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## **Improving the energy labelling scheme**

*Findings and recommendations for Denmark*

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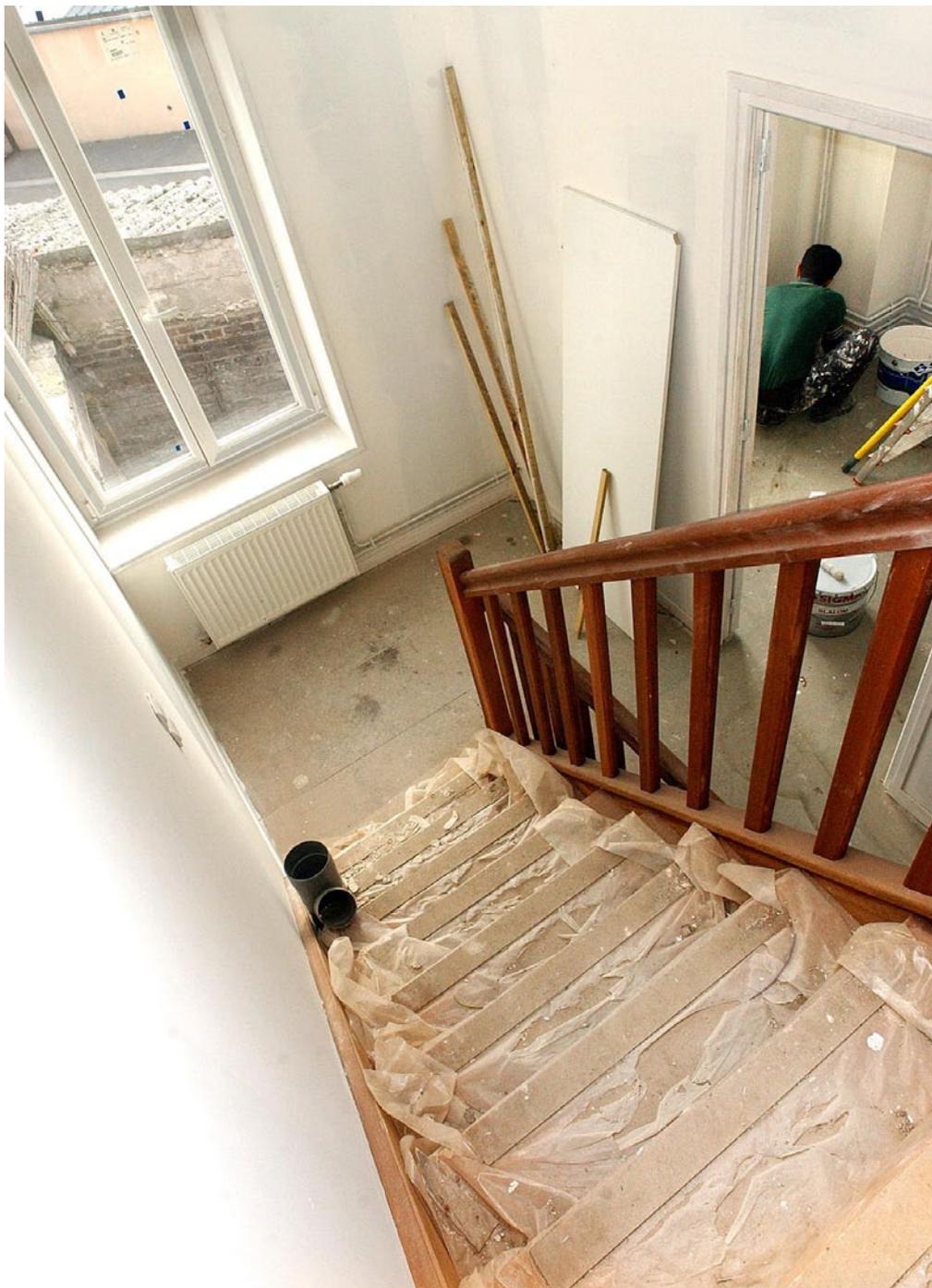
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# Improving the energy labelling scheme

Findings and recommendations for Denmark





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# Preface

This report summarises the main results of an EU project on consumer response to energy labels in buildings. The project is called Improving Dwellings by Enhancing Actions on Labelling for the EPBD (IDEAL EPBD). The IDEAL EPBD research project is funded by the EC Intelligent Energy Europe programme. This project commenced in October 2008 and will be finalised in September 2011. It is a joint undertaking of 10 European partners from Belgium, Bulgaria, the Czech Republic, Denmark, Finland, Germany, Latvia, the Netherlands, Portugal and the United Kingdom. For more information, see <http://www.ideal-epbd.eu/>.

This report is mainly directed at Danish policy makers. The main focus is therefore on results that are relevant from a Danish point of view and on how they can be used to further strengthen the EPBD process in Denmark. The first part of the report include the latest policy decisions and developments in relation to the EPBD process in Denmark, then it presents the methods of the study and its main findings and finally it propose some policy recommendations based on these findings and the current EPBD decisions.

Danish Building Research Institute, Aalborg University  
Town, housing and property  
August 2011

*Hans Thor Andersen*  
Research director

## Latest revisions on the EPBD in Denmark

In Denmark it has recently been decided to make some revisions in the way energy labels are considered, promoted and used. Whereas the primary idea of the label from its introduction was that the label in itself should encourage house owners to buy energy efficient buildings and to energy renovate their home, the label and its recommendations are now also seen as a source of information to be used by different types of other actors. All labels have for some years been publicly accessible via the internet attached to the address of the home, and in the future this will be further developed with more easy access and functionalities.

The idea is that the actors around the household, e.g. municipalities, tradespeople or bank advisers in contact with the household on other issues than energy renovations, easy can include knowledge from the label in their advice and dialogue with the household. At the same time, it is decided to run a major campaign on national television during 2011, aiming at encouraging people to energy renovate their home and to seek further information on the internet, where general knowledge and information will be further promoted. The label is thus seen as part of a whole package of information to homeowners and furthermore the label is also attempted to be used by others actors than the house owners.

In parallel, there is a Knowledge Centre for Energy Renovation of Buildings which focuses on information dissemination to professionals like tradespeople and building companies<sup>1</sup>. The label should still be issued prior to all sales of houses, and it is by now mandatory that the label is visible on all sales material from real estate agents.

Finally it is also decided to focus less on houses that have been built within the latest 25 years and thus have been covered by more tight energy regulations. These can now be labelled without the energy auditor physically inspecting the house, if the owner can document that the house has not undergone changes reducing the energy performance of the house since it was built. For new buildings there still need to be a physical inspection to control that the building is in accordance with the regulations.

## Methods in the study

The main results presented here build on a survey of 3200 households in Denmark (743), Germany (1165), Netherlands (565), England (626) and Finland (109). Results from this survey are further described in (Afi et al., 2011). Furthermore five qualitative interviews were conducted in these five countries and more than 25 qualitative interviews in each of the countries Belgium, Portugal, Latvia, Bulgaria and Czech Republic (Bartiaux, 2011). The households in the Danish part of the survey and interviews are drawn from the list of houses having received a label in 2007 or 2008. A random sample of 10,000 households was approached with a letter in June 2010 and encouraged to fill in an on-line questionnaire before mid-August. This resulted in 743 useable questionnaires. Survey respondents filled in a user-number on the questionnaire providing an opportunity to link the survey response to the information in the database of households with an energy label. However, this was not part of the present project and there is thus no funding for analysing on this part at the moment.

# Results from IDEAL-EPBD Project with a special Danish focus

Based on the current adjustments of the energy labels on buildings in Denmark, the results from the IDEAL-EPBD project, which can be of relevance to policy makers, can be divided into two parts. One focusing on results that can be used to support or comment on these adjustments and another focusing on more general issues that can be of relevance for further strengthening of the energy labelling system.

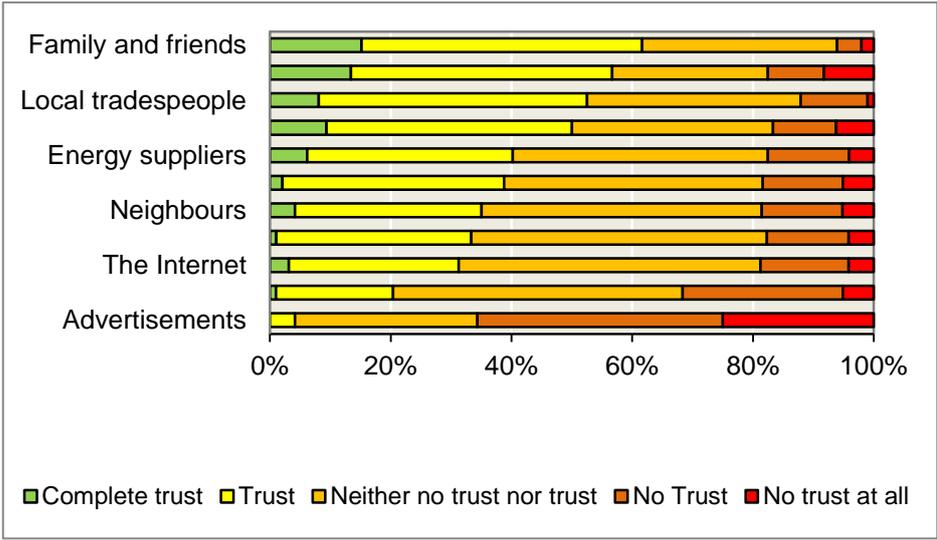
## The role of private and professional networks – Results related to recent changes

Based both on qualitative interviews in all 10 member states and on surveys in five member states, it is clear that the social network around the household is very important for decisions related to renovation of the home. This is seen in Figure 1, which summarises the Danish homeowners' level of trust in various sources of information on home improvements in general. It is here seen that family and friends are the most trusted sources. This is further developed in most of the Danish qualitative interviews, where the interviewees explain how they got advice from their friends or families regarding some of their renovations, and the same is seen in interviews from other member states (Bartiaux, 2011). Thus it is seldom that people carry through renovations of their home without discussing it with friends and family and seeking advice from their personal network. It will therefore be interesting to follow whether the label being still more available on the internet and thus being more easy accessible at all times thus also implies that the label and its recommendations will be included in (some of) the discussions in the personal network.

A less positive implication of making the label public might however relate to what was found in some of the interviews in other countries (Bartiaux, 2011; p18). Here we hear about informants who are reluctant to recognise the role of the energy assessment (in this case even though they have asked and paid for it themselves) and who prefer to show themselves as the master of their renovations. Making the label public without the owners acceptance might thus in some cases fuel a negative attitude towards the label from house owners.

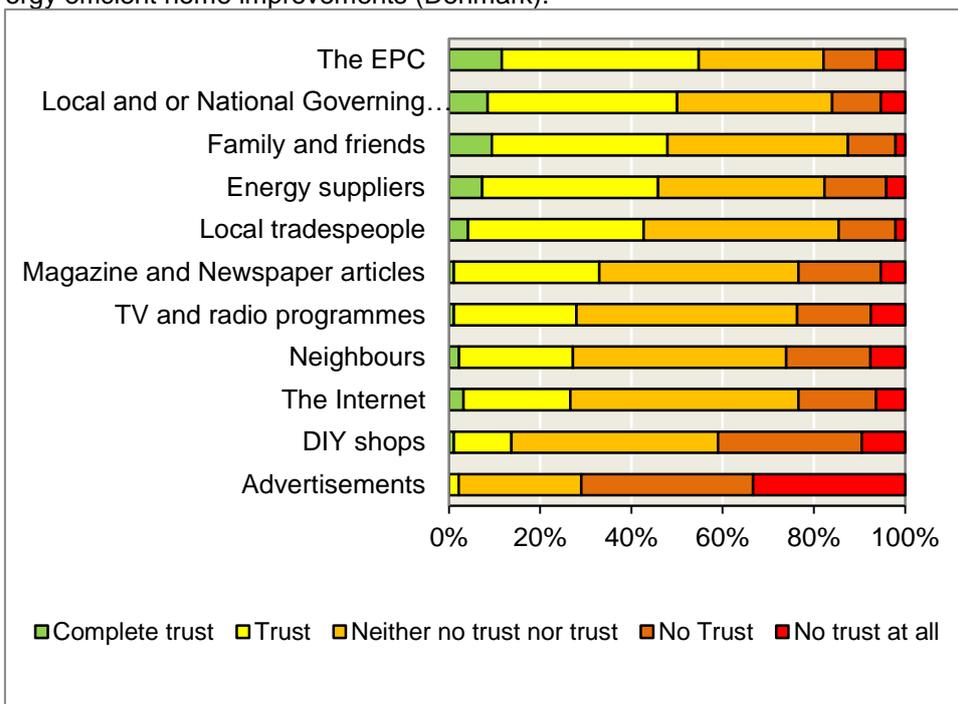
When asked about their trust in various sources of information on energy efficient home improvements (Figure 2), the EPC is rated by the Danish respondents as the most trusted source. However, family and friends are still among the three most trusted sources along with local or national governing authorities. In both figures, local tradespeople (= håndværkere) are among the five most trusted sources of information. However, if compared with the other four countries participating in the survey (Figure 3), Danish households are not those with the highest trust in local tradespeople and there are thus good arguments for improving the knowledge and competences of local tradespeople as is the purpose of the Knowledge Centre for Energy Renovation of Buildings. The question of how difficult people think it is to find reliable tradespeople, and the extent to which this prevents them from deciding to renovate their home as seen in Figure 4, further emphasises the need for this centre.

Figure 1. Homeowners level of trust in various sources of information on home improvements (Denmark)



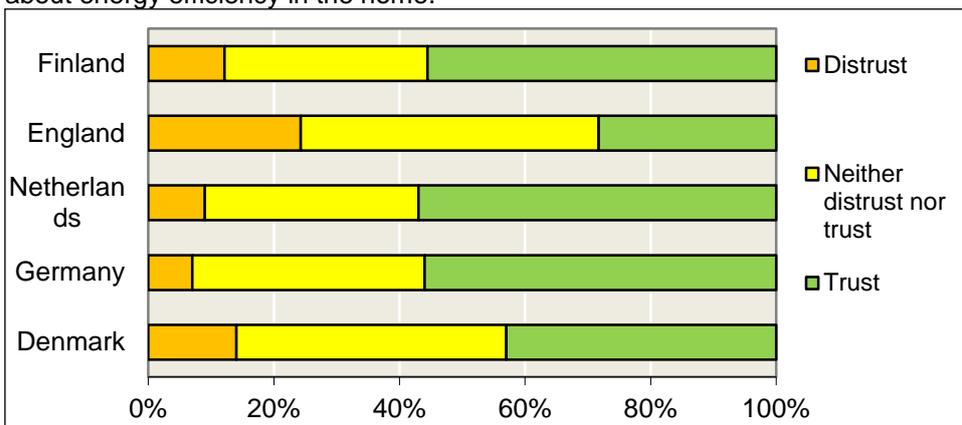
Source: Table C35-C45 in appendix C (Adjei, 2011).

Figure 2. Homeowners level of trust in various sources of information on energy efficient home improvements (Denmark).



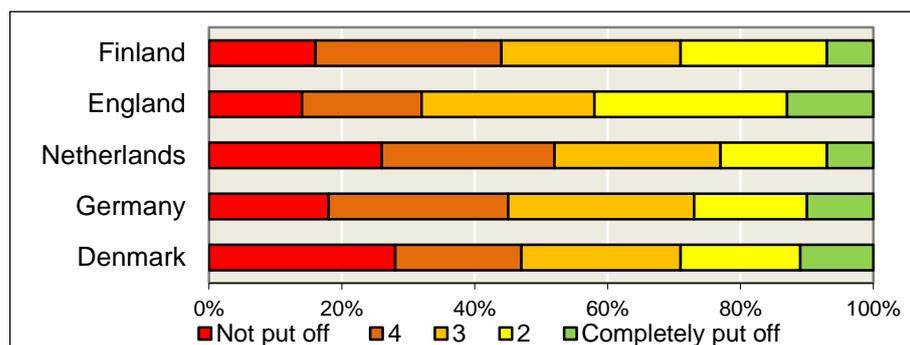
Source: Table F7-F17 in appendix F (Adjei, 2011).

Figure 3. The level of trust in local trades people as a source of information about energy efficiency in the home.



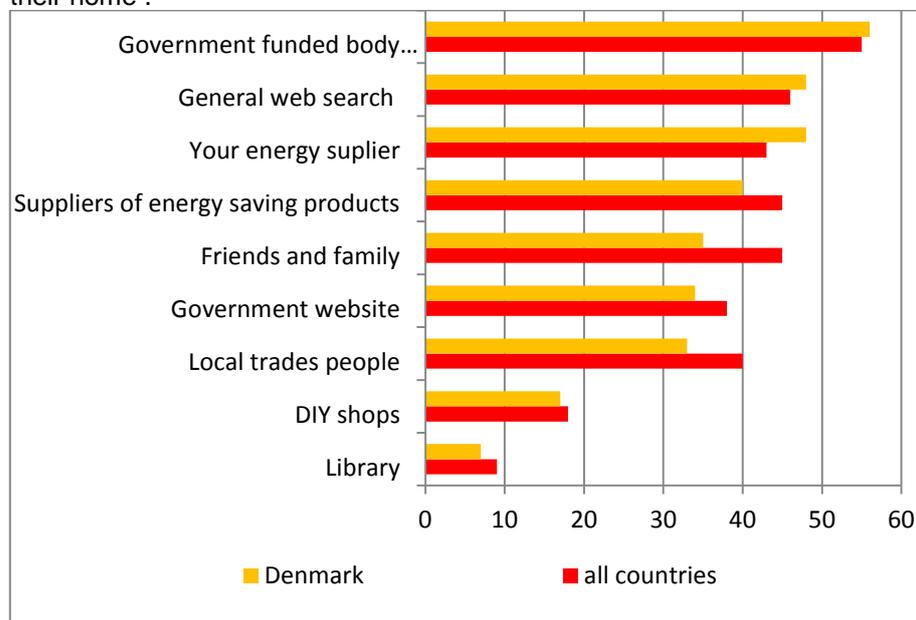
Source: table F11 in appendix F (Adjei, 2011).

Figure 4. Impact on decision to do work: Difficulties finding reliable tradespeople



Source: table F42 in appendix F (Adjei, 2011).

Figure 5. What sources of information respondents would consider in order to gain more information on how to make energy efficiency improvements of their home .



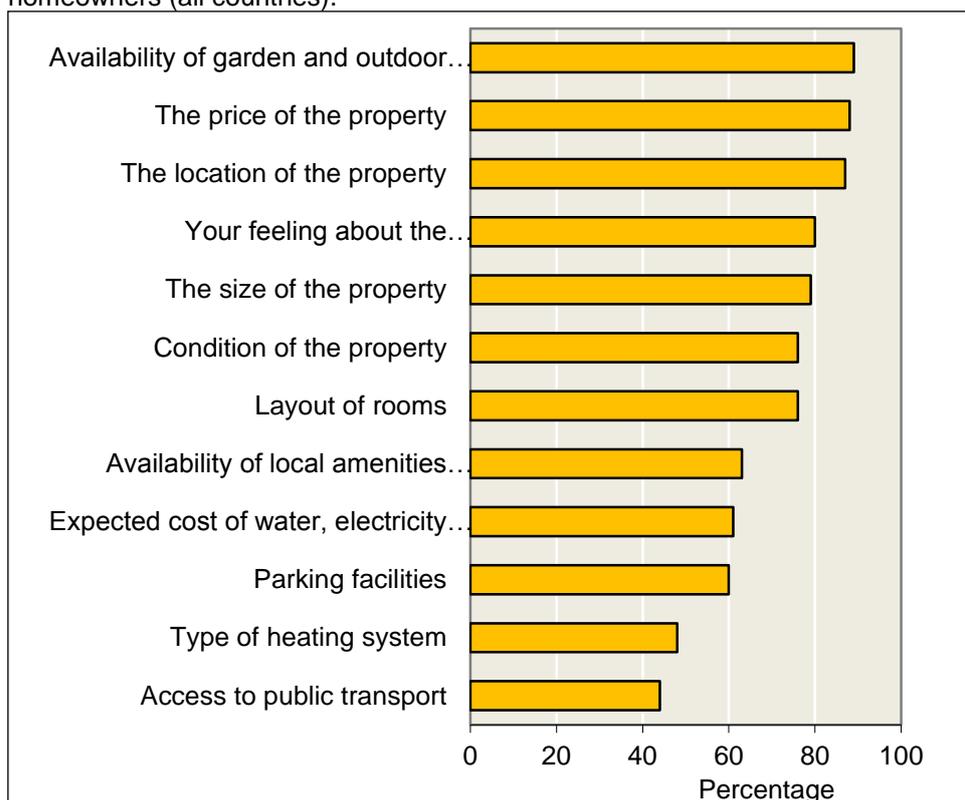
Source: table F19 in appendix F (Adjei, 2011).

People are also asked where they would prefer to seek further advice on energy efficiency. This is shown in Figure 5, and it is seen that a government-funded body providing information (in DK= *Elsparefonden/Center for energibesparelser*) has the highest score, together with general web search. This could thus be used to support the ideas to make government-funded knowledge even more accessible on the internet and through advertisement to promote even more people to seek information on the internet. Among the Danish respondents, it is also interesting to see that energy suppliers score quite high as source of information.

## Lessons learned about buying and renovating a home - Results of general relevance

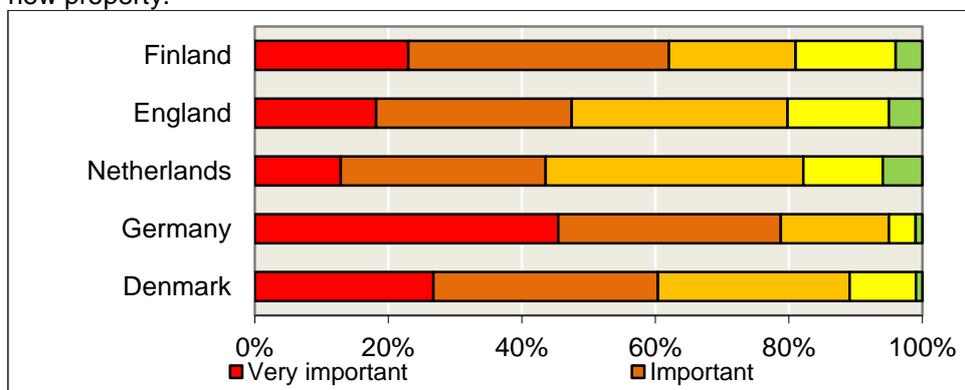
When people buy a new home, many things are considered to be more important than energy consumption, see Figure 6. However, when asked specifically about the importance of the utility cost, 60% of Danish households states that this is important or very important, see Figure 7. It is furthermore interesting to notice that women to a higher degree find the utility cost important than men do (not shown in figure here)

Figure 6. Home buying priorities rated 'very important' or 'important' by homeowners (all countries).



Source: table B13- B24 in appendix B (Adjei, 2011).

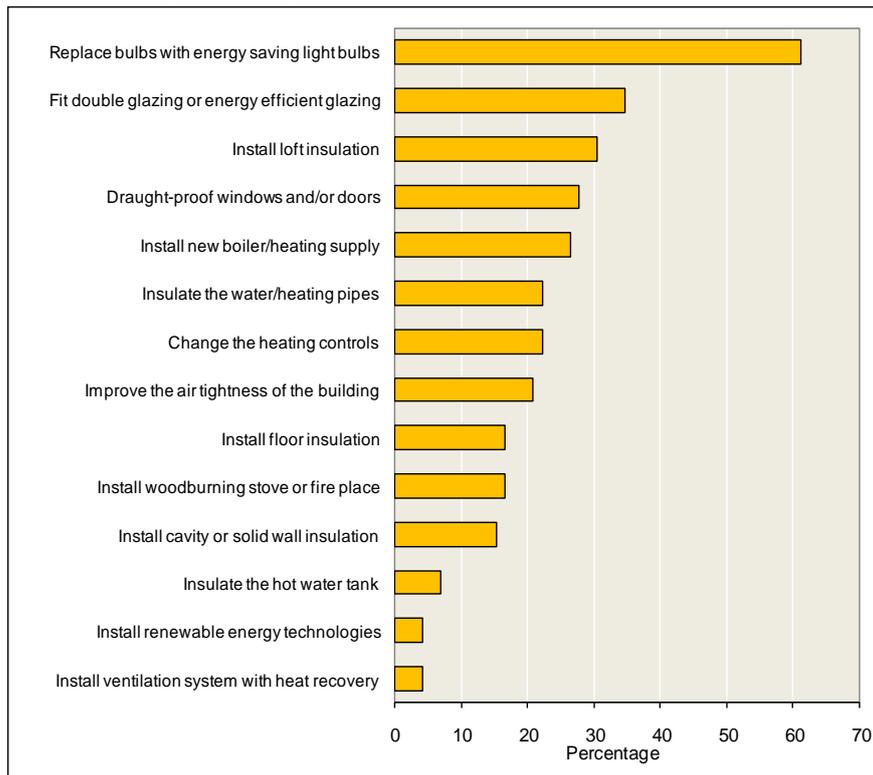
Figure 7. Importance of utility costs when respondents were looking for a new property.



Source: table B17 in appendix B (Adjei, 2011).

One thing is what people prioritise when buying a home, another is how they renovate the home after they bought it. The survey reveals that three quarters of the Danish homeowners (72%) had completed some form of home improvement, even though they had only lived in their home for a few years. The most common of these improvements was decorating the dwelling (58% of all respondents), changed garden and outdoor areas (49%) or change to energy efficient light bulbs (44%). Among the more costly improvements, 46% of those having done some improvements had renewed their kitchen and 39% their bathroom, whereas fitting double glazing or energy efficient glazing were done by 35%, installing loft insulation by 31%, draught-proofing windows and/or doors by 28% and installing a new boiler or heating system by 26%. In Figure 8, the percentages of households that had completed energy efficient improvements are shown. It is seen that besides installing energy-saving light bulbs and fitting double or energy efficient glazing, the other types of energy efficient home improvements are done by less than one-third of the households who carried out any kind of home improvement. It thus seems that when people choose to renovate their home, energy renovations are in general lower on the priority list than most other types of renovations such as general decoration or improving kitchen/bathroom.

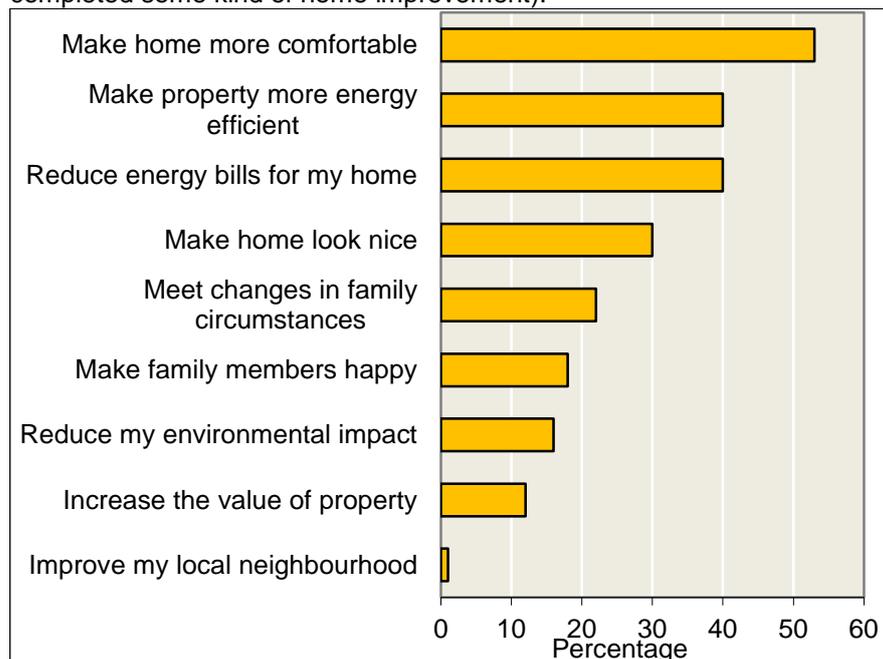
Figure 8. The percentage of the Danish households that had completed energy efficiency improvements (percent of households who had completed any kind of improvement).



Source: table C2 in appendix C (Adjei, 2011).

When looking at what has motivated people to carry out home renovations in general, it is found that comfort and energy concerns are the main reasons. Figure 9 shows that 53% rate comfort as a very important reason for carrying out improvements, whereas making the property more energy efficient and reducing the energy bill are rated as very important by 40% of the households who have carried out any kind of home improvement.

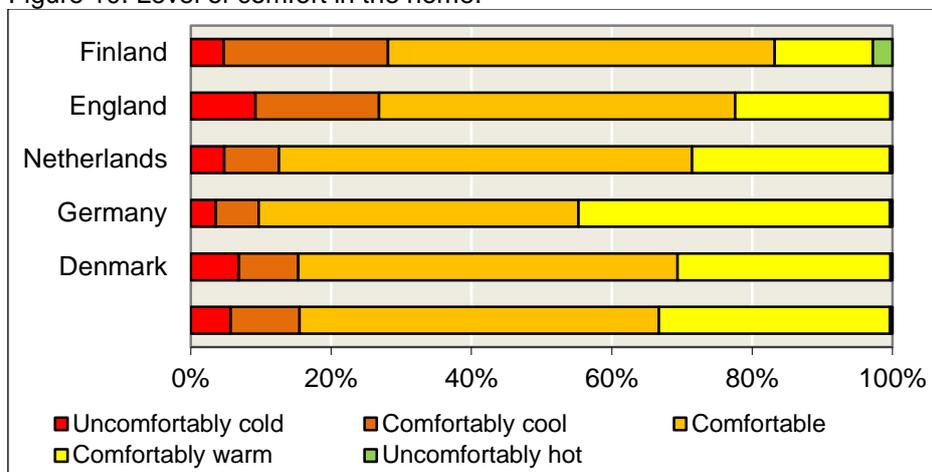
Figure 9. Reasons for completing home improvements rated as “very important” by homeowners (Denmark, percentage of homeowners who have completed some kind of home improvement).



Source: table C9-C17 in appendix C (Adjei, 2011).

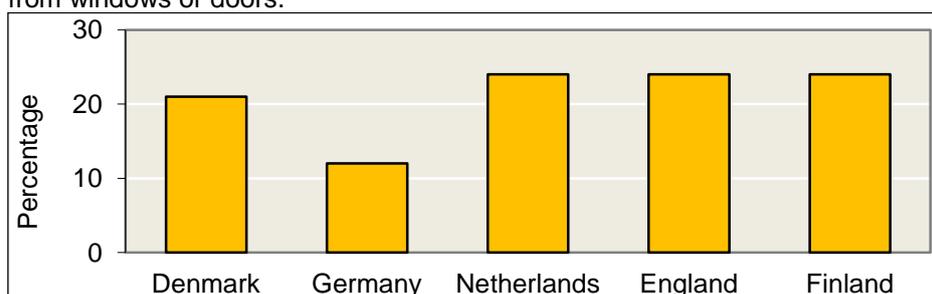
As comfort seems to be the main motivator for improvements, it is relevant to take a closer look at this. In Figure 10, households' statements on their level of comfort are shown. In Denmark only about 6% think that their home is uncomfortably cold, and in Figure 11 it is seen that approx. 20% think they have problems with draught from windows and doors. It is thus apparent that comfort issues are not likely to motivate the majority of households to do further extensive energy renovation on their home in Denmark.

Figure 10. Level of comfort in the home.



Source: table B31 in appendix B (Adjei, 2011).

Figure 11. Percentage of households with notable problems with draught from windows or doors.



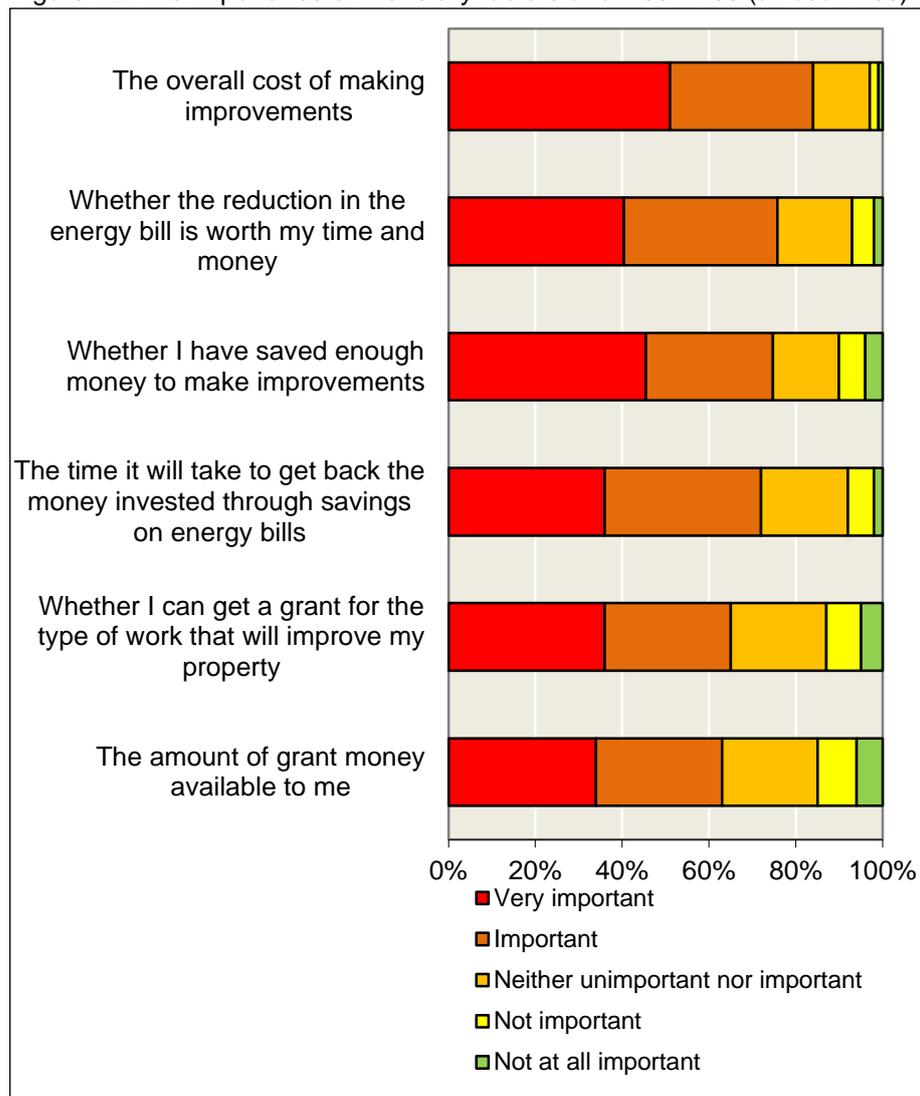
Source: table B26 in appendix B (Adjei, 2011).

Other factors that might work as motivators of energy renovations are monetary and fiscal incentives. In Figure 12, it is seen that all the proposed factors are valued as important by more than 60%. It is also seen that the overall cost and whether people have the money for the improvement are valued higher than possible savings and payback time.

However, we find a slightly different picture if we focus only on the Danish sample. Here, possible savings (whether the reduction is worth time and money) and payback time are the second and third most important factors (in the Danish sample, these are rated as important or very important by 73% and 69% respectively). Whether people have the money for the improvements are the fourth highest motivator (65%), while the overall costs are still the most important factor (75%). Thus, Danish homeowners seem to focus more on the direct profitability of energy efficiency home improvements as compared with the other countries.

Also, in the Danish sample we find that the importance of the grant money available is less important compared with the other countries, as less than 20% find that this is very important, which can probably be explained by the fact that there have been fewer possibilities in Denmark to get grant money compared with some of the other countries.

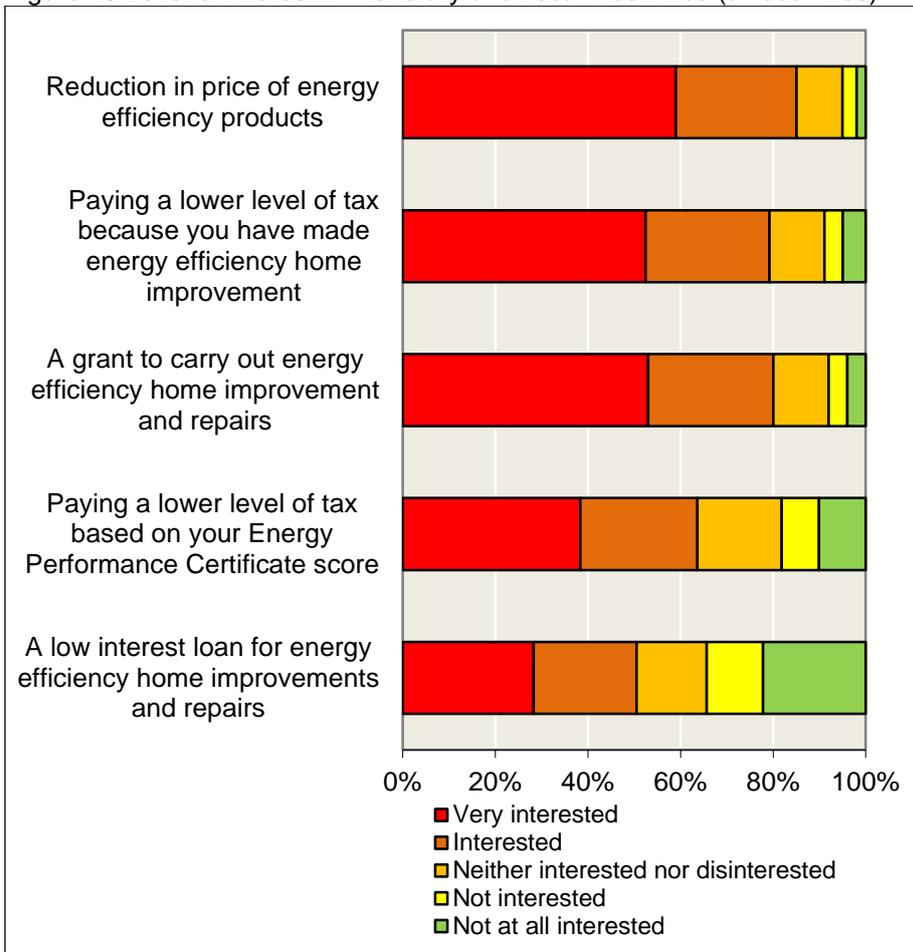
Figure 12. The importance of monetary factors and incentives (all countries).



Source: table F27 –F32 in appendix F (Adjei, 2011).

Respondents’ interest in different types of monetary and fiscal incentives is shown in Figure 13. Here it is seen that reduced prices on energy efficient products are valued the highest and low interest loan are valued the lowest. Respondents thus seem to prefer to be able to pay for the energy renovation rather than lending the money.

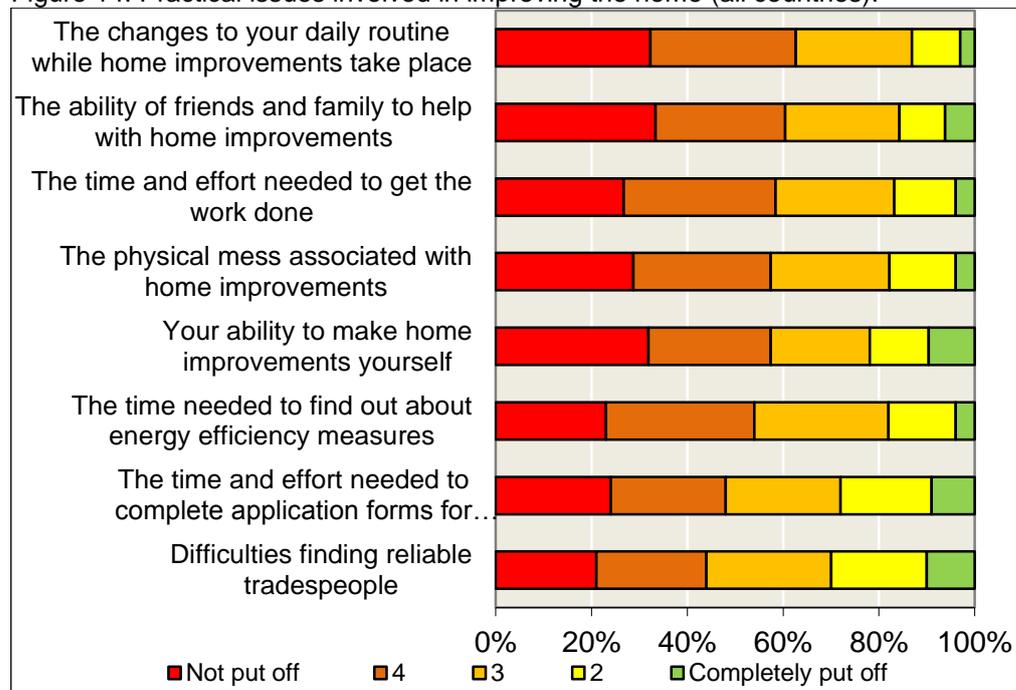
Figure 13 Level of interest in monetary and fiscal incentives (all countries).



Source: table F33 –F37 in appendix F (Adjei, 2011).

Above focus was on what can motivate house owners to renovate; in the following focus will be on what can hinder people in doing renovations. In Figure 14, households have stated to what extent different things “put them off” from renovating their home. In general, it is remarkable that more than 40% states that none of the proposed issues put them off. It is also interesting to see that finding reliable tradespeople is what put most households off renovating their home. In the Danish sample, 27% answer that this would put them off, which is the same amount as those who indicate that their lack of ability to make home improvements would keep them from doing these (also 27%).

Figure 14. Practical issues involved in improving the home (all countries).



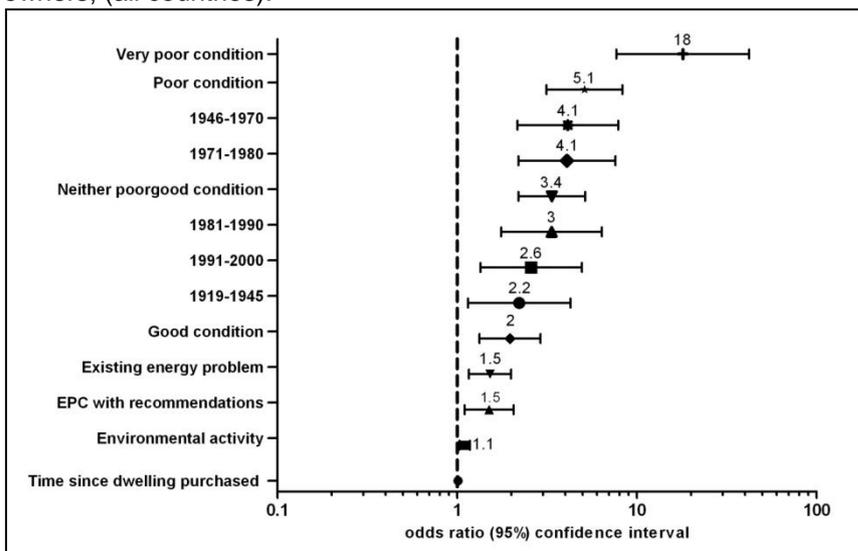
Source: table F38- F45 in appendix F (Adjei, 2011).

Based on the survey result, binary regression analysis has been made showing to what extent different factors can influence house owners to energy renovate their home. Figure 15 shows the odds ratio for different factors that might influence the likelihood of energy renovating the home. If a factor has an odd ratio higher than 1, it is associated with an increased likelihood of carrying out one or more energy efficiency improvements. It is seen that the condition of the house at the time of purchase is what influence the most if people energy renovate their home.

The second most important factor is the age of the house. People who reported that they had an energy-related problem in their dwelling are also more likely to carry out energy renovations. It is also seen that people who has stated that they have an energy label on their home with recommendations are more likely to carry out renovations.

In the Danish sample we know that all households included in the survey should have a label with recommendations; however, in some of the other countries this is not necessarily the case. Among the Danish respondents, 80% states that they have an energy label, meaning that 20% do not know that there is a label on their home. If people have reported that they carry out environmental activities (e.g. recycle paper, make compost reduce energy and water), to a minor extent this also seem to increase the chance that they will energy renovate their home.

Figure 15. Factors influencing the energy efficiency behaviour of all homeowners, (all countries).



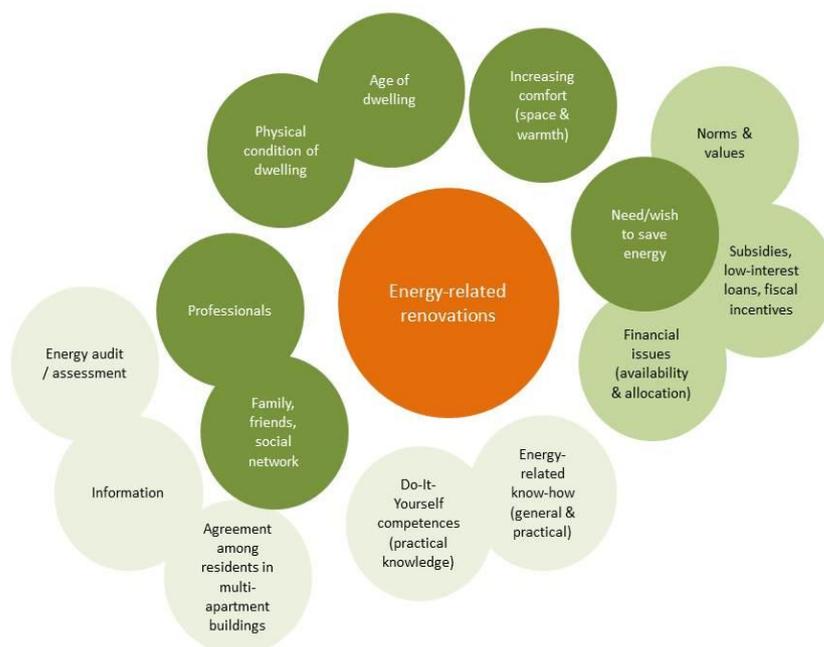
Source: p 98 (Adjei, 2011).

The tendencies that are shown in Figure 15 are further underlined in the picture overleaf showing the different factors playing a relevant role for why people energy renovate their home. This picture summarises the results drawn from more than 100 qualitative interviews in the ten participating countries.

The dark green circles represent the factors related to the dwelling, the owner and the network around the house owner, which might have a direct influence on the decision to energy renovate the home. The light green circles represent how the house owners, who wish to save energy, might be influenced by policy initiatives related to norms and values by campaigns or economic interest by different types of monetary initiatives. And finally the white circles represent the knowledge, know-how and competences of the house owners, and their private and professional network, and thus also represent a policy possibility of raising this level of the knowledge and competences related to energy renovations.

Figure 16. Factors influencing energy-related renovations (based on qualitative interviews in all countries).

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

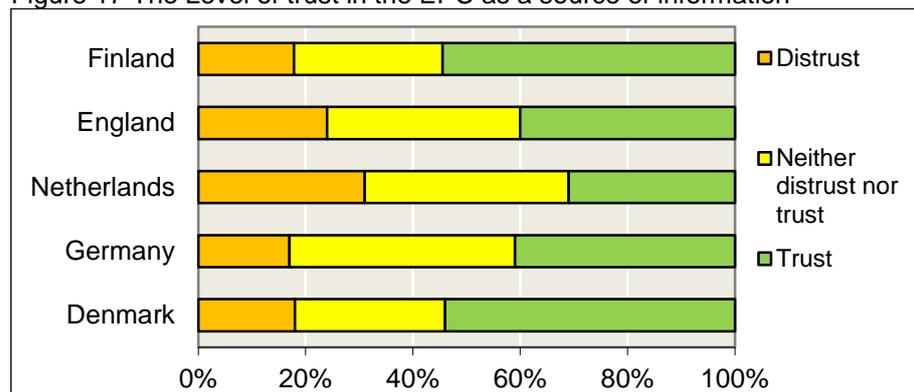


## What people think about the label - Results of general relevance

In the contact with the homeowners, the survey and the interviews, households were not told that the main purpose of the project was to improve the energy label. Households were told that the survey was about comfort in their home, and questions concerning the label were not at the beginning of the questionnaire. This was to prevent biasing people when they decided to take part in the survey and when answering questions on their renovation of the building, and also to have people answer even if they did not know about the energy label. In the survey, if respondents indicated that they did not know the energy label, a picture was shown of how the label looks, to help them remember it.

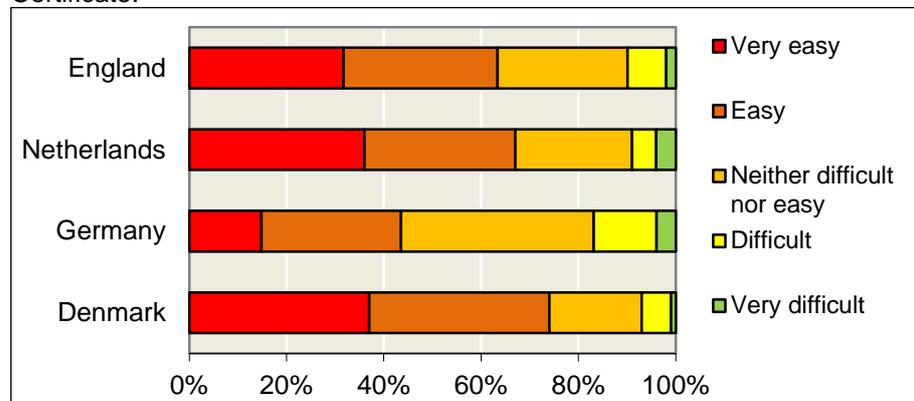
First of all it is interesting to notice that 20% of the Danish respondents state that they do not have a label, even though we have drawn their address from a list of houses with issued labels. It is thus relevant to question whether these house owners have just forgotten that they have seen the label, or if real estate agents have not given the label to the house owner. Among those knowing about the label, there are however almost 20% of Danish households who state that they do not trust the label and only slightly more than half of the respondents state that they trust the information (see Figure 17). Even though these figures are better than English and Dutch ones, it shows that there is certainly room for improvements. On the positive side, it can be said that 73% of Danish households find it easy to understand the label and only 6% find it difficult (see Figure 18).

Figure 17 The Level of trust in the EPC as a source of information



Source: table F15 in appendix F (Adjei, 2011)

Figure 18. Homeowners' level of understanding of the Energy Performance Certificate.

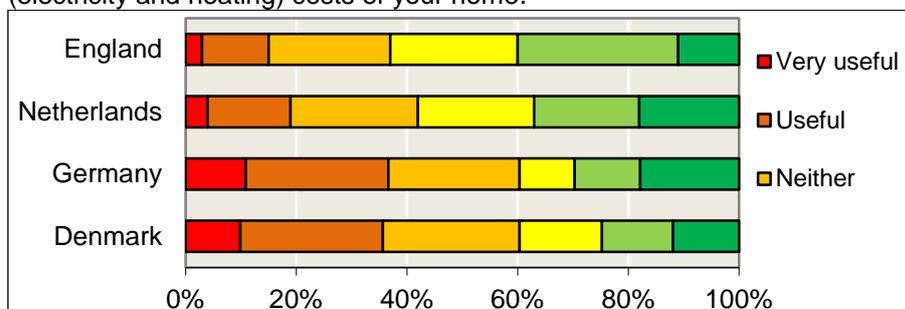


Source: table D39 in appendix D (Adjei, 2011).

Households have been asked how useful they find the label in relation to information on energy cost, on where to find further information, on the improvements needed and on the label as a source of information on the cost of making energy efficient improvements of the house. In Figures 19, 20, 21 and 22 it is seen that Danish households are among the most positive as re-

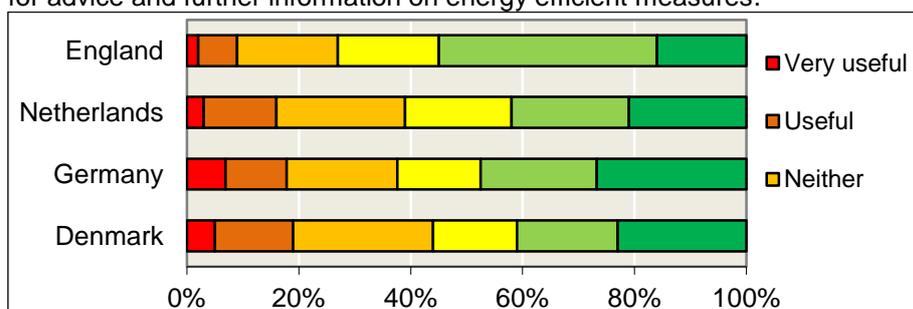
gards the usefulness of the label. In general, households find the label most useful for giving information on the energy costs of their home (figure 19) and on which improvements that are needed to reduce their energy bill (Figure 21). However, more than half of the Danish respondents do not find the label useful as regards recommendations of home improvements. Furthermore, only 20% find the label useful as a source of information on where to go for advice and further information on energy efficient measures (Figure 20). Thus, there is still room for improvements.

Figure 19. Usefulness of the EPC as a source of information on the energy (electricity and heating) costs of your home.



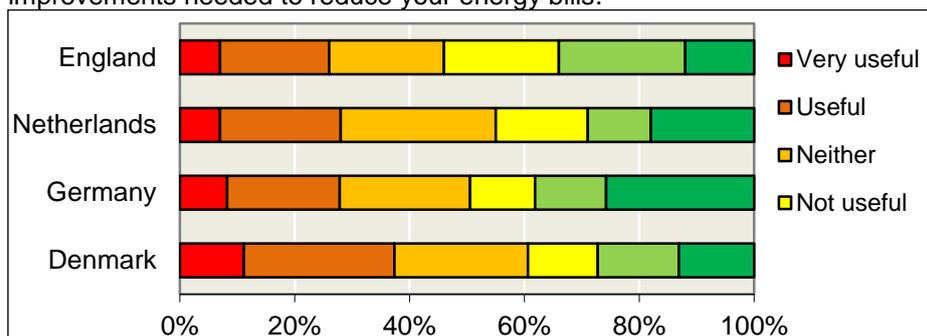
Source: table D42 in appendix D (Adjei, 2011).

Figure 20. Usefulness of the EPC as a source of information on where to go for advice and further information on energy efficient measures.



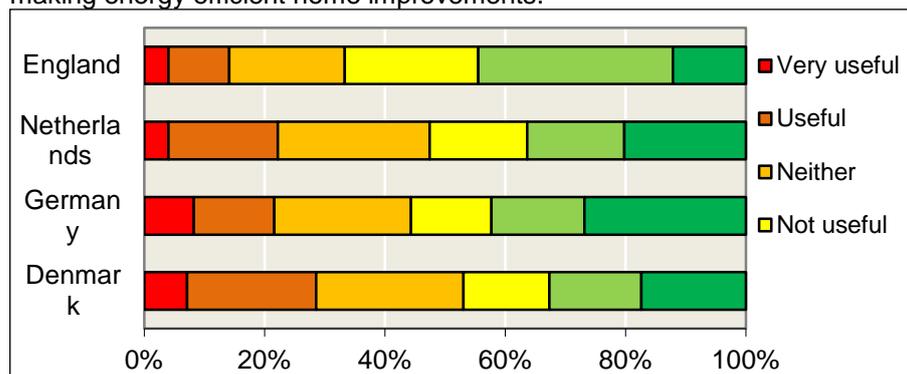
Source: table D45 in appendix D (Adjei, 2011)

Figure 21. Usefulness of the EPC as a source of information on the home improvements needed to reduce your energy bills.



Source: table D43 in appendix D (Adjei, 2011).

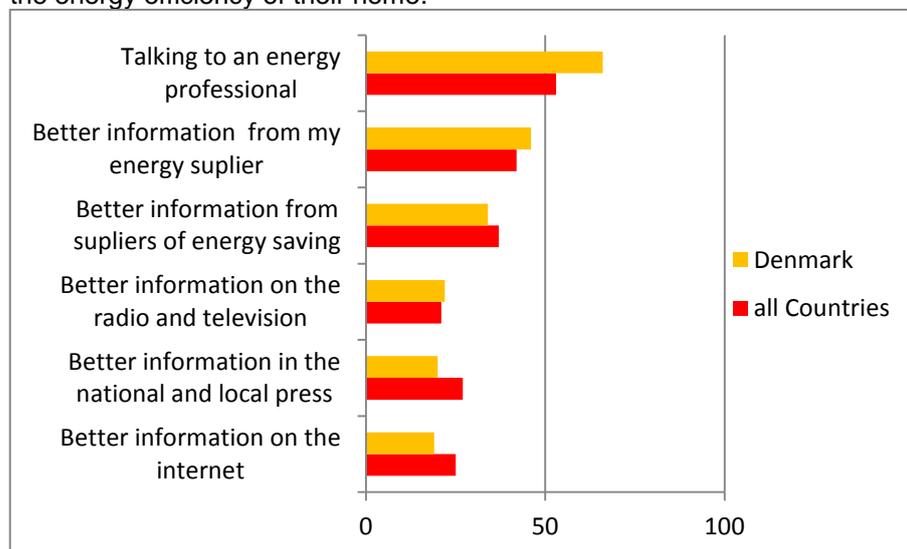
Figure 22. Usefulness of the EPC as a source of information on the cost of making energy efficient home improvements.



Source: table D44 in appendix D (Adjei, 2011).

What the respondents themselves think would help them to make decisions on improving the energy efficiency of their home is talking to an energy professional. As seen in Figure 23, this is rated by 53% of all house owners and by 66% of the Danish respondents. Comparing this with better information on the internet it is seen that only 19% of the Danish respondents find this would help them. This does however not mean that people do not use the internet or consider it important. Figure 5 in the first part of the memo shows respondents' answer to the question of which sources of information they would consider to gain more information on energy improvements of their home. Here it is seen that general web searches and information from *Center for Energibesparelser / Elsparefonden* are rated the highest. Taken together, this shows that relevant useable knowledge on the internet is important. However, either respondents think that the knowledge on the web is already as good as it can be, or they do not think that internet information can stand alone and that they also need more personally provided information.

Figure 23. What respondents think would help them to make decisions on the energy efficiency of their home.



Source: table F18 in appendix F (Adjei, 2011).

# Recommendations

Besides the improvements that are already decided or implemented in Denmark, there are some further recommendations based on results presented in the previous, which can be suggested:

## Improve the label on reliability (trust) and usefulness

If the label should work as a base of information for the network of actors around the household, it is very important that people trust the information in the label. Only half of the Danish respondents in this survey trust the information, which must be considered a problem. Higher trust can be achieved if label quality is improved, e.g. through better education of the energy auditors or enhanced inspection and spot test so that media cannot report on errors in labels.

In Denmark we can be satisfied that Danish households are among those who value their labels the most compared with households in the other countries involved in the survey. The feature that respondents find to be most useful in the label is which improvements are needed in order to make the house more energy efficient. This is important as this also must be seen as the main purpose of the label. Still, more than half of the respondents do not find the label useful as regards this information, and it is thus relevant to find out how the label can be improved on this issue.

## Include direct dialogue with the energy auditor

What people themselves state that they think would improve their knowledge on energy renovations is talking to an energy professional. It is thus relevant to consider how this could be incorporated into the Danish labelling scheme, especially for houses with a lower energy rating, and where renovations are most needed. For many house owners, decisions on what to renovate are taken after moving into the home. Talking to an energy professional should thus be after some months in order to give the new house owners some time to settle in and learn their new home before having this extra input. For some house owners it might, however, be relevant to have the personal consultation right after they have decided to buy the home and before they take loan for buying the house, so that they can include loans for energy renovation. Therefore, our recommendation would be that for houses with low energy rating it should be compulsory to have a personal consultation with an energy professional within the first two years (the specific time for the consultation being decided by the new owner themselves).

## Focus on the houses where energy renovations are most needed

From the binary regression analysis we see that the older the house is and the poorer its condition, the more likely it is that house owners will carry through renovations. This is quite obvious, and corresponds to which houses need the energy renovations the most. In continuation of this, it is remarkable that the European energy labelling scheme does not distinguish between older and newer houses in the efforts of encouraging house owners to improve their homes. In the latest Danish revisions there are included changes so that the newest and thus most energy efficient houses can have a more easy (and cheap) energy labelling process. This could be supplemented

with enhanced focus on the houses having the lowest energy labels, e.g. by a compulsory consultation by an energy professional.

## Improve economic instruments related to renovations

House owners rate economy as important when deciding to energy renovate, however in Denmark there are few economic incentives to make house owners invest in energy renovations. Incentives such as reduction of price, of tax or the possibility of getting a grant are weighted higher than the possibility of a low-interest loan.

## House owners' weighting of energy renovation versus other types of renovation

Related to economy, not only the payback time is important for people, but also the overall cost of the improvement and whether the house owners has the money. Therefore the house owners often realize that they have to choose between e.g. renovating the kitchen or making energy-efficient renovations. As the survey shows, people most often prioritise to do kitchen and bathroom renovations, rather than energy efficiency.

It is thus relevant to support the development of solutions within energy efficiency, which might be attractive in some of the same ways as kitchen and bathrooms, that is to work on how social status and aesthetics to a higher degree can be a driver for making energy-efficient renovations. Installing visible renewable energy solutions, such as PVs, might be of specific interest here.

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This report summarises the main results of an EU project on consumer response to energy labels in buildings. This report is mainly directed at Danish policy makers. The main focus is therefore on results that are relevant from a Danish point of view and on how they can be used to further strengthen the EPBD process in Denmark. Recommendations include

- Improve the label on reliability (trust) and usefulness
- Include direct dialogue with the energy auditor
- Focus on the houses where energy renovations are most needed
- Improve economic instruments related to renovations
- House owners' weighting of energy renovation versus other types of renovation

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