a general renovation as it is done a lot in the Czech Republic now. There are a lot of different windows on the market, basically split into those with a plastic frame, and those with a wooden frame. Some respondents had made a clear choice for either plastic frames (cheaper, practically no maintenance needed) and wooden frames (aesthetic reasons, plastic windows are "ugly").

Some respondents, like Radek, mentioned that they only took plastic frames because of the price: "Plastic frames we took mainly because of the price, because we have a lot of windows here and we could not afford wooden ones anymore. If we would have had the means, I think we would have used wooden ones".

- Remodelling the space

This was often done when respondents bought an old house as there was space needed for extending the kitchen or bathroom. Often there were no rooms in the attic and that had to be done by the respondents. E.g. Jitka mentioned: "Well the most important, the first was the ground floor, so that we could move in, because we moved in and at the same time we

reconstructed the roof and all. The façade as well, but that was not necessary to be able to live here, so the kitchen, living room and one other room downstairs”.

- Roof reconstruction and renovation (often, but not always including insulation)

Some older houses had a bad roof and had to be reconstructed. This was often (but not always) combined with insulation.

- Renovation and Insulation of the façade

Also here renovation of the façade was often necessary because of the appearance of the house. Also here this measure was often (but not always) combined with insulation measures.

- Replacement of the heating boiler

Here were basically two reasons to do so, 1. replacement of the boiler because the old one had to be replaced 2. a possibility to heat in a different way. Here is the example (Mirka) of the village, where a natural gas grid was laid.

- Replacement of the heating system

Sometimes this is a complete replacement of boiler and pipes/radiators, sometimes only radiators. Then one respondent (Roman) installed a heat pump in his house.

- Renovation and insulation of the floor

This is something that only appeared in older houses, as in newer house this was already done.

- Redoing the electricity system

Also this type of renovation is often related to older houses, where the electricity system was not fit for modern households (with lots of electric appliances).

- Installing a (new) kitchen and bathroom

Although often mentioned in older house as one of the first priorities, some people in new/reconstructed house also had their reasons for doing this renovation. A typical case of a respondent living in an older house in Kuba: “Well, I just did everything at once ... well, the most important was the bathroom, plus the kitchen, plus the heating system. The basic things so that one can live decently here”.

4.9 Owner’s relationship to comfort and indoor temperature

Most people mentioned that currently they feel comfortable with the indoor temperature in the house. Most people were able to recall the temperature they had in their house. Some also say that they have a lower temperature in the bedroom, that they feel comfortable with that.

The temperatures most often mentioned are within the range of 21-24 degrees for the living room (sometimes the house in general).

When asking about temperature differences, a large number of respondents were able to mention the temperature in the bedroom, which is often lower, e.g. the temperatures mentioned are within the range of 16-20 degrees.

Apart from that, some respondents mentioned that for some visitors it is cold in their house, but that they are used to it.

Some respondents also mentioned other things than only temperature, generally feeling comfortable in their house.

4.10 Other energy related practices and opinions

When asking respondents about energy savings and their interest in energy savings, they usually mentioned two things:

- Respondents mentioning that they have installed CFLs (Compact Fluorescent Lamps) in their house to save energy.
- Also energy efficient appliances were often mentioned (e.g. A-class appliances)

Respondents also often mention that they try to save water and separate waste. This came across when asking about the environment.

4.11 Other comments

A lot of respondents had their houses constructed, some recently, others 10-20 years ago, this is something that is very often done in the Czech Republic. Up to 15-20 years ago there were hardly any houses sold, so people had their own house built or inherited them from their parents.

Nowadays a lot of people are buying houses that are on the market, but constructing your own house is still something that a lot of people wish to do.

Here are the people who constructed a house (by themselves) or reconstructed it very thoroughly:

- Jarek – built a house in 1996/1997.
- Tom – completely reconstructed an old house (2000-2006).
- Kuba – reconstruction of a house that was almost not inhabitable since 1998.
- Katka – thorough reconstruction since 2005.
- Adam/Eva – new house built in 2008.
- Jana – new house built in 2000.
- Roman – new house built in 1989 – recently reconstructed.
- Jitka – house built in 2000 and thoroughly reconstructed.
- Andrej (2009) – house built in 2008.
- Kaja (2009) – complete reconstruction of old house since 2005.
- Sara (2009) – house built in 2004.

- Radek (2009) – house built in 2004.

4.12 Conclusions

- A lot of people did large renovations, which were very much related to general renovation of the house
- Energy related renovations were also done. Among the most often mentioned energy related issues were replacement of windows and insulation of the façade and the roof.
- The need of doing a general renovation of the house is often combined with energy saving measures. A lot of respondents new that replacing windows and insulating the house would help in reducing energy consumption.
- Some respondents mentioned that they had no money to do everything at once, so measures were done step by step.
- A certain group of people declared they were interested in energy savings, but related this mostly to saving energy in the home through behaviour, e.g. turning of the lights, buying more efficient appliances
- There was often a contradiction in peoples approach towards energy savings and the environment and climate change. Some people were sceptical in this, but declared to be concerned about the environment.
- People doing larger renovations had relatively good knowledge about the technical possibilities. Some of them even good knowledge about energy saving renovations.
- The role of actors seems to be important in making concrete decisions of what type of material to use (when doing reconstructions), but most respondents seemed to decide themselves what renovations to do and what not.

Chapter 5

Homeowners and energy-related renovations in Latvia

An analysis of 24 interviews

Līga Ozoliņa and Evita Garā

EKODOMA, Latvia

5. Homeowners and energy-related renovations in Latvia: An analysis of 24 interviews

5.1 Informants and their home

24 in-depth interviews were conducted in Latvia in the time period from July, 2009 to July, 2010 in the framework of IDEAL-EPBD project. The interviews were carried out all across the country (Figure 1) in order to obtain different opinions from informants on energy related renovations done in the households.

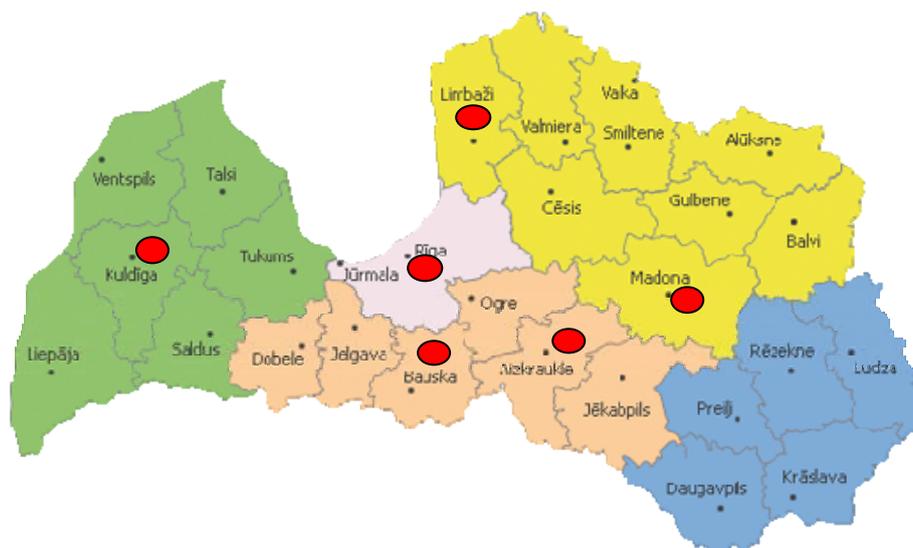


Figure 1 Interviews distribution by the places

The majority of the informant homes were located in urban areas, with 38% of them living in the capital city and 41% in other cities (Figure 2). The majority of the interviews were carried out with people living in multi-apartment buildings; one-fourth of them were conducted with the owners of private houses (Figure 3). The chosen proportion of multi-apartment buildings vs. private dwellings was based on the situation in the household sector in Latvia, where 23 % inhabitants live in private houses and 77 % in multi-apartment buildings

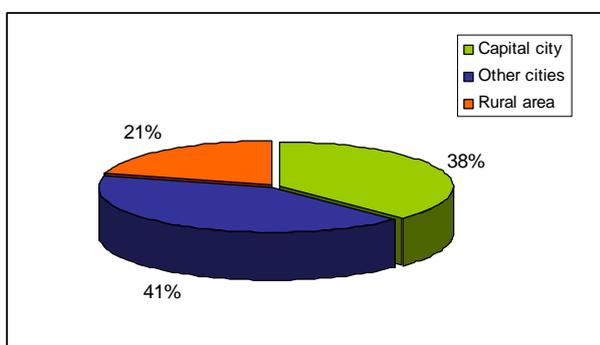


Figure 2 Occupancy by the type of place

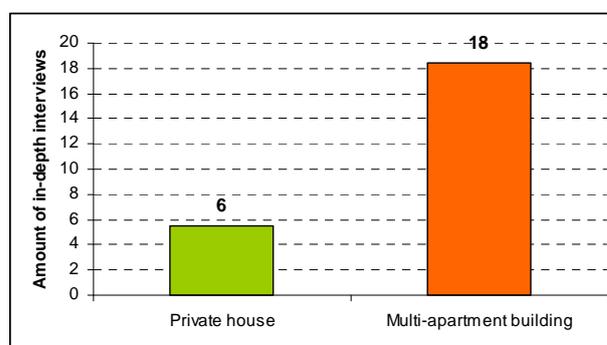


Figure 3 Occupancy by the type of households

The informants' distribution by the type of the households is mainly based on the historical aspects of the state development. For instance, people (in age category of 40-49, 50-59, and 60-75) who live in multi-apartment dwellings received their apartments during the Soviet Union occupation as a state merit award. They have been living in the apartments for life-time and are not able or are not interested to move elsewhere. The other informants who live in multi-apartment dwellings (in age categories of 30-39 and 20-29) have moved into the apartments recently because they have started a family life and had a necessity to find a living place. The informants from stand-alone house dwellings have bought the private houses or got the property as legacy after regaining the independence of Latvia. They have been living there or consider living there for the life time.

More than half of the interviews were conducted in the dwellings where energy audits have been made (Figure 4) and the results of them were introduced to the informants.

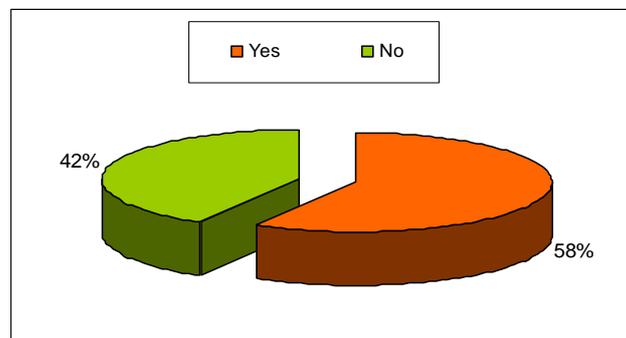


Figure 4 Energy audits performed in buildings

13 females, 8 males, and 3 couples gave the interviews. The age distribution of the informants is shown in Figure 5. The main age categories are 60-75 years and 20-29 years. Households of 2 persons are the most frequent among the interviewees (Figure 6).

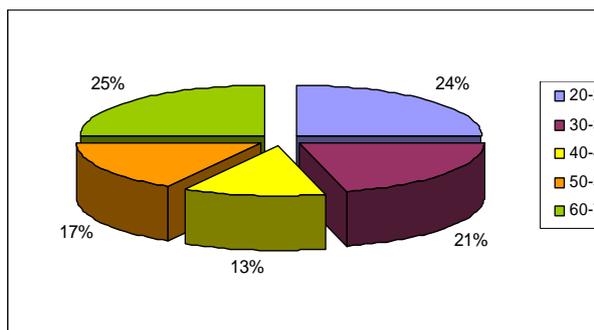


Figure 5 Age distribution of the informants

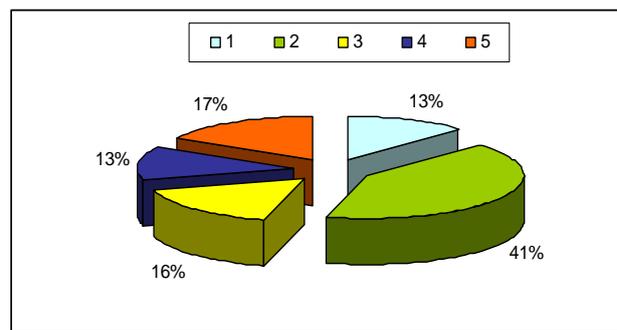


Figure 6 Number of people per household

The inhabitants of Latvia were difficult to contact using the invitation letters. As the result, the informants were selected through intermediary persons. During the in-depth interviews the informants were open and felt free to talk. Their answers were short and specific; thus, many additional questions were asked. The most important topics in the interviews from the informants point of view were renovation works (done, wished, liked, not done) and look of the building.

It was found that there are differences between informants from multi-apartment and house dwellings. The informants from multi-apartment dwellings consider as their own property the apartment only, but not the whole building. Consequently, more renovation works had been done in the apartments. It is complicated to implement the renovation works for the whole building mainly due to the community factor. The informants from the private houses consider the property as their own and the renovation works as the long term investments for better future.

The differences between the views of dwellers on levers and brakes to conduct energy related renovation works were also found in the interviews. For example the lever feeling cold and costs for energy were recognized only for inhabitants of the multi apartment buildings. At the same time there were no specific levers or brakes for the private house dwellers.

More specific information about the informants is shown in Table below. The informants are arranged by the age groups.

<i>Nickname</i>	<i>Age group</i>	<i>Gender</i>	<i>Type of dwelling</i>	<i>Energy audit</i>	<i>Spouse</i>	<i>People in the household</i>
Janina	60-75	Female	multi-apartment	Yes	No	2
Vija	60-75	Female	multi-apartment	Yes	No	1
Zigrīda	60-75	Female	multi-apartment	Yes	Yes	2
Ilze	60-75	Female	multi-apartment	Yes	Yes	3
Neo	60-75	Male	multi-apartment	Yes	No	1
Kriss	60-75	Male	private house	No	Yes	5
Rasma	50-59	Female	multi-apartment	Yes	Yes	2
Anna	50-59	Female	multi-apartment	Yes	Yes	2
Ojars	50-59	Male	private house	No	Yes	5
Billijs	50-59	Male	private house	No	Yes	5
Gunita	40-49	Female	multi-apartment	Yes	No	2
Vjaceslavs	40-49	Male	multi-apartment	Yes	No	2
Santa	40-49	Female	multi-apartment	Yes	Yes	4
Diana	30-39	Female	multi-apartment	No	No	3
Arlita/Ervinš	30-39	Female/Male	private house	No	Yes	3
Anna_2	30-39	Female	multi-apartment	No	No	1
Andrejs	30-39	Male	multi-apartment	Yes	Yes	4
Andris	30-39	Male	private house	No	Yes	4
Inna	20-29	Female	multi-apartment	No	Yes	2
Inga	20-29	Female	private house	No	Yes	5
Evija/Rudolfs	20-29	Female/Male	multi-apartment	Yes	Yes	2
Reinis/Loreta	20-29	Male/Female	multi-apartment	Yes	Yes	3
Janis	20-29	Male	multi-apartment	No	Yes	2
Lasma	20-29	Female	multi-apartment	Yes	Yes	2

5.2 In-depth analysis

The repetitions, hesitations and contradictions differ among the informants. There were very few similarities found in the conducted interviews.

5.2.1 Repetitions

The all repetitions can be divided in two groups with four subgroups for each group:

1. The expressions were used

- To emphasize own opinion: “I think” was used to give more importance to their own opinion. Many times “I think” was used to show that this is only the informant’s opinion, not the opinion of the whole family or of other persons.
- To show lack of information or disinterest on a topic: the expression “I do not know” mainly was used to show that they have no information and also when the informants were not interested in the topic or they had not thought about it. This expression was also used when the informants were not confident on the answers they gave.
- To give better explanation: “let's say”, “for example”. The informants were using the expressions when they wanted to give a better explanation and better view of the information they gave. Also, they were using the expressions when they thought that the interviewer has not understood them. It was important for them that the interviewer understood the situation.
- To put the attention on something: “of course”, “really”. The informants used the expression to point out or to give a sign to the interviewer that this is something important for them. Also, they were using it when they wanted to insist that they had the right opinion.
- Other: Lot of other expressions was used like: “yet” – it was used to show that the works had not been done, but they were planning to realize them in the future. That was like a temporary variant. “In reality” – was used to point out that the provided information was considerable. The repetition of the sentences – to approve the given information.

2. The repetition of ideas:

- Importance of construction workers³⁸/professionals³⁹. In several interviews the informants repeated ideas related to the construction workers/professionals who made the renovation works, about an importance of having them. The works made by the construction workers were also mentioned, as well as the kind of advices inhabitants had gotten from construction workers on the renovation works. Also, informants insisted on importance of having previous positive experience in cooperation with the construction workers or references for them.
- Energy related renovation works and practices. The informants repeated ideas related to renovation works and practices, like importance of installation of the wall insulation, renovation works, or practices of energy savings.
- Feeling or not feeling cold at home. Some informants repeated during the interview that they felt cold in the apartment or, on the opposite, that they were happy that they did not feel cold as others did. For many of the informants those factors were as the “judge factor” on the conditions of the building.
- Importance of Building Management Company (BMC). The necessity of BMC being active and the need of its willingness to convince people to make the building renovation works

³⁸ The person who carries out the renovation works in the dwellings of the informants.

³⁹ The person who has knowledge on a specific field and represents an individual company (heat insulation supplier, window manufacturer, etc.).

were emphasized on. The role of the BMC was identified as one of the main point for the success of the renovation works in multi-apartments buildings.

- Other: Some repetitions of ideas were related to the choice of home, the living space, the area around the building.

5.2.2 Hesitations

The reasons for hesitation in the interviews can be divided into the three following groups, listed according to their frequency of appearance in the interviews:

1. Over thinking and a wish to give a better explanation. The majority of the informants were hesitating when they were thinking over a question asked and were trying to find the best answers or to give detailed explanations.
2. Personal feelings. The hesitation moments also occurred when the questions were more related to the personal feelings, like comfort or climate. It was happening when people had to give their own opinion and to explain how they were feeling, to talk about their thoughts, etc.
3. Other. The other hesitations were linked to different moments like request for a break or interruption by another person.

5.2.3 Contradictions

The contradictions can be divided into the four following groups, arranged by their frequency of appearance in the interviews:

1. Climate. The most frequent contradiction was related to climate changes and energy savings. The first contradiction was when the informants were saying that they cared about the environment, but at the same time they had not had any energy saving practices implemented. The second type of contradiction was that informants were saying that they understood the link between energy and climate, but could not explain, meaning that the informants did not have clear view on it.
2. Energy. The informants were telling that they were implementing energy related practices and that they cared about energy, but at the same time they were not. In the opposite, some were saying that they were not doing, but in reality they were doing a lot.
3. Renovations. Some of the informants, mainly men, were saying that they were well informed on how to do the renovation works, but in reality (taking into account the answers to the questions in the interview) they were not.
4. Others. Some informants were mixing the meaning of energy audit and thermography, were saying that the temperature is the same in the apartment, but later were saying that it differed a lot.

5.3 Levers to conduct energy-related renovation works

The levers to conduct energy related renovation works are divided by the households and listed according to their frequency of appearance in the interviews. There is also a summary of the results obtained for each household.

5.3.1 Informants from apartment buildings

Feeling cold

The main motivation for the informants to do the renovation works is feeling cold in the apartment. This reason was recognized only for the informants of apartment buildings living on the ground or upper floor and/or at the end walls of the building. Also, the bad condition of the windows was linked to the feeling cold in the apartment and this was the main reason for changing. Together these reason identified 9 informants (Rasma, Gunita, Santa, Andrejs, Anna, Vjaceslavs, Ilze, Zigrida, Vija).

We changed the window in the kitchen because it was very cold, very cold. A smaller window was installed in the window and there was lot of chinks and it was very-very cold. And now when they put the new window, now it is better, but we would not change the other windows, because we do not have money and they also are good. (Zigrida)

As far as I see and hear these last two years, maybe three years they put the heat insulation. All the time I had a bed, the bed-foot [attached] to this wall (shows to which wall) my feet always suffered from cold there, I slept with wool stocks on my feet during that time. It was almost three years ago when the wall was insulated. Than I felt that my feet do not suffer from cold anymore (Anna).

There were only two men among the nine informants (Figure 7). The reason feeling cold in the apartment was not related to these informants (Andrejs and Vjaceslavs), but more to members of their families.

“I am saying I did not live here than. My ex wife’s mother lived here at that time. Probably, it was cold here, you know, [how] the outside walls [are], and there is also an outside wall. Probably it was more expensive [then], but now we pay the same as in other buildings that have no heat insulation on the walls. So they agreed and did the works and it became much warmer” (Vjaceslavs).

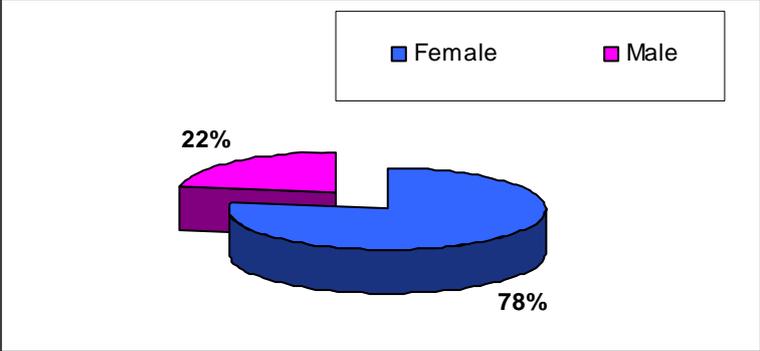


Figure 7 Informants by gender

Consequently, we can conclude that this reason determines whether it is necessity to implement building renovation measures for women mainly.

While making an analysis of informants by the age categories, it turned out that most of these informants were older people (Figure 8).

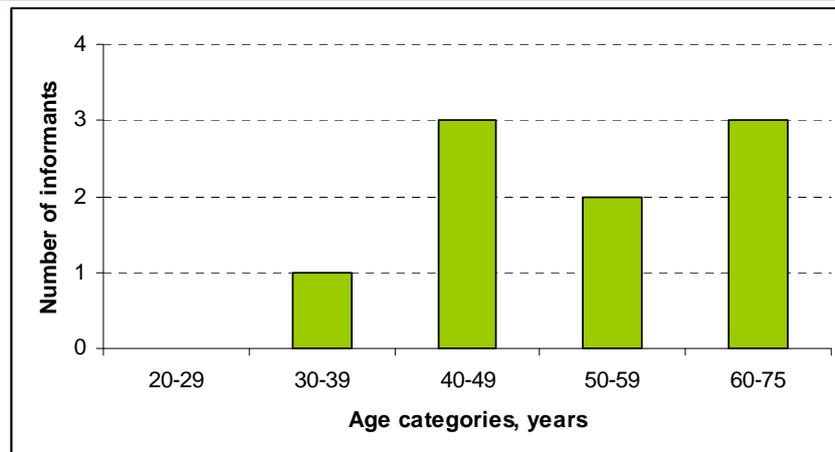


Figure 8 Informant breakdown by age categories

This is explained by the fact that older people are not as active as young people and their health is often deteriorated (impaired blood-wheels). Consequently, there is a need for warmer living conditions.

Costs of energy

Although this should be the main reason for building renovation, only 6 informants (Rasma, Neo, Inna, Anna_2, Santa, Evija/Rudolfs) identified it during the interviews. In addition, they were informers living in apartment buildings only. There are two reasons why the cost of energy influences building and apartment renovation. In the first place the current costs of heating are too high. Secondly, there is a desire to reduce costs for energy (heat, electricity). Both causes can strengthen each other, but usually the main reason is the high costs for heating. Reduction of heating costs was mainly possible with the help of thermostat installation on the radiators, which was also a very important issue for informants.

***Do you change temperature during the nights?** Mhmm...well if I am sitting and doing nothing then sometimes I would like [temperature] to be warmer, but when it becomes colder, we have the opportunity to turn on the temperature (laugh). So I can not say. This is my choice. If I sustain the temperature as is and I am paying less or I turn on the temperature and perhaps I am paying more (Rasma).*

Also, this reason was more often mentioned by women than men. Perhaps, women are those who pay utility bills for the apartment, therefore are more aware of energy costs.

Support and advices

Six informants (Gunita, Neo, Santa, Andrejs, Lasma, Reinis/Loreta) from apartment buildings recognized the reason as important. Family members and Building Management Company were mentioned as the main supporters, but the advices were given by the relatives and friends. Also, construction workers and professionals had an important role and mainly gave advices on how to carry out renovation works better. More explanations are given in chapter 6 - Roles of the actors (page 20).

***And was there any help from those who were giving information, maybe on choice of materials or on the works that have been done?** Ē, about windows, one year I had some works to do at Home 2006 exhibition. Before we moved in, I was doing some works in one company that was making windows and doors from wood materials, they were also selling them and*

*they had workers who were replacing them. I went to them to ask for an advice on what would be the best variant for me, also I receive small price cut (**Lasma**).*

Bad condition of the building

One of the main motivations to make the renovation works is the bad condition of the building. Five informants (Santa, Andrejs, Reinis/Loreta, Vjaceslavs, Zigrida) from apartment buildings recognized the reason as important. Three informants noted both that they felt cold in their dwellings, as well as buildings was in bad condition. The renovation works in this case are mainly related to the look of the apartment or building, in order to feel comfortable in it, less to energy savings.

*In reality why did we repair the whole kitchen? It was with mustiness the whole corner was covered with mustiness, because we had various vertical gaps in the walls of the building and when the weather was wet the water came into the apartment through the gaps (**Santa**).*

***Have you insulated the walls?** I have insulated in the bathroom. **And [what was] the reason?** Well, because it was cold and something there was musty and it was not nice and I thought we should insulate it. But it was my idea. And the bathroom was very cold. When I started the renovation works, we found out that ice develops on the floor and in general it was totally bad. I insulated the floor with the hard insulation material (**Andrejs**).*

*These windows. The building is very old. The windows could not open anymore all was rotten, we were afraid to open them. We could open some how, but then there was not possible to close them again (**Vjaceslavs**).*

Community factor

This factor is very important in the case of apartment buildings. In fact, in order to initiate renovation works on the whole building, a quorum of 51% of the residents must be achieved. When the quorum is reached it has a positive influence on all the tenants to make the renovation. When such a quorum is achieved, the residents generally agree on the renovation to be made, or they collect money together to make building renovation works. The reason was important for 5 informants (Santa, Janis, Vjaceslavs, Ilze, Janina).

*And then anything else, I lied. There the central [BMC] did something. They repaired central heating in the basement. We collected the money from the flats, some how, (silence) than they repaired the central heating, they put new in the basement, but only in the basement not to the flats, no. (**Janina**).*

Previous experience

For 5 informants (Neo, Inna, Santa, Evija/Rudolfs, Lasma) the previous experience has an important role in carrying out renovation work. In addition, the experience must be positive. Previous experience is less important to decide whether to do the renovation works or not to. Experience may include references, advices from friends and relatives. Previous experience is relevant to describe that practical knowledge of the renovation works has a central role.

***How did you find the company which would change the windows?** A, in "Lici" they started to change the windows of the big house at that moment. Yes, they started with the first floor windows and more and more and more to promote the comfort at that moment I asked if the employee can buy the windows from that company with discounts and it was easy (**Santa**).*

Low money resources required

One of the levers to make the renovation works are the low costs for the renovation works of the apartments or/and buildings, which includes costs for materials and labour. Also, discounts

and the possibility to make the renovation by its own without extra money spent on workers is consistent for this reason. The lower money resources required for renovation works recognized 3 informants (Andrejs, Lasma, Santa).

Why did you do the renovation works of the building? Was it in bad conditions, bad visual look, or the energy consumption? Not the visual look, no. I agreed for it because it did not cost a lot. Because we had to do it anyway. And we would have the [better] visual effect for several years. Well, it is very pleasing to live in such a house. As the plus before the walls were fissured and the gaps were painted with black color, so it used to look terrible (Andrejs).

Information and knowledge on energy – related renovation works

It is also important to have the information and the knowledge on renovation works as well as the willingness to get involved into these issues. The informants who were interested themselves in the renovation works and in energy related practices had also the knowledge and had made the renovation works. The same is correct about energy saving practices at home. Two informants (Diana, Evija/Rudolfs) during the interviews found that they were making efforts to implement various energy efficiency measures in the dwellings on the basis of the acquired knowledge about energy savings.

E: I do not know if we are the most economical [people], but at least we are trying to think about it, I think it is good itself. **And what are the practices? R:** To switch off the light when [we are] going out of the room. **E:** To save as much water as possible when I am washing the dishes. **R:** We have to drain the water than it is so. **E:** Well, yes the hot water we have to drain it and it is so, but we are using the oven as much as possible at one cooking time. Trying to plan something if I am cooking [on] what I am cooking. Something like this (**Evija/Rudolfs**).

Other: Following other levers were identified:

- Does not intend to live long in the apartment (Diana);
- Childbirth and confidence in the construction workers (Reinis/Loreta);
- **[Was there] some kind of a plan, how did you organize this all? Day and Night. (Both looking to each other and laughing) that was very fast, because, well Renars [the son] was the reason that all works had to been done very quickly. Renars has to be born about October, 20th, and we were willing that he would start to live in new home. And then really these construction workers were working till 11 in the evening, but I (Reinis) after work from 6 p.m. to midnight was driving to shops buying everything what was need. Well yes, I get how it is... Well, how we planed (Loreta) first we planed how to get everything out of here after this all works were going accordingly, first one room, than second and so on, in parallel we thought about things that have long life like tiles (Reinis/Loreta).**
- Desire to change his apartment (Janis);
- The apartment is too hot, noisy and unsafe (Lasma);

5.3.2 Informants from private houses

Support and advices

The main motivation for the informants from private houses to make the renovation works is the support and advices from various parties. In this case, support is essential during the renovation process, rather than deciding to make the renovation or not. The main supporters are the family members, but the advisers are relatives, friends, construction workers /professionals. The main

impact on carrying out the renovations works gave the advices from construction workers and professionals. More explanations are given in chapter 6 - Roles of the actors (page 20). The reason was important for 5 informants (Ojars, Inga, Arlita/Ervins, Billijs, Andris).

***Who made the renovation works?**the works on heating system did the professional constructors, who were the husband's relatives. **Did you trust the constructors' opinion?** We have not spoken with them on building construction materials. But regarding heating system on the whole heating system implementation, yes, [we did] of course. (Inga)*

Bad conditions of the building

This can be considered as the main reason for making renovation works of the building. The informers have purchased the building in bad condition deliberately, because the price was significantly lower than those for new dwellings. In addition, informants were aware that the renovation works of the buildings was needed. The reason was important for 4 informants (Inga, Billijs, Kriss, Andris).

***How did you decide to make these works?** It was necessary, because [it is cold] in the winter as the building is made of wood with plaster and it was in rather bad condition. The pervious dwellers had leaded the house to those conditions. Of course the ovens still gave enough heat we could heat the house very warm, but the heat did not stay long in the building and regarding to heat we had made the decision long time ago that when we had an opportunity and the money than we would install the new heating system for the whole building (Inga).*

Low money resources required

For two informants (Billijs, Kriss) the low money resources required was important reason for renovations making. The reason applies to costs of materials and labour.

***And the choice of materials?** Well, the choice of materials is the most widely offered isover wool - hydro film, isover wool, and foam (mhm). **And what thickness of insulation did you choose?** 10 cm wool and 4 cm foam polystyrene (mhm). **Why exactly 10 and 4 cm?** (Thinking) Well, after consulting with the various builders and [according to] our weather and the price, I found the average (Billijs).*

Information and knowledge

Also, the information and knowledge on renovation works were as a lever for making energy – related renovation works in the buildings. Informants themselves sought the information to better carry out the energy-related renovation works. Information was sought on the internet and in the books and magazines. The reason was important for two informants (Arlita/Ervins, Andris).

In general yes, although many people told that this must be done. In general the main fact was that the theory [read] from the book convinced us. But it was important that you have read it yourself. This must be done in such a way, because there was written how technically this must be done and why. So the questions did not appear (Arlita/Ervins).

***And, let say, where exactly did you find information about this boiler?** Well yes, nowadays, were I am looking first it's Google (both laughing) opening Google and put in finder "boilers", and then were looking through, but there is not a full information, this time I called my brother asking maybe he knows, he had a colleague (both laughing) who said that there is one company called Hromets, in Ozolnieki, near Jelgava that produced boilers and that colleague said that they were good, from that side I have a positive reference, **maybe he was using boiler produced by them**, oh that I don't know (Andris).*

Other: Renovation works are made with a view to the future. All what is done will remain in the property of their children. [Total: 1 - Kriss]

5.3.3 Summary

The table below summarizes the levers identified by the informants during the interviews. All informants who have carried out renovation works in the apartments or/and buildings, mentioned at least two levers. This means that this number of levers must be fulfilled at the same time in order for the informant to be interested in carrying out renovation works.

LEVERS	MAB ⁴⁰	PH ⁴¹	Total
Support and advices	6	5	11
Bad conditions of the building	5	4	9
Low money resources required	3	2	5
Information and knowledge	2	2	4
Feeling cold	9	0	9
Cost of energy	6	0	6
Previous experience	5	0	5
Community factor	5	0	5
Other	4	1	5

Summarizing the above information, the main levers are as follows:

1. **Support and advices.** 11 informants in total recognized this reason as an important. It was interesting that the reason is more important for men than for women (Figure 9).

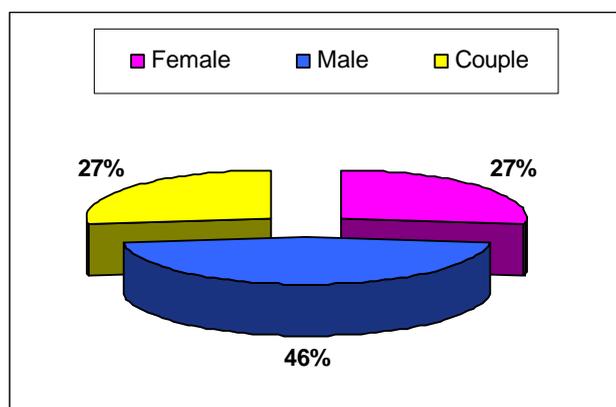


Figure 9 Type of informants

This can be explained by the fact that mostly men are responsible for the renovation works (technical things), therefore the support from family members, as well as the advices from the construction workers/professionals is important.

2. **Bad condition of the building.** The reason was important for 9 informants. Again, the reason is more important for men than for women (Figure 10). This is also explained by the

⁴⁰ Informants from multi-apartment building

⁴¹ Informants from private houses

fact that men are more interested in technical things, which also refers to the condition of the building.

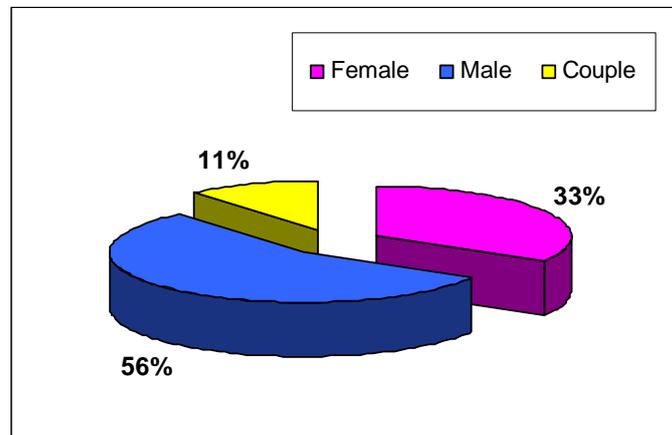


Figure 10 Type of informants

3. **Low money resources required.** The reason was found to be equally important for both women and men and in total for 5 informers.
4. **Information and knowledge on renovation works.** The reason was important for 4 informants. An interesting aspect is that all informants who recognized this reason were young. Consequently, it can be assumed that young people are more open to new knowledge and have higher desire to acquire knowledge than older people. It also contributes to implementation of energy efficiency measures in the buildings.

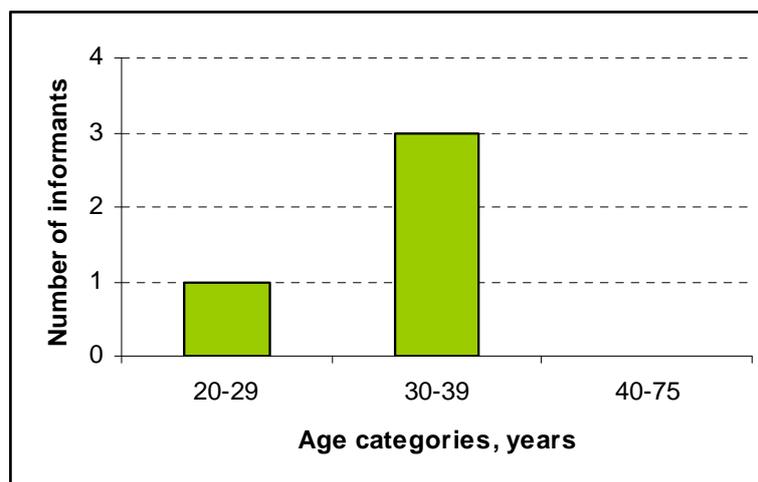


Figure 11 Informants breakdown by age categories

5.4 Brakes to conduct energy-related renovation works

The brakes for not doing the renovation works were more individual than the levers. The brakes to conduct energy related renovation works are divided by the households and listed according to

their frequency in the interviews. There is also a summary of the results obtained for each household.

5.4.1 Informants from apartment building

Lack of money

The main reason for not doing the renovation works is the lack of money. This opinion was very common for the older informants (60-75 years old group). This is related to the fact that these respondents are pensioners. Level of retiring pensions is very low in Latvia. This was also a brake for people who had the information and the knowledge on energy related renovation works and who would like to implement them, but considered that the works would request substantial financial resources. In total 11 informants (Rasma, Diana, Inna, Santa, Andrejs, Janis, Lasma, Vjaceslavs, Zigrīda, Janina, Vija) recognized this brake as important.

***What do you think about renovation works in the building?** I think that you are talking about putting heat insulation of the walls. I do not think that the building inhabitants will agree to put the heat insulation because the salaries are cut for everybody, there is no money for that (Vija).*

Community factor

The community factor becomes apparent as the lack of support from other dwellers of the building. Some informants complained that it is not possible to gather a quorum of 51%. Also, the residents of the building do not attend general meetings, where decisions on energy efficiency measures for the building are made. The reason was important for 4 informants (Reinis/Loreta, Neo, Zigrīda, Inna).

***Do you think that programs would be interesting for your house?** Judging by my neighbors I think that not. **Is it just because of people? Is it difficult to come together?** Yes, I think we will not meet together. We met just once when Nelts, Ltd offered to install new entrance doors. But we were just 30% of inhabitants then (Inna).*

Lack of support

For the informants from the apartment buildings the lack of support from BMC is very important. In this case, BMC is not sufficiently active. Also, the lack of support from family members was recognized. More explanations are given in chapter 6 - Roles of the actors (page 20). The lack of support was mentioned as the brake for 3 informants (Santa, Anna, Andrejs).

***Does your wife come up with some kind of suggestion to save energy?** She is the catastrophe of energy. I make suggestions how to save energy because I pay the bills (laughing) (Andrejs).*

Than we had the old building manager, I was saying to them, something must be done because we are paying the management fee and he simply said to me if you need it than do it. The only one that you can do is to establish an association. In the way that I would not establish any association and do nothing... (Santa).

High costs for renovation works

The argument of high costs used to explain why (some) renovations has not been done is common for the informants who can not make the renovations themselves. This brake is linked

to the opinion that the renovation works require high investment costs because the costs for materials and construction workers are high. The reason is important for 3 informants (Anna_2, Vija, Janina).

***Would you like to do something more in your building, not only in the apartment?** Well, I do not know. Maybe something needs to be improved...Probably that the roof should be insulated. That could also give a lot to the building. Yes, yes, we did not do it because it was [cost] too much. Lot of people did not want to take the loan. Then what can you do in the building, in a common building, I have to say that you must live in a private building if you do not like something (laughing) (**Rasma**).*

Lack of information and knowledge

The informants who had no interest and no information generally did not do the energy related renovations. The lack of information on renovation works and the lack of understanding for need of them have also been identified as brakes for energy related renovation works to be done. For example, some of the informants received contradictory opinions on wall insulation. The lack of information leads to the lack of knowledge that prevents the renovation to be done. Three informants (Neo, Zigrida, Andrejs) found the reason important.

*The insulation is not needed when there is very low temperature [outside], it is needed when the temperature is 0°C degrees, plus minus 2 degrees (**Andrejs**).*

Feeling warm in the apartment

It was interesting that the two informants admitted that there was no need to carry out renovation works because the apartments were warm enough. This was mentioned by Ilze and Zigrida. These opinions show that feeling warm or cold is of great importance for making a decision on renovation. Usually cold apartments are located on the ground and upper floors of the building, as well as at the end walls of the building. The warm apartments are located in the middle of the building. If the apartment is cold then it is necessary to carry out a renovation work, but if the apartment is warm, it is not necessary. Thus, if there are colder apartments in the building, then it is likely that people will agree on the renovation earlier than in a building where the apartments are warmer.

*“The heat insulation on the outside facade already was installed. (mbm). We have not changed the windows. We do not want so desperately to put new plastic windows and to do something here, because anyway [in the apartment] it is warm enough in winter” (**Ilze**).*

Other. In total 5 following other brakes were recognized:

- Renovation process is too messy (Diana);

***Speaking about the renovations again. What could motivate you to change radiators and install regulators for example?** If I make such a whole renovation I will change radiators, too. But I would not change them separately. It is not worth to make a mess just because of it only (**Diana**).*

- The limits of energy efficiency program (Santa);
- Do not see the sense of energy efficiency measures (Andrejs);
- It makes no sense to reduce energy consumption in the absence of individual metering system (Evija/Rudolfs);
- The building is in good condition and unwillingness to take loans from the banks (Reinis/Loreta).

5.4.2 Informants from private houses

Lack of money

In the case of informants from private houses this reason was mentioned as the main brake for not making or implementing step by step renovations works. The informants were aware what energy-related measures they had to implement. In addition, these measures were related to energy savings, less on the look of the building. The reason was mentioned by 4 informants (Inga, Arlita/Ervinš, Kriss, Andris).

... chimney, where the heating system is, chimney is in bad condition, building foundation is in bad condition, well, well, I don't know, [we] have to start from one side, have to start from one side, start with building basic, roof changing, then also insulation and so on, as, let say, all was, let say, there were no extra money at that moment when we bought this house that is why all stopped (Andris).

Unwillingness to take loans from the banks

Some of the informants admit that they do not want to take a loan, because they want to be financially independent. The reason behind generally mentioned is the economical situation in the country. This brake seems to be more related to renovation in houses than in apartments. The reason was important for 2 informants (Billijs, Kriss).

And were your relatives and friends or family, mmm, giving advice or were telling that there maybe you have to ask for some help from outside, some kind of professionals? (Both laughing) or in that moment it was not a... Well, let say, yes, I would not wish to deny that relative and friends were Well, if this is an interview I will say how it was honestly. (Surely, laughing) Relatives and friends, yes! The idea, yes, of course, our friends already were saying why are you doing this all yourself, you could go to a bank, take a loan and there a construction crew would come and everything would be done in one month, but I already had a bad premonition, that something would go wrong in the future, and I was right. Now I am the winner. Better I will do it all by myself and I will not be dependant on banks (Kriss).

Other In total 2 following other brakes were recognized:

- The current economical situation in the country was recognized as the brake (Kriss);
But for now it is not possible because of financial situation [in the country], before it there is some more works to be done (Kriss).
- High costs for renovation works (Billijs);
- The lack of support from the family (Ojars).

5.4.3 Summary

The table below summarizes the brakes identified by the informant during the interviews. Some “other” brakes of informants from private houses are mentioned in other groups.

BRAKES	MAB	PH	Total
Lack of money	11	4	15
High costs for renovation works	3	1	4
Lack of support	3	1	4
Unwillingness to take loans from the banks	1	2	3

Community factor	4	0	4
Lack of information and knowledge	3	0	3
Feeling warm in the apartment	2	0	2
Others	5	1	6

Summarizing the above information, the **lack of money** was recognized as the main brake. The reason was important for 15 informants. Mostly women, not men found the reason more important. This could be due to the fact that women are generally responsible for the family budget.

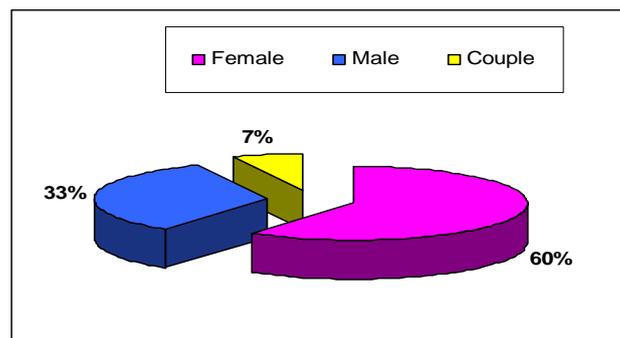


Figure 12 Type of informants

5.5 Impact of Energy label of the house (or an audit)

Practically, energy labels and audits have no impact on energy related renovation works conducted in the dwellings.

Main reason for carrying out an energy audit is participation in the national energy efficiency support programs or is related to the wish to take a loan from banks for building renovations. Regarding the topic about energy label and audit, half of the informants had no information and almost nobody knew what an energy label or a certificate was. The informants who had heard about an energy audit could not give an explanation or explain it more detailed. Despite that fact that the main part of the in-depth interviews was made in houses where an energy audit was done, almost nobody could explain what kind of information is covered by the energy audit. The informants who had implemented or were implementing energy saving practices admitted that it would be important to have an energy label, but some informants had no interest on it. Some informants considered that the audit did not give any new information that they did not already know, thus making the energy audit needless.

And what about energy certificate, have you ever heard about it? *Mmmm, no, no, well when I was looking for boilers I saw that they have some kind of certificates, let's say, European Union certificates, but no, I haven't heard!* (Andris)

Have you heard about an energy audit? *Em, well, I know the word "energy" and I know the word "audit" than if I put together I have feeling what it is, it is ...energy...electric...energy....Audit. Assessment. Consumption assessment.* (Inga)

Were you informed on the results of the energy audit? *This was already clear without knowing the results. And what was clear for you?* *That it was needed (laugh)* (Neo)

Let's say, have you heard anything about an energy label or an energy audit, about these things? No, unfortunately I haven't heard, maybe it would be worth to find out, yes, yes, that would be very interesting, yes (Janis).

5.6 Roles of the actors

To **implement** energy related renovations works it is important to have the advices and support from different types of actors. The actors are divided by the type of households and according to the frequency of them being mentioned in the interviews. Also, the summary of the results obtained for each household is available.

5.6.1 Informants from apartment buildings

Building Management Company (BMC). For the informants living in multi-apartment buildings, the role of BMC is very important for making the building renovation works. Their influence can be either positive or negative. The positive aspect is when a company participates actively and motivates residents to make the renovation works. The company also conducts the renovation works after collecting the money from the residents. The negative aspect is when the BMC defines requirements that are not accepted by the residents (e.g., installation of an individual heating metering system). In a specific case BMC inactive attitude motivated the residents to make building renovation, but this can be considered as an exceptional case due to very active actions of the residents. 8 informants identified the role of the BMC (Neo, Santa, Janis, Lasma, Anna, Vjaceslavs, Ilze, Janina).

So, you were the initiator? No, no it is not so dramatic. The initiator is the building management company, basically everything depended on them, everything, yes. There is the time for decision making, the work with necessary partners, or individual debates with each owner of the apartment...(Neo).

Friends. For the informants it was also important to have advices from their friends. More than half of the informants admitted that they discussed with a friend or asked them for an advice on how to make the renovation works better. The advices from friends had only a positive influence. It was not recognized that the friends were involved in the process of renovation. The role of friend was important for 6 informants (Diana, Anna_2, Santa, Andrejs, Reinis/Loreta, Janis).

I called some of my friends and asked how much they had usually [the bill for electricity], just to compare (Diana).

Relatives⁴². The role of relatives in renovation works was identified for the informants. It was identified two types of influence from relatives:

- Providing advices on how to carry out renovation works better;
- Were making the renovation works and they were also considered as the professionals from whom to ask an advice.

The advice from relatives had only positive influence. In total 5 informants (Anna_2, Andrejs, Evija/Rudolfs, Reinis/Loreta, Zigrida) recognized the role of relatives as important.

⁴² The relatives of the informant or informant's spouse.

How did you come to this idea? *Well I had.... Respectively the company's PAROC (a well-known manufacturer of heat insulation materials in Latvia) boss is my relative. I simply called him and he gave me 3 hour lesson [on] how and what I had to do. **Positive aspects and benefits...** Yes, and why I have to choose PAROC. So there was no other option (Andrejs).*

Construction workers/professionals. The informants admitted that they had consultations with construction workers/professionals on how to make the renovation works better. Mainly the advices were given by professionals, but the renovation works were made by construction workers. The advice from construction workers was also considered in the process of renovations. The professionals had only positive influence. The role of professionals was important for 5 informants (Gunita, Andrejs, Reinis/Loreta, Janis, Lasma).

Did you decide yourself on what kind of renovation works to do, or you asked for an advice from others? *No, no, no, well of course that we decided ourselves that we needed it. No, we did not have any advice. Well, we found people who would make the renovation works through..... Well, he was a very good one, but we found him through an advertisement in a newspaper (Gunita).*

Family⁴³. It is important for the informants to have the family support. Family support could be considered to have a positive or negative influence on making renovation works or energy saving practices. The negative influence was identified only in one interview. For 5 informants (Rasma, Gunita, Inna, Andrejs, Janis) the role of family was important.

Who is the initiator of the renovation works at home? *Definitely me, me (laughing), definitely me. **Did you get some help from friends, relatives?** No. It is simple. It comes in mind that nothing has been done for a long time and it starts to look not very good anymore, than definitely something must be done. **How did you choose who would do the works?** We did it ourselves. **Your selves?** Yes, my husband, he understands something from construction works and he himself was a carpenter. *Actualy, this is not a problem for us, we do not invite people from outside, no (Rasma).**

Colleagues. They have relatively less impact on the informants' decision to make energy renovation works. Only in few cases the informants were asking for an advice from colleagues or they got it from colleagues. The advice from colleagues had only positive influences. For only two informants (Santa, Reinis/Loreta) it was important.

Are they more colleagues or friends? *Of course the friend and colleagues, but colleagues at work the most. You start to talk during the lunch or in other moments that you have to solve some things and than the discussion starts that you can do this and that. Well, yes, practically, this was the reason why we bought the wallpaper [insulation material] and insulated all walls, but the windows, yes. We...(Santa).*

Couple. An interesting aspect of making renovation works and energy related practices is the couple distribution by roles. The roles are mainly divided as follows: the wife is the informant's supporter; the husband is responsible for the technical things. It is important to have both persons to make the renovation works done. The role of couples was recognized for two informants (Santa, Inna).

Husband: *I consider, for example, that I was looking after the project and realized it. Also when Santa was coming home, she saw it and was doing a lot here, and she was not unsatisfied... I was the main building supervisor (Santa).*

⁴³ The people who live together with an informant in the same dwelling.

5.6.2 Informants from private houses

Construction workers/professionals. The role of construction workers and professionals in case of informants from private house is more important than of apartments, because the renovations area is bigger. It is almost impossible to make all the renovation works for the house themselves without any support from construction workers or professionals. Usually, the professionals gave the advices, but the construction workers were making the renovations. Also, the advices from construction workers were considered by the informants. The advices from professionals were given on specific field like windows, roof materials, heating system, etc. The role of professionals was important for almost all informants (Ojars, Billijs, Kriss, Andris, Arlita/Ervins) from private houses.

***Have you had any assistants providing information support?** Yes, I talked to various trade organizations asking for information, I gathered information before I started doing something (Billijs).*

Family. In two cases the families provided support to the informants and gave the positive influence on renovation works. In case of Ojars there was a negative influence because there was no support from his wife or children. They were not participating or helping to save energy at home. For 3 informants (Ojars, Inga, Billijs) the role of the family was important.

***Do they [children] come whit the suggestions how to save energy?** Well with the opposite one. For example the radiators should be opened more to get warmer inside. In such a way. With no constructive suggestions (Ojars).*

Relatives. The relatives gave advice as well as participated in the process of building renovation. In this case the relatives were more involved in the renovation process. The role of relatives was recognized for 3 informants (Arlita/Ervins, Kriss, Andris).

At that moment [it was] my cousin who was working in this field and he was a professional helped us. We hired him privately (Arlita/Ervins).

Friends. The role of friend for informants from private houses is not as important as for informants from apartment buildings. This is explained by the fact that friends gave only advices, but did not participate or were not involved in the renovation process of the building. The role of friend had important role only for two informants (Ojars, Kriss).

***And were your relatives and friends or family, mmm, giving advice or were telling that there maybe you have to ask for some help from outside, some kind of professionals?** (Both laughing) or in that moment it was not a... Well, let say, yes, I would not wish to deny that relative and friends were Well, if this is an interview I will say how it was honestly. (Surely, laughing) Relatives and friends, yes! The idea, yes, of course, our friends already were saying why are you doing this all yourself, you could go to a bank, take a loan and there a construction crew would come and everything would be done in one month, but I already had a bad premonition, that something would go wrong in the future, and I was right. Now I am the winner. Better I will do it all by myself and I will not be dependant on banks (Kriss).*

Couple. It was recognized for one informant (Arlita/Ervins) that the role of couple is important for them to make the renovations.

***A:** Oh, on the walls? Well, the walls seem to be most crucial **E:** Well the construction is of a lightweight design. Basically it is made from wood. There are 12 mm plywood and 10 cm of cotton wool. And in such way it was made. **A:** Do we have 10 cm of heat insulation? **E:** Ten [cm] **A:** I*

would like to think that we have more – 15, but well, ok. **E:** Wait how it was 10 ...a, yes 15[cm]. Already managed to forget. **A:** 15! This is important_(**Arlita/Ervin**s).

5.6.3 Summary

The table below summarizes the influence of the roles of the actors, identified by the informants during the interviews.

	Influence	MAB	PH	Total
Masters/professionals	Positive	5	5	10
Family	Positive/negative	5	3	8
Relatives	Positive	5	3	8
Friends	Positive	6	2	8
Couple	Positive	2	1	3
BMC	Positive/negative	8	0	8
Colleagues	Positive	2	0	2

Summarizing the above information, the main actors are as follows:

- 1. Construction workers/professionals.** For 10 informants the role of construction workers /professionals had the main influence on building or apartment renovation. The advice from construction workers /professionals had only positive influence. It is interesting that this aspect is more important for men than for woman (Figure 13). This can be explained by the fact that men do renovation works and the opinion of construction workers /professionals is important for them.

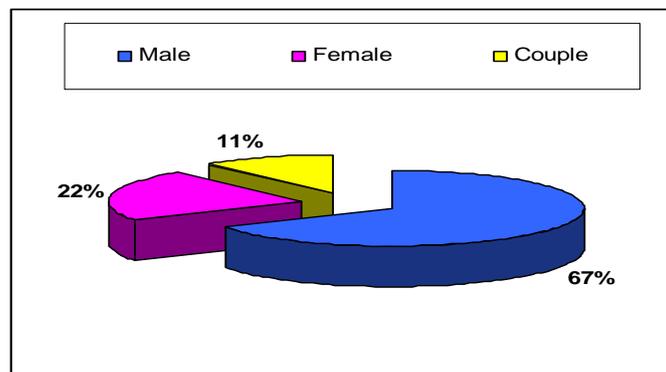


Figure 13 Type of informants

- 2. Family. Relatives. Friends.** For 8 informants the role of family, relatives, and friends was identified as important. Only the positive influence of relatives and friends was recognized, but both positive and negative attitude of the family. For the informants in age category 60 – 75 years the role of family was not identified, because the informants lived alone or their children had grown and no longer participated in decision-making process. The role of relatives was not recognized for the informants in age categories 40 – 49 years and 50 – 59 years, because they are able to find the solutions by themselves and no support from relatives is needed. The role of friend was more important for informants from apartment buildings.

5.7 Roles of incentives or renovation programs and policy in general

In general the informants have very few information about the policy and programs. They could generally not give any explanation or their own impression about policies, incentives or programs.

...Yes, about the subsidies. Yes, I have heard somewhere that the government or some one else must give [them], but I do not know how it is working... (Rasma)

The majority of informants have heard something about the support program for building renovations, but they have no full view of it. The informants are not interested in it for the following reasons:

- The informants who live in private houses said that they were not interested (1) because this was only for multi-apartment buildings and (2) due to their unwillingness to take a bank loan;

***Do you know about any incentives or subsidies regarding renovations?** I have heard something from mass media that the discussion is going on about the multi-apartment buildings, especially about the outside wall insulation (Ervinš).*

***In terms of initiatives and grants in relation to various renovation works, have you heard anything about those tools and what is your opinion on this issue?** (Thinking) Mmmm, well, if there would be a stable economic situation, then I could think about subsidies and loans for something, but for now, no, this is quite a risky option to take some kind of credits (Billijs).*

- The residents of multi-apartment buildings are not interested because they have already made the renovation works, or because of the neighbors' disagreements.

***Are you interested in incentives or maybe you have heard something?** I do not need any [support]. I see that other houses in Kuldīga are renovated and soon all houses in Kuldīga will be insulated. So I see that the process is going on. And as I understand and I also talked to Inārs who lives in the building that is being renovated now. And now, I am pissed off and I think that it is injustice that, because currently I do not understand what kind of European money it is and whether they have to give [us] back the money which was used for renovation works, because it comes out that we were totally stupid that five years ago we had to pay the full sum of the renovation works. This is not clear for me and I consider it as a great injustice if somebody would get this like a present. We are paying the credit very conscientiously (Neo).*

It seems that private house owners are more interested in such programs, but they do not have the opportunity because such programs do not exist for private houses. The residents of multi-apartment buildings are less interested in the programs, but they have them available. The reasons for not being interested in the programs are the following:

- Informants do not intend to live long in the apartment (Diana);
- The building has already been renovated (Santa, Andrejs, Neo, Gunita, Rasma);
- Do not believe that it would be possible to assemble a quorum (51%) of residents in the building (Inna, Reinis/Loreta, Zigrida);
- The building renovation is not necessary (Reinis/Loreat, Ilze, Zigrida).

In general, the informants think that the programs are meant for somebody else, not for them.

Some informants were interested in programs if they wanted to make the building renovations by themselves. The information on such programs was found by accident on the Internet. The informants were not satisfied about the documents submission process for the programme. From the informants' point of view, the requirements were too strict. It was a time consuming and too bureaucratic work. Also, informants were unsatisfied that they could not include the renovation of staircases and individual heating metering system in the application.

Nothing was anything has been fortunate, there was no luck for us. Despite 100% agreed, yes the residents agreed, but about this project the staircases are not finished, because we were the first one who made it and the requirements for submission now with all[...]. Yes, right now they do not need that and that....and the other thing is that no one will return back the previous year that changed the entire project. Because we submitted the project application on 14th of May, but forgive me - I am signing the documents only on 25th of October and I did not delay it myself, not a single day. So no one will return the winter [the energy savings in the winter provided by possible renovation of the building]. And now we are sitting and thinking what we will do if we must pay the high percentage [price increase for natural gas by 38%] (Santa).

There was no reason to submit the papers, if no one accepts them in case if we will not have the bank loan. I think it was the most stupid thing and I think it works also today. No one accepts it if you do not have the bank loan. We had the application from the first bank that they grant the money and this letter was a guaranty in the project. But than they put such a high interest rate and they changed it almost every day. We just refused them and changed the banks (Santa).

5.8 First and main renovation done and reasons

The main and the first renovations are energy related one like change of windows (6 informants), wall insulation (4 informants), and heating system replacement (5 informants). The main reason for making the renovations is feeling cold in the house and bad conditions.

What was the most important works for you that you did in the apartment? The most important is that I have changed all windows, because now it is warmer (Gunita).

Some people also mentioned other renovation works, like change of water pipelines and “cosmetic” works in the house. The reasons for doing the works were bad conditions and feeling uncomfortable at home.

Basically, from these works that have been done, what in your opinion was the most important what you've done? Well, this was this room, exactly this one, eee, ceiling preparation, there were all in gypsum fibred board and when they[workers] took it off, because previous owners had done something like lower ceiling and in original planning here also is wall who they took off, mhm, the ceiling was, well it was awful, the workers spent one week working only with the ceiling (Reinis/Loreta).

5.9 Relationships to comfort and indoor temperature

For the majority of informants the comfort is related to the size of the living space and to the idea that everything is arranged according to the wishes of owners'.

What do you link the comfort with? Hm, ergonomic furniture. Then, everything should be in order. And it would be nice if I would not take care of it. The light and fresh air should be also. And that is an ideal... it is a big space but it is not speaking about this flat (Diana).

The informants also admit that the comfort depends on indoor temperature, but only 6 informants mentioned it as the first reason. There is a strong difference between private houses and multi-apartment buildings regarding temperature and possibility to regulate it. There are regulators on the radiators almost in each private house, and they are used to reduce the inside temperature. In multi-apartment buildings there are no possibility to regulate the inside temperature and the informants are mainly complaining about coldness during winter. An actual topic for the informants is related to regulators. The informants who have the regulators said that it is very important, that it motivates to save money by consuming less heat energy. It was recognized in the cases where the individual heating metering system was implemented.

I see that you have the regulators on the radiators? Yes. Do you use them? Yes absolutely. Very often. I am very happy and this is the one of the greatest advantages for such new house and new system... (Anna_2).

The informants who had no regulators wished to have them for two reasons: to have the possibility to change the indoor temperature and to save money for energy consumption. Due to the unclearness of calculation method for heat energy many informants are hesitant to install the regulators. They fear that the regulators will not give any energy cost savings, because the heat energy calculation methods are set by the local building managing company that is also the owner of the local boiler house.

What about the individual heating metering system? The individual metering system no [we do not have], the owner of it is the building management company, it is only renting the room from us.... The building belongs to us, because we have the whole land under the building, practically the apartments are 100% privatized and also the land [is]. We pay the rent fee for the land under the building, and the room also. Of course we do not pay them any rent fee, the substation unit makes it all better, but there we can not do anything, we also did not insulate there, now we insulated the pipes there, because the basement is cold. So practically we have insulated their equipment instead of them, because this is their job (Santa).

For the majority of informants it is necessary to have temperature differences in varied rooms and also in different time of the day. It is important to have lower temperatures during the night and in the bedroom, but higher temperature during day and in the living room, except during working time. For some of the informants it is not possible due to the size of apartment (too small) or to the lack of possibility to regulate the temperature.

Do you keep different temperatures in different rooms? Yes! We change [it]. We do not roast the rooms for no reason just because it is winter now. No, it is ok that it is winter. If it is too warm here we switch it off (Arlita/Ervin).

Are you trying to keep various temperatures in different rooms? R: No, the regulation options are rather limited. E: Yes. R: Now we can change the floor [temperature of heated floor] a bit. Well let's say in the winter. E: Well practically we are trying to have the optimal temperature in the rooms. R: Yes (Rudolfs/Evija).

The actual inside temperature in average is 18 °C in multi-apartment buildings and 20 °C in private houses in winter. The preferred temperature is 21 °C in both cases.

What was the actual temperature in the winter? E: I think around 18 – 17[degrees] R: Well 18 [degrees] let's say (Evija/Rudolfs).

What is the temperature you would like to live with? Well I would need 21°C (Gunita).

5.10 Environmental knowledge

Almost all informants (21 persons out of 24) have heard information about climate change. There are different opinions regarding those issues. The main group of informants feels confused regarding the information given on climate change. They can not decide whether it is part of the Earth natural cycle or whether humans have made a substantial impact on climate change. At the same time, the informants do not believe that they can do anything about that, unless they do it all together.

What do you think about climate change? *Well, it is our [impact], yes, but how it [works] globally I do not know, really, the recent contradictions, even though I read articles it is something really not clear for me. There are some scientific publications and how they are made it is hard to say. The specialist of this field can understand what is written there, whether it is based on facts or not that the temperature increases... (Arlita/Ervin).*

Some informants, mainly men, asserted that climate change issues are a business for somebody and that climate change is a cyclic process because the information is insufficient in order to decide which factors have the highest impact on environment.

I follow it up all the time, but you know my opinion? It's all one big business. For somebody it is profitable to transfer the money. For somebody it is profitable to keep the panic. Or indeed the world by those who highlight the fact that we are guilty, that the glaciers are melting, the white bears have nowhere to live - I do not believe it, it's overdone. Are you sure that those who are yelling all over about this...they really do not understand that everything is cyclical. We just do not have whom to call and to ask: "Look how it was 100 years ago?"... (Neo).

When informants were talking about climate change, they related it to ozone-hole problem, deforestation, air pollution, and glacier melting. Also, informants were pointing out that the winters in Latvia have changed, that they are becoming warmer. This observed change of climate was considered a fact supporting the existence of global climate change:

...I have heard a lot that climate change exists. That it is affected by the emissions and deforestation and so on...I think that there is climate change and global warming, because the water level increases in the oceans, the glaciers are melting, and also the ozone-hole... (Lasma).

All informants could be divided into three groups, depending on their answers to questions concerning energy consumption and environmental issues:

1. Informants (14 persons out of 24) who consider that energy savings and climate change go hand in hand. This opinion was common for informants in age group of years 20-40. The most popular opinion was that these issues have more global origin (e.g., pollution from industrial sectors, the attitude of each country government), and depend less on each person's environmental behaviour.

Well, yes, and if we talk about environment and about all climate changes, in your opinion is there anything common of energy and water saving with climate change? *That our negative contribution when we are not saving energy definitely is not in that kind of impact level that it would be extremely significant, but definitely that this is significant (Reinis/Loreta).*

Do you understand the link between energy savings and environment? *Well, yes, probably, yes, but I do not think that my input is...specifically the inhabitants input is big, than the large companies have to think about it... (Anna).*

2. Informants (2 persons out of 24) who think that there is a link between energy savings and environmental issues, but could not explain in more detail. These informants are aware of the link between climate change and energy savings. It is mainly based on the information provided by TV, radio and other media, but they do not have their own opinion.

In your opinion, does energy consumption have something to do with environmental issues? Yes, I understand that there is a link between energy savings and impact on environment. ***Please, can you explain?*** No, I can not explain it (laugh) **(Gunita)**.

3. Informants (8 persons out of 24) who do not believe and say that they do not have any information on the link between energy savings and environment. Despite the information available from the media, they either could not answer the question or expressed the feeling that there is no link. This opinion was common for informants living in rural areas and in age group of 50-75 years.

Do you think that if you save energy, you also reduce environmental impact? I do not know.... I have not thought about it. Energy? (Silence) Probably. Maybe, I do not know, no, but although in reality I do not know, how could I. How the energy might affect the environment, I do not know... **(Rasma)**.

5.11 Environmental knowledge and practices

There is no strong connection between knowledge of environmental issues and energy renovation works performed in a building. At the same time people having more information on environmental issues have done more energy-related works and practices.

E: I do not know if we are the most saving [people], but at least we are trying to think about it, I think it is good in itself. ***And what are the practices?*** ***R:*** To switch off the light when [we are] going out of the room. ***E:*** To save as much water as possible when I am washing the dishes. (...), we are using the oven as much as possible at one cooking time. Trying to plan something if I am cooking [on] what I am cooking. Something like this **(Evija/Rudolfs)**.

When talking about environmental knowledge and practices, two main common contradictions were mentioned by the informants:

- The informant cares about the environment, but at the same time energy-saving practices have not been implemented. This contradiction reflects the opinion of most respondents. It seems that the informant knew or had heard that it was good to act, because it positively impacted the environment. This was the reason why many informants were asserting that environmental issues were important for them, but in reality they were doing little or nothing.

Do you think that if you consume less energy you reduce the impact on the environment? Of course I think about it without stopping. But as we use almost only green energy in Latvia, except that we buy electricity from. I do not remember from whom we buy the electricity. I do not know **(Andrejs)**.

- The opposite way is that the informant says that s/he does not care about the environment, but that s/he engages in a lot of energy-saving practices. Maybe these informants wanted to impress the interviewer with how much they cared about the environment by saying that they did not think much of other issues.

...Secondly, for example, the drinking water. I fill the teapot with the water I need for one cup of coffee, but Ervins fills the teapot to the top and boils it all. Well if we would not have this interview, we would

not know who is saving in the family and who is not. Well I am not trying to save..., no but of course, but I am trying to think about it (Arlita/Ervin).

The main practices related to environment are energy savings and waste separation. Several energysaving practices were reported by informants. For instance, they cited the use of energy efficiency appliances and compact fluorescent lamps (CFL's) that were linked directly to the reduction of both energy consumption and money. Some informants use CFL's, but can not explain the benefit for them; they do it because of information gleaned from advertisements. Some of the respondents admit that they would not use CFLs due to bad experience with the quality. The most common view is that they do not like the delay in illumination after switch it on or because of its colour. Also, some energy-saving practices are related to the informant's behaviour. For example, use of environmentally-friendly home care products, cloth washing in a water-saving regime and with a full washing machine, dishwashing with the dishwasher fully filled, etc. These energy-saving practices are common for informants belonging to the second group mentioned above, i.e., the informants say that they do not care about the environment, but perform a lot of energy saving practices.

***What energy saving measures do you implement at home to save electricity?** I have screwed in the CFL's everywhere. Not in the toilet and the bathroom, where they are not used a lot. So I do not know what else. **Where did you get the information on CFL's?** It is hard to say. I do not know from where. I have heard somewhere when I was living with my parents. Also, they were there (Gunita).*

The main reason for waste separation is the willingness to live in a green and clean place. Waste recycling is linked to the environment because in Latvia the waste separation process was implemented recently. Therefore a lot of discussions on these issues were going on in mass media.

***Do you think environment issues are important for you?** I am not a big environmental activist, but yes, it is important and I would like to have greener surroundings near the house, also a better air since we live near the main street and this is important. In relation to the environment, we separate waste at home. Previously we used the paper in the oven, collected organic waste and used it as fertilizer for flower beds, and so on....and we separate metal waste (Inga).*

5.12 Other energy related practices and opinions

Throughout the in-depth interviews several interesting comments related to wall insulation and usage of energy efficiency bulbs (CFL) were identified.

Two interesting opinions related to wall insulation are reported hereafter:

- a) The insulation of all inside walls of the apartment, including ceilings and floor, to reduce energy losses, thus to save money.
- b) There is no need for heat insulation in winter, it is needed only at 0°C +/- 2°C degrees. This is related to the fact that in winter there is a central heating anyway and it is warm. But there could be the situation when the outside air temperature is close to 0°C and it is cold. In this case, if there is no central heating, from the informer's point of view, the heat insulation would be needed.

There are also interesting opinions and practices regarding to CFL's. Some of the informants use CFL's, but could not explain the benefit of them and they do this due to experience or due to the

advertisements. Some of the persons admitted that they would not use CFL due to bad experience with their quality. The most common view was that they do not like the long time of switching on or the color of it. Some saw no use of them, because the electricity consumption comparing to heat was insignificant.

5.13 Other comments

Hereafter, 3 interesting situations are reported:

One informant bought an apartment in a multi-apartment building that was renovated a few years ago. Despite the building was renovated and the energy consumption was lower than in other building in that city, the person did not care about it when she was buying the apartment.

It was interesting that the main factor for choosing one of the apartments was the possibility to install or already have the natural gas heating system. It was important for the informants, who related it to the possibility to reduce the heat energy. It shows that the informants were already interested in the reduction of energy consumption.

It was interesting to note that younger people were thinking about energy efficiency and saving more than older people. One of the interviewees also said that his parents would not save energy if they couldn't get any benefits. In this case the smaller bills were not considered as benefits.

5.14 Conclusions

5.14.1 Similarities

One of the most frequent similarities is about the contradictions about climate and energy. Several informants were saying that the environment is important for them, but at the same time they were not implementing any energy saving practices.

The most similar lever, both for apartment and private house owners, is the bad conditions of the building and/or apartment and the support and advices on renovations.

For the informants from multi-apartment buildings, the most similar lever is feeling cold in the apartment. For this kind of informants the bad conditions and coldness goes hand in hand.

The most similar brake for both types of informants is the financial aspect. The main reason is lack of money. For this reason, informants who have the information and knowledge on renovation works are doing renovation works step by step. For the informants who are not so interested in the renovation works this is the main reason for not doing the renovation works at all.

Summarizing the findings of the lever and breaks, it can be concluded that despite the lack of money, building renovation works will be performed in case if more than two levers are fulfilled simultaneously.

In addition, it was concluded that women are more interested in how they feel in their homes and how the apartment or the building looks. The men are more interested in conditions of building constructions and opportunities to get the support from construction workers/professionals. Ultimately, the emotions are more important for women, but constructive aspects - for men.

The main actors in the decision making process for doing or not doing the renovation works are the construction workers and professionals. Also, such actors as families, relatives, and friends

were recognized. It was recognized that the family attitude (practical) could have either a positive or a negative influence on renovation works. The friends have only positive influence.

The informants have very low knowledge on energy related policies in general. Almost nobody could explain what an energy audit is or had no information on energy certificates. There are opinions that the energy efficiency programs on renovations are meant for somebody else, but not for them.

Opinions on comfort are quite similar among informants. Comfort is first linked to the size of the living place and on the fact that everything is arranged according to the wishes of the owners. At the same time, the informants also admit that the comfort depends on indoor temperature. In the winter, the actual inside temperature is 18 °C in apartments and 20 °C in private houses. The preferred temperature is around 21 °C.

5.14.2 Most innovative finding

For Latvia, the following most innovative findings were identified:

1. For the informants it is very important to have support and advice to conduct energy related renovation works.
2. For dwellers living in multi-apartment buildings, the decision to make the renovation works is mainly based on feeling cold or warm in the apartment.
3. The levers for building renovations for women are mainly based on the emotional aspects, but for men - on the practical aspects.
4. A general lack of information and knowledge on making energy renovation works has been observed.
5. The reduction of energy costs is considered as a lever by few informants.
6. A negative influence by the relatives or acquaintances is one of the main brakes for not doing the renovation works.
7. In order to achieve the energy-related renovation works, a number of levers must be met simultaneously. The same applies to the brakes.
8. The energy audit has been done for all the multi-apartment buildings visited, but the dwellers interviewed say they did not have the information.
9. A very high impact of the professionals on the renovation making process has been noted.
10. Building Management Companies have a very big impact on the renovation making process, either as a lever or as an important brake (resulting in the absence of renovation works done on the whole building).
11. The couples' factor has been identified as a lever for doing renovation works.
12. Low information on energy policy in general and no clear view on it were generally observed among informants.
13. The comfort is related to the size of the living place and to the fact that everything is arranged according to the wishes of the owners.
14. The importance of regulators on radiators is often mentioned, as well as its (possible) role in reduction of energy costs.



Chapter 6

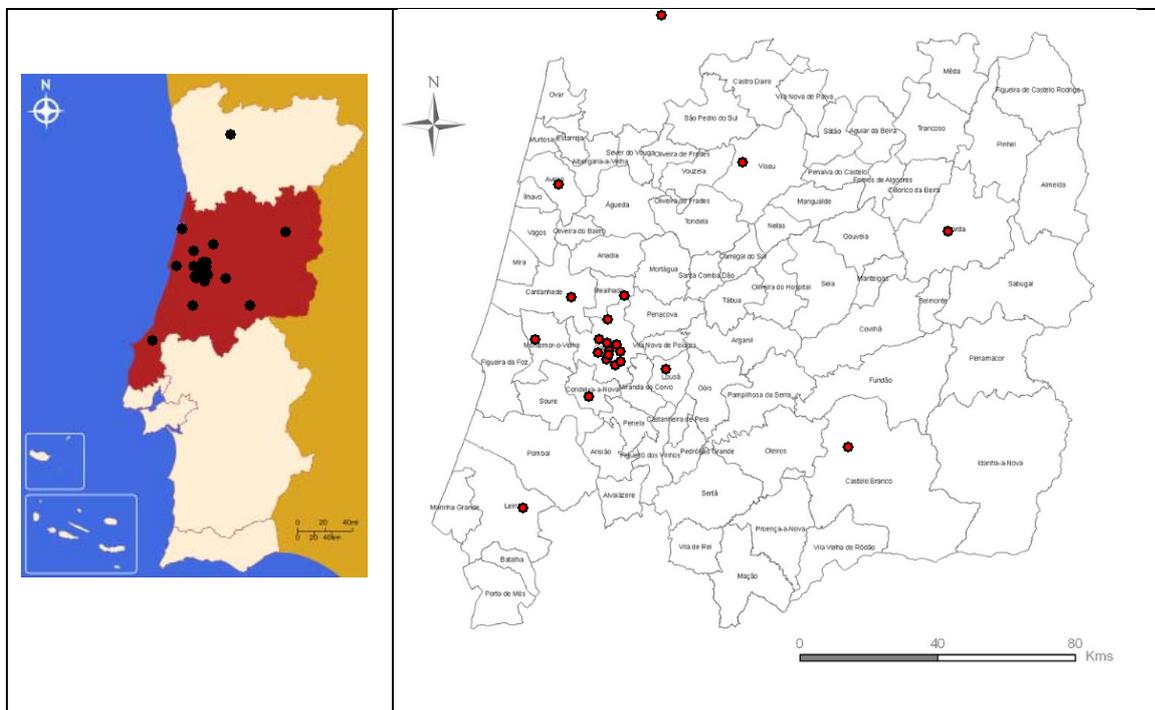
Homeowners and energy-related renovations in Portugal

An analysis of 23 interviews

Paula Fonseca and Anibal de Almeida
University of Coimbra, Portugal

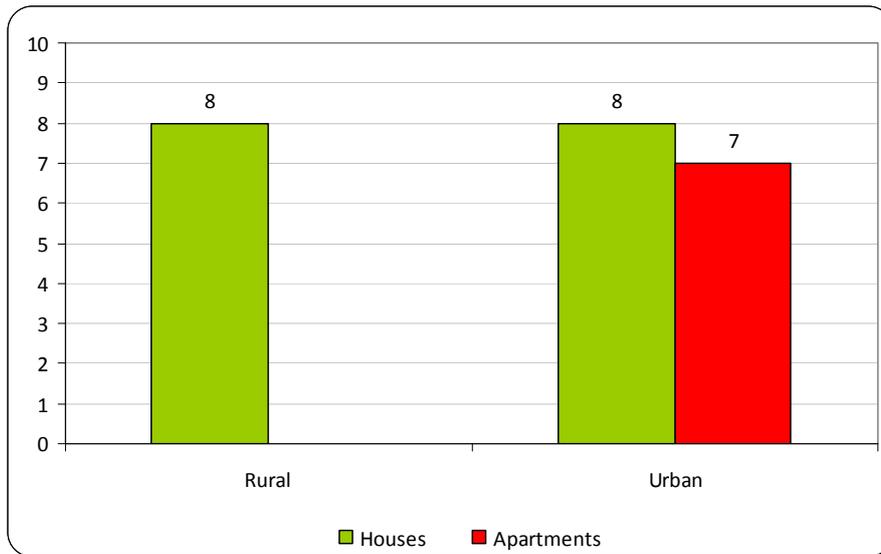
6.1 Informants and their home

Since in Portugal, Energy Performance Certificates are only mandatory as of January 2009, we have only searched for people who had recently bought a second hand house, and who lived relatively close to Coimbra (target group) in order to avoid long trips, that would make it more difficult to schedule the interviews. Coimbra is the largest city of the centre region, with about 100000 inhabitants, and the one of the six largest cities in Portugal. In terms of economic activity, the largest contributor to the GDP is the service sector, with the public services accounting for the largest share. Therefore, the vast majority of people living in Coimbra and neighbourhoods are graduated. As a consequence the sample lacks larger variation of socio-economic and social context informants, but is representative for the Coimbra area.



The common panorama in Portugal, concerning the target group, is to buy a second hand house/apartment in the best condition as possible so they do not spend more money renovating it. Since there are many houses in the market in Coimbra and in the country, the offer is varied, it was quite challenging to find people who bought a second hand house recently, and had made renovations! Fortunately it was possible to find 23 homeowners who were interested to participate.

Usually, younger people move in to a second hand house because they can not afford to buy a similar new house, and older people move in to a second hand house because of the location, need for more space and for a garden, inheritance of the house, and changes in their lives, like getting divorced. About 65% of informants live in urban places and 35% live in rural places.



Number of informants living in houses and in apartments, in rural and in urban areas

In line with the actual desegregation of houses and apartments in Portugal (houses 65% and apartments 35% ["Atlas da Habitação de Portugal, Instituto da Habitação da Reabilitação Urbana, Universidade Católica Portuguesa, Dezembro 2007"]), the sample includes a larger proportion of houses (70%) than apartments (30%). Fortunately, it was possible to have 3 houses and one flat with an Energy Performance Certificate.

While for the first wave of interviews all informants were friends of friends, for the second wave different approaches have been considered to find the target people: people we knew or through friend's friends, acquaintances, etc., (6 informants), contacts with real estate offices to find people who bought a house recently (2 informants), contacts with the National Energy Agency (ADENE) which has identified a list of potential candidates from the national buildings certification database (3 informants), contacts with qualified experts who are doing building certification (1 informant), and also contacts with builders/contractors (4 informants). There were two volunteers who knew about the project from the web-site. The most effective way was by far friends of friends.

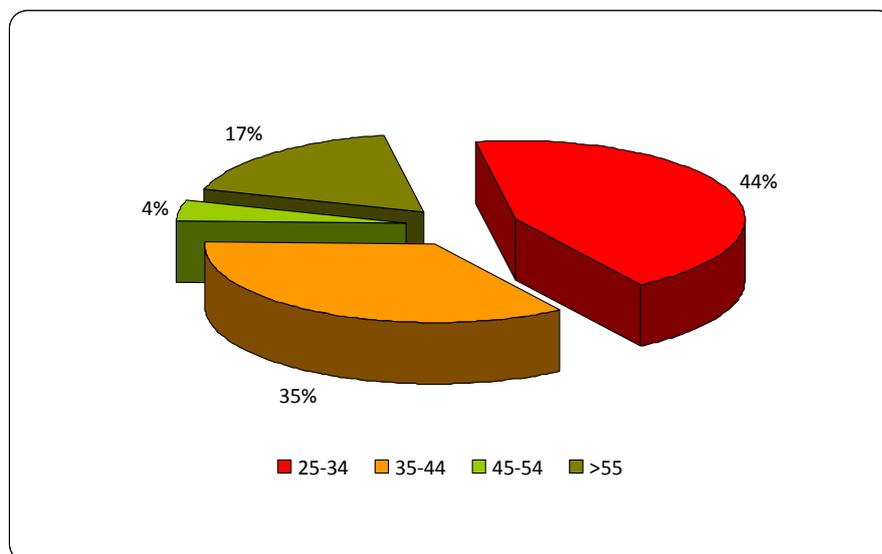
Two different groups can be clearly distinguished. The main indicator to group the informants is their long or short term perspective for staying in the dwelling. This indicator is related to the fact they are buying their first house, their second/third house or have inherited the house. Of course this indicator is also related to the age of the informants. Young people are more likely to be in the first group, while older people are more likely to belong to the second group. Informants in the first group are in the age range 25-34, and informants in the second group are in the age range above 35. The lesser number of informants in the >45 range is related to the fact that older people do not move in so frequently. Second/third house means it is the second/third time they are moving to another house, it does not mean they own two or three houses.

	First house		Second / third house	
	25-34	35-44	45-54	55+
Short term perspective	Long term perspective			
M&M	JF *	I&C		M *
M&P	Lil *	JN *		MCM *

C	AC *	H&C *		AM *
RJ	AL *	S *		AB *
BL	RM *	Mil *		
		Ln *	CJ	
		LA*		
		Nls *		
	10	8	1	4

* Informants who carried out energy related renovations. As it can be seen the long term perspective is determinant for people to carry out energy related renovations.

10 females, 9 males and 4 couples gave the interviews. The age distribution of the informants is shown in the next figure.



Social context of the informants was quite similar within the age range and even within the sample. All informants, except three, are university graduated in different disciplines, in particular engineering (5), psychology (2), architecture (3), pharmaceuticals (2), maths (1), languages (1), law (2), economics (1), primary teacher (1), biology (1) and design (1), and four of the informants hold a PhD. The level of energy efficiency awareness is very different from informant to informant even within the same age range and within the same discipline. Motivation for carrying out energy related renovation works can somehow be similar within the age range. Younger people with a short term perspective is living in temporary houses and therefore do not have motivation for carrying out major renovations, while those informants with a long term perspective, carried out energy related renovations.

BL, 61-62: "this is a house for some years, because the building is quite old.... Probably in ten years I will look for a more recent apartment"; 98-100: "Basically it was a question of budget. And because it is temporary..... I did not want to invest more if I am staying here for five six years. I did not want to loose money".

Middle aged and older people who moved recently to a new house, had already some experience of life and they think about a house for life, therefore they are the most concerned with energy efficiency renovations. There are some exceptions, related with the awareness of the informants (MCM) and the income/wealth (CJ), leading to aesthetic concerns only and to complete careless with the energy bills, respectively.

MCM, 423: “Look, to be honest it was aesthetics only” – when asked if she cares with the characteristics of the materials. 1234: “I don’t know what that is, to be honest I don’t know”- when asked about the performance certificate.

CJ: 568-582: “We have already spoke about that – referring to the installation of solar panels- he is very idealist, he wants everything beautiful, perfect but he doesn’t care about making accountshe doesn’t care with the bills! What matters is that everything is perfect.... “impeccable”..... Some of these days I told him: Look two bottles of gas in one month, this is too much! Each bottle costs 88 euros!. He has no idea about our bills... he doesn’t know if we spent two bottles of gas or one bottle.... Or how much we paid for energy I am the rational part. I am the one controlling the bills. But I do not succeed with my concerns, because he only does what he wants to do!”

Besides age, good level of education of the informant has stronger influence in his decisions and in his energy efficiency behaviour (Ln, LA, AB, Lil, RM, Nls, M). On contrary, people ignoring energy issues, associated with high income, like CJ husband, is a break for energy efficiency improvement measures. Sentimental connection with the house usually because it was inherited, (Ln, AB, MCM, M, H&C) is also an important driver for renovations, but is not a determinant factor for energy efficiency renovations (MCM, H&C). Good awareness about energy efficiency is needed to motivate people to take action (Ln, AB, LA, JN, JF).

It was not asked, but it is possible to conclude that the average economic status of the sample is medium class and medium/high. Only three informants can be considered very high class society (CJ, AC and M).

With the exception of AM, who got divorced recently and therefore had to look for a house because he was living in a rented flat, the other informants in his age group, moved in because they inherited the houses when their parents passed away.

Among the informants, most were very talkative, who explained every work carried out in detail (LA, AB, M, AL, RM, I&C, R, ...), but there were also very restrained persons who did not talk much, who gave very short answers (Ln, C, H&C, S, BL). Sometimes I got the feeling those felt intimidated because they felt they were somehow being evaluated.

In terms of gender the sample was balanced: four couples, nine females and nine males, however, without some exceptions, such as M and Lil who were aware of all the works, males were better informed than the females about the details.

Generally speaking all informants except RM, admitted they are concerned with climate change and environmental impacts of energy, but indeed very few informants were able to relate the impacts of energy production in the environment.

Mil, 532-538, “we care quite a lot with the environment, I use to see the Quercus programme on TV, and I have learnt from there how to protect the environment and I try to pass this information to my children, at least I tried that they think about the nature... they need it, they should preserve it”. [Note: Quercus programme is a short TV program that teaches people to save energy, to be more energy efficient]. 638, “We all see that in terms of temperatures, the climate is changing, isn’t it?... slowly, but it is changing... and this is also because of our activities here in the world ...”.

C, 127-129: “I think we should be extra careful with these questions, because they are indeed related with the environment, but why and how they are related, I don’t know”.

People also tend to mention they are interested in renewable energies when asked about climate change and environmental impacts of energy. This is because it is “the sexy business” of the moment in Portugal! It is fashionable to like renewable energies, to want renewable energies, to think green.

Environment, climate change and renewable energies are a concern for many informants, but it is the energy bill that makes people acting when it comes to behaviour changing. Social desirability can be identified when the issue is environment, climate change and environmental impacts of energy.

Mi, 525-528: Do you speak about energy consumption with your friends, or relatives? “Yes, sometimes, about electricity and gas consumption, especially when my bill rises up”.

6.2 In-depth analysis

- o Recurrent repetitions in several interviews and interpretations

Repetitions of words such as: well, so, therefore, yes, of course, ...are used quite often to reinforce own ideas or give emphasis to what they were saying.

An interesting aspect is that many informants tend to finish their answers with “Right?”, “Isn’t it?”, “You see?”, “Do you understand?”, as if they were waiting for the interviewer to answer they were right or wrong, if what they were saying wasn’t nonsense. This shows the fear of the informants of being evaluated and failing the answers:

C - 71-73, It is having the necessary conditions to feel good, right? And mainly, that energy thing, that is true. My house, regarding that aspect, in the winter is too cold, it is not as comfortable as I would like.”

AB - 946- 957, “... I think it is absolutely stupid, the huge amount of money I had to spent to carry out works in my property, do you understand?”

There is usually one person in the house that is more concerned with saving energy than the others, and this person usually is chasing for energy waste! (M, AL, H&C, LA, CJ).

M 236-239, “... Not me, I’m always turning off [the lights]. I’m always worried, always. My father was like me. It’s a familiar illness”; 251-252, “I go crazy. I get despaired when I see things on. If it were on me, Portugal would save a lot”.

H&C, 763: “Although you pay a special price this doesn’t mean it is free... Sometimes he forgets about this”.

AL, 674: “I try to turn off all the lights that are not needed, I do not have appliances on when they are not being used, etc... this is coming from my house [laughs], my husband is the opposite. Therefore we speak many times about..... savings... I have to call his attention”.

CJ, 568-582: “We have already spoke about that – referring to the installation of solar panels- he is very idealist, he wants everything beautiful, perfect but he doesn’t care about making accountshe doesn’t care with the bills! What matters is that everything is perfect.... “impeccable”..... Some of these days I told him “Look two bottles of gas in one month, this is too much! Each bottle costs 88 euros!”. He has no idea about our bills... he doesn’t know if we spent two bottles of gas or one bottle.... Or how much we paid for energy I am the rational part. I am the one controlling the bills. But I do not succeed with my concerns, because he only does what he wants to do!”.

When informants are pride with the renovations they enjoy speaking about it, and give all the details with a lot of enthusiasm, they tried to draw a picture of what has been done; they even invited me to visit the house (LA, AB, MCM and AL). M was also enthusiastic but the interview was already in her house. This is probably because they had never the opportunity to speak about something they were deeply involved and therefore they take this opportunity to speak and speak. And they were happy to contribute.

There were many sentences that were not concluded during the interviews. This is a sign of lack of confidence among the informants and therefore they tend to be vague. They fear to say something wrong.

○ Recurrent hesitations in several interviews and interpretations

Hesitations were common when speaking about comfort. Many informants have difficulties clarifying what is comfort for them, because it is related to many different aspects of the house, from the dimension, the lighting, the sights, the decoration, the style, the temperature, the acoustics, the space around, etc. The same applies to comfort temperatures.

AB, 977-980: "is... is like, I don't know, I don't know what to tell you... What matters for me is to have harmony. This is the first criteria to be comfortable. ... is to feel, have contact with the nature, to be close and at the same time to be far away from nature.... Do you understand? ..."

Mil, 475: "This is a difficult question...comfort is to arrive home and feel well, not feel cold in winter, not feel heat in summer...." [Comfort is associated with temperature inside the house].

S, 161: "... (Silence, thinking) I don't know, so many things... heating, that we did not use to have.....)"

CJ, 587-599: "What gives comfort to my house? Uhm, a nice temperature ... I don't know....is a combination of factors... natural light.....uhm, being isolated from the sounds coming from the outside, that is what happens here, there is little noise outside, but even the noise that exists can not be listen in inside, ... all these aspects".

Sometimes people didn't end their sentences, maybe because they didn't know how to or didn't know what was expected from them. Generally the informants were afraid to misunderstand some questions and they were trying to guess what it was about, they tried to understand if I was satisfied with their answer (Mil, AL, S, AB, ...).

When it turned to insulation (especially walls and floor.) there were some hesitant informants. Insulation is many times not associated with energy savings, with thermal comfort of the house. Insulation is rather thought for humidity avoidance (I&C, S). However it was evident that people associate bad windows and roof insulation with the thermal comfort, with the inside temperatures.

Lil, 92-97: "We changed the roof a bit because we have to improve the thermal insulation of the house, and we start with the roof... thermal insulation, a layer of 8 cm was installed..."

When asked about savings and what they could do more to save energy several informants hesitated and tend to speak in the indirect style. Indirect style is used quite often to speak about global warming as well. For Luis and Lino price was mentioned as a strong and first motivation to save energy. However some informants think they can not save more, because they are already using the less as possible.

LA, 1067-1068: well, well, well... no...it is evident the price is a strong motivation to save energy. When prices rising up people tend to save ...).

○ Recurrent contradictions in several interviews and interpretations

Climate change

People mention they care with the environment but don't acts like someone who cares with the environment. Social desirability, as mentioned above, when people speak about environment and climate change. Only four informants assumed they are not concerned with global warming and climate change. All these informants are well informed. Few informants (M&P, RM; Lil)

mentioned that they can't do much as an individual, however Lil is quite committed with reducing her carbon footprint.

Energy efficient behaviour

Some informants mentioned to care with energy savings but their behaviour is inefficient and irrational. Like the case of I&C, who heat the house and open the windows, or M&P who heat the house for the pet. Things like leaving the lights on are also common.

There is a concern among some informants that has to be with heating the entire house or only the rooms where they spend more time. There is still the myth that if you keep your house warmth during 24 hours you save energy. Marta& Pedro are considering this practice, while other informants are not sure if heating only part of the house is the best practice in terms of saving energy.

I&C, 501: "We then care with the ventilation of the house. ...the fact that I ventilate the house hinders the optimisation of the heating system. On one side I heat the house on the other I am ventilating it, so I have many losses".

Energy savings / Money savings

A common mistake is that people tend to confuse money savings with energy savings. In Portugal, the Energy Company has a special tariff, with two prices, one for during the day and one for the night. At night, electricity is cheaper, but one consumes the same electricity. But people seem to believe they are saving energy this way (M, I&C, AL).

M: "I'm a person who likes to go to bed early, but usually I wait for the bi-schedule time".

Renewables

People mix energy efficiency with renewable energy technologies. Renewable have been disseminated in Portugal quite a lot and there are attractive incentives for the installation of solar panels (tax deductions) and micro generation (interesting feed-in tariff). It is a sexy business and is fashion to have renewable at home. However people do not clearly understand why we should use renewable. AM for example mentioned he doesn't like solar panels, because of aesthetics, but he would like to have PV panels installed in his roof, which are far more expensive and less cost effective. Solar panels make a lot of sense in Portugal because the number of hours of sun is large, but PV panels do not make economic sense yet. However only very well informed people know about this! Therefore I think what makes people interested in PV is the feed-in tariff available in Portugal, that is very high (56€ per kWh feed into the grid). Feed in tariff is the driver for renewable, generally speaking.

AM, 506-509: "I have been seen solutions that nobody can realise they are there, in the roofs, in particular PV panels... hum... I don't know... well, I think I would not mind to have such type of solutions, those are welcome!"

6.3 Reason(s) to conduct energy-related renovation work (Levers)

Considering the levers for conducting energy related renovations there is clearly a division between house for life (either apartment or house) and temporary house, which is directly related to the age range of the informants. People living in houses that they consider as temporary do not have incentive to carry out energy related renovation works. They are willing to invest only in low efficient measures, and therefore no energy related renovation works are being undergone in temporary apartments that are being inhabited by the younger informants (RJ, M&M, C, M&P, BL), with the exception of AL. But she is an exception, she would not mind to live in her

apartment during her lifetime, but there is no lift and she lives in the fourth floor! On the contrary, people in the forties, already established in life, who move to a house that is considered to be for life, or at least for a long period, are willing to invest in more expensive energy efficiency measures, including energy efficiency renovations, under certain limits. The renovations are typically very well planned by the homeowners, or with the help of professionals (architects, builders, contractors and installers). Well informed persons, awareness informants prefer to be autodidact and they lead the works.

Increase comfort

Comfort is always related to the inside temperature, but also with aesthetics, functionality, sights, decoration, size, style, orientation, acoustic and cosiness. Increase the thermal comfort of the house was the first motivation mentioned by all informants who undergo energy related renovations as well as by those who did not carry any energy related works. Insulation from humidity was also mentioned as a measure to increase comfort (JN, I&C, H&C, AB, etc.).

H&C: 42-43: "it was old fashioned, and the rooms ... it was more in terms of decoration, but the thermal part did not function that well. Especially in the attic"

Ln, 218: "Because I try to have the best comfort that is possible at a reasonable price".

Convenience, functionality, cosiness

The redesign and rebuilt of the interior of the houses were an important driver especially in those very old houses because they were not convenient for the actual standards of living, the divisions were too small (JN, Ln, AB, NIs) or too big (MCM), the space was like a maze (AL and MCM)

JN, 94: "All the indoor space and the resizing of the divisions had to be carried out".

Ln, 31: "...I knew what the house needed to be pleasant...; line 72: try to improve the space, better sizing, more pleasant".

AL, 99: "the most important renovation was to create the open space in the living room, it was the best thing we have done; 502 505: the space is much better now, without those walls The house is cosier and more pleasant, less maze now!"

Old house / depreciation

The renovation of the interior part of the house was an important driver especially in those old houses that were damaged, depreciated, because of the age (MCM, JN, Ln).

Ln, 40-48: "Yes, I carried out renovations.... I only kept the façade because the house belong to an historic monument and I was not authorized to change it, and because the façade walls are interesting in terms of thermal inertia so it did not make sense to destroy them".

Energy bill

For several informants the energy bill was the driver to undergo energy related renovations and in particular to install solar panels (in this case, especially because incentives are available from the government). An increase in the energy price would make informants more active in terms of saving energy.

AC - 430-431, "... when I decide to install the solar panel I was thinking about the energy consumption..."

AL, 565-566: "Well, everything that contributes to reduce our energy bills and at the same time to improve the environment we are really keen on it".

Ln, 409: "An increase in the energy price".

House/apartment for life

When people intend to live in the house for their life they were willing to invest in energy efficiency renovations (LA, Ln, M, AM, S, ...).

House for life is the prime driver for energy efficiency renovation works, even for people with shortage of budget (S).

Ln 12, "I decided to move in because I inherited the house so I decide to retrofit it because it was a good place to live!"

LA, 56-59: "I was looking for a good location, more independency, a good solar orientation, I prefer a south façade house, and to be located in the centre; line 61-62: to have a reasonable area, to have more space than we had in the flat".

RM, 65-67: "Can it be a house for life?... Yes, that is the idea, that's why we bought a larger apartment"

Advice from the contractors and or friends

Contractor and friends advices were important to carry out energy related renovation works (Mil, LA, AB, Ln, H\$C, ...), (see section 6).

*Ln, 138-139: **It was you who specified the thermal insulation for the roof?...** It was specified by the architect!; 264: "The solar panels were suggested by the installer."*

Socio economic context

Socioeconomic context has a moderate impact in the energy related renovations. Older people, already established in life, usually have better socioeconomic situation, and with a bigger economic availability, but this alone is not the driver for the renovations (CJ). But of course socio economic situation is important to carry out renovations (M, Ln, AB, LA).

Good Knowledge / Awareness / Learning Skills

Well informed persons, high capacity to research and learn (learning experience) are important drivers for energy efficiency works (JN, LA, ...). Long learned behaviour about environment friendly behaviour was also important for Ln, AB and AL. S and LA, two informants with different social context in the same age range are both autodidact persons who have been directly involved with the works and the planning. Their capacity and keenness to learn was impressive and they were active implementing energy renovation measures.

LA, 318 "learning is what we, researchers, know to do better, isn't it?"

S, 279: "I research myself about all issues, and then sometimes I have to ask to specialists".

Others

- Only few informants mentioned to spend more energy in winter because they can't stand the cold (I&C, M&P and BL). It is interesting to see that all are living in the inner part of Portugal, where the winters are really cold. However all informants related the comfort of the house with the temperature. AM and BL have mentioned the cold as well, as a driver for the renovation of the windows, but his motivation is his chronic disease (rheumatic arthritis): he feels better with middle temperatures around 22°C (20-22°C). All informants related the comfort with the thermal performance of the house, with the temperature inside the house. 20-23°C is the preferred range temperature.

BL, 205 "I have (thinking of replacing the windows) because of the cold....because we can notice that those windows are not insulating, but to change all the windows it costs quite a lot for me. And I think it does not compensate...."

- **Age and long life experience** alone is not a driver for energy efficient renovations. Like the example of AM and MCM show, the main driver is comfort, convenience and cosiness. Special emphasis is given to cosiness in the older age range (AM, MCM and AB).
- **Efficiency concerns** were evident for some informants (Ln, LA, S, I&C, JN), but were absent from the majority of informants.
- **Sentimental connection**
There is a strong bond with the houses when they are inherited from parents (the situation in all cases), and this is an important driver to carry out the renovations, to maintain and improve the houses, once the informants know well the weak points of the house. This aspect is very interesting because it contributes to the improvement of the building park.
- **Previous experience with renovations**
AB had already renovated his old apartment twice. Therefore he had a long experience that was most positive for this renovation: he could learned and avoided mistakes of the past.

The following table summarises the main drivers mentioned by the informants for carrying out energy renovations. The criteria used to split the levers was gender of the informants, considering female, male and couples.

Summary table with the main drivers for carrying out energy renovations, per gender

Population	10	9	4	23
Main LEVERS:	Female	Male	Couple	Sum
Increase comfort	7/10	9/9	3/4	19
Energy bill	7/10	2/9	1/4	10
Advice from the contractors and or friends	3/10	5/9	2/4	10
Old house / depreciation	2/10	4/9	1/4	7
Convenience, functionality, cosiness	4/10	6/9	1/4	11
Good knowledge, Awareness about EE	4/10	9/9	0	13
Dwelling for life	3/10	6/9	0	9
Economic availability	1/10	3/9	0	4
Acoustics	3/10	1/9	0	4
Financial Incentives (personal income tax deductions, ...)	3/10	3/9	0	6
Environmental consciousness	1/10	2/10	0	3
Sentimental connection	2/10	2/10	0	4
Conservative Education	3/10	1/10	0	4

Interviews made to couples are far less productive (informative) than interviews made to one person alone. Probably, when couples are together they fear to say something wrong and therefore they tend to speak less, or they wait for the other to answer the questions and therefore none of the informants give detailed information. Economic availability was not particularly mentioned as a driver for renovations. Increase comfort, cosiness, convenience and the energy bill are far more important drivers than economic availability.

6.4 Brakes to conduct energy-related renovation work

Economic constraints

Lack of money, shortage of budget, was hindering many informants to carry out energy related renovation works.

Financial constraints are also avoiding people to look for specialized consultancy, for specialized advice, and therefore they rather get advice from friends and investigate on the internet, leading to wrong decisions sometimes.

I&C, 242-243: "And many times we took wrong decisions....but we only realise about that after we have taken the decisions".

C - 67, "I would, if I had the money, I would."

LA: 151: "we decided to keep the old wood in the floor, because it is recommended in the books, and it was less expensive"; we excluded the hypothesis of installing wood framework windows because the price was double the aluminium...";

H&C, 82: "Because of the price..."; 83: "Budget issues"; 498: "It's the financial question..."; 505: "When we have money!"; 506: "When we have money!"

S, 95: "We can not modify everything at once – referring to budget".

Lack of information / Awareness

People is aware of the efficiency label of appliances, but when concerns the performance of the house, they are not so well informed. People ignore the labelling of the houses, and the impacts that some renovations could have on the indoor comfort and efficiency level of the house. Even those that have already heard about the EPC do not know exactly what it is about, with some exceptions.

Good conservation of the house

The fact that the house is well conserved can delay or even postpone the energy related renovations to be done. H&C mentioned he did not even think about insulating the walls because it is a good construction (he was referring to a solid construction). LA decided to keep everything that was possible because the house was well conserved. Therefore the floor and the walls have been kept and have not been insulated. The same situation with AM, but he is convinced that large walls are very good to keep the temperature inside the house at comfortable levels, both in winter and in summer.

LA, 124-136: "Exactly, well we considered several options, one hypothesis was to rebuild everything, to construct new floors and new roof based on concrete. That will be a new house the only thing to keep was the façade. Hum...we vaguely thought about this. We always thought there was no need to rebuild everything, because the house was there for 100 years, with good quality, why should we retrofit everything? Why should we replace the wooden floors by concrete floors? Hum well we decide to keep most of things and besides there was an extra charge to retrofit everything. And the new house would not have the charm of the woods inside.... to remake all those wood finishing would be hard and so we decide to keep everything like it was...".

AM, 84-96: "110 years old... and we look and realise it is a good and solid construction, it seems more recent! Well there is a small problem... the walls are very large....but this is also an advantage....keeps the house fresh in summer and mild temperature in winter".

Temporary apartment

When the apartment is seen as a temporary one, there is no motivation to carry out energy renovation works. This was appointed by the younger informants as one important break for conduct energy-related renovations, (RJ, M&M, M&P, C).

M&M - 162-167, "Yes, yes. I mean, this apartment is just... It's an apartment we want to be temporary, for just some years. The objective is to build, build... Or at least change. Therefore, we weren't worried about it [efficiency], it was just, we needed a house..."

RJ, 179-183: "Hum, we did not modify because this is not a definite solution.... I do not feel this is the house for my life. There is not this.... There is not this feeling, may be if we feel this was a place for many years we would had invested more in the renovation."

Lack of information and of know how of Installers, builders, contractors / split incentives

Lack of information and know how of installers/builders who try to sell what is more convenient for their business instead of selling what is more convenient for energy efficiency. Many contractors lack know how on carrying out works that are different from what they used to do. They lack professionalism, they learn the job from their parents and they do not take any training or studies to get more insight.

I&C, 412- 415: "They have the information but they also have a lot of materials on stock, therefore they try to sell what they have on stock, and they ensure there is guarantee, they give assistance, but it is not a professional technical assistance, the assistance has no quality at all... they try to correct mistakes with other mistakes..."

LA: 340-343: "Well, ... let me say that the workers were not very professional....sometimes I had to ask them to redo some works! I think this is a national problem, our building workers lack awareness, they are not well trained; they only have the knowledge from their practice, and therefore more specialized works are not well done."

Historic centres / Obligation to keep the façades

Old houses, and or houses located in the historic centres are not authorized to make changes on the façade of the house (I&C, Nls). The same applies to houses belonging to historic monuments (Ln). Some measures related to wall insulation are therefore not carried out, because those houses typically have very large walls and to install insulation from the inside would mean losing space that people are not interested in (AB, Nls).

Ln, 268-272:" normal insulation against humidity, but I would like to install thermal insulation but the existing walls did not enable to install it because of the stone work in the windows ..."

LA,: The façade walls have not been insulated. He wished to install some kind of insulation, but it was not feasible to install insulation in the old façade. Aesthetics avoided the installation of insulation.

605-609: "Hum, we think about insulating from the inside, but it was not feasible as well, because of aesthetics"

Condominium limitations

AL and RJ mentioned the difficulty of implementing some renovations, like wall insulation, and or installing equipments, like solar panels, because they live in a multi apartment building.

AL: 532-537: "In this apartment installing solar panels seems not to be a good option ... it is a four floors building... it is more difficult. We know there are incentives and it was not the case those we didn't like to install, but it is a large investment, although the incentives...."

Rush to move

At least two informants revealed they were in a rush to move. Rush to move was hindering AL's husband to prepare a detailed planning of the works. The same situation with H&C, who only had four months for the renovations because he had sold the flat where he used to live, and had to move in. AM is not going to enlarge the windows, to have more natural lighting as it is his wish, because the process of changing the façade would take too long time.

AL, 184: Well, my husband has started to prepare Yes... we did not have a long time because we were in a rush to move. But yes, he had time to design something”.

AM, 173-176: I will keep all the windows obviously, and I am not doing more because this would modify the façade... and at the end, this would delay the process and I am dying to move in, of course [laughs]”.

- **Investment criteria**

Measures with a long return on investment were not attractive for the informants and were a barrier for the installation of solar panels and PV panels (RM, H&C, AM, AB, MCM). Although there is a campaign of incentives for solar panels in Portugal, the long return on investment continues to be a barrier for their installation.

MCM, 1099-1103: “I thought about installing solar panels. Vaguely, but I thought. But one cousin who lives in Alentejo (in the south of Portugal), she is a sciences woman, and she had done the economic analysis and concluded that the investment is huge and it does not make sense for us (being 60 years old), because we can not recover the investment. She mentioned that only young couples can recover the investment during their life.”

The following table summarises the brakes hindering energy renovations to be carried out, that were possible to identify in the sample. The criteria used to split the brakes was gender of the informants, being female, male and couples.

Summary table with the main brakes for carrying out energy renovations, per gender

Population	10	9	4	23
Brakes:	Female	Male	Couple	Sum
Budget constraints	5/10	2/9	3/4	12
Good conservation of the house	3/10	3/9	0	6
Temporary apartment	3/10	0	2/4	5
Lack of information and know how of Installers, builders, contractors, owners	2/10	0	1/4	3
Location in the historic centre / keep the façades	0	4/9	1/4	5
Condominium limitation	2/10	1/9	0	3
Rush to move / rush to carry out the renovation	1/10	2/9	1/4	4
Investment criteria	1/10	3/9	1/4	5

Economic constraint is by far the most important brake mentioned during the interviews, followed by the good conservation of the house. The obligation to keep the façades or location in the historic centres was mentioned 5 times, and this leads to the paradigm of rebuilding the historic centres of the cities, an urgent need in many Portuguese cities. However the EPBD methodology, when evaluating the performance of these buildings, does not take into account the technical unfeasibility of some improvements, and thus the impossibility of reaching A or A+ levels in these buildings. Therefore they will never be eligible for the available financial

incentives and owners loose interest in their renovation. All informants mentioning the temporary house as a brake for carrying out renovations are living in apartments, and some mentioned the condominium limitations as well.

6.5 Impact of Energy label of the house (or audit)

4 out of 23 households have an Energy Performance Certificate (AM, RM, Nls, AB). Although they recognize the usefulness of the EPC, they were not influenced by the recommendations given in the certificate. None has considered the EPC for planning the renovations. Not because they do not trust the certificate but because they had already decided about the renovations to carry out, either energy related or not. The Certificate was ordered just because it is mandatory for the notary when asking the municipality for the permission to live in the house (municipal licences).

AB, 1139-1142: "for me the energetic part makes a lot of sense, but the acoustic part did not make any sense, especially because this house is located in the top of a mountain, without any neighbours, only the nature around..."; 1130-1134: Of course I have the certificate, it is stored in a drawer.... I need it to show it in the municipality ... It is there, waiting to be showed to the municipality;

AB, AM and Nls could not remember all the measures recommended in the certificate, and did not consider the label for the renovations. RM could remember the measures but since he had already decided to implement 3 of the 5 recommended, he did not consider the information in the certificate. They were obliged to have the certificate for the notary, and that is why they got it. All have planned the works and made decisions on the measures to carry out, before the certificate was issued!

AB, 1124, "well no... I read it but I think there was not nothing special.... I do not know"; 1126-1127: "may be there was something... but I can not remember... it was along time ago...."

RM, 465-467: "I was not surprised. In addition I am not worried about it because I am doing renovations and I am sure the efficiency of the house will improve."

AM, 720-721: "Yes there were some recommendations, but in fact we had already thought about them. Therefore they had no effect."

Informants who know well the Certification of buildings process (RJ and Nls) were quite critical about the methodology used for giving the efficiency range of the houses, because it was not giving importance to the building envelop and was directed at end-use appliances. AM and RM also have a similar opinion, although they are not so well informed about the EPC as it is RJ and Nls. According to RJ, the way buildings are being rated is not the more correct and transparent way, as many houses with a really bad building envelop can get the same efficiency classification rate as very well constructed houses, having good envelops! This unfair situation should be corrected soon, she thinks, with the revision that was carried out in the methodology to rate the buildings. AM is convinced the certification is more directed to end-use devices than the building construction itself and the way it is working is not the correct one, will not transform the building stock into good construction. The certificate should not come after the house is built but before its construction, giving recommendations on the type of pavements, type of insulation, etc.

RJ, 380-383: In reality our regulation is done in such a way that emphasizes the contribution of the hot water equipment production and the HVAC equipment.... These equipments have a major weight for the efficiency rate.... But there is a revision undergone..."; 394-398: "Well, at least there should be a classification for the envelop and a separate classification for the equipments.... Two different labels."

AM, 698-708: "... I think the building certification is pretty much related to the appliances, because it is easier..... we know the efficiency of the appliances when we buy one, because they have been tested. But for the buildings the certification has to be thought in a different way... because the performance of the building depends on how it is built... so the certificate can not come after the house is built.... Has to be different.... Otherwise what they can tell is: you have a temperature below the desired levels, so you should install a heating or cooling system".

In old houses with very large walls, installing insulation is often not feasible neither in the inside, because it reduces the area, nor in the outside because of the stonework's around the windows. People don't like such measures and they are not implementing it. In fact, very large walls are very good for thermal insulation; they enable a good thermal inertia. However the certification methodology, being based on the end use appliances only, do not benefit old houses with very large walls. This problem has been mentioned by Ln, JN, LA, AB, Lil, AM. Hopefully the revision of the methodology will give emphasis to the building envelope. In relation to the certification of the existing buildings, and possibility of getting a tax reduction if a A or A+ rate is achieved, RM mentioned that it is very difficult to reach these efficiency levels in existing buildings! This is an unfair situation, and he suggested that for existing buildings, the incentive should be possible for those buildings that raise at least 3 levels, for example.

RM, 512-517: "Improving the energy performance of buildings should be promoted, mainly for new buildings. In the old buildings it is difficult to improve its performance for levels that give us access to financial benefits. Therefore, every building that is retrofitted and improve its efficiency by three levels (for example) should have access to financial benefits...."

There was one informant, M, who thinks label should had been mandatory already some years ago, when she carried out the renovations, because she believes they are important to maintain quality and to demand a higher level of quality to professionals and contractors.

Maria, 586-587, "I believe so, I believe they are highly important, specially to end with these crooks."

S, who has been involved in the certification of his old flat recently, thinks the Certification is not being well implemented. He thinks it should be possible to make a pre-audit check to investigate about the label of the house/apartment, without issuing any Certificate, without paying the Certificate. The owner of the house should then be obliged to make improvements to increase the rate of his house, thus enabling him to sell the house for a better price. This is the way to transform the building stock, he mentioned. LA has a similar perspective. On the other side, H (H&C), who has also been involved in the certification of his old flat, thinks the certification is of no use. CJ has a similar perspective, and she was not willing to pay to get the certificate, once it was not mandatory in the notary.

S, 598: "ex-ante evaluation before issuing the certificate, enabling homeowners to carry out improvements".

H (H&C), 864:868: "No. It is something that won't bring us any added value....; only if we would want to sell the house, because it is mandatory".

*CJ: line 729-732: It – the certificate - was not requested in the notary, but I know that it should be the owner of the house who had to arrange it. Well if I want to have the certificate my brother can do it....; line 754-755: And so, it was another.... – **referring the certificate as another expense-** ... it did not makehe told me: if you want it I can issue it in one day....; line 779-785: I don't know – speaking about what could make her more interested in the certificates- I don't know [laughs]. I would like to have suggestions to improve the energy efficiency that is it. This is something that we – **her and her brother-** can speak about at any time; well we did not had the opportunity yet. We do not met very often, and stay together little time. But to have the paper – **meaning the Certificate-** I do not see any difference – she was trying to explain that the*

certificate was not an added value, and besides she had to pay for it... it was an extra expense that she wanted to avoid once it was not mandatory.

Lil is quite optimistic in relation to the buildings certification; she thinks we are moving towards a better behaviour. She is convinced people are becoming more and more consciousness about the benefits of savings, about the benefits of reducing their carbon footprint, and soon the EPC will have a major role in the selection of houses.

Lil, 707-717: "About the building certification, I think it is a question of consciousness. So far, we only care about the consumption of appliances because those already have a certificate for a long time. Now, with the houses it is exactly the same situation, we will take consciousness about the energy that is necessary for one house to be functional....we will see this house that will use less energy to perform than that one... and we will care. The EPC will become common All people will be used to the EPC and all will want the A+, all! I think this is the way for the EPC. When all houses have the certificate people will look to the houses the same way they look to refrigerators."

6.6 Roles of the actors (professionals, relatives, acquaintances ...)

For each type of actors, explain the role they played in doing or not doing energy-related renovation works.

Professionals

It is very important that professionals (builders, contractors, etc.) have the correct knowledge about energy renovation works since many people seem to rely on their advice, when they trust them. People tend to choose contractors based on the trust and on their previous experience, as well as on the guarantees they offer for the long term (AB, LA, AL, L, H (H&C), Mil, S). However, in many situations it is not clear if the contractors have professional skills related to energy efficiency renovations. Many times the friends help identifying good contractors.

Mi, 344: "Yes... the builder has helped us!"; 233-234: it was the builder who suggest us to install insulation in the attic because it was better for comfort, it was better for winter to avoid cold coming inside the house, and I think this was a good thing."

H (H&C), 129-130: "I told him that: "I want a new water piping ... for the maximum amount of X. And he carried it out. And I knew in advance he would do it well. I already knew he worked pretty well....."

AB: 620, "I visited some constructions he has carried out and I liked"; 592: "they built well and they have a good attitude in face of any problem that will arise in the future with the renovation".

AL - 169: "We contracted a builder that we knew already"

AM, 302-314: "Only people that I know, people in whom I trust, because they are going to work on my house and this is something very intimate... the human factor is very important for me, more than the brand of materials, I trust in what these people say to me, their experience".

However well informed persons, informants who were involved with the works, trust more on his own knowledge, or his friends knowledge, than on contractors advice (LA, Nls, ...).

LA, 138: "I bought some literature to understand about renovations"; line 180: I asked for advice to some friends but I also studied, I looked at the available literature!; line 321-322: Studying and learning is what we do best, right?... Hum, it is nice to learn new things!..."

Professionals were appointed as responsible for bad works in some situations (I&C, LA, AL, M...) because they did not have the know how to do well the renovations.

M, 400-401, "I had days like this, I went there 4 times a day, to see what they were doing. And then I would say 'This isn't what we have arranged'.

C (I&C), 196- 198: "Contractors do not have the necessary background to be able to advise people. Their knowledge and know how was transmitted from father to son, generally speaking; line 565: "... and the contractor tells me that he does not know how to apply this material!"

Well trained and skilled contractors, well educated contractors can make a difference in the energy performance of buildings, since they can influence positively the informants. However they can have a negative influence as well, like it was the case with Maria. She was considering the installation of solar panels but the installer convinced her that this was not a good solution for her house. Unfortunately she couldn't explain the reason appointed.

M, 195-202 "Regarding energy, we would like to consider, and my husband has been insisting on it, and, at the time, I suggested to the engineer, to install solar panels. But he talked me out of it. He said that it wasn't a good idea, because... I don't know... He explained it to me at the time, but it's not something I understand and I can't remember what he said, but he said that in this house it would be very complicated; because of something ... He gave several reasons. I insisted more than once, because I believed it was time to think about it."

Relatives/Family

Generally speaking, family had not a very important role for the decisions on energy-related renovation work (RM, AL, AB, MCM, Mil ...) to carry out. However family is very important as a shining example for younger people (AL, AC), who tried to follow the parents example in what concerns energy practices and the adoption for energy efficient end-use equipments and energy renovation works.

Mil, 135: "No, only minor suggestions from my relatives, not significant at all".

AC, 94-95: "We decided to install the panel because it seemed to us a good decision, my parents already had one in their home and I was used to it"

Family is most relevant when they are well informed, when they are involved with energy (work or studied like). In some cases, family was pushing the informants for carrying out the energy related renovation works (AM was pushed by his sons who own an energy consulting company; Ln was influenced by his wife who is a strong environmental consciousness. I&C also gave importance to a cousin who works on energy efficiency). The decisions, the planning and the selection of materials were usually made by the couple in a concerted action. In some situations (M and MCM) it is the wife who controls the works, but supervision of the works is usually a task of the male.

AM, line 23 "... we have been analysing and studying about the renovations to be carried out; 122:" well my sons helped me quite a lot"; 124: "As they are related to- he was referring to energy."

Ln, 106, "Did you have any help, any advice....?; My wife."

Acquaintances /friends

Friends who worked on the field of construction, renovations, energy were important both for giving advice on the renovations to carry out and for identifying good contractors and installers for the works (RM, LA, AB, Mil, I&C,...).

AB, 585, "it was friends and acquaintances".

LA, 176-178: "well I had a couple of advisers, my friend Eng.^o BA is the person who I contacted more often, when the works were already going on; 250-257: there was special care in terms of thermal insulation with the roof. I made the specifications, but my friend BA gave me good advice that I took into consideration. This specification was not foreseen in the specifications guide, and it cost more,

however there was no problem with the contractor. He was open to make an amendment of the contract.”

Younger informants do not take into consideration his relatives opinions concerning the house, since they don't have the same interests. Their main concern is the location, nearby their friends. The interest of the group of friends had a strong influence in RJ's decision as well as M&M, M&P and AC.

RJ, 151-153: "The friends, because they are the same age, the same interests, the same tastes.... In some years may be I will have different drivers.... May be I will care more with the floor area and less with the location).

To summarize, positive influences in this sample are:

- To have professional people they knew and trusted (professionals with experience).
- Advices from friends
- Influence from relatives and friends
- Influence from the societal group
- Background and ability to learn
- long track record knowledge from experience learning because of his job
- Having friends and relatives working in the area of energy
- Open mind
- Economic availability
- Environmental consciousness
- Available incentives (income tax deduction for solar panels, possibility to recover the IMT,
- Income tax deductions for the replacement of old windows.

Negative influences in this sample are:

- Budget constraints
- Lack of know how of builders, contractors and installers
- Lack of professionalism: workers who have to redo some works to be well done
- Existing building structures that avoid some works to be done (especially related to wall insulation)
- Lack of awareness, careless with energy use and energy efficiency

6.7 Roles of incentives or renovation programmes, and policy in general

While for few informants incentives are important drivers for carrying out energy related renovation works (S, H&C, RJ, ...) for most informants, incentives are helpful but are not determinant meaning that they would carry the works independently of having or not incentives. However these informants are well informed and they understand the importance of the energy renovation works for the performance of the house. (Ln, LA, AC, RM, Nls, AB).

AC, 419-424: "I would have installed it anyway. For me, it was gold on the blue, because it was in the exact time I though.... well, I was about to think about this because I was in the point to start

thinking about the house, I would had installed it anyway, but I think.... Of course it would be harder because I would have to spend more money and for whom ...For many people it was an excellent idea, because this enable them to install solar panels, otherwise they would never be able to do so, I think”.

It was possible to understand that many informants have bad feelings with incentives (Nls, AB, RM, LA, M, MCM...). Those informants were quite critical about the available incentives in Portugal and the way they are being applied. It is a heavy bureaucratic process to apply for incentives, leading many homeowners to give up. In opposite, there are heavy charges to be paid in order to get the necessary licences to carry out renovations in a house. M referred that the available incentives is a scheme and that one end-up paying more! MCM was quite critic about the available subsidies for renovations. She thinks they are not distributed among those who really need the incentives. They are going to rich people who do not need the incentive, but have better access to information. This is an unfair situation that should be battled. Transparency and unbiased criteria are urgently needed.

AB, 946 : 957, “... I think it is absolutely stupid, the huge amount of money I had to spent to carry out works in my property, do you understand? I think it is stupid the money I had to pay to the municipality, the time I spent there, it is absolutely... to carry out works in my own property, with the care that I have, and I had to pay a lot of money!.... Of course, this was a disincentive... this is not an incentive.... It’s a disincentive ... and most of all, because they cause many delays in the works, If I wanted to live there, do you imagine how long I am involved in this process? Absolutely incredible!”

M, 287-288, “I’ve heard they end-up charging us twice the price, that the houses... and therefore, it doesn’t correspond to what is announced”

MCM, 704-708:”At the first sight incentives are great. Unfortunately I know some abuses...especially when it comes to guest houses..... there are situations that benefit from the incentives but they did not transform the house in a guest house)” MCM, line 710-711: “And the problem is that those people do not have particular need for incentives...while there are many inner places in Portugal where the houses are falling down places where these incentives are necessary.....”

S thinks that more and larger incentives are needed and they should be better disseminated.

S, 396-406: “There are few incentives, very few, and they are not disseminated, there are no advertisement of the incentives when they are available Direct speech and not advertisements in the TV”.

As to government support for carrying out renovations, some informants (M&M, Mil), looked puzzled because they do not seem to know anything about it.

M&M - 223-224, “No, we didn’t look for it, I didn’t even know I could have financial incentives”.

Mil – 423: “Who is giving this type of.....[laughs, she was referring to incentives]....No, I did not....”;
410: “No, I think there are no incentives”.

Nls mentioned the fact that some incentives are announced but in practice they are not running properly, or nobody seems to know how to apply for them. One example is the windows replacement programme in the scope of the NEEAP, which was enacted by law but is not being applied, and is not well disseminated.

Nls, 446-450: “I already listen about several things that are foreseen, but in practice are not working”. 454: “I have consciousness there are incentives but I am going to look for them and I realize they are not real, or the cabinets do not have specific information about the procedures to apply for the incentives”.

Policy is important for some informants who worry about the scarcity of fossil fuels and the impacts of energy production in the environment as well as with the climate change and global

warming (I&C, JN, AL, AB, Ln, Lil). They care about the environment in their daily life, either because they are environment consciousness or because of their jobs, somehow related to environment protection (JN, Biologist researcher).

Lil, 731-735: "We tried that our footprint will be as small as possible... there are some things that I can not change, for example using the car! I can not survive without it [laughs] but the rest I really have a concern, it is already something that belongs to me."

AM is very critic about the policies in Portugal that tend to be too demanding in terms of bureaucracy: there are too many decrees, about the several certification processes needed, everything has to be certified, and about the urgent need to simplify the system, by delivering simple notes with simple messages to the population.

AM, 824-840: "...the legislation exists but to comply with the legislation is missing. I think we have too many legislation and then.... There are so many decrees that nobody reads all the laws....and the many norms and decrees should be simplified. This is the only way to make people to comply with.... The system is failing ... the paradox is that government announces bureaucracy to be reduced, but this is not happening indeed. The only difference is that bureaucracy is different but still exists".

Incentives are generally more related to renewable energies, in particular for the installation of solar panels and micro generation than for energy renovations or energy efficiency (Mil, H&C,). The feeling of the informants with the renewable incentives is quite positive.

6.8 First and main renovations done (even if not energy-related) and reasons

A common behaviour among younger people within the sample, who decided to buy a dwelling based on a short term perspective, is to search for a second hand house/apartment because it is cheaper, and to look for an apartment in the best condition as possible, so that they don't have to spend much money renovating or changing it (M&M, M&P, RJ, C, BL). This dwelling is seen as a temporary house. Typical renovations are painting the walls; varnish the floor, changing the bathrooms, new kitchen, new water piping, etc. The reasons for these renovations are aesthetics, functionality, and convenience of use, style and decoration. Another reason appointed was hygiene (M&P, BL), especially for renovations in the bathroom.

BL, 61-62: "This is a house for some years, because the building is quite old.... Probably in ten years I will look for a more recent apartment"; 98-100: "Basically it was a question of budget. And because it is temporary..... I did not want to invest more if I am staying here for five six years. I did not want to loose money".

M&P, 46: "Just painting, to feel as if it were... that was it; 47: It was almost a matter of hygiene; even though everything looked OK; 48: one feels that the house...cleaning the floor, painting the walls and it is a new."

For the informants with a long term perspective, who admitted the house is a house for life, changing the windows is the first and main renovation, because of cold, because of thermal questions (they wanted to refer to thermal insulation). In addition, changing the windows was mentioned as a second or third renovation for many informants, being the more frequent energy related renovation work. Insulation measures were carried out in houses only. Wall Insulation and floor insulation was mentioned because of water infiltrations, or humidity condensation (M, I&C, AB, Ln,...). Roof and attic insulation was also mentioned several times and the reason is thermal insulation.

Lino, 59-61: "As I already said, there was a major renovation, so it is difficult to enumerate which one was more important.... The replacement of the windows was probably one of the most important".

Two of the older informants (MCM and AM) have other concerns. Their main motivation for implementing renovations is cosiness and comfort, being the replacement of the windows an important contributor to increase the thermal comfort.

About end-use appliances, 14 informants out of 23 have replaced the boiler because it was old, inefficient and in some cases security was also mentioned.

Among all informants the reason for the renovations was to increase comfort, followed by aesthetics/style (too old or too old-fashion) and convenience. Only NIs mentioned energy efficiency as the first reason for renovations, but his motivation is related to his job.

Summary table on renovation works carried out, levers and breaks

Nickname	A/H	Renovations carried out														Levers											Breaks								
		Wall insulation	Roof insulation	Floor insulation	Attic insulation	New Windows	Heating system replacement	Install solar thermal panels	Hot water pipes insulation	Heating pipe insulation	Boiler replacement	Aesthetics / Style / Decoration	New appliances	Comfort	Energy bill	Advice from contractors or friends	Old house - depreciation	Functionality/convenience/cosiness	Awareness /information	Environmental consciousness	House for life	Acoustics	Economic availability	Incentives (tax, etc)	Sentimental connection	Education (chilwood)	Budget constraints	Well conserved house	Temporary house	Location in the historic centre/ façades	Lack of info and know how (installers/contractors/owners)	Condominium	Push for carrying the renovation	Long return on investment	
M&M	A	0	0								1	1	1										0			1	1								
JF	H	0	1			1		1			1	1	1			1	1	1		1				0											
M&P	A	0	0								1															1	1								
C	A	0	0								1	1														1	1								
M	H	1	0	1		1	1				1	1	1	1	1	1			0	1		1	1	1	1	1									
I&C	H	0	0				1				1	1	1	1	1	1							0			1		1	1	1					
JN	H	1	0	1	0	1	1	0	0	0		1	1			1	1	1	1																
S	H	1	0	1	0	0	1	0	1	1	1	1	1					1						1			1								
H&C	H	0	0	0	1	0	1	0			0	1	1	1	0	1	1	0	0				1			1	1	0	0	0	0	0	0	1	1
Mill	H	0	0	1	1	1	0	0	1	1	0	1	1	1	1	1	1					1				1	1								
Lil	H	0	1								1	1							1																
RJ	A	0	0	0	0	0	0	0	0	0	1	1	1				1	1				1	1			1	1								
AC	H	0	0	0	0	0		1	0	0	1			1	1									1			1								
Ln	H	0	1	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1						
CJ	H	0	0									1		1	1							1	1				1						1		
AL	A	0	0	0	0	1	1	0	0	0	1	1	1	1	1			1	1	1				0	1	1	1						1	1	
MCM	H	0	1				1				1	1	1	1	1	1	1			1				1								1			1
LA	H	0	1	0		1	1	1	0	0	1	1	1	1	1	1	1		1	1				1			1	1	1						
BL	A										1	1		1	1			1								1	1						1		
AM	H	0	0	1		1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1				1	1	
RM	A	0	0	0	0	1		0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0			1	0	0	0	0	1	1	1	1	1
NIs	H	0	1	1	0	0	1	1			1			1	1	1	1															1			
AB	H	0	1	1		1	1	0	0	0	0	1	1	1	1		1	1	1	1	1	1	1	1	1										1
		3	7	8	2	10	13	5	3	2	14	21	7	19	10	10	7	11	13	3	9	4	4	4	6	4	3	12	6	5	5	3	3	4	5

There is a relation between house for life (AB, AM, JI, M, Ln, RM, MCM, LA) and high investment renovation measures (like insulation, windows, heating system and solar panels). Among those considering house for life as a lever, with the exception of MCM who has carried out only one high investment measure, the other informants carried out at least two high investment renovation measures.

Those mentioning temporary house as a break for renovations have only carried out renovations related to aesthetics like painting the walls, varnishing the floor, changing the toilet, etc. (M&M, M&P, C, RJ and BL).

Budget constraints were important for low income families as well as for some Medium/High income families (AL, LA, Mil). However the Medium/High income families have carried out some energy related renovations, high and low investment renovation measures, while the low income families avoided carrying out those measures.

Insulation measures were only found in houses while windows were mentioned in apartments as well. This is related to the difficulty to carry out insulation measures in buildings, involving condominium decisions and investments. The same breaks for the installation of solar panels. Long return on investment was a break mentioned by some informants (AB, AM, MCM, H&C) in relation to solar panels.

6.9 Owner's relationship to comfort and indoor temperature

Generally, comfort is related to several aspects of the house, in particular the decoration, the orientation of the façade and natural lighting, the sights, the style, the cosiness, the silence, etc.. Comfort was also directly related to indoor temperature by all the homeowner's. The average temperature wished for the indoor was mentioned to be around 22°-24° in all rooms, or with minor variation between divisions. Very few informants admit to have different temperatures in different rooms (LA, AL, RM, ...). It should be bear in mind that the interviews were carried out in summer and people were mostly thinking about summer temperatures.

AB, 977-980, "...is... is like, I don't know, I don't know what to tell you.... What matters for me is to have harmony. This is the first criteria to be comfortable. ... is to feel, have contact with the nature, to be close and at the same time to be far away from nature.... Do you understand? ...). Silence is also part of the comfort (line 990: I do not like noise, noise, noise, I do not like...)). However comfort is also to have a nice temperature inside the house, neither too cold neither too hot; 998-1001: the temperature is also important for me. As I told you, the air conditioning with inverter was very important for me ... I do not like very hot environment neither very cold. But I like to be comfortable....".

Mil, 465-470: "to have a nice temperature in house and preferably around the same temperature in all rooms, a well insulated house, as well as to feel well inside the house, to like the house: the way it looks, a good level of light, decorated according to their taste...".

C, 71-73: "It is having the necessary conditions to feel good, right? And mainly, that energy thing, that is true. My house, regarding that aspect, in the winter is too cold, it is not as comfortable as I would like."

All the informants could relate the comfort with the indoor temperature, and the vast majority mentioned the range 21-24° as the comfort temperatures. However not all the informants have thermostat or use it to control the temperature. It is usually their body, it is the sensation of warmth or cold that makes them using or not the heating system. The only informant that could correctly mentioned the comfort temperatures for winter and summer was LA, who has a small weather station at home to tightly and objectively control the use of heating, avoiding large energy bills. Those having central heating or modern electric heaters also have thermostat incorporated, and they often establish the set point to around 21-22, a common practice that AB took from his office. I&C decided to retrofit thermostats in the existing heaters, and they could benefit from a reduction in the electricity bill already.

6.10 Other energy related practices and opinions

Even for well informed, well educated informants, some energy related renovations (like double glazed windows, insulation of walls, roof, etc.) had nothing more to do with comfort than with energy saving. Energy savings, energy consumption are related to the appliances, the light bulbs, the solar panel, the behaviour.

JN 121-127: "It was more a question of isolating glasses and that was more because of comfort, not exactly because of... worrying about saving energy.Preoccupation with energy consumption. Yes, we had, when we bought the appliances, that preoccupation... To have reasonable energy efficiency... we also had the solar panel installed because of that ... and the light bulbs. But apart from that, it was just at that time, we don't talk about it usually."

There is a lack of energy saving attitude in some informants (M (M&M), H (H&C),...). This behaviour is linked to the financial stability of the informants on one hand, and to the lack of attitude/consciousness towards energy savings. In the case of H (H&C) it is related to the energy price he pays for, which is the production cost since he works for the utility! They have the perception they can do more, like turning off the lights, the TV, etc., but they are so used to behave in such a wasting way that it is difficult to change their habits. It is a problem of being aware and having the will to change one's behaviour.

M&M, 354-356: "From the moment we have a considerable financial stability, some things get behind, I'm aware of that."; 360-362: "It's a matter of behaviour. It's a matter of attitude because of my lack of time. As can see, I'm always running around and there are some things that are left behind..."

M, 233-234, "Well, my son, it's natural, because he doesn't have money problems, right? So, for now, that isn't something that he is concerned about."

C (H&C), 763: "Although you pay a special price this doesn't mean it is free... Sometimes he forgets about this".

It is interesting to see that most people thinks the same about saving energy: they believe they can't do much more about it, apart from turning down the lights, having energy saving lights and buying A+ appliances – it is a common feeling (M&M, M&P, JN, C).

C, 115: "I guess not. Where could I save more? Only not using things or, I don't know..."

In order to overcome the lack of technical information that exists within the population regarding energy issues, one informant suggested the creation of a cabinet, financed by the government or by the Utility-EDP, to give free, or at low cost, professional and personalized advice to end-users, installers and builders by well trained professionals and specialists. In the same line of thinking, another informant, Luis, has suggested that the Energy Performance Certificate of the house should be easily obtained from one cabinet, at low or no cost.

C (I&C), 198: "a public cabinet where people could go for advice, free advice or may be a low cost advice; 448: a clearinghouse should be created; 474: That's it with the creation of such cabinet; 665: technical staff, and such clearinghouse cabinet that I think should be created."

6.11 Other comments

Check a previous question or a hypothesis elaborated earlier in vertical analyses.

The awareness role

Is awareness alone a driver for energy efficient renovations?....

Based on the sample, Portuguese homeowners with a high level of education are more likely to invest in both efficient appliances and in new frame windows than in house insulation (walls and roofs). Even well informed persons (RJ, Nls) did not consider installing insulation.

Although thermal comfort was often mentioned, walls and floor insulation was usually associated with humidity condensation but not with inside temperatures. On contrary, all informants could associate the roof insulation, the frame windows and the type of glazed with thermal comfort.

Although the budget constraints play an important role, there is a general lack of awareness that is hindering the adoption of the best efficiency measures. Many times the information is not well understood by the consumers and they are paying for the efficiency Certificate to avoid paying penalties, rather than to realize the potential savings.

Good knowledge, well educated persons (well trained, high graduation), house for life, are drivers to take action, when people understand what efficiency is about (Ln, LA, AB, S, RM, JN, Nls). In these cases social context has a huge influence: high education make it possible to search for information, friends with good knowledge in construction and energy helped with the renovations and the contractors, influence from friends/relatives very conscious about energy and environment. The conclusion is that a combination of several factors like long term perspective, age of the house, knowledge, as well as economic availability are important drivers for energy renovation works to be done.

Social context has a huge influence for young people who lack awareness but have economic availability. Parents home practices are usually replicated by younger homeowners, who are more tented to *"follow the fashion"* in order to get a certain status quo. House for life is however a determinant factor for young people to carry out renovations.

Clear and simple information about energy efficiency in houses including a list of opportunities to improve the comfort of the house as well as its cost effectiveness indicators has to be disseminated among different groups of society to reach all kind of people.

Social Desirability

Some informants tried to give the good answers or the politically correct answers to the questions revealing their concern with the social context where they are inserted. They mentioned to be environmental consciousness, but their practices were going in the opposite direction to an environmental friendly behaviour. Some examples mentioned are: taking the car for short distances (LA) and using a lot of water for baths (Nls).

Also some contradictions show high social desirability:

Nls saying to care with indoor air quality but choosing a house in the middle of a crowded avenue and no measures are foreseen concerning air quality. This concern is related to the fact he is involved with the Certification of Buildings which has stringent requisites for air renovation in Portugal.

Nls, 355: "the indoor air quality is a concern for me and has to be taken into consideration", [however the house is located in a crowded avenue].

Mil saying her relatives try not to overcome certain levels of consumption because of the energy bill, and herself cares with the environment too. When previously she had mentioned she uses to speak about energy consumption when her bill rises up!

Mil, 516-518: "Yes, sometimes. About electricity and gás. Especially when my bill rises up."

Mil, 526 - 530: "yes, yes, yes.... Indeed both my mother and my brother they always try not to overpass certain level of energy consumptions. In their case, this is not only because of the environment but also

because of the energy bill. Myself, personally I also think in the environment, if we can save energy we should not spend it”

6.12 Conclusions

o What was similar between several interview(s)?

Lowest budget is not usually the first criteria in what concerns the selection of the contractors/builders. But budget limits are important for all informants. Shortage of budget, budget constraints avoids some energy efficiency renovation works to be carried out. The selection of the contractors is mostly based on trust (Ln, H (H&C), AB, JN, Mil, AL, AM, RM). The contractor/builder is usually selected based on previous experience with his work or recommendations from relatives or friends.

AL 169-175: “We contracted a builder that we knew already. He prepared the budget which we accepted because we thought it was a reasonable amount for the works planned, it was according to our expectation and there was no need to look for other budgets other contractors. Therefore, since we trusted him we contracted him”.

Comfort (thermal and acoustic) and aesthetics were the main drivers for the renovations made, even for energy related renovations. Energy efficiency is also a concern and the options made took into consideration the energy performance and the cost. Cost/quality, Cost/benefit ratios have been driving the decisions. The informants were will to pay more for better performance but at reasonable costs, and apparently they succeed!

JN, 321 “... once again here, it was the quality and the price, and when I say quality I mean the capacity to produce heat, hum, and the energy that is necessary for this.”

RM, 8: “For aesthetic reasons”, 100:” ... my main motivation was aesthetics humm; 104: “I am an architect, [laughs] and well, it is a question of aesthetic option”, 139-144: I have concerns in relation to the effectiveness of the apartment in terms of energy consumption for heating and cooling, which I still did not try”.

The fact that nowadays energy is on the agenda of everyone, everyone speaks about energy, climate change global warming, etc... there is the risk that people don't take energy seriously! People have a general knowledge, have heard about it, but more deep insight and concern is needed.

Professionals (builders and installers, etc.) have an important role in the renovations process because many people seem to trust them. At least those that are known as good builders, good installers! It is a big responsibility for them to carry out the work in the best quality possible, to install the most efficient technologies because people rely on them. However it turned up that many times people feel they were cheated because their expectations were high, they paid well for a better house, and the reality does not correspond to what was announced! A good inspection is fundamental to transform the buildings towards more energy efficient ones as well as a better training for builders. It is important to involve all parties taking care in the process of building; otherwise the building performance will not improve.

o What is the most innovative finding

Childhood education is determinant for influencing people behaviour. People with a more “conservative” education seem to care more with the environment and with savings because they were taught to avoid wasting (Ln, AB, LA, AL, M, BL, Lil). For instance AL is very active: she closely controls all the consumptions at home, she looks for alternatives in terms of appliances, energy tariff options, she is always chasing for energy savings. There is a similar situation with M. On contrary, CJ husband is ignoring energy efficiency, his careless about the energy bills if his

house and about saving energy is a consequence of his high income and his child less conservative education. He is not open to energy issues and since he can afford huge bills, he doesn't care at all.

*Ln, 424: **Why do you care with saving water?** "Because of my education, it is a question of being against waste... it does not make sense to spend without a good reason; line 392-393: I have good habits, I try to keep always my good habits, in order to guarantee there is no waste; line 408: I have the habit of avoiding waste".*

*AL, 670-676: "I am really this is a characteristic of my family [laughs] – **she was speaking about being conservative** – we like to keep, to preserve everything.... I try to turn off all the lights that are not needed, I do not have appliances on when they are not being used, etc... this is coming from my house [laughs], my husband is the opposite. Therefore we speak many times about..... savings... I have to call his attention".*

M, 236-239, "... Not me, I'm always turning off [the lights]. I'm always worried, always. My father was like me. It's a familiar illness"; lines 251-252, "I go crazy. I get despaired when I see things on. If it were on me, Portugal would save a lot".

BL, 387-389: "My sister, she also cares (with energy savings). This is something.... It's because of our education. My parents they were raised with many difficulties, living with the minimum as possible, so we have a conservative education....".

Incentives are not well seen by AB. His expression was of angry and revolt when I asked if he benefit from incentives. He mentioned he just found many disincentives. He does not agree with incentives if the house is for personal use:

AB, 945: "It depends on the aim of the house.... On the final use of the house. In these cases no!"

Even well informed persons (Ln, RM) first relate the energy consumption of the house with the end-use appliances (lighting, refrigerators, ...) rather than with the envelop of the house. Wall, roof and floor insulation was not mentioned spontaneously, I had to ask if they undergo this type of works. People tend to associate insulation with humidity condensation rather than with temperature.

The informants took (especially the males) this opportunity to somehow claim against political decisions on the area of energy (C (I&C), RM, RJ), as if I would be the vehicle for their voices to reach the politicians. Criticism came especially from those informants who are aware of the Energy Performance Certificate process (RM, Nls, RJ).

I found it strange that someone who works for the utility has not any motivation to save energy because he pays every kWh he spend at the cost of production! What would very well informed persons, who care with environment, do in the case they pay electricity at production costs?

Only one informant has made reference to the consumer's society of our days and mentioned the sufficiency aspect of life (MCM). It was interesting to see her assuming she belongs to a generation who lived in a different way, without the many commodities that are available today. She is convinced that if these commodities were not available we would survive anyway.

MCM, 540-550: "In summer nobody would had thought about a fan.... now, if it is a bit warmer we immediately use a fan.... this has to be with habits as well. We are now used to certain standards... what is called quality of life. ...But in reality it is an issue of availability of commodities, because if they were not available we went without them... we would organize in a different manner, we would put on more cloths!"

Appendix A

Brief analysis of 5 interviews in Denmark, Finland, Germany, the Netherlands and the United Kingdom

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Global analysis of IDEAL-EPBD in-depth interviews Denmark

Toke Haunstrup Christensen

Danish Building Research Institute,

Dr. Neergaards Vej 15, DK-2970 Hørsholm, Denmark

1. Informants and their home

Five interviews have been carried out with five households: One single-person household, one two-person household (a couple), and three households with more than two persons (couples with one or more children living at home). All informants live in detached houses (single-family houses).

The informants were selected on basis of a national database with information (including addresses) on all Danish energy labels and performance certificates issued during 2007¹. More specifically, we have chosen dwellings that 1) were built in the 1960s or 1970s, 2) got an energy label in January-March 2007, and 3) with a medium energy performance (label D1 and E1).

Following a short presentation of the informants and their families and dwellings:

- Morten (36 years) and Michele (41 years): The couple lives in a small town on Zealand. Morten works as a warehouse assistant (has no formal education) and Michele as an auxiliary nurse. They moved in to their present dwelling in May 2007. Their dwelling got an E1 label. They have carried out several renovations since they moved in, many of these as DIY. In their own view, their most important renovation was a complete renovation of their bathroom, which was mainly done by craftsmen. The only energy-related renovation was replacing the old insulation on the loft with a new and thicker layer.
- Jan (35 years) and Jenny (34 years): The couple lives in the suburb of Copenhagen together with their 8-year old daughter. Jan works as a draughtsman in an international company (he has an educational background as a blacksmith and mechanical engineer) and Jenny is an auxiliary nurse. They moved in to their present dwelling in August 2007. Their dwelling got an E1 label. They have carried out many renovations, almost a thorough renovation of the house. With few exceptions, all the renovations have been carried out as DIY. In their own view, the most important renovations were renovating the bedrooms and a total renovation of the kitchen. The only energy-related renovation was replacing the windows (primarily done for aesthetic reasons).
- Hanna (41 years) and Lewis (46 years): The couple lives in the suburb of Copenhagen together with their three children aged 3, 6 and 14 years (the oldest of the children is from Hanna's previous marriage). Hanna and Lewis are both financial advisors in a bank, and they both have a commercial education. They moved in to their present dwelling in March

¹ In Denmark, energy labels always include a description of the dwellings energy performance as well as suggestions for improvements.

2008. The dwelling got a D1 label. The couple has only done two renovations since they moved in – and none of these are energy-related. In their own view, the most important renovation was to place a new wooden floor on the top of the old floor in their combined living room and kitchen. This work was carried out by one of their relatives.

- Fred (58 years): Fred lives in a small town on Zealand. Fred is early retired (gets a social pension) because of an injury related to his previous job as a prison officer (ward). He moved in to his present house in July 2007. The house got an E1 label. He has carried out several renovations since he moved in. Most of the work is done by himself (partly with assistance from his ex-wife's grown-up son). Fred mentions two renovations as the most important: A thorough renovation of the basement and adding extra insulation on the loft (energy-related). Another energy-related renovation is replacing the windows and doors in the house.
- Richard (33 years). Richard lives together with his 31-year-old wife and their half year-old baby in large, urban area north of Copenhagen. Richard is a graduate engineer and employed in a Danish consultancy company, and his wife is a bachelor of commerce and employed as coordinator in an accountancy firm. They moved in to their present dwelling in January 2008. The dwelling got a D1 label. Since moving in, the couple has carried out many renovations. Richard explains that replacing the windows, which was primarily motivated by the bad conditions of the existing windows, has been the most important renovation. At the same time, this is the only energy-related renovation done. Except for the replacement of the windows, most of the renovations have been carried out by the couple themselves.

As it appears from the list above, all informants have carried out renovations since they moved in to their new houses. Except for Hanna and Lewis, all families have in fact done extensive renovations involving several to many projects. Particularly Jan and Jenny have done almost a thorough renovation of the house.

Except for Hanna and Lewis, all informants have done most of the renovations themselves as DIY. This corresponds with a widespread and popular understanding in Denmark of Danes being a “nation of DIY-people”.

2. Reason(s) to conduct energy-related renovation work (Levers)

The interview material includes many examples of renovations projects ranging from more simple refurbishments like painting walls to the comprehensive and ambitious projects like pulling down inner walls (partition walls), total renovations of kitchens etc. and building an extension to the existing house. Only few of these renovation projects are related to energy saving – and in many cases saving energy is actually not the main reason for carrying out the renovation.

The following table shows the energy-related renovations described by the informants. Notice, that in many cases the informants did not themselves recognize these as energy-related renovations. The reasons for carrying out these renovations are also indicated in the table.

Energy-related renovation	Informant(s)	Reasons (as stated by the informants)
Loft insulation – replacing old insulation with a new and thicker layer	Morten and Michele	To save money on heating.
Replacing the windows (<i>planned</i>)	Morten and Michele	For practical reasons: Some of the old windows cannot be opened, and they would like to get some new ones that can
Replacing the windows	Jan and Jenny	Both aesthetic and practical reasons: Did not like the look of the old windows. Prefer light colours. Also: They wanted windows with metal-frames because they like the idea of “maintenance-free” windows.
Replacing natural gas boiler with heat pump (<i>only a thought!</i>)	Jan and Jenny	Jan considers replacing the natural gas boiler with a heat pump. He likes the idea of “green energy” – but it must not be too expensive.
Replacing the oil-boiler with a natural gas boiler (<i>planned</i>)	Hanna and Lewis	Saving money: The local gas supply company runs a campaign with free installation of gas pipes. And they had to replace their old oil tank for a new within a few years according to Danish law, anyway.
Wall insulation in basement	Fred	Originally, it was not Fred’s idea to insulate the walls in the basement. But they turned out to be in very bad shape and in need for a thorough renovation. Fred therefore built an inner wall made of insulation and gypsum boards.
Loft insulation – adding extra insulation on the loft	Fred	To save money.
Replacing the windows	Fred	First of all because the old windows were in a bad condition. Secondly, Fred has chosen windows that are “maintenance-free” (convenience) and energy-efficient (to save money).
Replacing the windows	Richard	First of all because some of the old windows were in a bad condition. Have decided to replace all windows in order to get a uniform look of the house. Secondly, they chose “maintenance-free” windows with metal-covers (convenience).

It is apparent from the interviews (and the table above) that energy-related renovations are in general carried for many different reasons – and mostly for *other* reasons than saving

energy. In many cases, energy savings are regarded as an ‘additional bonus’ in relation to, for instance, replacing the windows for aesthetic reasons or because the old windows needed replacement. This understanding is perhaps expressed most clearly by Jan, who explains that he appreciates energy saving as a side-effect of doing renovations and other home improvements – but at the same time stresses that energy savings “always has to pay [itself] before I would do it.”

As the table shows, loft insulation (Morten & Michele and Fred) is the only example of renovations that are carried out mainly in order to save energy. However, in both cases the primary incentive is to save money on the heating bill (and less to save energy or – in a more abstract sense – to save the environment).

Furthermore, Jan is considering replacing his and Jenny’s old natural gas boiler with a heat pump based on geothermic energy; he likes the idea of “green energy” without CO₂-emissions, although it must not be too expensive compared to natural gas or other traditional heating solutions.

Other reasons for doing (energy-related) renovations are (stated by the informants):

- Aesthetic reasons
- Practical reasons (including convenience – e.g. the “maintenance-free” windows with metal-frames that three of the informants had chosen)
- Need of replacement/maintenance (if the old materials are in a bad shape)
- Making the house “one’s own” (one example is Jan and Jenny, who renovated their kitchen in order to make it suit their ‘personal style’ and their daily routines, see analysis report of Jan & Jenny p. 3-4).

It is interesting to notice that two of the informants (Morten and Richard) have made use of **internet-based ‘calculators’** in order to make cost-benefit-calculations of different energy saving renovations. These ‘calculators’ makes it possible to calculate costs (investments), annual savings and payback time of different alternative solutions. Morten used a calculator on the website of Rockwool (a large supplier of insulation) and Richard used a calculator on the website of their mortgage credit institute.

Help and advices from friends, colleagues and relatives are important. All informants describe how they got help by others in relation to the decision processes as well as carrying out renovations. For instance, Richard and his wife got help from the father of Richard with regard to assessing the condition of the windows. The father’s advice was to replace the windows instead of repairing them – an advice Richard and his wife followed. Another example is Hanna and Lewis, who explain that their original intention was to polish the old wooden floor in the kitchen/living room – but a cousin to Hanna convinced them that it would be better to place a new wooden floor on the top of the old floor instead of choosing a “partial solution” like polishing the floor.

3. Role of incentives

At the time of the interviews, the Danish government had just opened a new fund for renovations (“reoveringspuljen” in Danish), which Danish citizens could apply for financial

support to renovations. The fund was part of the Danish government's initiatives to tackle the financial crisis and the increasing unemployment in particularly the building industry. The total sum of the fund was 1.5 billion DKK and the fund subsidised costs to salaries (not materials). However, only Hanna and Lewis had applied (or planned to apply) the fund. Hanna and Lewis had applied the fund for support to their replacement of the old oil-boiler as this was among the type of projects the fund supported. They thought it was a 'lucky coincidence' that the fund had been established at the same time as they (in any case) had decided to replace their old oil-boiler with a new gas-boiler.

4. Brakes to conduct energy-related renovation work

Following some of the 'brakes' identified in the interviews:

- Long payback times: If the payback time is too long, this can be a reason for not carrying out energy-related renovations. For instance, Morten and Michele have improved the loft insulation in their house. Before they decided on the thickness of the insulation, Morten made some calculations on payback time on the website of Rockwool. With a 270 mm layer, the payback time would be only 3-4 years, which Morten found reasonable. He also tried to calculate the payback time if they placed 390 mm insulation instead of 270 mm, which resulted in a payback time of 9-10 years, which he found too long: "So, the last layer [the extra 120 mm /thc] would be rather expensive and we would not make much [i.e. the economic benefit would be rather small /thc] (...)". As this example indicates, even relatively 'short' payback times of about 10 years can be regarded as 'too long' (and this even though Morten and Michele planned to stay in the house for many years, perhaps the rest of their life).
- Savings being too small: In several cases, the informants find the potential energy savings too small and not worthy to invest money and (particularly) time in. For instance, Jan remembers he has read in the "energy calculation" (he presumably means the energy performance certificate) that "we would be able to save money by adding 100 mm or 200 mm extra [insulation on the loft /thc]." However, he does not think that they are going to save lots of money ("it's peanuts") – and as he hates to work with insulation, adding extra insulation has a low priority. Another example is Richard, who remembers that insulating the pipes in the boiler room was one of the recommendations in the energy performance certificate for the house. However, he thinks that the economical benefit will be very small as the boiler room is placed in the house and the heat lost from the pipes therefore heats the boiler room and the rest of the house. Therefore, it is not worthwhile to do this improvement as the time spend on insulating the pipes does not measure up with the size of the economical savings: "It's like whether you should walk around and look for the small two-kroner coin – or for the big 100-kroner note [instead /thc]."
- If residents do not expect to stay for long in a house this moderates their interests in energy improvements. One example is Fred, who does not expect to stay many years in his present house for many years. Therefore, he wouldn't do energy renovations unless he expected these to have a payback time shorter longer than a few years.
- Inconvenience: If energy-related solutions involve some kind of inconvenience (both in relation to carrying these out or afterwards), this can be regarded as a brake. One

example is Jan, who explains that he “hates” to work with insulation. In itself, this can be a kind of ‘barrier’ to loft insulation.

5. Impact of Energy label of the house (or audit)

Most of the informants remember the energy label report or that they got some kind of information about the energy standard of the house together with the other papers they got at the time they bought the house. Fred is the only informant who does not think that the house had an energy label. However, he remembers that the ‘house inspection scheme’ report included some recommendations for energy improvements. It is likely that he confuses the recommendations in the energy label report with the house inspection scheme report.

Of the informants that remember the energy label report, one are rather positive about the label (Richard), two are rather negative (Morten and Jan), while Hanna and Lewis do not express any clear attitude regarding the quality of the label.

Richard found the energy label interesting. He trust the quality and validity of the label and its recommendations – although he is critical about the idea of prioritizing the recommendations by calculating their payback time without also taking into account the size of the potential energy savings.

Jan (wrongly) remembers the energy label report as carried out by the estate agent. For this reason, he is very critical about the validity and quality of the report: “Well, I believe that much of it is just a bit fancy, like play to the gallery. I don’t give it much credence when it is themselves [the estate agents /thc] [who prepare the energy labels /thc]...” For the same reason, he did not spend much time on studying the report.

Morten queries whether the energy label gives a correct indication of the actual energy standard of the house and its energy consumption: "... it's also a question of who's living there. Do they use a lot of electricity and gas [gas for heating /thc]?" (line 867-868) By this, he indicates (correctly) that the actual energy consumption depends on the behaviour of the residents. However, the Danish energy labelling scheme is based on the calculated values instead of the actual energy use. It might be that Morten confuses these two concepts (the actual and the calculated energy consumption).

Some of the informants (Hanna & Lewis and Fred) comments on the amount of information they got at the time of the house purchase. According to Hanna & Lewis, the energy label report “drowned” in all the other information and papers they got, and Fred remembers that “there were a million of papers”.

All in all, the energy label report seems not to have had any great and lasting impact on the informants’ considerations with regard to energy improvements and renovations.

6. Energy related practices and opinions

Almost all informants explain that they try to save energy in their everyday life. Most of them provide examples like switching of the light or buying energy saving light bulbs instead of traditional bulbs.

All informants seem to accept the link between energy and climate change. However, two of the informants (Morten and Richard) are critical about the environmental issue. Particularly Morten is sceptical about the climate change debate. He thinks that the issue is somewhat exaggerated: "I feel it a bit like much of it is a storm in a teacup..." (line 937). Morten believes that many of the "so-called intelligent persons" [the experts /thc] have forgotten to see the current changes in context of the temperature changes during the history of Earth. He has seen some programmes on television (the Discovery channel) that describe how the temperature has changed a lot thousands of years ago – and compared to these changes, the present changes are minor. "I don't think that we can do so much about it, really."

Even though not as critical as Morten, Richard expresses an ambiguous attitude with regard to the environmental debate: On one hand, Richard acknowledges that it is an important issue. On the other hand, he also thinks that the discussion about the environment can be a bit "popped up". In his opinion there has to be a balance between "functionality" and "practicality" on the one hand and environmental concerns on the other.

7. Conclusion

Home renovation and DIY projects are widespread activities among the interviewed families, but only few of their renovation works are directly related to or motivated by energy saving. In most cases, energy improvements like wall insulation or replacing windows can be regarded as a "side-effect" of renovations carried out for other purposes than saving energy (e.g. for aesthetic or practical reasons). However, several informants regard energy saving as an "additional bonus" of doing these renovations.

The interviews indicate that home renovations are deeply integrated in informal social networks. All informants draw on their friends, acquaintances, work colleagues, relatives and others in relation to the decision making and planning of home renovation projects as well as (in the case of DIY projects) the carrying out of the projects. Friends and relatives typically have their own experiences with home renovation, and they represent a source of inspiration, advice and (perhaps) a "helping hand" to all informants.

The interviews indicate that the most important brakes to conducting energy-related renovation work are short payback times, small savings (e.g. if the needed efforts do not correspond the size of the energy saving). Also, inconvenience (e.g. in relation to loft insulation) and a limited time-perspective (if the house owners do not expect to stay in the house for many years) limit the motivation for carrying out energy renovations.

Except for one, all informants remember that they received an energy label report at the time of the house purchase. Despite this, the energy label report has not in general played a

Deliverable 4.2

significant role for their decisions regarding (energy) renovations. The limited impact of the energy label report seems partly related to a degree of mistrust in the validity of the report among some informants, while other informants states that the energy label report almost “drowned” in all the other information and papers they got at the time of the house purchase. The latter suggests that the timing of the energy label is not optimal.

Key findings of the interviews in Finland

Anne Tolman, VTT Technical Research Centre of Finland

1. The making of the interviews

The guidelines for finding the informants was to look for

- Differences between interviewees, or probability of such differences, should be searched for (social conditions, age, living place, ...).
- Buyers who did recently receive energy certificate/label/advice before buying that dwelling
- Chose families/people who received label/certificate in the beginning of 2007, e.g. March 2007. This allows some time for doing renovations. If you have access to the labels before the interview, preferably select homeowners whose house had a rather 'bad' label to ensure that advice was received.
- People to be interviewed should own their dwelling and must be the decision unit for renovation in their dwelling. Preferably, the dwelling should be a single-family house.
- People to be interviewed should be new owner of their dwelling, i.e. in the 5 last years.

The only decision making unit for housing in Finland is the owner of a single family private house. Even semi-detached two-family houses do not allow decision autonomy in i.e. any thermal insulation items.

To meet the whole above set of criteria could not be implemented in Finland, as the factual use of energy labelling is only emerging in 2009. So it was impossible to find informants with a label from 2007 or even 2008. Thus the selection was based of the feasible criteria, and the five interviews were carried out with families who had their houses since about four years, and had had enough time to observe the energy issues of the house and also had repaired their houses. Thus the energy improvement aspects could best be elicited by finding families with recently refurbished houses.

A recent study (2006) on the sellers and buyers of private houses in Finland found that the most common buyer is looking for a house that is affordable and that it is in such a condition that they can move and then repair it. According to the study, those moving out rarely move to another private house, they mostly are elderly and move to other forms of housing. Those moving in are mostly young families with children. Furthermore, most of the buyers of the houses have preferred established existing housing areas above newly build areas.

There is no register of house buyers available to public; the protective legislation prohibits the access to such information. Thus the means of locating cases of interest for the interviews, an inquiry was made to colleagues to get some names of the acquaintances that they knew would meet the requirements of having bought a house about five years ago and refurbished it.

With the above in mind, people of different social standing (ranging from student to docent) were selected, the age of the house buyers does not have a very large span because of the normal age to buy such a house is around 30 years (age range from 29 to 45).

2. The findings

Choice of home

The reason for looking for a house is the need of space; all of the cases were looking for more rooms for the growing family.

The most prominent reason for selecting the house was the location. 4 cases name it as a direct primary reason, and the fifth had had an idea of a type of house they were looking for and this was on a perfect location.

The combination of space, location and affordability was present for all, but also the good feeling about the place and/or the house.

During the sales process, most of the cases involved external expert to support the process, notably also for the interest of the seller to avoid disputes after the closing of the purchase. Most cases also involved trusted relatives or friends.

The concern in the building was mostly on the condition regarding the potential moisture damages or hidden structural damages. None of the interviewees mentioned energy audit. They all were quite well aware of the poor energy performance of the buildings at the time of the purchase, and had very different approaches from total renewal of the structures to simply accepting that.

All of the families intended to keep the house indefinitely.

Changes and renovations

All of the interviewees had done repairs on the house. The degree of repairs varied a lot, but a common reason was to add comfort, even if the means were different. Even the energy repairs were (at least partially) motivated by attempts to improve comfort.

Only one case had outsourced all the design and implementation of the repairs, most of the cases relied heavily upon their own planning and also took the effort to work as much as possible to accomplish the works.

All the cases included energy repairs, and they include upgrading of heating systems, additional thermal insulation and window alterations.

For advice, the trust was upon peers and close relatives with some professional attitude, and friends who had some qualifications to advice.

In every case they were at least mostly satisfied with the outcome of the repairs.

The roofs were not yet repaired in three cases, and were repaired in two cases. Even the three roofs are to be repaired, but did not have the urgency yet.

The windows were repaired with paint in only one case, not done anything in one case, and otherwise they were replaced.

External walls were repaired in two cases, the other changing the whole insulation, the other partially improving it. The external walls were not the priority for others, but there were plans to work on them later on as well.

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The incentives and subsidies were largely or partially unknown, and only minor contribution was got for a couple of cases.

All the houses had some remaining repair works, some quite extensively.

Comfort

Regarding comfort, some considered it mostly a feeling related to home, some saw it as indoor climate including acoustics and spaces for various purposes. When asked what to improve for getting more comfort, the better control of indoor temperature was a frequent issue (either to cool it in the summertime or get warmer in the winter) and improve the spaces and even the outlook of the house.

All the interviewees connected the comfort with temperature. Four of the five did not actually measure the temperature in their living rooms.

Socialisation

The energy issues were discussed within the family in three families, and with peers or other acquaintances in all the cases at least to compare the consumptions. If there were children, they were introduced to energy saving.

Knowledge about energy and energy savings

The interviewees were aware of their potential to save energy and able to name some means for it. Illumination was one of the favourite candidates for spearing energy. On the other hand, there was a prevalent notion that they already do quite some of the achievable and the further saving would lessen their comfort perhaps too much.

Energy label of the house

None had an energy label, as they are getting factually compulsory only this year and initially with the sales. Private owners do not feel they need it for anything unless they are going to sell the house.

Environment

People had generally good knowledge. They felt they know and have done things to the good direction. Frequent attitude was to blame the big industries to pardon themselves from further domestic savings.

Analysis of IDEAL-EPBD in-depth interviews in Germany

Bettina Brohmann & Martin Cames

Oeko-Institut e.V. - <http://www.oeko.de>

Institute for Applied Ecology

Freiburg - Darmstadt - Berlin

Informants and their homes

Among the 5 pilot interviews carried in Germany, all 3 couples and 2 singles (a man and a woman) are well to highly educated. The age of interviewees, however, varies widely, ranging from their mid-thirties (Mr and Ms Emil) to 73 years (Mr Green-Hell).

One woman (Ms Rebecca) and one man (Mr Thomas) are single without any children. Two couples (Mr and Ms Emil/Ms Biosphere) are living with their two children, the ages of which range from 3 to 13 years. The other couple (Mr and Ms Green-Hell) has four adult children who live on their own.

All informants are living in a detached house. The two singles and one couple (Mr and Ms Green-Hell) additionally own a multi-family building for which they all received Energy Performance Certificates. One of the houses is a very new dwelling which was built five years ago and was designed by the informant him-/herself (whose objective it was to construct a bright house with ecological building materials without involving an architect). Additionally, a ventilation system with heat recovery was installed. Another house received a new annexe and the old part of the house was renovated extensively. These renovations included enlargement of several rooms to match the old part of the building to the new one but also some energy related renovations. Others had carried out several renovation activities, which generally encompassed the replacement of old windows. In general, all informants are very open and active.

Reason(s) to conduct energy-related renovation work (Levers)

In general, all informants are well aware of the link between energy and climate change although there was a contradictory discussion on the effects and possible solutions with one couple. The key reasons for conducting energy-related renovation work appear to be the necessary replacement of an item which is in a poor condition and improvement of the comfort of the house (enlargement of rooms, new windows). Most of the informants are interested in and open about energy efficiency measures but saving money saving on the energy bill may also be an important reason. In the case of the Emil family the male informant responds to energy saving in economical terms. But also Mr Thomas is very 'rational' and economically motivated as he is doing things if they are or seem to be cost-efficient. On the other hand he has a very specific sense of humour: he likes to tease the energy supplier and to bring about the greatest energy efficiency possible (changing light bulbs is fun for him ...).

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“In my house I consistently replaced all incandescent light bulbs with compact fluorescent ones, and was able to notice a significant improvement in the last utility bill. Again, that was fun.”

In the case of Ms Rebecca, the aim is a higher standard and more efficiency, but she is also interested in renewable energies, being well-informed and motivated by friends who have implemented such technology.

Role of incentives

In general informants are aware of subsidies or financing schemes available for private home owners and are interested in information about funding. However, they face problems with applications. Ms Rebecca regards the application as too complicated for her and the conditions are not very supportive, from her point of view. Mr Emil is concerned about having missed any subsidies or credits (from the KfW program). He rails against the bureaucracy of it and the hindrances of getting a credit for his renovation activities. He mentioned that he has tried to figure out the conditions but even the energy auditor and the architect whom he asked for help, were not well-informed about it. Thus, he missed the window of opportunity this time, but he is still hopeful in the case of his next planned change (solar thermal and roof fit out).

“For me it is important – as already mentioned – that the programs for private investors should be much easier to handle. I don’t want to hire an energy auditor and pay a lot of money for insufficient advice or even no advice.”

“Furthermore it would be enjoyable if the offer (of credits or subsidies) would remain unchanged or even enlarged.”

On the other hand, Mr Emil stated that for him the sum that might be gained through a funding program was not decisive – he sees it as an additional incentive.

Mr and Ms Green-Hell ignore certain energy aspects and lack information about energy saving options but follow guidelines and recommendations given by “Haus und Grund” - the German home owners association – to meet the legal requirements for their multi-family building.

Brakes to conduct energy-related renovation work

The main brake to conducting energy-related renovation work seems to be the high investments involved. This is particularly true if the measures are considered as extra ones, which are implemented for the purpose of energy saving alone. Investments seem to be less of an issue in the case of necessary replacement of items in a poor condition. In one case (Ms Rebecca) energy-related renovations are very costly due to requirements relating to building conservation. In the case of Mr Thomas the insulation of the front facade of the multifamily building that he owns seems not to be possible because it would involve an extension into public space for which he would not receive planning permission from the city administration.

Impact of Energy label of the house (or audit)

All informants seem to be interested in energy performance certificates but do not all have one. In one case the Energy Performance Certificate led to the implementation of a ventilation system (Ms Biosphere). Ms Rebecca's decision to attain a certificate was motivated by her idea of installing a solar thermal system on the top of her roof. Although the energy auditor has rejected this idea for technical reasons, she still seems to be pursuing it and is talking with friends about finding a good solution. Even though the tenants have never asked for an Energy Performance Certificate, she wanted to be prepared in case. From her point of view the certificate offers well-founded recommendations for measures to be implemented but numbers and accounting are seen as incomprehensible. In turn, Ms Rebecca greatly appreciates the information of energy audits because of the visualisation using infrared pictures.

Energy related practices and opinions (if relevant)

Practice

The informants keep their temperature between 18 to 23°C, according to the use of the rooms and the level felt to be comfortable. The temperature in the bedroom is often lower than in the other rooms. The temperature level felt to be comfortable varies. Ms Biosphere's idea of a comfortable temperature is 19°C. However she doesn't mind using a blanket when she sits on the couch. In contrast, Ms Emil feels comfortable when the room has a temperature of 23°C. Mr Thomas heats his rooms in winter according to his daily use with a programmable controller. He heats his office all day but heats the bathroom only in the morning and the living room in the afternoon and evening. Ms Biosphere, besides reducing the energy consumption for space heating and warm water, is also concerned with reducing electricity consumption to the maximum extent possible. She tries to avoid using electricity for heating purposes. For this reason she uses a watering can to fill her washing machine with hot water from the solar thermal installation. Moreover she refuses to use an electrical toaster at all. Ms Biosphere talks within her family and with friends about energy consumption and options for energy saving.

Conclusion

Of 5 interviewees, 3 additionally own a multi-family building for which they have an Energy Performance Certificate. 3 of the 5 interviewees also have an Energy Performance Certificate for their houses. However, the certificates don't seem to play an important role in the decision to buy a house or in inspiring them to implement measures. Only in one case did the informant take measures that were recommended. Concerns when buying a house tend to relate more to living comfort in terms of having a good environment, a garden, peace and quiet or the like. Although awareness of financial support schemes differs among the informants, subsidies play an important role in whether measures are implemented or not, especially in terms of lowering investments and making measures more affordable. However, a balance should be struck between bureaucratic paper work and organisational requirements which may discourage people. Otherwise, there seems to be a tendency to

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postpone taking measures to a moment when the replacement of items in a poor condition really becomes a necessity.

Pilot interviews from the Netherlands: a global analysis

**Marjolein de Best-Waldhober, Paul Vethman, Jeffrey Sipma, Marcel Weeda,
Julia Backhaus (ECN)**

1. Informants and their home

Among the 5 pilot interviews carried in the Netherlands, all 2 men and 3 women are well to highly educated. They all followed a higher professional or university training. The age of informants, however, varies widely, ranging from mid-twenties (Flip) to 76 years (Miep). So education and diplomas acquired are difficult to compare.

Two women (Miep, Petra) and one man (Flip) are living on their own. The other woman (Truus) is living with husband and two older children, basically young adults (19 and 23 year). The other man (Piet) is living with wife and 3 year old son.

Except one terraced house built in 1998 (Flip), all houses involved are rather old. Two women (Miep, Petra) have been living in the house for more than 35 years. One of the old houses, a detached house, was completely renovated and extended in 1992 by previous owners. The other houses, one terraced house (Petra) and two semi-detached houses (Miep, Petra) are equipped with various energy-efficiency measures like secondary glazing, double glazing, wall insulation and roof insulation. Two informants have installed PV-panels (Petra, Truus) and one a solar heating system (Petra).

Only one of the houses, the one most recently built, had an energy label (Energy Performance Coefficient, EPC) when it was bought. However, it did not play a role in the house searching phase or purchase decision. Actually, informant (Flip) states he has no trust in the energy label because of criticism of the Dutch home owners association 'Vereniging Eigen Huis'. The other informant that recently bought a house (the one completely renovated in 1992), asked for an energy performance label after purchase of the house (Piet). So also in this case it did not play a role in the final decision. Informant asked for the label as some sort of second opinion, but also questions the trustworthiness of the energy label:

'You never know how objective that was arranged. I mean, the seller of the house was the one paying for the label'

2. Reason(s) to conduct energy-related renovation work (Levers)

In general, all informants are conscious of energy use and pay attention to measures that help saving energy. They all feel a certain urgency not to waste energy. The 2 man have a technical background and indicate that this makes them aware of energy use and the amount of energy that is wasted. One informant explicitly states that climate change or the environment do not directly motivate to save energy because of doubts whether strong conclusions can be drawn on the influence humans have on climate change. The oldest female (Miep) links her attitude towards energy saving with her childhood and upbringing:

'I think that it is the original feeling of saving. I am a warchild and we didn't throw anything away. I still won't throw away a crum of bread.'

Another female (Truus) relates her attitude to experiences from living in Tanzania, Africa for a couple of years:

'Yes, of course I monitor our energy use, because obviously it is just awful what is being used. When we returned from Africa we were as efficient as can be.'

Only one informant (Petra) is truly motivated from the link between energy use and climate change. During the interview she says her main motivation is 'idealism'.

In general, main reasons to conduct energy-related renovation work appears to be necessary replacement of an item in bad condition and improvement of the comfort of the house (warm feet, no draught, ...). Saving money saving on the energy bill may also be an important reason, but only one informant mentions this reason explicitly. She (Truus) believes cost of energy will increase and would like to reduce cost as much as possible. She sees saving potential everywhere around the house and states that she tries to stimulate her children to save more, because ultimately she pays the energy bill. In general, money seems to be more of an issue on the side of investments needed for energy-related renovation work than on the side of the energy bill. So it is more a barrier (investment) than an incentive (money saving on energy bill).

3. Role of incentives

The 2 men were not aware of any subsidies or financing schemes available for private home owners. This might be explained from the fact that they themselves have never implemented energy-related renovation works or energy saving measures. One (Flip) is very keen on cost and payback times, and says that he will probably look into possibilities for subsidies and financing when he takes measures in the future. The other (Piet) seems less definite. Whether he would apply for subsidy or not would depend on the total renovation cost, and whether the amount of subsidy, and the time spent to acquire it, would be worth the effort.

One informant (Miep) stated that financial incentives have played a role in measures taken in the past, but have not been decisive. Currently, however, incentives seem to play a larger role. She has obtained an Energy Performance Advise (EPA) within the framework of a government and has decided to do only the work advised that would have immediate effect and reasonable payback time. She tries to find suitable financing. The rest of the advice she will not follow because the investments are too big in relation to the payback time.

Also another informant does not value the role of incentives as decisive. Initiatives in which she (Petra) participates usually involves subsidies; e.g. national and local government programs to stimulate energy saving. This is nice, especially if it helps to reduce initial investment to an affordable level. Payback time is less important to her. But most important to her is the fact that energy saving is organised for her:

'Generally the payback time is not an issue, just as long as I can pay the initial investment'

'I find these things difficult to organise, and if there is an initiative then I think, why not get involved?'

4. Brakes to conduct energy-related renovation work

Main brake to conduct energy-related renovation work seems to be high investments involved. This holds in particular if the measures are considered as extra, just for the purpose of energy saving. Investments seem to be less of an issue in case of necessary replacement of items in bad condition, like e.g. replacing old woodwork of windows and old boilers that have broken down.

Furthermore a few interviewees mention a lack of information about possible measures, technical feasibility of measures, and companies that can implement measures. Also lack of knowledge to assess the effectiveness of measures is mentioned. They are looking for tailor-made advice and practical experience. Neighbours, family members, colleagues and written information (e.g. periodicals) are mentioned as sources of information, in addition to EPC/EPA consultants and specialised contractors. One of the informants (Truus) states:

'... the neighbours left and the neighbours right did have solar panels and we asked, you know, how is that working for you, and they said yeah, it really reduces, it really becomes less. So we figured, next time the subsidy comes up, we'll apply.'

One informant (Flip) mentions the number of years he expects to live in the house as a consideration in taking measures, or not. More general brakes mentioned are perceived difficulty to organise energy-related renovation work and the risk of things going wrong:

'They put a type of glass in that I didn't want. And also they put the solar heating system in incorrectly. Consequently, I now have two holes in my house that don't belong there.' (Petra)

5. Impact of Energy label of the house (or audit)

All informants have an energy label indication, either from an energy performance certificate or an energy performance advice. The informants with only an energy performance certificate (Piet, Flip) perceive the coefficient, which characterises the energy performance of their house, as not transparent (questioned objectivity and lack of explanation), and the recommendation for energy-related measures as too general. One house is connected to a district heating system. The label proposes a solar heating system, however, informant (Flip) doubts whether this can be integrated with the district heating system. Regarding transparency he remarks the following:

'You know what I actually would want is to check where, well, where that C comes from. And where that 1.54 comes from. That should just be transparent. I should be able to myself, like on the internet or something, find these criteria and how to ... That I could just check.'

Three informants acquired an EPA, which is tailor made and much more detailed. One of the informants (Truus) mentions that the advice has raised some ideas, but she also has objections:

'... I like to hear something about that [possibilities for saving energy] every now and then. And there are lots of suggestions in this advice. But there are also a lot of "buts". You see, insulation of the wall, they do advise that, but there is a balcony there, so that is actually not possible.'

She stated that she probably will not do much with the recent EPA, at least not in the short term. A number of renovations are considered for the future, but probably at a more "natural" moment in a few years. Other two interviewees that recently acquired an EPA (Petra, Miep) are more positive. In both cases the most concrete plan is to get floor insulation, not only because this will save energy, and seems cost effective and affordable, but also because this will also improve comfort of living.

6. Energy related practices and opinions

Practices

Most interviewees keep temperature on a comfortable level downstairs, which seems to be in the range of 18 to 21°C. Upstairs they maintain a slightly lower temperature (Flip) or heat only the bathroom. One interviewee keeps the thermostat downstairs low, on 16°C, to save gas. She (Petra) says, however, to perceive this as comfortable. Although she considers herself as very fanatic about saving gas, but believes she is less efficient concerning electricity use. For example, she dislikes energy efficient lamps and likes to have enough light, especially during winter. The same holds for another interviewee, who states that he (Piet) and his family do not particularly consider buying energy efficient appliances. On the other hand, the other male informant mentions he always takes into account energy efficiency when buying lighting and electrical appliances.

In particular, the female informants keep data on energy use. One, gathers data only broadly. The other two keep detailed files. Informants living in a family situation both mention that they discuss energy use and energy saving with family members, to make them aware not to waste energy, and to stimulate especially the children to be more energy efficient.

Opinions

The comments about Energy Performance Certificate (EPC) and Energy Performance Advice (EPA) vary but are usually negative. One informant (Piet) with an EPC expected more like a tailor made advice. He finds the recommendations given in the certificate rather standard, and considers the energy label as superficial. Informants with an EPA (Miep, Truus, Petra) indeed find the reports detailed, but certainly not always easy to understand and not always unambiguous. The other male interviewee (Flip) perceives the energy label as not very transparent, and believes that energy label and energy performance advice are rather expensive. He further indicates that he would only get an energy label if it would provide a "sales argument". Informants are sceptical about the impact of the energy label. One of the female informants (Truus) believes the energy label will not help to reach energy saving sufficiently since nobody has one or wants one. The most enthusiastic energy saver among the interviewees believes the same. She is happy to talk about the EPA during the interview, since most people are less interested. Informant comments,

'There is still a lot to do actually. If you ask me, there are many people among my acquaintances that are unaware of EPA and energy labels'.

Another informant believes the fact that the label is not mandatory is a reason why there is only a small demand for labels. Though sceptical, one informant (Truus) at the same time also indicate that the EPA brought up ideas for saving energy. Another (Petra) even stated that the EPA has motivated her to look for more energy saving measures than suggested.

7. Conclusion

Out of 5 interviewees, 2 recently bought a house. One received an EPC when he bought the house. The other one, asked for the certificate after purchase. In both cases the certificate did not play a role in the decision to buy the house. Informants believe the information in the certificate is not transparent and rather standard. The energy label itself did not inspire them to take measures. The EPA is more tailor-made, especially when personally clarified by an advisor, and better meets the need for information about possible energy saving measures. Although awareness about financial support schemes differs among informants, subsidies play an important role in taking measures, especially to lower investments and make measures better affordable. However, there should be a balance with bureaucratic paper work and organisational requirements that can discourage people. Otherwise, there seems to be a tendency to postpone taking measures to a moment when replacement of items in bad condition really becomes necessary. Most people are more concerned with living comfort inside their home than with energy saving.

WP4 Pilot interviews from UK: global analysis

Sharon MONAHAN*, Afi ADJEI* and Véronique GOSSELAIN**

*BRE, United Kingdom

**UCL, Belgium

Informants and their house

Among the five pilot interviews carried out in the UK, the two male and three female informants were educated to degree level or higher. One woman (Cath) was living on her own and did not intend to stay in her house for a long time; one man (Adam) was part of a couple; two other women (Ann, Bet) were living with their husbands; Bet had a one year old child and Ann had an 18 year old son. The second man (Son) lived with his wife, children and relatives, constituting a household of five people.

The recently bought dwellings were terraced, semi-detached or detached houses. They were bought between February 2007 and September 2008. Only one out of the five houses (the most recently acquired) was bought after the introduction of the Home Information Pack (HIP)² in UK; the pack included the Energy Performance Certificate (EPC) of the house.

Homeowners were recruited via email. An email was sent to staff at BRE, a research organisation based in Watford, in the East of England. BRE's staff were asked to forward a request for participants to family and friends that had bought a dwelling in the last two years. The five informants responded to the email.

Reason to conduct energy-related renovation work

In general, the main reasons for conducting energy-related renovation work included saving money on the fuel (energy) bill, the necessary replacement of an item in bad condition (*"the windows a lot of them had blown"*³) and improving the comfort of the house (house was cold). In each case, at least a second element was encouraging homeowners to do the work, for example, a relative being also a professional who was able to provide advice, or give a discount for carrying out work (Cath). For another informant renovation work was already planned (Son).

The case of Adam is particularly interesting as it shows how the combination of good reasons is acting for work to be done more than the addition of them. He negotiated with the seller to have the boiler replaced before he agreed to purchase the house. The EPC recommended replacing the boiler, but it is not clear from the interview if the recommendation for a new boiler influenced the seller's decision to pay for installing the boiler or whether it influenced the informant to negotiate with the seller.

Instead, there is a suggestion that both parties were concerned about the reliability of the boiler.

"The other renovation I suppose was done was a new boiler was put in, a more energy efficient boiler was put in, but that was actually paid and organised by the person who sold us the house. So that work was actually done before we moved in but it was on the, they agreed to have it done when we put an offer in." (Lns 42 – 49)

² The Home Information Pack includes a series of documents paid for by the seller of a house for potential buyers. The Energy Performance Certificate is one of the documents included in this pack.

³ Cath, line 45.

“certainly with the boiler when we negotiated to change that because I think the old one was unsafe and had basically had it and the son of the chap that sold us the house was actually pretty, errm, honest, he said that the boiler packs up almost weekly you know, it was at that stage, so as well as wanting energy efficient boiler put in we wanted something that was reliable.” (Lns 238 - 242)

The wall and roof insulation that had been completed was recommended by the EPC, which provided a bad label for the house⁴, and Adam received a subsidy provided by the energy supplier, which reduced the cost of installation. The energy supplier also organised an installer to carry out the work. Another factor that should also be considered is that the informant's father had recently installed wall and roof insulation. Adam also seemed very knowledgeable about climate change and stated that the issue was *“important to me”*.

On the other hand, a single reason, such as the leaking roof (Bet), doesn't seem sufficient for work to be done, even while claiming that money was not the first consideration about saving energy and saving the environment, which she seemed knowledgeable about.

Finally, energy efficiency, even when taken into account or wished by informant, was often put in balance with reliability and/or cost efficiency/effectiveness of the work. Wished work can then be left due to problems encountered (or imagined) about price, availability of product, availability of financial facility or paybacks, or timing.

“yeah, I was aware of the erhh, environmental additions I could make to the property, but I didn't make any, I didn't make any really, erhh due to the costs. Erhm, projected paybacks I couldn't make it work for me.” (Son, Lns 223-225)

“I suppose if planning energy saving generally looking for the, some sort of cost benefit. So one of the problems with getting new windows, I mean I have not gone down the route of getting a quote for windows yet but I know it's going to cost a lot of money but then the pay back what you would save on the fuel bills is probably not great. I mean, I don't know what the projected pay back is but I should think it's still years and years isn't it.” (Adam, Lns 243-248)

Role of incentives

Only one interviewee (Cath), who did not carry out many improvements to her house, mentioned that she would be interested in financial incentives, while another informant was not aware of available grants for works she would like to do. Two informants complained about lack of suitable grant for solid walls insulation. Both of them did not do this insulation work, because of a lack of financial means (Ann), or because the product was too costly in his opinion (Son). It remains to be seen whether this complaint about the lack of financial means was also (or only?) a convenient way to justify a non “socially-correct” behaviour, especially as homeowners were aware that the research topic was energy efficiency. Son nevertheless claimed that he would have done the work and invests his own money, i.e. even though it would have been more costly than non insulated dry lining, with some funding through a grant.

“It [a grant] could have [help me], say for example with the insulating dry lining, you know, if it could have reduced the cost by half I would have been prepared to pay, but it would have doubled my cost of dry lining but it would have been a hundred percent more not four hundred percent more.” (Son, Lns 428-431)

On the other hand, Adam, who benefitted from a welcome pack from his energy supplier, was impressed by the information supplied and described the service received as good value (for money). He was very pleased with the subsidies.

⁴ The informant thinks the house received an 'F' rating.

Brakes to conduct energy-related renovation work

Timing, either as “haven’t got round to⁵” or as narrow time of opportunity (eventually already gone), and financial constraints were often mentioned as brakes to (further) work to be done in house renovation. Those two elements were mentioned by informants and also emphasized through repetition in their talk (Son). So, during the renovations carried out by Son, there were many “windows of opportunity”⁶ for him to make changes that would have had a positive impact on the energy efficiency of his home but he described most of the option as not viable.

If financial constraints were mentioned by several informants, cost effectiveness seems also to be frequently pointed out, as is the case for Adam about replacing windows (see below), even if the same energy related work was cited as possibly helping to save energy. Appearance was also mentioned as a priority, along with price, in choosing products for energy-related works.

It was also interesting to note that interest and/or pride towards environmental and energy issues seems to be first expressed to other energy saving measures than energy-related renovation, even without financial constraints. Energy saving measures were mentioned by people concerned about the link between energy saving and environmental issues (climate change; Bet) or interested by saving money (Ann⁷).

Impact of the Energy Performance Certificate for the house

Adam, the only informant who benefited from an EPC label for his house, made a lot of renovation in the year since he purchased the dwelling. He seems knowledgeable about the EPC label and could recollect the rating and some of the recommendations made. The extent to which the Energy Performance Certificate and the welcome pack offered by the energy supplier when moving influenced the informant’s decision for renovation is a little uncertain (see above, about boiler replacement and insulation in Adam’s house).

While on the whole trusting the information and recommendation that were available from the EPC, Adam also mentioned some negativity from estate agents about the HIP, as was also mentioned by stakeholders⁸. He also reported negative media depictions of the energy label, leading to the fact that this label was not as well regarded as some of the others.

Adam was surprised about the recommendation to replace windows raising the issue of cost effectiveness; he was also surprised about the advice to install renewable technologies which he failed to believe would be efficient for his house.

Two informants, who either received an EPC (Adam) or did not (Son), thought it might not influence the buying decision as this is led by other considerations such as location, number of rooms, local educational establishments. It may nevertheless affect homeowners’ future decisions.

“Yes I think they are [useful], because they get people thinking about energy, when people who wouldn’t normally think about it may not affect their buying decisions but it may affect their future decisions. So it’s a starting point, that’s the way I see it, through step change that we all have to be involved in.” (Son, Lns 566-569)

⁵ Adam, lines 50-51.

⁶ See WP2 (Deliverable 2), p.11

⁷ Ann thinks environment issues are very important but is more interested in saving money than saving the climate. Actually, the household is very concerned about how cold the house is but financial constraints prevent them from improving the energy consumption of the house.

⁸ See Deliverable 3.1.

Conclusion

Out of the five interviewees, only one received an Energy Performance Certificate label for his recently bought house. He made several energy related renovations, as recommended in the EPC, and benefited from several levers to do so.

Appendix B

Methodology for in-depth interviews investigating EU dwelling owners' practices on (energy-related) renovation works) - D.4.1

Véronique Gosselain and Françoise Bartiaux
Université catholique de Louvain, Belgium



Working paper

Methodology for in-depth interviews investigating EU dwelling owners' practices on (energy-related) renovation works

Véronique **GOSSELAIN** & Françoise **BARTIAUX**

Deliverable 4.1

2010

Working paper

Methodology for in-depth interviews investigating EU dwelling owners' practices on (energy-related) renovation works

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2010

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1. Introduction

This working paper aims at providing all the methodological aspects of in-depth interviews needed to successfully accomplish work package 4 (WP4) of the IDEAL EPBD project. The paper will first briefly present the principles of qualitative interviews in social sciences. Then all methodological insights and recommendations about qualitative interviews and their first analyses will be given. These in-depth interviews aim at studying the practices by recently-moved (but not only) dwelling owners regarding (1) their reactions to recommendations received (if any), energy performance certificates (EPC), labels or audits, and (2) home renovation and energy related renovation in general (even without EPC/label/audit).

The purpose of the research in WP4 is to contribute to the *improvement of the understanding of consumer behaviour, the role of other actors and the effect of policy in general*¹. The work package devoted to in-depth interviews has been organised into two waves. In the 1st wave, the partners have carried out 5 in-depth interviews in each of the 10 participating countries/region. *The outcomes of this wave have been used to improve the draft design of the questionnaire developed in WP5 and the design of the in-depth interviews*² (WP4). In the 2nd wave, the partners of the five countries/region with less experience (if any) with labelling/auditing of existing dwellings will realise new interviews with dwelling owners.

Most points described hereafter have been communicated to partners prior to the 1st wave of interviews, through presentations and training sessions organised at the Prague IDEAL EPBD meeting (March 2009), working notes and copies of presentation provided to partners, as well as individual communication with partners. The improvements proposed for the 2nd wave of interviews are the result of the first outcomes of the 1st wave of interviews, discussion and further training organised during the Brussels IDEAL EPBD meeting (September 2009), and information provided by the partners.

2. Objectives of the research based on qualitative in-depth interviews

Planned objectives as described in the project agreement

The WP4 (in-depth interviews) overview of the grant agreement of the IDEAL EPBD project stated that "*in-depth interviews will be realised and used to analyse which of the recommended energy saving measures have been realised by recently-moved dwelling owners*", and should "*include questions on the barriers they face(d) and decision making processes*"³, in order to identify brakes and limitations for a successful EPBD application.

¹ IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, Specific objectives, p.3

² IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, WP4, Work package overview, p.19

³ IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, WP4, Work package overview, p.19

Lessons learned from pilot interviews

From the experience gathered from pilot interviews, including approaching of samples and conducting/analysing interviews, several points are to be taken into account to refine the methodology of the research.

The first results about reasons to conduct energy-related renovation (levers), brakes to do so and decision processes, tend to show the followings⁴:

- In some countries (LV, BG), the “community factor” seems to be a key factor for (energy-related) renovations of dwellings, as well as with a positive (lever) than a negative (brake) influence;
- In some countries (LV, BG), both poor conditions of dwellings and decision processes are quite challenging;
- In case of decision clearly in the hands of owners and information available about energy-related renovation useful to be done (UK, BE, ...), a combination of levers appears necessary for having works actually being done; in this case, energy labels act as one lever that will be effective only if it is in association with others;
- Construction or energy companies can play an important role for works to be done (CZ, UK);
- In countries with low decision making to owners and low renovation and energy-related practices, demonstration projects seem to play an important role in the EPBD application. The reactions of dwellers involved in these projects seem interesting to investigate and compare to reactions of dwellers involved in other type of renovation. This comparison could help to understand possible brakes, limitations and levers for the EPBD application in the future;
- Brakes to energy-related works are numerous, some of them being more common to all countries/regions and others more country/region specific. We can cite the followings: missed opportunity, work already done even if not in the appropriate way regarding energy savings, financial constraints, price, cost effectiveness, appearance, intention not to stay, other priorities, poor quality of materials and work, lack of control of work and prices, bureaucracy, frequent changes of laws and rules, lack of information and knowledge, ...;
- General and social context can vary from country/region to country/region. It is thus important to understand/consider the following questions:
 - Some observed differences are country/region specific or linked to the social context, thus emphasizing the importance of varying different social variables among interviews in each country/region;
 - How do people mainly improve comfort in their dwelling (by increasing energy consumption or by energy-related work)?

⁴ Bartiaux F. & V. Gosselain (2009), WP4, in-depth interviews, 1st wave, 10 countries; presentation given at the IDEAL EPBD meeting held in Brussels, 15 & 16 September 2009.

Refining the methodology of the qualitative research

As evidenced by the pilot interviews, in order to identify brakes, limitations, as well as possible levers for a successful EPBD application, recently-moved dwelling owners are not always the only group to be or that can be approached for in-depth interviews. Furthermore, the recent implementation of the EPBD in most of the countries involved in the 2nd wave of interviews will not allow to find enough new-owners who received a label with recommendations for their new dwelling and gather information on renovation works done thereafter. Nevertheless, actual practice of the main dweller's groups in each country will allow improving *the understanding of consumer behaviour, the role of other actors and the effect of policy in general*⁵.

In consequence, in order to optimise the study of the EPBD, the WP4 will study the practices by recently-moved (but not only) dwelling owners regarding their reactions to (recommendations by) energy performance certificate (EPC), label or audit, and their practices regarding renovation and energy related renovation in general (even without EPC/label/audit), through in-depth interviews.

The in-depth interviews will then look for

- The choice of and/or relation to (existing) dwellings by owners;
- The main renovations done by (new) owners and motivations for doing them;
- The levers and brakes to energy-related works to be done;
- The decision making processes and the place of individual dwelling owners in these processes;
- The possible role of other actors, financial incentives, energy certificate/label/audit and policy in general in owners' behaviour and practices;
- The relationship of owners to comfort and indoor temperature;

Different context factors will be considered, such as type of dwelling, social context, age, education, income level, knowledge about environmental issues and climate changes, cultural or country/region specific context. It is to be noted that age, social status and income and education level or variables are usually correlated.

By doing so, the in-depth interviews (WP4) will identify and analyse some levers and brakes faced by dwelling owners on one hand and differences between countries, if any, on the other hand in order to provide EU and country specific insights and policy recommendations.

⁵ IEE/07/600/SI2 499426 – IDEAL EPBD, Annex I, Specific objectives, p.3

3. Theoretical background of qualitative interviewing

The in-depth interviews' approach aims to understand processes, mechanisms, paradoxes, i.e. "how the studied phenomenon works". In this method, each informant (the interviewed person) is thus a key person for the research, as "*a concentrate of the social world*"⁶.

How does an interview work?

Looking for "how it works" will happen as a conversation between the researcher (or the interviewer) and the informant: the researcher encourages the informant to tell and explain, by asking the questions of the grid and also numerous follow-up questions. The general ability of the researcher to conduct the interview is thus crucial.

After the interview, the researcher will analyse the interview as later explained. It is best if the same person conducts the interview and writes its analysis (possibly at least its first draft).

4. The interviewer: qualifications needed for doing in-depth interviews

Recommendations provided before the 1st wave of interviews

The person who realises the in-depth interviews is preferably someone who is trained in qualitative research interviewing within for example sociology, anthropology or psychology. The person does not need technical knowledge on energy consumption, energy savings or energy labels, though s/he needs to know something about the IDEAL EPBD project in order to answer the questions on the project, if any, at the end of the interview.

The required qualifications are the following:

- The person who realises the qualitative interviews should be very good at asking questions that give the opportunity to the respondents to give long answers and develop their ideas. S/he must find and ask many follow-up questions ("*Could you please give me an example*", "*Could you tell me more on what you have just said*") and be able to summarise from time to time ("*Do I understand well: your point is ...*");
- The person is open towards other people and other ideas than hers/his;
- The person is very good at listening without talking too much and without thinking that s/he already knows the answers;
- S/he should be friendly and adapt the style of the interview (vocabulary ...) to the one of the respondent so that for the respondent, the interview looks like a conversation with someone familiar, and not an administrative and/or a (boring) questionnaire;
- The person should be patient as a qualitative interview usually lasts one hour or more, and after the interview, its full transcription requires care and time.

⁶ Kaufmann (1996)

Lessons learned from pilot interviews

While all partners and persons designated to conduct interviews have been trained by the WP4 leader team, and received recommendation notes about the different steps of in-depth interviews, a lot of biases have been identified at the end of the 1st wave of interviews. They are partly due to the prior non-experience of interviewers, not educated in social sciences and without any prior experience in qualitative interviewing for most of them.

The discussion about experience of the 1st wave in-depth interviews, carried out at the Brussels meeting allowed participants to expose difficulties encountered, as well as rewarding aspects of qualitative research. Further training organised in Brussels was particularly appreciated by the five partner teams continuing with WP4.

Recommendations for the 2nd wave of in-depth interviews

As the prior qualifications of interviewers are generally not the requested one for the task to be carried out, it is highly recommended to read and follow carefully all the recommendations and advises provided in this manual.

We also recommend that each interviewer tend to improve his/her practice by constant self-evaluation carried out after each interview (see "*Vertical analysis*", p. 34 and p. 34), as well as regular contacts with the leading team of in-depth interviews.

A third training, after a few more interviews conducted, is to be planned. This will help people to improve their practice, by external evaluation, which will complete their own self-evaluation, and help improving interviewing practices (see also p. 23).

5. Selection of interviewees

Recommendations provided before the 1st wave of interviews

Principle

The interviewees should be 'chosen' very carefully. All the research team members and the interviewees must not know each other, either because they live in the same neighbourhood, or because the interviewer has chosen acquaintances. Differences between interviewees, or probability of such differences, should be searched for (social conditions, age, living place ...). In order to guarantee free expression of interviewees, they should be chosen outside personal acquaintances, colleagues or people with whom the interviewer has a professional or personal relationship.

Choice of interviewees

In the framework of the IDEAL EPBD project, the following strategy is to be followed to choose people to be interviewed:

1. a) If available, a list with the names of the buyers/renters who did recently receive energy certificate/label/advice before buying/renting their dwelling should be used. For example, families/people who received label/certificate in the beginning of 2007, until March 2007, can be chosen. This allows some time for doing renovations. If you have access to the labels before the interview, preferably select homeowners whose house had a rather 'bad' label to ensure that advice was received and renovations suggested.

- b) If a list or a database is not available, intermediary persons for identification of potential interviewees must be used. This should allow selecting people you don't know personally. The principle "a different intermediary for each interviewee" is to be followed in order to avoid built-in similarities in the sample.
2. People to be interviewed should own their dwelling and must be the decision unit for renovation in their dwelling. Preferably, the dwelling should be a single-family house.
 3. The interviewees must be chosen in order to ensure the greatest differences between interviewees (type of dwelling, social conditions, income level, education, age, living place ...).

Remark: use of an incentive for participation?

To ensure consistency between the 10 countries no incentive should be used.

Lessons learned from pilot interviews

As has been shown from pilot interviews, great differences in context and implementation of EPBD exists across Europe, claiming to take into account the specific situations of each country/region in the choice of dwellings and people to interview⁷, as suggested in the following chapter. The main points asking for such differentiation are the followings:

- In several countries, implementation of EPBD is recent (January 2009: PT, FI), does not yet apply to existing dwellings (CZ, BG⁸) or is not yet fully implemented at all (LV: audit without label; BE: voluntary audit with labels);
- Decision unit and decision process vary according to dwelling type and regional context;
- The building stock and the way to inhabit dwellings vary greatly among countries and regions in Europe;
- In some countries (LV, BG), most of the people are living in apartments without an individual decision power.
- In some countries, some dwellings (apartments) are occupied for life time or even several generations; those dwellings can be in general bad conditions (LV);

⁷ See also in Annex 2, the detailed presentation of the choice and approach of people for WP4, 1st wave.

⁸ In Bulgaria energy labels exist since 2007, but are awarded almost entirely to new buildings. The Bulgarian legislation related to existing buildings has not been put into practice yet. In the beginning of 2009 (the time of selection of informants), there was only a single project for labelling of existing buildings – Demonstration Project for the Renovation of Multifamily Buildings, a joint initiative of the Ministry of Regional Development and Public Works and the United Nations Development Programme, which started in 2007 (see details in Annex 2).

Recommendations for the 2nd wave of in-depth interviews

Representativeness

No survey by qualitative interviews is fully representative (just as a survey by questionnaire which is filled in by self-willing persons). However, in WP4-2, efforts will be made to vary as much as possible the socio-economic characteristics of the informants.

Number of informants to interview per country/region (2nd wave)

There is no agreement in the literature about the number of interviews to be realised to reach 'data saturation', "that is, [when] no new or significant data emerge"⁹. In the Mental Models Approach, 16 interviews are usually realized¹⁰. Bryman¹¹ cites Warren¹² for whom "for a qualitative interview study to be published, the minimum number of interviews required seem to be between twenty and thirty." But "by no means all practitioners would agree with Warren's figure."¹³

However, the more comparisons between groups (age groups, socio-economic groups...) "in the sample will be required, the more interviews will need to be carried out"¹⁴.

For the 2nd wave, a number of **at least 16 in-depth interviews** (realisation, transcription, vertical and horizontal analyses) per country/region has been decided.

Target dwellings and informants to interview (2nd wave)

According to the pilot interviews carried out in the 10 countries/regions involved in the IDEAL EPBD project, the following target dwellings, people to interview and methodology to find them for the 2nd wave have been identified. They are described hereafter (see also *Introducing to the interviewer to the informant before the interview, Lessons learned from pilot interviews*, p. 19).

Type of dwellings

In the sample, there should be more **houses** and fewer **apartments** than in the housing stock of the country/region (as houses are easier units of decision than apartments are).

Dwellings with or without labels?

For the focus of the research project is on improving the EPBD, we propose to have in the final sample of each country (1st wave + 2nd wave) about half (if possible) of the sample of houses (or apartments) with a label and half (or more if needed) people having bought their house 1 to 5 years ago, to allow them enough time to renovate it, if and how they wanted it. In practical terms, this means (1) to begin the 2nd wave by the last category and to end it with people with labels and (2) to already search and find way(s) of having access to people who had a label in 2009 or earlier (BE, BG, PT, CZ?, LV?).

⁹ Strauss & Corbin (1998), p. 215

¹⁰ Young I. (2008).

¹¹ Bryman (2004), p. 335

¹² Warren (2002), p. 99

¹³ Bryman (2004), p. 335

¹⁴ Bryman, 2004, p. 334

Variation in the sample

Other factors than the dwelling type and labelling to vary in the sample of people to interview are: **age**, **social status** and **income**, **education level**, **rural/urban area**, the first 4 variables being usually correlated. For a same education level (MA for ex), the disciplines must be varied too (and not only engineers are to be selected).

Tableau 1 – Categories/types of dwellings available per country

	Houses			Apartments					
	existing		new	existing		new			
BE ¹⁵	x	ALv	(88%)	Lc	x	-	(12%)	-	< 2005 (voluntary audits); < 2010 certification
BG ¹⁶	x	-	(54%)	Lc	x	Pv	(46%)	Lc	< 2007
CZ ¹⁷	x	Pv	(30%)	Lc	x	Pv	(70%)	Lc	< 2009 labels available for new and reconstructed houses only
LV ¹⁸	x	AvLv	(23%)	Lc	x	AvPvLv	(77%)	Lc	< 2003 (voluntary audits); < 2009 certification
PT ¹⁹	x	Lc	(~66%)	Lc	x	Lc	(~34%)	Lc	< 2009

Legend:

- Main target dwellings of the IDEAL EPBD project
- Secondary target dwellings of the IDEAL EPBD project
- Not target group of the IDEAL EPBD project
- L** label available
- A** audit available (without label)
- P** specific program or project for renovation available
- v** voluntary
- c** certification according to the EPBD, i.e. when sold or rented
- x** dwelling of the category without label/audit
- blue** main target group for next wave (WP4, 2nd wave)
- blue grey** secondary target group for next wave (WP4, 2nd wave)
- (\$\$%)** estimated share of the existing housing stock (houses/apartments)

¹⁵ All information provided by the Belgian partner deals with Walloon Region; statistics are calculated from data of the Belgian Federal Government - SPF Economie, P.M.E., classes moyennes et energies, available on http://statbel.fgov.be/fr/statistiques/chiffres/economie/construction_industrie/parc/index.jsp.

¹⁶ Best expert estimation, based on the available statistical data about related issues (mainly total number of buildings, total number of dwellings, the allocation of these numbers in cities and villages, and historical trends in construction)

¹⁷ Czech Statistical Office

¹⁸ All information prepared based on the information provided by Ministry of Economics of Latvia, available at : <http://www.em.gov.lv/em/2nd/?cat=15992>

¹⁹ There is no national reference for this disaggregation. The number of apartment buildings is lower than the number of houses, in the percentage of 65% houses and 34% buildings (of apartments). However, there is no statistics available for the number of families living in apartments and in houses. From the samples considered in recent studies, this disaggregation was as follows: REMODECE 40% houses - 60% apartments; ECO CASA: 53% houses - 47% apartments. Of course this depends on the region we are considering. In large cities, like Lisbon, Porto, Coimbra the number of apartments is larger than the number of houses, while in the countryside and surrounding areas the number of houses is larger.

Recommendations per country/region

BE

	Houses			Apartments		
	existing		new	existing		new
BE	x	ALv	Lc	x	-	-

All interviews will be carried out with owners of houses.

While for the 1st wave, all informants were chosen from the database of voluntary audits done, in order to vary the range of social contexts of informants, most informants to contact for the 2nd wave will be new home-owners (since 2007) and they will be found otherwise (housing database? – to be further investigated)

Putting together interviews from the 1st and the 2nd waves, home owners with audits and labels will be half of the total owners interviewed.

Clue(s) to find people and maximise recommended factors

Use the voluntary audit database, as for the 1st wave.

Use another database or other means in order to enlarge the range of social background of informants (as not “everybody” pays for an audit).

BG

	Houses		Apartments	
	existing	new	existing	new
BG	x	- (54%)	Lc	x Pv (46%) Lc

Part of informants should be owners of **existing houses**. The proportion to look for should be ½ **houses** for ½ **apartments**.

Among arguments for similar proportion of houses and apartments in the interview sample are:

- In cities the proportion of single family houses is negligible and it would be difficult to find informants. Some interviews in villages are possible, but they request long travel time and it is difficult to find informants there. In cities the team will try to cover equally rich districts and poor districts;
- The majority of the population lives in apartments. In the last 20 years, many villages were depopulated;
- Apartment owners are decision-makers about the renovation of their apartments (it is possible to renovate individually each apartment, while still there is no practice to renovate the whole building block);
- Renovation of houses usually makes no sense because it is much more expensive than renovation of apartments and the heating costs are negligible (firewood and/or coal are mainly used). Additionally (also related to the depopulation) normally only a small part of each house is heated in winter;
- It will be too difficult to find many people who have recently purchased and moved into a house, because houses are located in villages and small towns and the urbanization goes in the opposite direction.

The choice criteria to use for selecting the dwelling-owners to be interviewed are:

- New owners (as much new owners as possible and at least half of the sample) since the last 1-5 years, with a priority to the home owners who had enough time to make renovations.

About the relevance of interviewing owners of apartments involved in the **Demonstration Project of dwelling renovation**, the proportion of dwellers involved to interview should be the same as in the whole housing stock. Indeed, the sample of these buildings is negligible. Moreover the people are not representative for the country – they are much more proactive to improve the energy performance of their building (they applied for the grant), they are already familiar with many aspects of the energy performance (most have passed the renovation process already), and their decision about the renovation is heavily influenced by the Project grants (not available for the buildings outside the project).

Clue(s) to find people and maximise recommended factors

The Bulgarian team has good contacts with real estate agents and counts on them to contact persons who have recently purchased and moved into an existing building.

CZ

CZ	Houses		Apartments	
	existing	new	existing	new
	x Pv (30%)	Lc	x Pv (70%)	Lc

While part of the interviews of the 1st wave was conducted with owners of new houses, the 2nd wave should only focus on **existing dwellings** (even if there are labels only for new houses).

Some of the houses to be chosen should be involved in the Program for insulating/renovating houses (even if not part of the EPBD). The proportion of dwellers involved in this renovation program to interview should be the same as in the whole housing stock of CZ.

Other factors to vary are to be followed (see *Target dwellings and informants to interview (2nd wave)*, on p. 11).

Clue(s) to find people and maximise recommended factors

ENVIROS has been in contact with the State Environmental Fund (Managing the Green Savings Programme for housing renovation) in November 2009. There is a possibility that the IDEAL EPBD research CZ team receives a database of households that already received support. This will give the possibility to choose from a large variety of households. It will almost completely consist of people living in existing houses. Since a few months this programme has also been opened for reconstruction of apartment buildings. The larger part of subsidies has, however, gone to houses so far.

Three (3) houses involved in the Program for funding housing renovation will be chosen for interviews.

LV

LV	Houses		Apartments	
	existing	new	existing	new
x	AvLv (23%)	Lc	x AvPvLv (77%)	-

As for the 1st wave, for the 2nd wave, a majority of informants should be owners of apartments (main dwelling type in Latvia), but considering both waves of interviews, the proportion of houses should be higher than in the building stock. So, for a total of 21 interviews, at least 6 must be with owners of houses.

Audited buildings can be selected from contact with managers and a particular attention is to be paid to the presentation of interviewer (and research) both to managers and possible informants. For both audited and non-audited dwellings, a recommendation from a University must be considered (in order to avoid the bias of introducing the interviewer as a member of Ekodoma that carried out the audits). Range of informants' ages should be broadened, e.g. by considering interviews at evenings or/and during week-ends. Informants should know in advance that the interview will last at least one hour.

At least several interviews should be conducted with owners of a house. Interviews will take place in urban and rural areas.

Clue(s) to find people and maximise recommended factors

For choosing informants considering the requirements, the following steps will be followed:

1. The energy audit database of Ekodoma will be surveyed and multi-apartment buildings and private houses (if possible) with energy audits done in 2006 – 2009 and in different areas of Latvia will be selected.
2. The communication with multi-apartment building managers and owners of private houses will be established through phone calls. The information regarding inhabitants' introduction on the results of energy audits will be clarified with building's managers. If the inhabitants were not introduced with the results, they will not be selected for interview.
3. The main points of the conversations of all contacts with managers will be written in a Word text file, in order to gather information on energy audits and information given or not to the dwellers. 6-7 questions will be made and asked by phone to the managers selected to be contacted.
4. A letter of invitation to participate to the study will be prepared for all inhabitants of the selected buildings, and put in each mailbox. The letter will be signed by a professor of the Riga Technical University. The letter will mention a study on housing, renovations and energy, conducted by several research institutes and universities in Europe, as well as the wish to find owners of houses and apartments for interviews carried out by students of Riga Technical University. Dwellers will be asked to contact the IDEAL EPBD Latvian team if they are interested to participate, in order to fix an appointment for interview at their home, either during the week, evenings or week-ends. An introduction to the letter will be provided to the chosen building's managers, to be placed on the front doors of the buildings.
5. At the appointment dates, the interviews will be held. A maximum of 2 or 3 dwellers from the same building or the same group of/manager's buildings will be chosen for interviews, and this information will be mentioned in the identification questionnaire.
6. In the case this method does not give enough answers, a new strategy will be discussed with the WP4 team leaders.

PT

	Houses			Apartments		
	existing	new		existing	new	
PT	x Lc (45%)	Lc	x	Lc (55%)	Lc	

Both apartments and houses should be considered for the 2nd wave of in-depth interviews. Nevertheless, a larger proportion of houses must be found for the interviews than the proportion of houses in the housing stock of PT.

Both dwellings with and without labels should be considered (see Target dwellings and informants to interview (2nd wave), *Dwellings with or without labels?*, on p. 11).

Clue(s) to find people and maximise recommended factors

While for the 1st wave of interviews all informants were friends of friends, for the 2nd wave different approaches to find the target people will be used:

- for the houses with label, the database where all certificates are registered will be used;
- contacts with real estate agencies to identify people who bought a house recently will be taken;
- contacts with qualified experts who are doing buildings certification and are members of the Steering Committee will be taken.

6. Introducing the interviewer to the informant before the interview

Recommendation provided prior to the 1st wave of interviews

To ensure an open talk and optimal material conditions for the interview, the topic of the interview should not be explicitly mentioned.

Example of a letter for invitation to interview to be sent to dwelling owners

Hereafter is a template of letter for invitation to the in-depth interviews that has been provided to each partner, to be translated in their own language and sent to the selected owners. Parts in yellow has been asked to be adapted to each country/region, as place and date, name of country, contact person, and final sentence with thanks.

Place, date
<p>Madam, Sir,</p> <p>Several research institutes and universities in Europe are currently conducting a study on housing, renovations and energy. In this context, a series of interviews are to be conducted with owners who have recently bought an existing dwelling in which they are living. No specific qualification is required to participate in these interviews.</p> <p>We would like to invite you to participate to an interview because your opinion matters a lot and will form the basis of our work.</p> <p>The interviews take place at the home of the person(s) and lasts between 1h and 1h30. The adult person most interested is the most appropriate to participate in the interview; couple participation is also welcome. The talk will remain strictly anonymous and will be tape-recorded for analysis.</p> <p>If you want to participate in such an interview, please get in touch as soon as possible and preferably before 9 April 2009 with the person responsible for interviews for Belgium:</p> <p style="text-align: center;">Name and contact of the person of your staff to contact to apply for an interview</p> <p>In advance we thank you for your interest to this invitation and present you our best regards.</p>

Lessons learned from pilot interviews

Based on the explanation related by the partners²⁰ on how people have been chosen and approached for the interview, we expose hereafter the problems encountered. The following section will suggest avenues to avoid such problems and, if any, suggest some possible solutions.

Problems faced were the following:

- Wording of the invitation letter and the wording from the interviewer can influence the interview. For e.g. UK changed some parts to adapt it and NL sent the template to a third party which did not use it at all;
- Privacy is an important issue in several countries (DE, FI, UK);
- Representativeness of the samples.

Recommendations for the 2nd wave of in-depth interviews

The principle and recommendations done for the 1st wave of interviews still apply.

In addition, in order to reduce the negative impact of problems faced for and biases that could have impacted the first interviews, we insist on the following points:

- Reduce influences on your informants by not announcing precisely the topic of the interview and reinforce conditions that will allow a more open conversation with the informants: take better control on the wording of sent documents and communication to possible informants;
- Support can be found from the European Commission and from Universities:
 - The European Commission will issue a letter of support to help the contact with persons in charge of databases (mainly for WP5);
 - Some countries must ask for a letter of support to their University (e.g. Portugal and Latvia).
- People to constitute the sample for interviews have to be chosen as close as possible from the recommendations given on Target dwellings and informants to interview (2nd wave), on page 11.

²⁰ For details on the choice and approach of people for WP4 – 1st wave, see Annex 2.

7. Conducting in-depth interviews

Recommendation provided prior to the 1st wave of interviews²¹

Place to carry out the interviews and duration

Interviews are supposed to be carried out face to face with the informant. Preferably they are carried out at the home of the informant. Interviews can be expected to last at least one hour (or more).

Preparing the interview

The following points are to keep in mind when preparing the interview:

- **Finding the informants:** take appointments without giving too much details on the topics of the interview
- **Contacting the informant:**
 - *Topic to announce:* your house, renovations, energy
 - With the adult(s) interested in these topics
 - *Duration:* 1 hour or more
 - The interview will be recorded
- **Preparing the interview:** read again the interview grid and memorise it
- **Practicalities:** recorder, adequate dress, routing directions

Guidelines for conducting in-depth interviews

As stated by Kaufmann (1996), the following rules are to be applied when conducting the interviews:

- No hierarchy: 2 equal persons, the informant and the interviewer;
- But 2 different roles: the informant describes and auto-analyses his/her own experience, the interviewer help him/her do so;
- Empathy;
- Engagement;
- Humour.

In addition, the interviewer will begin the interview by asking “*I’d like that you tell me about ...*”. He/she will then accompany the interview by:

- showing interest;
- avoiding interrupting the informant;
- asking for examples, description of different possibilities;
- rephrasing what the informant has said: “*if I understand well, you are telling me that ...*”.

²¹ This part of the recommendations has been provided to the partners through the presentation “Qualitative method: an introduction” by Françoise Bartiaux and Véronique Gosselain (UCL), given at the Prague meeting, and then provided to all.

First impression and further work

After finishing an interview, its transcription should be done as soon as possible, as well as its analysis. First impressions after the interview are to be written right after the interview, the same day.

Lessons learned from pilot interviews

As it already appeared to the leading team when receiving the transcription and vertical analyses of the 1st wave of interviews, the discussion we had at the Brussels meeting pointed out some major problems about the way in-depth interviews were conducted. These can be summarised as follows:

- Interviews are too short and do not allow to reach the level of information expected; a good interview must last at least one hour or even more, and result in a transcription of around thousand lines, which was far from the case for the majority of partners;
- Lack of using follow up questions (those provided in the grid and others) allowing a real conversation and a search in depth for useful explanations, i.e. the practices, motivations, contradictions, ... of the informants;
- Not enough questions allowing understanding clearly what the informant told the interviewer;
- Probably, a lack of conversational mode when conducting the interview;
- Probably not enough learning of the grid question before the interviews;
- Lack of adaptation to specific situations, e.g. when the dwelling was audited instead of being labelled;
- Some of the above difficulties may be due to the lack of prior experience by the persons who conducted the interview, as well as to the limited time allowed per interview in the project agreement (8 hours).

Tableau 2 - Number of lines per interview for the 5 interviews conducted by the 10 IDEAL-EPBD partners (1st wave)

	BE	BG	CZ	DE	DK	FI	LV	NL	PT	UK
min.	703	250	209	314	756	499	174	607	143	183
Max.	1161	421	313	489	1235	1154	303	1413	592	606
mean	992	290	271	382	1007	864	222	951	325	350

Recommendations for the 2nd wave of in-depth interviews

Clues for in-depth interviews

All above recommendations, provided prior to the 1st wave of interviews, have to be followed carefully. In addition, the training session of the Brussels meeting (September 2009) was the opportunity to re-insist on some clues for interviews, reported here after:

- Go where the informant is going: do not interrupt and be patient, listening and interested; but gently keep the lead of the interview;
- **Use all the follow up questions of the grid and a lot more!** You need to have information on each topic raised in each sub-question. In the example below, from a real interview, note how the answer to the 2nd follow-up question of the interviewer enables to deepen the informant's answer and to reveal his contradiction!

Interviewer: *“Did you get some help when you were working on the [new] boiler?”*

Édouard: *“No, I did all myself. And actually I prefer to work alone.”*

Interviewer: *“Did your wife intervene when you were working on the [new] boiler?”*

Édouard: *“No, certainly not. Well, maybe, to hang it, because it was rather heavy, though.”*

Interviewer: *“OK”*

Édouard: *“It was necessary to be at two”*

- Use different approaches for the same question;
- Investigate beyond the informant's intentions or feelings, for example by questions and follow up questions such as *“how did you do?”*, *“What did you do?”*, in order to reach information on practices;
- Ask further questions to clearly understand what the informant tells: e.g. *“the quality was not good”*: what does the informant mean with “quality” (insulation or colour of wall paper or what?);
- If/when informants talk in general or give indirect explanation (*“everybody”*, *“one”*, ...), allow the informant to speak in this indirect style (which will be used in the analysis, see below *Vertical analysis*, on p. 34 and 35);
- Show your empathy: there is a need to reach empathy with the informant and to keep trying to be empathic;
- Try that the informant just forgets that s/he is being interviewed. Make them feel like friends;
- Do not give advices. Never let the informant know that we are experts knowing the “good” answer. Every answer is good for the research!
- Read again recommendations given for the 1st wave of in-depth interviews (see above).

New training for interviewers

A new training session will be held after a few more interviews will be carried out. In fact, interviewers will be able to fully incorporate new learning and suggested clues for interviewing when putting them in their practice. The comparison of our evaluation of their new interviews and their self-evaluation (see below, "*Grid for vertical analysis – Self evaluation of the interview by the interviewer*", p. 34) will allow to point remaining problems and to have a coaching accordingly.

8. Grid for the interview

Recommendation and grid provided prior to the 1st wave of interviews

Approach and clues to elaborate the grid for interview²²

As already said, the aim of the in-depth interviews is to understand processes, mechanisms, paradoxes, in a word "how it works". The informants are thus key persons for the research. To look for "how it works", the interviewer will conduct the interviews as a conversation between familiars, encouraging the informants to tell and to explain. Follow-up questions are thus of prime importance.

When elaborating the grid for interview, the researcher imagines a real person who answers to the questions. None of the questions should bring about a short answer. On the contrary, questions usually starts by "*Tell me about ...*", allowing for long answers and explanations. In addition, the first question is about informant's practices and is chosen for being easy to talk about.

The grid is elaborated in a way to propose logical and consistent set of topics. The research questions are not the grid questions! The questions are chosen so that the informant will feel free to talk about his/her practices whatever they are. Every question must thus be open and allow several answers; there is no good and wrong answers, they are all 'good' as they reflect actual practices of the informant.

Questions of identification are asked at the end of interview (age, profession ...).

The grid for interview (1st wave)

The grid for interview has been elaborated by the leader team of WP4, with the contribution of SBi partners (DK). These two partners used their previous experience in research with qualitative methods, namely one on a close topic on a smaller scale though²³. The grid has been sent in English to all partners. Each partner was then invited to translate it in his own language.

The grid in English is provided in Annex 3.

²² This part of the recommendations comes from Kaufmann (1996) and has been provided to the partners through the presentation given at the Prague meeting "Qualitative method: an introduction" by Françoise Bartiaux and Véronique Gosselain (UCL), and then provided to all.

²³ Bartiaux F. *et al.* (2006). See also Gram-Hanssen K. *et al.* (2007).

Lessons learned from pilot interviews

The transcriptions and analyses provided by partners for the 5 pilot interviews (1st wave) showed unequal quality of interviews carried out.

The *major problems were about conducting in-depth interviews and are discussed in the previous section (p. 21).*

Recommendations for the 2nd wave of in-depth interviews

Some adaptation of the grid, according to the country/regional context or on the way to reach information looked for are discussed in the framework of 'Conducting in-depth interviews, Recommendations for the 2nd wave' (previous section, p. 22).

This new grid must be considered along with recommendations on how to conduct in-depth interviews (see just before, p. 18-20). In particular, the grid must be learned before the interviews.

Modifications to the grid for interview are the followings:

- Importance of follow-up questions, more than those provided, is emphasized;
- About energy savings at home, a question is added to cover actual practices and not only possible practices: “Do you save energy at home?” and “Could you save energy at home?”;
- Mention is done to ask questions on energy label only if relevant;
- Energy label has to be replaced by energy audit when relevant;
- Identification questions to be asked at the end of the interview have been completed with questions about the house and its environment;
- Questions on the household members have been completed in order to have information on diploma, profession and actual professional situation for all adults of the household.

The grid to be used for the 2nd wave of interviews is provided hereafter; modifications from the 1st wave interview grid are marked in yellow.

Interview grid for IDEAL-EPBD - 2nd wave

Guidelines for the interview

- Chapters to interview about (without telling the title in italics!) are in successive boxes. Please proceed in that order.
- In bold is the invitation to talk: allow the person to talk during several minutes!
- On the first level of indentation (with a hyphen) there are questions to be asked after time of free talk.
- The last level of indentation (with a small circle) shows follow-up questions, which the interviewer has to ask, possibly by rephrasing the answer already given ("So, if I understand well, you say that...[+ link with the follow-up question], am I right?"). A lot more follow-up questions should be asked. Please see before "Clues for in-depth interviews", on p. 22, for further explanations.
- Please, prior to the interview read and memorise the following interview grid
- Please, prior to the interview, also read carefully the explanations of part of the grid and further recommendations provided in the right column;
- Use the right column to note non-verbal expressions of the informant at the corresponding stage of the interview, so you can add these notes in the transcription.

Interview grid	Note for interviewer
<p><i>Introduction</i></p> <p>Thank you for accepting my visit for an interview. As I told you when we took the appointment, I guarantee to preserve your anonymity. This interview is part of a research about houses, renovations and energy.</p>	<p>Introduction to tell and then directly proceed to the first invitation to talk.</p>
<p><i>Choice of home</i></p> <p>So, I would like to ask you to tell me about your house/apartment.</p> <p>For instance, I would like to ask you to <u>tell me how</u> you came here, in this house.</p> <ul style="list-style-type: none"> – What did you like (in moving) here? <ul style="list-style-type: none"> ○ Why did you choose to move here? ○ What did you like here? ○ Why did you move to here? – Before buying/renting the house, did you ask any specific questions about the house? <ul style="list-style-type: none"> ○ Which questions did you ask? ○ To whom? ○ Why did you ask those questions? ○ Were the answer(s) to this/those question(s) determinant in your choice of moving here? ○ Did you visit the house with someone else before buying/renting it? – Do you intend to stay here? 	<p>→ <u>Allow the person to talk during several minutes!</u></p>
<p><i>Changes and renovations</i></p> <p>Have you made any changes or renovations of the house/apartment?</p> <p><i>If no renovation done, ask:</i></p>	<p>Allow the person to talk during several minutes!</p>

- What were the characteristics of the dwelling that you were the most satisfied with?
- Would you like to have some renovation done?
- *If yes (would like to have some renovation done):*
 - o Which renovation(s)?
 - o Is there something difficult to make this/these renovation/s?
 - o Is there something that could help you to do some?
 - o Is there something that could make you do that?

If renovation(s) done:

Can you talk about the renovation which has been the most important to you?

- 1- Why did you do this/these?
- 2- How did you decide about these renovations? ~~How did you think about these renovations?~~
 - o Can you tell me what brought you to this work?
 - o Was there more work to do in the house?
 - o Why did you choose this one?
- 3- Please tell me **whether** you have planned the renovations?
 - *If yes:*
 - o **How did you plan the renovations?**
 - o What were your "guidelines" for the work?
 - o What were your priorities **before** realising the work?
 - o Did you get some help, some advice...?
 - o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...)
 - o Did you get contradictory advice?
 - o *If yes:* Which one did you trust?
- 4- Please tell me about the realisation of the work?
 - o **What were your priorities when realising the work?**
 - o Who did the renovations?
 - o Did you get some practical help, some advice...?
 - o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...)
 - o Did you trust experts and professionals who were involved in the work?
 - o Which ones?
- 5- Are you happy with the work done?
 - o Do you feel proud of having this done?
- 6- Do you want to add something?

Have you made any changes or renovations on the roof?

If not, ask:

- **Would you like to have some renovation done?**

If the informant hesitates or doesn't look fully satisfied, go ahead with the 'if yes' questions.

Allow the person to talk during several minutes!

If the renovation mentioned has nothing to do with energy, only ask questions 2 and 4.

As soon as the informant talks about insulation or other energy renovation, go further in that direction! (but do not push)

To keep in mind:

Energy works are

- Roof insulation
- Double or triple glasses windows installation
- Wall insulation
- Floor insulation
- Boiler or heating system replacement by a more efficient one (ex: installing a heat pump)
- Water heating system replacement by a more efficient one
- Hot water pipes insulation
- Heating pipes insulation
- Aluminium sheet put behind radiators

If already explained, ask about the **windows**.

Allow the person to talk!!

If the informant hesitates or doesn't look

<p>– <i>If yes:</i></p> <ul style="list-style-type: none"> ○ Is there something difficult to make this/these renovation/s? ○ Is there something that could help you to do some? ○ Is there something that could make you do that? <p><i>If done:</i></p> <p>1- <u>Why</u> did you do this/these?</p> <p>2- <u>How</u> did you decide about these renovations? How did you think about these renovations?</p> <ul style="list-style-type: none"> ○ <u>Can you tell me what brought you to this work?</u> ○ Was there more work to do in the house? ○ Why did you choose this one? <p>3- Please tell me whether you have planned the renovations?</p> <p>– <i>If yes:</i></p> <ul style="list-style-type: none"> ○ How did you plan the renovations? ○ What were your “guidelines” for the work? ○ What were your priorities before realising the work? ○ Did you get some help, some advice...? ○ Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...) ○ Did you get contradictory advice? ○ <i>If yes:</i> Which one did you trust? <p>4- Please tell me about the <u>realisation of the work?</u></p> <ul style="list-style-type: none"> ○ What were your priorities when realising the work? ○ Who did the renovations? ○ Did you get some practical help, some advice...? ○ Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...) ○ Did you trust experts and professionals who were involved in the work? ○ Which ones? <p>5- Are you happy with the <u>work done?</u></p> <ul style="list-style-type: none"> ○ Do you feel proud of having this done? <p>6- Do you want to add something?</p> <p>Have you made any changes or renovations on the windows?</p> <p><i>If not, ask:</i></p> <ul style="list-style-type: none"> – Would you like to have some renovation done? – <i>If yes:</i> ○ Is there something difficult to make this/these renovation/s? ○ Is there something that could help you to do some? ○ Is there something that could make you do that? 	<p>fully satisfied, go ahead with the 'if yes' questions.</p> <p>If already explained, ask about the outside walls. Allow the person to talk!!</p> <p>If correspond to the 3rd explanation about energy work, just ask: - was the process the same as the one you previously explained?</p> <p>If the informant hesitates or doesn't look fully satisfied, go ahead with the 'if yes' questions.</p>
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If done:

- 1- Why did you do this/these?
- 2- How did you decide about these renovations? ~~How did you think about these renovations?~~
 - o Can you tell me what brought you to this work?
 - o Was there more work to do in the house?
 - o Why did you choose this one?
- 3- Please tell me **whether** you have planned the renovations?
 - *If yes:*
 - o **How did you plan the renovations?**
 - o What were your "guidelines" for the work?
 - o What were your priorities **before** realising the work?
 - o Did you get some help, some advice...?
 - o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...)
 - o Did you get contradictory advice?
 - o *If yes:* Which one did you trust?
- 4- Please tell me about the realisation of the work?
 - o **What were your priorities when realising the work?**
 - o Who did the renovations?
 - o Did you get some practical help, some advice...?
 - o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...)
 - o Did you trust experts and professionals who were involved in the work?
 - o Which ones?
- 5- Are you happy with the work done?
 - o Do you feel proud of having this done?
- 6- Do you want to add something?

Have you made any changes or renovations on the outside walls?

- Was the process the same as the one you previously explained?

After finishing about renovations done, and if not yet talked about:

Do you know about any incentive or subsidies regarding renovations?

- What is your opinion about such instruments?
- Did you benefit from any?

After finishing about renovations done:

In the future are you going to make any changes?

Why (or why not)?

What will be your next work in the house?

If already explanation about 3 energy works, don't ask any question here.

Allow the person to talk!!

<p><u><i>If the planned work has to do with energy:</i></u> Will you do it the same way as you explained or in a different way?</p> <p><u><i>After finishing about renovations and if nothing was mentioned about energy renovations:</i></u> Did you made any renovation regarding energy?</p>	<p>Allow the person to talk!!</p> <p>Allow the person to talk!!</p>
<p><i>Comfort</i> Let's talk about comfort.</p> <ul style="list-style-type: none"> – According to you, what makes a house comfortable or nice to live in? – Would you like to change something to make your house more comfortable? – For you is there any relation between comfort and temperature? – Is the temperature you are usually living in your living room comfortable for you? <ul style="list-style-type: none"> ○ Do you know the temperature of the room you are living in? ○ What is the temperature you like to have in your living room? ○ And in your bedroom? ○ What is the temperature you are actually living with? ○ In which rooms? ○ What would you need to live with the temperature you like? 	<p>Allow the person to talk!!</p>
<p><i>Socialisation</i> Do you speak about energy consumption? With whom?</p> <ul style="list-style-type: none"> – Do you speak about energy consumption in the <u>family</u>? <ul style="list-style-type: none"> ○ With whom? ○ Do you speak about energy savings? ○ With whom? ○ Who in the family does think about it? – Do you speak about energy consumption with <u>other persons</u>? <ul style="list-style-type: none"> ○ With whom? ○ Do you speak about energy savings? ○ With whom? – Do you have child(ren)? – If so, what do they know about energy consumption? <ul style="list-style-type: none"> ○ Do they tell you anything about energy? ○ Do you teach them anything about energy? ○ Do they talk about it at school? 	<p>Allow the person to talk!!</p>
<p><i>Knowledge about energy and energy savings</i> Let's speak about energy and energy savings!</p> <ul style="list-style-type: none"> – Do you save energy at home? <ul style="list-style-type: none"> ○ Where? ○ How? – Could you save energy at home? <ul style="list-style-type: none"> ○ Where? 	<p>Allow the person to talk!!</p>

Deliverable 4.2

<ul style="list-style-type: none"> ○ How? – What would make you save more? – Do you care about saving energy (and water)? – Who in the family does think about it? – Do you know where to get the knowledge? 	
<p><i>Energy label/audit of the house</i></p> <ul style="list-style-type: none"> – Did this house/apartment have an energy label/audit (when you bought it)? <p><u>If no: gently insist</u></p> <p><u>If yes:</u></p> <ul style="list-style-type: none"> ○ Do you remember which labels this house had? ○ What was your reaction to the label(s)/audit at that time? <ul style="list-style-type: none"> – Did the label(s)/audit of this house come with recommendations and advice? <ul style="list-style-type: none"> ○ Were any advice given regarding energy savings? ○ Did you speak about this advice? ○ With whom? ○ Did you read the report? ○ With interest? ○ Have you kept the report? – What were the recommendations and advice? Please list the ones you remember. <ul style="list-style-type: none"> ○ Have you followed any of the advice? <ul style="list-style-type: none"> ➤ <u>If yes:</u> Which recommendations? Why this/these one/s? ➤ <u>If not:</u> What was difficult? Can you tell me why you did not follow the advice? ○ What do you think about this Energy label/audit system? – What could make you more interested in Energy labels/audits? <p><i>If the advice is part of the labelling/auditing:</i></p> <ul style="list-style-type: none"> – What could make you more interested in following the advice? – Do you trust the information that you were given? – Do you think other experts would have given other recommendations? 	<p>To be asked only if relevant! To be adapted according to the situation (to be carefully checked prior to interview!)</p> <p>Please repeat the follow-up questions for every recommendation that the informant remembers.</p>
<p><i>Environment</i></p> <ul style="list-style-type: none"> – In your opinion has energy (and water) consumption something to do with environmental issues? – Are environmental issues important or are you tired of hearing about it? – Have you heard of global warming? – What do you know about it? 	
<p>Do you want to add something?</p>	

Our interview is now ending. I will switch off the recorder and ask you a few last questions (note answers below).

The house

- How long have you lived here? Years / Months
- Is it a 2-façade house, a 3-façade house, a 4-façade house; an apartment?
- If apartment, which position does it have in the building?.....
 - Highest floor? Ground floor? Basement?
 - At a corner of the building?.....
- What is the construction year of the house?..... What is its floor area?
- Give information on the neighbourhood of the house (urban, countryside, ..., distance from main city, ...)

The previous dwelling

- Where did you live before?
- Was it a 2-façade house, a 3-façade house, a 4-façade house, an apartment?

The household

- Who is living here? *Please complete the table with all adults of the household, including the interviewee*

	Mister	Madam	
Choose a name to ensure anonymity			
Gender			
Age			
What is your present professional situation?			
What is your profession?			
What is your last diploma?			
At what age did you get it?			

- Give number, age and gender of all children of the household.
- Date and place of the interview?

Thank you very much for your contribution!

9. Transcription of interview

Recommendation provided prior to the 1st wave of interviews²⁴

The transcription has to be done after each interview. It should respect the following rules:

- Respect anonymity;
- Transcribe everything verbatim (no summary);
- Alternate question/answer, using bold characters for questions;
- Follow the informant's expression, not the grammar;
- Take care to punctuation!
- Transcribe everything, including silences, "heu", writing vocal between brackets, e.g.: (silence), (laugh), (heu),...;
- Add, in italics, information on non verbal expressions.

The transcription should also follow the following presentation:

- Use a left margin of 3 cm and an interline of 1.5;
- Number the lines of the interview²⁵;
- Note date and place of the interview.

Lessons learned from pilot interviews

Recommendations were not fully followed resulting in discrepancies in the files to be potentially treated in a final stage of analysis, and thus a waste of time.

Recommendations for the 2nd wave of in-depth interviews

Reasons for fully transcribing all in-depth interviews

1. It enhances the **scientific robustness** of the qualitative survey, both in the phase of data collection and during the analysis. For the further data collection, the transcription makes a (self-)evaluation of the interviewer work in conducting the interview possible. We plan to add this aspect in the grid for the analysis of the interview. Nevertheless, the most important aspect of the transcription is to make a grounded analysis. Many authors do recommend full transcription of the interview²⁶.
2. The transcription facilitates a **more reflexive way** of looking at the content of the interview, as the first impression of the analyst about what the informant has said is to be tested: very probably, the informant says more than what has been first grasped. So the transcription and its analysis force *“researchers to consider the range of plausibility (...) it is the researcher who is being jolted out of his or her usual modes of thinking. It is not the data that are being forced. The data are not being forced, they are allowed to speak.”*²⁷.

²⁴ F. Bartiaux & V. Gosselain, Qualitative methods: an introduction, PowerPoint presented at the IDEAL EPBD Prague meeting, March 2009.

²⁵ Explanation for line numbering is provided in Annex 1.

²⁶ Miles & Huberman (1994), pp. 92-93 in the French translation (2003), Willig (2001), pp. 24-25, Strauss & Corbin (1998), pp. 57-71, take it for granted when explaining their "line-by-line" method of microanalysis

²⁷ Strauss & Corbin (1998), pp. 65.

Microanalysis (or line-by-line analysis) “enables the analyst to rise above the commonplace and develop truly innovative but grounded theory.”²⁸.

3. **Team work** is facilitated, both within a country and for the coordination between the 5 countries. Team work is one way of bringing about intersubjectivity between the researchers, which is a condition of scientific **robustness** in social sciences. In some countries (CZ, partly BE and probably PT), the interviewers (young scientist or student) are not in charge of the analysis of the interviews (one by one and transversal analysis), done by a senior scientist. Without transcription, the analysis is more time consuming, especially to find appropriate quotes – and we will demand more quotes than during the 1st wave, for quotes are important for the scientific robustness.
4. For the leading team, audio-record interviews are not manageable given time and money constraints whereas transcriptions are usable and were used to find insights on the quality, the openness and the deepness of the interviews and then to give appropriate further advice for conducting the following interviews. A comparative study between different countries, such as the IDEAL-EPBD project, cannot be organised in a same way as a research in one country made by one researcher who works mostly alone and has a long experience in conducting and analysing qualitative interviews (and who could avoid the transcriptions in the analysis process).
5. Bryman (2004)²⁹, following Heritage (1984), expresses the same ideas by giving 6 reasons explaining “*why you should record and transcribe interviews*”:
 - a) It helps to correct the natural limitations of our memories and of the intuitive glosses that we might place on what people say in interviews;
 - b) It allows more thorough examination of what people say;
 - c) It permits repeated examination of the interviewees' answers;
 - d) It opens up the data to public scrutiny by other researchers, who can evaluate the analysis that is carried out by the original researchers of the data (that is, a secondary analysis);
 - e) It therefore helps to counter accusations that an analysis might have been influenced by a researcher's values or biases;
 - f) It allows the data to be reused in other ways from those intended by the original researcher – for example, in the light of new theoretical ideas or analytic strategies.

Recommendations

Please, follow carefully all the recommendations provided for the 1st wave of interviews. Note in addition the following:

- On the top of the transcription, indicate the pseudo name chosen by for the informant, as well as date and place of the interview and name (or initials) of the interviewer.
- Insert in English the subtitles of the interview grid.
- Insert the file name (see on page 42) and the page number in the header of the word file.

²⁸ Strauss & Corbin (1998), p. 71.

²⁹ Bryman (2004), p. 330.

10. Vertical analysis

Recommendation provided prior to the 1st wave of interviews³⁰

A first analysis is carried out for each interview: it is called the vertical analysis. It comprises a content analysis and an in-depth analysis.

Content analysis

The content analysis aims at reproducing the informant's point of view. For each topic of the interview, a synthesis of his/her ideas and points of view are reported and illustrated by quotes. Quotes are exact citation of the informant speech about an idea or a practice, translated into English. They are noted in *italics* and between quotation marks, with the corresponding line numbers in the transcription.

In-depth analysis

Beyond the point of view of the informant, the researcher should take the risk to propose one or more interpretations of the informant's quotes. In the presentation of the analysis, the author should clearly separate the point of view of the informant and his/her proposed interpretation.

Grid for analysis

The grid proposed for the analysis of interviews carried out in the 1st wave is reproduced in Annex 4.

Lessons learned from pilot interviews

As evidenced from the provided analyses, few analyses conformed to recommendations. Most of the partners had to review their analyses and to add missing parts (quotes in English, detailed information required about renovations done ...).

Recommendations for the 2nd wave of in-depth interviews

Analysis

In addition to the recommendations already mentioned, we have modified the grid for analysis in order to add the following information:

- A small description of the way the informant has been found;
- More detailed information about informant's relationship to comfort (not only temperature information);
- More details about labels/audit and recommendations provided as well as follow-up given to them by the informants (what has been done that was recommended);
- More in-depth analysis (analysing wordings and other verbal and non-verbal expressions used by the informants);
- In addition, according to the difficulties encountered for IDEAL EPBD partners to conduct interviews, we ask to add a self-evaluation of the interviewer for each interview carried out.

³⁰ F. Bartiaux & V. Gosselain, *Qualitative methods: an introduction*, PowerPoint presented at the IDEAL EPBD Prague meeting, March 2009.

Furthermore, much attention is required about the followings:

- Pay attention of possible transformation or interpretation of what interviewees actually said;
- Use quotes to illustrate the answer to each item of the analysis grid;
- About comfort, it is important to understand the context and global picture about comfort and energy (e.g.: in Portugal, to increase indoor comfort, do people insulate roof/walls or are they buying heating/cooling devices?);
- The “main” renovations done and perceived so by the informant are to be included in the analysis, which should not be restricted to energy-related renovations.

The new grid for vertical analysis is provided hereafter. Modifications from the 1st wave vertical analysis grid are marked in yellow.

Summary tables

In addition to the grid, we ask to complete the tables presented here after the grid for analysis, as a check list and summary of information gathered.

Grid for the vertical analysis of IDEAL-EPBD in-depth interviews

2nd wave: Winter - Spring 2010

After the transcription, write a text (no bullet please) synthesising the interview, according to the following grid. This **text should be 8-10 pages long**. Send us this vertical analysis in English, as well as the corresponding transcription in your own language.

For each point of the analysis, please give a quote in English.

1. Identification information

Brief presentation of the person/family (report also the answers to the last questions on age etc) and how you find the person/family.

+ quote if possible

2. First reactions after the interview

To be written **by the interviewer** right after the interview.

3. Self evaluation of the interview by the interviewer.

Explain briefly how you conducted the interview: the first contact with the informant(s), the appointment, the introduction, the interview itself. Then present and comment your good points, the points you feel to have improved from previous interviews, and your points to be improved, as well as corresponding reaction(s) of the informant(s). Finally, make a synthesis of points to keep in mind for further interviews.

4. Renovations made

- a. Most important renovation done and **levers for doing it (either energy-related or not!) + quotes**
- b. For each energy-related renovation work:
 - i. give details on what has been done and how **+ quote**
 - ii. Any help, any social support? **+ quote**
 - iii. Pride? **+ quote**
 - iv. **Does the interviewee consider the work energy efficient? + quote**
 - v. indicate positive and negative influences **+ quote**

5. Renovations planned + quotes

6. Renovations not done

For each energy-related renovation work talked about in the interview and not done, give the brakes mentioned by the informant(s) **+ quotes**

./.

./.

7. Roles of the actors (professionals, relatives, acquaintances, ...)

For each type of actors, explain the role they played in doing or not doing energy-related renovation works.

8. Effects of incentives or renovation programmes, and policy in general

9. Comfort and temperature

- a. i. For the informant, what is comfort? + **quote**
- ii. Need/wish to improve it? + **quote**
- iii. How? + **quote**
- b. i. Preferred temperature + **quote**
- ii. In which rooms + **quote**
- c. i. Actual temperature + **quote**
- ii. In which rooms + **quote**
- iii + info about "actual"(thermometer, thermostat, ...) + **quote**

10. Labels/audit

- a. Knowledge
- b. Remembered and actual label(s) + **quotes** + **summary table**
- c. Recommendations provided + **quotes** + **summary table**
- d. Reaction(s) and comment(s) to the recommendations + **quotes**
- e. Reactions to the label(s)/audit + **quote(s)**
- f. Suggestions + **quote(s)**

11. Link done (or not) between energy and climate change + **quote(s)**

12. **In-depth analysis** (Please also answer to this point!)

- a. Repetitions of words or ideas and **quotes**+ Proposed interpretation
- b. Hesitations and **quotes** + Proposed interpretation and **quotes**
- c. Indirect style ('One', 'Everybody', 'People'...) and **quotes** + Proposed interpretation
- d. Contradictions (words: 'but, though, however, whereas...' ; or contradictory ideas to be looked at in the whole interview) and **quotes** + Proposed interpretation
- e. Silences and **quotes** + Proposed interpretation
- f. Laughs and **quotes** + Proposed interpretation
- g. Non verbal attitudes and **quotes** [**explain the context!**] + Proposed interpretation

13. Other interesting aspects or comments

+ **quotes**

./..

./..

14. Conclusion

- a. Summary on levers and brakes
- b.
 - i. What was new in this interview?
 - ii. Formulate a question or a hypothesis to be checked with the other interviews
- c.
 - i. What was similar in this interview with other interview(s)?
 - ii. Check a previous question or a hypothesis elaborated earlier with this interview

15. Identification information

Add the questionnaire completed in English with identification information, asked after the interview (See p. 29), at the end of the analysis.

16. Summary tables on labelling and renovation

Fill in the two tables on the labelling of the dwelling and on the renovation works (see p. 37-38).

17. Synthetic Table comparing the informants

Fill in the column corresponding to this informant of the table "*Synthetic data on the household and dwelling*" (see p. 39). This can be done by the interviewer.

Methodology for in-depth interviews investigating EU dwelling owners' practices
on (energy-related) renovation works

Summary table on the labelling of the dwelling (please answer by yes or no, except for the 3rd and last columns)

	Available for the dwelling	Provided to the informant	Through / by	Known by the informant	Taken into account by the informant	Comment(s), among others: label received (A, B, C, ...)
Certificate / audit						
Label						
Energy saving recommendations						

Summary table on renovation works (please answer by yes or no, except for the last column)

EPBD Work / status	Mentioned during the interview	Not mentioned during the interview	Recommended by the labelling / audit	Done	Planned	Wished (past)	Liked (future)	Found useful by the informant?	Reason why or why not?
Wall insulation									
Roof insulation									
Floor insulation									
New windows									
Boiler replacement									

Deliverable 4.2

EPBD Work / status	Mentioned during the interview	Not mentioned during the interview	Recommended by the labelling / audit	Done	Planned	Wished (past)	Liked (future)	Found useful by the informant?	Reason why or why not?
Heating syst. replacement									
Hot water pipes insulation									
Heating pipe insulation									
Aluminium sheet behind radiators									
Other									

Synthetic data on the household and dwelling

Nickname of the informants / General information					
Type of dwelling					
Owner(s) (Y / N)					
No of apartment in the building					
Type of place (rural/urban; distance with the capital; other information)					
Dwelling bought / moved in, in (year)					
Time spent in the dwelling (years)					
Building year of the dwelling					
Floor area of the dwelling					
Energy label/audit available (Y / N)					
Label value					
Energy-related renovation(s) done (Y / N)					
Saving energy practices (Y / N)					
Gender of interviewee(s) (M / F)					
Age of householder/interviewee					
Level of education					
Year of last diploma					
Gender of husband/wife (M / F)					
Age					
Level of education					
Year of last diploma					
Number of people in the household					
Other members of household (whom + age)					
Selected through					
Place of interview					
Date of interview					
Time of interview					
Duration of interview					
Initials of interviewer					
Number of lines of the transcription					

11. Horizontal analysis per country

Done for the 1st wave of in-depth interviews

Except for the partners who already had a previous experience in in-depth interviews in social sciences, i.e. SBi and VTT partners (from DK and FI, respectively), the transversal analyses per country were carried out entirely by the WP4's leader team.

The summary of the main information available in vertical analyses was done, aiming at identifying useful and specific information for each country/region. These preliminary analyses have been organised along the following sections³¹:

- Informants and their home
- Reason(s) to conduct energy-related renovation works (levers)
- Role of incentives;
- Brakes to conduct energy-related renovation work
- Impact of Energy label of the house (or audit)
- Energy related practices and opinions (if relevant)
- Preliminary conclusion

Lessons learned

The main findings of the 1st wave of interviews in the 10 partner countries/regions of IDEAL-EPBD project have been summarised in section 2, *Objectives of the research based on qualitative in-depth interviews, Lessons learned from pilot interviews* (p. 6).

Planned work for the 2nd wave of in-depth interviews

After the 2nd wave of interview, a horizontal analysis per country will include **all** interviews (1st wave and 2nd wave), thus at least 21 in-depth interviews. It will follow a grid to which the following aspects are added:

- Use of the in-depth analysis of the interviews;
- First and main renovations done and reasons;
- Relationship to comfort and temperature.

The new grid is provided hereafter.

³¹ The actual grid for horizontal analysis is provided in Annex 5.

Grid for the horizontal analysis of IDEAL-EPBD in-depth interviews

Spring 2010

For the 2nd wave of in-depth interviews (WP4), a horizontal analysis will be performed by each national team in each country by following the grid presented hereafter. This horizontal analysis has to be done for the interviews performed both in the 1st and 2nd waves, which means at least 21 in-depth interviews.

The horizontal analysis aims at showing similarities and differences between all the informants. Informants having similar answers for one topic may not be similar for another topic. So it will be interesting to group informants according to the similarities and to check if these groups are consistent for several topics.

This analysis should be written as a text. It will be a synthesis of the vertical analyses and contain quotes. The text of the analysis will include at least one quote from each informant. This horizontal analysis will be 10-12 pages long.

Information gathered on knowledge about energy and climate change issues are to be used and incorporated to points 3 and 4 as relevant.

1. Informants and their home

Brief presentation of the persons/families (report also the answers to the last questions on age etc) and how you find them.

2. In-depth analysis

- Recurrent repetitions in several interviews and interpretations
- Recurrent hesitations in several interviews and interpretations
- Recurrent contradictions in several interviews and interpretations

For topics 3 to 9 please cite at least one quote per topic and use results and interpretations from both the content analyses and the in-depth analyses

3. Levers to conduct energy-related renovation work

4. Brakes to conduct energy-related renovation work

5. Impact of Energy label of the house (or audit)

6. Roles of the actors (professionals, relatives, acquaintances ...)

For each type of actors, explain the role they played in doing or not doing energy-related renovation works.

7. Roles of incentives or renovation programmes, and policy in general

8. First and main renovations done (even if not energy-related) and reasons

9. Owner's relationship to comfort and indoor temperature

10. Other energy related practices and opinions

11. Other comments

Check a previous question or a hypothesis elaborated earlier in vertical analyses.

11. Conclusions

- What was similar between several interview(s)?
- What is the most innovative finding

12. Naming your files

Recommendation provided for the 1st wave of interviews

All files should be named in a similar manner, allowing to make the correspondence between transcription and analyses, as well as an easy sorting of all files (including all partners).

We thus suggest that all files begin with the double letters corresponding to your country and finishes with date of interview, followed by A or T, respectively for vertical analysis and transcription. In the space between you can write the name chosen to identify the person.

Example: BE_Bob_090421_A.doc

Lessons learned from pilot interviews

This recommendation was not followed by every partner, resulting in a waste of time for the leading team.

Recommendations for the 2nd wave of in-depth interviews

Please follow the files naming rule provided for the 1st wave.

The same pattern must apply for all kind of files provided to the leading team, with the initial of country added to all sent files.

The small questionnaire with identification information must be provided in English in the same file and at the end of the vertical analysis.

The summary tables and synthetic data table should also be named in the same way.

Tableau 3 - Summary of the files and naming of files to be sent by the IDEAL-EPBD partners for 2nd wave of interviews

Transcription	BE_Bob_090421_T.doc	
Vertical analysis	BE_Bob_090421_A.doc	This file <u>must include the identification questionnaire</u> (questions asked at the end of interview)
Horizontal analysis	BE_HorizontalA.doc	See below " <i>Horizontal analysis per country</i> ", p. 42
Summary tables	BE_Bob_090421_S.doc	See " <i>Vertical analysis</i> ", p. 37
Synthetic data table	BE_SyntheticData.doc	See " <i>Vertical analysis</i> ", p. 39

13. Transversal global analysis (comparison among countries)

Done for the 1st wave of in-depth interviews

A first transversal global analysis has been carried out prior to and presented at the Brussels meeting held in September 2009³². The main results concerning levers and brakes to energy-related renovations were found as follows³³:

Main levers

- Combination of levers is important (UK, BE, ...) and always include several reason(s) to do so among the followings: increase comfort, reduce energy cost, reduce coldness, necessary replacement of item in bad condition, financial incentives, audit/label recommendations, advices from relatives/professionals, information, environmental concern, ...;
- The “community” factor (BG, LV): can be positive or negative and is very important for taking action (advice/information from building manager, building company, relatives, technical experts. ...);
- Poor condition of dwellings (BG, LV).

Main brakes

Brakes are numerous, some of them being more common and others more country specific (missed opportunity, work already done, financial constraints, price, cost effectiveness, appearance, intention not to stay, other priorities, poor quality of materials and work, lack of control of work and prices, bureaucracy, frequent changes of laws and rules, lack of information and knowledge, ...).

Lessons learned

Results have been discussed at the Brussels meeting (Sept. 2009) and have fed the reflexion for the building of the questionnaire (WP5) as well as the reflexion to improve the design of the in-depth interviews (WP4), as presented in this paper.

Planned work for the 2nd wave of in-depth interviews

The work will be continued by the leading team after the 2nd wave of interviews, on the basis of the horizontal analyses of each country/region.

³² See the presentation “WP4, in-depth interviews, 1st wave, 10 countries”, by Françoise Bartiaux & Véronique Gosselain, September 2009, presented at the IDEAL EPBD meeting held in Brussels. The presentation is available to partners on the IDEAL EPBD website.

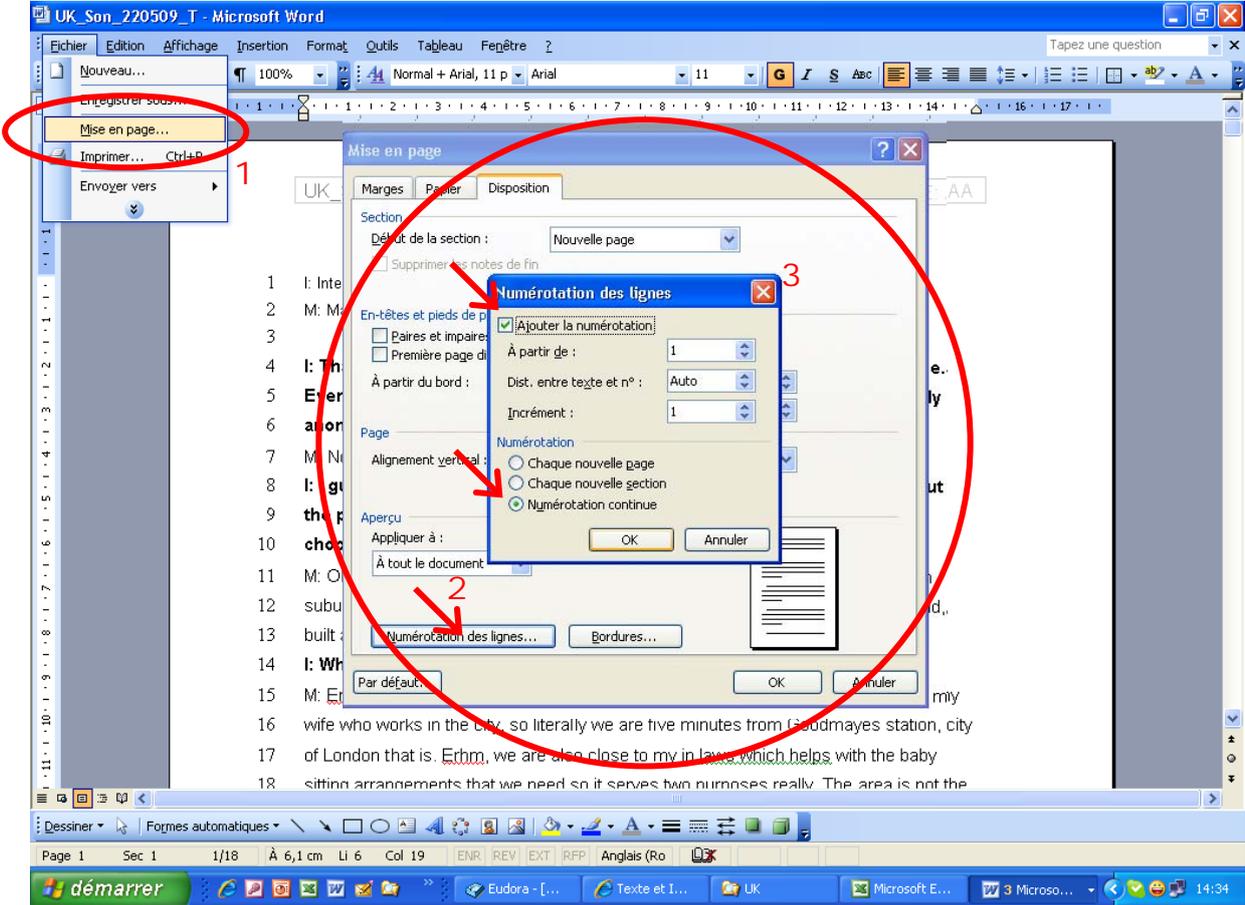
³³ See also on page 4.

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Annex 1 – Technical explanations

How to number the lines of a text in MS Word



Annex 2 – Detailed explanations of way people were found for the 1st wave of interviews

How informants have been chosen and approached for interview?

The following description from each partner provides explanation on how people were found, based on the rules for selection of interviewees (see on p. 9), and for introducing to people (see on p. 18 and following).

Belgium Voluntary audits, providing labels and recommendations, are available since a few years in the Walloon Region. Contacts were taken with the public service in charge of the EAP database which provided with information about all audits carried out in 2007. An e-mail was sent by the administration to all home owners who paid for an audit in 2007, i.e. 228 persons, mentioning the university partnership and the researchers to contact if the home owners agreed on participating to the research and the interview³⁴.

Twenty people answered positively to the invitation, either by e-mail or by phone (1 informant). A selection of interviewees was carried out in order to vary size and localisation of dwellings. The first 5 persons re-contacted agreed and were interviewed.

Bulgaria Labelling is mandatory as of January 2009 for rented apartments, but it is not working properly; in practice, only new houses have a label.

In order to find people whose dwellings received energy labels and energy advice, ENA OPTIMA, the audit company which audited dwellings in the framework of the Demonstration Project for the Renovation of Multifamily Buildings³⁵ has been contacted. People who benefited from an audit were then contacted by telephone, based on the template letter, not mentioning labels, etc. Three persons were chosen at random; all agreed.

As the project provides more favourable framework (in comparison to the overall country market) for the labelling and renovation decisions, in order to improve the representativeness of our interviews, we decided to include informants from existing buildings, whose owners purchased and moved into the building in the last several years, and the building had poor energy performance at the time of purchase. Real Estate agencies were thus contacted and asked for people who had bought a house recently. New Estate Bulgaria, real estate agency which operates in Sofia, Plovdiv, Bansko and other Bulgarian cities provided contact information of one interviewee. The family is a new owner (since 2006), and the dwelling is a single-family house; the family carried out an energy-efficient renovation of the dwelling.

The last interviewee was recruited via an acquaintance of one of the project managers. She was selected because she has bought a one-family house in the countryside in 2006 and is the decision-maker in terms of renovations. The house has poor energy performance and has undergone neither energy audit nor labelling procedures.

³⁴ See below for the copy of the sent letter.

³⁵ See below for details on the project.

Czech Republic

Labels are mandatory as of January 2009 for new houses only, so it would have been very difficult to find informant with a label in the Czech Republic at the moment of 1st wave preparation.

Given the fact that in this phase a small number of interviews has to be done, colleagues were asked to look for suitable people. The four people/families interviewed were not colleagues of Enviros, nor experts working in the energy sector.

The conditions for selection were:

- The informants should own the dwelling (be home-owner)
- They moved into the dwelling during the last five years
- It must be a single family house so that they can influence the exterior of the dwelling (façade, roof, etc.), i.e. no apartment

The informants were between 30-40 years old and living outside Prague (with one exception, Sara, living relatively close to the city).

Denmark

The database of people who benefited from a label for their house is accessible without any problem. People were contacted by telephone. Sending a letter is not effective, as only few people answered.

The recruitment of informants has been based on a national database with information (including addresses) on all energy labels issued during 2007. More specific, dwellings that got an energy label in January-March 2007 were chosen.

In order to get a wide representation of different social groups/classes, informants were chosen from areas typically associated with lower middleclass (two dwellings) as well as middleclass (two dwellings) and the more wealthy class (one dwelling).

After choosing the dwellings in the database, the house-owners were contacted by telephone and asked them if they wanted to participate in the interview. In several cases, however, the answer was negative. In these cases, another dwelling was chose from the same area and a new phone call was made.

A large share of the Danish single-family houses was built in the 1960s and the 1970s. Therefore, houses from these two decades have been chosen. Furthermore, houses were chosen with a "medium to rather bad" label (two dwellings got D1 and three got E1).

Finland

Use of energy labelling is only emerging in 2009. So it was impossible to find informants with a label from 2007 or even 2008. Training of auditors will take place this spring; only after 2 years that implementation of EPBD will be really working.

Data protection is a big issue!! There is no register of house buyers available to public; the protective legislation prohibits the access to such information. Thus the means of locating cases of interest for the interviews, an inquiry was made to colleagues to get some names of the acquaintances that they knew would meet the requirements of having bought a house about five years ago and refurbished it. Thus, people were contacted by telephone through friends

of friends and acquaintances, explaining that an EU project is going on; all accepted interview.

With the above in mind, people of different social standing (ranging from student to docent) were selected. The age of the house buyers does not have a very large span because of the normal age to buy such a house is around 30 years (age range from 29 to 45).

It is to be noted that people do not own their house if not detached house; owned only the share; they cannot change anything on it without a consensus (annual meeting of the boarding).

People could maybe be reached through newspaper devoted to home owners.

Germany Due to data protection regulations in Germany direct access to households with an EPC is not possible. In addition, there is no centralised database for EPC, and the available information is not enough to know if the person is a good candidate for the interview.

Indirect invitations were sent, through other entities (Öko-Institut → Dena → EPC issuers → home owner). This resulted in very few responses, especially when the invitation is circulated through several relay stations³⁶.

People interviewed were the only one that could have been finally reached and that accepted the interview.

Latvia The “Ekodoma” Ltd. data base was surveyed to find buildings where energy audits within last 3 years have been made. “Ekodoma” Ltd. is the Latvian partner in the IDEAL EPBD project and the company who carried out the audits in Latvia

Contacts were taken with the building managers to get the information if the inhabitants of the multi apartment building have been introduced with the results of energy audit. If yes, an agreement was made with building manager that an application for interview will be put in front of the building doors. In the application was written following information:

“In your house an energy audit has been made and you all have been introduced with the results of it. The company “Ekodoma” who made this audit wants to take an interview with you. This interview is part of a research about houses, renovations and energy.”

In the applications also the date of the interview was mentioned and people were invited to register.

People are afraid of the request being a scheme which motivated the way chosen to contact them.

The Netherlands At first, in January, when doing the stakeholder interviews, question were raised if any databases were available that had addresses of people that had recently acquired an EPC or label for the house they own. During one of these interviews, the organization “Meer met Minder” reacted to have been involved in several local projects that stimulated people to get a label with

³⁶ See below for details on the efforts taken to identify interviewees in Germany.

advice. They said they would be able to help finding 5 volunteers for interviews.

First, an e-mail went out in March. Unfortunately, at the Stichting "Meer met Minder", they were too busy and didn't use the e-mail. E-mail text was then changed as requested by Françoise and Kirsten. "Meer met Minder" was contacted again. It was agreed with "Meer met Minder" that they would send out the exact supplied e-mail to possible informants. The first amount of e-mails would be about 40. It turned out that "Meer met Minder" had no direct addresses themselves, but turned to the local project leaders. The first project leaders they turned to, refused to send out the e-mail. By now, it was May.

Several colleagues involved started to address their own network, asking around at friends and family occasions. Also, an e-mail went out to the whole unit asking for outside of the unit with a recent EPC or label.

In the mean time, "Meer met Minder" agreed to try to get an amount of e-mails out to possible informants. This happened again via a liaison, in this case the local project leader of a project in Wageningen. Unfortunately, despite very clear instructions on how to try to get volunteers with the text that was supplied, without mention of the label, the project leader in Wageningen ignored this and send out her own text, specifically mentioning the label. These e-mails only went out to people known to have an energy efficiency certificate/label.

Our ply with our colleagues finally led to two volunteers that had recently moved and had received an energy efficiency label. One of the volunteers was a brother of a colleague in another department; the other volunteer was a friend of a roommate.

Sending the e-mails in Wageningen led to four reactions. The fourth reaction however was quite late, and came after some interviews were already done and appointments taken for others.

People to interview were therefore not really chosen; those who volunteered were interviewed. The fact that the sample was quite differentiated was pure luck. All informants were owner of their house, were the decision maker, and none had an A label.

Portugal

A database exists and it is public, but labels are available only as of 2009.

People were contacted through friends of friends and acquaintances.

All 5 interviewees were found through friend's friends and acquaintances, searching for people who had recently bought a second hand house. Unfortunately, 4 out of the 5 interviewees are of the same age range and context.

In fact, it is more common for young people to buy a second hand house/apartment. A common panorama in Portugal is to buy a second hand house/apartment because it is cheaper, and in the best condition possible so they don't to spend more money renovating it.

**United
Kingdom**

A hundred letters were sent and no one answered. It is to be mentioned that the letter³⁷ explicitly mentioned the IDEAL EPBD project with a link to the web site, which is contrary to the recommendations.

In UK, they have a land registry and know when every property is sold. Sometimes pay people to participate (around 30 pounds). Data protection issues are important in UK. Partner doesn't know who to contact to access the database.

Finally e-mails were sent to colleagues asking them to contact people who recently bought an existing house; 5-6 people answered positively for interview and 5 were interviewed.

³⁷ See below for the copy of the sent letter.

Belgium (Walloon Region): letter sent to invite people to participate



Département de l'Energie et du Bâtiment durable
Direction du Bâtiment durable
Avenue Prince de Liège 7
5100 Jambes
Tél. : 081 33 56 40 • Fax : 081 33 55 11

Jambes, le

Objet : Etude portant sur les habitations, les rénovations et l'énergie

Madame, Monsieur,

Plusieurs instituts de recherche et universités en Europe mènent actuellement une étude portant sur les habitations, les rénovations et l'énergie. Dans ce cadre, une série d'entretiens sont réalisés avec des propriétaires ayant acquis une habitation existante ces dernières années. Aucune qualification spécifique n'est requise pour participer à ces entretiens.

Nous souhaitons vous inviter à participer à un entretien car votre avis nous intéresse beaucoup et constituera la base de notre travail.

Les entretiens ont lieu au domicile des ou de la personne(s) et durent entre 1h et 1h30. La personne adulte la plus intéressée est la plus indiquée pour participer à l'entretien ; les participations en couple sont également les bienvenues. Les entretiens resteront strictement anonymes et seront enregistrés pour analyse ultérieure.

Si vous voulez bien participer à un tel entretien, nous vous remercions de prendre contact dès que possible et de préférence avant le 20 mai 2009 avec l'une des personnes responsables de l'étude pour la Belgique :

Françoise BARTIAUX
Institut de démographie, UCL
francoise.bartiaux@uclouvain.be
010/47.29.59

Véronique GOSSELAIN
Institut de démographie, UCL
veronique.gosselain@uclouvain.be
010/47.29.61

D'avance nous vous remercions vivement de l'intérêt que vous voudrez bien porter à cette invitation et vous présentons nos salutations distinguées.

A handwritten signature in black ink, appearing to read 'Michel Grégoire', is written over a horizontal line.

• Michel Grégoire
Directeur



Bulgaria: the Demonstration Project for the Renovation of Multifamily Buildings

The Demonstration Project for the Renovation of Multifamily Buildings is a joint initiative of the Ministry of Regional Development and Public Works and the United Nations Development Programme, which started in 2007. The Project aims at developing a replicable scheme for renovation of multifamily buildings, consisting of 3 major components:

- a) Conditional subsidies to condominiums for renovation purposes: the subsidy covers 20 % of the total sum for the renovation for single apartment and 100% of the total sum for the renovation of common property (roof, basement, stairs, replacement of old internal plumbing system, etc);
- b) Facilitated access to loans for renovation;
- c) Technical assistance to the voluntarily associated homeowners of entire buildings for the organisation of the renovation process.

The selection of condominium buildings is on competitive basis – the association of home owners must express its willingness to participate in the project. Eligible candidates are voluntary associated homeowners of multifamily residential buildings. Signed agreement of all owners (100%) is the most important condition in evaluation process. The package of documents also includes application form, written statement of the General Committee of the owners, registration form of all owners, verification form about the apartments. The selection includes evaluation process in 3 stages: (1) evaluation of administrative accordance, (2) evaluation of eligibility of candidates, and (3) technical evaluation. All requirements are given in terms of reference. So far, 56 buildings are involved in the project.

The project is being implemented by ENA OPTIMA Company with whom the partner has a good connexion.

Comment

The existing dwellings with labels only result from the above single project.

The provided financial and technical assistance made the labelling a viable (feasible) option. Otherwise, the national legislation does not provide the necessary stimuli, while many obstacles exist.

Germany: history of efforts to identify interviewees

- 4 May 2009** Request to co2online to circulate our invitation for an interview (translation of the template circulated by UCL) to entries within their data base of households with an EPC; some 50 invitations were circulated on 6 to 8 May 2009
- 20 May 2009** Circulation of the some 60 additional invitations for an interview after having lifted the reason "selling of the property" by co2online. No reactions on any of the invitations until mid June
- 22 June 2009** Meeting of the National Steering Committee (NSC); recommended to delete the expected duration of the interview (was considered to be scaring) and to include an incentive (small present); in addition the NSC to circulate the invitation through the data base of EPC issues of the Dena (Federal German Energy Agency)
- 25 June 2009** Request to Dena to circulate our invitation to their database of issuers of EPC; circulation of invitation to some 1,400 EPC issuer by 2 July 2009
- 13 July 2009** Reaction by one home owner; due to holiday season interview postponed to early September
- 16 July 2009** Response by one EPC issuer; identification of four interviewees whose interviews have been carried out during August 2009

Analysis

- Due to data protection regulations in Germany we don't have direct access to households with an EPC; indirect invitation through other entities results in very few responses, especially when the invitation is circulated through several relay stations (Öko-Institut → Dena → EPC issuers → home owner)
- Data bases do not allow to distinguish why the EPC was issued

Sent letters

Letters that have been sent are reproduced here after.



Dipl.-Volksw. Martin Cames
Leiter Bereich Energie &
Klimaschutz (Berlin)

Büro Berlin
Novalisstraße 10
D-10115 Berlin

Telefon +49 (30) 28 04 86-80
Durchwahl -83
Fax +49 (30) 28 04 86-88
E-Mail m.cames@oeko.de

Geschäftsstelle Freiburg

Postfach 50 02 40
D-79028 Freiburg
Hausadresse
Merzhauser Straße 173
D-79100 Freiburg
Telefon +49 (0) 76 1 - 4 52 95-0
Fax +49 (0) 76 1 - 4 52 95-88

Büro Darmstadt

Rheinstraße 95
D-64295 Darmstadt
Telefon +49 (0) 61 51 - 8191-0
Fax +49 (0) 61 51 - 8191-33

Geschäftsführung:

Dr. Joachim Lohse

Vorstand:

Helmut Meinel
Anja Köhne
Dr. Wolfgang Brühl
Dorothea Michalsen-Friedlieb
Nicola Moczak
Hanne Tögel
Franz Unterkoller
dr. Geschäftsführer
drei Mitarbeiterinnen

Wiss. Kuratorium:

Prof. Dr. Amin Bechmann
Dr. Erhard Epler
Prof. Pierre Fornalaz
Prof. Dr. Ludwig von Friedeburg
Prof. Dr. Martin Führ
Hermann Graf Habfeldt
Prof. Dr. Doris Janssen
Prof. Dr. Regine Kolliek
Prof. Dr. Heinrich Fibr. von Lössner
Prof. Dr. Peter C. Mayer-Tasch
Prof. Dr. Eckard Rohlfänder
Dr. Hans-Erich Schöll
Dr. Christian Schölze
Prof. Dr. Udo Ernst Simonis

Bankverbindungen

Sparkasse Freiburg – Nördlicher Breisgau
BLZ 680 501 01
Konto-Nr. 2 063 447
BAN: DE96 6805 0101 0002 0634 47
BIC: FRSPDE33

Post girokonto
Postbank Karlsruhe
BLZ 660 100 75
Konto-Nr. 136 018 759

Steuernummer: 06470/45009
UID-Nummer: DE 142 117 254

Öko-Institut e.V. • Novalisstr. 10 • D-10115 Berlin

Berlin, 4. Mai 2009

Sehr geehrte Damen und Herren!

Mehrere Forschungsinstitute und Universitäten in Europa führen derzeit eine Studie zum Themenfeld Wohnen, Renovierung und Energie durch. In diesem Zusammenhang wird eine Interviewserie mit Hauseigentümern und Hauseigentümerinnen durchgeführt, die in ihrem Haus wohnen.

Wir möchten sie einladen an diesen Interviews teilzunehmen, da uns ihre Meinung wichtig ist und die Grundlage unserer wissenschaftlichen Arbeit bildet. Für die Teilnahme an diesen Interviews sind keine besonderen Voraussetzungen erforderlich.

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Bitte kontaktieren sie uns sobald wie möglich, wenn sie an diesen Interviews teilnehmen wollen:

Dipl.-Volkswirt Martin Cames
Öko-Institut e.V.
Novalisstr. 10
10115 Berlin
Tel: +49 (30) 280 486-83
Mobile: +49 (170) 735 08 70
E-Mail: m.cames@oeko.de

Vielen Dank im Voraus für ihr Interesse an dieser Einladung.

Mit besten Grüßen



Öko-Institut e.V. • Novalisstr. 10 • D-10115 Berlin

Dipl.-Volksw. Martin Cames
Leiter Bereich Energie &
Klimaschutz (Berlin)

Büro Berlin
Novalisstraße 10
D-10115 Berlin

Telefon +49 (30) 28 04 86-80
Durchwahl -83
Fax +49 (30) 28 04 86-88
E-Mail m.cames@oeko.de

Geschäftsstelle Freiburg

Postfach 50 02 40
D-79028 Freiburg

Hausadresse

Merzhäuser Straße 173
D-79100 Freiburg

Telefon +49 (0) 76 1 - 452 95-0
Fax +49 (0) 76 1 - 4 52 95-88

Büro Darmstadt

Rheinstraße 95
D-64295 Darmstadt

Telefon +49 (0) 61 51 - 8191-0
Fax +49 (0) 61 51 - 8191-33

Berlin, 18. Juni 2009

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Geschäftsführung:
Dr. Joachim Lohse

Vorstand:

Helmut Meinel
Anja Köhne
Dr. Wolfgang Brühl
Dorothea Michaelsen-Friedlieb
Nicola Moczak
Hanne Tögel
Franz Untersteller
dr. Geschäftsführer
drei MitarbeiterInnen

Wiss. Kuratorium:

Prof. Dr. Amin Bechmann
Dr. Erhard Eppler
Prof. Pierre Fomellaz
Prof. Dr. Ludwig von Friedburg
Prof. Dr. Martin Führ
Hermann Graf Halbfeldt
Prof. Dr. Doris Janshen
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Prof. Dr. Heinrich Fric. von Lesner
Prof. Dr. Peter C. Mayer-Tasch
Prof. Dr. Eckard Rehlinger
Dr. Hans-Erich Schött
Dr. Christian Schütze
Prof. Dr. Udo Ernst Simonis

Bankverbindungen

Sparkasse Freiburg – Nördlicher Breisgau
BLZ 680501 01
Konto-Nr. 2 063 447
BAN: DE96 6805 0101 0002 0634 47
BIC: FRSFDE33

Post girokonto
Postbank Karlsruhe
BLZ 660 100 75
Konto-Nr. 136 018 759

Steuernummer: 06470 745 009
UID-Nummer: DE 142 117 254



Öko-Institut e.V. • Novalisstr. 10 • D-10115 Berlin

Dipl.-Volksw. Martin Cames
Leiter Bereich Energie &
Klimaschutz (Berlin)

Büro Berlin
Novalisstraße 10
D-10115 Berlin

Telefon +49 (30) 28 04 86-80

Durchwahl -83

Fax +49 (30) 28 04 86-88

E-Mail m.cames@oeko.de

Geschäftsstelle Freiburg

Postfach 50 02 40
D-79028 Freiburg

Hausadresse

Mozhauser Straße 173
D-79100 Freiburg

Telefon +49 (0) 76 1 - 4 52 95-0
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Als Dankeschön für die Teilnahme überreichen wir jedem teilnehmenden Haushalt ein themenbezogenes Präsent.

Bitte kontaktieren sie uns sobald wie möglich, wenn sie an diesen Interviews teilnehmen wollen:

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Postbank Karlsruhe
BLZ: 660 100 75
Konto-Nr. 136 018 759

Steuernummer: 06470/45009
UID-Nummer: DE 142117254

United Kingdom: letter sent to invite people to participate

7 April 2009

Dear Homeowner

Home Improvements and Energy Efficiency

The Building Research Establishment (BRE) is an independent organisation based in Garston, Watford. We are conducting research into home improvements and energy efficiency as part of a European study and we would like to interview owner-occupiers who have recently bought a house or flat. For more information on the project please visit our website at www.ideal-epbd.eu

We would like to invite you to participate in an interview with a researcher about your home. Your views on home improvements and energy efficiency are important as they will help us to understand the issues faced by new owner-occupiers. The interview will take place at your home at a convenient time for you and will last up to an hour.

The interview will remain strictly anonymous and will be tape recorded for analysis purposes only. You will not be identified in the report and any information provided will only be used for the purposes of this project.

Please contact Ms Afi Adjei on 01923 664494 if you would like to participate in this study.

We look forward to hearing from you

Yours sincerely



Ms Afi Adjei
Senior Consultant
For and on behalf of BRE
Telephone: +44 (0)1923 664494
E-mail: adjeia@bre.co.uk



BRE's Quality Management System is approved to BS EN ISO9001:2000,
certificate number LRQ 4001053

Annex 3 – Grid for interview proposed for the 1st wave of interviews to the 10 IDEAL EPBD partners

Interview grid for IDEAL-EPBD

Guidelines for the interview:

- Chapters to interview about (without telling the title in italics!) are in successive boxes. Please proceed in that order.
- In bold is the invitation to talk: allow the person to talk during several minutes!
- On the first level of indentation (with a hyphen) there are questions to be asked after time of free talk.
- The last level of indentation (with a small circle) shows follow-up questions, which the interviewer has to ask if the informant has not already answered on this topic in a more general question.
- Use the right column to note non-verbal expressions of the informant at the corresponding stage of the interview, so you can add these notes in the transcription.

Interview grid	Note for interviewer
<p><i>Introduction</i></p> <p>Thank you for accepting my visit for an interview. As I told you when we took the appointment, I guarantee to preserve your anonymity. This interview is part of a research about houses, renovations and energy.</p>	<p>Introduction to tell and then directly proceed to first invitation to talk.</p>
<p><i>Choice of home</i></p> <p>So, I would like to ask you to tell me about your house. For instance, I would like to ask you to <u>tell me how</u> you came here, in this house.</p> <ul style="list-style-type: none"> - What did you like (in moving) here? <ul style="list-style-type: none"> o Why did you choose to move? o What did you like here? o Why did you move to here? - Before buying/renting the house, did you ask any specific questions about the house? <ul style="list-style-type: none"> o Which questions did you ask? o To whom? o Why did you ask those questions? o Were the answer(s) to this/those question(s) determinant in your choice of moving here? o Did you visit the house with someone else before buying/renting it? - Do you intend to stay here? 	<p>→ Allow the person to talk during several minutes!!</p>

Changes and renovations

**Have you made any changes or renovations of the house?
Can you talk about the one which has been the most important to you?**

If no renovation done, ask:

- What could have helped you to do some? / What could have made you do that?

If renovation(s) done:

- 1- Why did you do this/these?
- 2- How did you decide about these renovations? How did you think about these renovations?
 - Can you tell me what brings you to this work?
 - Was there more work to do in the house?
 - Why did you choose this one?
- 3- Please tell me how you plan the renovations? What were your "guidelines" for the work?
 - What were your priorities realising the work?
 - Did you get some help, some advice...?
 - Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...)
 - Did you get contradictory advice? Which one did you trust?
- 4- Please tell me about the realisation of the work?
 - Who did the renovations?
 - Did you get some practical help, some advice...?
 - Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...)
 - Did you trust experts and professionals who were involved in the work? Which ones?
- 5- Are you happy with the work done?
 - Do you feel proud of having this done?
- 6- Do you want to add something?

Have you made any changes or renovations on the roof?

If not, ask:

- What could have helped you to do some? / What could have made you do that?

If done:

Allow the person to talk during several minutes!

If the renovation mentioned has nothing to do with energy, only ask questions 2 and 4.

As soon as the informant talks about insulation or other energy renovation, go further in that direction! (but do not push)

To keep in mind:

Energy works are

- Roof insulation
- Install double or triple glasses windows
- Wall insulation
- Floor insulation
- Replacing the boiler or heating system by a more efficient one (ex: installing a heat pump)
- Replacing water heating system by a more efficient one
- Hot water pipes insulation
- Heating pipes insulation
- Putting aluminium sheet behind radiators

If already explained, ask about the **windows**.

Allow the person to talk!!

<p>1- <u>Why</u> did you do this/these?</p> <p>2- <u>How</u> did you decide about these renovations? How did you think about these renovations?</p> <ul style="list-style-type: none"> o Can you tell me what brings you to this work? o Was there more work to do in the house? o Why did you choose this one? <p>3- Please tell me <u>how you plan</u> the renovations? What were your "<u>guidelines</u>" for the work?</p> <ul style="list-style-type: none"> o What were your priorities realising the work? o Did you get some help, some advice...? o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...) o Did you get contradictory advice? Which one did you trust? <p>4- Please tell me about the <u>realisation of the work</u>?</p> <ul style="list-style-type: none"> o Who did the renovations? o Did you get some practical help, some advice...? o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...) o Did you trust experts and professionals who were involved in the work? Which ones? <p>5- Are you happy with the <u>work done</u>?</p> <ul style="list-style-type: none"> o Do you feel proud of having this done? <p>6- Do you want to add something?</p> <p>Have you made any changes or renovations on the windows?</p> <p><i>If not, ask:</i></p> <ul style="list-style-type: none"> - What could have helped you to do some? / What could have made you done that? <p><i>If done:</i></p> <p>1- <u>Why</u> did you do this/these?</p> <p>2- <u>How</u> did you decide about these renovations? How did you think about these renovations?</p> <ul style="list-style-type: none"> o Can you tell me what brings you to this work? o Was there more work to do in the house? o Why did you choose this one? <p>3- Please tell me <u>how you plan</u> the renovations? What were your "<u>guidelines</u>" for the work?</p> <ul style="list-style-type: none"> o What were your priorities realising the work? o Did you get some help, some advice...? o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, help, ...) 	<p>If already explained, ask about the outside walls. Allow the person to talk!!</p> <p>If correspond to the 3rd explanation about energy work, just ask: - was the process the same as the one you previously explained?</p>
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Methodology for in-depth interviews investigating EU dwelling owners' practices on (energy-related) renovation works

<p>o Did you get contradictory advice? Which one did you trust?</p> <p>4- Please tell me about the <u>realisation of the work</u>?</p> <p>o Who did the renovations?</p> <p>o Did you get some practical help, some advice...?</p> <p>o Did your relatives, colleagues, ... get interested, involved in the work (advices, choice of professional(s), choice of material, practical help, ...)</p> <p>o Did you trust experts and professionals who were involved in the work? Which ones?</p> <p>5- Are you happy with the <u>work done</u>?</p> <p>o Do you feel proud of having this done?</p> <p>6- Do you want to add something?</p> <p>Have you made any changes or renovations on the outside walls?</p> <p>- Was the process the same as the one you previously explained?</p> <p><i><u>After finishing about renovations done, and if not yet talked about:</u></i></p> <p>Do you know about any incentive or subsidies regarding renovations?</p> <p>- What is your opinion about such instruments?</p> <p>- Did you benefit from any?</p> <p><i><u>After finishing about renovations done:</u></i></p> <p>In the future are you going to make any changes? Why (or why not)?</p> <p>What will be your next work in the house?</p> <p><i><u>If the planned work has to do with energy:</u></i></p> <p>Will you do it the same way as you explained or in a different way?</p> <p><i><u>After finishing about renovations and if nothing was mentioned about energy renovations:</u></i></p> <p>Did you made any renovation regarding energy?</p>	<p>If already explanation about 3 energy works, don't ask any question here.</p> <p>Allow the person to talk!!</p>
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<p><i>Comfort</i></p> <p>Let's talk about comfort.</p> <ul style="list-style-type: none"> – According to you, what makes a house comfortable or nice to live in? – Would you like to change something to make your house more comfortable? – For you is there any relation between comfort and temperature? – Is the temperature you are usually living in your living room comfortable for you? <ul style="list-style-type: none"> ○ Do you know the temperature of the room you are living in? ○ What is the temperature you like to have in your living room? And in your bedroom? ○ What is the temperature you are actually living with? ○ In which rooms? ○ What would you need to live with the temperature you like? 	
<p><i>Socialisation</i></p> <p>Do you speak about energy consumption? With whom?</p> <ul style="list-style-type: none"> – Do you speak about energy consumption in the <u>family</u>? <ul style="list-style-type: none"> ○ With whom? ○ Do you speak about energy savings? ○ With whom? ○ Who in the family does think about it? – Do you speak about energy consumption with <u>other persons</u>? <ul style="list-style-type: none"> ○ With whom? ○ Do you speak about energy savings? ○ With whom? – Do you have child(ren)? If so, what do they know about energy consumption? <ul style="list-style-type: none"> ○ Do they tell you anything about energy? ○ Do you teach them anything about energy? ○ Do they talk about it at school? 	
<p><i>Knowledge about energy and energy savings</i></p> <p>Let's speak about energy and energy savings!</p> <ul style="list-style-type: none"> – Could you save energy at home? <ul style="list-style-type: none"> ○ Where? ○ How? – What would make you save more? – Do you care about saving energy (and water)? 	

Our interview is now ending. I will switch off the recorder and ask you a few last questions (note answers below).

- How long have you lived here? Years
- Is it a 2-façade house, a 3-façade house, a 4-façade house; an apartment?
.....
- Where did you live before? Was it a 2-façade house, a 3-façade house, a 4-façade house, an apartment?
- Who is living here? (age and gender household members)
.....
.....
.....
- Date and place of the interview?
.....

	Mister	Madam
Choose a name to ensure anonymity		
What is your profession?		
What is your last diploma (and what was your age when you got it)		

Thank you very much for your contribution!

Annex 4 – Grid for vertical analysis proposed for the 1st wave of interviews to the 10 IDEAL EPBD partners

Grid for analysis of IDEAL-EPBD in-depth interviews

Spring 2009

After transcription, write a synthesis of the interview, according to the following grid. Send us the analysis in English, as well as the corresponding transcription in your own language.

1. Identification information

Brief presentation of the person/family (report also the answers to the last questions on age etc) and how you find the person/family

2. First reactions after the interview

To be written right after the interview

3. Renovations made

- a. Most important renovation done and reasons
- b. For each energy-related renovation work:
 - i. give details on what has been done and how
 - ii. Any help, any social support?
 - iii. Pride?
 - iv. indicate positive and negative influences

4. Renovations planned

5. Temperature

- a. Preferred + in which rooms
- b. Actual + in which rooms

6. Labels

- a. Knowledge
- b. Reactions
- c. Suggestions

7. Link done (or not) between energy and climate change

8. Repetitions, contradictions, hesitations

+ Proposed interpretation

9. Other interesting aspects or comments

Annex 5 – Grids for horizontal analysis used for the 1st wave of in-depth interviews

Grid for analysis of IDEAL-EPBD in-depth interviews

Fall 2009

For the global analysis of first wave of in-depth interviews (WP4), I carried out a global analysis per country according to this general grid.

I would greatly appreciate that those who sent me their contribution lately could help me by sending me a first draft of this global analysis.

Many thanks

1. Informants and their home

Brief presentation of the persons/families (report also the answers to the last questions on age etc) and how you find them.

2. Reason(s) to conduct energy-related renovation work (Levers)

3. Role of incentives

4. Brakes to conduct energy-related renovation work

5. Impact of Energy label of the house (or audit)

6. Energy related practices and opinions (*if relevant*)

7. Conclusion