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# A practice-theory based analysis of energy renovations in four European countries

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consumers, Directive on Energy Performance in Buildings (EPBD), households, housing refurbishment, practices, qualitative survey, practice theory

## Abstract

In the past few years social practice theories have been used, discussed and developed in the sociology of consumption, namely in the field of energy consumption. This paper examines whether and how the renovation of dwellings, including energy renovations, can be understood within this perspective. It describes and compares energy-related renovation practices and their variability in four European countries that are quite different on geographical, cultural, and housing grounds but are regulated by the common EPBD (Energy Performance of Buildings Directive): one country in Southern Europe (Portugal), one in Western Europe (Belgium), one North-Eastern European country (Latvia) and one Scandinavian country (Denmark) that was a frontrunner in issuing energy-performance certificates. The empirical material used in the paper is based on around 20 in-depth interviews on renovation and energy-saving works in the residential sector in each of these four European countries.

This comparison of renovation practices across these four countries will discuss the extent to which energy renovation is the same practice in these different settings, whether practice differences should be interpreted as variations within a practice or as different practices and whether practice differences relate to differences in culture, climate, building style, in knowledge or in teleo-affective structures. This analysis hopes to feed the discussion on how a common European policy tool, like the

EPBD, may be meaningful and efficient, when taking into account these variations.

## Introduction and theoretical framework

This paper<sup>1</sup> examines whether and how the renovation of dwellings, including energy renovations, can be understood by social-practice theories. It describes and compares renovation practices and their variability in four European countries<sup>2</sup> that were chosen because they are quite different on geographical, cultural, and housing grounds but all regulated by the common European EPBD (Energy Performance of Buildings Directive).

Recent years have seen several attempts to use practice theory as a basis for understanding everyday practices related to energy consumption, we also follow this line of thinking and in this paper. Practice theory was (re)introduced in consumer studies some years ago (Warde, 2005; Shove and Pantzar, 2005) following the argument that hitherto there had been too much focus on conspicuous consumption, and the symbolical and communicative aspects of consumption, at the expense of understanding routinised and ordinary consumption. The emphasis on bringing practice theory into studies on consumption and the environment mainly draws on practice theory as

1. This comparison is part of a larger IEAA-funded project, coordinated by ECN (NL), on energy performance labels in ten European countries, the IDEAL EPBD research project (Improving Dwellings by Enhancing Actions on Labelling for the Energy Performance in Buildings Directive, see [www.ideal-epbd.eu](http://www.ideal-epbd.eu), IEE/07/600/SI2.499426). The overall objective of the whole project is to identify factors leading to a more successful EPBD application.

2. In Belgium, most energy matters, namely the labels, are a regional competence. This paper is thus focused on one of the three Regions, Wallonia, the Southern and French-speaking Region. In this paper, we use for brevity and clarity the terms "Belgium" for "Wallonia" and the term "country" also for this "region".

formulated by Schatzki (1996) and further elaborated by Reckwitz (2002). Both Schatzki and Reckwitz accentuate the collective aspect of practices. Reckwitz (2002: 249-50) says that the single individual acts as a carrier of practices, while Schatzki (1996:89) says that a practice is a coordinated entity, i.e. a “temporally unfolding and spatially dispersed nexus of doings and sayings”. Before going further, let’s underline that by linking doings and sayings, a practice blurs and overcome the opposition between behaviours and cognitions – an opposition often done in Western traditions and also in social and environmental psychology.

Saying that a practice forms a nexus also means that there are “major avenues of linkage” holding together the practice seen as a nexus. There is a discussion on the nature and the number of “key components of the nexus identified by Schatzki as linking doings and sayings in order to constitute a practice” (Warde, 2005: 139). Schatzki (1996) identifies three components: practical understanding, explicit rules, and teleo-affective structures. Warde follows Schatzki (1996), but renames the three linking components as respectively understandings, procedures and engagements. Shove and Pantzar as well are inspired by Schatzki; however, they group two components (practical understanding and explicit rules) as one linking component that they call “competences”. With reference to Reckwitz (2002), they further add material items as one additional linking component, i.e. things, products or items of consumption.

Wilhite (2008, 2010) also stresses the importance of taking into account the material structure and the technologies in describing social practices and analysing their change over time. With his concept of “distributed agency” (the agency being defined by social scientists as the ability to act as an agent of change and the associated power feeling), he shows how the agency is distributed between technologies, social norms and the individual agents.

In relation to an empirical study of households’ heating practices and indoor climate, it has been argued that the following four linking components seem to be the most relevant and appropriate (Gram-Hanssen, 2010); they will thus also be used in this paper and defined below: 1. Technologies and material structure, 2. Know-how and embodied habits, 3. Institutionalised knowledge and explicit rules and 4. Teleo-affective structures.

*Technologies and material structure.* The practice of renovating a house is of course closely related to the physical features of the house, what material the house is built of, the type of house etc. and furthermore, the renovation practice is also held together by the products which are available on the market for doing the renovation.

*Know-how and embodied habits.* This include the skills that some Do It Yourself (DIY) homeowners have or acquire, on how to do craft work on a house. For craftsmen carrying out the renovations, this linking component includes what they have learned during their training (as institutionalised knowledge) and continuously learn in doing their work. In this way there is a fluid demarcation between what is known as know-how and what is known as institutionalised knowledge. Craftsmen learn something during their education, and later this is transformed into know-how during their daily work.

*Institutionalised knowledge and explicit rules.* This refer for example to the content of school training (as legitimated by diplomas), procedures to apply for energy-related subsidies,

explicit rules on houses insulation, and so on Institutionalised knowledge and explicit rules are typically something that can be directly decided and influenced through policies. An obvious example of the explicit rules which might take part in guiding renovation processes is thus the regulations from the EPBD.

*Teleo-affective structures.* The fourth linking component, called the teleo-affective structures, includes, but is not reduced to, the reasons that homeowners have to renovate their house. And here it is important to insist that most often energy concern is not the main reason or maybe not at all part of the reasons for renovating a house. The reasons related to renovation include comfort, convenience for organising daily life, aesthetics, or simple maintenance related to the wear and tear of the house (Bartiaux et al., 2006; Gram-Hanssen et al., 2007). As for other linking components of a practice, it is useful to stress the social characteristics of the teleo-affective structures. “It is the fact of engagement in the practice, rather than any personal decision about a course of conduct, that explains the nature and process of consumption.” (Warde, 2005: 138). And as explained in Bartiaux (2008), this engagement in a practice namely depends on how the consistency between personal actions and concern is valued and thus on the socially accepted ways of linking, or not, individual doings and sayings.

The objectives of this paper are to analyse the extent to which energy renovation is the same practice in the four countries and to discuss whether practice differences should be interpreted as variations within a practice or as different practices. In defining the practice(s) of home renovating or energy renovations, a first question is how to account for the social variations within a practice such as the differences, either between or within countries, in renovating houses or apartments, by young families or by elderly people living alone, for example. In his account of a theory of practice Warde (2005: 139) gives some clues to this question: “It is worth considering that the three key components of the nexus identified by Schatzki as linking doings and sayings in order to constitute a practice (understandings, procedures and engagements) may vary independently of one another between groups of participants. For it is highly likely that – without flouting the condition that the elements constitute a linked nexus – agents vary in their understandings, skills and goals and that the relationship between these three components also varies.” In this paper, we will report on the variations we were able to observe but it is out of its scope to “examine in detail how understandings, procedures and values of engagement are each acquired and then adapted to performances”, as suggested by Warde (2005: 139).

A second question relates to the extent of a practice or to its diversification: how many ‘actions’ may a practice involve? Examples of practices given by Schatzki (1996: 89) are “cooking practices, voting practices, industrial practices, recreational practices, and correctional practices” and they show a range in their diversification as some practices seem more multifiform (as industrial practices) than others (voting practices). Warde, for his part, exemplifies his account with the practice of travelling privately by car. It is thus relevant to define and differentiate several concepts: practice, dispersed practices, and an integrated practice.

Again, we refer to Warde's account of practice theory, in order to delimitate afterwards the extent of the practice(s) performed in the process of home renovating or energy renovations: are changing the windows and doing indoor decoration parts of the same practice(s) of renovating a home, even if the first one is less frequent than the second one? In other words, is the frequency of these actions a criterion? Does the reproduction of the nexus require regular enactment? As Reckwitz (2002: 249-50) puts it: "a practice represents a pattern which can be filled out by a multitude of single and often unique actions reproducing the practice. (...) The single individual – as a bodily and mental agent – then acts as the 'carrier' (Träger) of a practice" (Warde, 2005: 134). Seeing a practice as a pattern that needs regular enactment, at the aggregate level, not by each single individual, may mean that a rare practice, such as insulating the outside walls of a house in Belgium or in Portugal, is not (yet?) part of the practice(s) of renovating a home. However, changing the windows, which is done in a good many houses in all the four countries, can be seen as part of the practice of renovating a house, even though each individual homeowner probably does this only once in his life.

'Dispersed practices' as defined by Schatzki "appear in many sectors of social life, examples being describing, following rules, explaining and imagining. Their performance primarily requires understanding; (...) about 'knowing how to' do something, a capacity which presupposes a shared and collective practice involving performance in appropriate contexts and mastery of common understandings" (Warde, 2005: 135).

Integrated practice is defined by the same authors as "the 'more complex practices found in and constitutive of particular domains of social life' (Schatzki, 1996: 98). Examples include farming practices, cooking practices and business practices. These include, sometimes in specialized forms, dispersed practices, which are part of the components of saying and doing which allow the understanding of, say, cooking practice, along with the ability to follow the rules governing the practice and its particular 'teleoaffective structure.'" (Warde, 2005: 135) For Warde, consumption is *not* an integrated practice (whereas shopping is) because people do not think themselves as consuming and do not mobilise emotional affects in liking or hating 'consuming' (Ibid, p. 150). With these two criteria and following Watson and Shove (2008), home renovating is considered here an integrated practice because "competent practitioners will avail themselves of the requisite services, possess and command the capability to manipulate the appropriate tools, and devote a suitable level of attention to the conduct of the practice. This is, of course, in addition to exhibit common understanding, know-how, and commitment to the value of the practice." (Ibid, p. 145).

One of the challenges of this paper is to discuss whether energy-related renovations are also an integrated practice on their own, and this question is discussed in the final sections of this paper, along with the relevance of regulating this or these practices by a common European regulation like the EPBD. It would have been interesting to discuss whether energy-related renovations can be considered a specialised practice within the practice of home renovation, but we lack enough material to do so, as shown in the next sections that are devoted to the data collected and then to the countries study.

## Methods: Four qualitative data sets

In all countries but Denmark, interviews were realised in 2009–10 with home owners only, using the same grid. In this grid, questions 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, if any. By prompting the informants with the topic of "renovation" or "works", we have much less information on the adjacent practices of home decorating and shopping for home commodities. Environmental knowledge and concern are dealt with at the end of our interviews, to avoid the possibility of this to influencing their explanations on renovating the home. All in-depth interviews were recorded and transcribed and 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.

### BELGIUM

Two subsamples were constituted, both of them in the Wallonia region of Belgium. In Wallonia, energy certificate has only been mandatory since May 2010, but since 2006, homeowners can pay for a full energy assessment. Half of the respondents are thus found among people having done this. The other half of the sample (12 informants) bought their house around 2007 and was found with the help of at least one intermediary person. The variety of socio-economic background, housing type and the 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.

### PORTUGAL

The Portuguese sample is concentrated in the Coimbra area, one of the six cities of importance of Portugal and is composed of 23 informants, many of them being related in one way or another with the University of Coimbra and holding at least a master degree (3 with 12 years of schooling or less, 16 with a master and 4 with a PhD). So this sample should be seen as representing the cultural elite of a provincial town and its surroundings. The sample includes a larger proportion of houses than apartments, according to the national situation in the housing sector. Only informants who moved recently (around 5 years ago) and made renovations were included, of whom 3 houses and 1 apartment with an energy certificate, mandatory for all residential buildings, to be sold or rented, since January 2009. All the interviews were conducted by the Portuguese author of this article.

### LATVIA

In Latvia, 24 interviews were carried out across the country with different types of households. 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. Also,

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 author of this article and one colleague.

#### DENMARK

In Denmark, 5 interviews were conducted in 2009 using the same question grid as the other 3 countries. And in 2005, 10 interviews were carried out under the SEREC project (Bartiaux et al., 2006) using a quite similar grid though additionally focusing on the energy label of the house. All 15 informants were drawn from a list of people who had bought a single family detached house recently and thus had received the mandatory energy label. Households were chosen from different types of neighbourhoods according to building style and approximate prize to secure a wide socio-economic diversity among the interviewees. Furthermore all interviewees had a house with an energy label below a B label, implying that the energy certificate would have included recommendations on how to improve the energy efficiency. Interviews were conducted by the Danish authors of this article.

### Energy-related renovations in homes of four European countries

#### DENMARK

##### Technologies and material structure

In Denmark, 58 % of the dwellings are single-family houses, almost all of them being owner occupied and the remaining are mostly dwellings in multi-family buildings. The number of dwellings completed peaked between the last years of the 1960s and the mid of the 1970s. Of the current dwelling stock, 32 % was built during the 1960s and 1970s. Ten per cent of the dwelling stock was built before 1900. In general, the technical standard of the Danish housing is relatively high, though from an energy-efficiency point of view there are potentials for improvements especially in houses from before 1980.

The interview material includes many examples of renovations projects ranging from simple refurbishments like painting walls to comprehensive and ambitious projects most commonly including total renovations of kitchens and bathrooms, but also pulling down inner walls and building an extension to the existing house. There are also a good many homeowners who have carried out renovations which can be connected to energy savings, typically replacing windows and insulating the roof, though in many of these cases energy saving was actually not the main reason for carrying out these renovations.

##### Know-how and embodied habits

Renovations are often not based on habitual or routinised doings and sayings as people e.g. only replace windows a few times in their lifetime. This is also the reason why informants often seek other's advice on how to do renovation works. Most informants describe how they got help by others in relation to the decision process as well as carrying out renovations. For instance, in one family they got help from the father of the husband with regard to assessing the condition of the win-

dows. The father's advice was to replace the windows instead of repairing them – an advice they followed. Another example is a couple, who explained that their original intention was to polish the old wooden floor in the kitchen/living room, but a cousin convinced them that this would be a “partial solution” and that it would be better to place a new wooden floor on top of the old floor. An example of a family where advice included a recommendation for energy renovation came from a family who wanted to change their entrance door because the wife found the old one was too transparent. The carpenter, who made the new door for them, told them that they should choose energy glass for their new door, and they did so. Furthermore, some informants consult the local DIY centre for information and advice. These examples show how there is a common or collective know-how among the practitioners' network. Thus, even if renovating is not done on a daily basis or by routine, it might make sense to include know-how in the understanding of what assembles the practice of renovating a house. This know-how is very often distributed through informal, daily conversations between people, e.g. at workplaces and at social occasions, about experiences with home renovation and DIY projects.

Several of the informants who do home renovation themselves also consult craftsmen for help on how to carry out particular tasks. For instance, one informant explains that besides asking friends, acquaintances or the staff at the local DIY centre, he also sometimes contacts a craftsman for advice. Other informants described how they similarly get advice from professionals in their personal network of friends and relatives. The informants in general expressed trust in the work and the advice from craftsmen.

##### Institutionalised knowledge and explicit rules

The use of institutionalised knowledge within renovations includes the extent to which house owners use the advice they get from the energy label on their newly bought house. 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 other papers, at the time of the purchase of the house. Among the informants who remember the energy label report, some are more positive than others, which partly depends on to what extent people trust the quality and validity of the label and its recommendations. For instance, one informant (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 playing to the gallery. I don't give it much credence when they themselves [the estate agents] [prepare the energy labels]...”  
(Male, 35 years, draughtsman)

Some informants also comment that the label did not include much new information that they could not easily have found themselves. As one informant explains:

“Well, the things that are stated were that the old windows could be replaced. Yeah, we could see that ourselves” (Male, in the forties, graduate)

Furthermore, some of the informants commented on the amount of information they got at the time of the house pur-

chase. They felt that the energy label report was “drowned” in all the other information and papers they got. As one of the informants expressed it: “there were a million 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.

There are also other examples of how institutionalised knowledge is used by informants. Two informants thus have made use of internet-based calculators in order to make cost-benefit calculations of energy-saving renovations and other informants told of websites where they could find relevant information. In general it seems that people feel that they are quite well informed about energy issues, although this does not necessarily mean that they use and implement this information.

At the time of the interviews, the Danish government had just launched a new programme for renovations, which the private households could apply for financial support for renovations. Only one of the interviewed households (a couple in their forties with three children) had applied the fund for support to the replacement of their old oil-boiler with a natural gas boiler. However, their decision of replacing the boiler was not motivated by the programme in itself, and they thought that it was a “lucky coincidence” that the fund had been established at the same time that they (in any case) were going to replace their old boiler.

#### Teleo-affective structures

The extent to which people renovate their houses varies among the informants and one of the reasons is that some people simply like to renovate their houses, one informant explains:

“We wanted a house that was cheap. The only thing we cared about was that it had brick walls. Because the rest has been torn down and changed.” (*Male, in the thirties, craftsman*)  
The wife adds: “My husband is a craftsman”

Far from all of the interviewed house owners are as extreme as regard to what extent they renovate their house. Though most of the informants have done at least some of the renovation themselves as DIY works, which reflects that DIY activities are widespread in Denmark, especially among owners of single-family houses.

The interviews furthermore show that renovations are carried out for many different reasons, and often informants describe more than one reason for a particular renovation. The most widespread reasons, as stated by the informants, are: Aesthetic reasons, convenience and comfort (e.g. several informants had replaced their old windows with “maintenance-free” windows with metal-frames), general wear and tear or in order to making it “one’s own” home (e.g. renovate a kitchen in order to make it suit the “personal style” and the daily routines of the family). Even if we focus only on renovations that include energy-saving elements, it is apparent from the interviews that these are in general carried out 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 a man, who explains that he appreciates energy saving as a side-effect of doing renovations and other home improve-

ments, but at the same time stresses that energy saving “always has to pay itself before I would do it.” Loft insulation is, however, an exception and an example of renovations that are carried out mainly in order to save energy. However, in these cases the primary incentive seems to be to save money on the heating bill (and less to save energy or – in a more abstract sense – “to save” the environment), though this may vary among the informants as some comment that saving money also means that it is good for the environment because they consume less.

Except for one, all informants think that there is link between energy consumption and climate change. However, a few informants are critical about the importance of the environmental issue. Particularly one informant (male, 36 years, warehouse assistant) is sceptical about the climate change debate; he thinks that the issue is somewhat exaggerated: “I feel that much of it is a storm in a teacup”. He believes that many of the “so-called intelligent persons” (the experts) have forgotten to see the current changes in context of the temperature changes during the history of Earth, and seen in this perspective he do not think that “we can do so much about it, really.” However, this informant represents the exception from the general picture of informants that acknowledge the importance of the environmental issue and, in most cases, also explain that they try to save energy in their daily life like switching of the light or buying energy saving light bulbs.

#### BELGIUM

##### Material structure, technologies and products

In Wallonia, the building stock is made of 87 % of houses that are rather old in 2009: 31 % were built before 1900, more than half between 1900 and 1981, and 16 % after 1981. Indeed, two informants said that they have recently bought “a ruin”, two others did not dare to use that word (appropriate though). There are several old farms in our sample. In the Western part of Wallonia, many houses are built in bricks, and the ones built in the seventies or after have also walls of concrete blocks whereas in the Southern and Eastern parts, many houses are built in schist or in stones. 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. The potential of energy savings is thus high. In Wallonia, 68 % of the adults (18-79 years) own their dwelling. Among energy-related renovations, the most often cited is to change frames and windows (see below). 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 rooms as I wanted to do.” (Man living alone).

About the products, several informants report contradictory advice on insulation material and techniques: “For the insulation material, there are many opinions on the matter. Many opinions ... here I have more conflicting opinions than for the frames.”

### Know-how and embodied habits

For an informant (who has a 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.”” However, this “culture” is not yet turned into know-how and practical knowledge on insulation, especially so for walls insulation and 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 [energy audits]”, but he finds that the boiler of their house “is not an old boiler (...), it’s a boiler from the seventies”.

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 are likely to be replaced, as illustrated by this woman who tells her first visit to her future house “just by seeing the old frames with single-glass windows, I knew that they had to be changed”. So people heavily rely on Internet (“Google is your friend as one says” as put by an engineer), on professionals and/or on their social network, if it includes person(s) evaluated as competent, or on sellers of DIY shops, as DIY is rather widespread. This last informant 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]”, 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.”

This opinion appears to be valid for many professionals according to our interviewees: they spoke about one frames’ installer who found triple-glass windows “exaggerated” and “not worthwhile for our house” (and they follow his advice), another one (a teacher) 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”. Still another customer, interested in new technologies chose “by elimination” with her heating installer “a low-condensing boiler, an old thing (laughs), not as one does now” because “it was by far too complicate and he didn’t want to go into that”. However we also met 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 ready to promote a small enterprise installing PV panels. But these professionals rather appear as exceptions, especially when it comes to walls insulation.

### Institutionalised knowledge and explicit rules

Tacit knowledge on energy-saving issues is quickly increasing though in the population mainly through several media of communicating institutionalised and explicit rules 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 advice. These last years, there were also a lot of advertisements on the regional subsidies, and more generally, TV broadcasts (“you cannot escape them”) 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.” But contrary to most informants, she didn’t apply as she found that it was too much paper work. Indeed, many informants got at least one subsidy and a fiscal rebate: most often for energy-efficient frames and windows, less often for boilers and/or roof insulation, and more rarely for photovoltaic panels and outside walls insulation (this last subsidy has been strongly reduced in 2010 and the one for PV, suppressed). At least eight informants benefit either of a low-interest loan for low-income families or a special subsidy (for an old house ‘rehabilitation’) that are granted to the condition of doing energy-saving renovations.

Among our 11 informants who paid for an energy assessment of their house, few spoke by themselves about this audit as a major guideline when describing the renovations they did. The next quote (from a loquacious lawyer) is more representative of the apparent difficulty of the 7 others to confess at the end of the interview, a need for help 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:

“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.”

And among the other informants, no one was wishing to have such an assessment, either because they claimed knowing enough by themselves or because they prefer 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”.

Several informants mention other 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 to free information, e.g. on techniques for insulating and so on that can be found namely in shops for organic food (most of them have a DIY section, with environmentally-friendlier products). One informant also reports on participatory renovation projects and Internet websites on alternative construction techniques.

### Teleo-affective structures

In this context – old building stock, still rather low practical knowledge about insulation and energy efficiency, but an increasing tacit knowledge, mainly through several media of communicating about regional subsidies and fiscal (and federal) rebates for energy-saving works or investments – “ends, projects, tasks, purposes, beliefs, emotions and moods” (which make ‘teleoaffective’ structures for Schatzki, 1996:89) appear to be socially and affectively structured mainly by the ways developed for handling contradictions with previous beliefs and projects and for triggering energy-saving practices among home-renovating practitioners. Many contradictions were indeed said during the in-depth interviews and they indicate shilly-shallying when faced to questions about global warming and/or personal practices. By chance, the 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 installed thick roof insulation with a high priority and others didn't. The following contradiction (from an insurance broker who admitted earlier in the interview that most of his renovations were to save money or to his “desire” or “preference”, and not for the environment) also illustrates how he links sayings and (not) doings in a socially acceptable way (nearly as a victim):

I: “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.”

Among home-renovating practitioners, what else does trigger energy-saving practices? Saving energy 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 either ‘to save money’ for one spouse and to be ‘greener’ for the other one and/or to make fruitful investments. Second, the reasons to conduct energy-related renovation work are quite varied and always in combination (as already noted in Bartiaux et al., 2006: 222). For example, 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. Other reason often cited are acoustic insulation and the wish to enlarge the windows to have more light, 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 associated benefits have to be first (and not secondary) to bring about insulation, and the reason most often invoked is the need for more living space, usually for the children's bedrooms. The next quote of a couple illustrates why saving energy is never an end in itself, even so among owners who paid for an energy audit of their house: Mr: “Security for electricity; issues of economy and ecology for the insulation [of the roof].” / Mrs: “And for comfort.”

### PORTUGAL

#### Technologies and material structure

In 2007, the housing stock in Portugal was estimated at 5,600,000 dwellings, where 65 % of the dwellings are detached and semi-detached houses and 35 % are dwellings in multi-

family buildings (apartments). In 2001, 76 % of the households lived in owner-occupied dwellings. Considering the age of the dwelling stock in 2001, 63 % of the existing dwellings were built between 1971 and 2001, 21 % between 1946 and 1970, and 14 % before 1945. The building code enacted in 1990, was the first building standard imposing some thermal comfort requisites and the potential for renovation works to improve energy performance of dwellings is therefore significant.

Among the renovations carried out by home owners interviewed, there are few examples of complex renovation projects that only kept the façade of the old house, there are some relatively complex retrofits like changing the roof, the windows, the plumbing, new kitchens and new bathrooms, pulling down inner walls, building an extension to the existing house and double ceiling, and there are also very simple refurbishments like painting the walls and varnishing the floor. All dwellings where insulation measures have been carried out (like attic, roof, wall and floor) are houses. Some informants admitted to carrying out renovations because of energy savings. Others, who have undergone energy-related renovation works, like windows and roof insulation, for example, do not consider energy as the main reason for these renovations, but comfort, as well as thermal comfort is mentioned quite often.

#### Know-how and embodied habits

The best educated informants (well trained, highly educated, especially informants used to research in their jobs) search for detailed and practical information, namely on the Internet, they have friends with good knowledge in construction and energy who helped with the renovations and the contractors and they are influenced by friends/relatives (possibly foreigners) who are very conscious about energy and environment.

Professionals (like builders, contractors, installers) also have an important role in the energy renovations, since several informants seem to rely on their advice and trust them. All informants except one have contracted a professional to carry out the works, someone they already knew from other experiences or was recommended by friends. Quite often friends help to identify good contractors and when they are involved with renovations, they can also give important advice.

“Yes... the builder helped us (...) it was the builder who suggested we install insulation in the attic because it was better for comfort, it was better in winter to avoid cold entering the house”, (man, 43 years old, electrical engineer).

Do it yourself practices are not common; however, well informed persons may prefer to be autodidact, to lead and control the field work: “learning is what we, researchers, know to do best, isn't it?”, (man, 43 years old, PhD, Professor).

In the sample of Portuguese homeowners with a high level of education, although thermal comfort was often mentioned, walls' and floor's insulation were usually associated with humidity condensation but not with inside temperatures. To the contrary, all informants could associate roof insulation, frames and windows as well as the type of glaze used with thermal comfort.



### Institutionalised knowledge and explicit rules

Often energy information is not well understood by the consumers, especially concerning the buildings' certification. Few informants understand it correctly, and they are paying for the efficiency Certificate only to avoid paying penalties, rather than to realize the potential savings. Efficiency concerns were absent for the vast majority of informants.

4 out of the 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. They did not even remember about all those measures. 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 be carried 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).

"Well no ... I read it but I think there was not nothing special ... I don't know"; ... "may be there was something ... but I can't remember ... it was a long time ago ..." (man, 57 years old, psychologist).

Some informants who knew the certification process pretty well, either because they were involved with some certification procedure or are working with buildings certification, two informants are qualified experts doing certification, were quite critical about the way the certification procedure is being implemented. They even made suggestions about improving the building stock, which was to make a pre-audit check on the dwelling, in order to investigate about the performance of the house/apartment, without issuing any Certificate and without paying for it.

### Teleo-affective structures

When it comes to the reasons given by the Portuguese informants for conducting energy-related renovations, there is clearly a division between informants who see their home as where they will live for life (either apartments or houses) and the others for whom it is a temporary dwelling, which is found especially among the younger informants. People living in dwellings that they consider as temporary do not have incentive for carrying out energy-related renovation works, they are only willing to invest in low-cost efficient measures. Therefore no energy-related renovation work is implemented in temporary apartments.

"Just painting, to feel as if it were ... that was it; .... It was almost a matter of hygiene; even though everything looked OK; one feels that the house ... the floor cleaned, the walls painted and it is a new one". (female, 26 years old, secondary school)

On the contrary, people in their forties, who move to a house that is considered to be for life, or at least for a long period, are more willing to invest in renovations. Increasing comfort is the reason most often given by most informants for doing energy-related renovations. Comfort is always related to the inside temperature, but also with aesthetics, functionality, aspect, decoration, size, style, orientation, acoustics and cosiness. To increase the thermal comfort of the house was the first motivation mentioned by all informants whether they carried out

energy-related renovations or not. Insulation from humidity was also mentioned as a measure to increase comfort.

"It was old fashioned, and the rooms ... it was more in terms of decoration, uhm the thermal part did not function that well. Especially in the attic ..." (Female, 40 years old, teacher)

Among the well-educated informants, holding a PhD or post-graduation and those used to research, the second most often cited reason is knowledge regarding energy and a high level of awareness on regarding energy and environment. But even so, these informants are more likely to invest in both efficient appliances and in new frames and windows rather than in house insulation (walls and roofs). Beside of this high level of awareness, a conclusion is that for energy renovation works being done, several factors in combination are needed, such as long term perspectives, age of the house, knowledge, as well as economic availability. Another observation related to awareness on energy and environment is that social desirability does play an important role: indeed, some informants tried to give what they thought to be the good answers or the politically correct ones that are related to the concerns shared in the socially privileged context they are inserted into. They mentioned being environmentally conscious, but their practices were going in the opposite direction to an environmentally friendly behaviour. Some examples mentioned are: taking the car for short distances and using a lot of water for baths.

Energy efficiency is a concern for some informants and the options made took into consideration the energy performance and the cost. Cost/quality, Cost/benefit ratios drove the decisions. The informants were willing to pay more for better performance but at reasonable costs, and apparently they succeed!

"Well, everything that contributes to reducing our energy bills and at the same time improving the environment – we are really keen on it", (female, 35 years old, mechanical engineering doing PhD, professor in one polytechnic).

Another main motivation is related to convenience, functionality and cosiness, which often drive people to redesigning and rebuilding the interior of the houses, especially in very old houses because they are no longer convenient for modern standards of living: the rooms were more often found to be too small than too big:

"the most important renovation was to create the open space in the living room, it was the best thing we ever did. The space is much better now, without those walls. The house is cosier and more pleasant, less maze now", (female, 29 years old, PhD on biology, researcher at the university)

## LATVIA

### Technologies and material structure

The total number of dwellings in the year 2006 in Latvia was 1,035,126, of which 27.6 % are single family houses and 72.4 % apartment dwellings. 63 % of single family houses and 42 % of the apartment buildings were built before 1960. Consequently, the main part of the existing buildings does not meet the requirements of existing social and technical standards. In general, there is a strong need for renovation works and energy efficiency improvements of buildings in Latvia.

Informants who live in apartment buildings primarily think about their living spaces and consider only the apartment and not the whole building as their own property. Consequently, more renovation work has been done inside the apartments. It is complicated to implement the renovation work for the whole building, mainly due to an organisational factor: the necessity for finding an agreement among the majority of co-owners of the building apartments. When a discussion about renovation works arises, on floor or ceiling insulation, people who live in the middle of the building are often not interested to do such work because they don't see any benefits for them. Once the majority of co-owners has reached an agreement regarding building renovations, all the tasks are taken over by the building management company. Renovation in flats is mainly done by inhabitants themselves or with some help when, for example, windows have to be changed. In general informants first make some aesthetic changes and if their financial situation allows it, they also make some energy-related works as these are more expensive than just painting walls or floor. The main and the first energy related renovation measures are the change of windows and doors, wall insulation of the building, and heating system replacement.

“The most important is that I have changed all windows, and now it is warmer.” (Gunita, Female, 40 years, Bachelor degree, not married)

In detached houses, informants make most renovation works step by step. The informants consider the property as their own and the renovation works as long term investments for a better future. They explain that costs of renovation works in private houses are not low, and that it is not possible to do it all at once. The renovations that have to be done are mostly the same as in apartment buildings, including: roof replacement and insulation, heating or hot and cold water system replacement, window and door replacement.

#### Know-how and embodied habits

For people living in apartments, information on what kind of renovation works have to be done and how to do them mostly come from friends, colleagues, and also from advertisements. The building management company also plays a big role on carrying out renovation works.

“Where did you get the information?” “From the shops. Yes, the Internet ... no, the Internet of course didn't exist at that time, but now also with Internet. I do not know, actually probably from some friends, from the shops, from advertisements.” (Santa, Female, 42 years, Master degree, married)

For people living in detached housing information correspondingly most often comes from friends, colleagues, advertisements and also from the Internet.

“Well yes, nowadays, where I look first is Google (both laughing): opening Google and typing ‘boilers’, and then looking through, but there is not full information. This time I called my brother, asking whether maybe he knows something about it: he had a colleague (both laughing) who said that there is one company called Hromets, that produced boilers and that colleague said that they were good.” (Andris, Male, 35 years, College, married).

Informants in private houses are more involved in renovation work than those in apartment buildings. House owners do more often the work by themselves, or by persons whom they trust, and are always informed about works that are done and will be done.

#### Institutionalised knowledge and explicit rules

Though the Energy Performance Directive has been legally correctly prepared in Latvia, it does not necessarily reach the objectives of improving the energy efficiency, as is the goal of the directive. The main problem is that energy certificates for buildings are needed only if the building is being built, sold or rented as a whole. As the main building stock in Latvia consists of soviet era multi-apartment buildings, these buildings will never be sold or rented simultaneously. This means that these buildings do not need energy certificates, though these types of old buildings are especially very energy inefficient and thus makes this problem even more serious.

Among the informants, it is seen that more institutionalised or theoretical information and knowledge on renovation works was most often mentioned by younger informants. Consequently, it can be assumed that young people are more open to this type of new knowledge. It also contributes to the implementation of energy efficiency measures in the buildings.

“In general the main fact was that the theory from the book convinced us. But it was important that we read it ourselves. This must be done in a certain way, because it was written there technically how this must be done and why.” (Arlita and Ervins, 35/38, College/Master, married)

#### Teleo-affective structures

Only 6 informants, all living in apartment buildings, identified energy saving as the main reason for doing building renovation. Energy cost influences building and apartment renovation because the current costs of heating are seen as too high, and there is a desire to reduce energy costs (mainly heat). The main reason for doing renovation works in apartments is a feeling of cold and discomfort and the bad conditions of the building. The reasons why the renovation works in detached dwellings are made are quite similar to those for apartments. Though, age of the house is mentioned while coldness has never been.

Both in apartments and in detached housing, the financial aspect is often a main reason for not carrying out renovations. Though some also mention the low costs, including costs for materials and labour, as a lever in doing renovation work. Also, discounts and the possibility to doing the renovation oneself without extra money spent on workers is consistent with this reason.

“How did you find the company that changed 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 could buy the windows from that company with discounts and it was easy.” (Santa, Female, 42 years, Master degree, married)

There is no strong connection between knowledge on environmental issues and energy renovation works of the building. However, it is seen that people having more information on environmental issues have done more energy-related works

and practices. When talking about environmental knowledge and practices, two common main contradictions are heard in the interviews. First is that the informants care about the environment, but at the same time energy-saving practices have not been implemented. This contradiction reflects the opinion of most respondents. It seemed that the informant knew or heard that it was good to act, because it positively impacted the environment. This was the reason why many informants were asserting that the 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, Male, 34 years, Bachelor degree, married)

The second contradiction is in the opposite sense. The informant says that s/he does not care about the environment, but s/he has a lot of energy saving practices. Maybe these informants wanted to impress the interviewer and wanted to hear how well they cared about the environment by saying that they did not think much of these issues.

Informants could be divided into three groups, depending on their answers to the question on energy consumption and environmental issues: The first group included 14 persons out of 24 and they 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., pollutions from the industrial sector, the attitude of each country government), and depends 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 between energy and water saving and 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, 24/26, Bachelor/Master, married)

The second group of informants (2 persons out of 24) thinks that there is a link between energy savings and environmental issues, but could not explain in more detail. It is mainly based on the information from TV, radio and other media, but they do not have their own opinion. The third group of informants (8 persons out of 24) does not believe or do not have any information on the link between energy savings and environment. Despite the information available from media, they either could not answer the question or they think that there is no link. This opinion was common for informants living in rural areas and in the 50-75 year age group.

“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, Female, 58 years, Bachelor degree, married)

## Discussion: Understanding differences in practices

The purpose of the article is to discuss to what extent the practice of renovating a house or an apartment is the same throughout Europe: what variations there are, and if these variations are different from variations within each country? Cases studies in four different countries have been described and these four countries have been chosen to represent as broad a picture as possible as regards differences in climate, building style, housing culture and implementation of energy policy. In the following, focus will be on similarities and differences between the countries and inside countries under each of the four components holding a practice together.

### TECHNOLOGIES AND MATERIAL STRUCTURE

Buildings generally have rather different technical standards in the four countries: In Latvia a good many buildings are in such a bad shape that maintaining a high enough indoor temperature is an issue, which is not the case in the other countries, except for persons in energy poverty (one informant in Belgium). In general, the Walloon housing stock seems older than in the other countries, though in all countries there is a big energy potential in having the existing building stock renovated according to latest energy standards. Changing frames and windows is the most common energy renovation in all four countries, though there seem to be differences between the countries in what is regarded as high energy standard and normal standard. In Denmark for example, the energy choice would include triple glass or energy coating and the standard window would be double glazed. In the other countries double glazing would be expected as an energy choice for many of the respondents.

Especially in the Latvian interviews, we heard that there are differences between the practice of renovating an apartment and a detached house and that this relates to the organisation and owner structure of the dwellings, which may obviously also be the case in other countries. This was not as outspoken in the Portuguese interviews, but there it was clear that people living in apartments would most often not invest too much as they were not sure how long they would be staying in their present dwelling. This might also be relevant in the other countries, but the Danish and Belgian samples did not include persons living in apartments, so these issues were not touch upon there.

### KNOW-HOW AND EMBODIED HABITS

It is interesting to notice that in all four countries, friends, and to some extend family, are the main sources of advice about how to renovate a home and for choosing trustworthy contractors. In all countries internet is also mentioned as a source of information. In Denmark and Portugal, craftsmen or contractors are generally seen as reliable sources of information, whereas in Belgium their advice appears to be more discussed. In most countries there seem to be a social stratification, where the younger and better educated themselves indicate that they have more knowledge on energy issues, however, in Denmark, it seems that all informants are quite knowledgeable, independently of education and age. Though having knowledge is not the same as putting this knowledge into practice, which was also apparent in all countries. Do-it-yourself (DIY) is seen in all countries, more rarely though in Portugal (only in 1 out of 23

interviews) and more widespread in Denmark (almost all interviews), implying that these people actually have some knowledge and skills related to the practice of renovating a house.

#### INSTITUTIONALISED KNOWLEDGE AND EXPLICIT RULES

As the implementation of the EPBD goes on at very different paces, there are potential differences between the countries here. However, as having an energy label for the house does not seem to influence the renovations to a very high degree for those who have had one (all informants in Denmark, about half in Belgium and in Latvia and a few in Portugal) then the actual differences is not that big. In all four countries, there are some financial programs supporting energy renovations, though it seems from the interviews that these instruments have a higher impact in Wallonia on the practice of renovating as compared to the other countries.

#### TELEO-AFFECTIVE STRUCTURES

In all four countries, the main and common goal for the inhabitants is to have a nice home, including a comfortable indoor climate and aesthetic interior. Also it is common throughout all interviews that the interior aesthetic is more important to the inhabitants than energy renovations. In some countries (Latvia) the indoor climate seem to be a stronger aspect in renovating the buildings because of rather bad conditions of the building stock combined with cold climate, meaning that it is difficult to maintain a comfortable indoor climate, but even here inhabitants often prioritise first doing some interior decorations rather than prioritising energy, also because the interior decoration can be less expensive.

In all countries there are people knowledgeable about the link between energy and environment/climate, and in Belgium, all informants, possibly by chance, have a generally good knowledge on climate change and many of them share an environmental concern. In the other 3 countries there are people who do not really believe in these relations. Also in Latvia some older people living in rural areas explain that they have no knowledge at all about these issues, which is not the case in the other countries. Some inhabitants see a link between energy consumption and environmental concern and others do not. In relation to environmental concern, there seems to be almost as much variation within the countries (except in Belgium) as between the countries. And in all countries there are examples of ambivalences and contradictions between the practices and the awareness on energy and environment. The informants of the four countries thus do not necessarily do something with their environmental knowledge. Also in none of the countries, is environmental concern really a driver of energy renovations for the majority of the informants.

#### Conclusion

After this summary of the similarities and differences within and between our four samples, we now focus on the question of the relevance of subsuming under one practice that could be called 'energy renovating' (without going any further in the discussion regarding the practice of home renovation in general as it is not the main topic of this paper). We argue that 'energy renovating' is not (yet?) an integrated practice in these four different European countries despite the EPBD and the ef-

forts of the energy advisors to create such a practice that would integrate know-how that is now fragmented and differentiated between several types of professionals (carpenters, heating installers, frames and windows installers...). In addition, these professionals do not share a common and particular goal (that would be 'to save energy where ever possible in a building') nor do they recognise themselves as 'energy-savers practitioners'. Among the interviewed home owners, three DIY Walloon informants would probably accept this appellation though because they are engaged in such works, all three willing to have an environmentally friendlier "way of life" and insisting that their DIY projects are not motivated by financial reasons.

Another question raised by this research is that the EPBD intends to label *buildings*, with procedures varying per country (as seen here for Portugal giving more importance to solar thermal and HVAC (Heating, Ventilation and Air Conditioning) than to the building envelope) but not made clear to the population in any of the four countries studied here, while wishing at the same time to pushing *persons* (home owners) to enrol themselves in a (still non existing, we argue) practice of energy renovating. A conclusion of this research is thus that a social practice cannot be 'created' from scratch by a law or a European Directive before being sustained by common and conventionalised routines, both mental and behavioural, shared know how and ends.

This analysis based on social practice theories therefore may explain why the present execution of the EPBD is not having any substantial influence on the practice of renovating houses. If the EPBD is to have an impact, it should thus be suited to the local material structure e.g. the building stock to a higher degree. In Denmark, where the EPBD has the longest history of implementation, it is seen that it has little impact on the practice. The energy label is not considered as an important part of the knowledge about energy renovations, and as regards the teleo-affective structures, which are related to the reasons for carrying out renovations, there is no sign of encouragement in receiving a higher grade of the label among the informants.

Maybe the Latvian study shows the most coherent case on this way of creating this new practice of energy renovations, with its old building stock mainly made of post-soviet apartment blocks, cold winters and a majority of home owners who are feeling coldness – a more unacceptable feeling given the current norms on comfort – and unable to pay a more and more expensive energy: all these factors converge to require urgent renovations of multi-apartment buildings in a more energy-efficient way.

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