HOUSING ENERGY-RELATED RENOVATIONS BASED ON PERSPECTIVES ON SOCIAL AND LIFESTYLE STANDARDS: PORTUGUESE HOMEOWNERS

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ABSTRACT

Recent studies have argued that energy-related renovations, which are not distinctive from other house improvements, must be socially contextualized and interwoven with householders' daily social practices. Based on a practice-theory approach, this study explores how tastes, lifestyles and social values and norms can shape homeowners' energy renovation practices. The study conducted semi-structured interviews with energy advisors and residents of owner-occupied housing in the North-eastern of Portugal, where purposive sampling techniques were used to manage participant selection. Results suggest that there are differentiated taste-motivated issues that could incentivize homeowners to renovate. This highlights the importance for public policy-makers to understand the diversity of homeowners' desires and preferences regarding house renovation activities. Reflecting upon this diversity inside the household domain, gender differences reveal to be a significant factor in domestic energy management. These findings also corroborate those of previous works on how home renovation decisions reflect societal values and norms that determine "what would look nice" to have in a house, and why visible renovations (usually non-energy related) are often prioritized. An implication derived from these findings is that energy policies should be drawn in a way that portray energy efficiency in houses as fashionable as other consumer goods related with home design. These involve inter alia innovative partnerships between energy policy-makers and household products industries, home design magazines, marketing experts or real estate experts, which have the know-how to shape people's tendencies and tastes.

Keywords: *energy efficiency; housing, owner-occupied subsector; social practices; Portugal*

1 INTRODUCTION

Buildings are part of the built environment. The built environment comprises human-made buildings, built assets, and facilities viewed collectively as an environment in which we live and work [1]. The building sector is responsible for 32% of global energy consumption and have a large energy saving potential [2,3] with available and demonstrated technologies that can increase building's energy performance to nZEB level, which are, in many cases, economically viable [4]. Economic potential of these technologies has also been acknowledged in residential buildings of the European Union (EU) [5], and, particularly, in the owner-occupied housing subsector that sheltered 70% of the EU population in 2021 [6]. In terms of building renovation activities, a range of 0.4-1.2 % of the EU residential stock is energy-retrofitted each year, a figure roughly a fifth of what would be needed to contribute to the GHG emissions ambitions of the Organisation for Economic Co-operation and Development (OECD) countries [7]. These developments show that, despite their availability and economic viability, energy efficiency measures have not been deployed at the required rate to meet EU's energy and climate targets [8,9]. Housing energy-related renovations are not considered as a common practice yet [10], and when they take place, they get merged with other house renovations, in a predominantly step-by-step process, and as a continuous improvement for living in and maintaining homes [8,11]. Often, energy efficiency is not a primary consideration for many homeowners but other types of home renovations may include improved energy efficiency [12]. Models based on the techno-economic approach dominate by far energy policies [10, 13, 14, 15]. Narrow arguments for motivating homeowners to renovate are still based on the idea that they wish to make one-off renovation to save energy and money but are hindered from doing so mostly by financial constraints, doubts regarding energy savings, high up-front costs and lack of trust in energy professionals [12]. This rational is embedded in the behavioural sciences paradigms that treat homeowners as individuals who make rational choices in order to obtain certain results, which are often dissociated from mundane perspectives and practices of everyday life [12]. However, behavioural sciences, as applied in housing energy research, do not consider house renovation as a social practice because this approach is limited to the decision rather than to the process preceding it [12]. Most recent approaches, based on social sciences paradigms, conceptualise housing renovation as a social practice, by identifying what and how this practice is shaped by householders' daily life conditions, their preferences and aspirations, as well as by societal values and norms. According to these approaches, the decision to renovate is itself a process, rooted in a socio-economic and cultural context and negotiated at the householders' level, which arises from, and take place within, the home life dynamics [11]. Within this negotiation process, gender is a factor rarely considered for energy initiatives, particularly the key role women play in domestic routines and energy management [25]. Framing the decision-making process within these home dynamics brings to light those deepest influences at the beginning of decision (why renovate?), and with which social sciences work better

than behavioural sciences [12]. Homeowners´ stages of life, conditions of domestic life, experience with renovations, home meanings or householders´ roles and relationships within household dynamics are the ultimate influences for householders' renovation decisions [12]. Furthermore, because home renovation is often a way that dwellers use to resolve tensions, achieve goals, take up opportunities and give wings to personal and family ambitions, aspirational renovations tend to surpass renovations made out of necessity. These aspirational renovations let homeowners dream of, make plans and convey to others their way of life [10, 16]. This social desire paths on renovations need to be better apprehended within the whole complex of tastes, social status, lifestyles and consumer choices [16, 17, 18]. Within this context, homeowners' decisions are seen through a lifestyle vs. wear and tear and product vs process perspectives, which delineate the arrays with which homeowners´ decision operate [16]. With regard to tastes and lifestyles, homeowners having a calm and busy life [19], appreciating a healthy or environmental lifestyle [10, 18], wanting something more fashionable for their house [16] or being DIY adopters [16, 20], can reveal differentiated types of homeowners' profiles and energy renovations propensities and styles. Houses are makers of social values and status, and frames for social relations, being householders the carriers of social norms that establish what is normal to do and to say [21]. The "what would be nice to have" and "what look nice" for a renovated home are often compared with more economically advantageous renovating solutions because how other people see the house is important for householders [21]. Some types of home renovations may be connoted with an improved social status and invoke an image of prosperity and prestige [21], despite the view shared by many writers that the lack of enthusiasm for energy efficiency measures is due to the fact that energy efficient homes per se are not a true reflection of social status [18]. Enhanced status as a motive for renovations is first and foremost carried via visual perception and thus reduced to visible renovations measures [10]. In fact, visible renovations tend to be prioritized and made before non-visible renovations, although homeowners might concede that the former measures might not be the most advantageous options in terms of energy efficiency [11, 18, 22, 23]. Subsequently, the visual aspects of home renovations seem to be as important as the technological aspects [29] because visible renovations are usually interconnected with the improvement of aesthetic aspects of houses [16, 23, 24].

Most recent studies have argued that there is an association between shared values and common understandings connected with homeowners' everyday lives and energy-related home improvements [25-33]. Hence, this work aims to contribute to this growing body of literature by investigating the influence that specific values, such as the ones related with tastes, lifestyles and social values and norms, have on the motivation of Portuguese householders to make energy-related renovations in owner-occupied housing. This paper is an extended, up-to-date version of a previous work [34]. The remainder of the paper is

organised as follows: Section 2 describes the methodology adopted in the study; in Section 3, the results of the study are presented and commented upon, and the main findings are discussed and; finally, a concluding remark is presented in Section 4.

2 MATERIALS AND METHODS

A qualitative in-depth exploratory study was selected to gain an in-depth knowledge and make emerge new topics about the influence that homeowners' tastes, lifestyles, social values and norms have on energy renovations' decisions. The main goal was to identify the underlying reasons, emphasising the "how" and "what" is happening and not "how much" is happening. Hence, to analyse how everyday life practices affects home renovation, the practice-theory approach was the theoretical background used in the study. Theories of practice or practice-theory is a group of theories from sociology. It takes practices like home routine practices as its main unit of analysis [35], and has proved to be a promising approach since its focus is on practices and not on individuals [36]. Note that the aim is to achieve outcomes from a collective practice point of view since the research goals are related with social practices, and home renovations' decisions involve, in general, family negotiation and social network influences rather than being an individual decision [12].

A set of fifteen in-depth and semi-structured interviews were conducted between September 2020 and March 2021, with a length of approximately 60 minutes. Three of them were conducted on certified energy advisors and twelve on residents of owner-occupied single-family buildings. A few interviews took more than 60 minutes due to a more active participation of some participants. The semi-structured interviews enabled the informants to describe their experiences in their own terms and thereby to redefine the scope of the interview questions, if necessary. Regarding the number of participants, previous studies have suggested that a sample size around twelve is sufficient to make emerge relevant data [37].

The participants were selected by using the purposive sampling method. Purposive sampling is a technique used to provide researchers with the discretion to choose participants who have a detailed understanding of a subject. In this method, specific criteria are used for selecting a particular sample, the aim of which is to collect in-depth information from the right respondents [37]. In this case, selecting residents of owner-occupied single-family housing that had already made some energy-related improvements in the last few years or who were in the process to of doing so was the main criterium. The selection of householders who participated in the interviews was guided by the energy advisors.

In total, sixteen householders in the North-eastern region of Portugal (10 males + 6 females; age of participants in the range between 39 and 65 years) were interviewed. It was asked, in a first contact, if it was possible for more than one person per household to participate in the interviews,

preferably the couple, in order to understand the decision-making dynamics inside the household. The aim was to collect, as much as possible, opinions and experiences from women due to their growing importance in this subject [15]. Four interviews included, in full time, the couple and in the remaining interviews, other household members were present for brief instances (Table 1).

Table 1. Characteristics of the interviewees

Interviewees	Number of interviews	Persons per interview	Gender per interview
Householders	6	1	1 Male
	2	1	1 Female
	4	2	1 Male and 1 Female (couple)
Energy Advisors	3	1	1 Male

Semi-structured interview plans were prepared for both interviewees (homeowners and energy advisors). In-depth interviews were firstly conducted with the energy advisors so as to make it possible to collect relevant issues to be used in the subsequent interviews. An interview guide, with the summary of topics to explore, and the interviewer intervention mode were defined in these plans. The interview topics, which were used to prepare a group of direct (closed and open) questions were derived from the hypotheses constructed from the theoretical background. But before that, an introductory approach to explore general motives about why homeowners did or usually do renovations was put in practice. It is worth noting that the interviewer refrained to use some particular terms related with the study aim until the interviewees raised their own themes. The main strategy used along the interview sessions was to firstly enquire about direct closed questions in line with the interview guide topics followed by open questions. The open questions aimed to induce the interviewees to speak more freely about a particular subject to gain a deeper understanding about it or make new issues arise. In spite of the direct questions were closely dependent and interrelated with the interview guide, spur-of-the-moment questions emerged during the interviews in response to the flow of homeowners´ narratives. Without losing the aim of the research, key questions were intentionally asked during the interview to give continuity to spontaneous conversations (the interviewees express themselves following the course of thoughts [38]). Great part of the interview sessions was used to explore the interviewees´ narratives. In sum, information did not emerge rigidly and exclusively in response to the sequence of questions prepared by the interviewers, which were based on theoretical notions about the subject under investigation.

The interview structure for homeowners was organized around the day-to-day experience of living inside the home, the daily social practices inside the family and with the social network around. In order to get more reliable narratives, the interviewees were encouraged to remember part of their daily life [38]. It included questions about: the renovations already made

(energy-related or not); justification thereof; the homeowners' lifetime stage/context; the homeowners´ beliefs, aspirations and ideals for the family, the planning phase, the negotiation for decision inside the households; the social environment around and the community social values and norms involved. Table 2 summarizes the general topics that guided the interview questions. Former studies have identified several challenges when it comes to interviewing householders on energy efficient decisions. Possible biases are related with some stylized facts: householders are highly involved in the decision but lack relevant technical and economical knowledge; they can demonstrate the commonly described "attitude action gap" (what consumers report as concerns or intentions has often little relation with what they do) and; consumers tend to change their evaluation after high-involvement purchases [29]. Therefore, energy advisors (with more than 5 years of experience) were also selected to try to get a rather unbiased view of homeowners' decision-making. The aim was to get insights from the accumulated knowledge energy advisors gain through multiple in-person energy consultations they make along their professional experiences. Built on the information drawn from the theoretical framework, a similar interview plan to that designed for the homeowners was used (with some few adaptations). The focus during these interviews was to let them reveal their considerations and experiences when dealing with homeowners as professionals (Table 2).

The use of video-conferencing allowed visual interaction and the capture of both affective and cognitive aspects of the interviewees. It was not possible to make a walk-through to their houses. All the interviewees were primarily elucidated with clear explanations about the purpose of the study, the ethical guidelines governing the interviews, the use of data and the recording of the interview to make disappear any possible fears. Another important rule followed in the interviews was to ensure an environment of tranquillity and confidence to the interviewees.

The analysis of data relied on inductive reasoning, where the themes emerge from the raw data through repeated examination and comparison. The interviews were digitally recorded and then their transcripts were coded and categorized (with the help of the qualitative software webQDA), by using a realist theory approach that detects the most common themes along the transcriptions in line with the research questions but also tries to see how previous knowledge about the subject in question might be addressed and enlightened by the data [39]. All the interviewees were given pseudonyms from the transcription phase onwards.

Table 2. Topics Used in the Homeowners' Interview Plan

Time (minutes)	Interview topics
5	Brief characterization of the interviewees (age, education, household composition, position in life);

	Renovations made (energy-related or not) and when, in the homeowners´ lifetime/context, were they made.
10	-Preliminary assessment of general factors for renovations to take place in order to make emerge new issues (the interviewer refrained to use terms related with previous knowledge about the subject drawn from the theoretical background in order to minimize any influence on the homeowners´ narratives); -Get the interviewees to talk about their home life before and after the renovation.
20	Explore and delve into the terms/reasons/subjects specified by homeowners related with the research goals in response to the questions made previously (using pre-prepared or spontaneous open questions).
20	-Explore other issues/influences based on the literature review that did not emerge from the previous exploratory part; -Using closed direct questions (Ex: Is this issue/factor important?) and letting the interviewees construct their narratives through open questions (Ex: Why? Why not? What do you think about this?) afterwards. Topics: -Tensions and negotiation within the households related with the renovation decision; -Taste-motivated influences for renovating; -Personal beliefs, emotions and aspirations for their home; -Day-to day life inside home, ideals for family life and home living standards (lifestyle-related issues and family identity); -Energy-related renovations associated to prestige and as transmitting something about the family identity and "way of living"; -Visible renovations and how homeowners think their houses should look like; -Friends', families' and neighbours' influence within the social network; -Social values and norms in the community that influence house design; -Fashion and trends influence on shaping home design and homeowners´ decisions.
5	Finalizing the interview

3 Results and discussion

3.1 General outcomes

The research findings demonstrated that homeowners started by doing small, sometimes low-cost renovations, which were not necessarily energetic-related, and gradually continued, or not, with other renovations over time. Energy improvements made part of the initial plans for some of the interviewees or arise for other purposes later in the renovation process as an additional benefit. The perception highlighted during the research was that saving energy is not an end in itself as homeowners conceptually link the energy renovations with other associated benefits they expected to reach with the renovation (e.g. house is going to look modern and updated, using less clothes inside, children enjoying more time in their bedroom).

The findings also showed that the decision to renovate was, in most situations, entrenched in a householders' negotiation process where

different decisions-makers had often discordant aspirations and priorities. The social influences discussed in the following subsections help to explain the initial intention to renovate. The findings, in general, indicated that homeowners' engagement in a renovation is a complex process that needs a non-conflicting coexistence with other motives, through a cognitive multiple criteria process that depends on each person.

Comentado [J1]:

3.2 Tastes and lifestyles influencing energy-related renovations

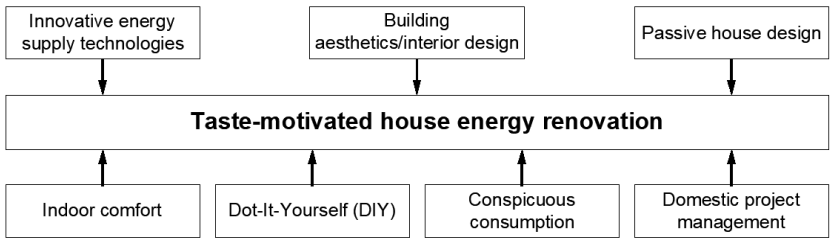
Primarily, the findings suggested that personal beliefs, emotions, aspirations and shared understandings were, in some degree, involved in home improvements' decisions, even in the cases involving energy renovations in which homeowners knew, informed by energy advisors, that rational arguments would point to selecting other more advantageous solutions in an economic point of view. The energy advisors unanimously agreed that there are underlying emotional influences beneath the options that their clients usually take on home energy renovation, which frequently surpass energy savings and monetary arguments. One of the energy advisors noted:

> "This is not necessarily wrong because for them there is a logic behind, we should be capable of understand that logic". (Pedro, male, 46).

The energy advisor also revealed that negative ideas about energy renovations exist, which could represent a disruption factor for the energy renovation market.

Taste-motivated energy renovations were revealed by the presence, amongst the interviewees, of enthusiasts in passive house design, building aesthetics/interior design, innovative energy supply technologies, conspicuous consumption, DIY, domestic project management and indoor comfort, each of them with different levels of engagement (Figure 1). The narratives suggested that some homeowners´ tastes had a strong influence both in the initial decision to renovate and in the subsequent decision on what to renovate. One of the energy advisors noted that taste-motivated reasons are often interconnected with homeowners' apparent lifestyle.

Figure 1. Taste-motivated house energy renovations identified in the study



A significant number of homeowners demonstrated a fascination for passive houses design for this is, in their opinion, associated with modernity. In contrast, two women linked these types of houses to an unpleasant building design. The visibility of the renewable energy systems gave an aesthetical empowerment to the house for some homeowners and, in reverse, for others, it did create an unpleasant atmosphere (solar collectors' panels in the roof visible from the main street, for example). One woman revealed that she had been resistant to installing solar collectors in the most efficient part of the roof because they were visible from outside. In general, to be appealing, energy-related renovations need to be convergent with an idealized appearance of the house. Thus, a 3D visualization software displaying the final house appearance with visible energy improvements could be an interesting tool to be used by energy advisors to motivate homeowners to renovate.

Aesthetics improvement as a drive to renovation, mentioned namely by middle-aged women, were due to the fact that they no longer felt identified with the image of the house because their tastes had gradually changed over time. If the women interviewed revealed more attractiveness for indoor comfort and house appearance, men, in general, proclaimed to be seduced by technical innovations about which they liked to be up to date. Tensions between the couples were perceptible during the interviews in what regards their preferences and priorities.

Energy advisors also noted that energy systems tend to be overvalued by their clients as if "miraculous" devices were going to solve the energy inefficiency of their homes. In part, the fascination for innovative systems and aesthetic improvements for houses was linked by one of the energy advisors to a modern conspicuous consumption practice, which involves purchasing great quantity of goods/services, especially expensive things, to publicly display wealth rather than spending their money on what is more needed in practice. This exposes a potential connection of energy-related renovations to luxury goods, a market in which certain industries and marketing experts have a long experience and knowhow. Another personal taste mentioned by some informants was the enjoyable hobby of planning and overseeing the renovation works to which they felt very committed and involved. One of the interviewees noted:

> "I got excited about the planning process, to see things being done day after day was really nice". (Jorge, male, 55)

These findings suggested that householders' tastes are still a significantly unexplored niche market in housing energy policies.

With regard to lifestyles that influence home renovations, ideals of family life and maintaining or changing home living standards were some of the reasons mentioned by the informants to adapt their houses for modern living patterns. One practice identified by four interviewees, which could potentially trigger energy renovations, is the practice of socializing with family and friends at home, which leads to an increase in energy consumption. Comfortable spaces for schoolchildren to play was also

mentioned by a younger couple as a drive to energy improvements. Maintaining a balanced relationship between householders around the day-to-day activities of living at home was also revealed by a number of the interviewees. An example extracted from the interview data was the current generation of teenagers who makes an intensive use of their bedrooms, where they study, have a computer and sometimes even a television. More comfortable spaces, more energy load is needed during the day, contrarily to what happened in the past, when most home life activities took place in the kitchen and living room. Moreover, some interviewees became aware of how beneficial had their energy-renovated homes been during the COVID 19 pandemic because they had to work from home. A good example of an increasingly blurred work-home boundaries, which could also be conducive to an uptake in renovation rates. This brings into the discussion the fact that generalised comfort all over the house has become a required pattern for relatively well-off Portuguese householders, to which the women, interviewed form the study, seemed to be more attentive and demanding.

A change in the social status or a beginning, or ending, of a life cycle was also a lifestyle-related issue mentioned by the Portuguese informants in their narratives. Three of the middle-aged homeowners (45-60 years old) recognized that a new position in life and a change in their socio-economic circumstances induced them to make house improvements. Two examples are revealed in the following citations:

> "I am in a position in life where I want to do what pleases me the most and I do not mind to spend some extra money on it". (Rui, male, 56)

> "My husband got a job promotion and some of his colleagues are from a higher social class. All of them have energy efficient systems installed in their houses". (Carla, female, 53)

Some of the interviewees mentioned either the fact that their house was no longer compatible with their actual personal and family identity or with their way of living or even with what they dreamt of for their family in the near future. New jobs, new friends and the beginning of a new life cycle, sometimes financially more stable, made people to want more for their homes as if the house were an extension of themselves. These examples strengthen the fact that homeowners' life and their individual preferences evolve over time and the house is the setting that needs to keep up with this.

3.3 Social networks, values and norms influencing energy-related renovations

The findings showed that personal tastes and self-ambitioned lifestyles were not the only direct elements responsible for influencing the renovation decisions of the Portuguese householders. They also suggested that householders´ and their close relatives' opinions about the standards of their houses were also determined by cultural and social values and

norms largely shared in society, which have more influence than campaigns, rules and financial incentives.

The majority of the interviewees showed concern about what social identity should their house exhibit to the local community- through its appearance and, consequently, about the way the home was perceived in the neighbourhood, often as an object of the latter's judgments. They admitted in their responses that they wanted a house that better reflects the image of themselves. The energy advisors sensed that householders´ choices were often determined by a hidden willingness to display an overrated image of themselves or a certain social status. Nevertheless, none of the householders directly recognized this in the interviews. To incentivise this group of householders for energy renovations, energy policies should perhaps encompass strategies that connote passive house standards with a high social status. When they were asked about what type of energy-related renovations they associated to prestige and as transmitting something about the family lifestyle, most of the informants mentioned installing new windows, solar thermal collectors or PV solar panels, and renovating the gardens, all visible from the outside. This suggested that visibility is somehow important and so prioritized by the householders. Only two, both younger respondents, declared that they did not care if the efficiency measures were visible or not, suggesting that an environmental concern was more in their minds. In sum, homeowners´ aspirations about their house tend to reflect what others and society in general consider what should an ideal home be. Therefore, if social norms include energy efficiency as an important feature that a house should have, this will definitely have a positive impact on the energy renovation market.

Householders neighbours' influence in shaping home energy renovations was also revealed in the interviews. More than a half of homeowners spoke spontaneously about the types of home improvements that their neighbours had implemented in their houses. In the same line, the energy advisors also mentioned the fact that many of their clients used the examples of their neighbours to show their preferences for home improvements. Thus, it is reasonable to assume that comparisons were constantly made and an implicit competition did exist in the community. One of the participants noted:

> "I was not very attentive to campaigns about renewable energy systems until some neighbours started to put solar collectors on their roofs and their feedback was quite good. Some of them used to ask me, why don't you try? Well… at some point I didn't even know what to answer anymore!" (Hugo, male, 50)

Homeowners' friends and neighbours seemed to have a major influence in sharing information within the social network. The energy advisors noted that the homeowners´ social context, through knowledge networks, define implicitly an imagined standard for houses in each community and homeowners, unconsciously or not, make gradual efforts to conform to, sometimes even surpassing their taste. In general, fashions can lead to

more general consumption or even to conspicuous consumption connoted with high social status. Fashion and trends created by household products industry marketing strategies and home design and decoration magazines is an interesting topic that arose more than once from the women's responses. One female interviewee revealed:

> "I love internal decoration and beautiful houses and I usually read some articles in a home decoration magazine. Heating systems, types of windows and other things appear from time to time. This gave me confidence to go forward with my plans". (Rute, female, 61)

This suggests that energy policies could be inspired by the way these sectors visually stimulate different householders to model their tastes and demands. Partnerships between energy policy-makers and household products industries, home design magazines, marketing experts and real estate agents could bring an innovative approach for designing energy policies.

4 Conclusions

This research has emphasised the presence of a high emotional involvement behind the Portuguese homeowners´ decisions on building energy retrofitting. Houses are emotional and social places that tend to reflect personal tastes and shared understandings of their residents. Because achieving convenience and personal fulfilment are important criteria for homeowners, aspiring renovations, frequently taste-motivated, often take precedence over other types of renovations. In the same way, desired or out of necessity changes in the way homes are used can also activate mental processes in homeowners to make renovations. The findings of the study highlighted the importance of understanding and categorizing the diversity of householders´ tastes and lifestyles in a way to make a link between energy-related renovations and the subjects that homeowners most appreciate and enjoy. These linkages should be considered in energy policy initiatives.

The study also shed light on the fact that since home renovations decisions involve a negotiation between household members (usually the couple), gender is an influence factor in this decision-making, where women, due to their role on domestic energy consumption and management, need to be considered in a more relevant way by public policy-makers. House is a means to express householders' identity or the identity householders want to display. If a house is no longer compatible with these attributes, it is likely that house improvements, energy-related or not, do happen. This identity is also more or less influenced by the social values and norms shared in the community, making society a decisive factor in establishing norms about what should houses look like. These social norms are reproduced through social networks, where friends and neighbours seem to have a major influence. The social context defines implicitly an imagined standard for houses, which some homeowners make efforts to conform to, prioritizing visible renovations. The latter renovations, often, are not energy-related or even the most advantageous options for energy savings. Energy-efficient

housing should, ideally, be included in the social values and norms expressed in communities, and energy policies should devise strategies that would emulate these social norms in society. These strategies would involve innovative partnerships between energy policy-makers and household products industries, home design magazines, marketing experts or real estate experts, which have the know-how to shape people's tendencies and tastes.

This study has some limitations. The first one has to do with the nature of qualitative research regarding the generalizability of research results [40]. The fact that the householders, which were interviewed for the study, all come from a medium-to-high educational and professional background is another limitation. In addition, the interviews were conducted in a specific region of Portugal, which is one of the country's six climate zones. Thus, further studies should extend the householders' characteristics to include different age groups, educational backgrounds, household composition and socio-economic status. The sample of participants should also include householders across different regions of Portugal.

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